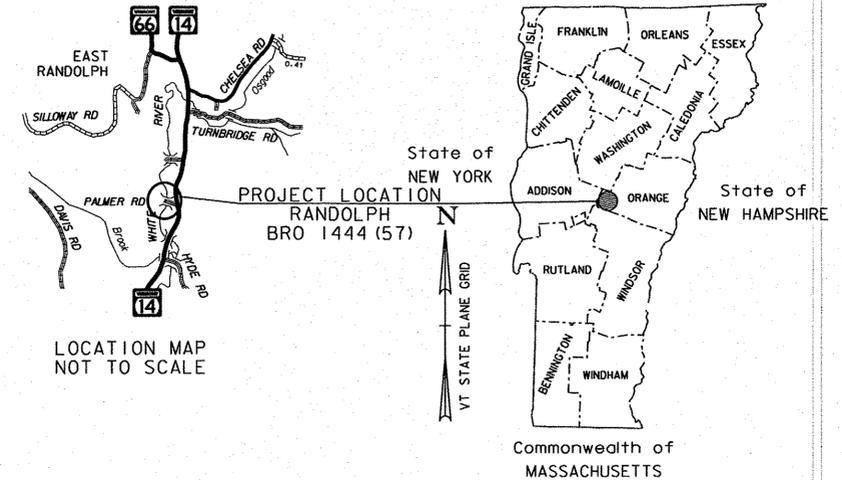


# STATE OF VERMONT AGENCY OF TRANSPORTATION



## PROPOSED IMPROVEMENT BRIDGE PROJECT TOWN OF RANDOLPH COUNTY OF ORANGE

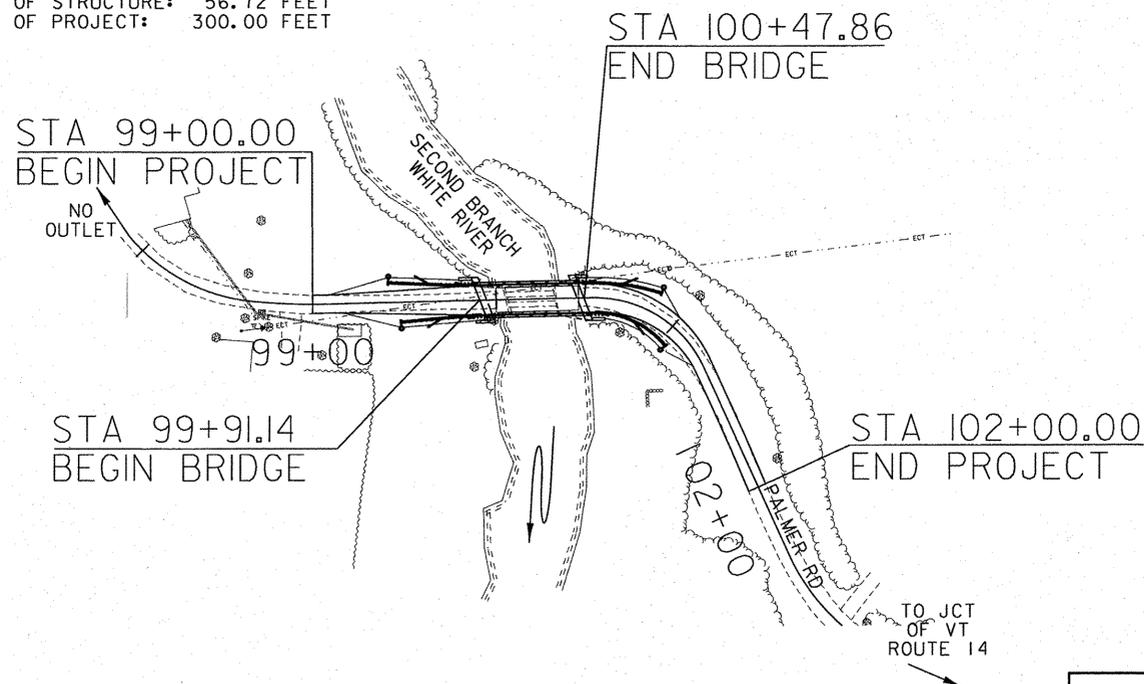
### TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD - BRIDGE NO. 35



**PROJECT LOCATION:** LOCATED IN THE TOWN OF RANDOLPH, ON TOWN HIGHWAY 65, BEGINNING FROM A POINT APPROXIMATELY 700 FEET WEST OF THE INTERSECTION WITH VT ROUTE 14 AND EXTENDING EASTERLY 300 FT TO A POINT APPROXIMATELY 400 FEET WEST OF THE INTERSECTION WITH VT ROUTE 14.

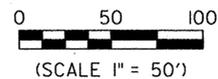
**PROJECT DESCRIPTION:** WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES REPLACEMENT OF THE EXISTING STRUCTURE WITH A NEW STRUCTURE INCLUDING RELATED ROADWAY AND CHANNEL WORK.

**LENGTH OF ROADWAY:** 243.28 FEET  
**LENGTH OF STRUCTURE:** 56.72 FEET  
**LENGTH OF PROJECT:** 300.00 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 : VTRANS SURVEYED DATE : 12/11/2012
DATUM VERTICAL NAVD 88 HORIZONTAL NAD 83 (96)



	<p>540 Commercial Street Manchester, NH 03101 (603) 668-8223 www.cldengineers.com</p>	DIRECTOR OF PROJECT DELIVERY APPROVED: <i>[Signature]</i> DATE 8/12/2014
		PROJECT MANAGER : TODD SUMNER, P. E.
		PROJECT NAME : RANDOLPH PROJECT NUMBER : BRO 1444(57)
		SHEET 1 OF 39 SHEETS

C.D. 12-0175 MODEL: T116

# PRELIMINARY INFORMATION SHEET (BRIDGE)

LRFD

INDEX OF SHEETS

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STRUCTURES DETAILS

SD-501.00	CONCRETE DETAILS AND NOTES	02-09-2012
SD-502.00	CONCRETE DETAILS AND NOTES	10-10-2012

STANDARDS LIST

B-5	SLOPE GRADING, EMBANKMENTS, MUCK	06-01-1994
G-1b	BOX BEAM GUARDRAIL	06-01-1994
S-364A	BRIDGE RAILING, GALVANIZED 3 RAIL BOX BEAM	04-23-2012
S-364B	GUARDRAIL APPROACH SECTION, GALVANIZED 3 RAIL BOX BEAM	04-23-2012
S-364C	GUARDRAIL APPROACH SECTION, GALVANIZED 3 RAIL BOX BEAM	04-23-2012
S-364D	GUARDRAIL APPROACH SECTION, GALVANIZED 3 RAIL BOX BEAM	04-23-2012
T-1	TRAFFIC CONTROL GENERAL NOTES	08-06-2012
T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	08-06-2012
T-28	CONSTRUCTION SIGN DETAILS	08-06-2012
T-40	DELINEATORS AND MILEPOSTS	01-02-2013
T-45	SQUARE TUBE SIGN POST AND ANCHOR	01-02-2013

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: September 27, 2013

DRAINAGE AREA : 47.3 SQ. MI  
 CHARACTER OF TERRAIN : HILLY TO MOUNTAINOUS  
 STREAM CHARACTERISTICS : STRAIGHT, NON-ALLUVIAL, AND PERENNIAL CHANNEL  
 NATURE OF STREAMBED : GRAVEL AND COBBLES WITH SILT

PEAK FLOW DATA

Q 2.33 =	1510 CFS	Q 50 =	7060 CFS
Q 10 =	3730 CFS	Q 100 =	8570 CFS
Q 25 =	5390 CFS	Q 500 =	13810 CFS

DATE OF FLOOD OF RECORD : UNKNOWN  
 ESTIMATED DISCHARGE : N/A  
 WATER SURFACE ELEV. : N/A  
 NATURAL STREAM VELOCITY : @ Q25 = 8.2 FPS  
 ICE CONDITIONS : MODERATE  
 DEBRIS : MODERATE  
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? NO  
 IS ORDINARY RISE RAPID? NO  
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? NO  
 IF YES, DESCRIBE :

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE : CONCRETE JACK ARCH WITH STONE ABUTMENTS  
 YEAR BUILT : 1919  
 CLEAR SPAN(NORMAL TO STREAM) : 26 FT  
 VERTICAL CLEARANCE ABOVE STREAMBED : 9.5 FT (EL. 571.7 FT)  
 WATERWAY OF FULL OPENING : 240 SQ. FT.  
 DISPOSITION OF STRUCTURE : REPLACEMENT  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE : SEE BORINGS

WATER SURFACE ELEVATIONS AT:

Q2.33 =	571.3 FT	VELOCITY =	9.1 FPS
Q10 =	576.2 FT	"	8.0 FPS
Q25 =	577.3 FT	"	8.2 FPS
Q50 =	578.0 FT	"	8.8 FPS
Q100 =	578.5 FT	"	9.3 FPS

LONG TERM STREAMBED CHANGES : MINIMAL DUE TO LARGE SIZE OF  
 STREAMBED MATERIAL

IS THE ROADWAY OVERTOPPED BELOW Q100 : YES  
 FREQUENCY : Q10  
 RELIEF ELEVATION : 573.6 FT  
 DISCHARGE OVER ROAD @Q100 : 1438 CFS

UPSTREAM STRUCTURE

TOWN : RANDOLPH DISTANCE : 0.5 MI  
 HIGHWAY# : TH NO. 64 STRUCTURE # : 38  
 CLEAR SPAN : 33 FT CLEAR HEIGHT : UNKNOWN  
 YEAR BUILT : 1904 (REBUILT 2008) FULL WATERWAY : UNKNOWN  
 STRUCTURE TYPE : ROLLED BEAM / SEMI KG POST - COVERED BRIDGE

DOWNSTREAM STRUCTURE

TOWN : RANDOLPH DISTANCE : 0.4 MI  
 HIGHWAY# : VT 14 STRUCTURE # : 34  
 CLEAR SPAN : 55 FT CLEAR HEIGHT : UNKNOWN  
 YEAR BUILT : 1995 FULL WATERWAY : UNKNOWN  
 STRUCTURE TYPE : ROLLED BEAM

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	1.50	1.02					
POSTING							
OPERATING	1.88	1.33	1.86	1.04	1.35	1.23	1.47
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	
2014	15	2	64	7.3	1	20 year ESAL for flexible pavement from 2014 to 2034 : 4000
2034	20	2	64	9	2	40 year ESAL for flexible pavement from 2014 to 2054 : 9000
						Design Speed : 25 mph

PROPOSED STRUCTURE

STRUCTURE TYPE : CONCRETE NEXT BEAMS ON INTEGRAL ABUTMENTS  
 CLEAR SPAN(NORMAL TO STREAM) : 47 FT  
 VERTICAL CLEARANCE ABOVE STREAMBED : 9.7 FT (EL. 571.9 FT)  
 WATERWAY OF FULL OPENING : 354 SQ. FT.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	570.7 FT	VELOCITY =	6.0 FPS
Q10 =	575.8 FT	"	8.4 FPS
Q25 =	577.1 FT	"	8.2 FPS
Q50 =	577.9 FT	"	8.9 FPS
Q100 =	578.4 FT	"	9.3 FPS

IS THE ROADWAY OVERTOPPED BELOW Q100 : YES  
 FREQUENCY : Q10  
 RELIEF ELEVATION : 574.0 FT  
 DISCHARGE OVER ROAD @Q100 : 642 CFS

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE : 572.4 FT  
 VERTICAL CLEARANCE : @Q25 = -4.7 FT (SUBMERGED)

SCOUR : CONTRACTION SCOUR - 0 FT

REQUIRED CHANNEL PROTECTION : TYPE IV STONE FILL

PERMIT INFORMATION

AVERAGE DAILY FLOW : 400 CFS DEPTH OR ELEVATION :  
 ORDINARY LOW WATER : 250 CFS 565.9 FT  
 ORDINARY HIGH WATER : 648 CFS 567.9 FT

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE : NO TEMPORARY STRUCTURE  
 CLEAR SPAN (NORMAL TO STREAM) : N/A  
 VERTICAL CLEARANCE ABOVE STREAMBED : N/A  
 WATERWAY AREA OF FULL OPENING : N/A

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	d <sub>p</sub> : 2.5 INCH
3. DESIGN SPAN	L : 53.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ : 0.81 INCH
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f <sub>y</sub> : 270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f'c : 6.0 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'cr : 4.8 KSI
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'c : ---
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'c : ---
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'c : ---
11. CONCRETE, CLASS C	f'c : ---
12. REINFORCING STEEL	f <sub>y</sub> : 60 KSI
13. STRUCTURAL STEEL AASHTO M270	f <sub>y</sub> : ---
14. SOIL UNIT WEIGHT	γ : 0.125 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q <sub>n</sub> : ---
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ : ---
17. NOMINAL BEARING RESISTANCE OF ROCK	q <sub>n</sub> : ---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ : 0.45
19. NOMINAL AXIAL PILE RESISTANCE	q <sub>p</sub> : 270.3 KIPS
20. PILE YIELD STRENGTH ASTM A572	f <sub>y</sub> : 50 KSI
21. PILE SIZE	HP 12X63
22. EST. PILE LENGTHS (TWO SUBSTRUCTURES) (ABUTMENT 1 = 40 AND ABUTMENT 2 = 50) FT	L <sub>p</sub> :
23. PILE RESISTANCE FACTOR	φ : 0.50
24. LATERAL PILE DEFLECTION	Δ : 0.18 INCH
25. BASIC WIND SPEED	V <sub>3s</sub> : ---
26. MINIMUM GROUND SNOW LOAD	p <sub>g</sub> : ---
27. SEISMIC DATA	PGA : 8 %g S <sub>s</sub> : 18 %g S <sub>1</sub> : 5 %g

PROJECT NAME : RANDOLPH

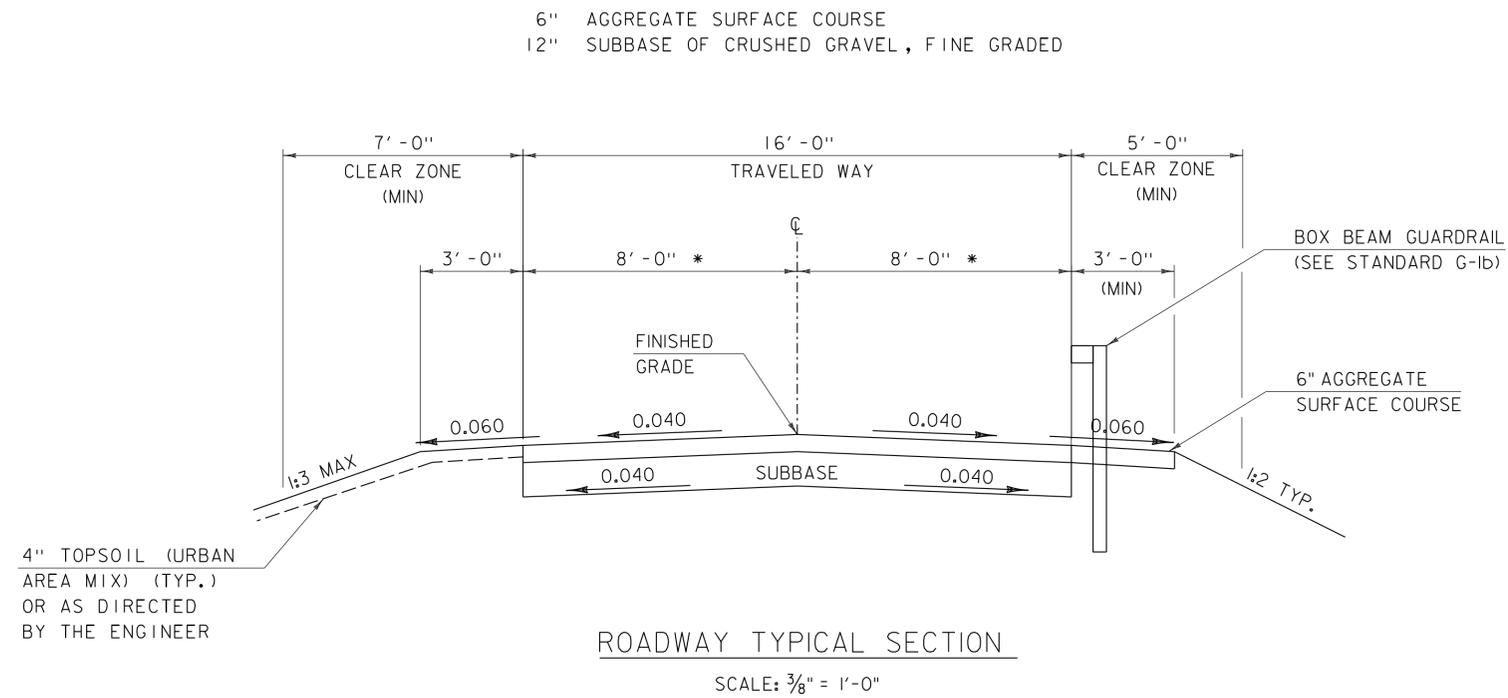
PROJECT NUMBER : BRO 1444(57)

FILE NAME : z11j078pi.xls PLOT DATE : 3/12/2014  
 PROJECT LEADER : J. BYATT DRAWN BY : S. GOODWIN  
 DESIGNED BY : N. CARON CHECKED BY : J. BYATT  
 PRELIMINARY INFORMATION SHEET SHEET 2 OF 39

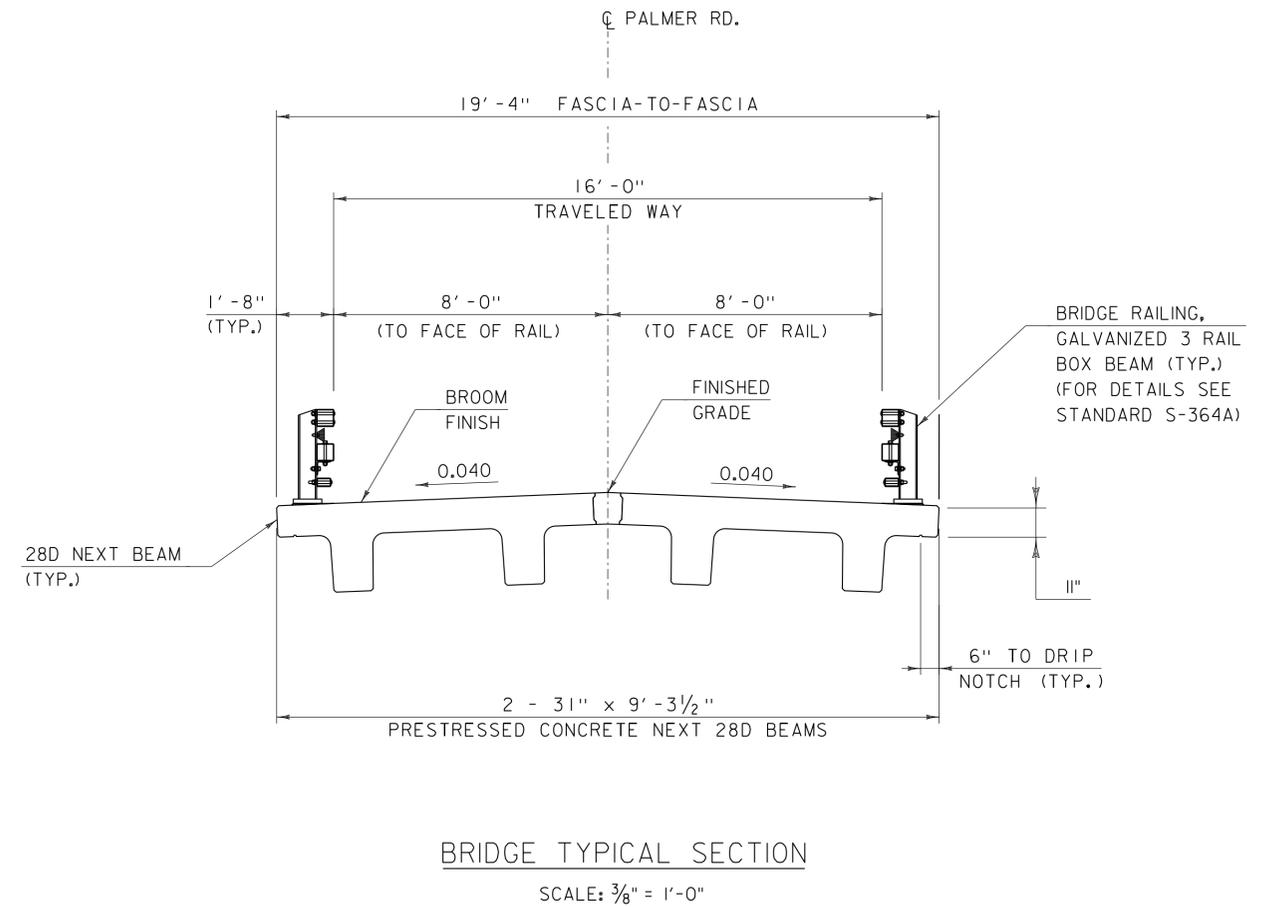
**MATERIAL TOLERANCES**

(IF USED ON PROJECT)

SURFACE	
- AGGREGATE SURFACE COURSE	+/- 1/2"
- SUBBASE	+/- 1"



\*WIDTH OF GRAVEL ROAD APPROACH TO BRIDGE VARIES FROM 16' AT BRIDGE TO 10' TO MATCH EXISTING ROAD WIDTH. SEE LAYOUT SHEET.



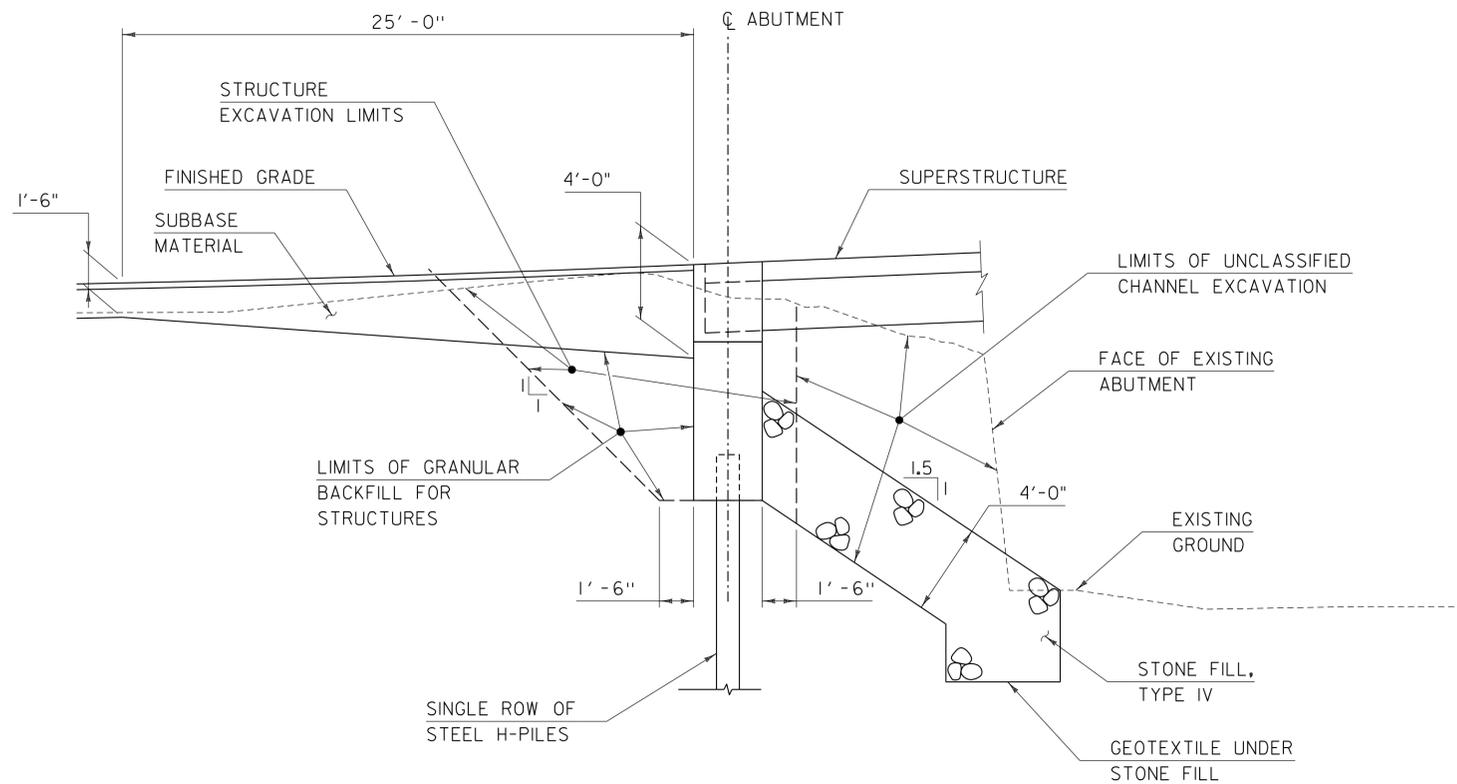
CLD\_XX-XXXX MODEL:01



PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078+yp.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: J. SMITH  
TYPICAL SECTIONS

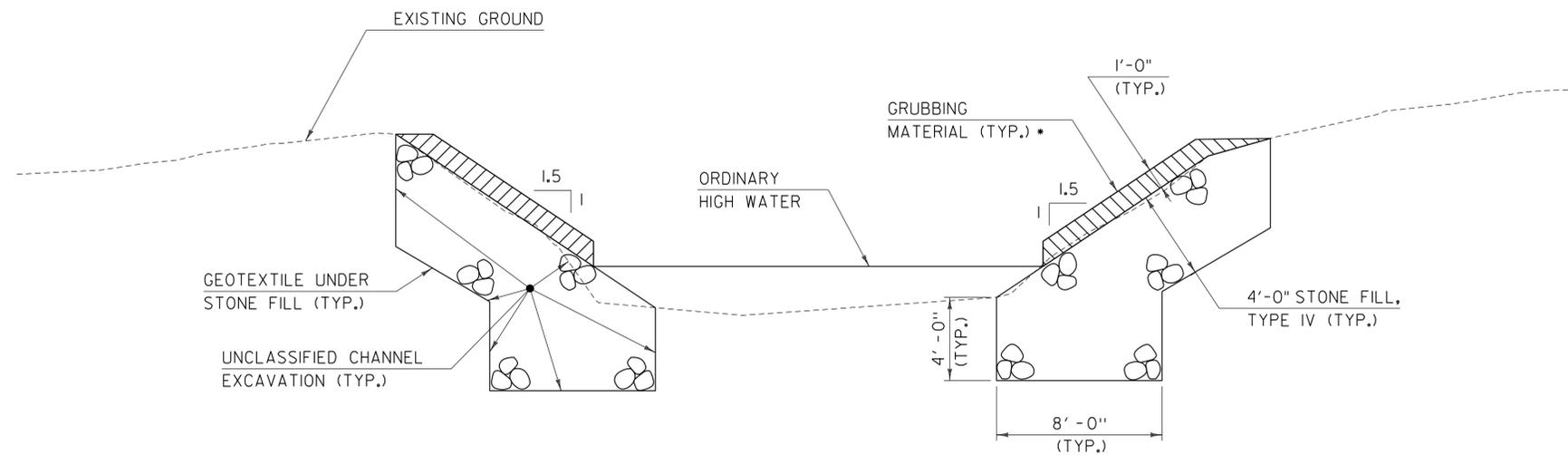
PLOT DATE: 8/12/2014  
DRAWN BY: J. SMITH  
CHECKED BY: D. MUNRO  
SHEET 3 OF 39



ABUTMENT EARTHWORKS TYPICAL SECTION

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

NOTE: ACTUAL EXCAVATION LIMITS SHALL BE DETERMINED BY THE CONTRACTOR. HOWEVER ONLY THE EXCAVATION BETWEEN THE LIMITS SHOWN WILL BE PAID FOR UNDER ITEM 204.25, "STRUCTURE EXCAVATION". ALL NECESSARY EXCAVATION OUTSIDE OF THESE LIMITS SHALL BE PAID FOR UNDER ITEM 203.27, "UNCLASSIFIED CHANNEL EXCAVATION".



CHANNEL TYPICAL SECTION

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

\* 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: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078sub.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
TYPICAL EARTHWORK SECTIONS

PLOT DATE: 9/9/2014  
DRAWN BY: M. SMITH  
CHECKED BY: J. BYATT  
SHEET 4 OF 39



## GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, DATED 2012, AND ITS LATEST REVISIONS.
2. THE BRIDGE WAS DESIGNED FOR THE HL-93 LIVE LOAD WITH AN ALLOWANCE FOR 2½" OF FUTURE PAVEMENT.
3. ALL PRECAST CONCRETE ELEMENTS TO BE FABRICATED TO THE SPECIFIED DIMENSIONS WITHIN THE TOLERANCES DICTATED IN THE PRECAST/PRESTRESSED CONCRETE INSTITUTE TOLERANCE MANUAL FOR PRECAST AND PRESTRESSED CONCRETE CONSTRUCTION, MNL 135-00, AND ITS LATEST REVISIONS.
4. DUE TO STABILITY CONCERNS AT THE ABUTMENTS DURING THE ERECTION OF THE SUPERSTRUCTURE THE CONTRACTOR SHALL SUBMIT THE ERECTION PLAN A MINIMUM OF 30 WORKING DAYS PRIOR TO THE BRIDGE CLOSURE PERIOD. UNDER NO CIRCUMSTANCES SHALL A BRIDGE CLOSURE PERIOD BEGIN PRIOR TO HAVING AN ACCEPTED ERECTION PLAN.
5. THE METHOD OF FORMING FOR SUBSEQUENT POURS AFTER PLACING PRECAST/PRESTRESSED SUPERSTRUCTURE UNITS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR IS ENCOURAGED TO WORK WITH THE FABRICATOR IF ADDITIONAL SUPPORTS MAY BE REQUIRED. IN NO CASE SHALL THE CONTRACTOR ATTACH ADDITIONAL FORM OR SCREED SUPPORTS BY DRILLING OR SIMILAR MEANS INTO ANY PRECAST/PRESTRESSED SUPERSTRUCTURE UNIT.
6. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL AND VERTICAL AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.
7. THE CONTRACTOR SHALL BE MADE AWARE THAT EXISTING UTILITIES ARE WITHIN THE CONSTRUCTION LIMITS OF BRIDGE 35. THE UTILITIES WILL BE RELOCATED BY OTHERS PRIOR TO THE START OF CONSTRUCTION. THE LOCATION OF ANY UTILITY INFORMATION SHOWN ON THE PLANS IS APPROXIMATE. NO CLAIMS ARE MADE AS TO THE ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING AND PROTECTING FROM DAMAGE ALL UTILITIES ON SITE DURING ALL STAGES OF CONSTRUCTION. SEE LAYOUT PLAN AND SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
8. NO SUBSTITUTION FOR PRECAST CONCRETE WILL BE PERMITTED.
9. A TEMPORARY DETOUR ACCESS ROAD ON THE WEST SIDE OF THE RIVER WILL BE USED BY THE HOMEOWNER AT THE END OF PALMER ROAD DURING THE BRIDGE CLOSURE PERIOD. THE TOWN OF RANDOLPH IS RESPONSIBLE FOR THE TEMPORARY ACCESS ROAD AND IT IS ONLY INTENDED TO BE USED BY THE HOMEOWNER AND TOWN EMERGENCY VEHICLES. NO CONSTRUCTION VEHICLES OR EQUIPMENT SHALL USE THIS ACCESS FOR ANY PURPOSE, AS INDICATED IN THE ENVIRONMENTAL STIPULATIONS FOR THE PROJECT.
10. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET.
11. SLOPE ROUNDING: ALL CUT SLOPES TO BE ROUNDED IN ACCORDANCE WITH STANDARD SHEET B-5.

## EARTHWORK

12. REMOVAL OF THE EXISTING STRUCTURE SHALL BE UNDER ITEM 529.15, "REMOVAL OF STRUCTURE (EXISTING ORIGINAL STRUCTURE)". THIS WORK SHALL INCLUDE REMOVAL OF ANY PORTIONS OF THE EXISTING STRUCTURE, INCLUDING EXISTING GUARDRAIL, THE SUPERSTRUCTURE, ABUTMENTS, AND WINGWALLS, THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION. REMOVAL OF THE TEMPORARY BRIDGE SHALL BE PAID UNDER ITEM 529.15, "REMOVAL OF STRUCTURE (EXISTING TEMPORARY STRUCTURE)". SEE NOTE 47 FOR MORE DETAILS.
13. THE "STONE FILL, TYPE IV" UNDER THE BRIDGE AS SHOWN IN THE PLANS SHALL BE PLACED BEFORE THE NEW BEAMS ARE SET.

## CONCRETE AND REINFORCING STEEL

14. "WATER REPELLENT, SILANE" SHALL BE APPLIED IN ACCORDANCE WITH SECTION 514 TO ALL EXPOSED CONCRETE ON THE BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE, WITH THE EXCEPTION OF THE BOTTOM OF THE PRECAST NEXT BEAMS BETWEEN DRIP NOTCHES. THIS WORK SHALL BE PAID FOR UNDER THE CONTRACT OPTIONAL PRECAST ABUTMENT BID ITEM, OR CONTRACT ITEM 900.640, "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS) (NEXT 28 D)" AS APPROPRIATE.
15. ALL CONCRETE PLACED INTEGRALLY WITH THE SUPERSTRUCTURE SHALL BE ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)".
16. ALL PRECAST SUBSTRUCTURE CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 540 - PRECAST CONCRETE.
17. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE "CONCRETE REINFORCING STEEL INSTITUTE".
18. PAYMENT FOR REINFORCING STEEL IN PRECAST OR PRESTRESSED COMPONENTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST OR PRESTRESSED CONCRETE CONTRACT ITEM. ALL REINFORCING STEEL PLACED WITHIN THE BEAM-END CLOSURE POURS SHALL BE PAID FOR UNDER CONTRACT OPTIONAL PRECAST ABUTMENT BID ITEM. ALL REINFORCING STEEL PLACED WITHIN THE NEXT BEAM FLANGE CLOSURE POUR SHALL BE PAID FOR UNDER CONTRACT ITEM 900.640, "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS) (28D)".
19. ALL REINFORCING STEEL IN THE PRECAST ABUTMENTS SHALL MEET THE REQUIREMENTS FOR REINFORCING STEEL, LEVEL 1, UNLESS NOTED OTHERWISE. ALL REINFORCING STEEL IN THE NEXT BEAMS, NEXT BEAM FLANGE CLOSURE POUR, BEAM-END CLOSURE POUR, AND PRECAST WINGWALLS SHALL MEET THE REQUIREMENTS FOR REINFORCING STEEL, LEVEL 1, EPOXY COATED.
20. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

ALONG BACK FACES OF WALLS AGAINST EARTH:	2.00 INCHES
ALONG TOP SURFACE OF DECK SLAB:	3.50 INCHES
ALONG BOTTOM SURFACE OF DECK SLAB:	1.75 INCHES
BEAM-END CLOSURE POUR:	2.00 INCHES
ELSEWHERE UNLESS OTHERWISE INDICATED:	3.00 INCHES
21. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE "VERMONT AGENCY OF TRANSPORTATION MATERIALS SAMPLING MANUAL".

## H-PILES

22. TO PREVENT DAMAGE TO THE PILES, PILE SHOES ARE REQUIRED AND SHALL CONFORM TO SUBSECTION 505.04 (f).
23. THE TOPS OF THE PILES AFTER DRIVING SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN THREE INCHES. THE PILE ORIENTATION SHALL NOT VARY BY MORE THAN FIVE DEGREES. THE CONTRACTOR SHALL DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER HOW THE TOLERANCES WILL BE MET. THESE MEASURES SHALL BE DEMONSTRATED IN A SUBMITTAL TO BE ACCEPTED BEFORE PILE DRIVING COMMENCES.
24. THE PILES SHALL BE DRIVEN TO A NOMINAL PILE DRIVING RESISTANCE (RNDR) OF 207.9 KIPS, AS DETERMINED BY THE RESULTS OF DYNAMIC TESTING, AND AS INTERPRETED BY THE ENGINEER. HOWEVER, THE PILES SHALL BE DRIVEN TO A MINIMUM DEPTH OF 20 FEET BELOW THE BOTTOM OF THE PRECAST ABUTMENT.
25. TO ENSURE THAT THE NOMINAL CAPACITY HAS BEEN ATTAINED AND TO PREVENT THE OVERSTRESSING OF THE PILES DURING DRIVING OPERATIONS, DYNAMIC TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 505. A MINIMUM OF ONE DYNAMIC PILE TEST SHALL BE CONDUCTED ON THE FIRST PILE DRIVEN FOR EACH SUBSTRUCTURE UNIT, FOR A TOTAL OF TWO TESTS. MORE TESTS MAY BE ORDERED BY THE ENGINEER. ADDITIONAL TEST(S) ORDERED BY THE ENGINEER SHALL BE PAID FOR AT THE UNIT PRICE BID FOR CONTRACT ITEM 505.45.
26. STRESSES IN THE PILE DURING DRIVING SHALL NOT EXCEED THE MAXIMUM DRIVING STRESS. THE MAXIMUM DRIVING STRESS SHALL BE DETERMINED AS 90 PERCENT OF THE PILE STEEL STRENGTH MULTIPLIED BY A RESISTANCE FACTOR OF 1.00.
27. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED TO BE AS SHOWN ON THE BORING LOGS. THE ACTUAL IN PLACE LENGTH MAY VARY.

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: zllj078gennotes.dgn	PLOT DATE: 9/9/2014
PROJECT LEADER: J. BYATT	DRAWN BY: M. SMITH
DESIGNED BY: N. CARON	CHECKED BY: J. BYATT
PROJECT NOTES (1 OF 2)	SHEET 5 OF 39

## PRECAST ABUTMENTS AND POST-TENSIONING

28. THE UNIT PRICE FOR EACH PRECAST ABUTMENT SHALL INCLUDE THE ASSOCIATED WINGWALLS AND ALL LABOR AND MATERIALS TO CONNECT THE WINGWALLS TO THE ABUTMENT. THIS WORK SHALL BE PAID FOR UNDER THE CONTRACT OPTIONAL PRECAST ABUTMENT BID ITEM.
29. WATERSTOPS SHALL BE PLACED AT THE JOINT BETWEEN THE PRECAST ABUTMENTS AND CAST-IN-PLACE END DIAPHRAGMS. THIS WORK SHALL BE PAID FOR UNDER THE CONTRACT OPTIONAL PRECAST ABUTMENT BID ITEM.
30. IF VERTICAL CONSTRUCTION JOINTS ARE REQUIRED BY THE CONTRACTOR FOR SHIPPING OF THE ABUTMENTS THEN THE SECTIONS SHALL BE KEYED AND MATCH CAST. A JOINT DETAIL SHALL BE SHOWN ON THE FABRICATION DRAWINGS.
31. POST-TENSIONING AND ASSOCIATED ITEMS ARE ONLY REQUIRED IF THE PRECAST ABUTMENT IS CONSTRUCTED OF MORE THAN ONE UNIT. ANY POST-TENSIONING STRANDS AND CONDUIT SHALL ADHERE TO THE REQUIREMENTS OF SECTION 510 - PRESTRESSED CONCRETE. GALVANIZED ANCHOR ASSEMBLIES, CONDUIT, AND POST-TENSIONING STRANDS SHALL BE INCLUDED UNDER THE CONTRACT OPTIONAL PRECAST ABUTMENT BID ITEM. POST-TENSIONING STRANDS SHALL BE COVERED WITH SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF THE STRAND, EXCEPT AT ANCHORAGE LOCATIONS.
32. GALVANIZE ANCHOR ASSEMBLIES AFTER FABRICATION ACCORDING TO AASHTO M232M/M232.
33. DESIGN VALUES:
- A. CONCRETE COMPRESSIVE STRENGTH:  $f'_c = 5,000$  PSI.
  - B. POST-TENSIONING STRANDS: 0.5 INCH DIAMETER, 270 KSI, LOW RELAXATION 7-WIRE STRANDS.
  - C. ASSUMED MODULUS OF ELASTICITY IS 28,500 KSI.
  - D. THERE SHALL BE TWO STRANDS PER CONDUIT.
  - E. JACKING FORCE PER STRAND: 32 KIPS
34. THE CONCRETE FOR THE ABUTMENT #1 AND ABUTMENT #2 PILE CAVITIES SHALL MEET THE REQUIREMENTS OF ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)".
35. THE CORRUGATED STEEL PIPE SHALL BE TYPE 1 AND SHALL MEET THE REQUIREMENTS OF SUBSECTION 711.01 AND AASHTO M289. ALL COST ASSOCIATED WITH PLACING THE CORRUGATED STEEL PIPE SHALL BE INCLUDED IN THE CONTRACT OPTIONAL PRECAST ABUTMENT BID ITEM.
36. PROPOSED SEQUENCE OF CONSTRUCTION:
- A. PREPARE AND GRADE FOUNDATION TO REQUIRED ELEVATION.
  - B. DRIVE PILES.
  - C. PLACE PRECAST ABUTMENTS AND INSTALL TRANSVERSE STRANDS (IF MORE THAN ONE UNIT IS USED).
  - D. APPLY EPOXY BONDING COMPOUND TO MATCH CAST FACES OF VERTICAL CONSTRUCTION JOINT (IF MORE THAN ONE UNIT IS USED).
  - E. USE A CALIBRATED JACK TO TENSION TO 3 KIPS TO REMOVE SAG IN STRANDS.
  - F. CHECK ALIGNMENT OF PRECAST ABUTMENT ELEMENTS.
  - G. STRESS POST-TENSIONING STRANDS USING A CALIBRATED JACK.
  - H. FILL PILE CAVITIES WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)".
  - I. PLACE PRECAST WINGWALLS AND GROUT SPLICE CONNECTORS.
  - J. BACKFILL MAY BE COMPLETED AFTER SPLICE CONNECTOR GROUT HAS REACHED 85% OF 5,000 PSI.
37. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED TO THE VTRANS PROJECT MANAGER FOR APPROVAL.

## NEXT D BEAMS

38. NEXT D BEAMS ARE A NON-PROPRIETARY SHAPE DEVELOPED BY PCI NORTHEAST (PCINE). STANDARDIZED SECTION PROPERTIES AND DETAILS MAY BE FOUND AT <http://www.pcine.org>.
39. DESIGN VALUES:
- A. CONCRETE DESIGN COMPRESSIVE STRENGTH:  $f'_c = 6,000$  PSI.
  - B. CONCRETE COMPRESSIVE STRENGTH AT RELEASE:  $f'_{ci} = 4,800$  PSI.
  - C. PRESTRESSING STRANDS: 0.6 INCH DIAMETER, 270 KSI, LOW-RELAXATION 7-WIRE STRANDS.
  - D. ASSUMED MODULUS OF ELASTICITY: 28,500 KSI.
  - E. JACKING FORCE PER STRAND: 44 KIPS.
  - F. SERVICE LOADS:
- |                               |                        |
|-------------------------------|------------------------|
| MEMBER MOMENT                 | 634.6 K-FT             |
| SUPERIMPOSED DEAD LOAD MOMENT | 173.7 K-FT             |
| LIVE LOAD AND IMPACT MOMENT   | 797.1 K-FT             |
| DEAD LOAD REACTION            | 74.1 KIPS              |
| LIVE LOAD AND IMPACT REACTION | 50.7 KIPS              |
| TOTAL REACTION                | 124.8 KIPS             |
| CAMBER AT RELEASE             | $\frac{13}{16}$ INCHES |
| FINAL CAMBER                  | $\frac{17}{16}$ INCHES |
40. ENDS OF FLANGES IN CONTACT WITH GROUT SHALL BE SANDBLASTED PRIOR TO DELIVERY AND POWER WASHED WITH WATER PRIOR TO ERECTION OF THE BEAMS.
41. FILL THE FLANGE TO FLANGE CONNECTION WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)".
42. THE TOP FLANGE OF THE NEXT BEAMS, TOP OF THE FLANGE CONNECTION POUR, AND TOP OF THE BEAM-END CLOSURE POUR SHALL RECEIVE A BROOM FINISH. THE COST OF APPLYING THE BROOM FINISH SHALL BE INCLUDED IN CONTRACT ITEM 900.640, "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS) (NEXT 28 D)" OR CONTRACT ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)", AS APPROPRIATE.
43. METHOD OF FORMING FLANGE CONNECTION SHALL BE DETERMINED BY THE CONTRACTOR. THE FORMS SHALL BE REMOVABLE AND ABLE TO ACCOMMODATE DIFFERENTIAL CAMBER. FORM SUPPORTS SHALL NOT PENETRATE THROUGH THE TOP OF POUR UNLESS APPROVED BY THE ENGINEER.
44. THE FABRICATOR MAY ALTER THE DESIGN AS DETAILED IN THESE PLANS TO ACCOMMODATE THE FABRICATOR'S SPECIFIC OPERATION. THIS ALTERATION MUST BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT, MEET THE ABOVE CRITERIA, AND SHALL BE APPROVED BY THE PROJECT MANAGER.
45. PROPOSED SEQUENCE OF CONSTRUCTION:
- A. LAY OUT WORKING LINES THE ENTIRE WIDTH OF THE BRIDGE ALONG CENTERLINE OF BEARING, MEASURED FROM A SINGLE WORKING POINT. THE WORKING LINES SHALL BE BASED ON THE NOMINAL BEAM WIDTHS.
  - B. VERIFY THE BEAM SEAT ELEVATIONS AND TAKE CORRECTIVE ACTION IF NECESSARY.
  - C. INSTALL BEARINGS.
  - D. ERECT THE BEAMS TO FIT WITHIN THE WORKING LINES.
  - E. ADJUST BEAMS TO FIT SNUG AGAINST  $\frac{1}{2}$ " CORK ON INTERIOR OF CHEEK WALLS.
  - F. CONSTRUCT FORMS FOR THE FLANGE CONNECTION POUR AND BEAM-END CLOSURE POUR.
  - G. GROUT CONNECTIONS BETWEEN BEAM FLANGES, APPLY LONGITUDINAL GROOVES IN ACCORDANCE WITH SECTION 509, AND CURE.
  - H. COMPLETE BEAM-END CLOSURE POUR TO TOP OF DECK, APPLY LONGITUDINAL GROOVES IN ACCORDANCE WITH SECTION 509, AND CURE.
46. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED TO THE VTRANS PROJECT MANAGER FOR APPROVAL.

