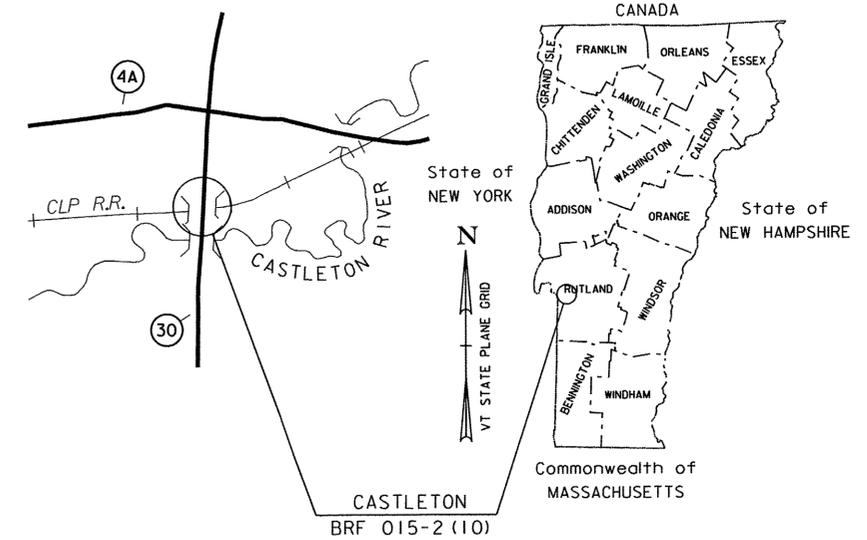


STATE OF VERMONT AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT BRIDGE PROJECT

TOWN OF CASTLETON
COUNTY OF RUTLAND
VT ROUTE 30 (RURAL MINOR ARTERIAL), BRIDGE NO 93

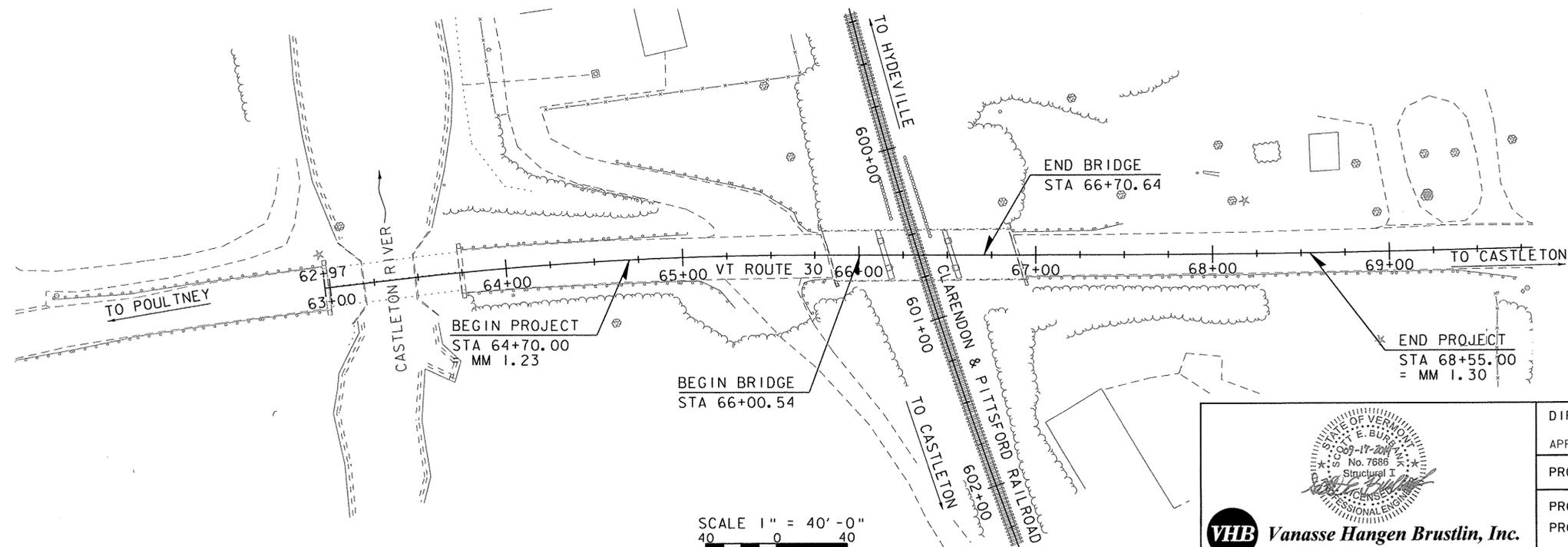
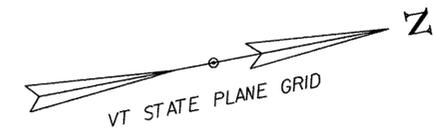


PROJECT LOCATION: LOCATED IN THE COUNTY OF RUTLAND, TOWN OF CASTLETON, ON VT ROUTE 30; BRIDGE NO. 93 OVER THE CLARENDON AND PITTSFORD RAILROAD; APPROXIMATELY 0.3 MILES SOUTH OF INTERSECTION OF VT ROUTE 30 AND VT ROUTE 4A.

PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES THE REMOVAL AND REPLACEMENT OF BRIDGE NO. 93 ON THE EXISTING ALIGNMENT, WITH ASSOCIATED ROADWAY AND RAIL WORK.

LENGTH OF STRUCTURE: 70.10 FEET
LENGTH OF ROADWAY: 314.90 FEET
LENGTH OF PROJECT: 385.00 FEET

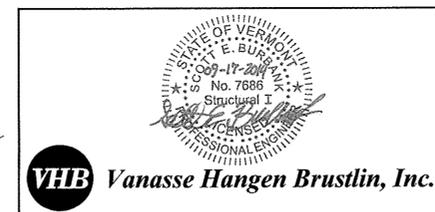
LENGTH OF RAIL WORK: 1126.00 FEET



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

QUALITY ASSURANCE PROGRAM : LEVEL 2	
SURVEYED BY :	L. ORVIS
SURVEYED DATE :	03-28-2012
DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD83 (1992)

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



DIRECTOR OF PROJECT DELIVERY	
APPROVED	<i>[Signature]</i> DATE 9/18/2014
PROJECT MANAGER :	JENNIFER M.V. FITCH, P.E.
PROJECT NAME :	CASTLETON
PROJECT NUMBER :	BRF 015-2 (10)
SHEET 1 OF 81 SHEETS	

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FINAL HYDRAULIC REPORT

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B-71	STANDARD FOR RESIDENTIAL AND COMMERCIAL DRIVES	07-08-2005
C-10	CURBING	02-11-2008
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	01-03-2000
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIUM)	01-03-2000
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	08-08-1995
E-136B	STATE ROUTE MARKER SIGN DETAILS	08-08-1995
E-154	WARNING SIGN DETAILS	05-01-2004
E-193	PAVEMENT MARKING DETAILS	08-18-1995
S-360A	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	04-23-2012
S-360B	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	04-23-2012
S-363	THREE BEAM TO STANDARD STEEL BEAM TRANSITION SECTION	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-30	CONSTRUCTION SIGN DETAILS	08-06-2012
T-35	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS	08-06-2012
T-42	BRIDGE NUMBER PLAQUE	04-09-2014
T-45	SQUARE TUBE SIGN POST AND ANCHOR	01-02-2013

STRUCTURES DETAILS

SD-501.00	CONCRETE DETAILS AND NOTES	6/4/2010
SD-502.00	CONCRETE DETAILS AND NOTES	6/4/2010
SD-516.10	BRIDGE JOINT ASPHALTIC PLUG	6/4/2010

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_p : 0.0 INCH
3. DESIGN SPAN	L : 67.30 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ : 2.15 INCH
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f_y : 270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f'_c : 10.0 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci} : 7.5 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_y : 60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y : ---
14. SOIL UNIT WEIGHT	γ : 0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q_n : ---
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ : ---
17. NOMINAL BEARING RESISTANCE OF ROCK	q_n : ---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ : ---
19. NOMINAL AXIAL PILE RESISTANCE	q_p : ---
20. PILE YIELD STRENGTH ASTM A572	f_y : 50 KSI
21. PILE SIZE	HP 12x63
22. EST. PILE LENGTH	L_p : 75 FT
23. PILE RESISTANCE FACTOR	ϕ : 0.65
24. LATERAL PILE DEFLECTION	Δ : ---
25. BASIC WIND SPEED	V_{3s} : ---
26. MINIMUM GROUND SNOW LOAD	p_g : ---
27. SEISMIC DATA	PGA : --- S_s : --- S_1 : ---

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	2.03	1.1					
POSTING							
OPERATING	2.85	1.46	2.77	1.85	2.39	2.14	2.35
COMMENTS:	The exterior beam controls the rating.						



AS BUILT "REBAR" DETAIL		
LEVEL I	LEVEL II	LEVEL III
TYPE: _____	TYPE: _____	TYPE: _____
GRADE: _____	GRADE: _____	GRADE: _____

* - SEE PROJECT NOTES

PILE DRIVING AND TESTING REQUIREMENTS

1. NOMINAL PILE DRIVING CAPACITY	F_{ndr} : *
2. PILE TEST RESISTANCE FACTOR	ϕ : 0.65
3. MAXIMUM PILE TIP ELEVATION	*
4. A MINIMUM OF 3 DYNAMIC TESTS SHALL BE PERFORMED DURING INSTALLATION. NO LESS THAN 1 TEST SHOULD BE PERFORMED AT EACH ABUTMENT. THE REMAINING SHOULD BE CALIBRATED BY WAVE EQUATION ANALYSIS.	

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	
						20 year ESAL for flexible pavement from 2015 to 2035 : 2064000
2015	4000	450	52	5.8	250	40 year ESAL for flexible pavement from 2015 to 2055 : 4920000
2035	4200	470	52	8.9	410	Design Speed : 30 mph

PROJECT NAME: **CASTLETON**

PROJECT NUMBER: **BRF 015-2(10)**

FILE NAME: **z12b138pi.dgn**

PROJECT LEADER: **S.E. BURBANK**

DESIGNED BY: **E.A. FIALA**

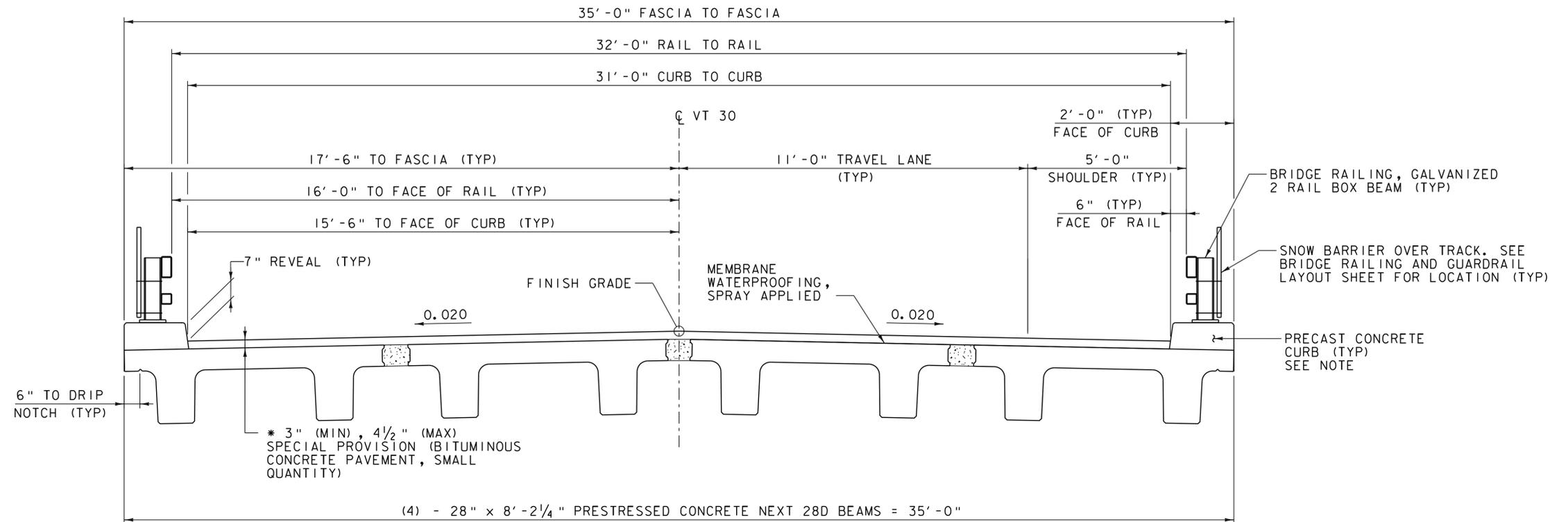
PRELIMINARY INFORMATION SHEET

PLOT DATE: 10/23/2014

DRAWN BY: **E.A. FIALA**

CHECKED BY: **S.E. BURBANK**

SHEET **2** OF **82**



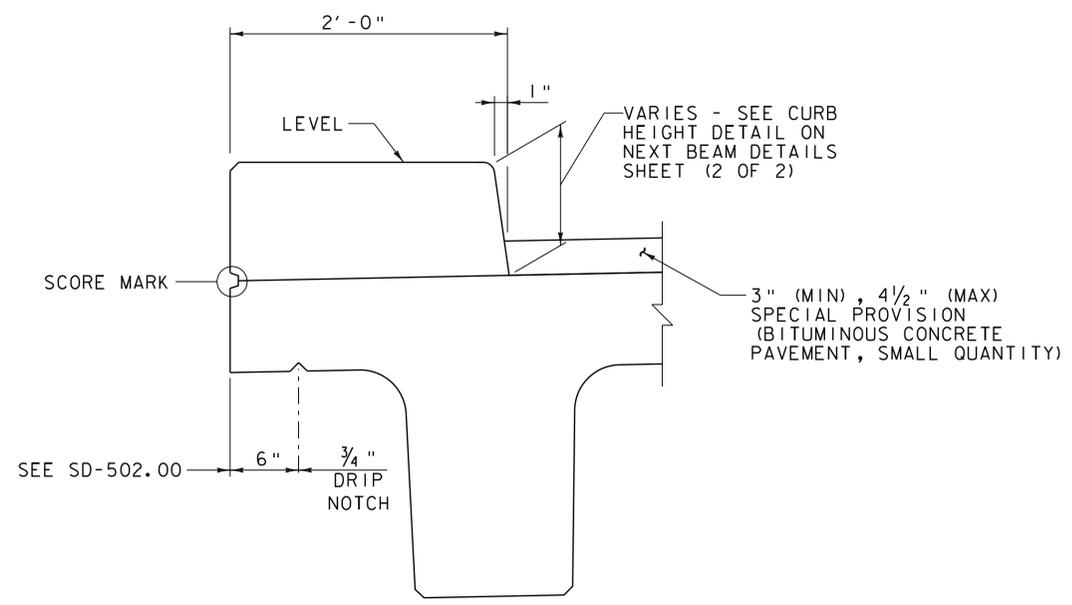
6" TO DRIP NOTCH (TYP)

* 3" (MIN), 4 1/2" (MAX) SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)

(4) - 28" x 8'-2 1/4" PRESTRESSED CONCRETE NEXT 28D BEAMS = 35'-0"

* (2) - 1 1/2" LIFTS OF TYPE IVS OR
(3) - 1 1/2" LIFTS OF TYPE IVS

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



FASCIA DETAIL
SCALE 1/2" = 1'-0"

NOTE: COSTS FOR PRECAST CURB ON BRIDGE TO BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 900.640, "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS) (NEXT 28D)".

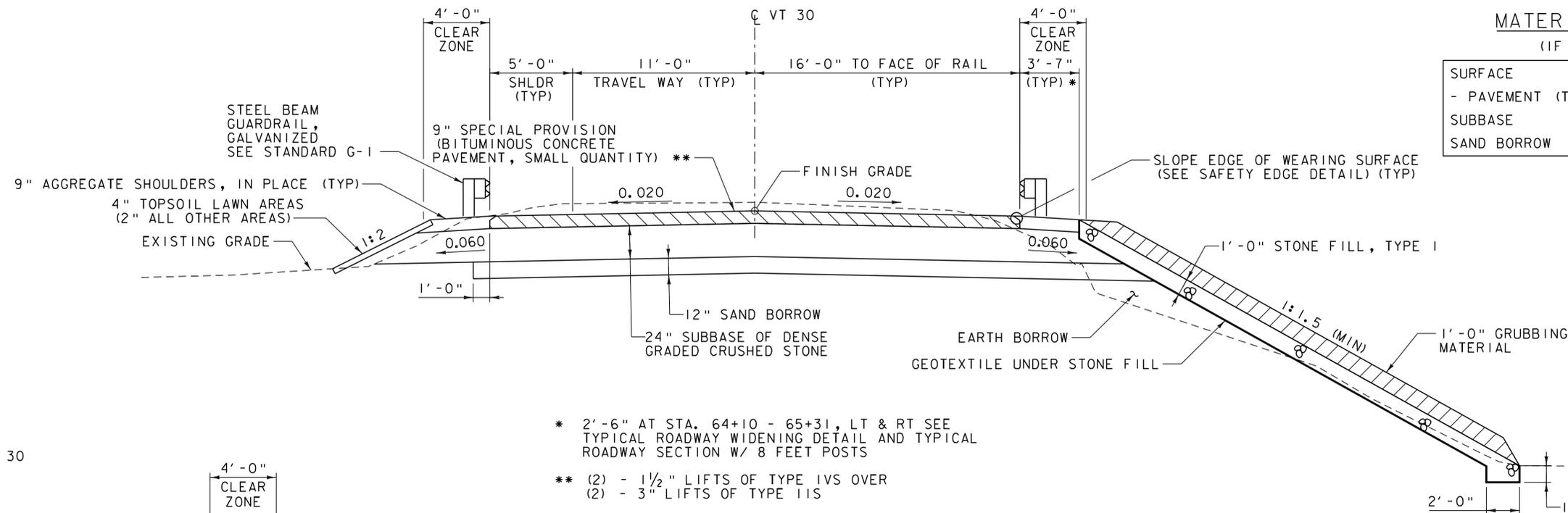
PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138typ.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
TYPICAL BRIDGE SECTION	SHEET 3 OF 82



MATERIAL TOLERANCES

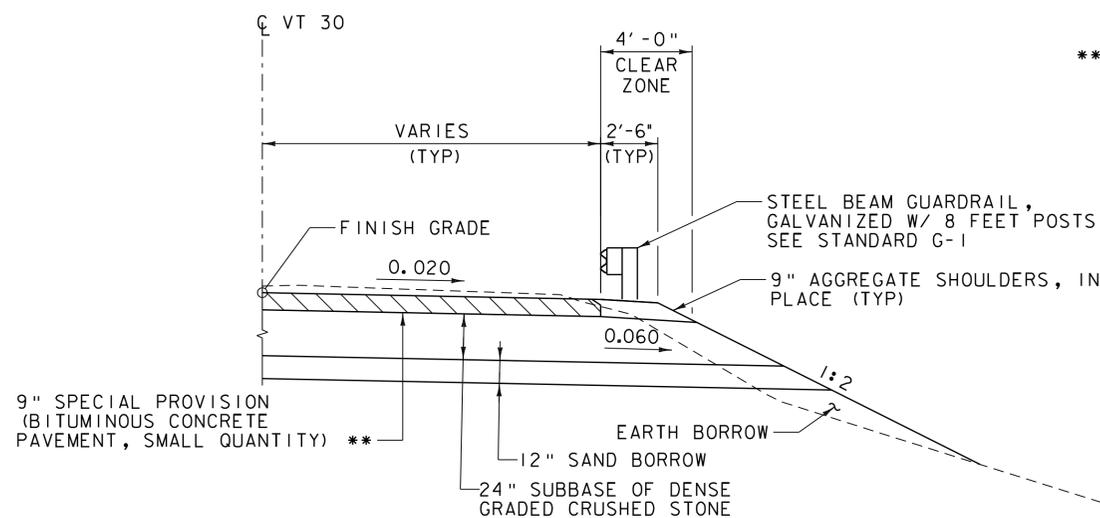
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

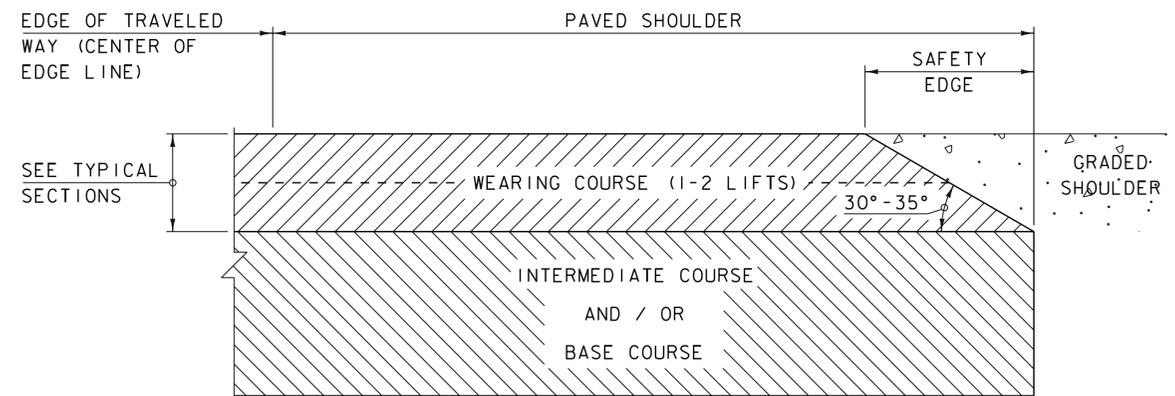


* 2'-6" AT STA. 64+10 - 65+31, LT & RT SEE TYPICAL ROADWAY WIDENING DETAIL AND TYPICAL ROADWAY SECTION W/ 8 FEET POSTS
 ** (2) - 1 1/2" LIFTS OF TYPE IVS OVER
 (2) - 3" LIFTS OF TYPE IIS