## MISCELLANEOUS

47. A TEMPORARY BRIDGE IS IN PLACE OVER THE EXISTING STRUCTURE. REMOVAL OF THE TEMPORARY BRIDGE SHALL BE PAID FOR UNDER ITEM 529.15, "REMOVAL OF STRUCTURE (EXISTING TEMPORARY STRUCTURE)". THIS WORK SHALL INCLUDE THE REMOVAL OF ANY PORTIONS OF THE SUPERSTRUCTURE AND SUBSTRUCTURE OVERLAYING THE EXISTING STRUCTURE.
48. THE EXISTING STRUCTURAL STEEL ON THIS PROJECT WAS PAINTED WITH A MATERIAL WHICH MAY CONTAIN LEAD. THE REMOVED STRUCTURAL STEEL IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE, ITS OFFICERS AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR'S USE OR DISPOSITION OF THE STRUCTURAL STEEL.

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11J078gennotes.dgn	PLOT DATE: 9/9/2014
PROJECT LEADER: J. BYATT	DRAWN BY: M. SMITH
DESIGNED BY: N. CARON	CHECKED BY: J. BYATT
PROJECT NOTES (2 OF 2)	SHEET 6 OF 39

# QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
							ROADWAY	EROSION CONTROL	BRIDGE 35	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	-			
							240				240		CY	COMMON EXCAVATION	203.15	5.2	235	CY	COMMON EXCAVATION
									306		306		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27		306	CY	UNCLASSIFIED CHANNEL EXCAVATION
							20				20		CY	EARTH BORROW	203.30	-	285	CY	STRUCTURE EXCAVATION
							1				1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	-	826	CY	SUBTOTAL
									266		266		CY	STRUCTURE EXCAVATION	204.25	0.7	5	CY	ROUNDING
									39		39		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	0.6	831	CY	TOTAL FILL AVAILABLE
							150				150		CY	SUBBASE OF CRUSHED GRAVEL, FINE GRADED	301.26	6.9	59	CY	TOTAL FILL REQUIRED (1.15 FACTOR)
							80				80		CY	AGGREGATE SURFACE COURSE	401.10	2.3	772	CY	TOTAL WASTE
									1		1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10	-			
									360		360		LF	STEEL PILING, HP 12 X 63	505.155	-			
									2		2		EACH	DYNAMIC PILE LOADING TEST	505.45	-			
									117		117		LF	BRIDGE RAILING, GALVANIZED 3 RAIL BOX BEAM	525.335	0.5			
									1		1		EACH	REMOVAL OF STRUCTURE (400 SF. - EST.) (EXISTING ORIGINAL STRUCTURE)	529.15	-			
									1		1		EACH	REMOVAL OF STRUCTURE (629 SF. - EST.) (EXISTING TEMPORARY STRUCTURE)	529.15	-			
									8		8		EACH	BEARING DEVICE ASSEMBLY, STEEL REINFORCED ELASTOMERIC PAD	531.17	-			
														BEGIN OPTION AA					
									1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #1)	540.10	-			
									1		1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #1)	900.645				
														END OPTION AA					
														BEGIN OPTION BB					
									1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #2)	540.10	-			
									1		1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE) (ABUTMENT #2)	900.645				
														END OPTION BB					
								40			40		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	EST.			
									296		296		CY	STONE FILL, TYPE IV	613.13	0.1			
							60				60		LF	BOX BEAM GUARDRAIL	621.30	4.8			
									4		4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 3 RAIL BOX BEAM	621.725	-			
										1	1		LS	FIELD OFFICE, ENGINEERS	631.10	-			
										1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16	-			
										3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26	-			
							1				1		LS	MOBILIZATION/DEMobilIZATION	635.11	-			
							1				1		LS	TRAFFIC CONTROL	641.10	-			
									373		373		SY	GEOTEXTILE UNDER STONE FILL	649.31				
								80			80		SY	GEOTEXTILE FOR SILT FENCE	649.51	5			
								20			20		LB	SEED	651.15	6.5			
								50			50		LB	FERTILIZER	651.18	3			
								0.5			0.5		TON	AGRICULTURAL LIMESTONE	651.20	0.33			
								0.5			0.5		TON	HAY MULCH	651.25	0.33			

CLD 12-0175 MODEL-01



PROJECT NAME: RANDOLPH  
 PROJECT NUMBER: BRO 1444(57)  
 FILE NAME: z11j078qss.dgn  
 PROJECT LEADER: J. BYATT  
 DESIGNED BY: J. SMITH  
 QUANTITY SHEET 1

PLOT DATE: 9/9/2014  
 DRAWN BY: K. RUTTER  
 CHECKED BY: D. MUNRO  
 SHEET 7 OF 39

# QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
							ROADWAY	EROSION CONTROL	BRIDGE 35	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							50				50		CY	TOPSOIL	651.35	5			
									121		121		SY	GRUBBING MATERIAL	651.40	0.1			
								1			1		LS	EPSC PLAN	652.10	-			
							50				50		HR	MONITORING EPSC PLAN	652.20	8			
								1			1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I)	652.30	-			
							150				150		SY	TEMPORARY EROSION MATTING	653.20	8			
							6				6		CY	TEMPORARY STONE CHECK DAM, TYPE I	653.25	-			
							15				15		CY	VEHICLE TRACKING PAD	653.35	EST.			
								2			2		EACH	FILTER BAG	653.45	-			
							130				130		LF	BARRIER FENCE	653.50	5.8			
							350				350		LF	PROJECT DEMARCATION FENCE	653.55	0.9			
							1				1		EACH	REMOVING SIGNS	675.50	-			
							4				4		EACH	DELINEATOR WITH STEEL POST	676.10	-			
									18		18		CY	SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)	900.608	1			
									109		109		LF	SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS) (NEXT 28 D)	900.640	-			

CLD-12-0175 MODEL-02



PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078qss.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: J. SMITH  
QUANTITY SHEET 2

PLOT DATE: 8/12/2014  
DRAWN BY: K. RUTTER  
CHECKED BY: D. MUNRO  
SHEET 8 OF 39

**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 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 RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

**UTILITY SYMBOLGY**

**UNDERGROUND UTILITIES**

— UT —	UTILITY (GENERIC-UNKNOWN)
— UE —	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 —	UTILITY (GENERIC-UNKNOWN)
— E —	TELEPHONE
— 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 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)
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: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078legend.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: VTRANS  
CONVENTIONAL SYMBOLGY LEGEND SHEET

PLOT DATE: 8/12/2014  
DRAWN BY: J. SMITH  
CHECKED BY: D. MUNRO  
SHEET 9 OF 39



GPS CONTROL POINTS

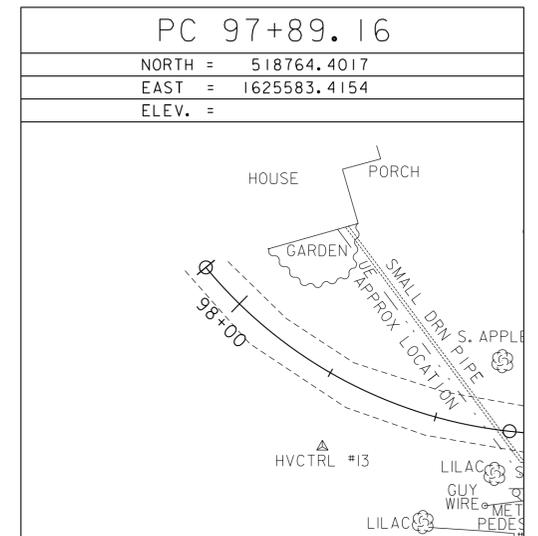
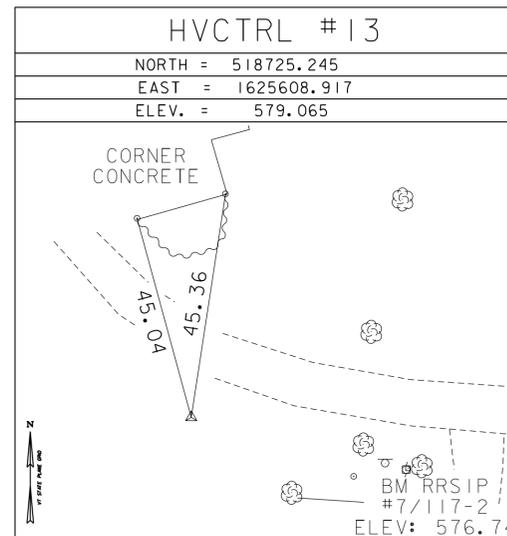
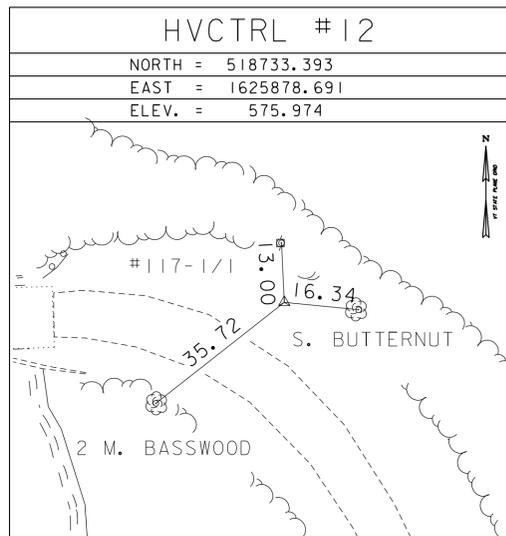
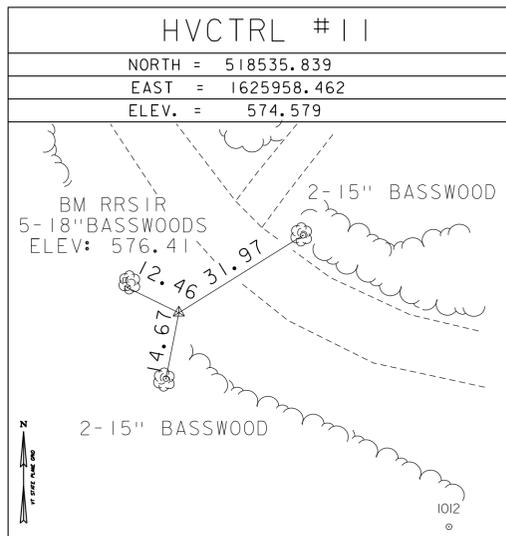
HVCTRL #1  
 EAST RANDOLPH  
 NORTH = 521893.79  
 EAST = 1626547.81  
 ELEV. = 657.60

GENERAL LOCATION, RANDOLPH, VT., JUST SOUTH OF EAST RANDOLPH. TO REACH FROM THE INTERSECTION OF VT ROUTE 14 AND VT ROUTE 66 IN EAST RANDOLPH GO SOUTH ALONG VT ROUTE 14 FOR 0.6 MI (1.0 KM) TO THE EAST RANDOLPH SCHOOL ON THE LEFT AND THE SITE OF THE MARK ON THE LEFT IN A LAWN IN FRONT OF THE SCHOOL. THE MARK IS SET 10 CM BELOW GROUND SURFACE IN THE TOP OF A 30 CM DIAMETER CONCRETE MONUMENT POURED 1.3 M (4.3 FT) DEEP. IT IS 6.7 M (22.0 FT) EAST OF AND ABOUT 0.1 M (0.3 FT) LOWER THAN THE CENTERLINE OF VT ROUTE 14, 13.0 M (42.7 FT) NORTH OF THE CENTERLINE OF THE MOST SOUTHERLY ENTRANCE DRIVE TO THE SCHOOL, 27.1 M (88.9 FT) WEST NORTHWEST OF THE SOUTHWEST CORNER OF THE SCHOOL BUILDING, AND 18.1 M (59.4 FT) SOUTHEAST OF POLE NO 61/20 AND A FIBERGLASS WITNESS POST.

HVCTRL #2  
 EAST RANDOLPH AZ MK  
 NORTH = 520093.26  
 EAST = 1626438.54  
 ELEV. = 647.11

GENERAL LOCATION, RANDOLPH, VT., JUST SOUTH OF EAST RANDOLPH. TO REACH FROM THE INTERSECTION OF VT ROUTE 14 AND VT ROUTE 66 IN EAST RANDOLPH GO SOUTH ALONG VT ROUTE 14 FOR 0.9 MI (1.4 KM) TO THE INTERSECTION OF A GRAVEL DRIVE LEFT, AT THE SOUTH EDGE OF A CEMETERY, AND THE SITE OF THE MARK ON THE LEFT, SOUTH OF THE GRAVEL DRIVE. THE MARK IS SET 3 CM BELOW GROUND SURFACE IN THE TOP OF A 30 CM DIAMETER CONCRETE MONUMENT POURED 1.3 M (4.3 FT) DEEP. IT IS 6.6 M (21.7 FT) EAST OF AND ABOUT 0.5 M (1.6 FT) HIGHER THAN THE CENTERLINE OF VT ROUTE 14, 5.1 M (16.7 FT) SOUTH OF THE CENTERLINE OF THE GRAVEL DRIVE, 13.1 M (43.0 FT) EAST OF POLE NO 30T/7/122/61/30, 14.8 M (48.6 FT) SOUTHWEST OF THE SOUTHWEST CORNER OF THE GRAVESTONE OF BLODGETT, AND 0.3 M (1.0 FT) WEST OF A FIBERGLASS WITNESS POST.

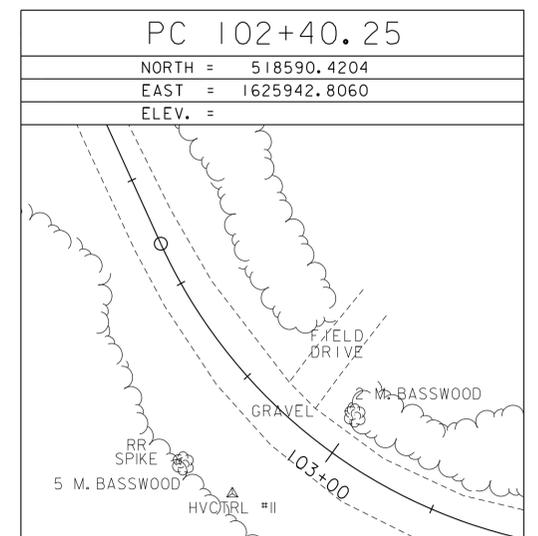
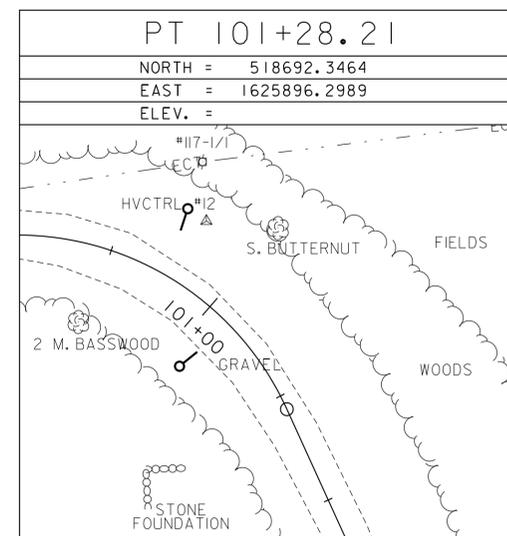
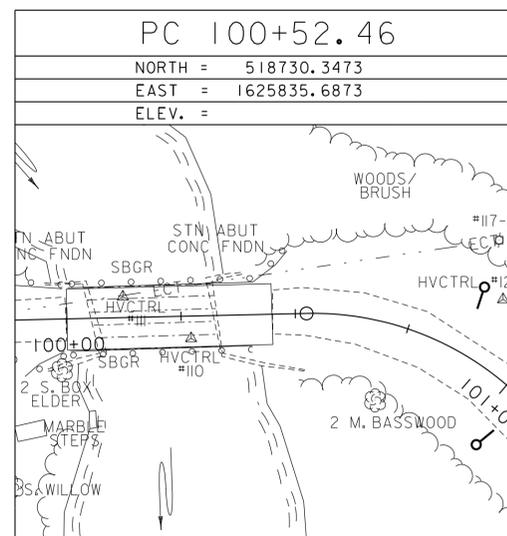
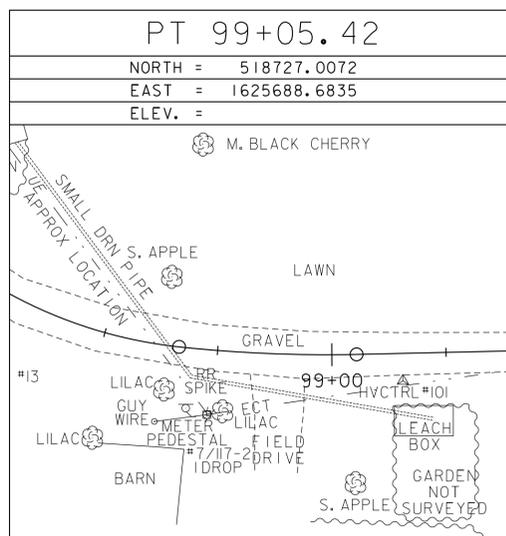
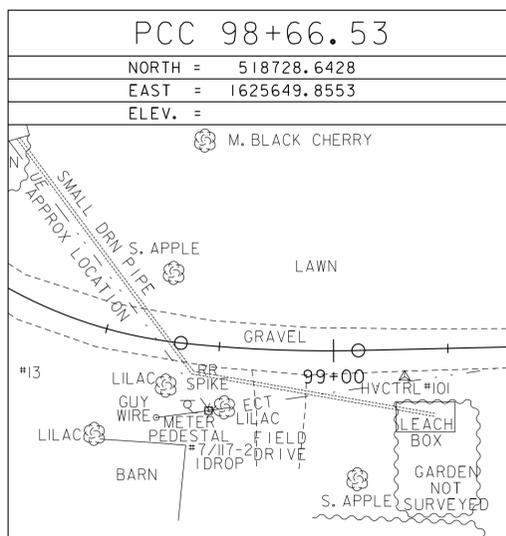
TRAVERSE TIES



\* Main Traverse Completed 8/11/2011 by R. GILMAN P.C & P. WINTERS

ALIGNMENT TIES

ALIGNMENT TIES



CLD.12-0175 MODEL: TIE.01

DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83 (96 )
ADJUSTMENT	COMPASS

PROJECT NAME: RANDOLPH	
PROJECT NUMBER: BR0 1444 (57)	
FILE NAME: survey\11078t1.dgn	PLOT DATE: 8/12/2014
PROJECT LEADER:	DRAWN BY: R. Bullock
DESIGNED BY:	CHECKED BY:
TIE SHEET	SHEET 10 OF 39

CURVE (1)  
 BK BRG = S 39°32'46" E  
 AH BRG = S 83°52'27" E  
 DELTA = 44°19'41" LT  
 D = 57°17'45"  
 R = 100.00'  
 T = 40.74'  
 L = 77.37'  
 E = 7.98'

CURVE (2)  
 PI 98+86.00 BK =  
 PI 98+85.95 AH  
 DELTA = 7°25'39" LT  
 D = 19°05'55"  
 R = 300.00'  
 T = 19.47'  
 L = 38.89'  
 E = 0.63'

**BOX BEAM GUARDRAIL**  
 99+41.3 TO 99+55.1 LT  
 99+48.0 TO 99+61.8 RT  
 100+74.3 TO 100+86.1 LT  
 100+88.6 TO 101+04.8 RT

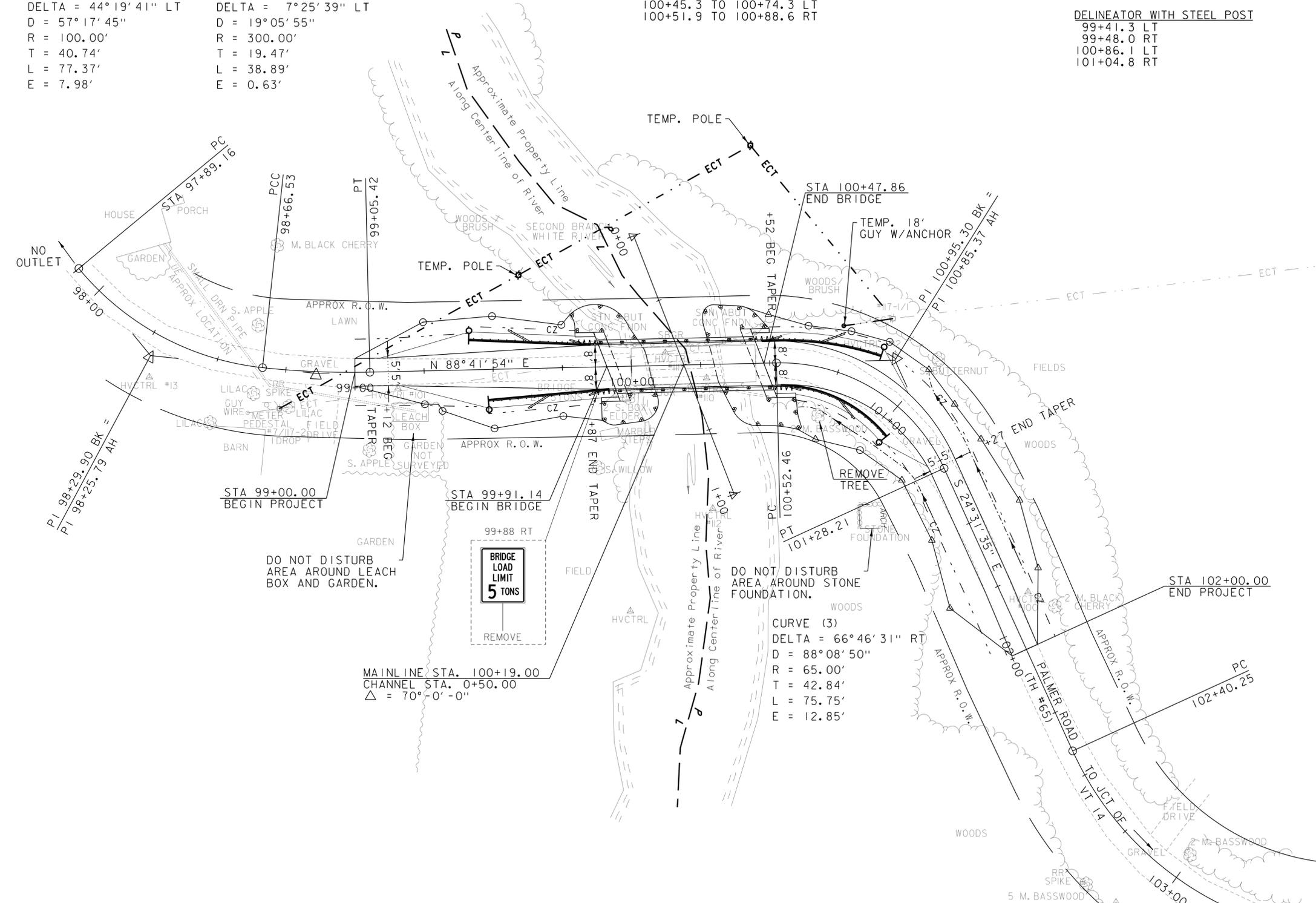
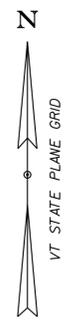
**GUARDRAIL APPROACH SECTION,  
 GALVANIZED 3 RAIL BOX BEAM**  
 99+55.1 TO 99+87.2 LT  
 99+61.8 TO 99+93.7 RT  
 100+45.3 TO 100+74.3 LT  
 100+51.9 TO 100+88.6 RT

**BRIDGE RAILING, GALVANIZED 3 RAIL BOX BEAM**  
 99+87.2 TO 100+45.3 LT  
 99+93.7 TO 100+51.9 RT

**REMOVAL AND DISPOSAL OF GUARDRAIL  
 INCLUDED UNDER BRIDGE REMOVAL ITEM**

**REMOVING SIGNS  
 AS SHOWN - 1**

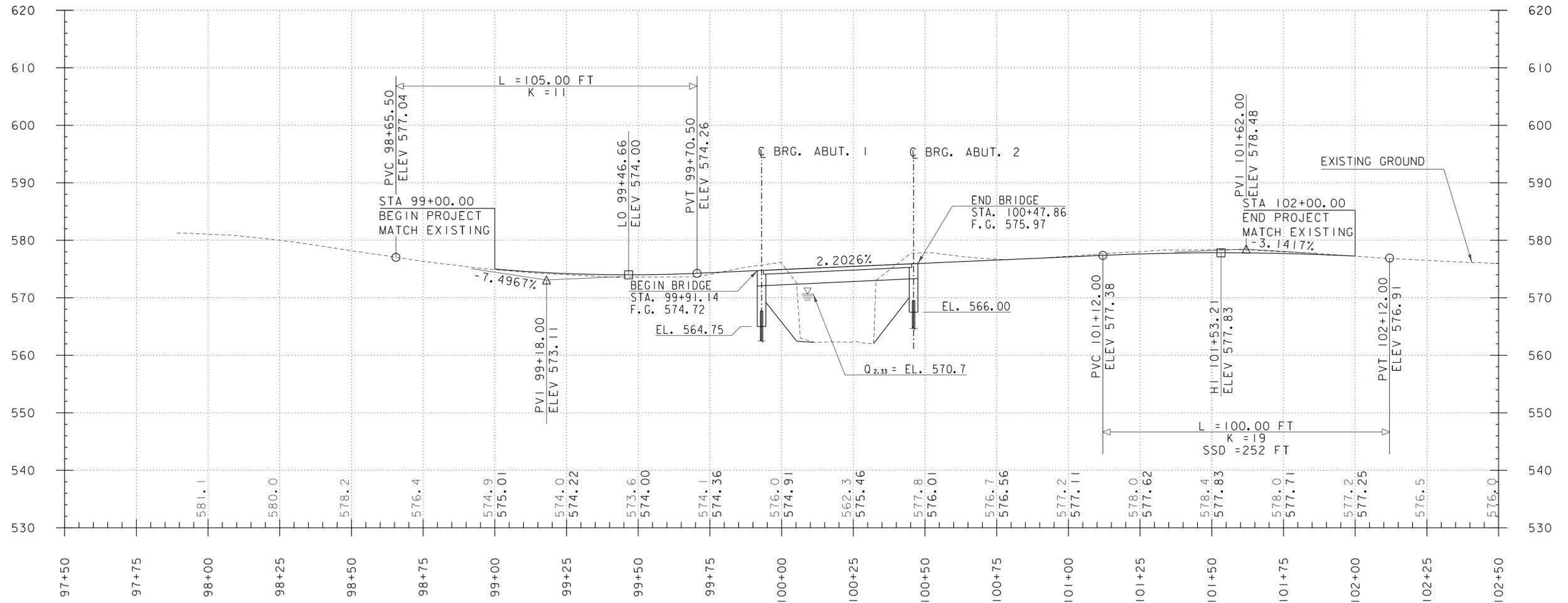
**DELINEATOR WITH STEEL POST**  
 99+41.3 LT  
 99+48.0 RT  
 100+86.1 LT  
 101+04.8 RT



CLD 12-0175 MODEL:01



PROJECT NAME: RANDOLPH		PLOT DATE: 8/12/2014	
PROJECT NUMBER: BRO 1444(57)		DRAWN BY: S. GOODWIN	
FILE NAME: z11j078bdr.dgn	DESIGNED BY: J. SMITH	CHECKED BY: D. MUNRO	SHEET 11 OF 39
LAYOUT SHEET			



**PALMER RD PROFILE**  
 HOR. SCALE 1" = 20'-0"  
 VER. SCALE 1" = 10'-0"

THE ELEVATIONS SHOWN TO THE NEAREST TENTH ARE FOR EXISTING GROUND ALONG THE CENTERLINE.

THE ELEVATIONS SHOWN TO THE NEAREST HUNDREDTH ARE FOR PROPOSED FINISHED GRADE ALONG THE CENTERLINE.

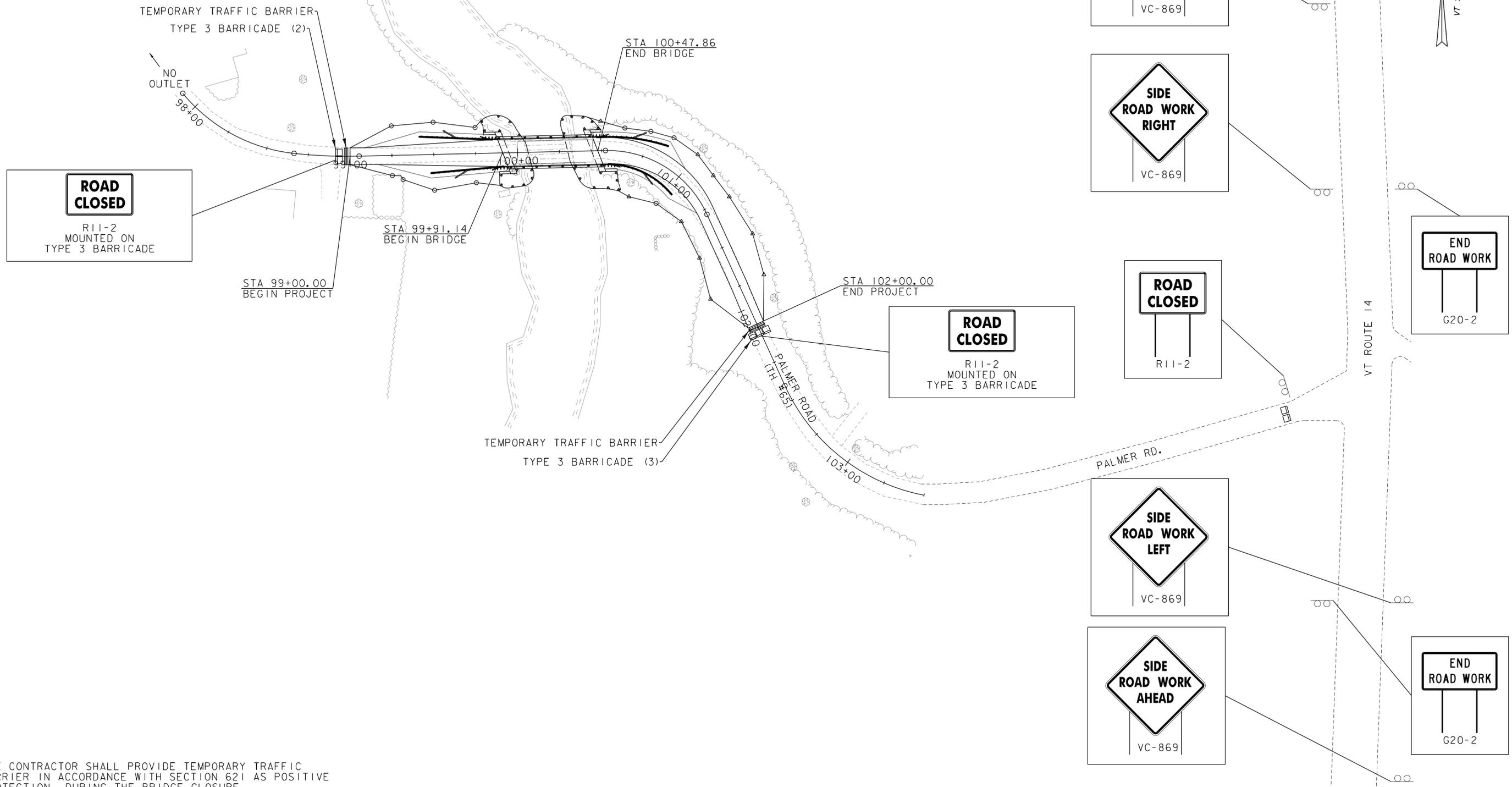
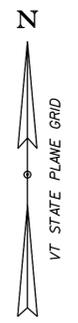
PROJECT NAME: RANDOLPH  
 PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078pro.dgn  
 PROJECT LEADER: J. BYATT  
 DESIGNED BY: J. SMITH  
 PROFILE SHEET

PLOT DATE: 8/12/2014  
 DRAWN BY: J. SMITH  
 CHECKED BY: D. MUNRO  
 SHEET 12 OF 39



CLD-12-0175 MODEL:01

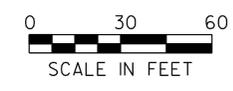


- NOTES:**
1. THE CONTRACTOR SHALL PROVIDE TEMPORARY TRAFFIC BARRIER IN ACCORDANCE WITH SECTION 621 AS POSITIVE PROTECTION DURING THE BRIDGE CLOSURE.
  2. ALL TEMPORARY SIGNING, TEMPORARY TRAFFIC BARRIER, AND BARRICADES SHALL BE PAID FOR UNDER ITEM 641.10 TRAFFIC CONTROL.
  3. REFER TO STANDARD SHEET T-10 FOR APPLICABLE SIGN PLACEMENT AND SPACING CRITERIA ON VT ROUTE 14.

**LEGEND**

□ TYPE 3 BARRICADE

▬ TEMPORARY TRAFFIC BARRIER



PROJECT NAME: RANDOLPH	
PROJECT NUMBER: BRO 1444(57)	
FILE NAME: z11j078bdr+cp.dgn	PLOT DATE: 8/12/2014
PROJECT LEADER: J. BYATT	DRAWN BY: M. SMITH
DESIGNED BY: K. RUTTER	CHECKED BY: D. MUNRO
TRAFFIC CONTROL SHEET	SHEET 13 OF 39

**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**

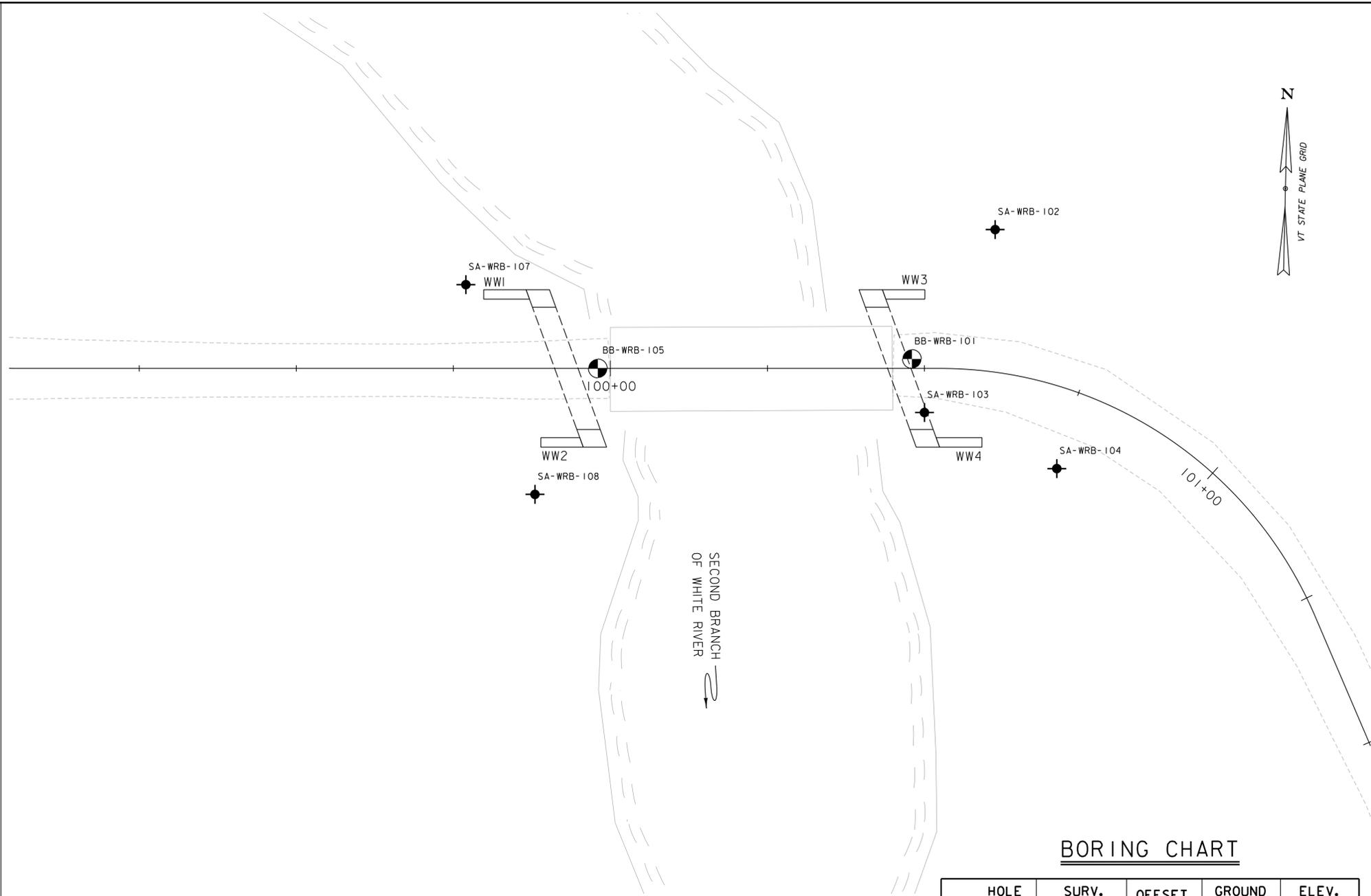
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

**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 PLAN**

SCALE 1" = 10'-0"  
10 0 10

**BORING CHART**

HOLE NO.	SURV. STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
BB-WRB-101	100+48	1.5 LT	577.00	N/A
BB-WRB-105	99+98	0	575.95	529.7

**AUGER CHART**

HOLE NO.	SURV. STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
SA-WRB-102	100+59	22.5 LT	572.34	N/A
SA-WRB-103	100+50	7.0 RT	576.06	N/A
SA-WRB-104	100+76	12.5 RT	576.97	N/A
SA-WRB-107	99+77	12.0 LT	572.09	N/A
SA-WRB-108	99+88	20.0 RT	570.97	N/A

**DEFINITIONS (AASHTO)**

- BEDROCK (LEDGE)** - Rock in its native location of indefinite thickness.
- BOULDER** - A rock fragment with an average dimension > 12 inches.
- COBBLE** - Rock fragments with an average dimension between 3 and 12 inches.
- GRAVEL** - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).
- SAND** - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).
- SLT** - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.
- CLAY** - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.
- VARVED** - Alternate layers of silt and clay.
- HARDPAN** - Extremely dense soil, cemented layer, not softened when wet.
- MUCK** - Soft organic soil (containing > 10% organic material).
- MOISTURE CONTENT** - Weight of water divided by dry weight of soil.
- FLOWING SAND** - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.
- STRIKE** - Angle from magnetic north to line of intersection of bed with a horizontal plane.
- DIP** - Inclination of bed with a horizontal plane.

**GENERAL NOTES**

1. The subsurface explorations shown herein were made between 6/24/13 and 6/25/13 by Golder Associates, Inc.
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.



PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078bor.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
BORING INFORMATION SHEET

PLOT DATE: 8/12/2014  
DRAWN BY: M. SMITH  
CHECKED BY: J. BYATT  
SHEET 14 OF 39

CLD\_12-0175 \$FILE.ABBREV\$ MODEL: BOROZ

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-WRB-101 SHEET 1 of 3 DATE STARTED: 6/24/13 DATE COMPLETED: 6/24/13			
PROJECT NAME: Randolph Bro 1444(57) TH 65 BR35		PROJECT NUMBER: 123-87463					
SITE NAME: Randolph, VT		SITE NUMBER: TH 65 BR 35					
STATION: 100+48		GROUND ELEVATION: 577.0 ft					
OFFSET: 1.5 LT		GROUNDWATER DEPTH: 12.6 ft 6/24/13					
VTSPG:		PROJECT PIN NUMBER:					
BORING CREW: New Hampshire Boring		BORING RIG: Diedrich D-50 Track					
CREW CHIEF: W. Hoeckle		BORING TYPE: Wash Bore					
DRILLER: W. Hoeckle		SAMPLE TYPE: Split Barrel					
LOGGER: C. Stuart		CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
2.5		A-1-a, GrSa, Rec. = 1.0 ft, brown, moist, medium dense, gravelly fine to coarse SAND, subrounded, (GW), [Sample 1D].	16				
5.0		A-4, SaSi, Rec. = 0.92 ft, brown, moist, medium dense, silty fine SAND, (SM), [Sample 2D - Top 8"].	28				
7.5		A-4, SaSi, gray-brown, moist, medium dense, silty fine SAND, (SM), [Sample 2D - Bottom 3"].					
10.0		A-4, SaSi, Rec. = 1.25 ft, gray-brown, wet, medium dense, silty fine SAND, (SM), [Sample 3D]. 10.0 ft, End of fill layer.	14	29.8	0.0	58.0	42.0
12.5		13.5 ft, Driller reported possible cobble.					
15.0		A-1-b, SaGr, Rec. = 0.42 ft, dark gray-brown, wet, very dense, gravelly fine to coarse SAND, (SW), [Sample 4D].	53				
17.5		18.0 ft, Driller reported high casing blows (approx. 350 blows / 5 ft).					
20.0		A-1-b, SaGr, Rec. = 0.42 ft, gray, wet, very dense, gravelly fine to coarse SAND, some silt, (SM), [Sample 5D].	69				
22.5		A-1-b, SaGrSi, Rec. = 0.75 ft, dark gray, wet, fine to coarse SAND, some gravel, little silt, (SM), [Sample 6D]. Note: some weathered	40	12.9	46.0	38.0	16.0

BOTTOM OF  
ABUT. 2  
EL. 566.00'

LOG OF BORING & WELL: 123-87463 RANDOLPH.GPJ VT\_AOT\_GDT\_7/23/13

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-WRB-101 SHEET 2 of 3 DATE STARTED: 6/24/13 DATE COMPLETED: 6/24/13			
PROJECT NAME: Randolph Bro 1444(57) TH 65 BR35		PROJECT NUMBER: 123-87463					
SITE NAME: Randolph, VT		SITE NUMBER: TH 65 BR 35					
STATION: 100+48		GROUND ELEVATION: 577.0 ft					
OFFSET: 1.5 LT		GROUNDWATER DEPTH: 12.6 ft 6/24/13					
VTSPG:		PROJECT PIN NUMBER:					
BORING CREW: New Hampshire Boring		BORING RIG: Diedrich D-50 Track					
CREW CHIEF: W. Hoeckle		BORING TYPE: Wash Bore					
DRILLER: W. Hoeckle		SAMPLE TYPE: Split Barrel					
LOGGER: C. Stuart		CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
27.5		oxidized rock fragments observed (platy). Casing hammer broke; open hole from 24 ft to 51 ft.					
30.0		A-4, SaSiGr, Rec. = 1.0 ft, dark gray with some brown, dense, silty fine to coarse SAND, little gravel, (SM), [Sample 7D]. Note: 2" gravel and fractured cobble in spoon.	41				
35.0		A-1-b, SaGr, Rec. = 1.42 ft, gray, wet, very dense, medium to fine SAND, trace fine gravel, (SP), [Sample 8D].	57				
40.0		A-1-b, SaSiGr, Rec. = 1.33 ft, gray with some oxidized spotting, wet, very dense, fine to coarse SAND, some silt, little coarse gravel, (SM), [Sample 9D]. Note: fractured cobble in sampler.	86				
45.0		A-1-b, SaSiGr, Rec. = 1.67 ft, gray brown, wet, very dense, fine SAND, some silt, little gravel, (SM), [Sample 10D - Top 10"].	46				
47.5		A-2-4, Sa, gray, wet, fine SAND, (SP), [Sample 10D - Bottom 10"].					
		A-1-b, SaGrSi, Rec. = 1.67 ft, dark gray and brown, wet, very dense, medium SAND, little gravel, little silt (SM), [Sample 11D - Top 14"].	67	14.2	25.0	59.0	16.0

LOG OF BORING & WELL: 123-87463 RANDOLPH.GPJ VT\_AOT\_GDT\_7/23/13

ESTIMATED  
PILE TIP  
EL. 520.00'

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-WRB-101 SHEET 3 of 3 DATE STARTED: 6/24/13 DATE COMPLETED: 6/24/13			
PROJECT NAME: Randolph Bro 1444(57) TH 65 BR35		PROJECT NUMBER: 123-87463					
SITE NAME: Randolph, VT		SITE NUMBER: TH 65 BR 35					
STATION: 100+48		GROUND ELEVATION: 577.0 ft					
OFFSET: 1.5 LT		GROUNDWATER DEPTH: 12.6 ft 6/24/13					
VTSPG:		PROJECT PIN NUMBER:					
BORING CREW: New Hampshire Boring		BORING RIG: Diedrich D-50 Track					
CREW CHIEF: W. Hoeckle		BORING TYPE: Wash Bore					
DRILLER: W. Hoeckle		SAMPLE TYPE: Split Barrel					
LOGGER: C. Stuart		CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
52.5		A-4, SaSiGr, dark gray and brown, wet, very dense, silty medium to coarse SAND, some gravel, (SM), [Sample 11D - Bottom 6"]. 51.0 ft, Drill bit plugging up, possible caving. End of exploration. Hole stopped @ 51.0 ft.  Safe-T hydraulic winch 140 lb hammer used.					

LOG OF BORING & WELL: 123-87463 RANDOLPH.GPJ VT\_AOT\_GDT\_7/23/13

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078bor.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
BORING LOGS (1 OF 4)

PLOT DATE: 8/12/2014  
DRAWN BY: M. SMITH  
CHECKED BY: J. BYATT  
SHEET 15 OF 39



VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-WRB-105 SHEET 1 of 3 DATE STARTED: 6/25/13 DATE COMPLETED: 6/25/13			
PROJECT NAME: Randolph Bro 1444(57) TH 65 BR35		PROJECT NUMBER: 123-87463					
SITE NAME: Randolph, VT		SITE NUMBER: TH 65 BR 35					
STATION: 99+98		GROUND ELEVATION: 575.95 ft					
OFFSET: 0.00		GROUNDWATER DEPTH: 11.25 ft 6/25/13					
VTSPG:		PROJECT PIN NUMBER:					
BORING CREW: New Hampshire Boring		BORING RIG: Diedrich D-50 Track					
CREW CHIEF: W. Hoeckle		BORING TYPE: Wash Bore					
DRILLER: W. Hoeckle		SAMPLE TYPE: Split Barrel					
LOGGER: C. Stuart		CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
2.5		A-1-b, SaGr, Rec. = 1.42 ft, brown, dry, medium dense, subrounded gravelly fine to coarse SAND, (SW), [Sample 1D].	26				
5.0		A-4, SaSiGr, Rec. = 1.0 ft, brown to gray, wet, medium dense, silty fine SAND, trace gravel, (SM), [Sample 2D].	23				
10.0		A-4, SaSi, Rec. = 1.5 ft, gray, wet, loose, silty fine SAND, (SM), [Sample 3D]. Note: Some oxidized coloring @ 10.5ft, wood encountered in bottom 3'. 10.75 ft, End of fill layer.	6	34.5	0.0	53.0	47.0
12.5		12.5 ft - 13.0 ft, Driller notes harder material. Casing driven from this point on.					
15.0		A-1-b, SaGrSi, Rec. = 0.58 ft, gray, wet, dense, gravelly fine to coarse SAND, some silt, (SW), [Sample 4D].	41				
20.0		A-4, SiSa, Rec. = 1.25 ft, gray, wet, medium dense, SILT, trace fine sand, (ML), [Sample 5D].	17	28.3	0.0	4.0	96.0
22.5		A-4, SiSa, Rec. = 1.25 ft, gray, wet, medium dense, SILT, trace fine sand, (ML), [Sample 6D].	17				

BOTTOM OF ABUT. 1  
EL. 564.75'

ESTIMATED  
PILE TIP  
EL. 529.75'

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-WRB-105 SHEET 2 of 3 DATE STARTED: 6/25/13 DATE COMPLETED: 6/25/13			
PROJECT NAME: Randolph Bro 1444(57) TH 65 BR35		PROJECT NUMBER: 123-87463					
SITE NAME: Randolph, VT		SITE NUMBER: TH 65 BR 35					
STATION: 99+98		GROUND ELEVATION: 575.95 ft					
OFFSET: 0.00		GROUNDWATER DEPTH: 11.25 ft 6/25/13					
VTSPG:		PROJECT PIN NUMBER:					
BORING CREW: New Hampshire Boring		BORING RIG: Diedrich D-50 Track					
CREW CHIEF: W. Hoeckle		BORING TYPE: Wash Bore					
DRILLER: W. Hoeckle		SAMPLE TYPE: Split Barrel					
LOGGER: C. Stuart		CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
27.5							
30.0		A-2-4, SaSi, Rec. = 1.33 ft, gray, wet, medium dense, fine to medium SAND, little silt, (SM), [Sample 7D].	24	16.7	5.0	78.0	17.0
32.5		32.5 ft, Driller reported possible cobble.					
35.0		A-1-b, SaSi, Rec. = 0.92 ft, gray, wet, medium dense, medium SAND, trace silt, (SP), [Sample 8D].	15				
40.0		A-3, SaGrSi, Rec. = 0.83 ft, brown, wet, dense, fine SAND, little coarse sand, trace gravel, trace silt, gap graded, (SP), [Sample 9D]. End of casing. Open hole from 39 ft to 52.3 ft.	44				
45.0		Rec. = 0.0 ft, 44.0 ft - 46.0 ft, No recovery [Sample 10D].	42				
47.5		Run 1: 47.3-52.3 ft Dark grey (N3) to medium light grey (N6), fine to medium grained, strongly foliated, slightly weathered to fresh, strong (R4), muscovite-biotite-quartz SCHIST. Foliation dips 50-60 degrees. Discontinuities very closely to closely spaced, dipping 25-30 degrees, planar, very rough. Trace dark red garnets to 0.25 inch diameter. [Gile Mountain Formation]	1	100	99.6	60	0.3

Top of Bedrock @ 46.3 ft

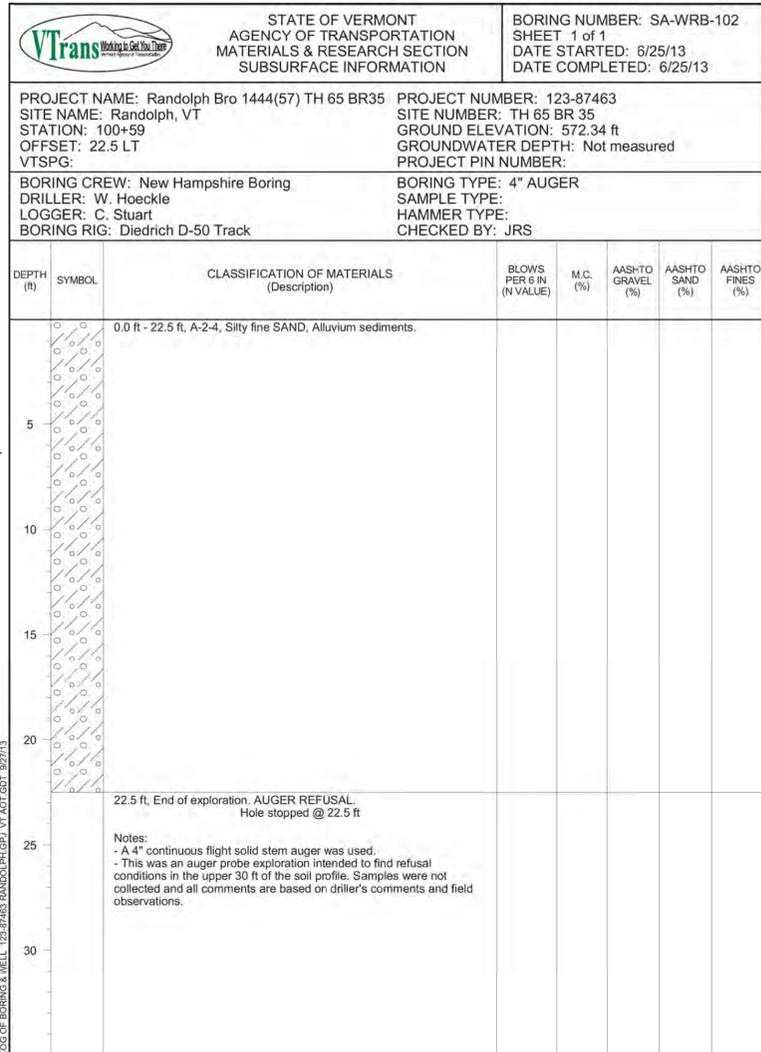
VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-WRB-105 SHEET 3 of 3 DATE STARTED: 6/25/13 DATE COMPLETED: 6/25/13			
PROJECT NAME: Randolph Bro 1444(57) TH 65 BR35		PROJECT NUMBER: 123-87463					
SITE NAME: Randolph, VT		SITE NUMBER: TH 65 BR 35					
STATION: 99+98		GROUND ELEVATION: 575.95 ft					
OFFSET: 0.00		GROUNDWATER DEPTH: 11.25 ft 6/25/13					
VTSPG:		PROJECT PIN NUMBER:					
BORING CREW: New Hampshire Boring		BORING RIG: Diedrich D-50 Track					
CREW CHIEF: W. Hoeckle		BORING TYPE: Wash Bore					
DRILLER: W. Hoeckle		SAMPLE TYPE: Split Barrel					
LOGGER: C. Stuart		CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	RUN	REC (%)	RQD (%)	Dip (deg)	Drill Rate (min/ft)
52.5		R1: Core limes (min:sec) 47.3-48.3' (4:00) 48.3-49.3' (5:05) 49.3-50.3' (4:00) 50.3-51.3' (2:45) 51.3-52.3' (3:20), 46.3 ft NX, Rec. = 5.0 ft Hole stopped @ 52.3 ft Safe-T hydraulic 140 lb winch hammer used.					

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078bor.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
BORING LOGS (2 OF 4)

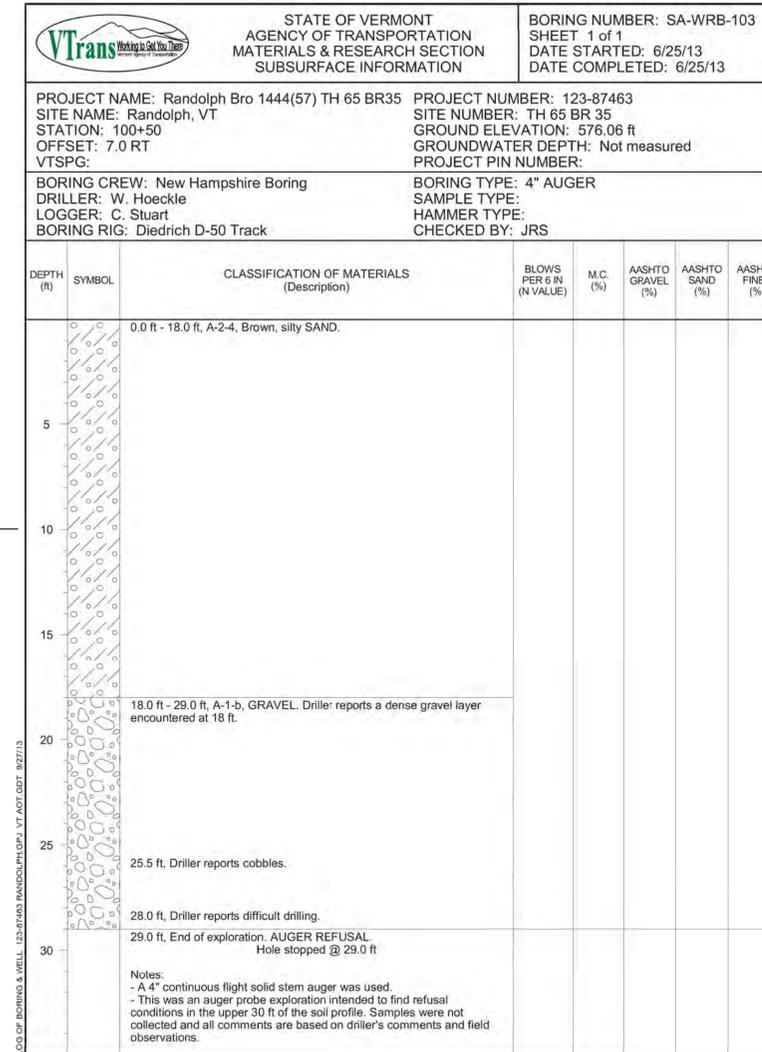
PLOT DATE: 8/12/2014  
DRAWN BY: M. SMITH  
CHECKED BY: J. BYATT  
SHEET 16 OF 39





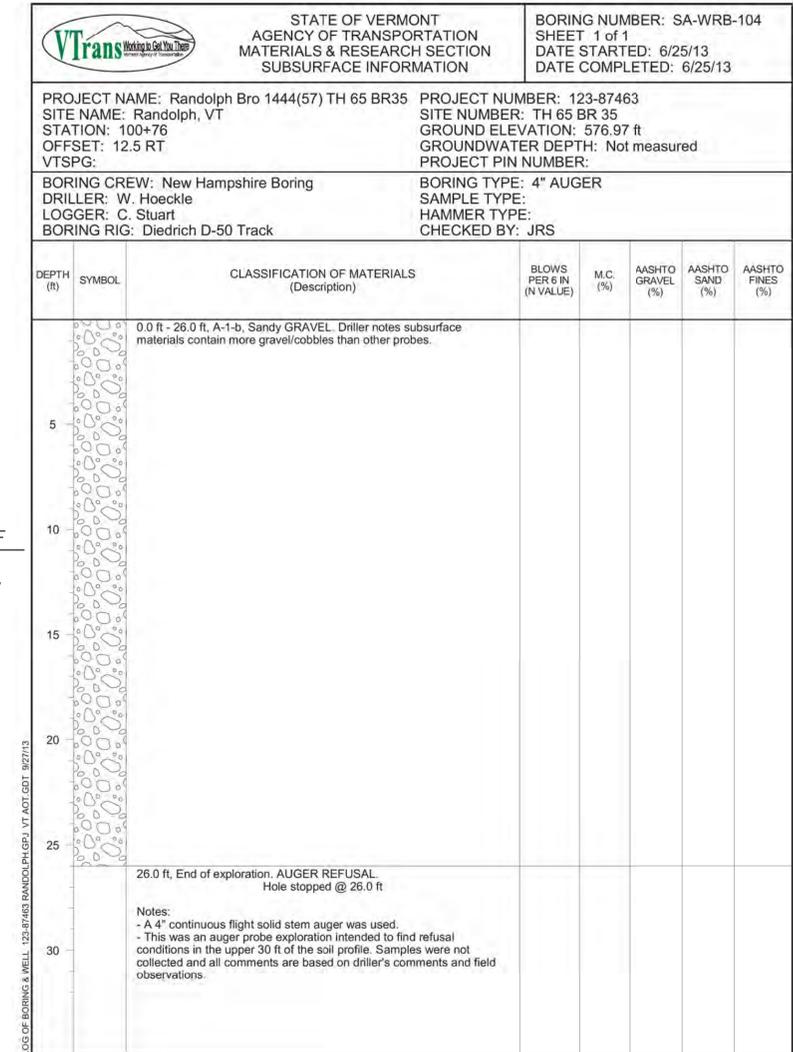
BOTTOM OF ABUT. 2  
EL. 566.00'

LOG OF BORING & WELL 123-87463 RANDOLPH.GPJ VT NOT GDT 9/27/13



BOTTOM OF ABUT. 2  
EL. 566.00'

LOG OF BORING & WELL 123-87463 RANDOLPH.GPJ VT NOT GDT 9/27/13



BOTTOM OF ABUT. 2  
EL. 566.00'

LOG OF BORING & WELL 123-87463 RANDOLPH.GPJ VT NOT GDT 9/27/13

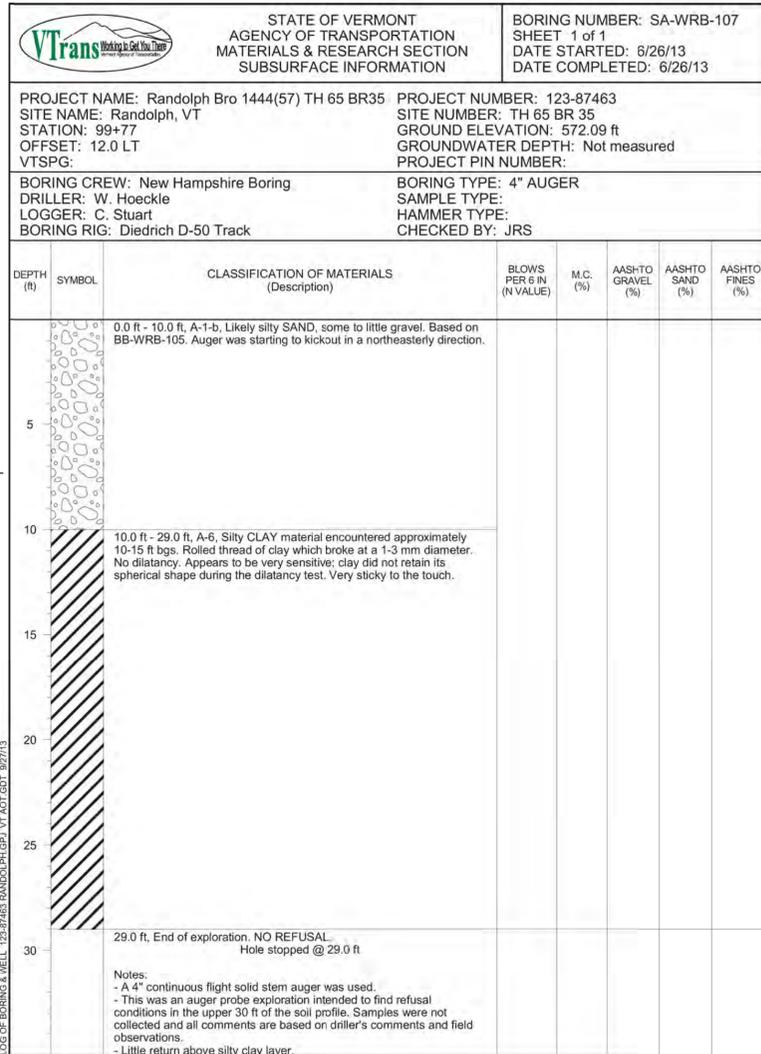
PROJECT NAME: RANDOLPH  
 PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078bor.dgn  
 PROJECT LEADER: J. BYATT  
 DESIGNED BY: N. CARON  
 BORING LOGS (3 OF 4)

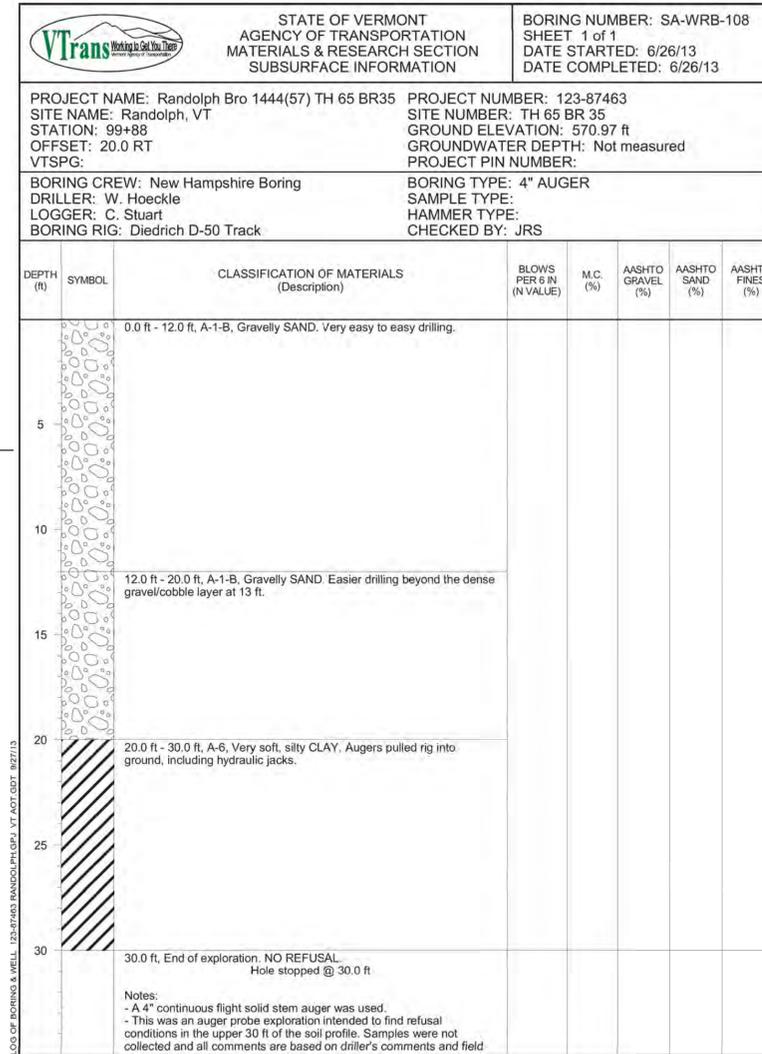
PLOT DATE: 8/12/2014  
 DRAWN BY: M. SMITH  
 CHECKED BY: J. BYATT  
 SHEET 17 OF 39



CLD 12-0175 \$FILEABBREV\$ MODEL: BOR05



BOTTOM OF ABUT. 1  
EL. 564.75'



BOTTOM OF ABUT. 1  
EL. 564.75'

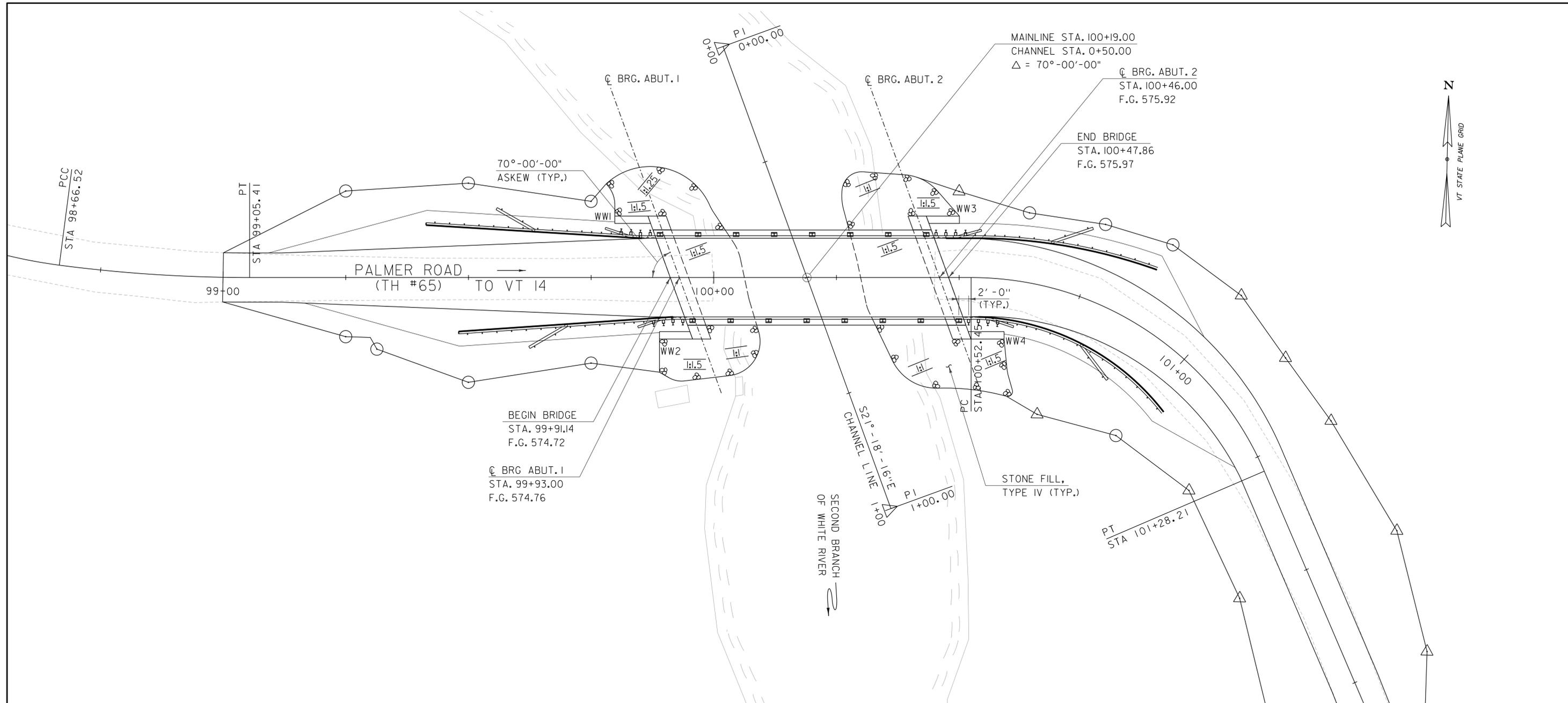
PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078bor.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
BORING LOGS (4 OF 4)

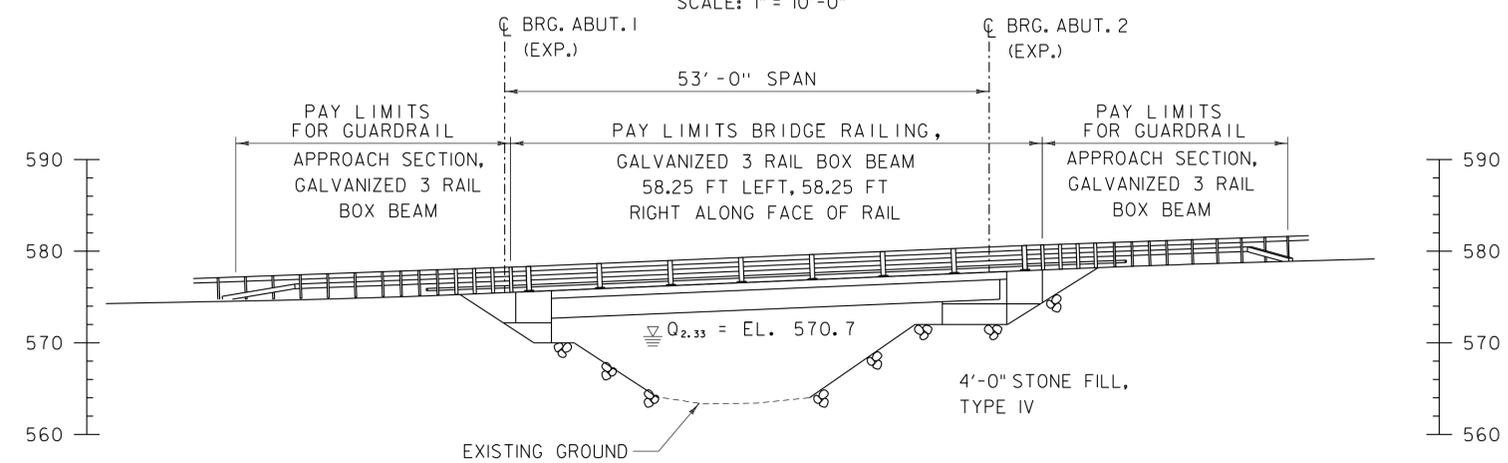
PLOT DATE: 8/12/2014  
DRAWN BY: M. SMITH  
CHECKED BY: J. BYATT  
SHEET 18 OF 39



CLD.12-0175 MODEL:PE01



PLAN VIEW  
SCALE: 1" = 10'-0"

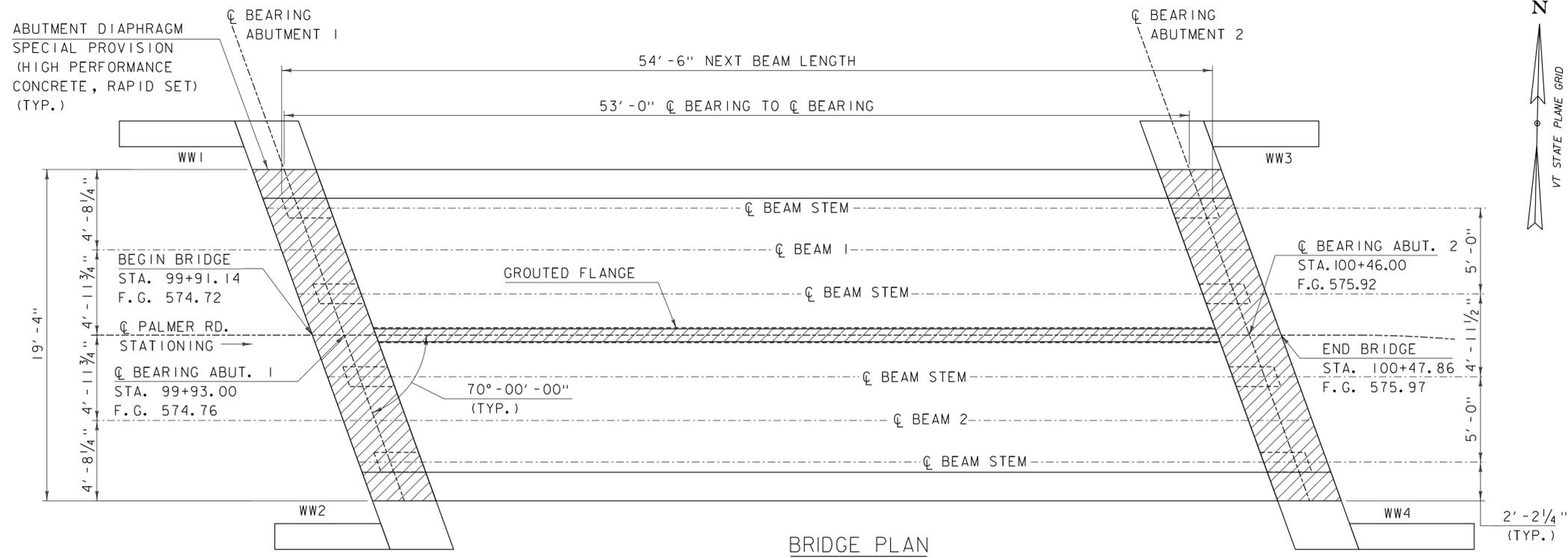


ELEVATION  
SCALE: 1" = 10'-0"

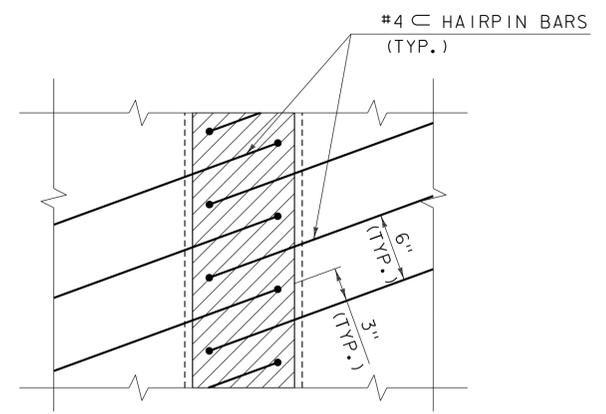


PROJECT NAME:	RANDOLPH	PLOT DATE:	8/12/2014
PROJECT NUMBER:	BRO 1444(57)	DRAWN BY:	M. SMITH
FILE NAME:	z11j078pe.dgn	DESIGNED BY:	N. CARON
PROJECT LEADER:	J. BYATT	CHECKED BY:	J. BYATT
PLAN AND ELEVATION		SHEET	19 OF 39

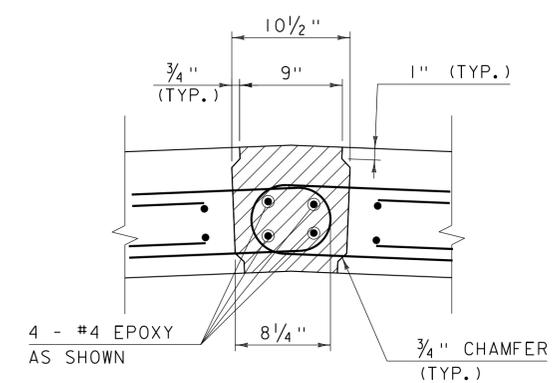




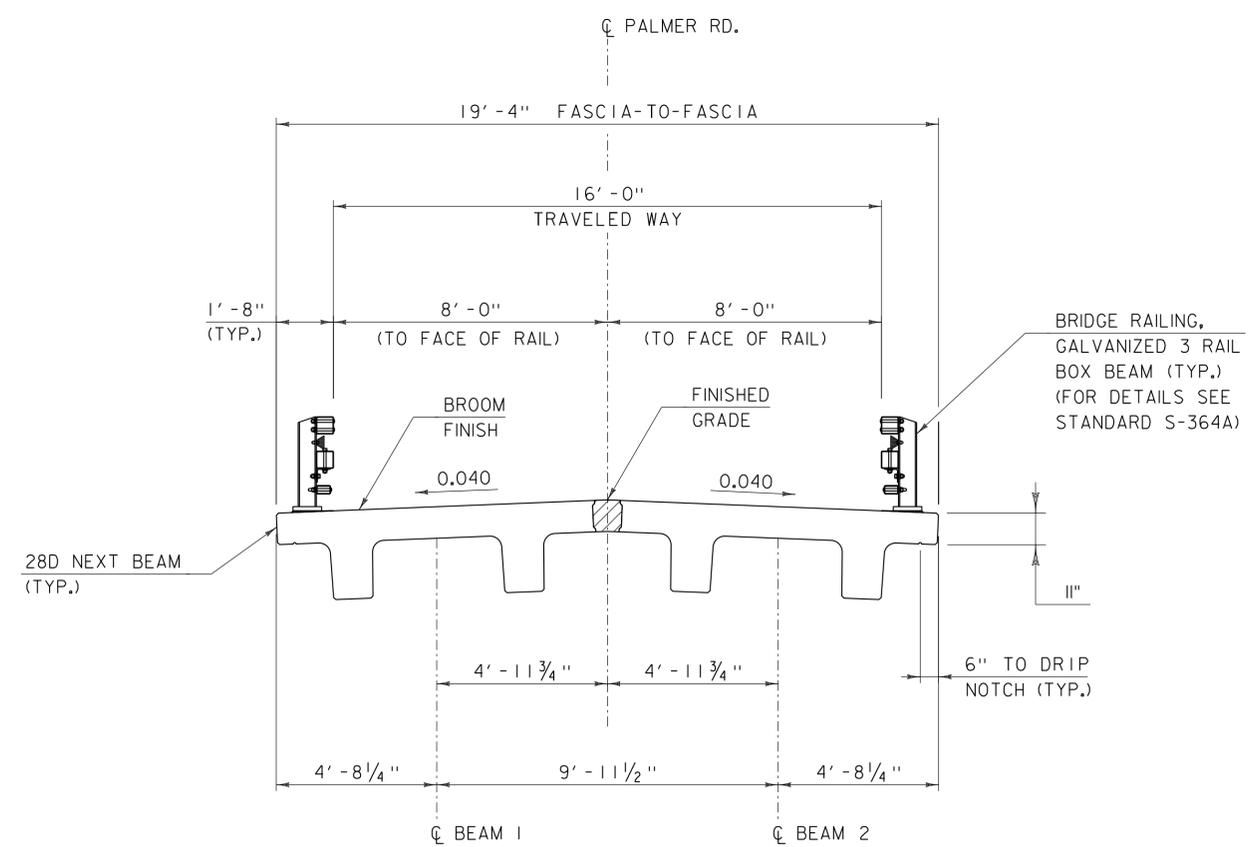
BRIDGE PLAN  
SCALE: 1/4" = 1'-0"



CONNECTION DETAIL PLAN  
SCALE: 1/2" = 1'-0"



CONNECTION DETAIL SECTION  
SCALE: 1/2" = 1'-0"



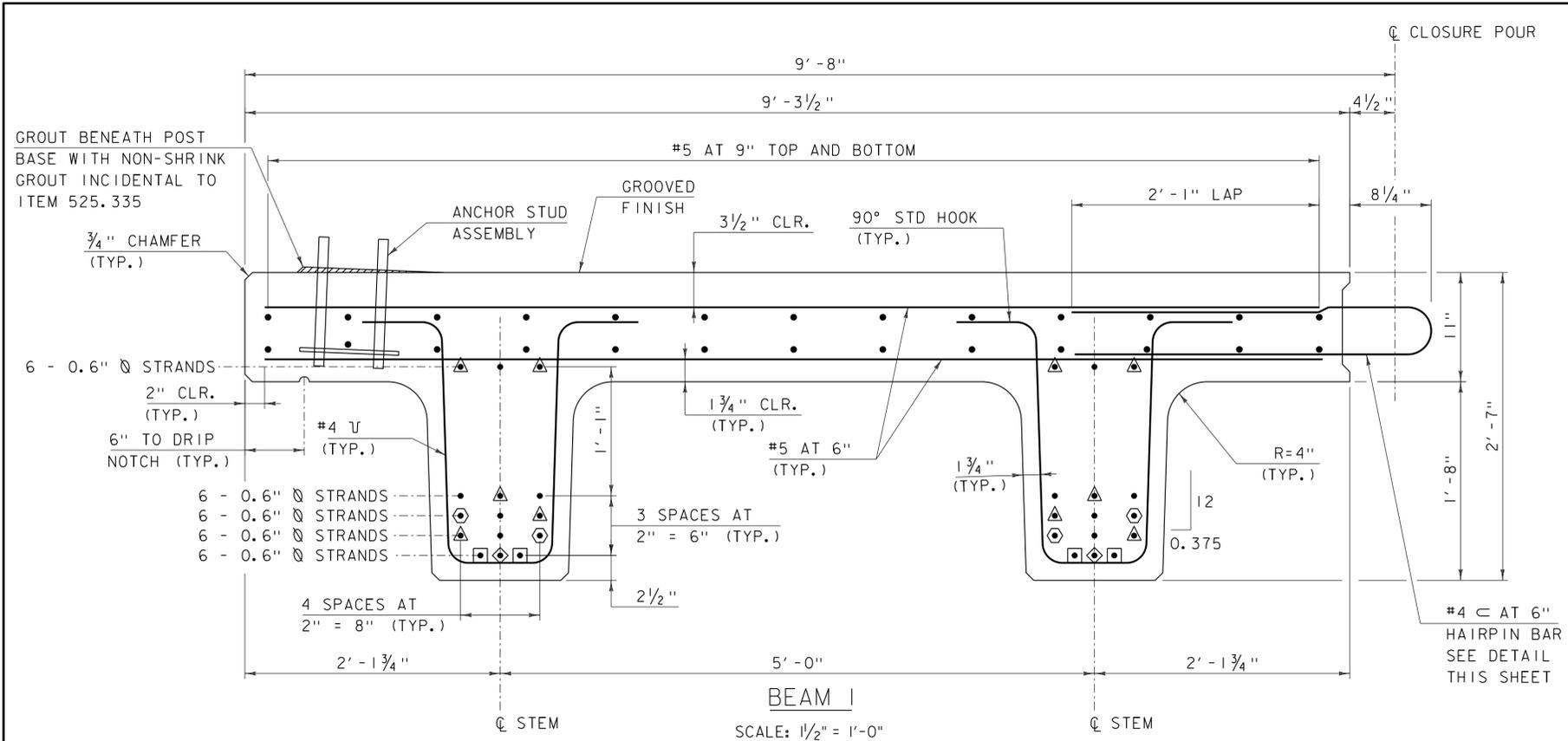
TYPICAL BRIDGE SECTION  
SCALE: 3/8" = 1'-0"

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (TYP.)

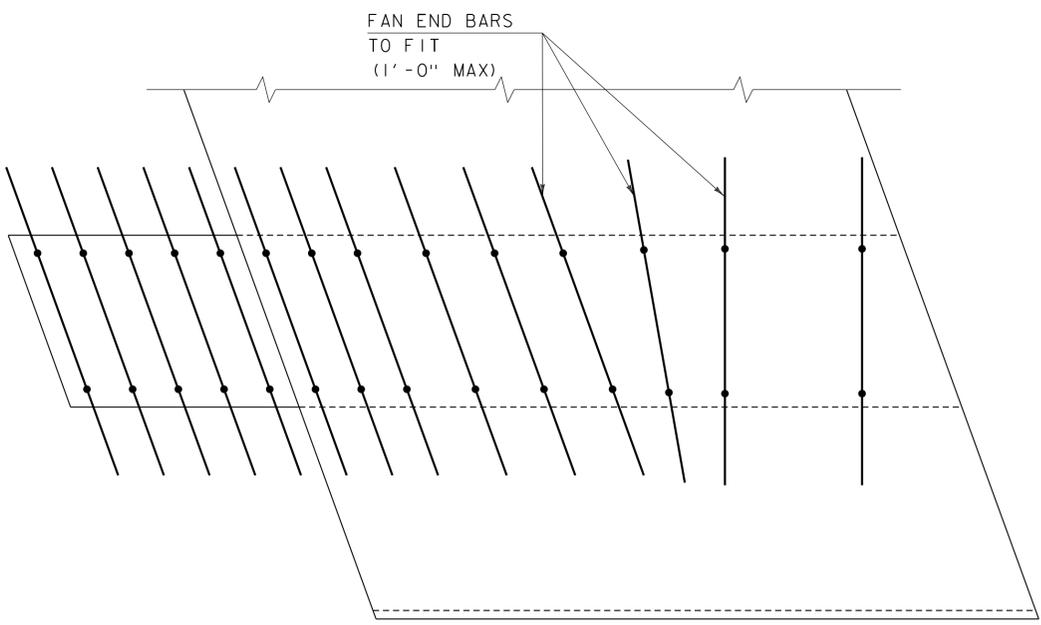
PROJECT NAME:	RANDOLPH	FILE NAME:	z11j078sup.dgn	PLOT DATE:	8/12/2014
PROJECT NUMBER:	BRO 1444(57)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. SMITH
		DESIGNED BY:	N. CARON	CHECKED BY:	J. BYATT
		BRIDGE PLAN AND TYPICAL SECTIONS			SHEET 20 OF 39



CLD 12-0175 MODEL:01

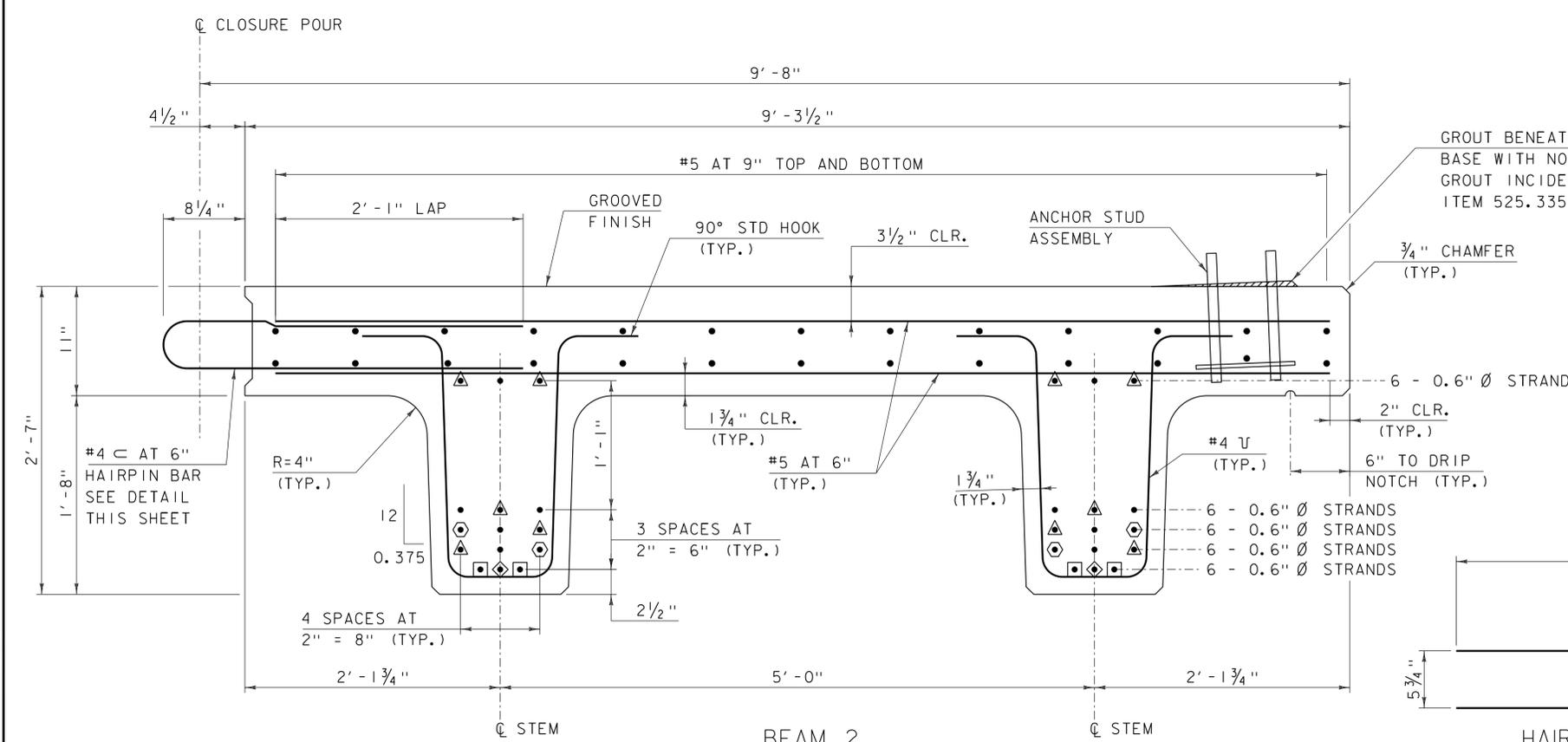


BEAM 1  
SCALE: 1/2" = 1'-0"

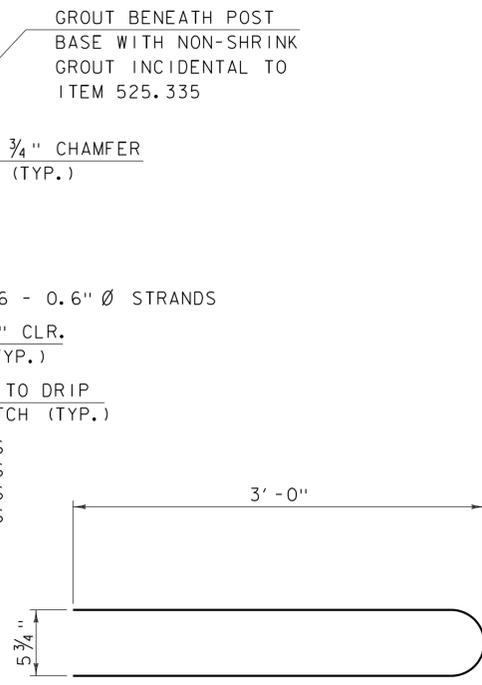


SKewed END DETAIL  
SCALE: 1/2" = 1'-0"

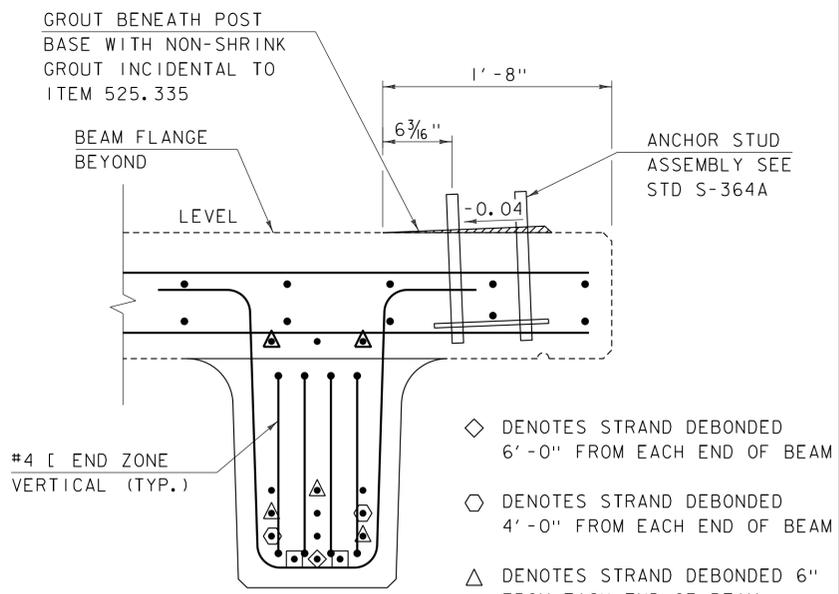
- NOTE:
1. BARS IN DECK OMITTED FOR CLARITY.
  2. TRANSVERSE REINFORCING IN THE DECK SHALL BE PLACED PARALLEL TO THE SKEW.