TYPICAL ROADWAY SECTION
 SCALE 1/4" = 1'-0"

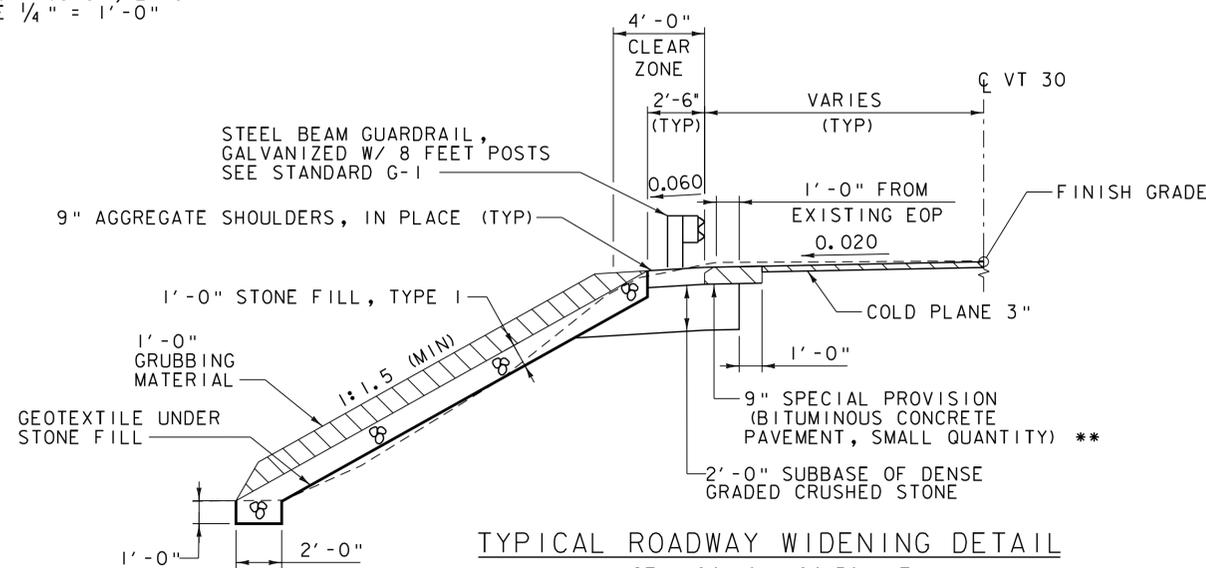


TYPICAL ROADWAY SECTION W/ 8 FEET POSTS
 STA. 64+30 - 65+31, LT & RT
 SCALE 1/4" = 1'-0"



SAFETY EDGE DETAIL
 NOT TO SCALE

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

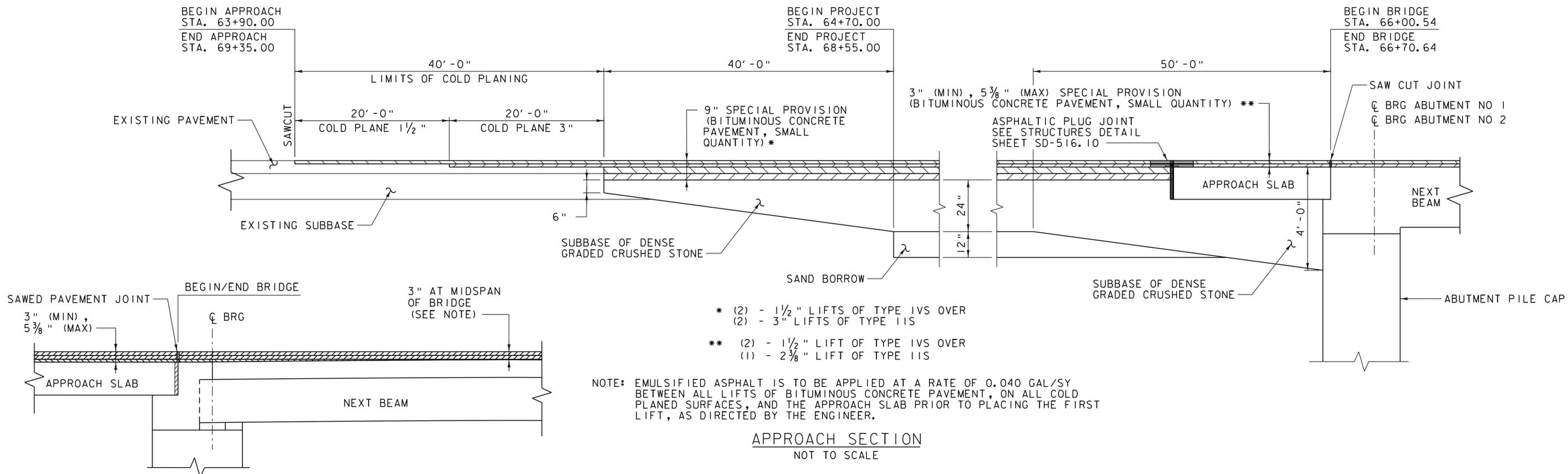


TYPICAL ROADWAY WIDENING DETAIL
 STA. 64+10 - 64+30, LT
 SCALE 1/4" = 1'-0"

PROJECT NAME: CASTLETON
 PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12bl381yp.dgn
 PROJECT LEADER: S.E. BURBANK
 DESIGNED BY: E.A. FIALA
 TYPICAL SECTIONS (10 OF 3)

PLOT DATE: 9/19/2014
 DRAWN BY: E.A. FIALA
 CHECKED BY: S.E. BURBANK
 SHEET 4 OF 82



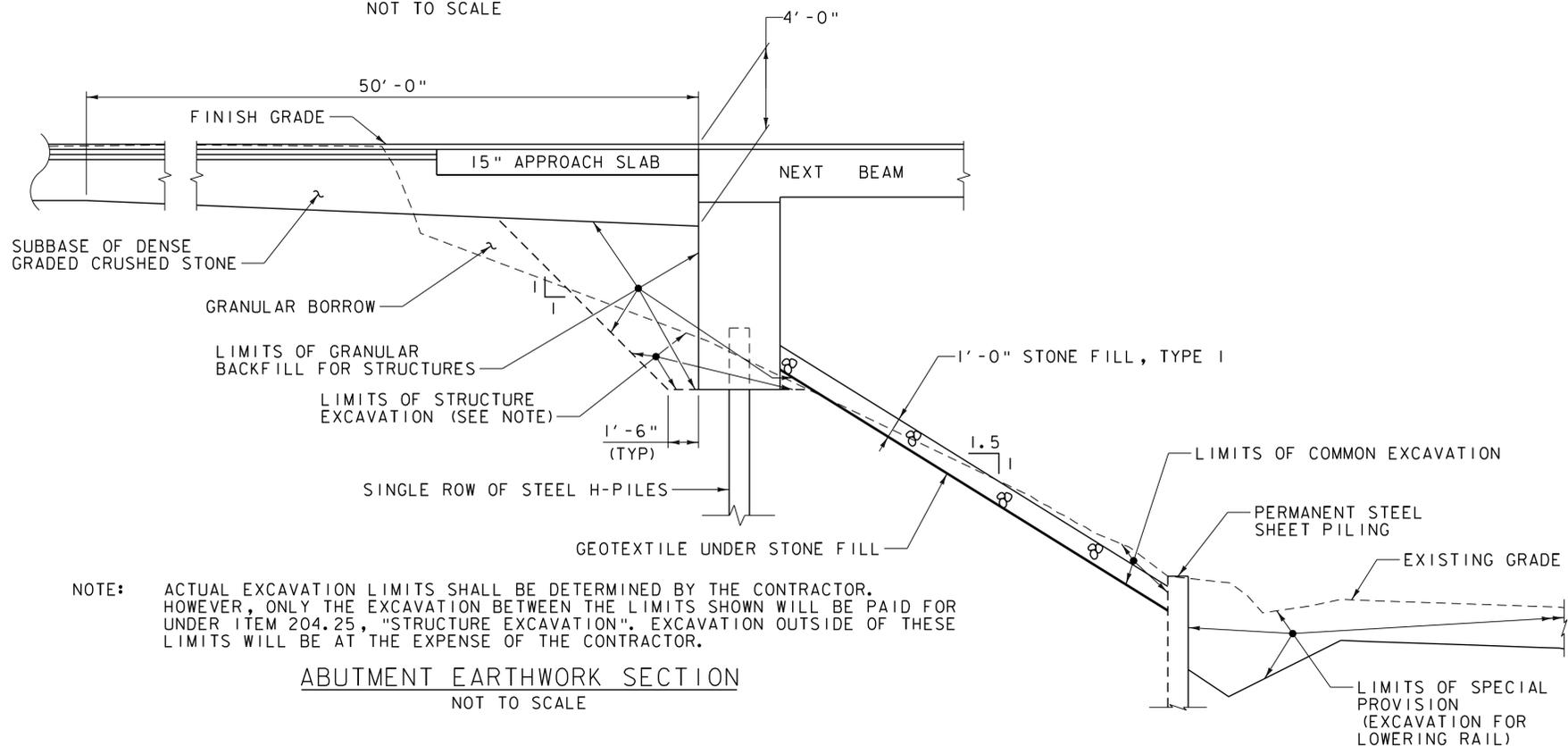
- * (2) - 1 1/2" LIFTS OF TYPE IVS OVER
(2) - 3" LIFTS OF TYPE IIS
- ** (2) - 1 1/2" LIFT OF TYPE IVS OVER
(1) - 2 3/8" LIFT OF TYPE IIS

NOTE: EMULSIFIED ASPHALT IS TO BE APPLIED AT A RATE OF 0.040 GAL/SY BETWEEN ALL LIFTS OF BITUMINOUS CONCRETE PAVEMENT, ON ALL COLD PLANED SURFACES, AND THE APPROACH SLAB PRIOR TO PLACING THE FIRST LIFT, AS DIRECTED BY THE ENGINEER.

APPROACH SECTION
NOT TO SCALE

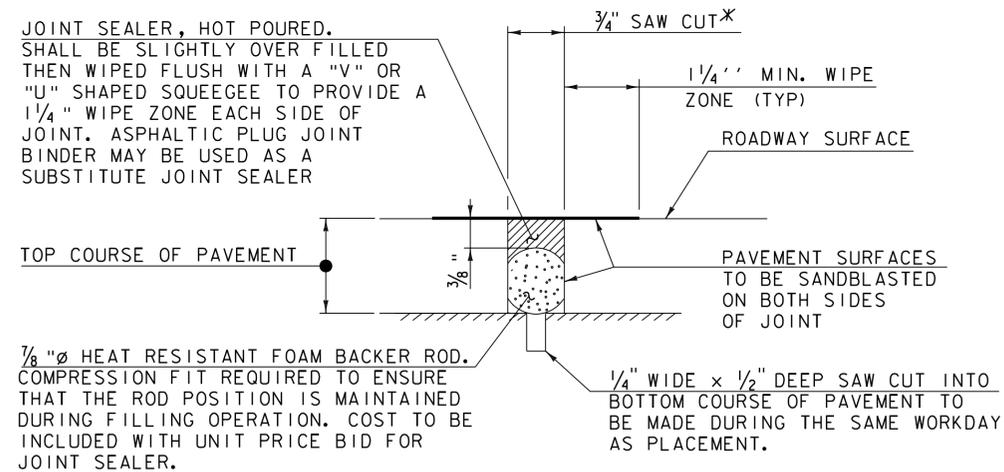
NOTE: PAVEMENT THICKNESS VARIES ON BRIDGE TO ACCOUNT FOR THE DIFFERENCE BETWEEN FINISH GRADE AND DESIGNED CAMBER OF THE BEAMS. SEE NEXT BEAM DETAILS (2 OF 2) FOR PAVEMENT THICKNESS AND PRECAST CONCRETE CURB HEIGHT DETAIL.

PAVEMENT TRANSITION DETAIL
NOT TO SCALE



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". EXCAVATION OUTSIDE OF THESE LIMITS WILL BE AT THE EXPENSE OF THE CONTRACTOR.

ABUTMENT EARTHWORK SECTION
NOT TO SCALE



SAWED PAVEMENT JOINT DETAIL
(NOT TO SCALE)

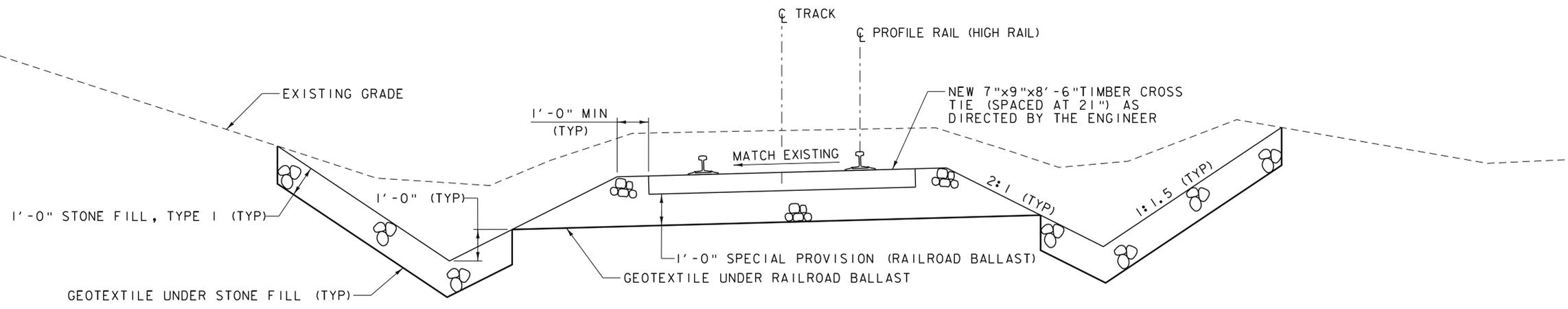
* JOINT IS TO BE LOCATED ACCURATELY BY STRING LINING, OR OTHER MEANS, PRIOR TO PAVING, SO THAT THE SAW CUTS WILL BE MADE DIRECTLY OVER THE END OF CONCRETE DECK. JOINT SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. JOINT SHALL BE CLEANED PRIOR TO APPLYING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

PROJECT NAME: CASTLETON
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12bl381yp.dgn
PROJECT LEADER: S.E. BURBANK
DESIGNED BY: E.A.FIALA
TYPICAL SECTIONS (2 OF 3)

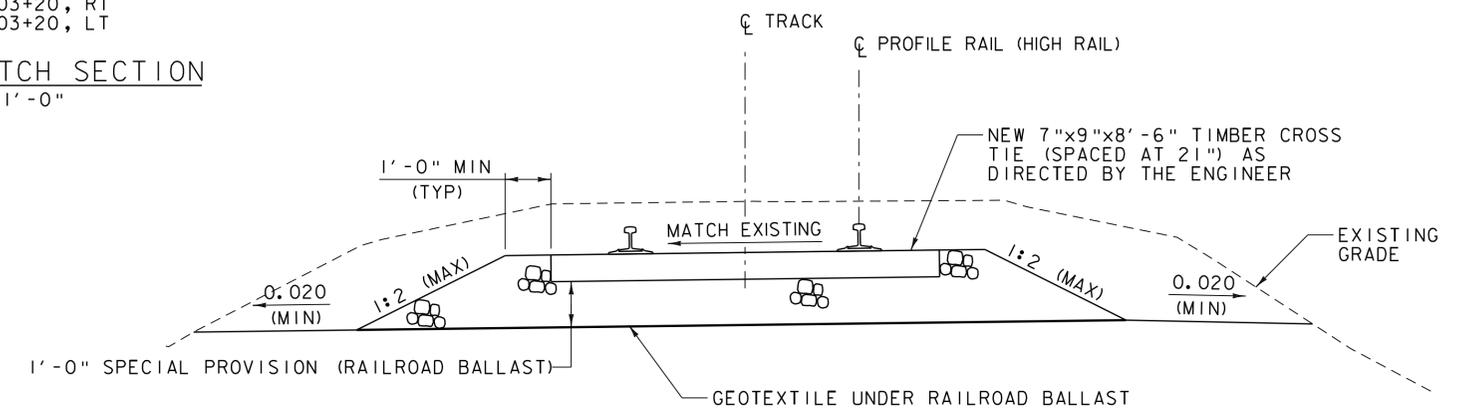
PLOT DATE: 10/16/2014
DRAWN BY: E.A.FIALA
CHECKED BY: S.E. BURBANK
SHEET 5 OF 82





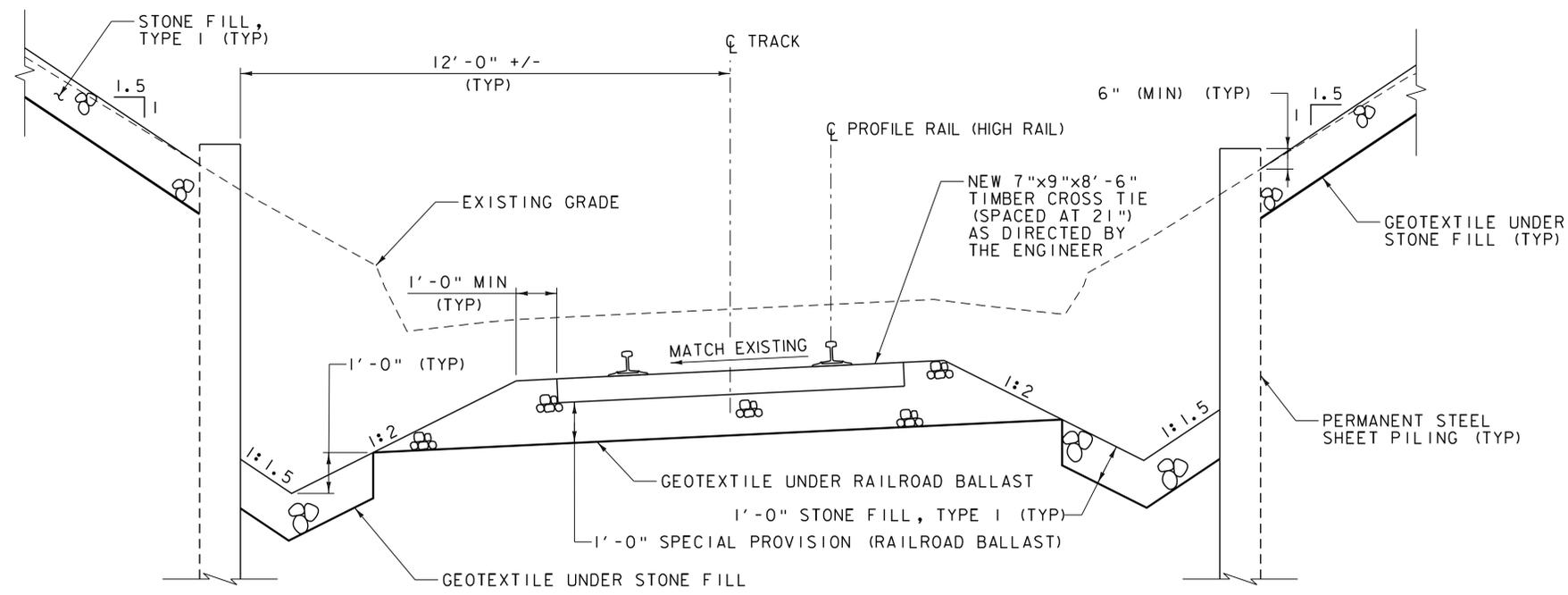
STA. 598+58 - 599+79, LT
 STA. 598+58 - 600+14, RT
 STA. 600+99 - 603+20, RT
 STA. 601+20 - 603+20, LT

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



STA. 594+94 - 598+58, LT & RT
 STA. 603+20 - 606+20, LT & RT

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



STA. 599+79 - 601+20, LT
 STA. 600+14 - 600+99, RT

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

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138typ.dgn	PLOT DATE: 10/23/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
TYPICAL SECTIONS (3 OF 3)	SHEET 6 OF 82



PROJECT NOTES

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, 6TH EDITION, AND ITS LATEST REVISIONS.
2. 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.
3. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.
4. NO ADJUSTMENTS TO THE BITUMINOUS WEARING SURFACE ON THE BRIDGE SHALL BE MADE TO ACCOUNT FOR THE DIFFERENCE BETWEEN THE ACTUAL BEAM CAMBER AND THE THEORETICAL ROADWAY PROFILE. THE WEARING SURFACE SHALL BE SHIMMED TRANSVERSELY AS NECESSARY TO ACCOUNT FOR POTENTIAL DIFFERENTIAL CAMBER OF THE ADJACENT BEAMS.
5. REMOVAL OF EXISTING BRIDGE PAVEMENT SHALL BE PAID AS ITEM 529.10, "REMOVAL OF BRIDGE PAVEMENT".
6. ITEM 529.15, "REMOVAL OF STRUCTURE", SHALL INCLUDE THE COMPLETE REMOVAL AND DISPOSAL OF THE EXISTING BRIDGE SUBSTRUCTURE AND SUPERSTRUCTURE, INCLUDING ALL BRIDGE RAIL, PIERS, BEARINGS AND ANCHOR BOLTS, WHERE THE REMOVAL IS OUTSIDE OF THE AREAS COVERED BY THE CONTRACT EXCAVATION ITEMS.
7. NO SUBSTITUTION FOR PRECAST CONCRETE WILL BE PERMITTED.
8. USE OF TEMPORARY BRIDGE WILL NOT BE PERMITTED.
9. THE CONTRACTOR SHALL CONTACT THE TOWN TO VERIFY THE LOCATION OF THE SEWER PIPE WITHIN THE PROJECT LIMITS. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE PIPE AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PUMPING SEWAGE FROM THE MANHOLE ON THE NORTH SIDE OF THE BRIDGE TO THE SEWER TREATMENT PLANT IN THE EVENT THE SEWER LINE IS DAMAGED DURING CONSTRUCTION. DAMAGE TO THE SEWER LINE AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE ENGINEER AND TOWN OF CASTLETON AT THE CONTRACTOR'S EXPENSE.
10. 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 ERECTING THE SUPERSTRUCTURE.
11. 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.
12. SEE THE SPECIAL PROVISIONS FOR REQUIREMENTS OF SPECIAL PROVISION ITEM 900.650, "SPECIAL PROVISION (LOCAL ROADWAY MAINTENANCE)" FOR MAINTENANCE ON MAIN, COLLEGE, AND YORK STREETS.