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



HAIRPIN BAR DETAIL  
SCALE: 1/2" = 1'-0"



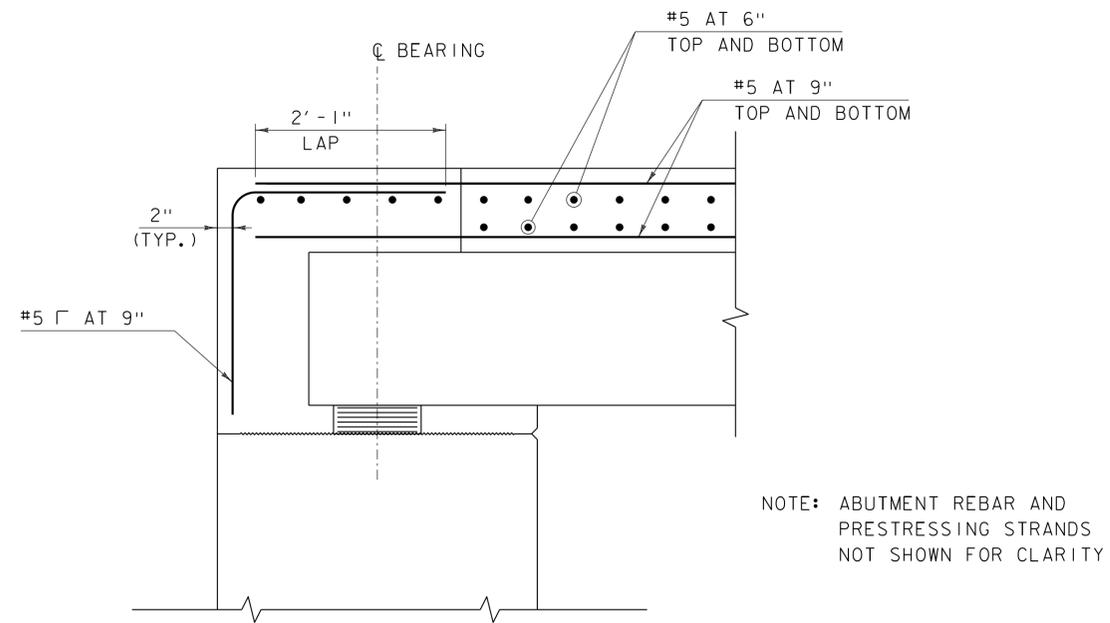
END SECTION DETAIL  
SCALE: 1/2" = 1'-0"

- ◇ DENOTES STRAND DEBONDED 6'-0" FROM EACH END OF BEAM
- DENOTES STRAND DEBONDED 4'-0" FROM EACH END OF BEAM
- △ DENOTES STRAND DEBONDED 6" FROM EACH END OF BEAM
- DENOTES FULLY BONDED STRAND EXTENDED 3'-0" FROM BEAM END

PROJECT NAME:	RANDOLPH	FILE NAME:	z11j078sup.dgn	PLOT DATE:	8/12/2014
PROJECT NUMBER:	BRO 1444(57)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. SMITH
		DESIGNED BY:	N. CARON	CHECKED BY:	J. BYATT
		NEXT BEAM DETAILS (1 OF 2)		SHEET	21 OF 39

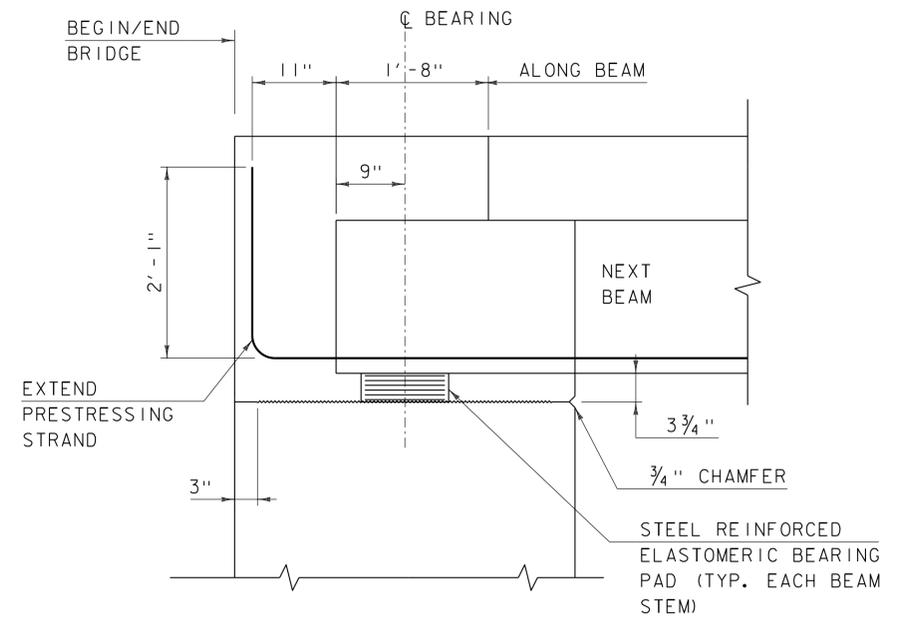


MODEL: 02  
CLD. 12-0175



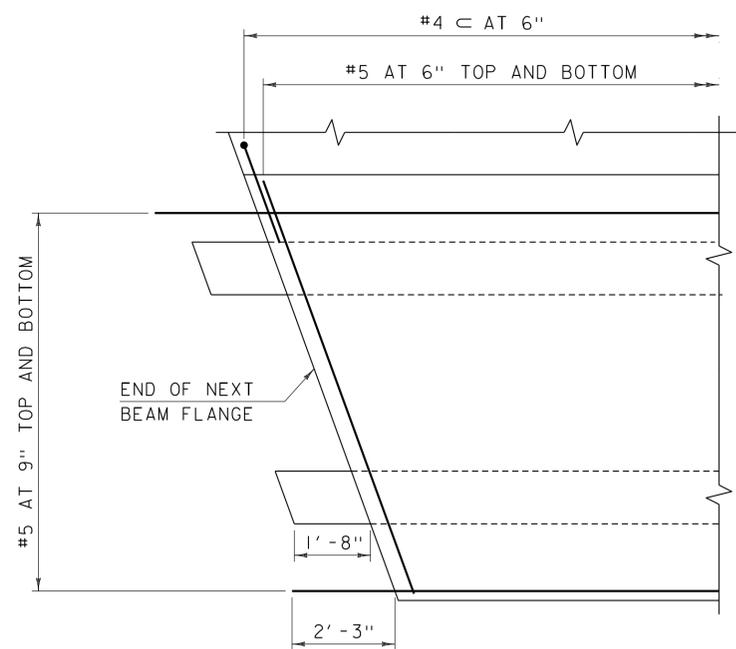
TYPICAL DECK REINFORCING AT BEAM END

SCALE: 1" = 1'-0"



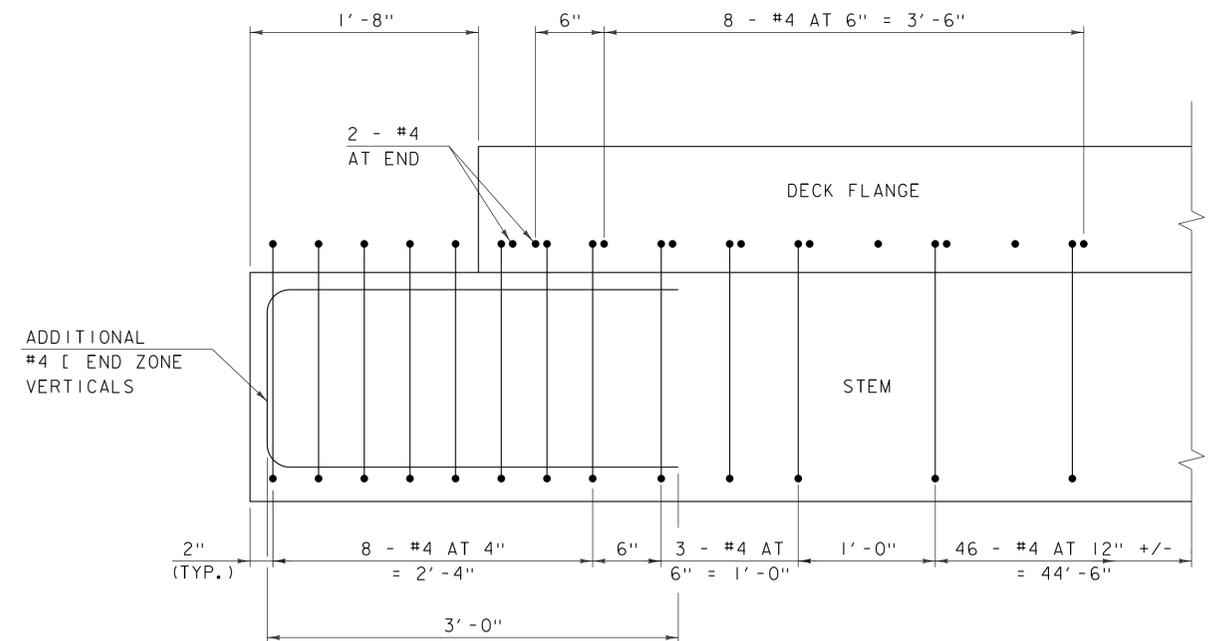
TYPICAL BEAM END DETAIL

SCALE: 1" = 1'-0"



PARTIAL BEAM FLANGE PLAN

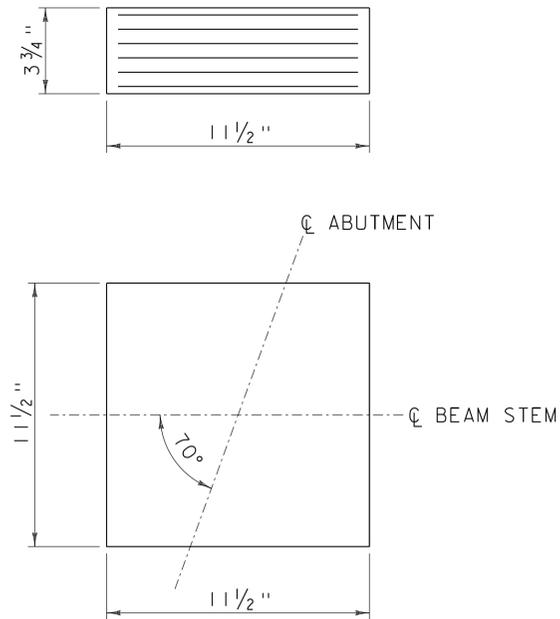
SCALE: 1/2" = 1'-0"



ADDITIONAL BEAM END REINFORCING

LONGITUDINAL SECTION

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



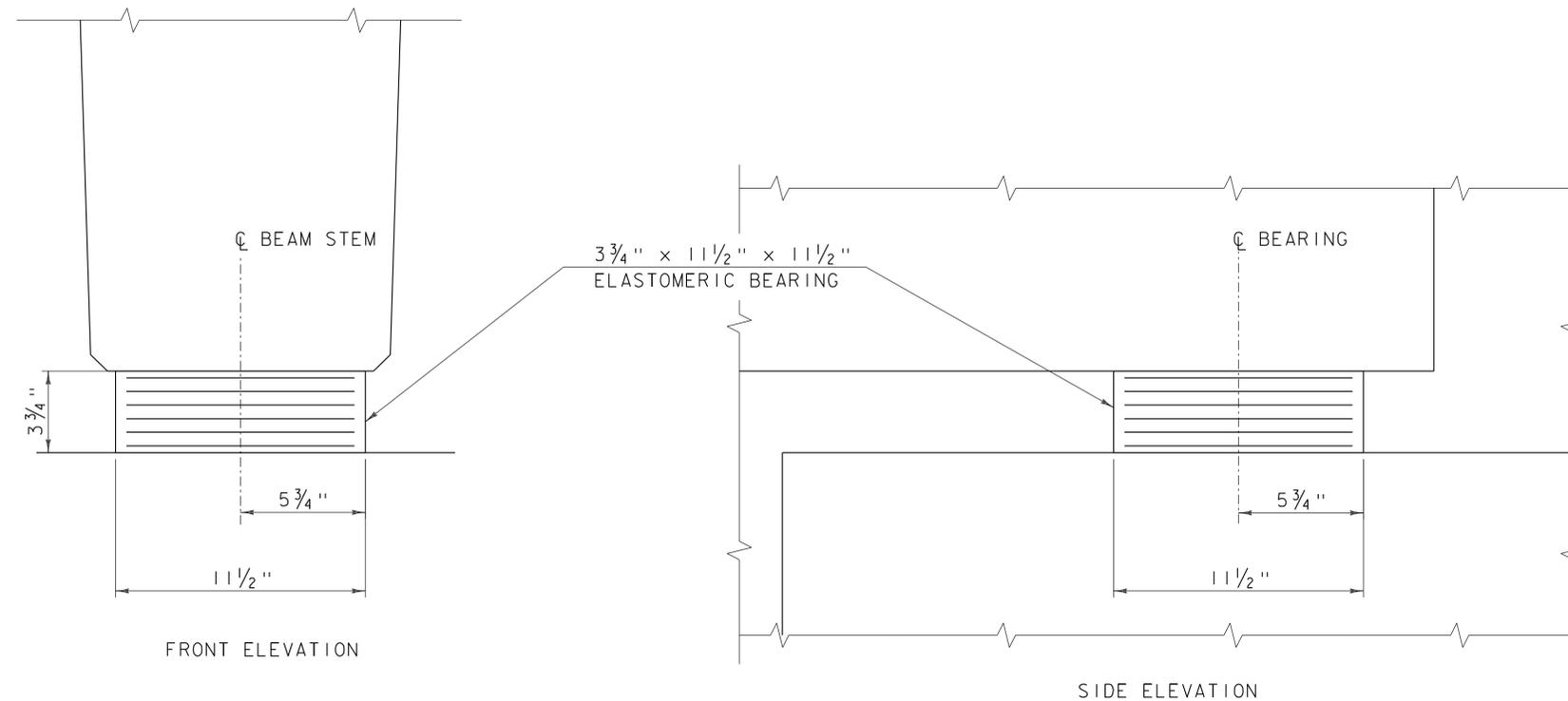
ELASTOMERIC BEARING DETAIL

SCALE: 3" = 1'-0"

- 2 - 1/4" EXTERIOR LAYERS OF ELASTOMER
- 5 - 1/2" INTERIOR LAYERS OF ELASTOMER
- 6 - 1/8" STEEL REINFORCING PLATES

BEARING NOTES

1. BEARINGS SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF SECTIONS 531 AND 731 AND SHALL BE PAID UNDER CONTRACT ITEM 531.17.
2. ALL REINFORCEMENT BETWEEN LAYERS OF ELASTOMER SHALL BE STEEL MEETING THE REQUIREMENTS OF SUBSECTION 714.02. ALL INTERNAL STEEL PLATES SHALL BE SAND BLASTED AND FREE OF COATINGS, RUST AND MILL SCALE. THE PLATES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. STEEL REINFORCED ELASTOMERIC BEARINGS SHALL HAVE A MINIMUM 1/4" EDGE SEAL OF ELASTOMER INTEGRAL WITH BEARING OVER ALL INTERNAL PLATES.
4. THE ELASTOMER WAS DESIGNED WITH A SHEAR MODULUS RANGE OF 130 PSI - 200 PSI.
5. THE ELASTOMER SHALL MEET THE REQUIREMENTS OF LOW TEMPERATURE ZONE D, GRADE 4.
6. THE CONTRACTOR IS ADVISED TO HAVE A MINIMUM OF 8 - 1/4" x 12 1/2" x 12 1/2" GALVANIZED STEEL SHIMS AVAILABLE FOR ELEVATION ADJUSTMENTS UPON THE SETTING OF THE SUPERSTRUCTURE UNITS. THE SHIMS SHALL BE FABRICATED ACCORDING TO SECTION 531 AND SHALL BE INCLUDED IN THE UNIT BID PRICE FOR CONTRACT ITEM 531.17.
7. DESIGN SERVICE LOADS PER BEARING: (DESIGN METHOD A)  
 MAX DEAD LOAD: 30.5 K  
 MAX LIVE LOAD: 30.4 K



ELASTOMERIC BEARING DETAIL

SCALE: 3" = 1'-0"

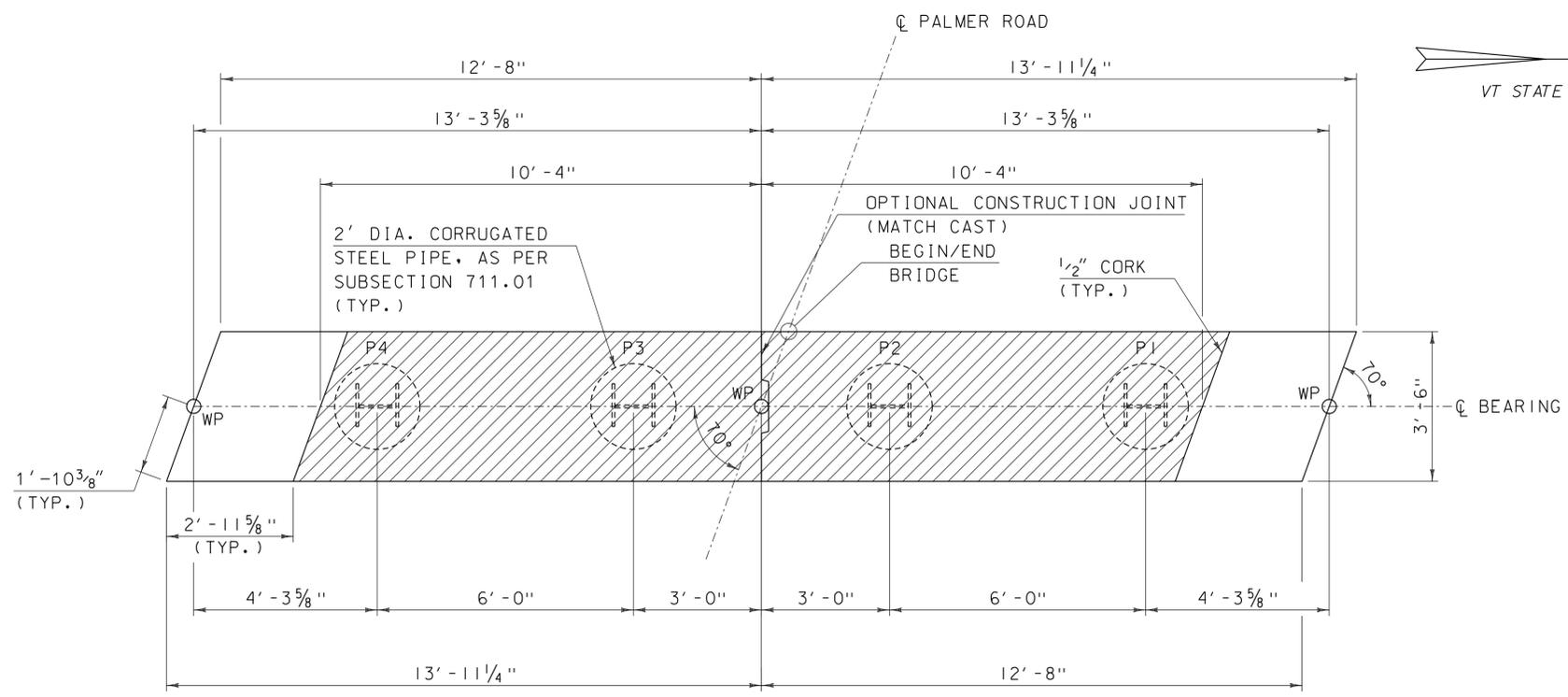
CLD 12-0175 MODEL: 04



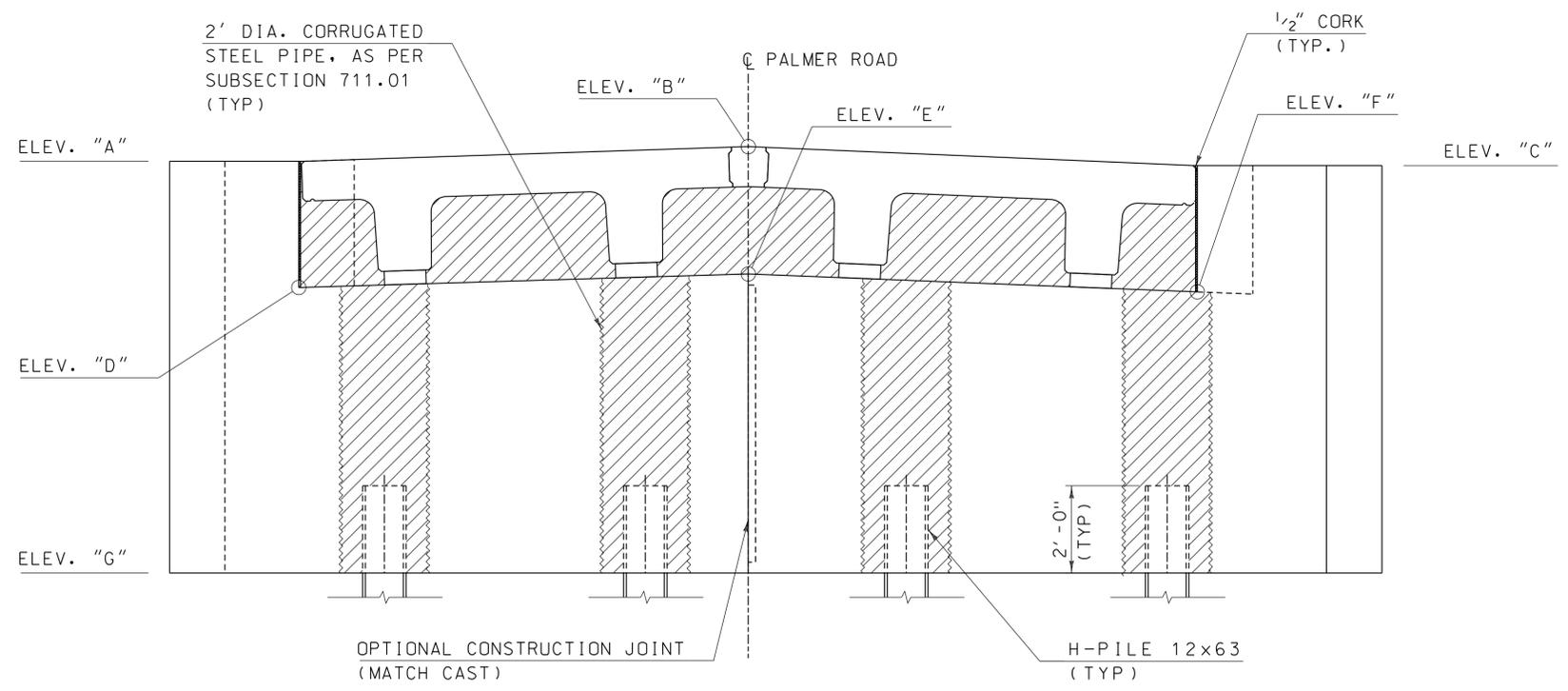
PROJECT NAME: RANDOLPH  
 PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078sup.dgn  
 PROJECT LEADER: J. BYATT  
 DESIGNED BY: N. CARON  
 BEARING DETAILS

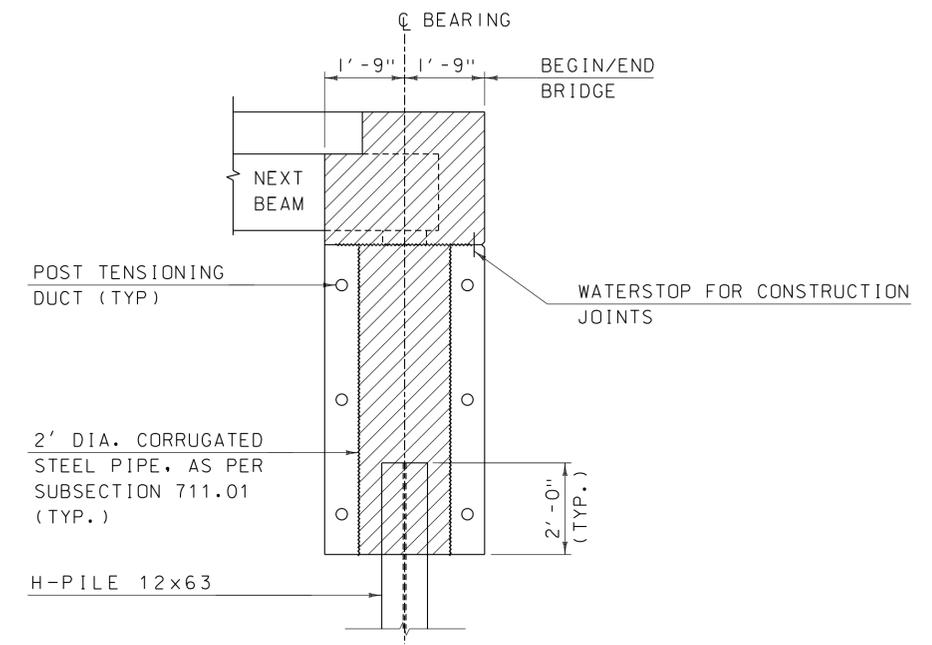
PLOT DATE: 8/12/2014  
 DRAWN BY: M. SMITH  
 CHECKED BY: J. BYATT  
 SHEET 23 OF 39



ABUTMENT I PLAN (PCU I)  
SCALE: 1/2" = 1'-0"



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



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

PCU ELEVATIONS

	AB1	AB2
ELEV "A"	574.45	575.46
ELEV "B"	574.76	575.92
ELEV "C"	574.29	575.62
ELEV "D"	571.55	572.56
ELEV "E"	571.86	573.03
ELEV "F"	571.40	572.72
ELEV "G"	564.75	566.00

NOTE: ELEVATIONS ARE AT CENTERLINE BEARING

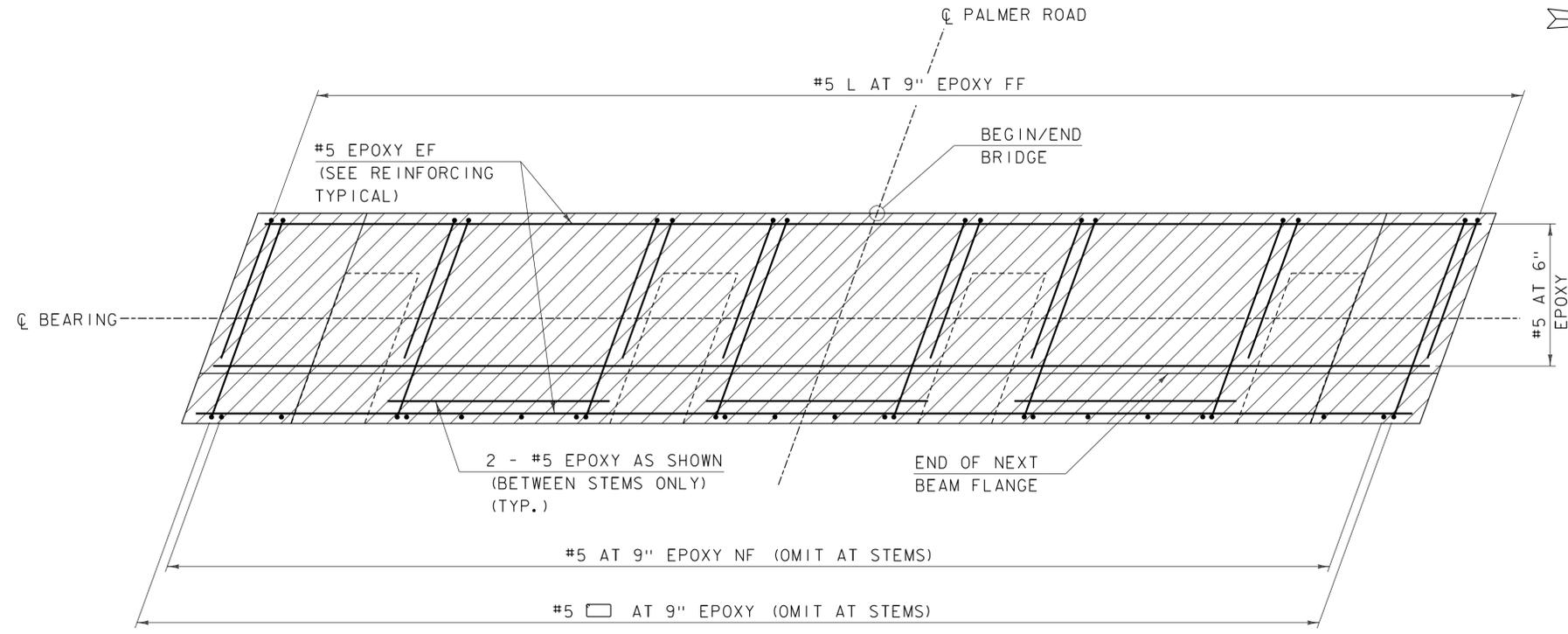
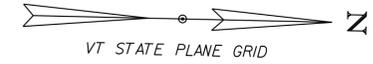
NOTE: ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR



PROJECT NAME:	RANDOLPH	PLOT DATE:	8/12/2014
PROJECT NUMBER:	BRO 1444(57)	DRAWN BY:	M. SMITH
FILE NAME:	zlij078sub.dgn	DESIGNED BY:	N. CARON
PROJECT LEADER:	J. BYATT	CHECKED BY:	J. BYATT
ABUTMENT PLAN		SHEET	24 OF 39

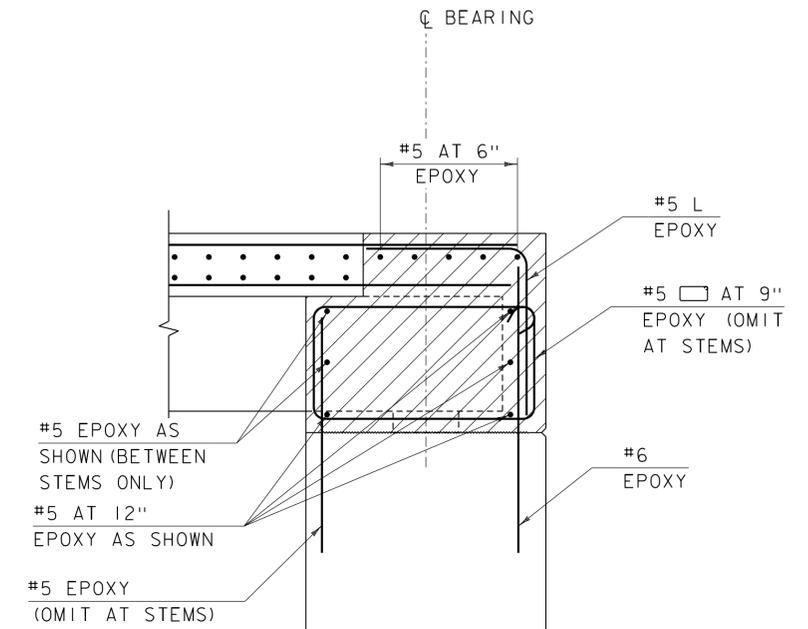
CLD-12-0175 MODEL: 02





**BEAM-END CLOSURE POUR  
REINFORCING PLAN**

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

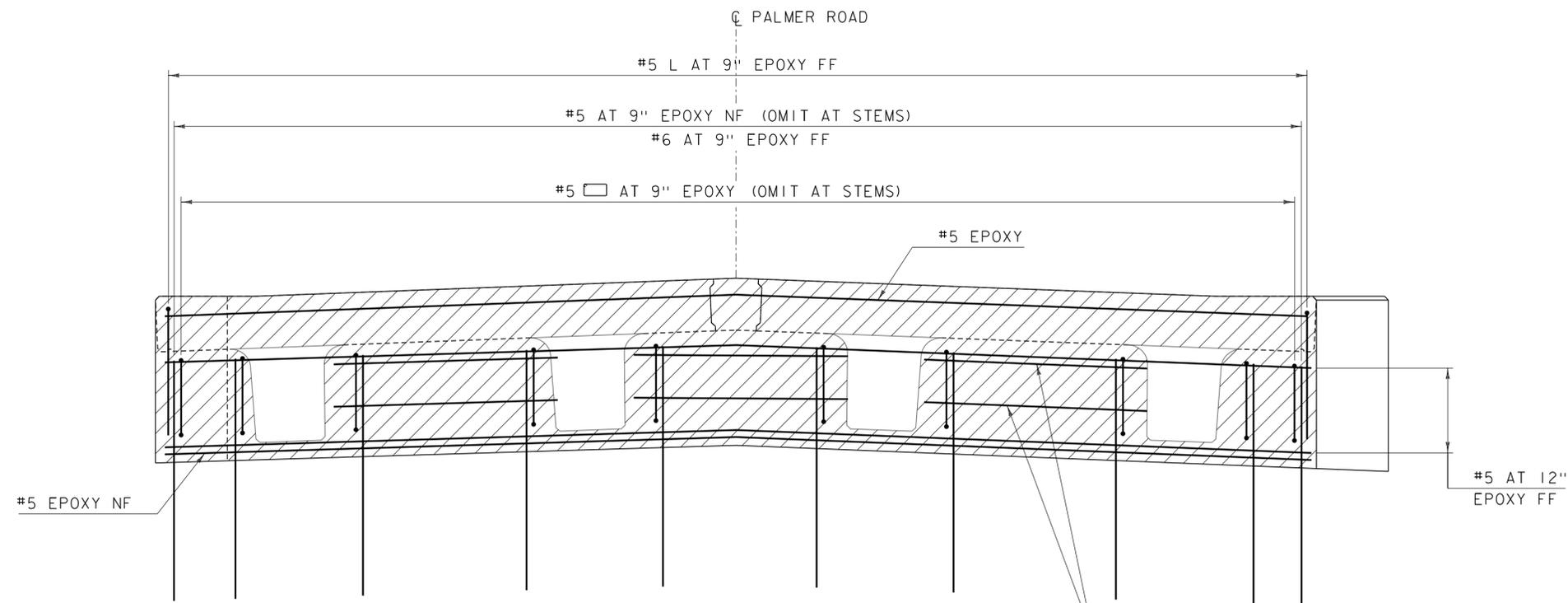


**REINFORCING TYPICAL**

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

**NOTE:**

- NF = NEAR FACE
- FF = FAR FACE
- EF = EACH FACE
- 2" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE THE PLANS.
- 2'-1" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS



**BEAM-END CLOSURE POUR  
REINFORCING ELEVATION**

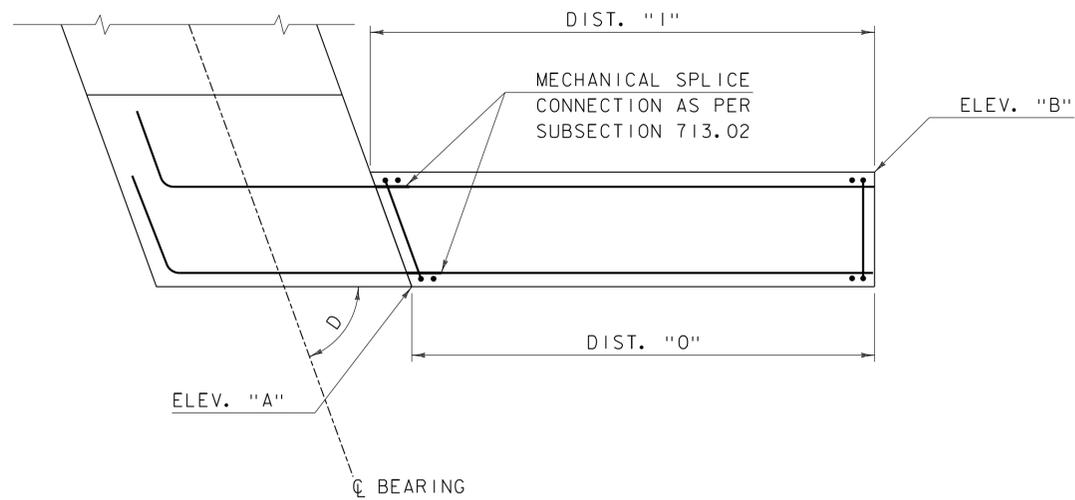
SCALE: 3/4" = 1'-0"

NOTE: REINFORCING STEEL FOR ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR

2 - #5 EPOXY NF AS SHOWN (BETWEEN STEMS ONLY) (TYP.)

PROJECT NAME: RANDOLPH	PLOT DATE: 8/12/2014
PROJECT NUMBER: BRO 1444(57)	DRAWN BY: M. SMITH
FILE NAME: zllj078sup.dgn	CHECKED BY: J. BYATT
PROJECT LEADER: J. BYATT	SHEET 26 OF 39
DESIGNED BY: N. CARON	
BEAM-END CLOSURE POUR DETAILS	





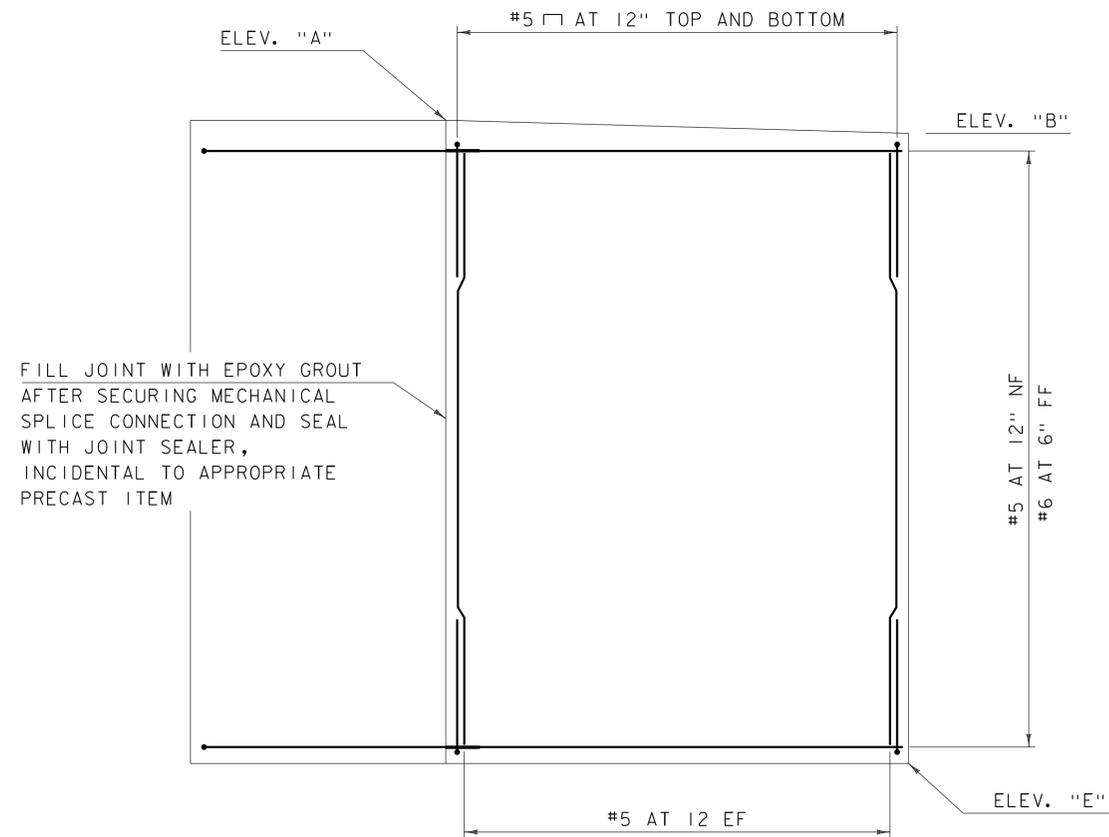
WVI PLAN (PCU3)  
SCALE: 3/4" = 1'-0"

PCU ELEVATIONS

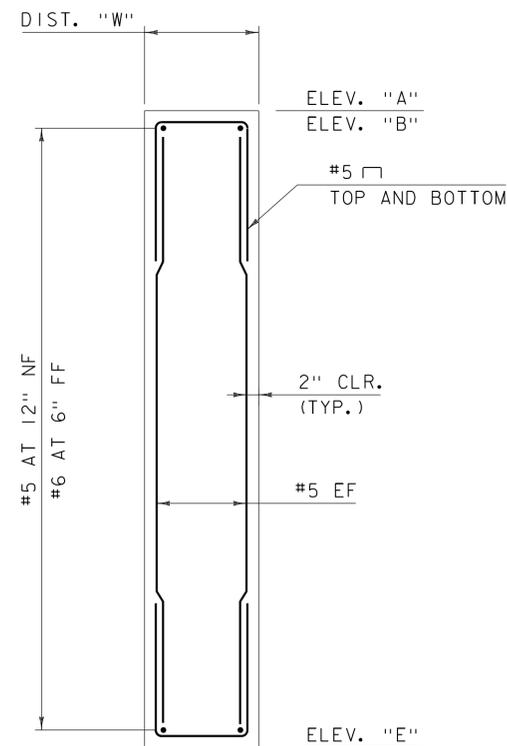
	WW1	WW2	WW3	WW4
ELEV. "A"	574.25	574.41	575.50	575.66
ELEV. "B"	574.08	574.28	576.63	575.86
ELEV. "E"	564.75	564.75	566.00	566.00
DIST. "W"	1'-6"	1'-6"	1'-6"	1'-6"
DIST. "I"	7'-3 1/2"	6'-2 1/2"	6'-2 1/2"	7'-3 1/2"
DIST. "O"	6'-9"	6'-9"	6'-9"	6'-9"
ANGLE "D"	70°	110°	110°	70°

NOTES:

1. EPOXY GROUT SHALL BE INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE".
2. ALL REBAR AND MECHANICAL CONNECTORS IN WINGWALLS SHALL BE LEVEL 1 EPOXY COATED.
3. THE BRIDGE PLAQUE FURNISHED BY THE AGENCY SHALL BE CAST INTO WINGWALL 2. ALL WORK TO INSTALL THE PLAQUE SHALL BE INCIDENTAL TO THE PRECAST CONCRETE STRUCTURE ITEM. SEE SD-502.00 FOR FURTHER DETAILS.
4. WW1 SHOWN, OTHERS SHALL BE SIMILAR.