TRAFFIC CONTROL

13. THE CONTRACTOR SHALL IMPLEMENT THE ROAD CLOSURE, TRAFFIC CONTROL, AND DETOUR AS SHOWN ON THE PLANS.
14. THE CONTRACTOR SHALL NOTIFY THE TOWN A MINIMUM OF SIX (6) WEEKS PRIOR TO CLOSING VT ROUTE 30. THE CONTRACTOR SHALL NOTIFY THE VT STATE POLICE DISPATCHER AT 802-468-5355, EXT 212; AND NEW YORK STATE WASHINGTON COUNTY DISPATCHER'S OFFICE AT 518-747-3325 A MINIMUM OF TWO (2) WEEKS PRIOR TO CLOSING VT ROUTE 30, IMMEDIATELY ONCE VT ROUTE 30 IS CLOSED AND AGAIN WHEN IT IS OPENED.
15. FULL ACCESS TO ALL DRIVES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED AT ALL TIMES. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".
16. UNLESS COVERED UNDER INDIVIDUAL PAY ITEMS OR NOTED OTHERWISE, ALL COSTS FOR WORK SHOWN ON THE TRAFFIC CONTROL SHEETS AND FOR TEMPORARY TRAFFIC CONTROL DEVICES WILL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE FOR ITEM 641.10, "TRAFFIC CONTROL". THIS INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING ITEMS:
 - TEMPORARY TRAFFIC BARRIERS
 - RETROREFLECTIVE DRUMS & CONES
 - SIGNS
 - SIGN POSTS
 - INSTALLATION OF SIGNS AND SIGN POSTS

TEMPORARY TRAFFIC BARRIER SHALL BE FURNISHED IN ACCORDANCE WITH SECTION 621.
17. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK (SHSM) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).

EARTHWORK

18. THE CONTRACTOR'S ATTENTION IS DIRECTED TO SUBSECTION 301.06 REGARDING THE COMPACTION OF THE SUBBASE MATERIAL.
19. THE "STONE FILL, TYPE 1" UNDER THE BRIDGE AS SHOWN IN THE PLANS SHALL BE PLACED BEFORE THE NEW BEAMS ARE SET.

CONCRETE AND REINFORCING STEEL

20. ITEM 514.10, "WATER REPELLENT, SILANE", SHALL BE APPLIED TO ALL EXPOSED CONCRETE ON THE BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE, WITH THE EXCEPTION OF THE BOTTOM OF THE PRECAST NEXT BEAMS BETWEEN THE DRIP NOTCHES.
21. ALL CONCRETE PLACED INTEGRALLY WITH THE SUPERSTRUCTURE SHALL BE ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)". ALL PRECAST SUBSTRUCTURE AND APPROACH SLAB CONCRETE SHALL MEET THE REQUIREMENTS OF THE APPROPRIATE PRECAST ITEM.
22. THE CONNECTION BETWEEN APPROACH SLAB UNITS SHALL MEET THE REQUIREMENTS OF ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)".
23. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI).
24. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE "VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL" AVAILABLE ON THE AGENCY WEBSITE. A MINIMUM OF TWO TEST SECTIONS ARE REQUIRED FOR EACH SIZE, BRAND, AND GRADE OR TYPE OF REINFORCING. SEE THE MANUAL FOR ACCEPTABLE DIMENSIONS OF TEST SECTIONS. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE APPROPRIATE PRECAST ITEM.
25. ALL REINFORCEMENT SHALL MEET THE REQUIREMENTS OF LEVEL II REINFORCING STEEL IN ACCORDANCE WITH SECTION 507. PAYMENT FOR STEEL REINFORCEMENT IN NEXT D BEAMS, INCLUDING REINFORCING FOR THE CLOSURE POUR AND PRECAST CONCRETE BRIDGE CURBS WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 900.640, "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS)(NEXT 28D)". PAYMENT FOR STEEL REINFORCEMENT IN PRECAST SUBSTRUCTURE UNITS AND APPROACH SLABS, INCLUDING REINFORCING FOR THE CLOSURE POUR, WILL BE INCLUDED IN THE APPROPRIATE PRECAST CONTRACT ITEM.
26. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

ALONG BACK FACES OF WALLS AGAINST EARTH:	2 INCH
ALONG TOP SURFACE OF DECK SLAB:	2 1/2 INCH
ALONG BOTTOM SURFACE OF DECK SLAB:	1 3/4 INCH
ELSEWHERE UNLESS OTHERWISE NOTED:	3 INCH

PRECAST ABUTMENTS AND POST-TENSIONING

27. IF VERTICAL CONSTRUCTION JOINTS ARE REQUIRED BY THE CONTRACTOR FOR SHIPMENT OF THE ABUTMENTS, THEN THE SECTIONS SHALL BE KEYS AND MATCH CAST. A JOINT DETAIL SHALL BE SHOWN ON THE FABRICATION DRAWINGS. NO LESS THAN TWO PILES SHALL SUPPORT EACH PRECAST ABUTMENT SECTION.
28. EPOXY BONDING COMPOUND SHALL BE APPLIED TO ALL VERTICAL MATCH CAST CONSTRUCTION JOINTS. SEE AGENCY WEBSITE FOR LIST OF APPROVED EPOXY BONDING COMPOUNDS. PAYMENT FOR EPOXY WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.
29. POST-TENSIONING AND ASSOCIATED ITEMS ARE ONLY REQUIRED IF THE PILE CAP 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 ITEM 540.10, "PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 1)" OR "PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 2)" AS APPROPRIATE. 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.
30. GALVANIZE ANCHOR ASSEMBLIES AFTER FABRICATION ACCORDING TO AASHTO M232M/M232.
31. 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 2 STRANDS PER CONDUIT.
 - E. JACKING FORCE PER STRAND = 32 KIPS.
32. THE CONCRETE FOR THE ABUTMENT NO. 1 AND ABUTMENT NO. 2 PILE CAVITIES SHALL MEET THE REQUIREMENTS OF ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)".
33. THE CORRUGATED STEEL PIPE SHALL MEET THE REQUIREMENTS OF SUBSECTION 711.01. ALL COSTS ASSOCIATED WITH FURNISHING AND PLACING THE CORRUGATED STEEL PIPE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.

34. 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).
 - D. APPLY EPOXY BONDING COMPOUND TO MATCH CAST FACES OF VERTICAL CONSTRUCTION JOINT.
 - E. USE A CALIBRATED JACK TO TENSION 3 KIPS TO REMOVE SAG IN STRANDS.
 - F. CHECK ALIGNMENT OF PILE CAP 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)(FPQ)".
 - I. PLACE PRECAST WINGWALLS AND GROUT SPLICE CONNECTORS.
 - J. BACKFILL MAY BE COMPLETED AFTER SPLICE CONNECTOR GROUT HAS REACHED 85% OF 5,000 PSI. BACKFILL SHALL NOT EXCEED BRIDGE SEAT ELEVATIONS UNTIL NEXT BEAMS ARE SET AND THE CLOSURE POUR IS CAST.
35. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED FOR APPROVAL BY THE PROJECT MANAGER.

NEXT D BEAMS

36. 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>
37. DESIGN VALUES
 - A. CONCRETE COMPRESSIVE STRENGTH: $f'_c = 10,000$ PSI.
 - B. CONCRETE COMPRESSIVE STRENGTH AT RELEASE: $f'_{ci} = 7,500$ psi.
 - C. PRESTRESSING STRANDS: 0.6 INCH DIAMETER, 270 KSI, LOW-RELAXATION 7-WIRE STRANDS
 - D. ASSUMED MODULUS OF ELASTICITY = 28,5000 KSI
 - E. PRESTRESSING STRANDS SHALL EACH BE PULLED TO HAVE A NET TENSION FORCE OF 44.0 KIPS AFTER ACCOUNTING FOR CHUCK SLIPPAGE.
 - F. SERVICE LOADS

MEMBER MOMENT	803 K-FT
NON-COMPOSITE SUPERIMPOSED DEAD LOAD MOMENT	177 K-FT
COMPOSITE SUPERIMPOSED DEAD LOAD MOMENT	275 K-FT
LIVE LOAD AND IMPACT MOMENT	1,297 K-FT
DEAD LOAD REACTION	75 KIPS
LIVE LOAD AND IMPACT REACTION	92 KIPS
TOTAL REACTION	167 KIPS
FINAL CAMBER AT ERECTION	3 1/4 INCHES
38. FORMING FOR ENDS OF FLANGES ALONG LONGITUDINAL CLOSURE POURS MAY BE TREATED WITH CONCRETE SURFACE RETARDER OR SIMILAR, TO PROVIDE A ROUGHENED SURFACE; AND SHALL BE POWER WASHED WITH WATER PRIOR TO ERECTION OF THE BEAMS.
39. FILL THE FLANGE TO FLANGE CONNECTION WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)".
40. 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 BE ATTACHED TO ANY PREFABRICATED SUPERSTRUCTURE ELEMENT BY DRILLING OR SIMILAR MEANS.
41. THE FABRICATOR MAY ALTER THE DESIGN AS DETAILED IN THESE PLANS TO ACCOMMODATE THEIR SPECIFIC OPERATION. THIS ALTERATION SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF VERMONT TO MEET THE ABOVE CRITERIA AND SHALL BE APPROVED BY THE PROJECT MANAGER.
42. NEXT BEAMS SHALL BE PAID FOR AS ITEM 900.640, "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS)(NEXT 28 D)".
43. THE PRECAST CONCRETE CURBS ON NEXT D BEAMS SHALL BE POURED PRIOR TO THE ERECTION OF NEXT BEAMS.
44. PROPOSED SEQUENCE OF CONSTRUCTION
 - A. LAYOUT 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 FASCIA BEAM TO FIT SNUG AGAINST 1/2" CORK ON INTERIOR OF CHEEKWALL.
 - F. CONSTRUCT FORMS FOR THE FLANGE AND CURTAIN WALL CONNECTION POURS.
 - G. GROUT CONNECTIONS BETWEEN BEAM FLANGES AND CURE.
 - H. COMPLETE BEAM-END CLOSURE POUR TO BOTTOM OF DECK ALLOWING FOR APPROACH SLAB BRACKET.
 - I. COMPLETE PLACEMENT OF BACKFILL AND PREPARE GRADE FOR APPROACH SLABS.
 - J. PLACE APPROACH SLABS.
 - K. GROUT REBAR DOWELS IN APPROACH SLAB.
 - L. COMPLETE LONGITUDINAL CLOSURE POURS OF APPROACH SLAB.
 - M. COMPLETE BEAM-END CLOSURE POUR TO TOP OF DECK AND APPROACH SLABS.
45. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED FOR APPROVAL BY THE PROJECT MANAGER.