WVI ELEVATION (PCU3)  
SCALE: 3/4" = 1'-0"



WVI TYPICAL (PCU3)  
SCALE: 3/4" = 1'-0"

NOTE:

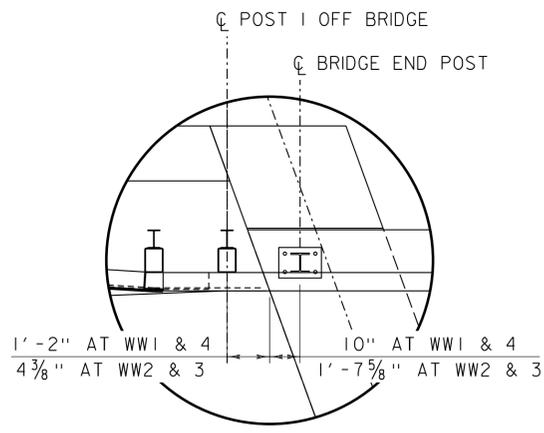
NF = NEAR FACE  
FF = FAR FACE  
EF = EACH FACE  
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE THE PLANS.  
2'-6" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078sub.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
WINGWALL DETAILS

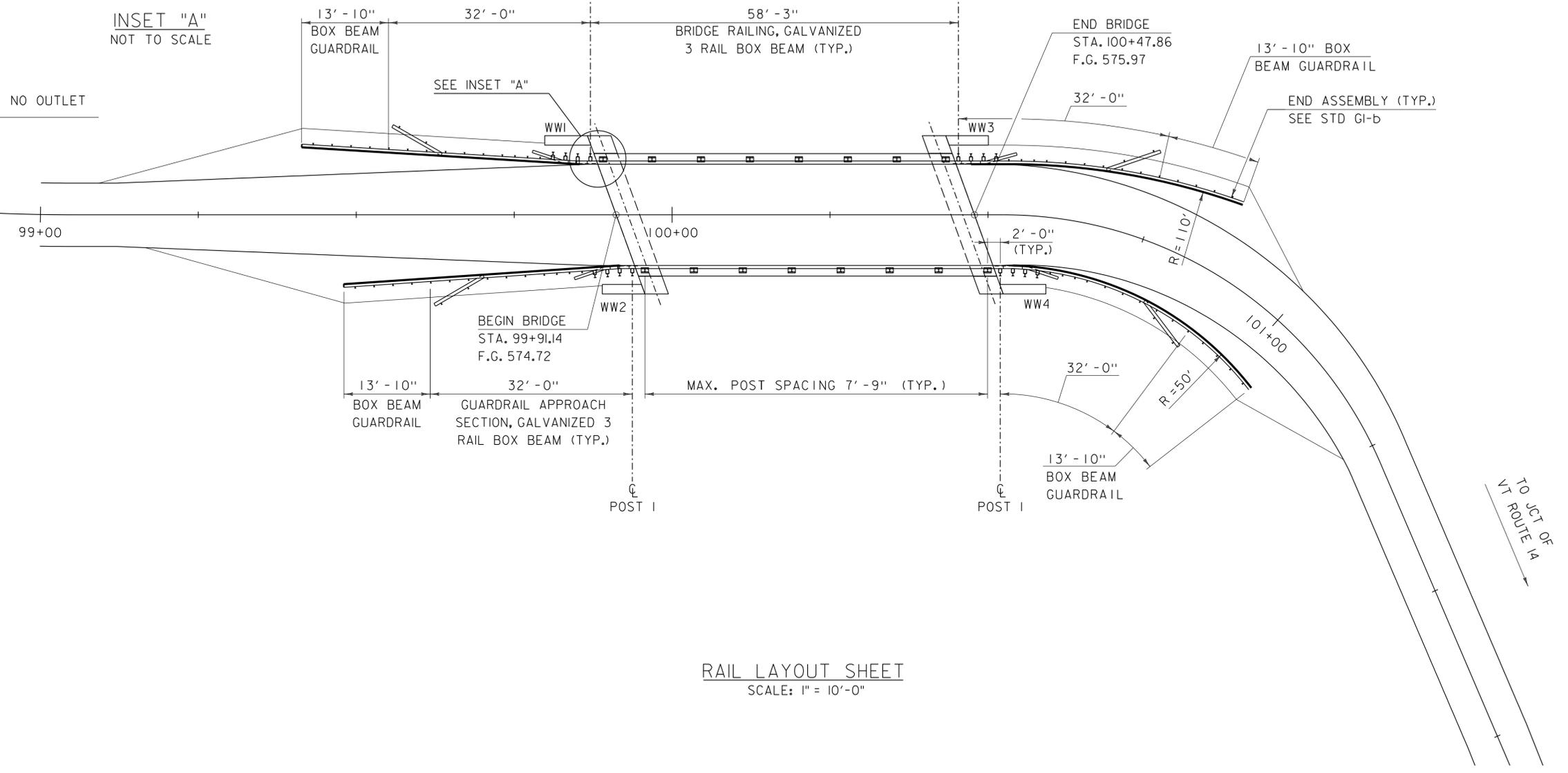
PLOT DATE: 8/12/2014  
DRAWN BY: M. SMITH  
CHECKED BY: J. BYATT  
SHEET 27 OF 39





INSET "A"  
NOT TO SCALE

NO OUTLET



RAIL LAYOUT SHEET  
SCALE: 1" = 10'-0"

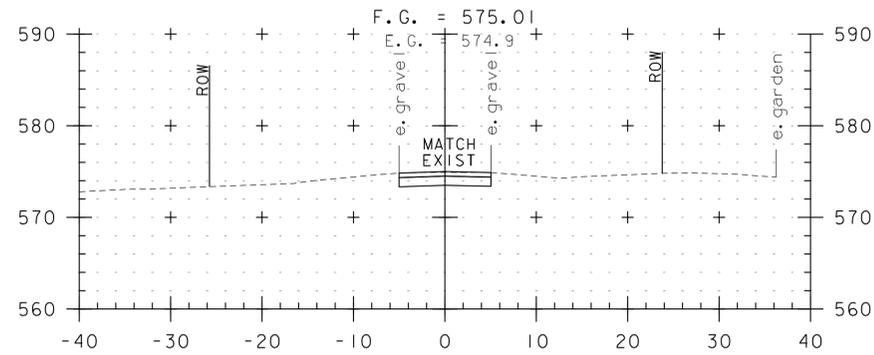
NOTES:

- SEE STANDARDS G-1b, S-364A, S-364B, S364C AND S-364D FOR FURTHER DETAILS.

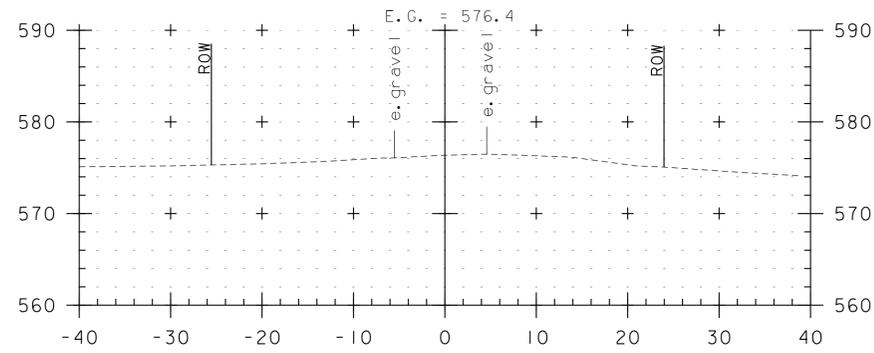


PROJECT NAME: RANDOLPH	
PROJECT NUMBER: BRO 1444(57)	
FILE NAME: z11j078rail.dgn	PLOT DATE: 8/12/2014
PROJECT LEADER: J. BYATT	DRAWN BY: M. SMITH
DESIGNED BY: N. CARON	CHECKED BY: J. BYATT
RAIL LAYOUT SHEET	SHEET 28 OF 39

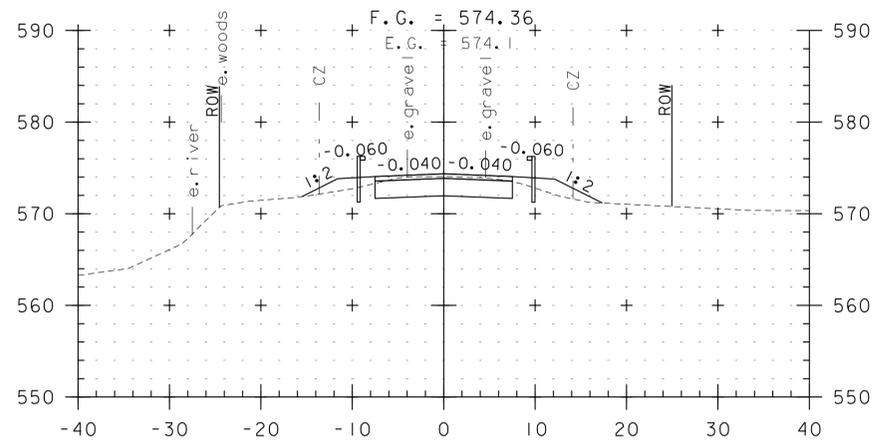
C.L.D. 12-0175 MODEL: 01



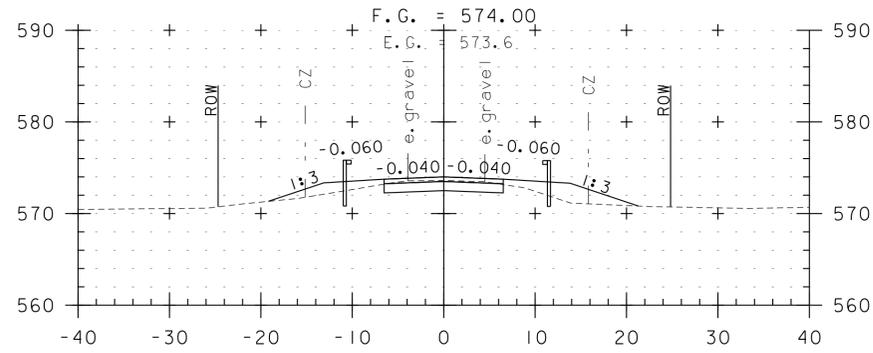
99+00  
BEGIN PROJECT



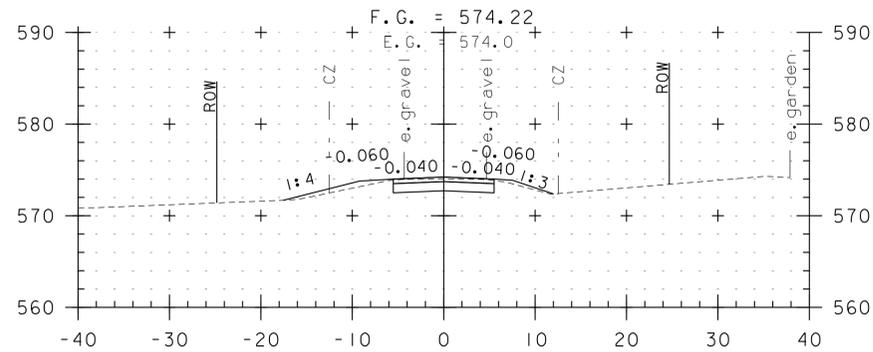
98+75



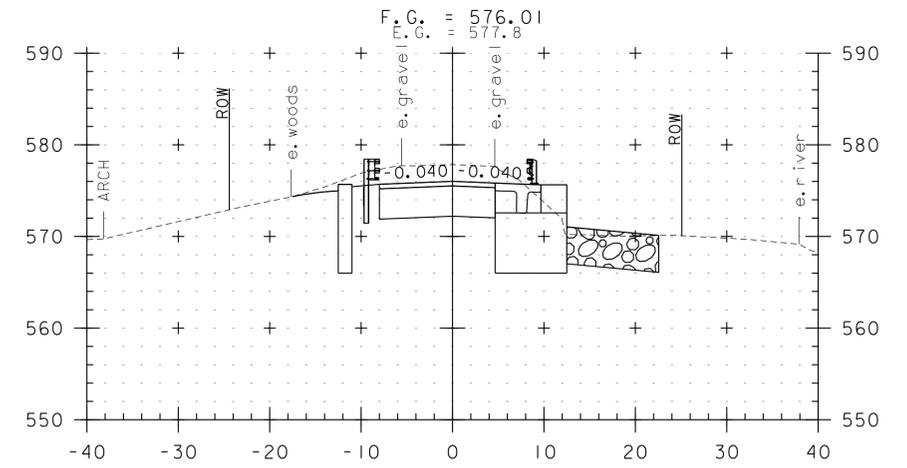
99+75



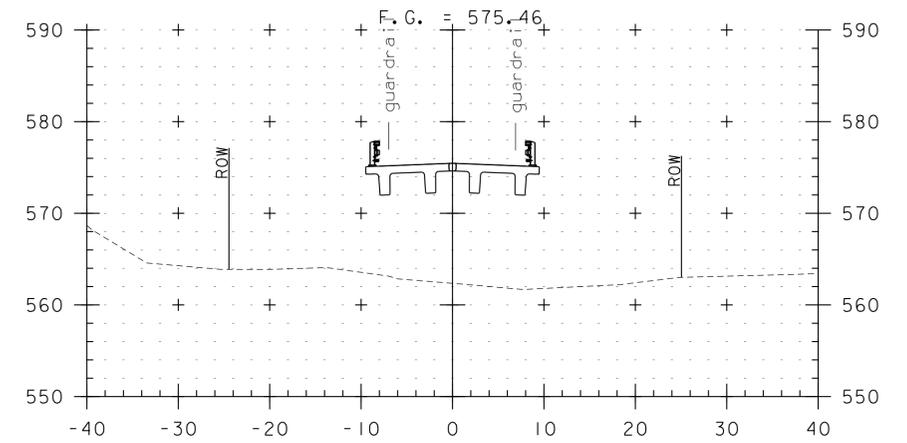
99+50



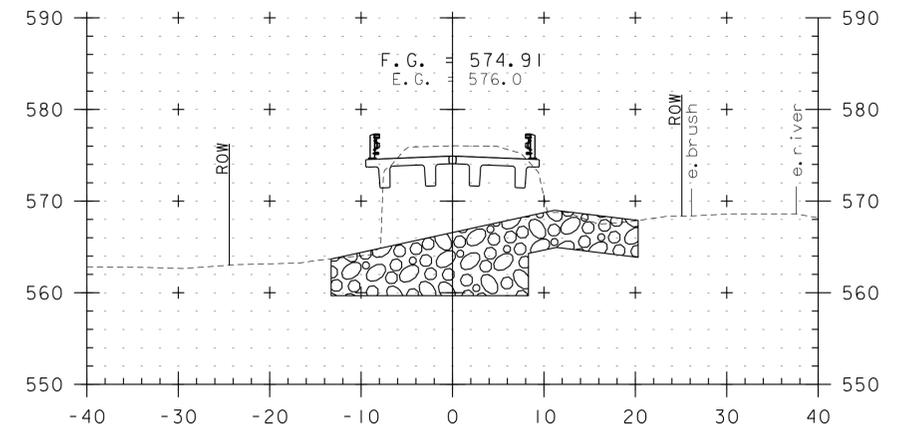
99+25



100+50  
END BRIDGE STA. 100+47.86



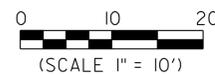
100+25

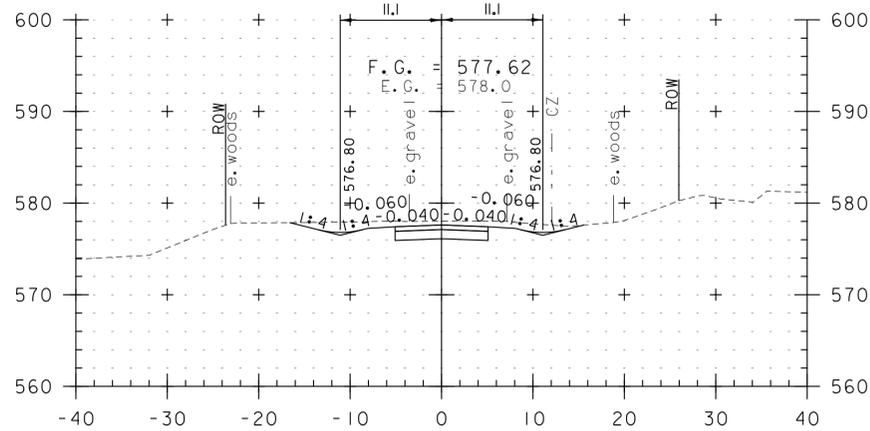


100+00  
BEGIN BRIDGE STA. 99+91.14

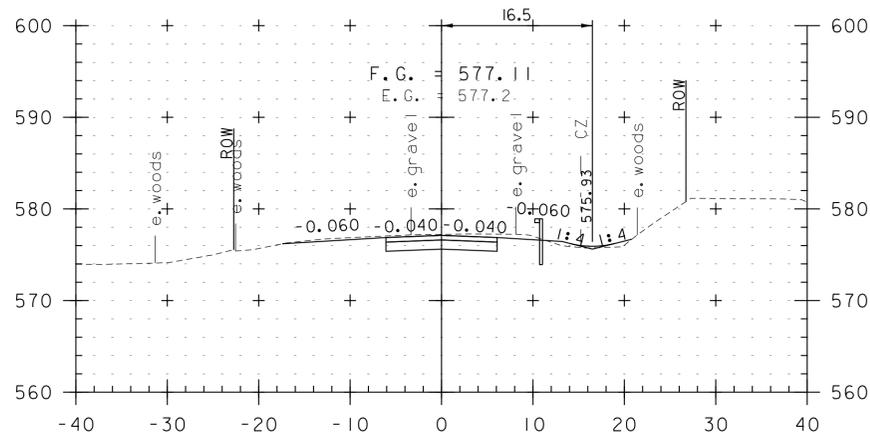
STA. 98+75 TO STA. 100+50

PROJECT NAME:	RANDOLPH	FILE NAME:	z11j078xsl.dgn	PLOT DATE:	8/12/2014
PROJECT NUMBER:	BRO 1444(57)	PROJECT LEADER:	J. BYATT	DRAWN BY:	J. SMITH
		DESIGNED BY:	J. SMITH	CHECKED BY:	D. MUNRO
		ROADWAY CROSS SECTIONS I		SHEET	29 OF 39

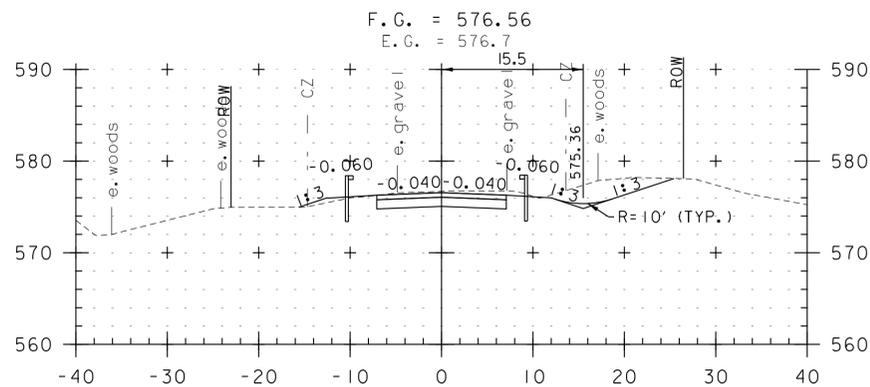




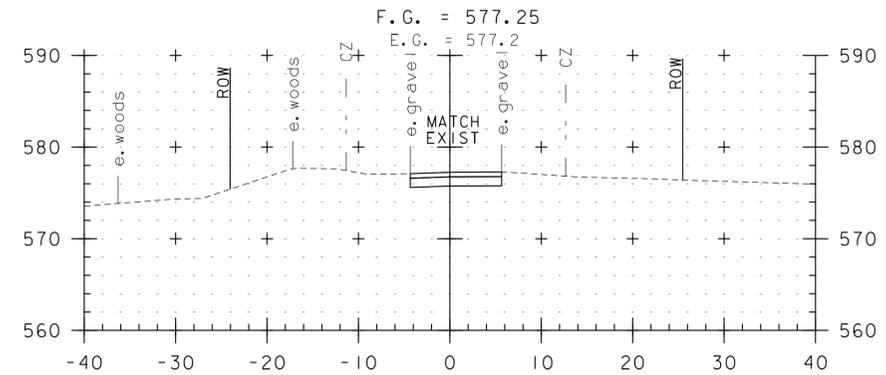
101+25



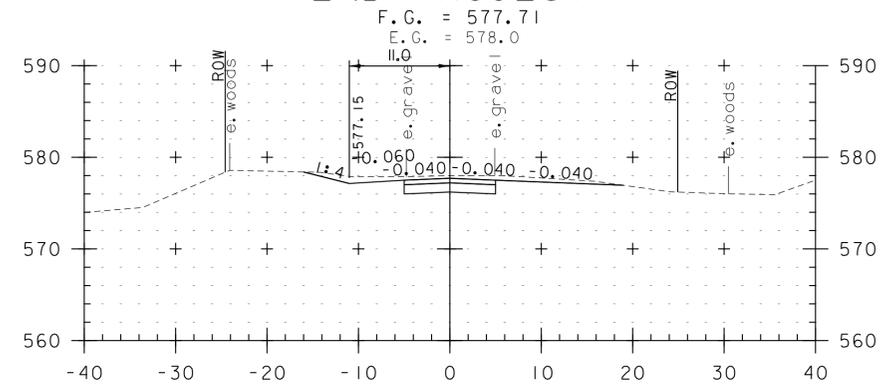
101+00



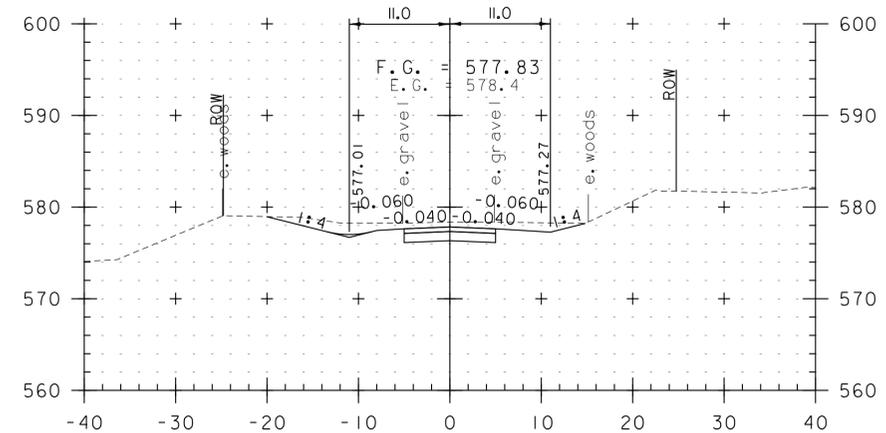
100+75



102+00  
END PROJECT



101+75



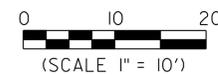
101+50

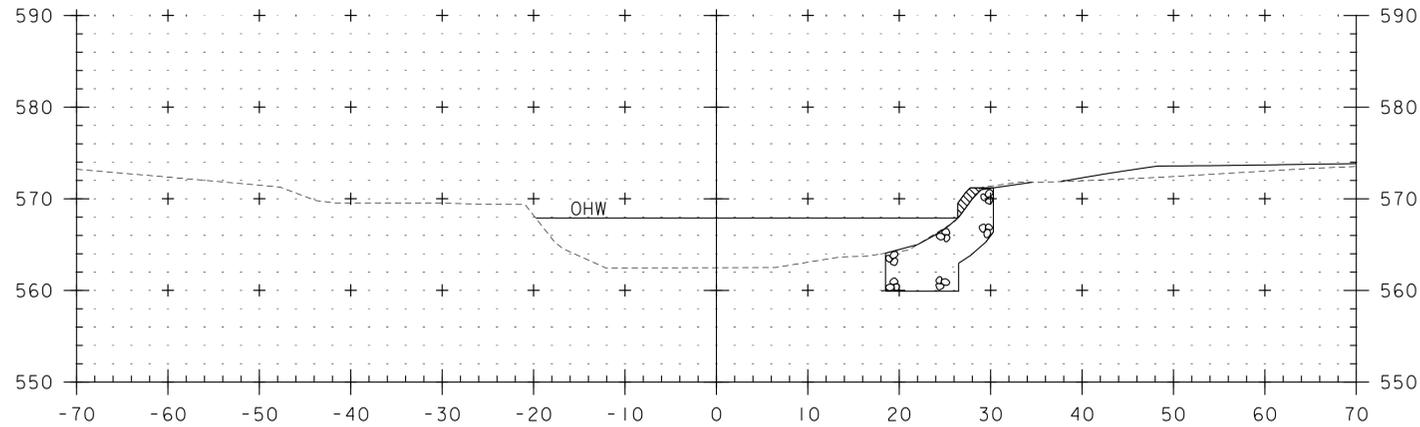
STA. 100+75 TO STA. 102+00

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078xsl.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: J. SMITH  
ROADWAY CROSS SECTIONS 2

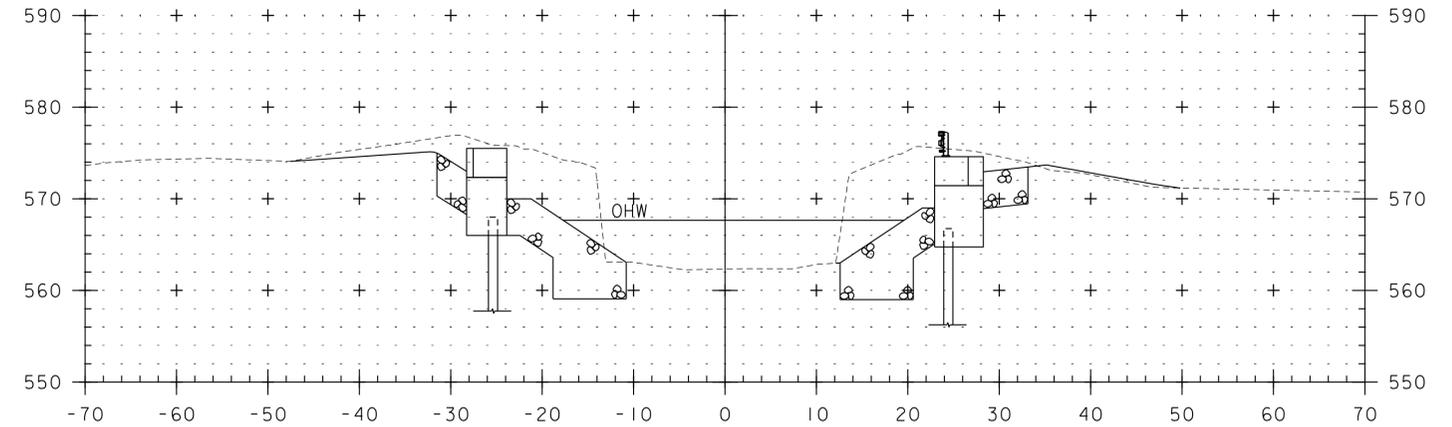
PLOT DATE: 8/12/2014  
DRAWN BY: J. SMITH  
CHECKED BY: D. MUNRO  
SHEET 30 OF 39





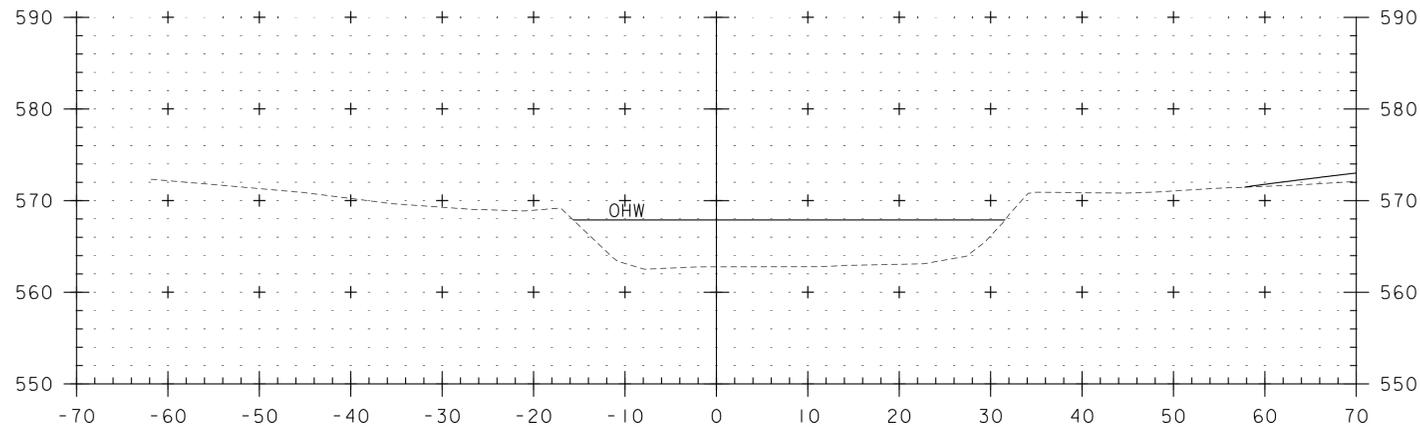
0+20

STA. 0+17 RT  
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION  
 STONE FILL, TYPE IV  
 GEOTEXTILE UNDER STONE FILL, TYPE IV  
 GRUBBING MATERIAL

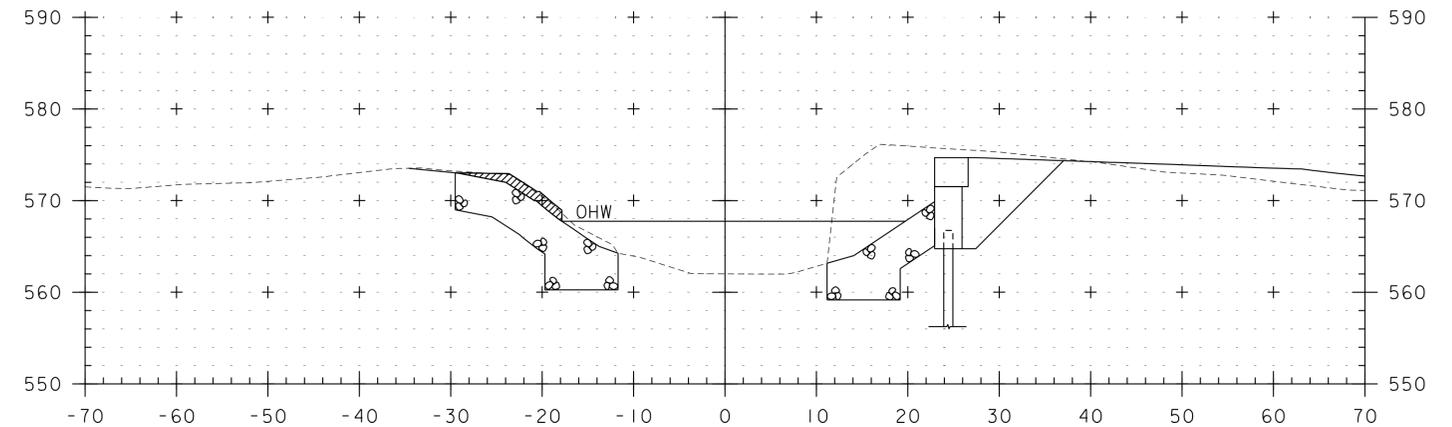


0+50

STA. 0+49 LT  
 END GRUBBING MATERIAL



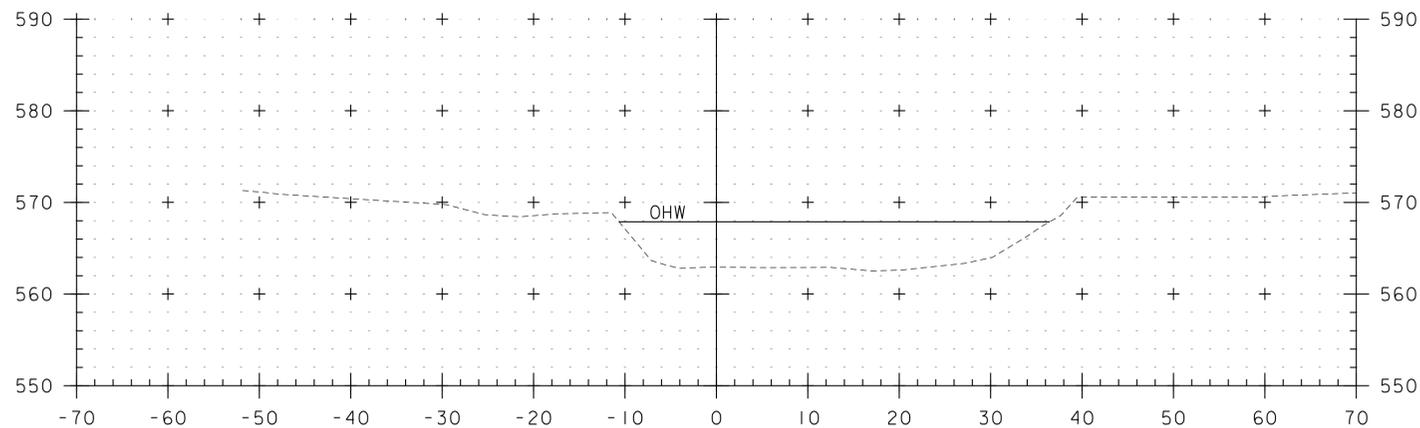
0+10



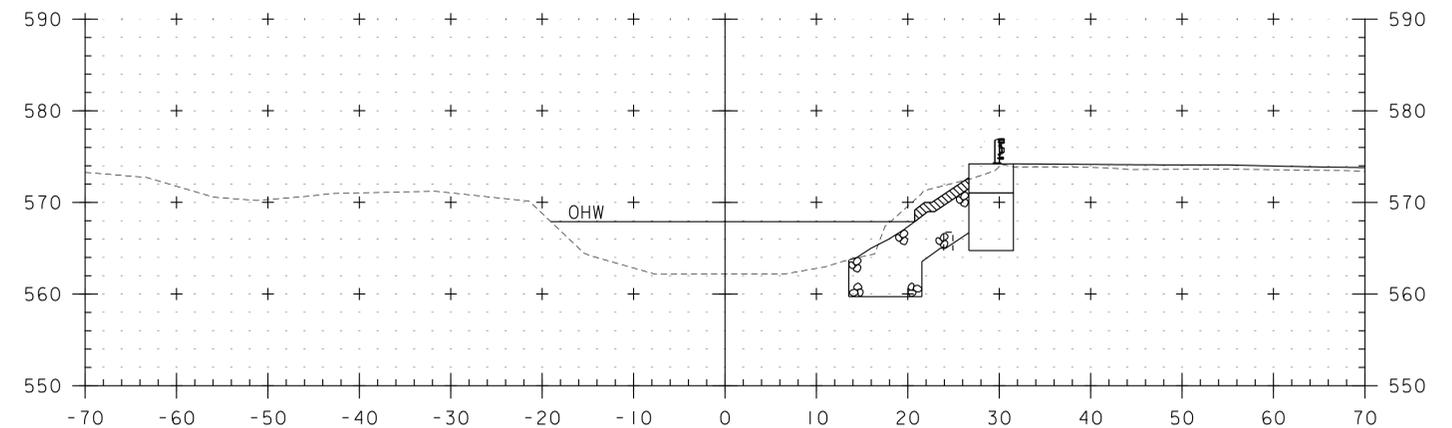
0+40

STA. 0+33 LT  
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION  
 STONE FILL, TYPE IV  
 GEOTEXTILE UNDER STONE FILL, TYPE IV  
 GRUBBING MATERIAL

STA. 0+36 RT  
 END GRUBBING MATERIAL



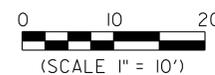
0+00



0+30

STA. 0+00 TO STA. 0+50

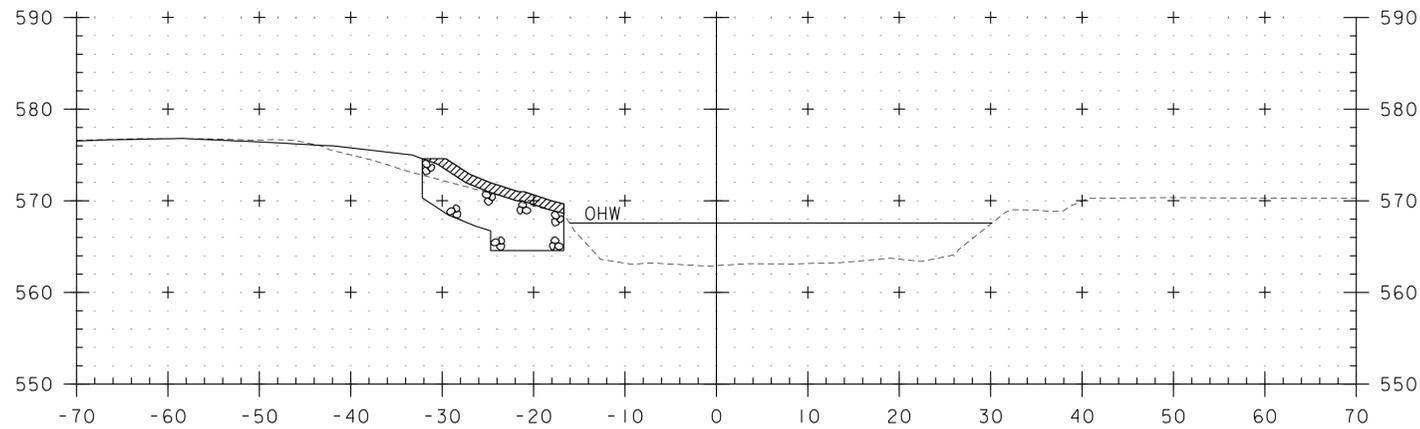
CLD 12-0175 MODEL: XSCHL01



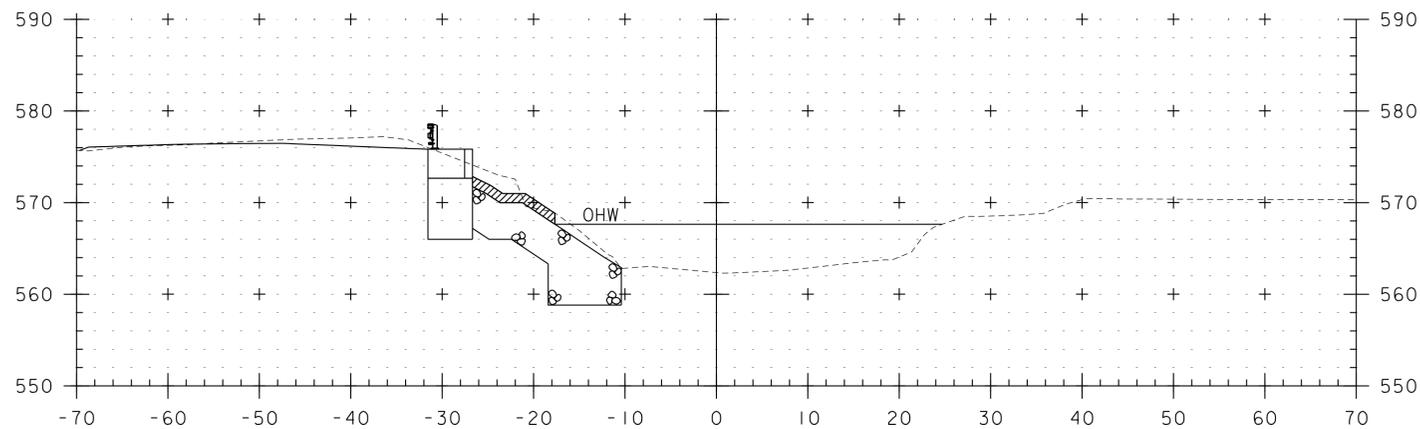
PROJECT NAME: RANDOLPH  
 PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078xschl.dgn  
 PROJECT LEADER: J. BYATT  
 DESIGNED BY: N. CARON  
 CHANNEL CROSS SECTIONS (1 OF 2)

PLOT DATE: 8/12/2014  
 DRAWN BY: M. SMITH  
 CHECKED BY: J. BYATT  
 SHEET 31 OF 39



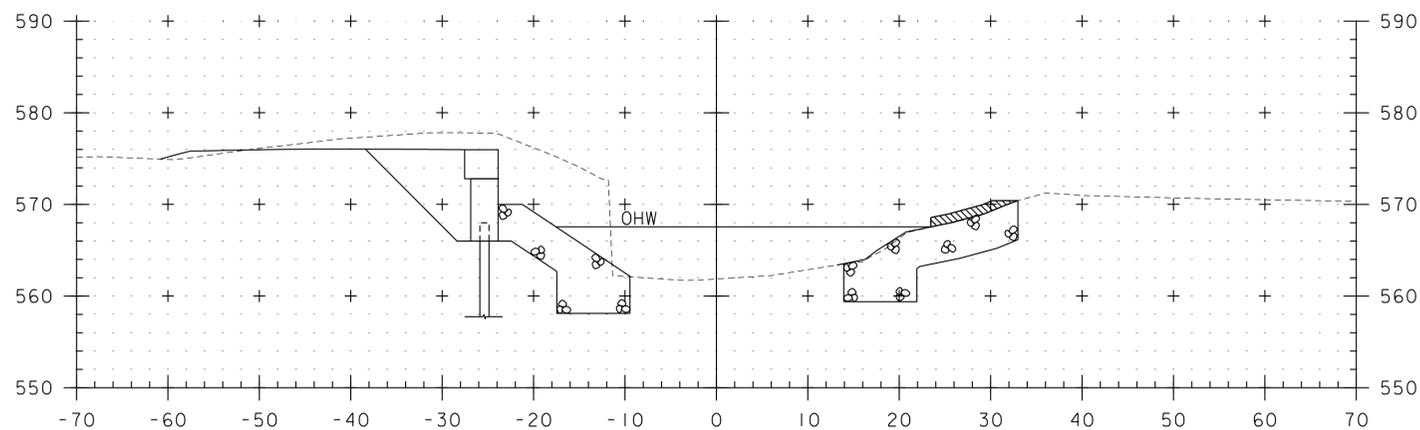
0+80



0+70

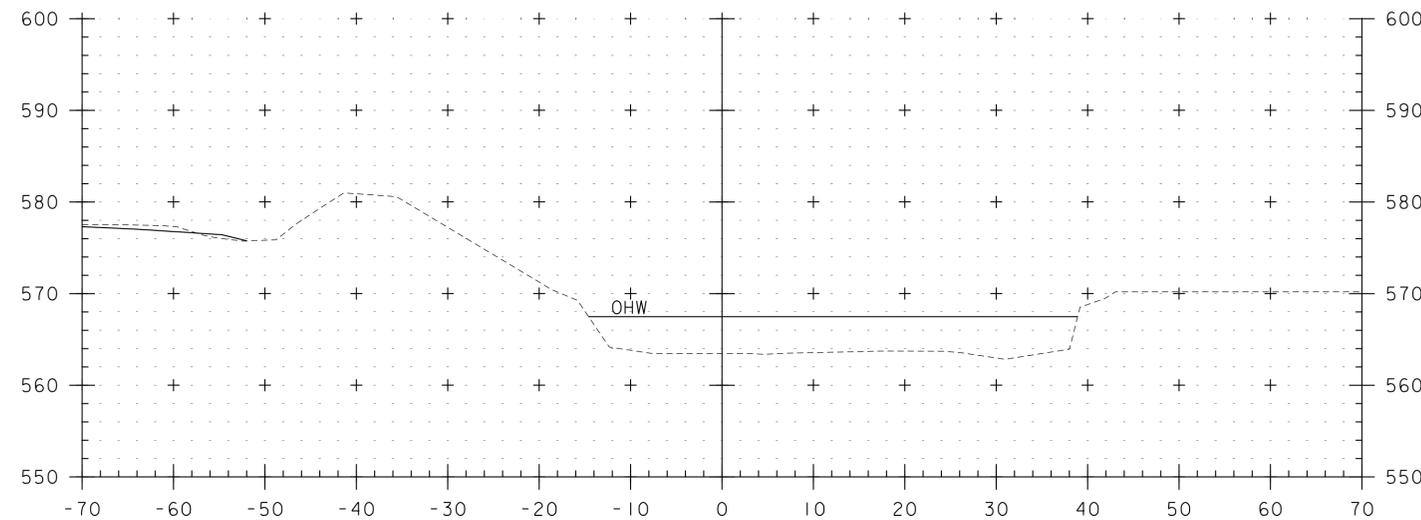
STA. 0+63 LT  
BEGIN GRUBBING MATERIAL

STA. 0+64 RT  
END UNCLASSIFIED CHANNEL EXCAVATION  
STONE FILL, TYPE IV  
GEOTEXTILE UNDER STONE FILL, TYPE IV  
GRUBBING MATERIAL

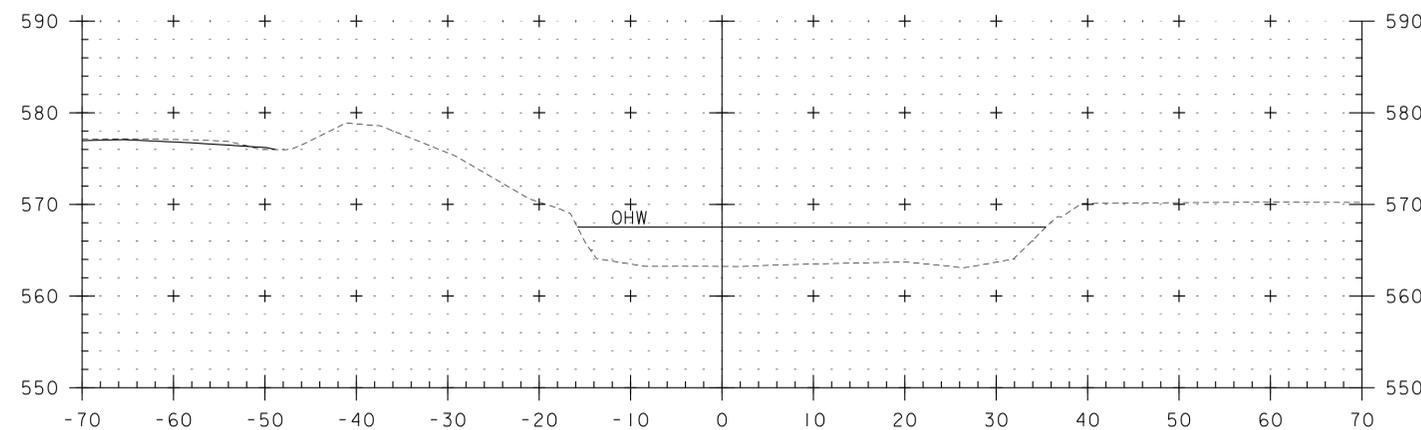


0+60

STA. 0+52 RT  
BEGIN GRUBBING MATERIAL



1+00

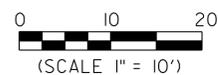


0+90

STA. 0+87 LT  
END UNCLASSIFIED CHANNEL EXCAVATION  
STONE FILL, TYPE IV  
GEOTEXTILE UNDER STONE FILL, TYPE IV  
GRUBBING MATERIAL

STA. 0+60 TO STA. 1+00

CLD\_12-0175 MODEL: XSCHL02



PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078xschl.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
CHANNEL CROSS SECTIONS (2 OF 2)

PLOT DATE: 8/12/2014  
DRAWN BY: M. SMITH  
CHECKED BY: J. BYATT  
SHEET 32 OF 39

## EPSC PLAN NARRATIVE

### 1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REMOVAL OF BRIDGE 35 WHICH IS A 28-FOOT-SPAN JACK ARCH BRIDGE WITH A CONCRETE DECK SUPPORTED ON DRY LAID STONE ABUTMENTS WITH CONCRETE FOOTINGS. BRIDGE 35 WILL BE REPLACED WITH A PRECAST STRUCTURE, SPANNING 57 FEET OVER THE SECOND BRANCH OF THE WHITE RIVER, ON NEW FOOTINGS ALONG THE SAME ALIGNMENT. THE WIDTH OF THE BRIDGE WILL BE INCREASED TO 16 FEET. BRIDGE 35 IS LOCATED IN THE TOWN OF RANDOLPH ON TOWN HIGHWAY 65, APPROXIMATELY 585 FEET WEST OF THE INTERSECTION OF TOWN HIGHWAY 65 AND VERMONT ROUTE 14.

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 0.29 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 A VALLEY THAT IS WOODED WITH FARM FIELDS. THERE IS ONE RESIDENCE AND A BARN ON THE WEST SIDE OF THE PROJECT. THERE IS ALSO A SMALL GARDEN AREA ON THE SOUTHWEST SIDE OF THE PROJECT.

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

THE SECOND BRANCH OF THE WHITE RIVER IS THE ONLY WATER SOURCE ON THE PROJECT SITE. THERE ARE NO WETLANDS OR SIGNIFICANT NATURAL COMMUNITIES IDENTIFIED WITHIN THE PROJECT AREA. THE STREAM BED CONSISTS OF PRIMARILY GRAVEL AND COBBLES. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 47.3 SQUARE MILES. DUE TO THE NATURE OF THE SURROUNDING TERRAIN THE PROJECT SITE COULD RECEIVE RUNOFF WATER FROM A FEW NEARBY SLOPES.

#### 1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF PINE AND HARDWOOD TREES, UNDERGROWTH, AND BRUSH. 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 IV 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 ORANGE, VERMONT. SOILS ON THE PROJECT SITE ARE WINOOSKI VERY FINE SANDY LOAM, 0 TO 3% SLOPES, "K FACTOR" = 0.49. THE SOIL IS CONSIDERED HIGHLY ERODIBLE.

**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: NO  
HISTORICAL OR ARCHEOLOGICAL AREAS: YES, ONE ARCHEOLOGICAL AREA IN THE SOUTHEAST QUADRANT CONSISTING OF A SMALL STONE CELLAR HOLE APPROXIMATELY 75 FEET SOUTHEAST OF THE BRIDGE.  
PRIME AGRICULTURAL LAND: NO  
THREATENED AND ENDANGERED SPECIES: NO  
WATER RESOURCE: SECOND BRANCH OF WHITE RIVER  
WETLANDS: NO

### 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, 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) 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.

A TRACKING PAD WILL BE UTILIZED AT THE INTERSECTION OF VT ROUTE 14. THE EXISTING GRAVEL ROADWAY WILL BE CLOSED DURING CONSTRUCTION AND WILL BE UTILIZED TO ACCESS THE BRIDGE.

#### 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 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.

MOST OF THE PROJECT AREA SITS HIGHER THAN THE SURROUNDING TERRAIN. CONSTRUCTION VEHICLES WILL BE ABLE TO UTILIZE THE EXISTING ROADWAY. 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.

STONE CHECK DAMS WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN, AT A MINIMUM.

#### 1.4.7 CONSTRUCT PERMANENT CONTROLS

PERMANENT STORMWATER TREATMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PERMIT CONDITIONS.

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED ON THIS PROJECT.

#### 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. TEMPORARY EROSION CONTROL MATTING WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN, AT A MINIMUM.

#### 1.4.9 WINTER STABILIZATION

IT IS NOT ANTICIPATED THAT WINTER STABILIZATION WILL BE REQUIRED ON THIS PROJECT. 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. STONE FILL SHALL BE USED TO STABILIZE ROADWAY SLOPES AND THE CHANNEL AS SHOWN ON THE PLANS.

#### 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.

TREATMENT OF DISCHARGE FROM DEWATERING ACTIVITIES IS ANTICIPATED. A LOCATION FOR TREATMENT HAS BEEN PROPOSED AND SHOWN ON THE PLANS. HOWEVER, THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE WILL BE PAID UNDER CONTRACT ITEM 653.45.

#### 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 SUBSECTIONS 105.25 - 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

#### 1.5.3 UPDATES

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078erode.t.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: J. SMITH  
EROSION CONTROL NARRATIVE

PLOT DATE: 8/12/2014  
DRAWN BY: S. GOODWIN  
CHECKED BY: D. MUNRO  
SHEET 33 OF 39





SOIL INFORMATION: WINOOSKI VERY FINE SANDY LOAM  
 K = 0.49, HIGHLY ERODIBLE  
 HYDROLOGIC SOIL GROUP: B

SOIL INFORMATION: MERRIMAC FINE SANDY LOAM, 25 TO 50 PERCENT SLOPES  
 K = 0.24, NOT HIGHLY ERODIBLE  
 HYDROLOGIC SOIL GROUP: A



PROJECT NAME: RANDOLPH  
 PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078bdrer.oex.dgn  
 PROJECT LEADER: J. BYATT  
 DESIGNED BY: J. SMITH  
 EPSC EXISTING PLAN SHEET

PLOT DATE: 8/12/2014  
 DRAWN BY: S. GOODWIN  
 CHECKED BY: D. MUNRO  
 SHEET 34 OF 39

GEOTEXTILE FOR SILT FENCE  
 99+00 TO 99+06 LT  
 99+09 TO 99+12 RT  
 99+19 TO 99+23 LT  
 99+28 TO 99+77 LT  
 99+32 TO 99+90 RT  
 100+43 TO 100+65 LT  
 100+64 TO 101+10 LT

TEMPORARY EROSION MATTING  
 99+34 TO 99+81 LT  
 99+41 TO 99+88 RT  
 100+41 TO 100+92 LT  
 100+59 TO 101+13 RT

TEMPORARY STONE  
 CHECK DAM, TYPE I  
 100+62 TO 101+50 RT  
 101+00 TO 101+75 RT

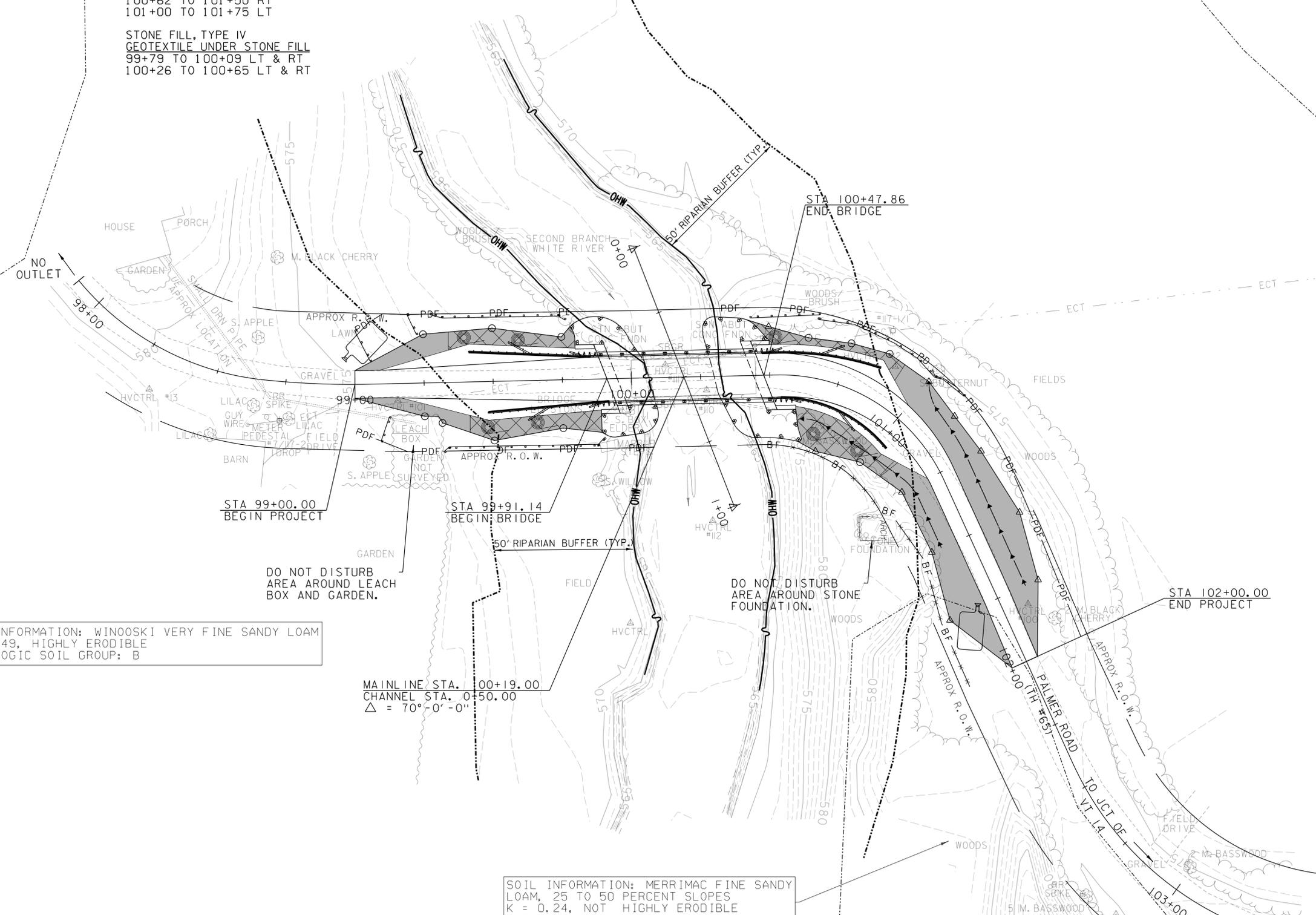
STONE FILL, TYPE IV  
 GEOTEXTILE UNDER STONE FILL  
 99+79 TO 100+09 LT & RT  
 100+26 TO 100+65 LT & RT

PROJECT DEMARCATION FENCE  
 99+00 TO 99+78 LT  
 99+00 TO 100+04 RT  
 100+32 TO 102+00 LT

BARRIER FENCE  
 100+47 TO 102+00 RT

VEHICLE TRACKING PAD  
 PLACED ON PALMER RD AT INTERSECTION WITH VT 14

FILTER BAG  
 99+04 LT  
 101+82 RT



SOIL INFORMATION: WINOOKSI VERY FINE SANDY LOAM  
 K = 0.49, HIGHLY ERODIBLE  
 HYDROLOGIC SOIL GROUP: B

MAINLINE STA. 100+19.00  
 CHANNEL STA. 100+50.00  
 $\Delta = 70^{\circ}-0'-0''$

SOIL INFORMATION: MERRIMAC FINE SANDY LOAM, 25 TO 50 PERCENT SLOPES  
 K = 0.24, NOT HIGHLY ERODIBLE  
 HYDROLOGIC SOIL GROUP: A

CLD 12-0175 MODEL:01



PROJECT NAME: RANDOLPH  
 PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078bdrerocn.dgn  
 PROJECT LEADER: J. BYATT  
 DESIGNED BY: J. SMITH  
 EPSC CONSTRUCTION PLAN SHEET

PLOT DATE: 8/12/2014  
 DRAWN BY: S. GOODWIN  
 CHECKED BY: D. MUNRO  
 SHEET 35 OF 39



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

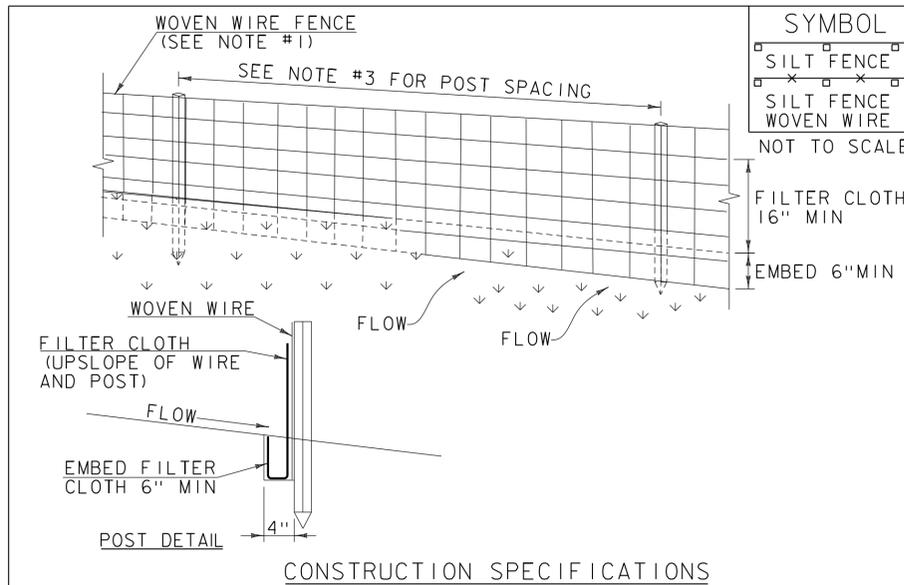
**CONSTRUCTION GUIDANCE**

- RURAL SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
- URBAN SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED LAWN AREAS DISTURBED BY THE CONTRACTOR.
- ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
- FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER
- 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.
- TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
- 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
- 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**

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



- 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.
- FILTER CLOTH SHALL BE EITHER FILTER X, MIRAF1100X, STABILINKA T140N OR APPROVED EQUIVALENT.
- 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'.
- 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.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY 6" AND FOLDED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN SEDIMENT REACHES HALF OF FABRIC HEIGHT.

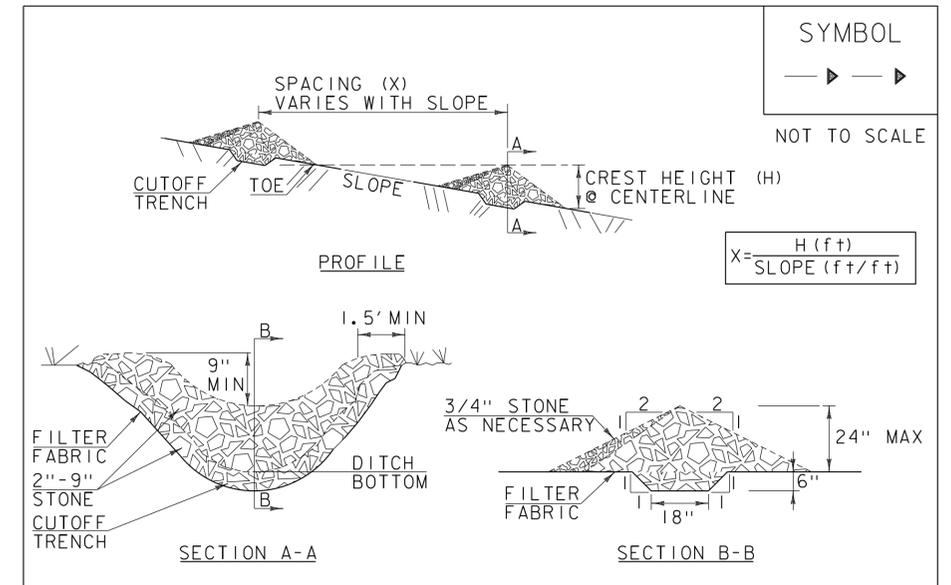
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

**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	



- STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION.
- CHECK DAMS SHALL BE SPACED SO THAT THE ELEVATION OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION AS THE TOE OF THE UPSTREAM DAM.
- 3/4" FILTERING STONE MAY BE ADDED TO THE FACE OF THE CHECK DAM AS NECESSARY.
- EXTEND THE STONE A MINIMUM OF 1.5' BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
- PROTECT CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
- ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.
- MAXIMUM DRAINAGE AREA 2 ACRES.

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

**CHECK DAM**

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 TEMPORARY STONE CHECK DAM, TYPE I (PAY ITEM 653.25)

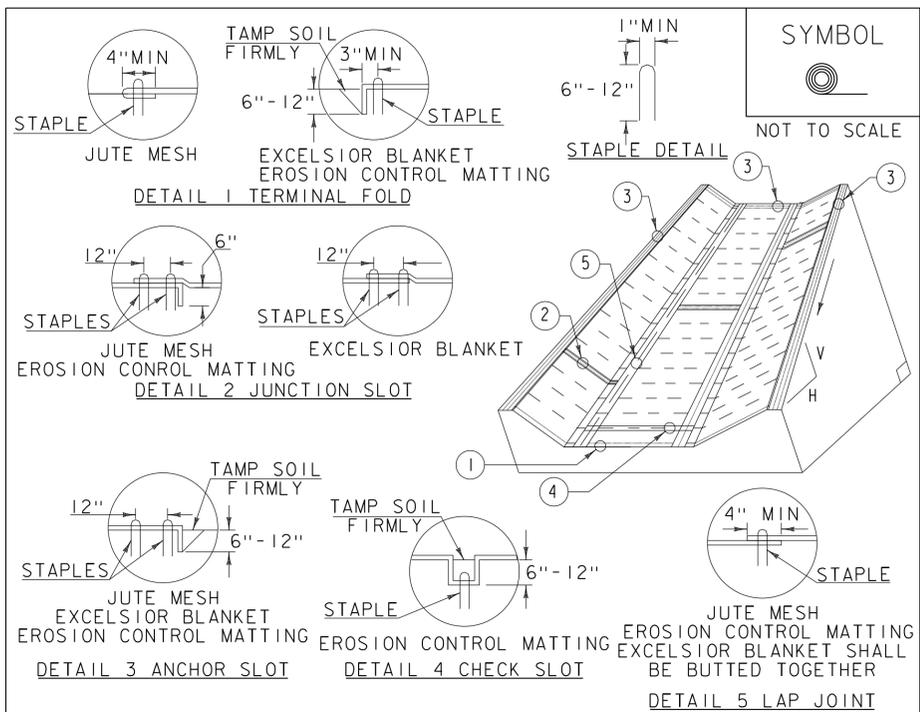
REVISIONS		
MARCH 21, 2008	WHF	
JANUARY 8, 2009	WHF	

PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078erode.t.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: J. SMITH  
EPSC DETAILS I

PLOT DATE: 8/12/2014  
DRAWN BY: S. GOODWIN  
CHECKED BY: D. MUNRO  
SHEET 37 OF 39





CONSTRUCTION SPECIFICATIONS

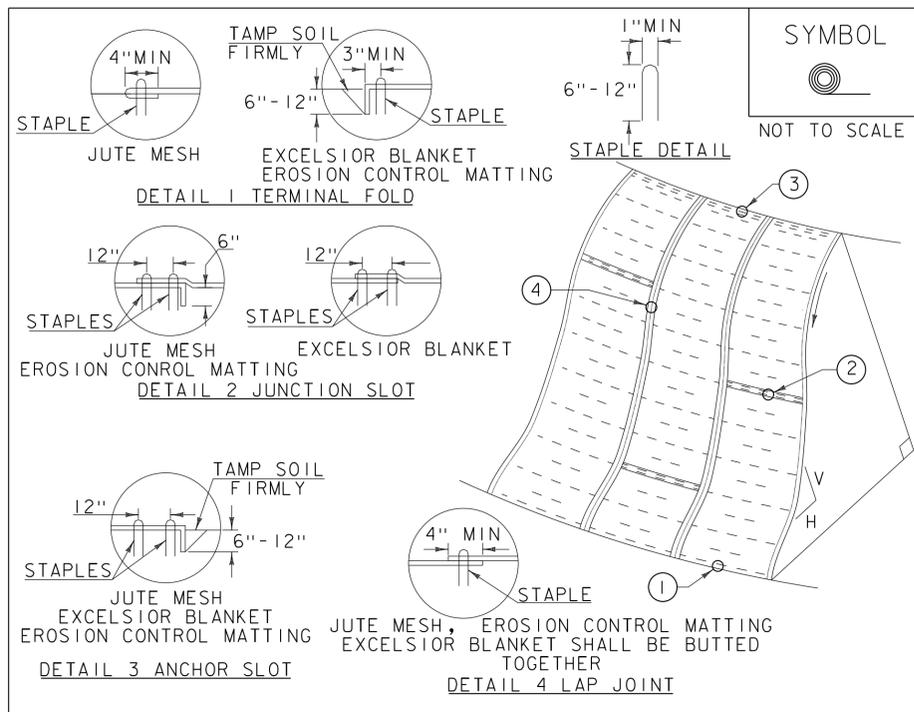
1. EROSION MATTING, CHECK SLOTS, SHALL BE SPACED IN DITCH CHANNEL SO THAT ONE OCCURS WITHIN EACH 50' ON SLOPES OF MORE THAN 4% AND LESS THAN 6%. ON SLOPES OF 6% OR MORE, THEY SHALL BE SPACED SO THAT ONE OCCURS WITHIN EACH 25'.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4'X225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4'X150' 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) DITCH

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		
MARCH 8, 2007	JMF	
APRIL 16, 2007	WHF	
JANUARY 13, 2009	WHF	



CONSTRUCTION SPECIFICATIONS

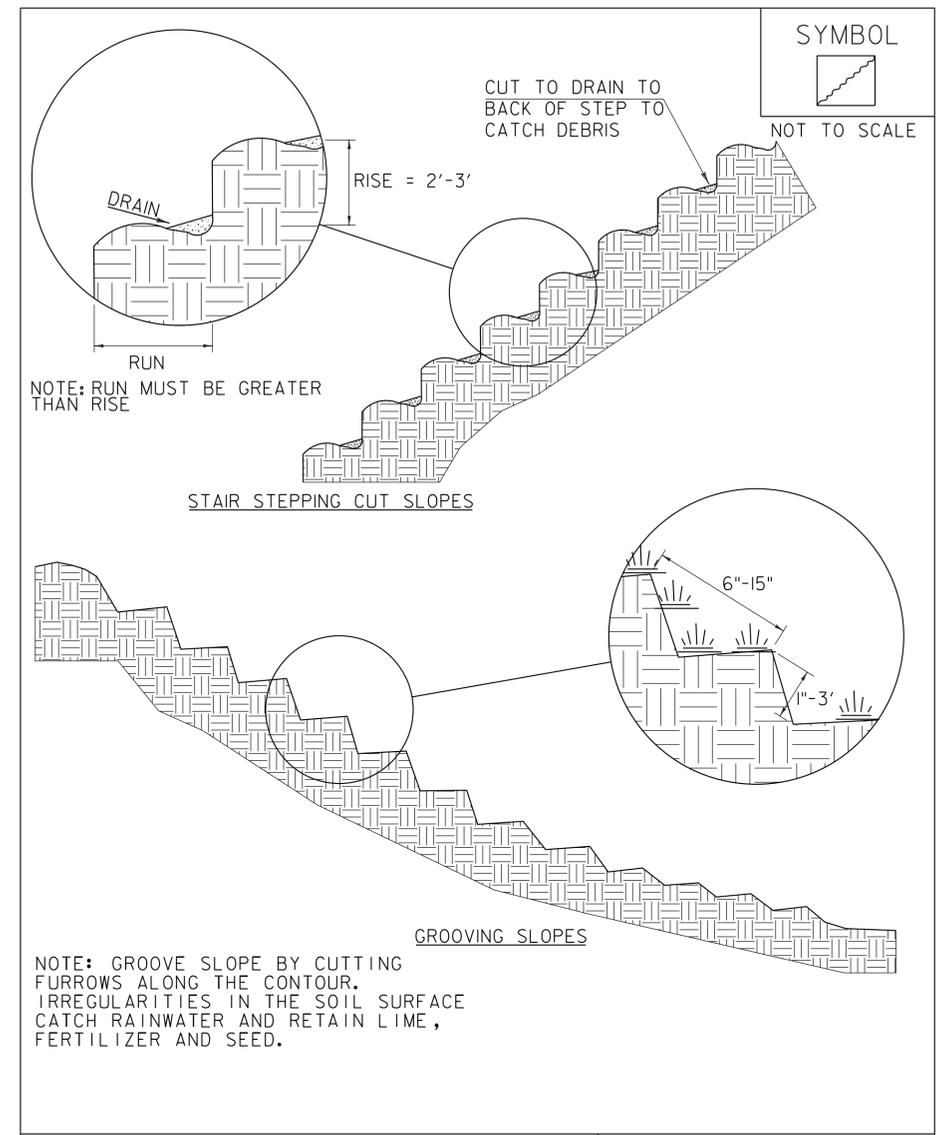
1. APPLY TO SLOPES GREATER THAN 3H:1V OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4'X225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4'X150' 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

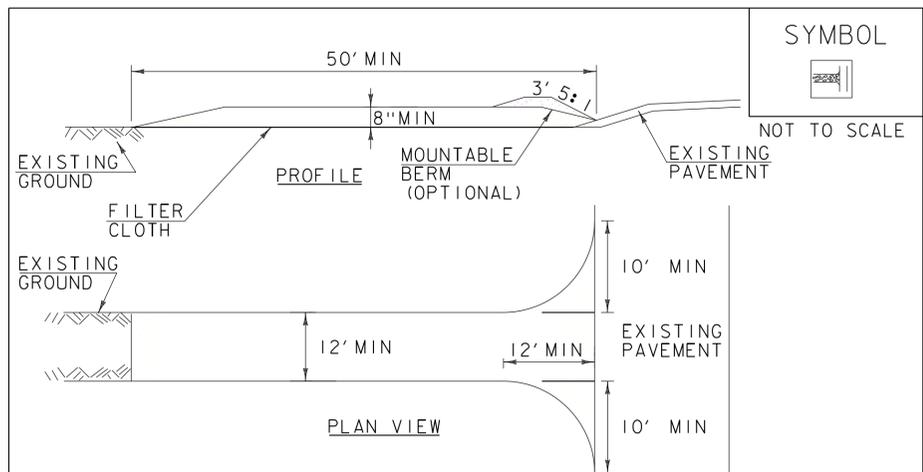
REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	



PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078erode.t.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: J. SMITH  
EPSC DETAILS 2

PLOT DATE: 8/12/2014  
DRAWN BY: S. GOODWIN  
CHECKED BY: D. MUNRO  
SHEET 38 OF 39



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.

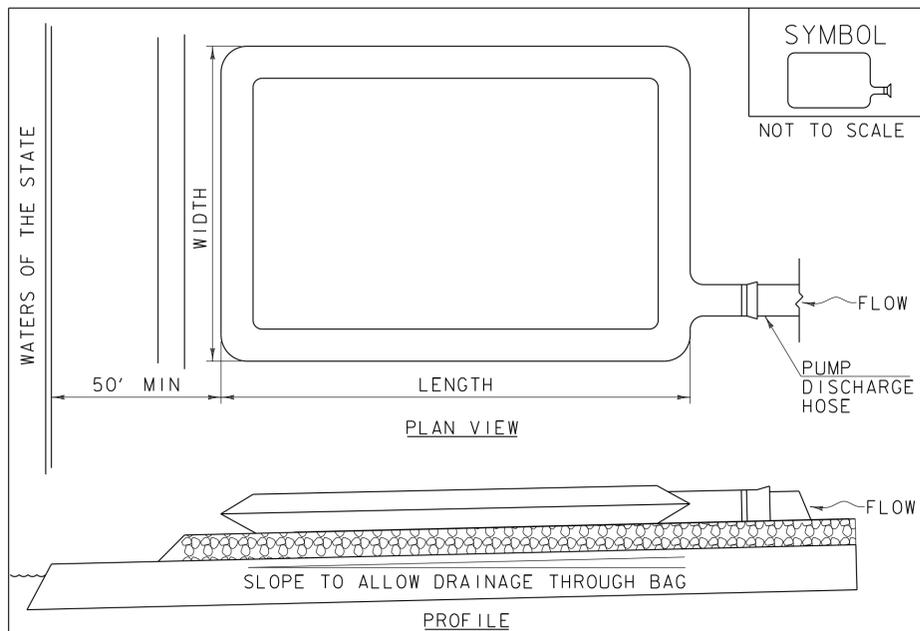
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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



CONSTRUCTION SPECIFICATIONS

1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION EFFICIENCY.
4. FILTER BAGS SHALL BE LOCATED A MINIMUM OF 50' FROM WATERS OF THE STATE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. THE NECK OF THE FILTER BAG SHALL BE STRAPPED TIGHTLY TO THE DISCHARGE HOSE.
6. A FILTER BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A REASONABLE RATE.
7. FILTER BAG SHALL BE DISPOSED OF AS APPROVED IN THE EPSC PLAN OR AS DIRECTED BY THE ENGINEER.

FILTER BAG

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 FILTER BAG (PAY ITEM 653.45) AND AS  
SPECIFIED IN THE CONTRACT.

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



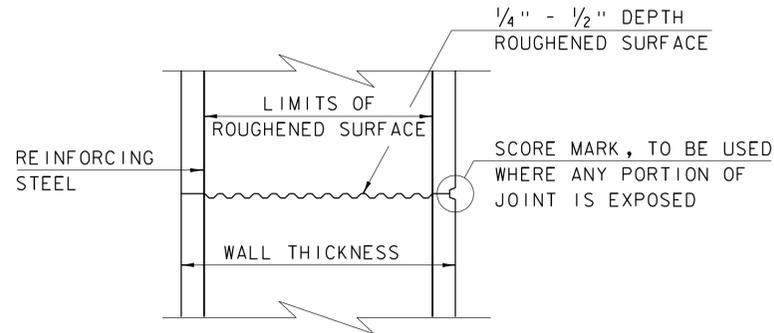
PROJECT NAME: RANDOLPH  
PROJECT NUMBER: BRO 1444(57)

FILE NAME: z11j078erode.t.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: J. SMITH  
EPSC DETAILS 3

PLOT DATE: 8/12/2014  
DRAWN BY: S. GOODWIN  
CHECKED BY: D. MUNRO  
SHEET 39 OF 39

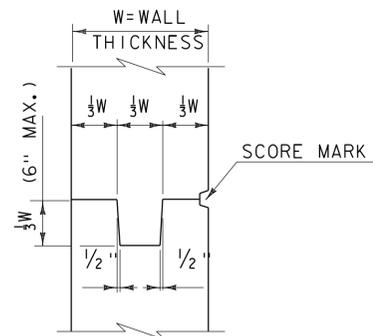
**CONCRETE GENERAL NOTES**

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.

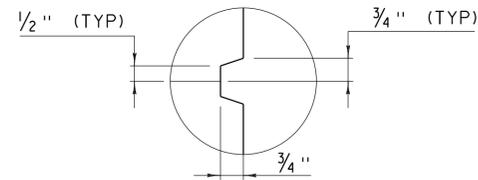


**TYPICAL HORIZONTAL CONSTRUCTION JOINT**  
(NOT TO SCALE)

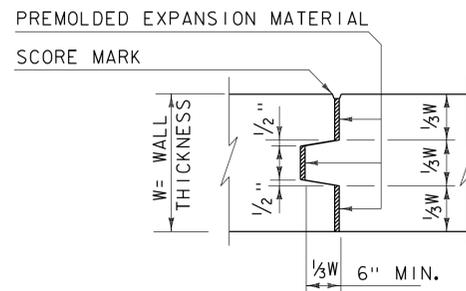
1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



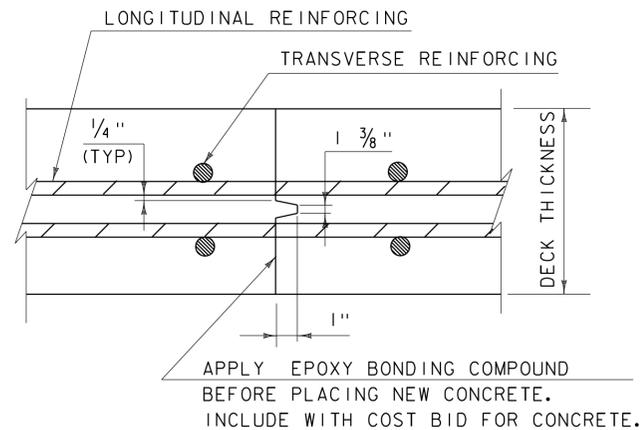
**TYPICAL CONCRETE CONSTRUCTION JOINT**  
(NOT TO SCALE)



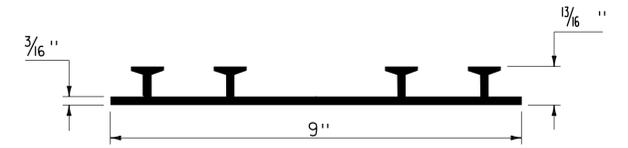
**SCORE MARK DETAIL**  
(NOT TO SCALE)



**TYPICAL CONCRETE EXPANSION JOINT**  
(NOT TO SCALE)



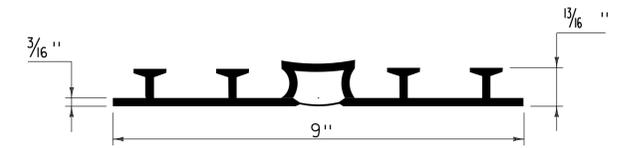
**TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS**  
(NOT TO SCALE)



**P.V.C. WATERSTOP FOR CONSTRUCTION JOINTS**  
(NOT TO SCALE)

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

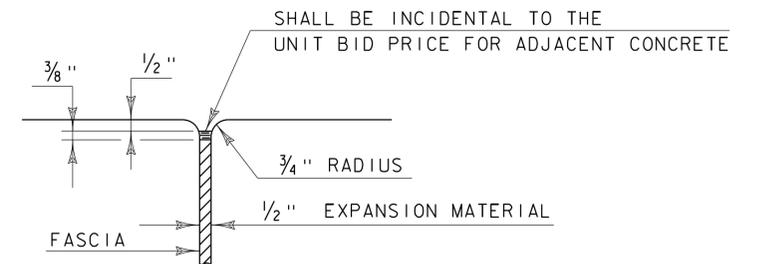
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



**P.V.C. WATERSTOP FOR EXPANSION JOINTS**  
(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.



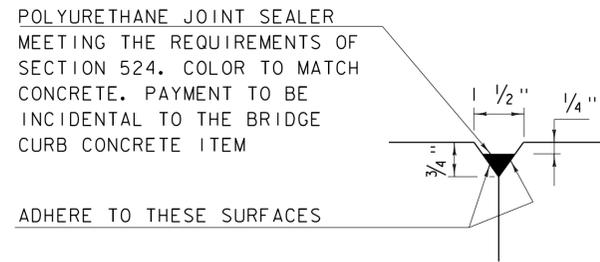
**JOINT BETWEEN FASCIA AND WINGWALL**  
(NOT TO SCALE)

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

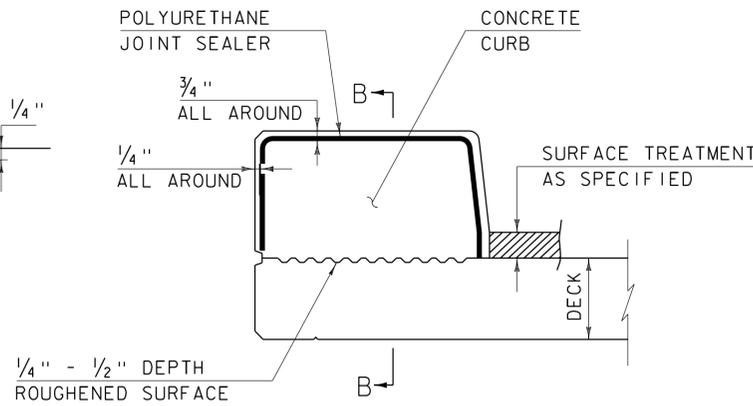
**CONCRETE  
DETAILS AND NOTES**



**STRUCTURES  
DETAIL  
SD-501.00**

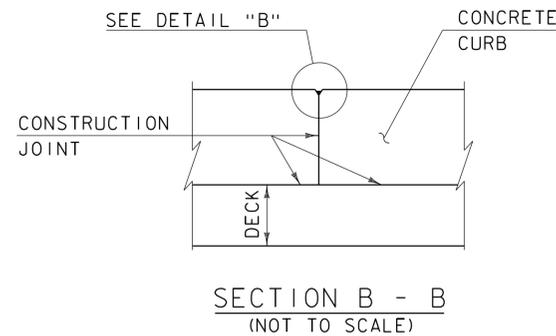


DETAIL "B"  
(NOT TO SCALE)

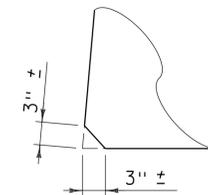


CONCRETE CURB JOINT SECTION  
(NOT TO SCALE)

1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION



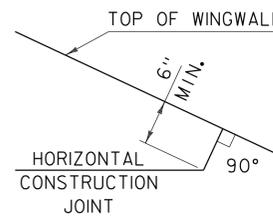
SECTION B - B  
(NOT TO SCALE)



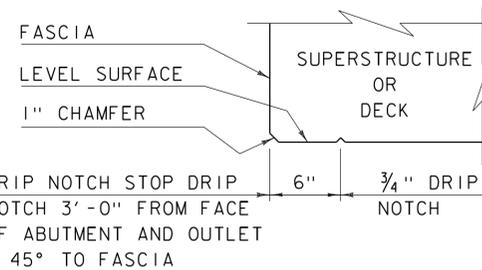
ACUTE ANGLE  
CLIP DETAIL  
(NOT TO SCALE)

CONCRETE CURB JOINT NOTES

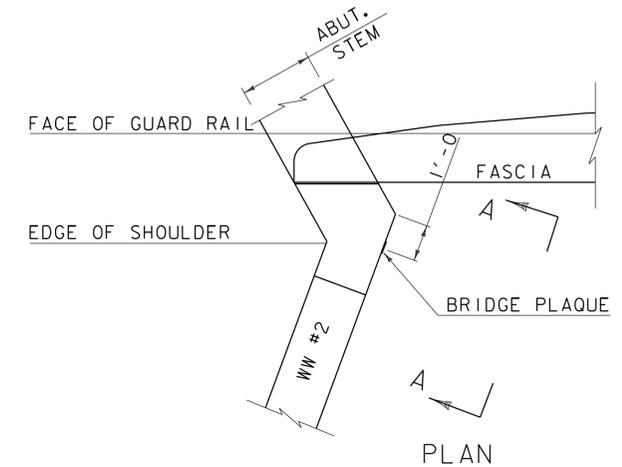
1. CONCRETE CURBS MAY BE PLACED IN ONE CONTINUOUS OPERATION IF AN APPROVED SHRINKAGE REDUCING ADMIXTURE LISTED IN THE SPECIAL PROVISIONS IS USED WITH THE CONCRETE MIX DESIGN. PAYMENT FOR THE SHRINKAGE REDUCING ADMIXTURE WILL BE INCIDENTAL TO THE BRIDGE CURB CONCRETE ITEM.
2. IF THE CONTRACTOR CHOOSES 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.



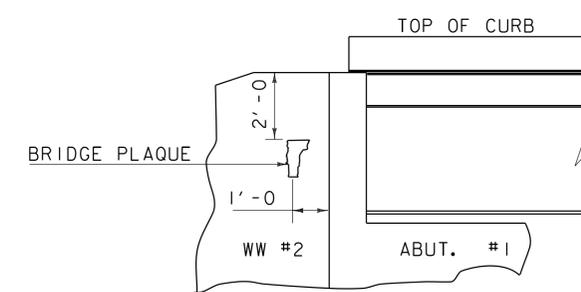
HORIZONTAL WINGWALL  
CONSTRUCTION JOINT  
(NOT TO SCALE)



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.