REV.	DESCRIPTION	DATE	PROJECT NAME:	CASTLETON
1	CONTRACTOR-FABRICATED PRECAST	12/01/2014	PROJECT NUMBER:	BRF 015-2(10)
			FILE NAME:	z12b138pn.dgn
			PROJECT LEADER:	S.E. BURBANK
			DESIGNED BY:	E.A. FIALA
			PROJECT NOTES (1 OF 2)	PLOT DATE: 12/1/2014
				DRAWN BY: M.C. SCOTT
				CHECKED BY: S.E. BURBANK
				SHEET 7 OF 82

H-PILES

- 46. TO PREVENT DAMAGE TO THE PILES, PILE SHOES ARE REQUIRED AND SHALL CONFORM TO SUBSECTION 505.04 (f).
- 47. ABUTMENT PILES
 - A. THE PILES SHALL BE HP 12x63.
 - B. THE PILES SHALL BE DRIVEN TO NOMINAL PILE DRIVING RESISTANCE (RNDR) OF 288 KIPS, PROVIDED A MINIMUM PENETRATION OF 25 FEET BELOW THE BOTTOM OF PILE CAP HAS BEEN ACHIEVED.
- 48. A MINIMUM OF THREE DYNAMIC TESTS ARE REQUIRED DURING PILES INSTALLATION. NO LESS THAN ONE DYNAMIC PILE TEST SHALL BE CONDUCTED AT EACH ABUTMENT. PAYMENT WILL BE MADE UNDER ITEM 505.45, "DYNAMIC PILE LOADING TEST".
- 49. THE TOPS OF THE PILES AFTER DRIVING SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN 3 INCHES. THE PILE ORIENTATION SHALL NOT VARY BY MORE THAN 5 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.
- 50. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED AS SHOWN ON THE BORING LOGS. THE ACTUAL IN PLACE LENGTHS MAY VARY.

ABUTMENT CLOSURE/END DIAPHRAGM

- 51. THE ABUTMENT CLOSURE POUR SHALL BE MADE WITH HPC RAPID SET CONCRETE. PAYMENT WILL BE MADE UNDER ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)."
- 52. AFTER THE CONCRETE HAS BEEN PLACED AND THE FINISHING OPERATIONS CONCLUDED, IT SHALL NOT BE WALKED ON OR DISTURBED IN ANY MANNER, INCLUDING THE REMOVAL OF FORMS FOR 12 HOURS.
- 53. THE CONCRETE SHALL OBTAIN A STRENGTH OF 4000 PSI PRIOR TO ANY VEHICULAR LOADING.

APPROACH SLABS

- 54. PRECAST CONCRETE COMPRESSIVE STRENGTH: $f'c = 4,000$ PSI.
- 55. SLAB EDGES IN CONTACT WITH HPC RAPID SET CONCRETE SHALL BE TREATED WITH CONCRETE SURFACE RETARDER, OR SIMILAR, TO PROVIDE A ROUGHENED SURFACE; AND SHALL BE POWER WASHED WITH WATER PRIOR TO INSTALLATION.
- 56. FILL CLOSURE POURS WITH HPC RAPID SET CONCRETE IN ACCORDANCE WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)".
- 57. THE APPROACH SLABS ARE TO BE SET AT THE GIVEN ELEVATIONS IN ORDER TO ACCOMMODATE THE ROADWAY GEOMETRY. THE PAVEMENT OVER THE APPROACH SLAB WILL VARY TO ACCOUNT FOR THE DIFFERENCE BETWEEN THE TOP OF SLAB ELEVATIONS AND THE FINISH GRADE. A MINIMUM OF 3" PAVEMENT SHALL BE MAINTAINED OVER THE APPROACH SLABS.

SHEET PILING

- 58. ALL STEEL SHEET PILING SHALL HAVE A MINIMUM SECTION MODULUS OF 31.0 IN³/FT AND SHALL CONFORM TO AASHTO M202, GRADE 50.
- 59. THE STEEL SHEET PILING SHALL HAVE A MINIMUM EMBEDMENT DEPTH OF 20 FEET AND A TOTAL LENGTH OF 30.5 FEET.
- 60. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER INFORMATION ON THE TYPE OF EQUIPMENT PROPOSED TO BE USED, METHODS OF OPERATION, SEQUENCE OF SHEET PILE DRIVING, AND DETAILS OF ALL PILE DRIVING EQUIPMENT AND ACCESSORIES.
- 61. THE PERMANENT STEEL SHEET PILING SHALL BE INSTALLED BEFORE THE NEW PRECAST ABUTMENTS ARE SET ONTO THE STEEL H-PILES.

RAILROAD

- 62. ALL CONTRACTOR DESIGN, CONSTRUCTION AND FABRICATION SHALL CONFORM TO THE "AMERICAN RAILWAY ENGINEERING & MAINTENANCE OF WAY ASSOCIATION (AREMA) MANUAL FOR RAILWAY ENGINEERING, 2009" AND THE "STATE OF VERMONT AGENCY OF TRANSPORTATION (VTRANS) STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2011" AND ITS LATEST REVISIONS.
- 63. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT CONTINUOUS COORDINATION WITH THE OPERATOR, CLARENDON AND PITTSFORD RAILROAD, CO (CLP), WILL BE REQUIRED THROUGHOUT CONSTRUCTION. CLP WILL PROVIDE THE CONTRACTOR WITH FLAGGERS FOR PROTECTION OF RAILROAD TRAFFIC WHILE WORK IS BEING PERFORMED WITHIN THE RAILROAD RIGHT OF WAY (R.O.W.). THE CONTRACTOR SHALL NOT ENTER THE R.O.W. AT ANY TIME WITHOUT CLP AUTHORIZATION. ALL COSTS FOR RAILROAD FLAGGER PROTECTION AND RAILROAD COORDINATION SHALL BE INCLUDED UNDER ITEM 900.650, "SPECIAL PROVISION (MAINTENANCE OF RAILROAD TRAFFIC)(N.A.B.I.)". SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- 64. ALL WORK WITHIN THE RAILROAD R.O.W. SHALL BE PERFORMED DURING THE TIME SEGMENTS IN THE CONTRACT DOCUMENTS. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

- 65. THE RAILROAD R.O.W. WIDTH IS DELINEATED ON THE LAYOUT SHEET. CONSTRUCTION AND ACCESS SHALL BE WITHIN THE R.O.W. UNLESS OTHERWISE APPROVED BY THE PROPERTY OWNER(S) AND VTRANS ENVIRONMENTAL PERMITTING. THE CONTRACTOR SHALL COORDINATE DIRECTLY WITH THE PROPERTY OWNER(S) TO OBTAIN WRITTEN APPROVAL OF LAND USE OUTSIDE THE R.O.W. THE CONTRACTOR SHALL SUBMIT COPIES OF WRITTEN PROPERTY AGREEMENTS TO THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR ANY ADDITIONAL PERMITTING REQUIRED FOR OUTSIDE THE R.O.W. LAND USE AT NO ADDITIONAL COST TO THE STATE.
- 66. THE CONTRACTOR IS ALLOWED A SINGLE TEMPORARY RAILROAD CROSSING. THE CONTRACTOR SHALL COORDINATE THIS LOCATION WITH THE CLP. THE TEMPORARY CROSSING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CLP'S REQUIREMENTS. RUBBER TIRES SHALL BE PLACED ON THE RAILS WHENEVER TRACKED VEHICLES UTILIZE THE TEMPORARY CROSSING.
- 67. WITH THE EXCEPTION OF THE FIBER OPTIC CABLE AND THE TOWN SEWER LINE, THERE IS NO RECORD OF ANY UNDERGROUND UTILITIES THAT WOULD BE IMPACTED BY LOWERING OF THE TRACK AS DETAILED IN THE PROJECT PLANS. FIBER OPTIC UTILITY WILL BE LOWERED BY OTHERS PRIOR TO THE START OF CONSTRUCTION. THE SEWER LINE SHALL BE PROTECTED AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS ADVISED THAT EXPLORATORY EXCAVATION TO LOCATE EXISTING UNDERGROUND FACILITIES MAY BE NECESSARY TO PROTECT THESE FACILITIES FROM DAMAGE. SEE THE UTILITY SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS. THE CONTRACTOR SHALL CONTACT DIG-SAFE, CLP, FIRST LIGHT, AND THE TOWN OF CASTLETON TO DETERMINE THE PRESENCE AND LOCATION OF ANY UTILITIES WHETHER IN SERVICE OR OUT OF SERVICE, PRIOR TO ANY CONSTRUCTION AT THE SITE. THE UTILITY COMPANY SHALL BE RESPONSIBLE FOR LOWERING THE EXISTING FIBER OPTIC CABLE.
- 68. DAMAGE AS A RESULT OF THE WORK TO EXISTING COMPONENTS TO REMAIN, INCLUDING THE SEWER LINE IN THE TOWN OF CASTLETON, SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AS DIRECTED AND APPROVED BY THE ENGINEER AT NO ADDITIONAL EXPENSE TO THE BRIDGE OWNER (VTRANS), THE RAILROAD OPERATOR (CLP), OR THE SEWER OPERATOR (TOWN OF CASTLETON).
- 69. THE CONTRACTOR SHALL FIELD VERIFY EXISTING TOP OF RAIL ELEVATIONS AT THE HIGH RAIL AND SHALL VERIFY DESIRED FINAL TOP OF RAIL ELEVATIONS WITH CLP BEFORE STARTING THE WORK. TEMPORARY CHANGES TO TOP OF RAIL ELEVATIONS DURING THE WORK MUST BE APPROVED BY THE ENGINEER AND CLP BEFORE ADVANCING THE WORK.
- 70. THE CONDITION OF THE CROSS TIES WITHIN THE LIMITS OF THE RAIL LOWERING SHALL BE REVIEWED BY THE CONTRACTOR, ENGINEER, AND THE CLP FOR REMOVAL AND REPLACEMENT. FOR ESTIMATING PURPOSES IT WAS ASSUMED THAT 50% OF THE TIES WILL BE REMOVED AND REPLACED. NO TIES SHALL BE REMOVED AND REPLACED WITHOUT THE APPROVAL OF THE ENGINEER. PAYMENT FOR REMOVING, REPLACING AS DIRECTED BY THE ENGINEER, AND RESETTING EXISTING TIMBER CROSS TIES WILL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 900.640 (REMOVE AND RESET RAILROAD TRACKS).
- 71. THE EXISTING RAIL SHALL BE REMOVED AND RESET AS REQUIRED FOR THE LOWERING OF THE TRACKS. EXISTING RAILS AND JOINT BARS SHALL BE REUSED. THE CONTRACTOR SHALL PROVIDE ALL NEW RAIL ANCHORS, TRACK BOLTS, WASHERS, AND NUTS FOR JOINT BARS AND ALL NEW TRACK SPIKES AND TIE PLATES WHERE THE CROSS TIES ARE TO BE REMOVED AND REPLACED. PAYMENT WILL BE MADE UNDER CONTRACT ITEM 900.640, "SPECIAL PROVISION (REMOVE AND RESET RAILROAD TRACKS)".
- 72. NEW TRACK BOLTS FOR THE EXISTING 6-HOLE RAIL JOINT BARS SHALL BE 7/8" DIAMETER x 5 1/2" LONG. NEW TRACK SPIKES FOR THE NEW 4-HOLE TIE PLATES SHALL BE 6" TRACK CUT SPIKES. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL MATERIAL REQUIREMENTS.
- 73. TIE PLATE PADS WILL NOT BE USED UNDER TIE PLATES ON ANY OF THE NEW CROSS TIES.
- 74. NEW BALLAST AND TIMBER CROSS TIES SHALL BE PLACED AS REQUIRED FOR THE LOWERING OF THE TRACKS. THE CONTRACTOR SHALL PROVIDE THE CROSS TIES AND BALLAST. SEE THE SPECIAL PROVISIONS FOR MATERIAL REQUIREMENTS.
- 75. PRIOR TO REMOVING THE EXISTING RAIL, THE CONTRACTOR SHALL SURVEY THE EXISTING RAIL AND SUPERELEVATION OF THE EXISTING RAIL AND ESTABLISH SUFFICIENT SURVEY CONTROL TO ACCURATELY RESET THE RAIL TO THE ELEVATIONS SHOWN ON THE RAIL PROFILE, TO PROVIDE 21'-2 1/4" VERTICAL CLEARANCE BETWEEN THE LOWERED RAIL AND THE NEW BRIDGE LOW CHORD, AND TO RESET THE EXISTING SUPERELEVATION. PAYMENT FOR THIS WORK WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 900.640, "SPECIAL PROVISION REMOVE AND RESET RAILROAD TRACKS)".