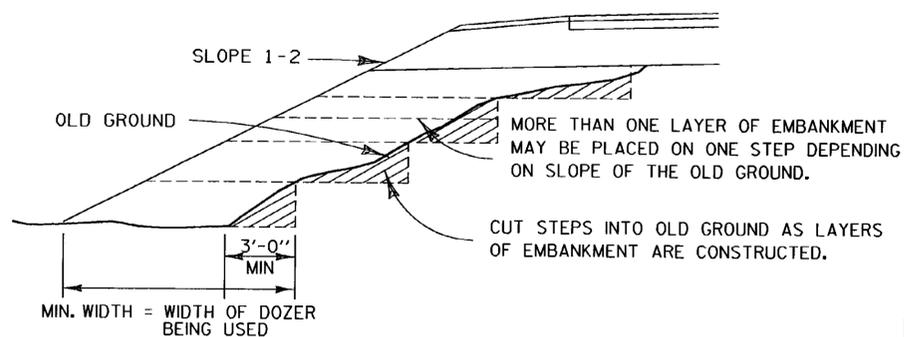
REVISIONS

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

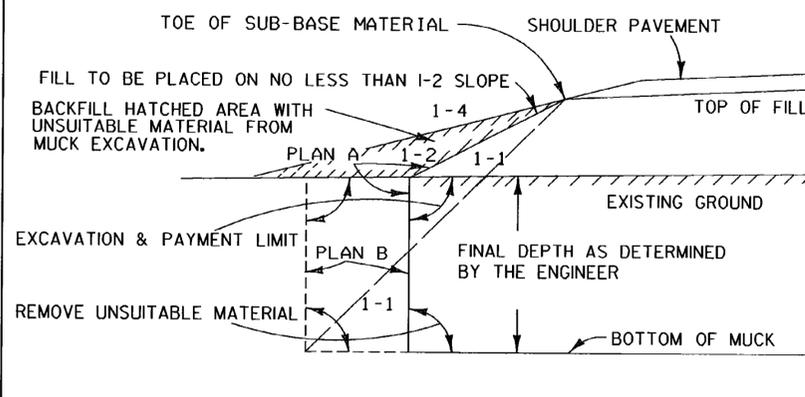
CONCRETE  
DETAILS AND NOTES



STRUCTURES  
DETAIL  
SD-502.00

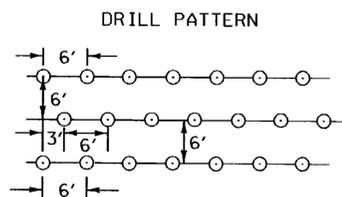
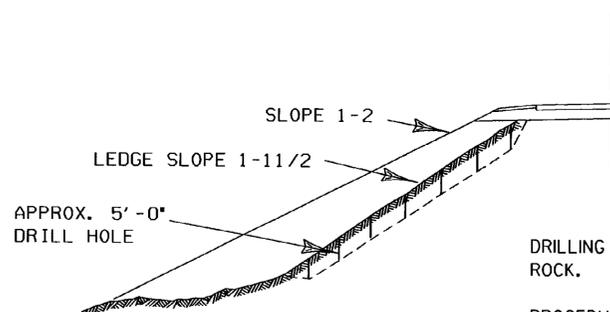


METHOD FOR CONSTRUCTING AN EMBANKMENT ON EARTH SLOPE



GENERAL NOTES:  
 THE MUCK OR UNSUITABLE MATERIAL SHALL BE EXCAVATED TO THE NEAT LINES SHOWN ON THE PLANS OR AS DETERMINED BY THE ENGINEER.  
 EXCAVATION AND PAYMENT LIMIT WILL BE DETERMINED FROM EITHER PLAN "A" OR PLAN "B", WHICHEVER PRODUCES THE GREATER WIDTH IN A GIVEN MUCK AREA.  
 BACKFILL MATERIAL MUST MEET THE REQUIREMENTS SET FORTH UNDER MUCK EXCAVATION, SECTION 203

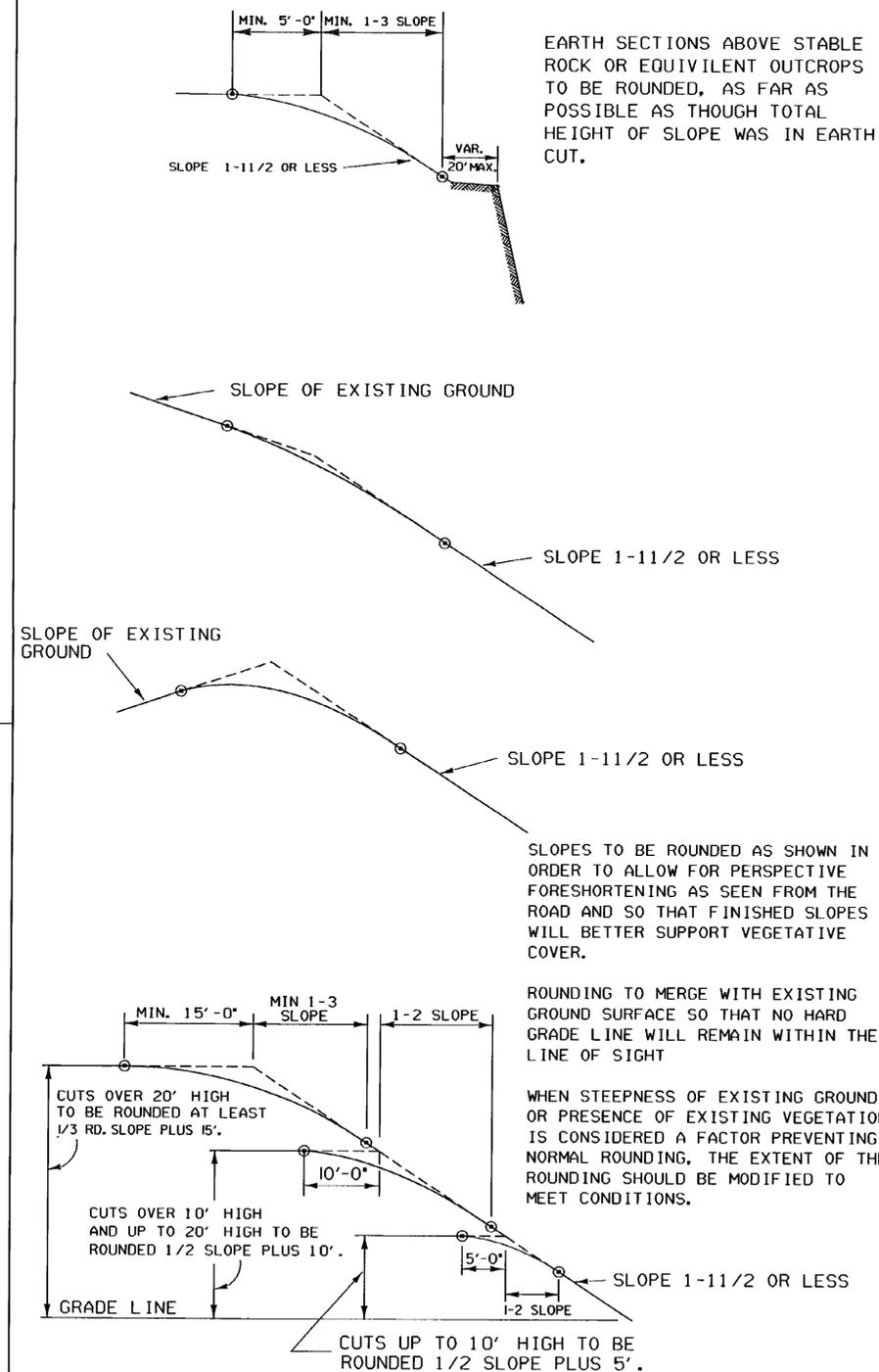
TYPICAL NEAT PAY LINES FOR MUCK EXCAVATION



DRILLING AND BLASTING OF SOLID ROCK.  
 PROCEDURE TO BE FOLLOWED WHEN LEDGE SLOPE ON OLD GROUND IS BETWEEN A 1-1 AND A 1-5 SLOPE.

ALL HOLES TO BE APPROXIMATELY 5'-0" DEEP. HOLES TO BE IN ROWS, SPACED AND STAGGERED AS SHOWN IN DRILL PATTERN, OR AS DIRECTED BY THE ENGINEER, SEE SECTION 205

A METHOD FOR PREPARING LEDGE SLOPE BEFORE CONSTRUCTING AN EMBANKMENT



EARTH SECTIONS ABOVE STABLE ROCK OR EQUIVALENT OUTCROPS TO BE ROUNDED, AS FAR AS POSSIBLE AS THOUGH TOTAL HEIGHT OF SLOPE WAS IN EARTH CUT.

SLOPES TO BE ROUNDED AS SHOWN IN ORDER TO ALLOW FOR PERSPECTIVE FORESHORTENING AS SEEN FROM THE ROAD AND SO THAT FINISHED SLOPES WILL BETTER SUPPORT VEGETATIVE COVER.

ROUNDING TO MERGE WITH EXISTING GROUND SURFACE SO THAT NO HARD GRADE LINE WILL REMAIN WITHIN THE LINE OF SIGHT

WHEN STEEPNESS OF EXISTING GROUND OR PRESENCE OF EXISTING VEGETATION IS CONSIDERED A FACTOR PREVENTING NORMAL ROUNDING, THE EXTENT OF THE ROUNDING SHOULD BE MODIFIED TO MEET CONDITIONS.

TYPICAL SLOPE ROUNDING

REVISIONS AND CORRECTIONS

DEC. 6, 1971 - ORIGINAL APPROVAL DATE  
 JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION. FHWA FINAL APPROVAL PENDING.

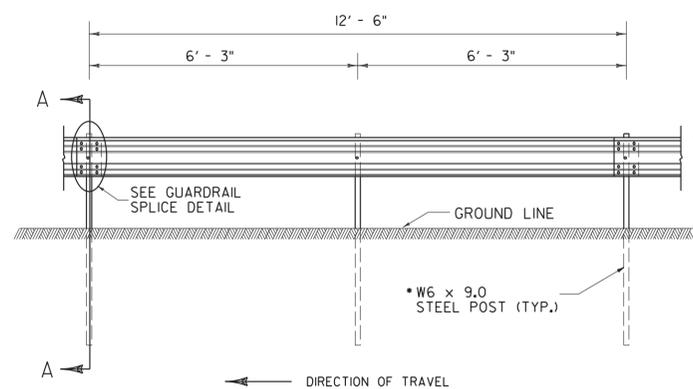
*Stephen D. MacArthur, P.E.*  
 DIRECTOR OF ENGINEERING  
*Robert M. Murphy, P.E.*  
 DESIGN ENGINEER

EMBANKMENT ON EARTH SLOPE  
 EMBANKMENT ON ROCK SLOPE  
 MUCK EXCAVATION  
 TYPICAL SLOPE ROUNDING

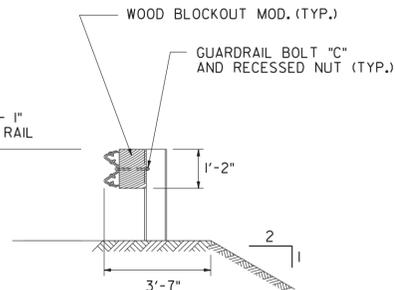


STANDARD  
 B-5

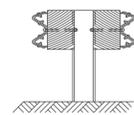
"W" BEAM GUARDRAIL WITH STEEL POSTS



ELEVATION FROM CL OF ROAD

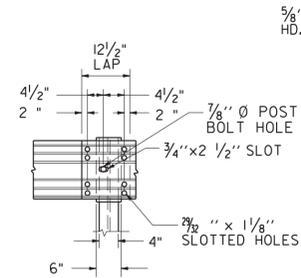


SINGLE - FACED BARRIER

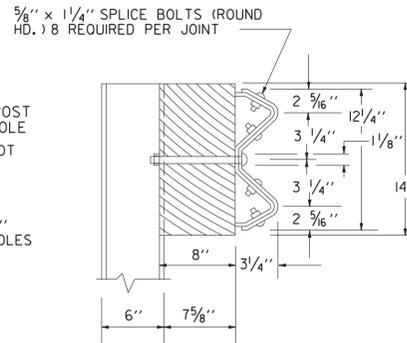


DOUBLE - FACED BARRIER

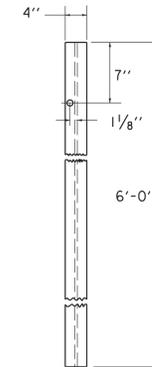
SECTION A - A



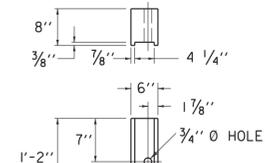
ELEVATION



SECTION



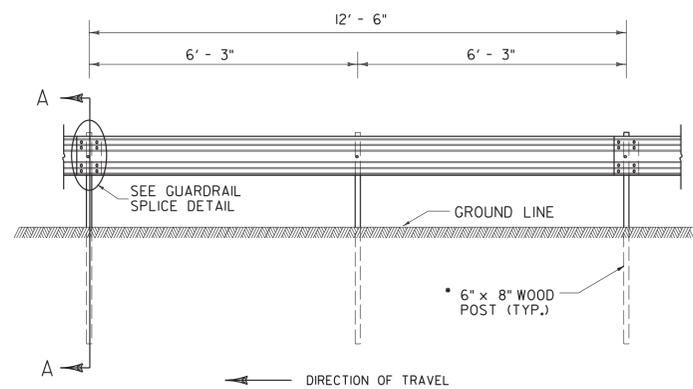
FRONT FACE STEEL POST



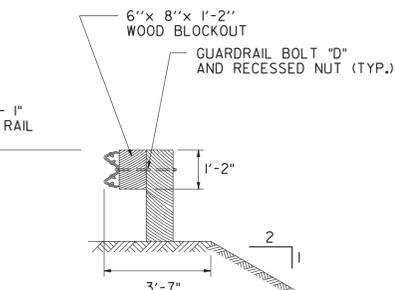
POST FACE  
MODIFIED WOOD BLOCKOUT - ROUTED  
6" x 8" x 1'-2"  
FOR USE W/ STEEL POSTS ONLY

- NOTES:
- BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSIOR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE SIZE TOLERANCE OF ROUGH SAWN BLOCKS IN THE DIRECTION OF THE BOLT HOLES SHALL BE NOT MORE THAN +/- 1/4".
  - SUPPLY WOOD BLOCKS PER AASHTO M 168.
  - TREAT WITH PRESERVATIVE PER AASHTO M 133.
  - BLOCKOUTS MAY ALSO BE MADE OF APPROVED ALTERNATIVE MATERIAL.

"W" BEAM GUARDRAIL WITH WOOD POSTS



ELEVATION FROM CL OF ROAD

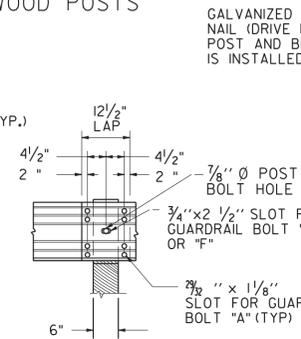


SINGLE - FACED BARRIER

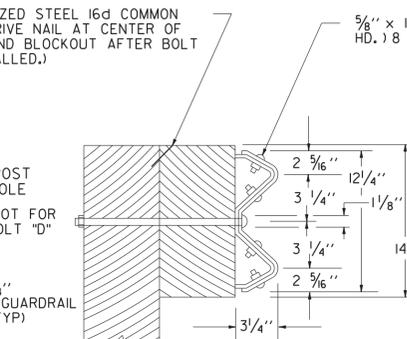


DOUBLE - FACED BARRIER

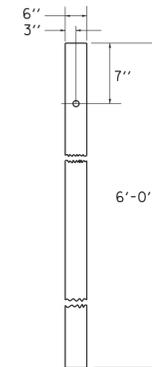
SECTION A - A



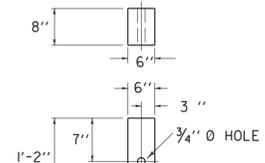
ELEVATION



SECTION



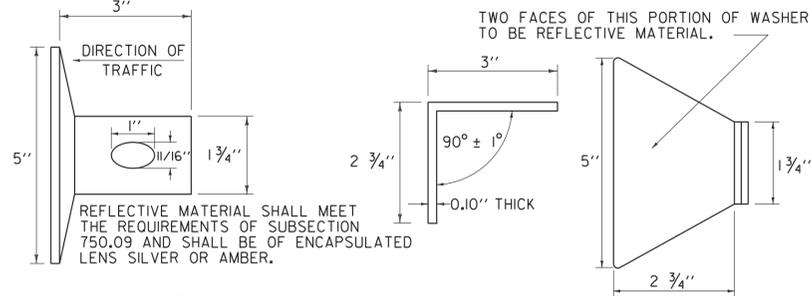
FRONT FACE WOOD POST



POST FACE  
WOOD BLOCKOUT  
6" x 8" x 1'-2"

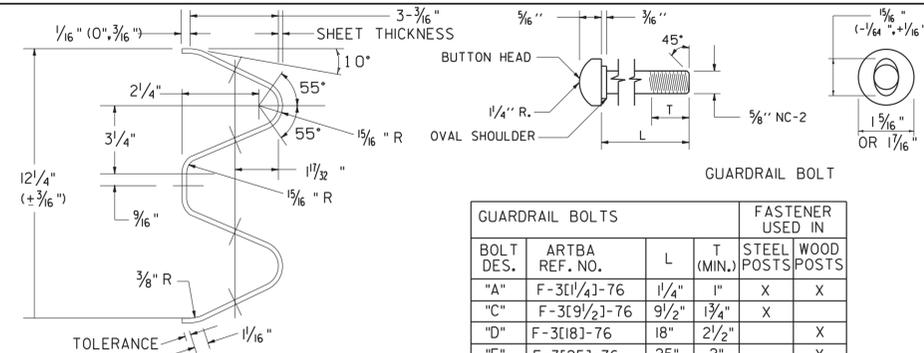
- NOTES:
- BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSIOR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE SIZE TOLERANCE OF ROUGH SAWN BLOCKS IN THE DIRECTION OF THE BOLT HOLES SHALL BE NOT MORE THAN +/- 1/4".
  - SUPPLY WOOD BLOCKS PER AASHTO M 168.
  - TREAT WITH PRESERVATIVE PER AASHTO M 133.
  - BLOCKOUTS MAY ALSO BE MADE OF APPROVED ALTERNATIVE MATERIAL.

GUARDRAIL DELINEATOR



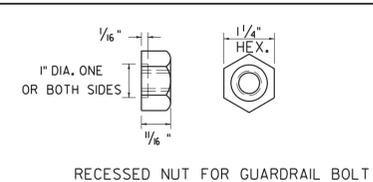
REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.

THIS REFLECTORIZED ALUMINUM WASHER IS TO BE PLACED IN VALLEY OF BEAM WHEN MOUNTING BEAM ONTO EACH FIFTH POST. WASHER SHALL MEET SPECIFICATION REQUIREMENTS FOR A.S.T.M. B-209 ALLOY 5052-H32.

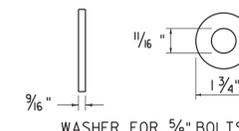


ARTBA RE-3[206]-3'-12'-6" CLASS A, TYPE IJ-73  
TYPICAL GUARDRAIL SECTION

BOLT DES.	ARTBA REF. NO.	L	T (MIN.)	STEEL POSTS	WOOD POSTS
"A"	F-3[1/4]-76	1 1/4"	1"	X	X
"C"	F-3[9/2]-76	9/2"	1 3/4"	X	
"D"	F-3[18]-76	18"	2 1/2"		X
"F"	F-3[25]-76	25"	2"		X



RECESSED NUT FOR GUARDRAIL BOLT



WASHER FOR 5/8" BOLTS  
ARTBA F-13-73  
NOTE: WASHER IS USED UNDER RECESSED NUT WHERE GUARDRAIL BOLT IS USED WITH WOOD POSTS.

- GENERAL NOTES:
- GUARDRAIL SHALL MEET THE REQUIREMENTS OF AASHTO M 180, CLASS A, TYPE I, UNLESS OTHERWISE DESIGNATED.
  - GUARDRAIL SHALL BE SINGLE FACED UNLESS OTHERWISE DESIGNATED.
  - GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW FOR THE LANE NEAREST THE GUARDRAIL.
  - FOR DESCRIPTION AND SPECIFICATION OF PARTS IDENTIFIED BY (ARTBA ...) AND OTHER DETAILS OF POSTS, POST ACCESSORIES, FASTENERS & RAIL ELEMENTS, SEE AASHTO-ACC-ARTBA JOINT TASK FORCE NO. 13, TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE", LATEST EDITION.
  - STANDARD STEEL BEAM TO BE 1/8" AND THE HEAVY DUTY TO BE 3/4" THICK.

OTHER STANDARD REQUIRED: G-1d

REVISIONS AND CORRECTIONS

- JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.
- JAN. 3, 2000 - UPDATED TO REFLECT METRIC STD. CHANGES
- FEB. 10, 2014 - UPDATED TO REFLECT GUARDRAIL HEIGHT OF 29"; AS NOTED IN FHWA LETTER DATED MAY 17, 2010

APPROVED

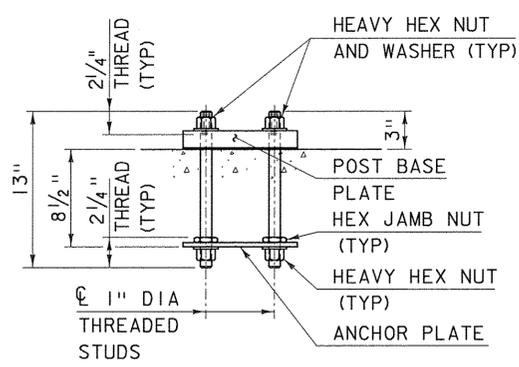
*Richard Thraut*  
HIGHWAY SAFETY & DESIGN ENGINEER

*Mark D. Richter*  
DIRECTOR OF PROGRAM DEVELOPMENT  
FEDERAL HIGHWAY ADMINISTRATION

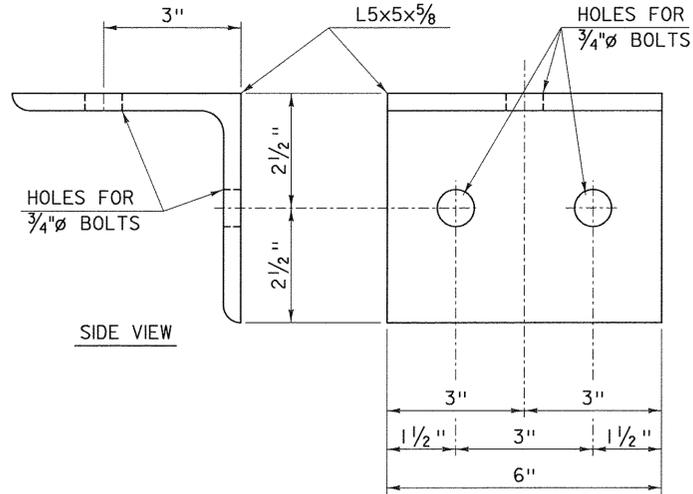
STEEL BEAM GUARDRAIL WITH STEEL POSTS  
STEEL BEAM GUARDRAIL WITH WOOD POSTS



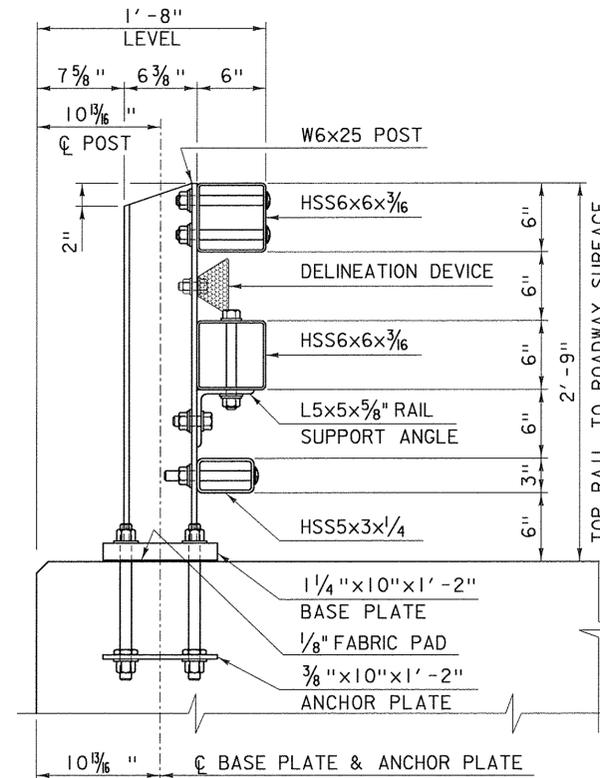
STANDARD  
G-1



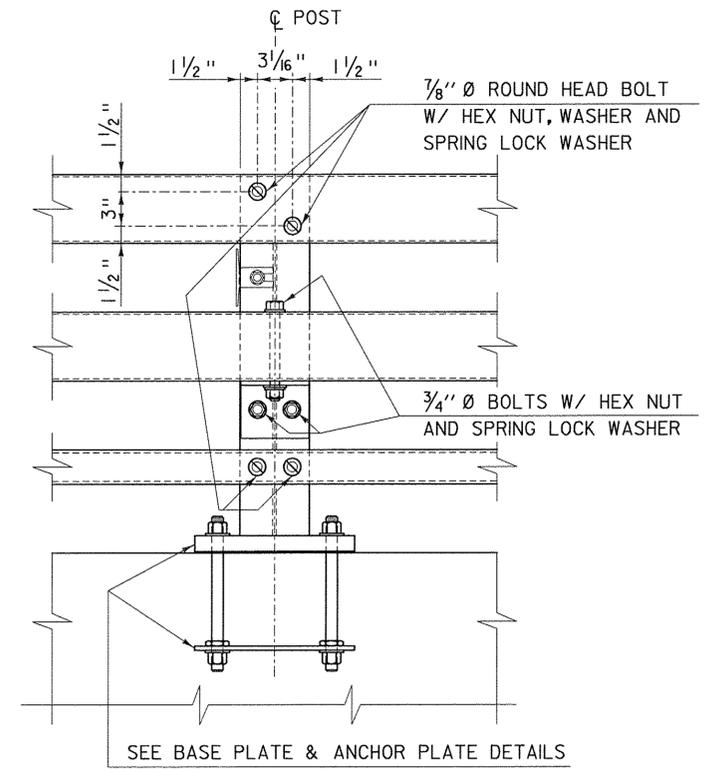
RAILING POST ANCHORAGE



ELEVATION VIEW  
RAILING ANGLE DETAILS

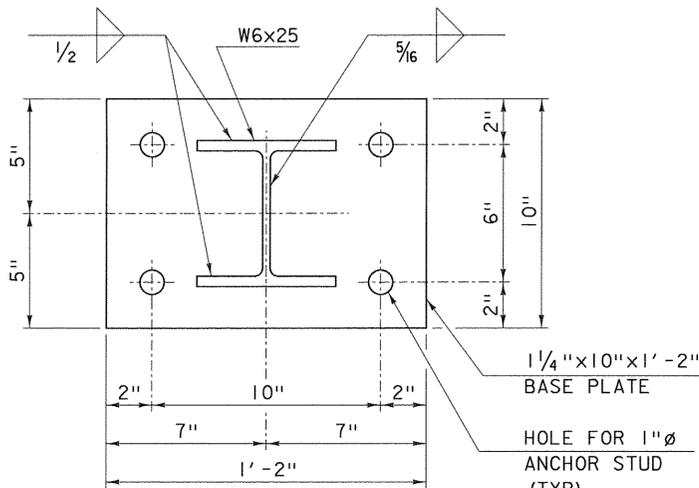


RAILING SECTION

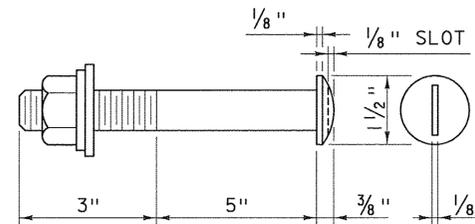


RAILING ELEVATION

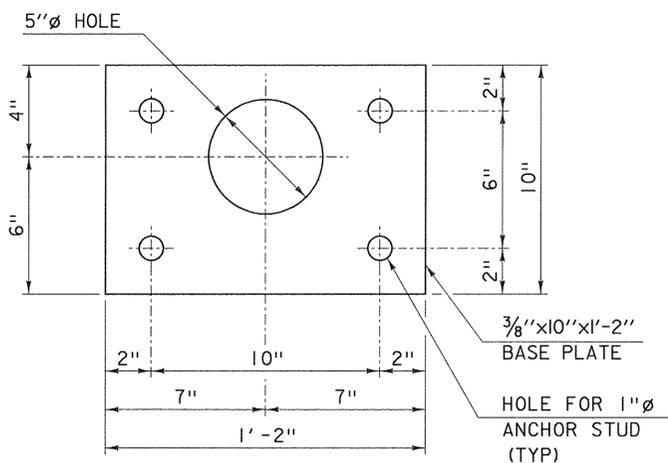
- NOTES: 1. ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 525.
2. PRIOR TO GALVANIZING THE ASSEMBLED POST, GRIND ALL EDGES TO A MINIMUM RADIUS OF 1/16".
3. ALL POSTS SHALL BE SET NORMAL TO GRADE. THE MAXIMUM CENTER TO CENTER SPACING OF BRIDGE RAIL POSTS IS 8'-3".
4. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO BRIDGE POSTS AND PREFERABLY TO AT LEAST 4 POSTS.
5. RAIL TUBE EXPANSION JOINTS SHALL BE PROVIDED IN ANY RAIL BAY SPANNING THE END OF AN INTEGRAL ABUTMENT BRIDGE AND AT ALL SUPERSTRUCTURE EXPANSION JOINTS. EXPANSION JOINT WIDTH SHALL BE 4" @ 68°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.
6. HOLES IN RAILS FOR TUBE ATTACHMENT MAY BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO INSTALLATION.
7. BOLTS SHALL BE TORQUED SNUG TIGHT (APPROXIMATELY 100 FT-LB).
8. SEE STANDARD DRAWING G-1B FOR DETAILS OF DELINEATORS. A DELINEATOR SHALL BE INSTALLED AT 30 FOOT SPACING OR THE NEAREST POST. WHITE IS TO BE INSTALLED ON THE DRIVER'S RIGHT. FOR ONE WAY BRIDGES, YELLOW IS TO BE INSTALLED ON THE DRIVER'S LEFT. PAYMENT SHALL BE INCIDENTAL TO OTHER ITEMS.
9. ANY BENDING OF RAIL SHALL BE DONE AT THE FABRICATION PLANT ACCORDING TO A PROCEDURE PROVIDED BY THE FABRICATOR.
10. THE MINIMUM DISTANCE FROM THE POST TO AN EXPANSION JOINT SHALL BE DETERMINED BY THE MINIMUM EDGE DISTANCE OF 5" FROM ANY ANCHOR STUD TO THE END OF THE SLAB, OR TO THE EXPANSION JOINT RECESS POUR, IF ONE IS USED.
11. THIS RAILING MEETS THE REQUIREMENTS FOR A TL-4 SERVICE LEVEL.



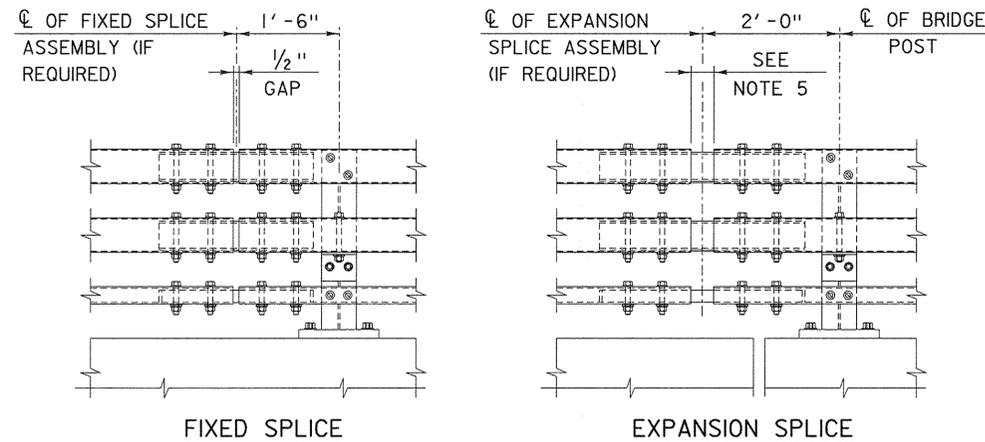
BASE PLATE DETAIL



ROUND HEAD BOLT DETAIL  
A449 (TYPE 1)



ANCHOR PLATE DETAIL



RAILING SPLICE DETAIL ELEVATION

A RAILING EXPANSION SPLICE IS REQUIRED IN ANY POST SPACING THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT

REVISIONS AND CORRECTIONS  
AUGUST 9, 2010 - ORIGINAL APPROVAL  
APRIL 23, 2012 - GENERAL UPDATE 2012

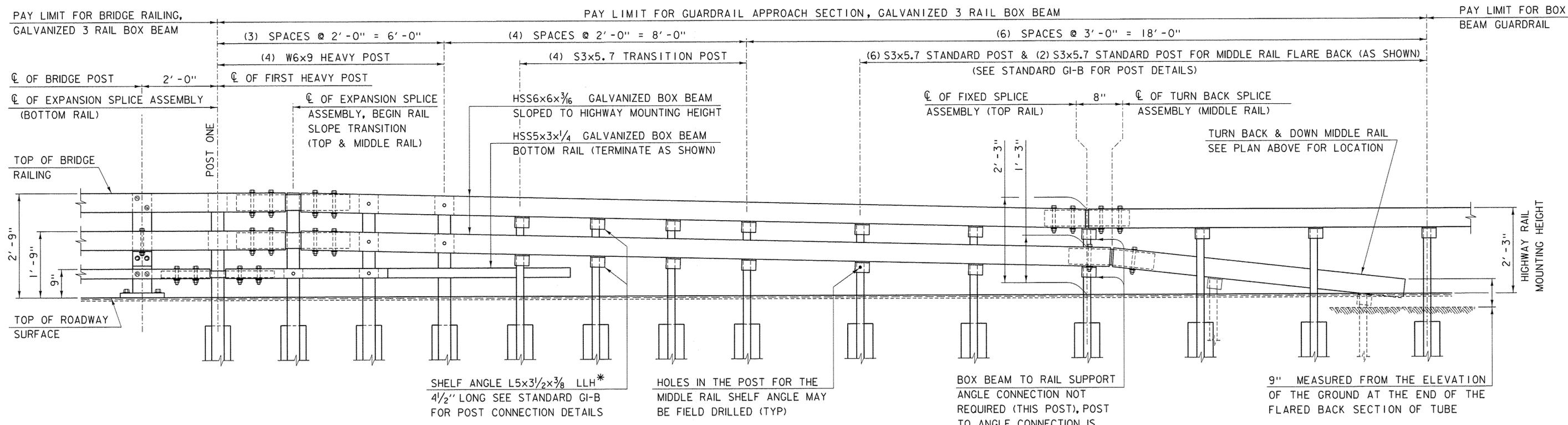
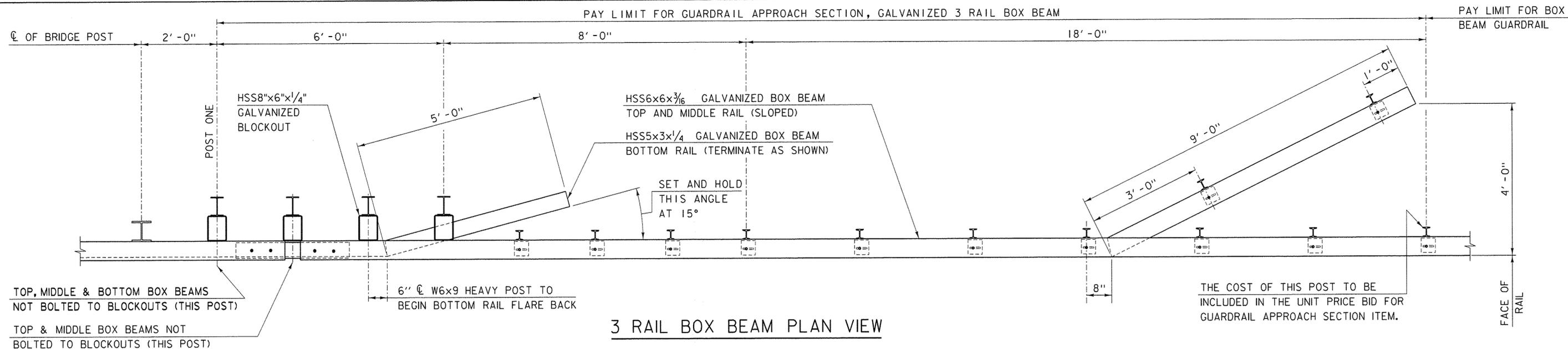
APPROVED  
*Wm. Michael Hedges*  
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*Richard Fehrnau*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

BRIDGE RAILING,  
GALVANIZED  
3 RAIL BOX BEAM

OTHER STDS. REQUIRED: **G-1B, S-364C**



STANDARD  
S-364A



**3 RAIL BOX BEAM ELEVATION**

\* LONG LEG HORIZONTAL

**NOTES:**

1. BOX BEAM TUBE AND STEEL POST MATERIALS, DIMENSION SIZES AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL, UNLESS OTHERWISE NOTED.

**OTHER STDS. REQUIRED: G-1B, S-364A**

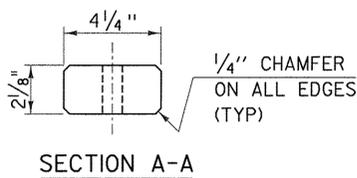
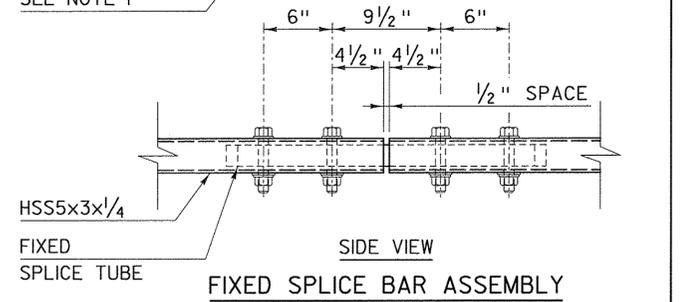
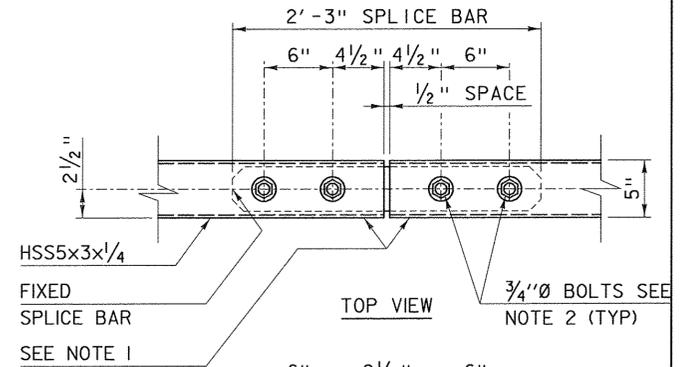
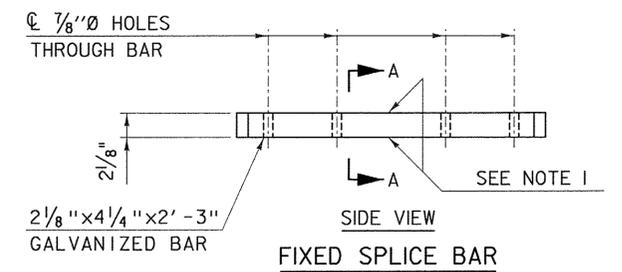
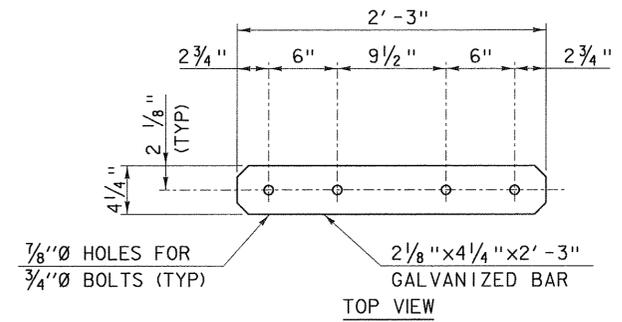
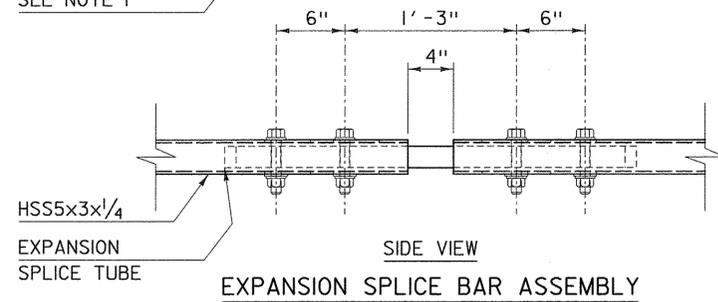
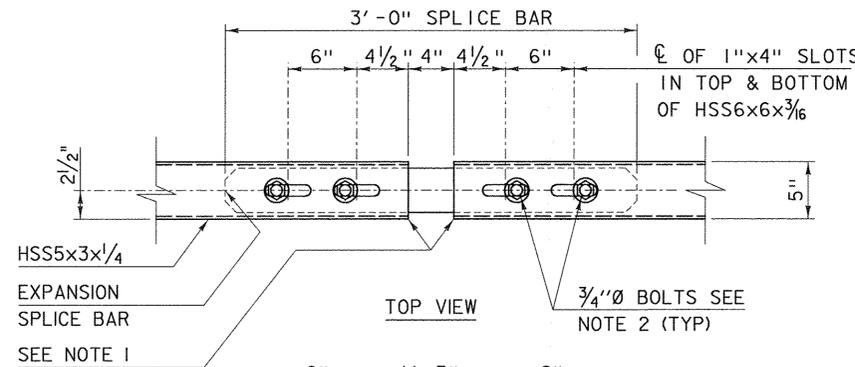
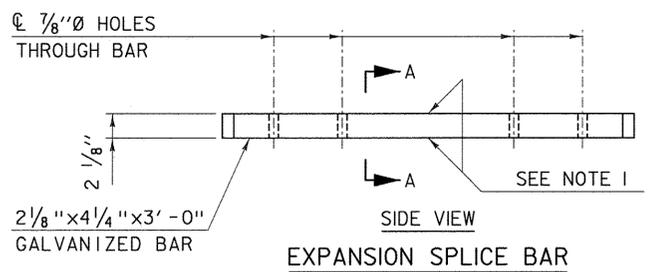
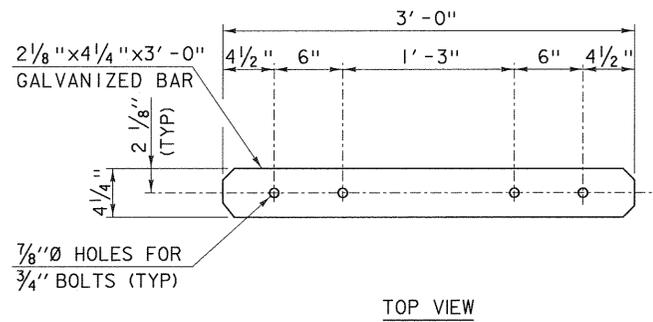
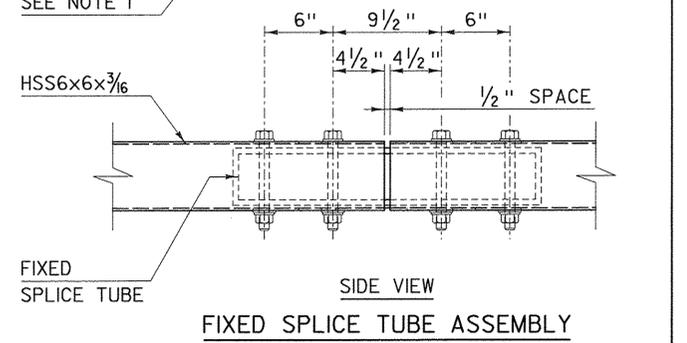
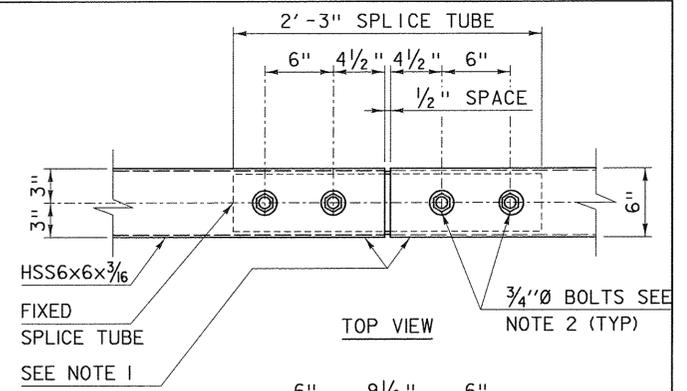
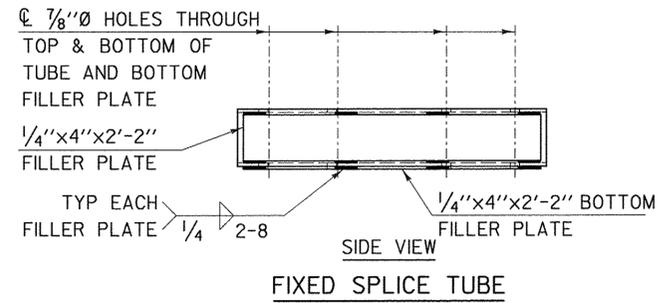
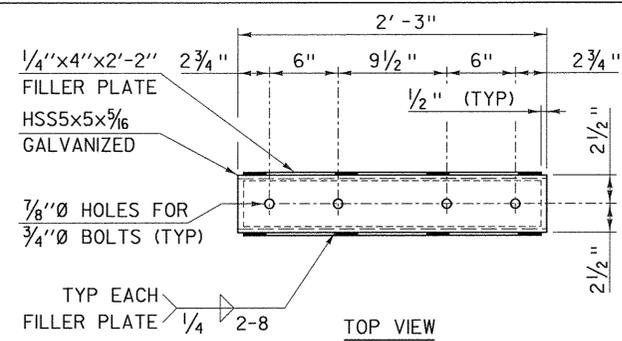
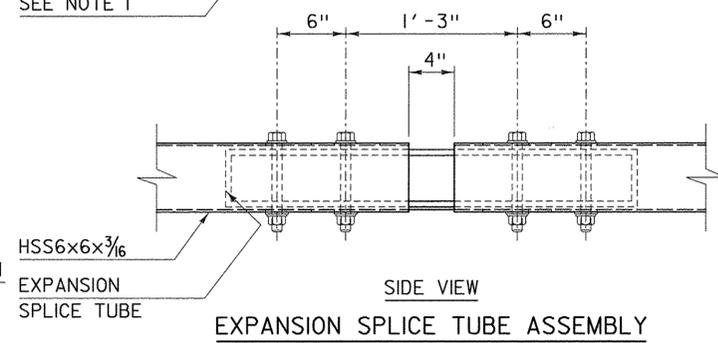
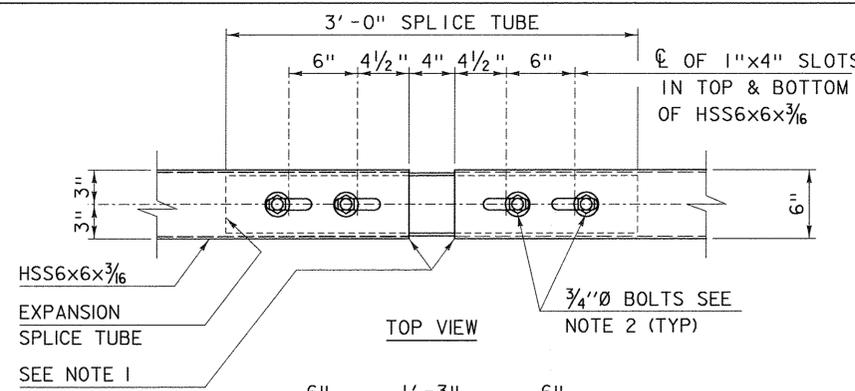
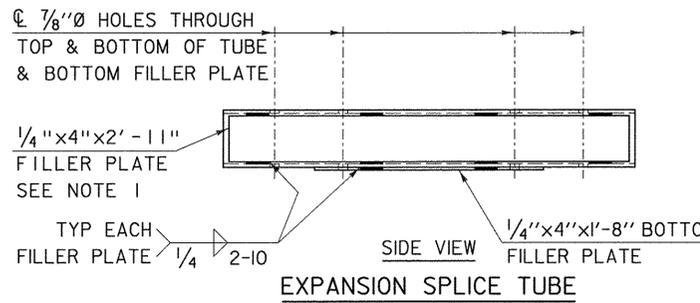
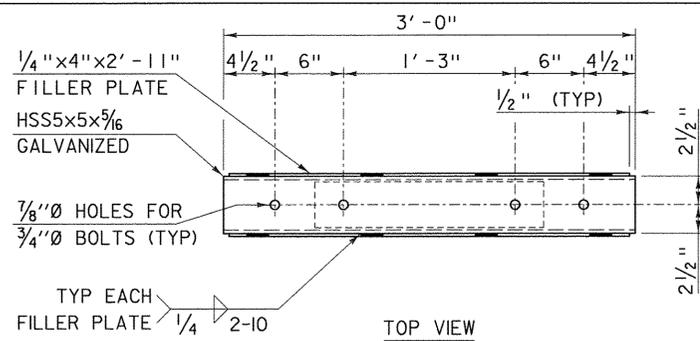
REVISIONS AND CORRECTIONS  
 AUGUST 9, 2010 - ORIGINAL APPROVAL  
 APRIL 23, 2012 - GENERAL UPDATE 2012

APPROVED  
*Wm. Michel Hedges*  
 STRUCTURES PROGRAM MANAGER  
  
*Richard Johnson*  
 DIRECTOR OF PROGRAM DEVELOPMENT  
  
*Mark D. Richter*  
 FEDERAL HIGHWAY ADMINISTRATION

**GUARDRAIL APPROACH SECTION, GALVANIZED 3 RAIL BOX BEAM**



**STANDARD S-364B**



NOTES:

1. PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE BOX BEAM RAILS, SPLICE TUBES AND FILL PLATES.
2. FOUR (4) 3/4" DIAMETER FULLY THREADED BOLTS, 7 1/2" LONG WITH TWO (2) WASHERS AND A HEAVY HEX NUT ON EACH BOLT. NUT TO BE FINGER TIGHT AND THE FIRST THREAD BELOW THE NUT TO BE BURRED TO PREVENT DISLODGING. FOUR (4) BOLTS AT EACH SPLICE.