MISCELLANEOUS

- 76. ITEM 520.10, "SHEET MEMBRANE WATERPROOFING, SPRAY APPLIED" SHALL BE APPLIED TO THE BRIDGE DECK AS PER THE MANUFACTURER'S INSTRUCTIONS AND EXTEND ONTO THE APPROACH SLAB 2'-0" BEYOND THE BEGIN BRIDGE/END OF BRIDGE.

REV.	DESCRIPTION	DATE
△	PZ SHAPE REMOVED FROM NOTE & CONTRACTOR-FABRICATED PRECAST	12/01/2014
PROJECT NAME: CASTLETON		
PROJECT NUMBER: BRF 015-2(10)		
FILE NAME: z12bl38pn.dgn		PLOT DATE: 12/1/2014
PROJECT LEADER: S.E. BURBANK		DRAWN BY: M.C. SCOTT
DESIGNED BY: E.A. FIALA		CHECKED BY: S.E. BURBANK
PROJECT NOTES (2 OF 2)		SHEET 8 OF 82



QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	EROSION CONTROL	RAILROAD	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
						1					1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10				
						1750					1750		CY	COMMON EXCAVATION	203.15		1750	CY	COMMON EXCAVATION (1750 * 1.0)
						350					350		CY	SAND BORROW	203.31		38	CY	SPECIAL PROV. (EXCAV. FOR LOWERING RAIL) (2300 * 0.75)
									190		190		CY	GRANULAR BORROW	203.32		9	CY	STRUCTURE EXCAVATION (12 * 0.75)
						1					1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22		1797	CY	SUBTOTAL
									12		12		CY	STRUCTURE EXCAVATION	204.25		1689	CY	ROUNDING
									150		150		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30		3485	CY	TOTAL
						230					230		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10		3485	CY	FILL AVAILABLE
						1120					1120		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35		350	CY	FILL REQUIRED
						75					75		CY	AGGREGATE SHOULDERS, IN PLACE	402.10				
						16					16		CWT	EMULSIFIED ASPHALT	404.65				
						1					1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				
									1		1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10				
									900		900		LF	STEEL PILING, HP 12 X 63	505.155				
									7300		7300		SF	PERMANENT STEEL SHEET PILING (MIN. SECTION MODULUS = 31.0 IN3/FT)	505.35				
									3		3		EACH	DYNAMIC PILE LOADING TEST	505.45				
									10		10		GAL	WATER REPELLENT, SILANE	514.10				
									66		66		LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10				
									265		265		SY	MEMBRANE WATERPROOFING, SPRAY APPLIED	520.10				
									68		68		LF	JOINT SEALER, HOT POURED	524.11				
									141		141		LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33				
									335		335		SY	REMOVAL OF BRIDGE PAVEMENT	529.10				
									1		1		EACH	REMOVAL OF STRUCTURE (3,085 SF - EST.)	529.15				
									16		16		EACH	BEARING DEVICE ASSEMBLY, STEEL REINFORCED ELASTOMERIC PAD	531.17				
														BEGIN OPTION AA					
									1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 1)	540.10				
									1		1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)(ABUTMENT NO. 1)	900.645				
														END OPTION AA					
														BEGIN OPTION BB					
									1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT NO. 2)	540.10				
									1		1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)(ABUTMENT NO. 2)	900.645				
														END OPTION BB					
														BEGIN OPTION CC					
									1		1		LS	PRECAST CONCRETE STRUCTURE (APPROACH SLAB NO. 1)	540.10				
									1		1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)(APPROACH SLAB NO. 1)	900.645				
														END OPTION CC					

EARTHWORKS SUMMARY

1750	CY	COMMON EXCAVATION (1750 * 1.0)
38	CY	SPECIAL PROV. (EXCAV. FOR LOWERING RAIL) (2300 * 0.75)
9	CY	STRUCTURE EXCAVATION (12 * 0.75)
1797	CY	SUBTOTAL
1689	CY	ROUNDING
3485	CY	TOTAL
3485	CY	FILL AVAILABLE
350	CY	FILL REQUIRED
3,135	CY	TOTAL WASTE

REV.	DESCRIPTION	DATE
△	CONTRACTOR-FABRICATED PRECAST	12/01/2014

PROJECT NAME:	CASTLETON
PROJECT NUMBER:	BRF 015-2(10)
FILE NAME:	z12b138qs.dgn
PROJECT LEADER:	S.E. BURBANK
DESIGNED BY:	E.A. FIALA
CHECKED BY:	E.A. FIALA
QUANTITY SHEET #1	
PLOT DATE:	11/17/2014
DRAWN BY:	M.C. SCOTT
CHECKED BY:	E.A. FIALA
SHEET	9 OF 82



QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	EROSION CONTROL	RAILROAD	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
									1		1		LS	BEGIN OPTION DD					
									1		1		LS	PRECAST CONCRETE STRUCTURE (APPROACH SLAB NO. 2)	540.10				
									1		1		LS	SPECIAL PROVISION (CONTRACTOR-FABRICATED PRECAST CONCRETE STRUCTURE)(APPROACH SLAB NO. 2)	900.645				
														END OPTION DD					
						1					1		EACH	CHANGING ELEVATION OF SEWER MANHOLES	604.42				
						1					1		MGAL	DUST CONTROL WITH WATER	609.10				
							465	400			865		CY	STONE FILL, TYPE I	613.10				
						155					155		LF	PRECAST REINFORCED CONCRETE CURB, TYPE B	616.26				
									104		104		LF	SNOW BARRIER	620.75				
						330					330		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20				
						175					175		LF	STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS	621.205				
						4					4		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
						4					4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	621.72				
						57					57		LF	REMOVE AND RESET GUARDRAIL	621.75				
						480					480		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
								2			2		MFBM	INSULATION BOARD	622.10				
						480					480		HR	FLAGGERS	630.15				
										1	1		LS	FIELD OFFICE, ENGINEERS	631.10				
										1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
										1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
										3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
						1					1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
						1					1		LS	TRAFFIC CONTROL	641.10				
						2					2		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15				
						1090					1090		LF	4 INCH WHITE LINE	646.20				
						1090					1090		LF	4 INCH YELLOW LINE	646.21				
							1025	1150			2175		SY	GEOTEXTILE UNDER STONE FILL	649.31				
							1390				1390		SY	GEOTEXTILE FOR SILT FENCE	649.51				
							6.75				6.75		LB	SEED	651.15				
							50				50		LB	FERTILIZER	651.18				
							0.25				0.25		TON	AGRICULTURAL LIMESTONE	651.20				
							0.25				0.25		TON	HAY MULCH	651.25				
							70				70		CY	TOPSOIL	651.35				
							1075				1075		SY	GRUBBING MATERIAL	651.40				
							1				1		LS	EPSC PLAN	652.10				
							160				160		HR	MONITORING EPSC PLAN	652.20				
							1				1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30				
							515				515		SY	TEMPORARY EROSION MATTING	653.20				
							30				30		CY	VEHICLE TRACKING PAD	653.35				
							2900				2900		LF	PROJECT DEMARCATION FENCE	653.55				

REV.	DESCRIPTION	DATE	PROJECT NAME: CASTLETON
△	CONTRACTOR-FABRICATED PRECAST	12/01/2014	PROJECT NUMBER: BRF 015-2(10)
		FILE NAME: z12b138qs.dgn	PLOT DATE: 11/17/2014
		PROJECT LEADER: S.E. BURBANK	DRAWN BY: M.C. SCOTT
		DESIGNED BY: E.A. FIALA	CHECKED BY: E.A. FIALA
		QUANTITY SHEET #2	SHEET 10 OF 82

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	EROSION CONTROL	RAILROAD	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
						18					18		SF	TRAFFIC SIGNS, TYPE A	675.20				BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY
						60					60		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341		389 TON		TYPE IVS - WEARING COURSE
						1					1		LU	PRICE ADJUSTMENT, FUEL (N.A.B.I.)	690.50		264 TON		TYPE IIS - BASE COURSE
								2300			2300		CY	SPECIAL PROVISION (EXCAVATION FOR LOWERING RAIL)	900.608		7 TON		ROUNDING
									27		27		CY	SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)	900.608		660 TON		TOTAL
								560			560		CY	SPECIAL PROVISION (RAILROAD BALLAST)	900.608				
									281		281		LF	SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS)(NEXT 28D)	900.640				
								1131			1131		LF	SPECIAL PROVISION (REMOVE AND RESET RAILROAD TRACKS)	900.640				
						1					1		LS	SPECIAL PROVISION (CPM SCHEDULE)	900.645				
								1			1		LU	SPECIAL PROVISION (INCENTIVE/DISINCENTIVE)(RAILROAD)(N.A.B.I.)	900.650				
						1					1		LU	SPECIAL PROVISION (INCENTIVE/DISINCENTIVE)(ROADWAY)(N.A.B.I.)	900.650				
						1					1		LU	SPECIAL PROVISION (LOCAL ROADWAY MAINTENANCE)(N.A.B.I.)	900.650				
								1			1		LU	SPECIAL PROVISION (MAINTENANCE OF RAILROAD TRAFFIC) (N.A.B.I.)	900.650				
						1					1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY)(N.A.B.I.)	900.650				
						1					1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650				
						45					45		SY	SPECIAL PROVISION (HAND-PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES)	900.675				
						660					660		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