REVISIONS AND CORRECTIONS  
AUGUST 9, 2010 - ORIGINAL APPROVAL  
APRIL 23, 2012 - GENERAL UPDATE 2012

APPROVED

*Wm. Michael Hedys*  
STRUCTURES PROGRAM MANAGER

*Richard J. Petrone*  
DIRECTOR OF PROGRAM DEVELOPMENT

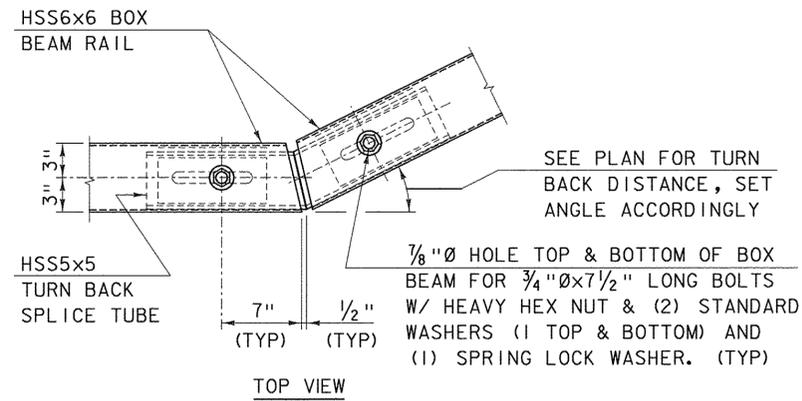
*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

GUARDRAIL APPROACH  
SECTION, GALVANIZED  
3 RAIL BOX BEAM

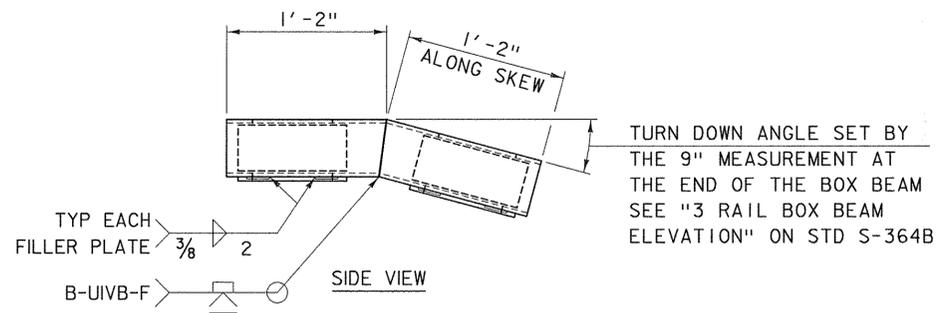
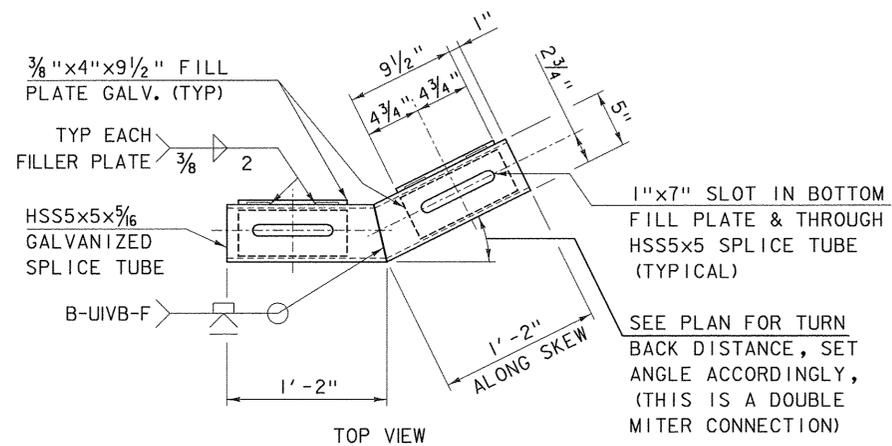
OTHER STDS.  
REQUIRED:



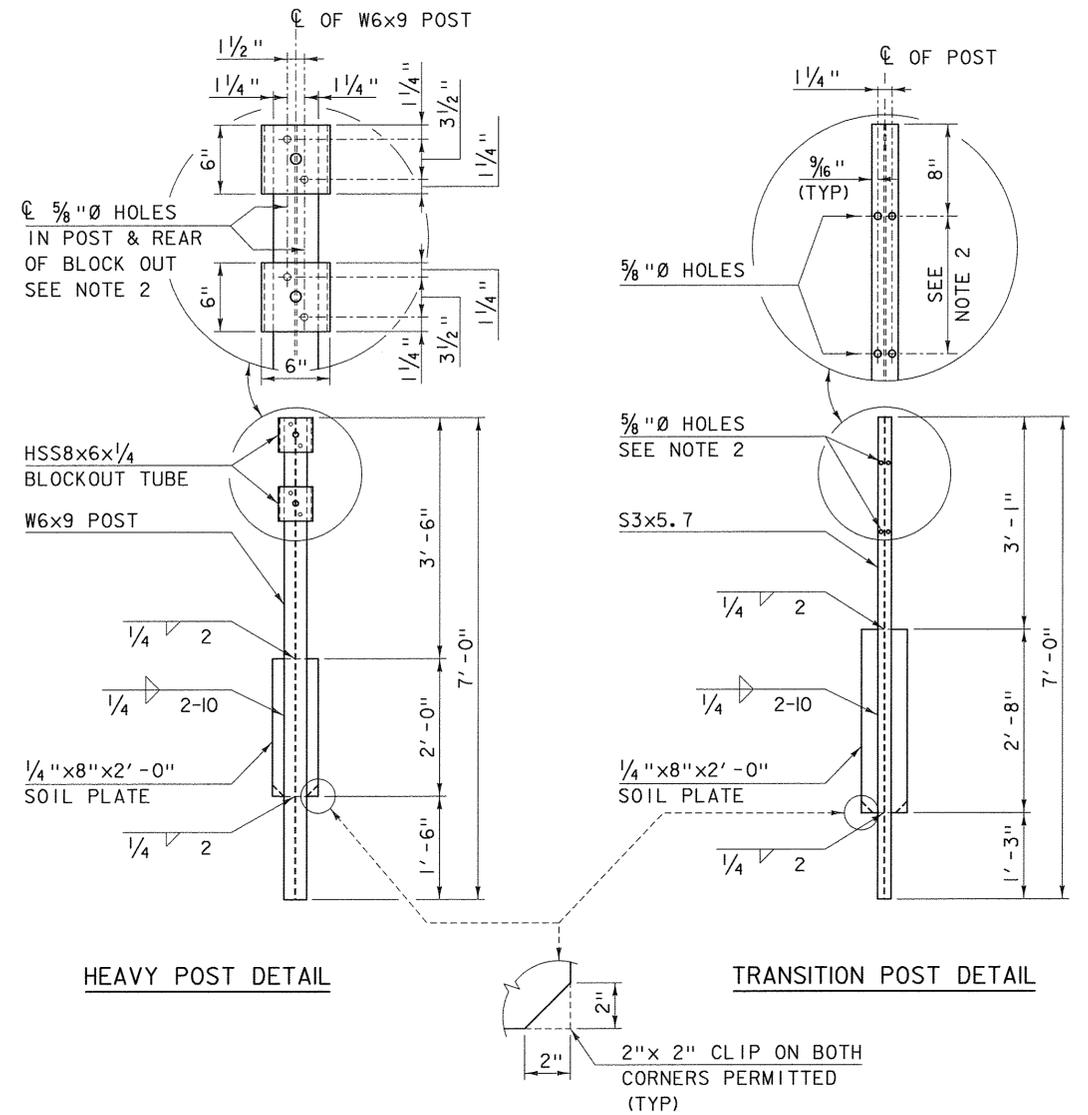
STANDARD  
S-364C



TURN BACK SPLICE TUBE ASSEMBLY



TURN BACK SPLICE TUBE DETAIL  
TURN BACK & TURN DOWN TUBE JOINT



NOTES:

- PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE BOX BEAM RAILS, SPLICE TUBES AND FILL PLATES.
- HOLES IN THE POST FOR THE LOWER RAIL MAY BE LOCATED AND DRILLED IN THE FIELD. IF SO, THE GALVANIZING SHALL BE REPAIRED IN ACCORDANCE WITH SPECIFICATION SECTION 525.

OTHER STDS. REQUIRED:

REVISIONS AND CORRECTIONS  
AUGUST 9, 2010 - ORIGINAL APPROVAL  
APRIL 23, 2012 - GENERAL UPDATE 2012

APPROVED

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STRUCTURES PROGRAM MANAGER

*Richard Fetsch*  
DIRECTOR OF PROGRAM DEVELOPMENT

*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

GUARDRAIL APPROACH  
SECTION, GALVANIZED  
3 RAIL BOX BEAM



STANDARD  
S-364D

1. TRAFFIC CONTROL DEVICES NOT DETAILED IN THE VERMONT AGENCY OF TRANSPORTATION (VAOT) "STANDARD DRAWINGS" OR THE PROJECT PLANS SHALL BE IN ACCORDANCE WITH THE "MANUAL ON TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK (SHSM) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
2. CONSTRUCTION SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY OR UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER.
3. CONSTRUCTION SIGN COVERS SHALL CONSIST OF A PANEL, PAINTED FLAT BLACK, THE SAME SIZE AS THE SIGN IT COVERS. THE PANEL SHALL BE OF WOOD, PLYWOOD, HARDBOARD OR ANY MATERIAL SATISFACTORY TO THE ENGINEER. NO MATERIAL WILL BE APPROVED THAT WILL DETERIORATE BY EXPOSURE TO THE WEATHER DURING THE PROJECT. MOUNTING OF THE PANEL SHALL BE DONE IN SUCH A WAY AS NOT TO DAMAGE THE SIGN FACE MATERIAL.
4. SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACED OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.
5. NO CROSS-BRACING OR BACK-BRACING TO KEEP POSTS PLUMB WILL BE ALLOWED. CONCRETE FOUNDATIONS, COLLARS OR SOIL BEARING PLATES ARE NOT PERMITTED. CONSTRUCTION SIGNS SHALL BE PLACED ON TWO POSTS.
6. CONSTRUCTION SIGNS INSTALLED ON POSTS SHALL BE SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST FIVE FEET ABOVE THE EDGE OF PAVEMENT AND THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT, FOUR FEET OUTSIDE GUARDRAIL, OR TWO FEET OUTSIDE CURBING OR SIDEWALK. THE INSTALLATION OF SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER. IN URBAN AREAS, THE BOTTOM OF THE SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE SIDEWALK OR EDGE OF PAVEMENT, WHICHEVER IS HIGHER.
7. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND A MINIMUM OF ONE FOOT ABOVE THE TRAVELED WAY. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. WHEN PLACED BEHIND GUARDRAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL.
8. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
9. ROLL UP CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE VI AND TYPE VII UNLESS OTHERWISE NOTED.
10. SOLID SUBSTRATE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING THE "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE VIII OR IX REQUIREMENTS UNLESS OTHERWISE NOTED.
11. WHERE CONSTRUCTION SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL MEET "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 OR THE AASHTO "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH). THE APPROPRIATE RESOURCE SHALL BE DETERMINED AS DESCRIBED IN THE MASH PUBLICATION. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POSTS. WHEN ANCHORS ARE INSTALLED, STUBS SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
12. ROADWAY AND SHOULDER WIDTHS DEPICTED ON THE STANDARD DRAWINGS MAY VARY.
13. THESE STANDARD DRAWINGS ARE INTENDED TO SERVE AS VTRANS STANDARD OPERATING PROCEDURE. IT IS NOTED THAT COMPONENT PARTS OF A TEMPORARY TRAFFIC CONTROL WORK ZONE MAY BE MODIFIED DUE TO FIELD CONDITIONS, AT THE DISCRETION OF THE ENGINEER.

OTHER STDS. REQUIRED: **NONE**

REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

APPROVED  
*W.A.P.*  
HIGHWAY SAFETY & DESIGN ENGINEER  
*Rubén J. Huante*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

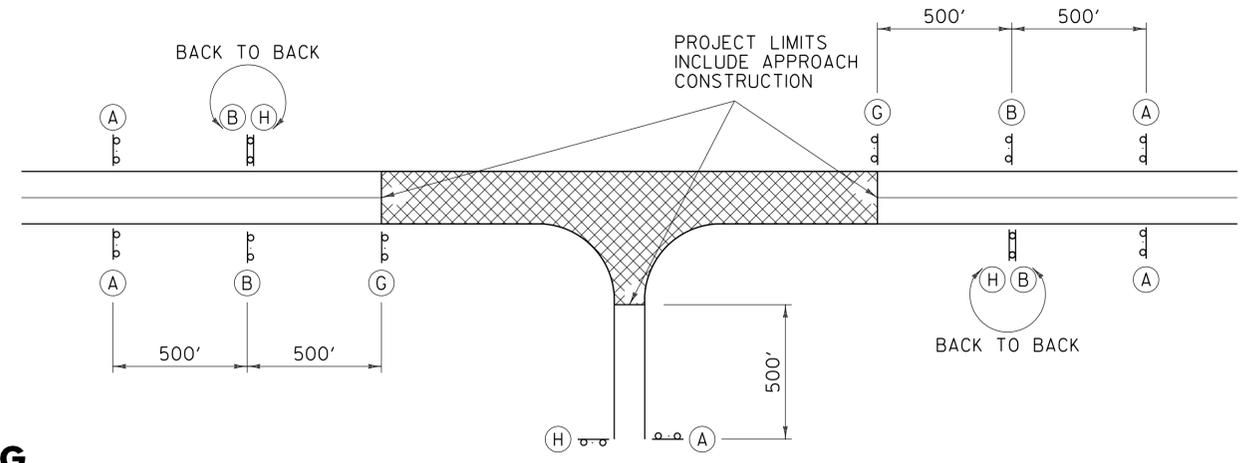
## TRAFFIC CONTROL GENERAL NOTES



STANDARD  
T-1

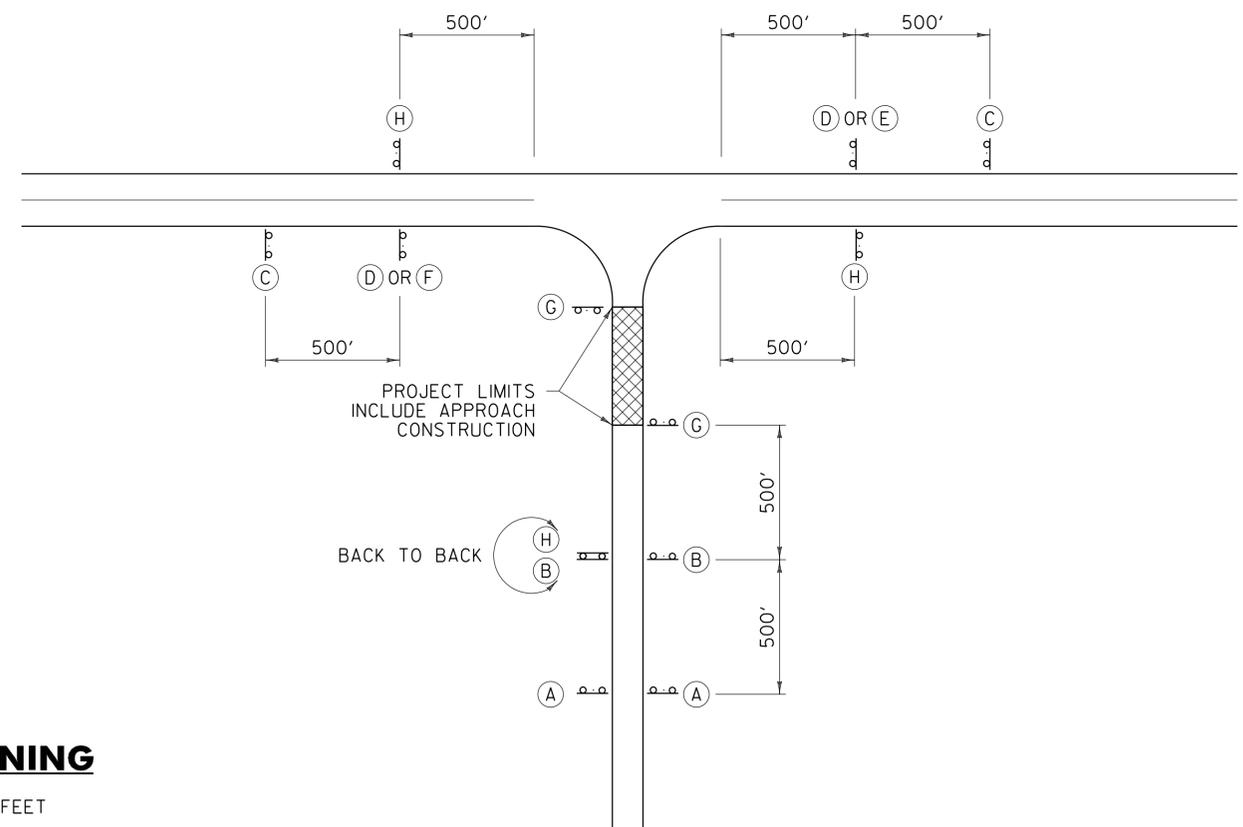
**LEGEND**

- (A)  ROAD WORK AHEAD  
W20-1
- (B)  ROAD WORK 500 FT  
W20-1
- (C)  SIDE ROAD WORK AHEAD  
VC-869
- (D)  SIDE ROAD WORK 500 FT  
VC-869
- (E)  SIDE ROAD WORK LEFT  
VC-869
- (F)  SIDE ROAD WORK RIGHT  
VC-869
- (G)  ROAD WORK NEXT XX MILES  
G20-1
- (H)  END ROAD WORK  
G20-2



**TYPICAL APPROACH SIGNING**

FIELD CONDITIONS MAY DICTATE THE ACTUAL PLACEMENT.



**SIDE ROAD APPROACH SIGNING**

TO BE USED WHEN CONSTRUCTION IS UP TO 1000 FEET FROM THE INTERSECTION. FIELD CONDITIONS MAY DICTATE THE ACTUAL PLACEMENT.

**GENERAL NOTES:**

1. SIGNS SHOWN ON THIS SHEET ARE INTENDED FOR USE IN PROVIDING ADVANCE WARNING AND INFORMATION ON CONSTRUCTION PROJECTS OVER WHICH TRAFFIC WILL BE MAINTAINED. WHEN ADDITIONAL APPROACH SIGNS OR OTHER TYPES OF ADVANCE SIGNING OR CONTROL ARE NECESSARY, THE PLANS AND/OR THE SPECIFICATIONS FOR THAT PROJECT WILL GIVE THE DETAILS OF THE SIGNS AND DEVICES REQUIRED. FOR ON-PROJECT CONSTRUCTION SIGNS, REFER TO APPROPRIATE STANDARD SHEETS.
2. THE "ROAD WORK NEXT XX MILES" SIGN (G20-1) SHALL BE INSTALLED IN ADVANCE OF TEMPORARY TRAFFIC CONTROL ZONES THAT ARE MORE THAN TWO MILES IN LENGTH OR AS DIRECTED BY THE ENGINEER. DISTANCES SHALL BE STATED TO THE NEAREST WHOLE MILE.
3. SIGNS SHALL BE LOCATED AS DETAILED ON THIS SHEET OR AS OTHERWISE SHOWN ON THE PLANS. THEY SHALL APPEAR AT EACH END OF THE HIGHWAY UNDER CONSTRUCTION AND ON ALL INTERSECTING PUBLIC HIGHWAYS. THE ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

**OTHER STDS. REQUIRED: T-1, T-28**

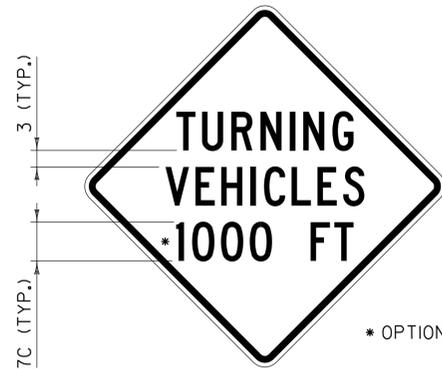
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

APPROVED  
*[Signature]*  
HIGHWAY SAFETY & DESIGN ENGINEER  
*[Signature]*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*[Signature]*  
MARK D. RICHTER  
FEDERAL HIGHWAY ADMINISTRATION

**CONVENTIONAL ROADS  
CONSTRUCTION APPROACH  
SIGNING**

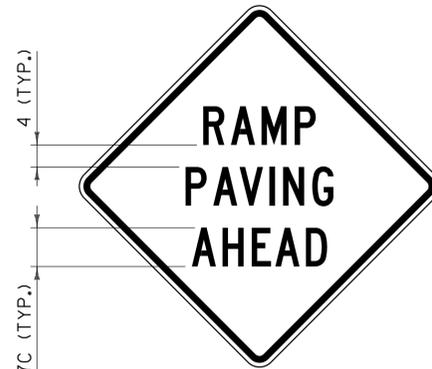


**STANDARD  
T-10**

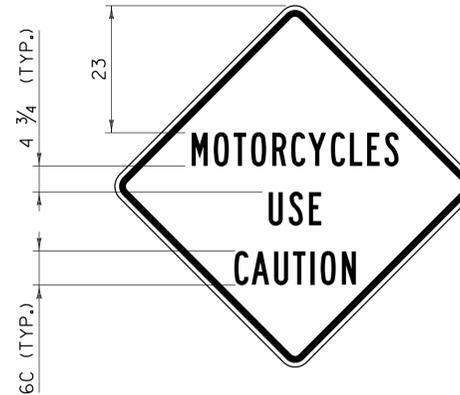


**VC-001**

\* OPTIONS { 500  
1500



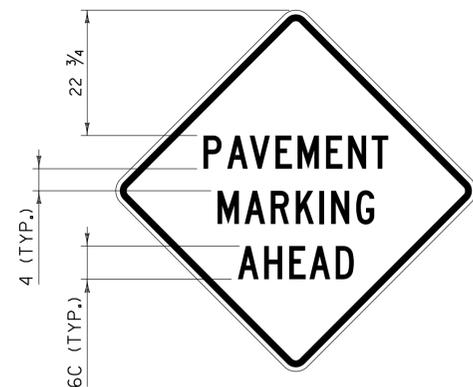
**VC-003**



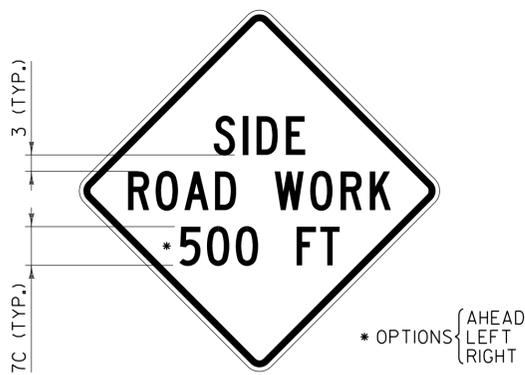
**VC-004**



**VC-008**



**VC-813**



**VC-869**

\* OPTIONS { AHEAD  
LEFT  
RIGHT



**VC-874**

**GENERAL NOTES:**

1. COLORS FOR SIGNS SHALL BE BLACK LEGEND AND BORDER ON FLUORESCENT ORANGE BACKGROUND.
2. CONSTRUCTION SIGNS SHALL BE 48 INCH BY 48 INCH. IF SOLID SUBSTRATE SIGNS ARE USED, SIGNS SHALL HAVE CORNERS ROUNDED TO A THREE INCH RADIUS.
3. SIGNS SHALL HAVE 1 1/4 INCH WIDE BORDERS THAT ARE INDENTED 3/4 INCH FROM THE EDGE OF THE SIGN.
4. SIGNS SHALL HAVE THE LEGEND CENTERED HORIZONTALLY AND VERTICALLY ON THE SIGN UNLESS OTHERWISE INDICATED.
5. ALL DIMENSIONS SHOWN IN INCHES.

**OTHER STDS. REQUIRED: T-1**

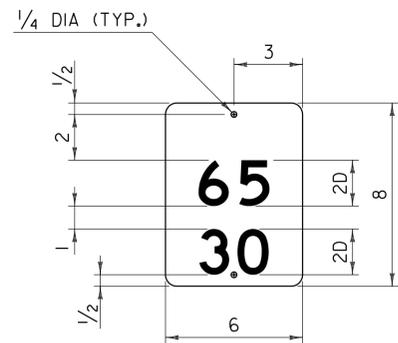
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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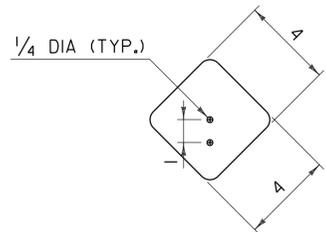
CONSTRUCTION SIGN  
DETAILS



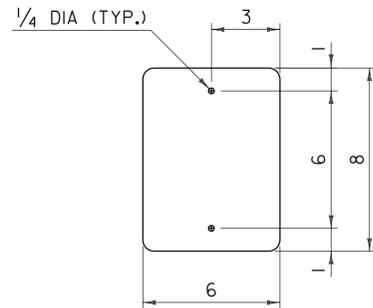
STANDARD  
T-28



**INTERSTATE MILEPOST PLAQUE**



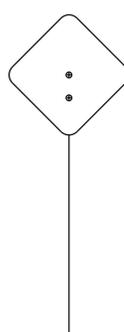
**TYPE I DELINEATOR**



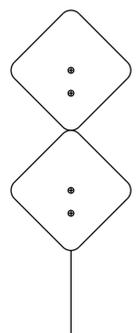
**TYPE II DELINEATOR**

**GENERAL NOTES:**

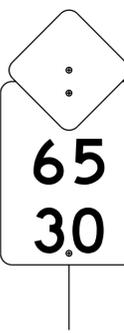
1. THE FIRST LINE OF TEXT ON INTERSTATE MILEPOST PLAQUES INDICATES THE WHOLE NUMBER MILEAGE FROM THE BEGINNING OF A ROUTE. MILEAGE IS ALWAYS MEASURED TRAVELING FROM THE SOUTH TO NORTH OR FROM THE WEST TO EAST. THE ROUTE DIRECTION IS ESTABLISHED USING THE VERMONT AGENCY OF TRANSPORTATION (VAOT) ROUTE LOGS.
2. THE SECOND LINE OF TEXT ON INTERSTATE MILEPOST PLAQUES INDICATES THE ADDITIONAL MILEAGE, IN HUNDREDTHS, FROM THE BEGINNING OF A ROUTE. MILEAGE IS ALWAYS MEASURED TRAVELING FROM THE SOUTH TO NORTH OR FROM THE WEST TO EAST. THE ROUTE DIRECTION IS ESTABLISHED USING THE VAOT ROUTE LOGS.
3. THE INTERSTATE MILEPOST PLAQUE SHALL BE GREEN RETROREFLECTIVE LEGEND ON A WHITE RETROREFLECTIVE BACKGROUND AND SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE III.
4. ALL LINES OF TEXT SHALL BE CENTERED HORIZONTALLY AND SHALL BE AS IDENTIFIED IN THE PLANS.
5. THE INTERSTATE MILEPOST PLAQUE AND DELINEATOR BASE MATERIAL SHALL BE 0.063 INCH FLAT SHEET ALUMINUM.
6. CORNERS SHALL BE ROUNDED TO A 1/2 INCH RADIUS.
7. A TYPE III DELINEATOR CONSISTS OF A TYPE I DELINEATOR FACING THE NORMAL DIRECTION OF TRAVEL AND A SINGLE RED TYPE I DELINEATOR FACING THE OPPOSITE DIRECTION. THE WHITE DELINEATOR AND RED DELINEATOR COMBINATION IS PLACED ON THE DRIVER'S RIGHT AND THE AMBER DELINEATOR AND RED DELINEATOR COMBINATION ON THE DRIVER'S LEFT.
8. DELINEATORS SHALL HAVE WHITE, GREEN, OR BLUE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 ASTM D 4956 TYPE III, OR RED OR YELLOW RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 ASTM D 4956 TYPE VII, VIII, OR IX.
9. A SINGLE 14 GAGE, 1.75 INCH SQUARE STEEL POST AND 12 GAGE, TWO INCH SQUARE ANCHOR SHALL BE USED FOR INSTALLATION. THE ANCHOR SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
10. THE TOP OF POST SHALL BE ONE INCH ABOVE THE UPPER HOLE FOR ALL TYPE I DELINEATORS.
11. THE TOP OF POST SHALL BE FLUSH WITH THE TOP OF ALL TYPE II DELINEATORS.
12. ALL DIMENSIONS SHOWN IN INCHES.



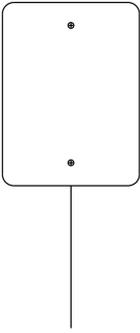
**TYPE I**



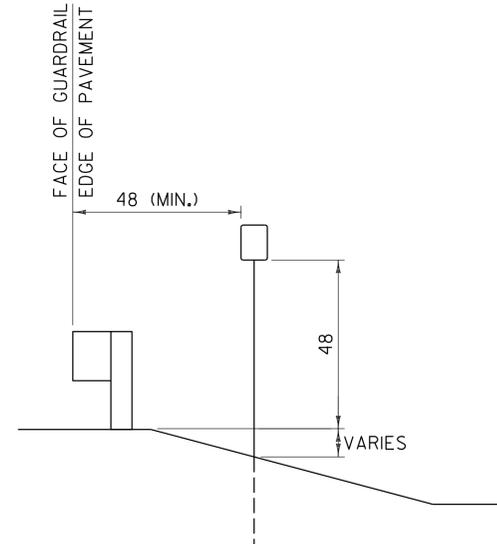
**TYPE I - U-TURNS**



**WHITE TYPE I WITH MILEPOST PLAQUE**



**TYPE II**



**INSTALLATION DETAIL\***

\* INSTALLATION DETAIL APPLICABLE TO ALL DELINEATOR ASSEMBLIES

**OTHER STDS. REQUIRED: T-45**

REVISIONS AND CORRECTIONS  
JAN. 2, 2013 - ORIGINAL APPROVAL DATE

APPROVED  
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**DELINEATORS AND MILEPOSTS**



**STANDARD  
T-40**

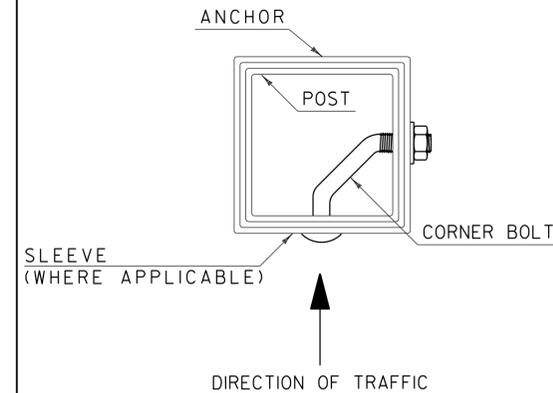
## POST AND ANCHOR SELECTION CHART

POST SIZE (IN.)	POST THICKNESS (IN.)	POST WEIGHT (LBS./FT.)	POST GAGE	SECTION MODULUS (IN. <sup>3</sup> )	ONE POST SV	TWO POST SV	THREE POST SV	POSTS PERMITTED IN 8' PATH	ANCHOR SIZE (IN.)	ANCHOR GAGE	MINIMUM ANCHOR LENGTH
1.75	.083	1.88	14	0.222	45	90	135	TWO	2.00	12	30
2.00	.109	2.42	12	0.393	80	160	240	TWO	2.25	12	48
2.50	.109	3.35	12	0.673	137	274	411	ONE	3.00	7	48

### NOTES:

- ALL SIGN POSTS SHALL HAVE  $\frac{7}{16}$  INCH HOLES EVERY ONE INCH ON CENTER (ALL FOUR SIDES).
- THE NUMBER OF SIGN POSTS PERMITTED WITHIN AN EIGHT FOOT PATH ASSUMES THAT THE SIGN ASSEMBLY IS NOT PROTECTED BY GUARDRAIL OR IS LOCATED WITHIN A GUARDRAIL'S DEFLECTION DISTANCE DETERMINED PER THE CURRENT "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) ROADSIDE DESIGN GUIDE. ADDITIONAL POSTS MAY BE INSTALLED USING SLIP BASES THAT MEET "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 OR THE AASHTO "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH). THE APPROPRIATE RESOURCE SHALL BE DETERMINED AS DESCRIBED IN THE MASH PUBLICATION.
- TO USE THE SELECTION VALUE (SV) COLUMNS IN THE TABLE ABOVE, MULTIPLY A SIGN'S SURFACE AREA IN SQUARE FEET ( $H \times L$ ) BY THE SIGN'S HEIGHT IN FEET MEASURED FROM THE GROUND TO THE CENTROID OF THE SIGN ASSEMBLY ( $h$ ). THIS RESULT MUST BE LESS THAN OR EQUAL TO THE CORRESPONDING SELECTION VALUE. NOTE THAT FOR SIGNS WITH MULTIPLE POSTS, THE LARGEST HEIGHT DIMENSION SHALL BE USED TO CALCULATE THE POST SELECTION VALUE.
- THE DESIGN CRITERIA UTILIZED IN SIGN POST AND ANCHOR SELECTION IS AS FOLLOWS: WIND SPEED OF 70 MPH (10 YEAR MEAN RECURRENCE INTERVAL), WIND PRESSURE OF 19 PSF, STEEL MINIMUM YIELD OF 55,000 PSI, AND AN ALLOWABLE STRESS OF 1.4 (0.60 F<sub>y</sub>).

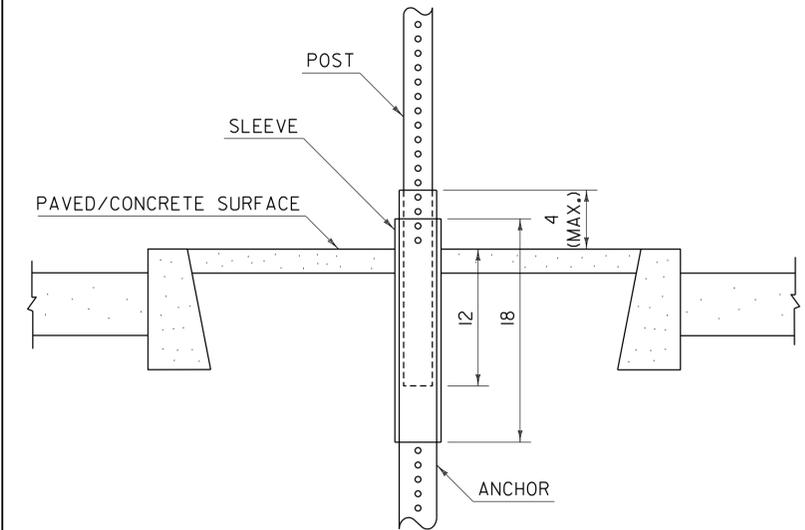
### CORNER BOLT INSTALLATION DETAIL



### NOTES:

- CORNER BOLTS SHALL BE  $\frac{5}{16}$  INCH DIAMETER WITH 18 THREADS PER INCH AND DIMENSIONS SHALL BE DETERMINED BASED ON THE OUTERMOST DIMENSION OF THE SLEEVE, ANCHOR OR POST. THREAD EXPOSURE MUST EXCEED THE CORRESPONDING NUT WIDTH. THE CORNER BOLT AND CORRESPONDING HARDWARE SHALL BE ZINC PLATED, MEETING OR EXCEEDING THE REQUIREMENTS OF THE "AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) A307.

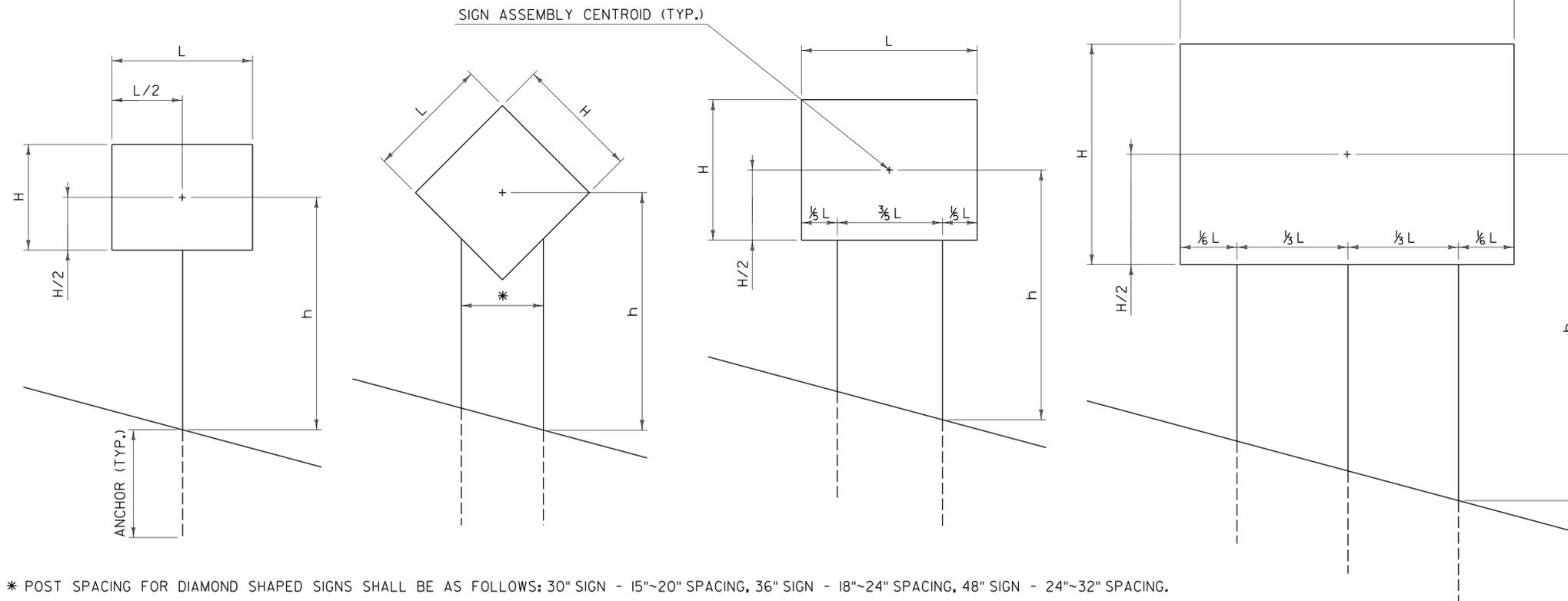
### SLEEVE /ANCHOR INSTALLATION DETAIL



### NOTES:

- A SLEEVE SHALL BE INSTALLED FOR SIGN INSTALLATIONS IN CONCRETE OR PAVEMENT.
- THE SLEEVE SHALL BE 18 INCHES MINIMUM IN LENGTH.
- THREE INCH SLEEVES THAT DO NOT HAVE HOLES WILL REQUIRE THAT  $\frac{7}{16}$  INCH HOLES ARE DRILLED TO FACILITATE CONNECTIONS.
- REFER TO CURRENT EDITION OF THE "VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION" FOR MATERIAL REQUIREMENTS.

### POST SPACING DETAILS



### GENERAL NOTES:

- ALL SQUARE TUBE STEEL POSTS AND ANCHORS SHALL BE FORMED INTO A SIZE AND SHAPE IN SUCH A MANNER THAT NEITHER FLASH NOR WELD SHALL INTERFERE WITH THE TELESCOPING PROPERTIES, NOR DAMAGE THE GALVANIZING.
- ANCHORS MAY BE DRIVEN OR SET INTO A DUG HOLE AND BACKFILLED. IF DRIVEN, A DRIVING CAP SHALL BE USED. THE DUG HOLE INSTALLATION METHOD SHALL BE UTILIZED IN AREAS WITH POOR SOIL CONDITIONS OR AS DIRECTED BY THE ENGINEER. BACKFILL SHALL BE COMPACTED AS DIRECTED BY THE ENGINEER.
- THE TOPS OF SIGN POSTS SHALL BE AT OR NEAR THE TOP OF SIGN. THE POST SHALL NOT EXTEND ABOVE THE TOP OF SIGN.
- SIGN POSTS SHALL BE INSTALLED A MINIMUM OF ONE FOOT BELOW GROUND, INSIDE THE ANCHOR. THE LENGTH OF ANCHOR EXPOSED ABOVE GROUND SHALL NOT EXCEED FOUR INCHES.
- ALL DIMENSIONS SHOWN IN INCHES.

**OTHER STDS. REQUIRED: NONE**

REVISIONS AND CORRECTIONS  
JAN. 2, 2013 - ORIGINAL APPROVAL DATE

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*W.A.C.M.*  
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## SQUARE TUBE SIGN POST AND ANCHOR



# STANDARD T-45