REV.	DESCRIPTION	DATE
△	CONTRACTOR-FABRICATED PRECAST	12/01/2014

PROJECT NAME:	CASTLETON
PROJECT NUMBER:	BRF 015-2(10)



FILE NAME: z12b138qs.dgn
 PROJECT LEADER: S.E. BURBANK
 DESIGNED BY: E.A. FIALA
 QUANTITY SHEET #3

PLOT DATE: 11/17/2014
 DRAWN BY: M.C. SCOTT
 CHECKED BY: E.A. FIALA
 SHEET 11 OF 82

GENERAL INFORMATION

SYMBOLY LEGEND NOTE

THE SYMBOLY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLY. THE SYMBOLY 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. SYMBOLY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

COMMON TOPOGRAPHIC POINT SYMBOLS

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

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

PROPOSED GEOMETRY CODES

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

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
I&M	INSTALL & MAINTAIN EASEMENT
LAND	LANDSCAPE EASEMENT
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 CALCULATED ROW POINT [DISTANCE]
[DISTANCE]	DISTANCE CARRIED ON NEXT SHEET

UTILITY SYMBOLY

UNDERGROUND UTILITIES

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

ABOVE GROUND UTILITIES (AERIAL)

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

PROJECT CONSTRUCTION SYMBOLY

PROJECT DESIGN & LAYOUT SYMBOLY

— — — 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 — PDF —	PROJECT DEMARCATION FENCE
BF * * * BF * * *	BARRIER FENCE
XXXXXXXXXXXXXXXXXXXX	TREE PROTECTION ZONE (TPZ)
//////	STRIPING LINE REMOVAL
~~~~~	SHEET PILES

**CONVENTIONAL BOUNDARY SYMBOLY**

**BOUNDARY LINES**

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

**EPSC LAYOUT PLAN SYMBOLY**

**EPSC MEASURES**

QNNNOONNOONNO	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 — 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 SYMBOLY**

**EXISTING FEATURES**

— — — — —	ROAD EDGE PAVEMENT
— — — — —	ROAD EDGE GRAVEL
— — — — —	DRIVEWAY EDGE
— — — — —	DITCH
— — — — —	FOUNDATION
x — x — x — x —	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: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138LegendSheet.dgn PLOT DATE: 9/19/2014  
PROJECT LEADER: S.E. BURBANK DRAWN BY: E.A. FIALA  
DESIGNED BY: VTRANS CHECKED BY: S.E. BURBANK  
CONVENTIONAL SYMBOLY LEGEND SHEET 12 OF 82

GPS CONTROL POINTS

HVCTRL #1

4 AND 30 AZ MK  
 NORTH = 409162.672  
 EAST = 1455266.440  
 ELEV. = 511.154

GENERAL LOCATION, CASTLETON, VT.  
 TO REACH FROM THE U.S.ROUTE 4 EASTBOUND BRIDGE OVER VT ROUTE 30 GO EAST ALONG U.S.ROUTE 4 EASTBOUND FOR 0.4 MI (0.6 KM) TO A U-TURN LEFT. TURN LEFT INTO U-TURN AND PARK VEHICLE. WALK EAST ALONG THE TOP OF THE SOUTH EDGE OF A ROCK CUT IN THE MEDIAN FOR ABOUT 110 M (360.9 FT) TO THE SITE OF THE MARK. THE MARK IS SET FLUSH WITH THE GROUND SURFACE IN THE TOP OF A MASSIVE ROCK OUTCROP. IT IS 16.3 M (53.5 FT) (SLOPE) NORTH OF AND ABOUT 8 M (26.2 FT) HIGHER THAN THE NORTH EDGE OF PAVEMENT OF THE U.S.ROUTE 4 EASTBOUND LANE, 107.5 M (352.7 FT) EAST OF THE EAST EDGE OF PAVEMENT OF THE U-TURN, 15.0 M (49.2 FT) (SLOPE) NORTHWEST OF THE CENTER OF A DROP INLET, 4.0 M (13.1 FT) NORTHWEST OF THE SOUTHEAST EDGE OF THE ROCK CUT, 3.2 M (10.5 FT) EAST OF A TRIPLE TRUNK 3 CM CEDAR, AND 0.6 M (2.0 FT) SOUTHWEST OF A FIBERGLASS WITNESS POST.

HVCTRL #2

4 AND 30  
 NORTH = 407313.559  
 EAST = 1453250.519  
 ELEV. = 455.642

GENERAL LOCATION, CASTLETON, VT.  
 TO REACH FROM THE U.S.ROUTE 4 EASTBOUND BRIDGE OVER VT ROUTE 30 GO SOUTH ALONG VT ROUTE 30 FOR ABOUT 100 M (328.1 FT) TO THE MARK ON THE LEFT IN A GRASS TRIANGLE FORMED BY THE EAST EDGE OF VT ROUTE 30 AND TWO LEGS OF THE U.S.ROUTE 4 EASTBOUND ENTRANCE RAMP. THE MARK IS SET FLUSH WITH GROUND SURFACE IN THE TOP OF THE NORTHEAST CORNER OF A 1.2 M (3.9 FT) SQUARE CONCRETE BASE FOR A DROP INLET. IT IS 3.6 M (11.8 FT) EAST OF AND ABOUT 0.1 M (0.3 FT) LOWER THAN THE EAST EDGE OF PAVEMENT OF VT ROUTE 30, 14.4 M (47.2 FT) NORTH OF THE SOUTH POINT OF THE GRASS TRIANGLE, 7.6 M (24.9 FT) SOUTHWEST OF THE NORTHWEST POINT OF THE TRIANGLE, 13.4 M (44.0 FT) SOUTHWEST OF THE NORTHEAST POINT OF THE TRIANGLE, 0.15 M (0.49 FT) SOUTH OF THE NORTH EDGE OF THE CONCRETE BASE, AND 0.15 M (0.49 FT) WEST OF A FIBERGLASS WITNESS POST AND THE EAST EDGE OF THE CONCRETE BASE.

TRAVERSE TIES

HVCTRL #3	
NORTH = 405869.465	
EAST = 1452940.393	
ELEV. = 453.529	
NOT TIED	

HVCTRL #4	
NORTH = 404714.404	
EAST = 1452786.203	
ELEV. = 453.920	

HVCTRL #5	
NORTH = 403386.539	
EAST = 1452523.569	
ELEV. = 414.126	

HVCTRL #6	
NORTH = 402364.299	
EAST = 1452476.207	
ELEV. = 380.380	

HVCTRL #7	
NORTH = 401123.889	
EAST = 1452552.093	
ELEV. = 381.239	

*MAIN TRAVERSE COMPLETED 9/22/1997 BY L. ORVIS P.C. & R. BULLOCK FOR POULTNEY - CASTLETON FO15-2 (3) [84B814]

ALIGNMENT TIES

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

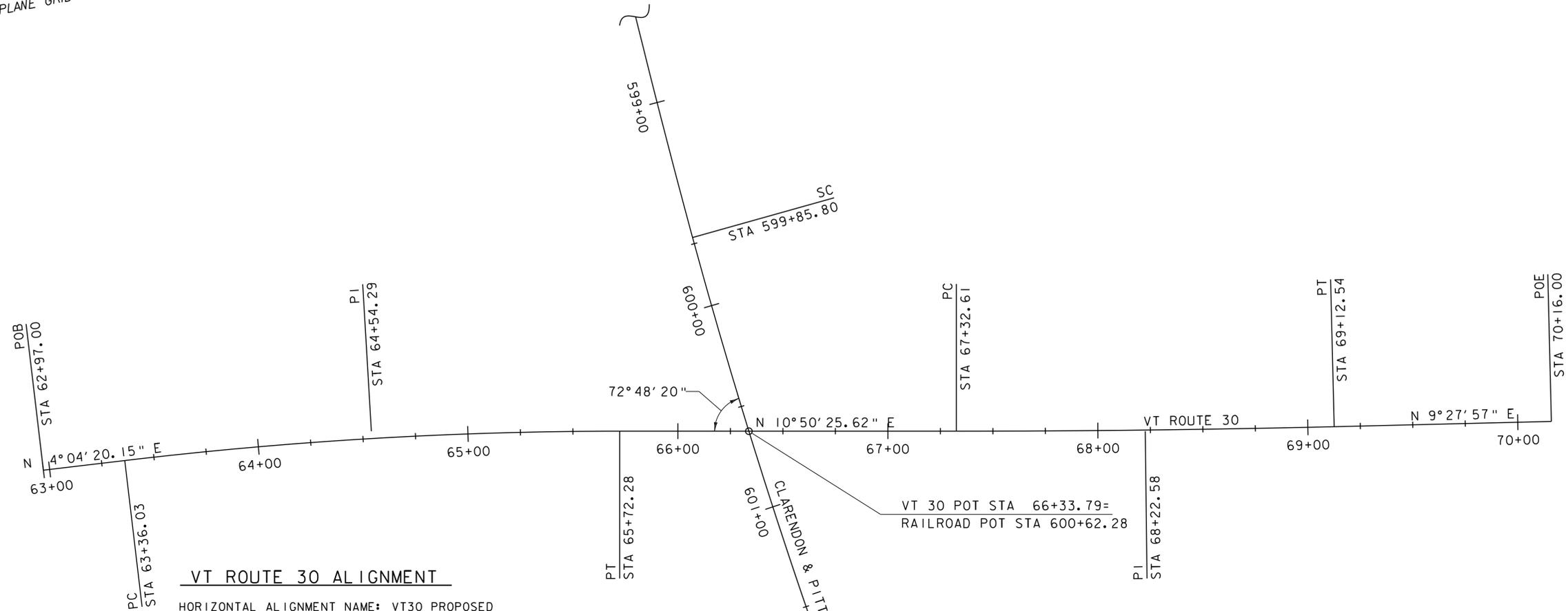
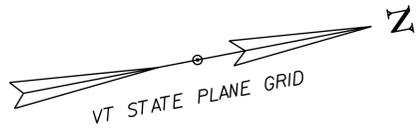
NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83(92)
ADJUSTMENT	COMPASS

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2 (10)	
FILE NAME: z12bl38t1.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: R. BULLOCK
DESIGNED BY: VTRANS	CHECKED BY: S.E. BURBANK
TIE SHEET	SHEET 13 OF 82



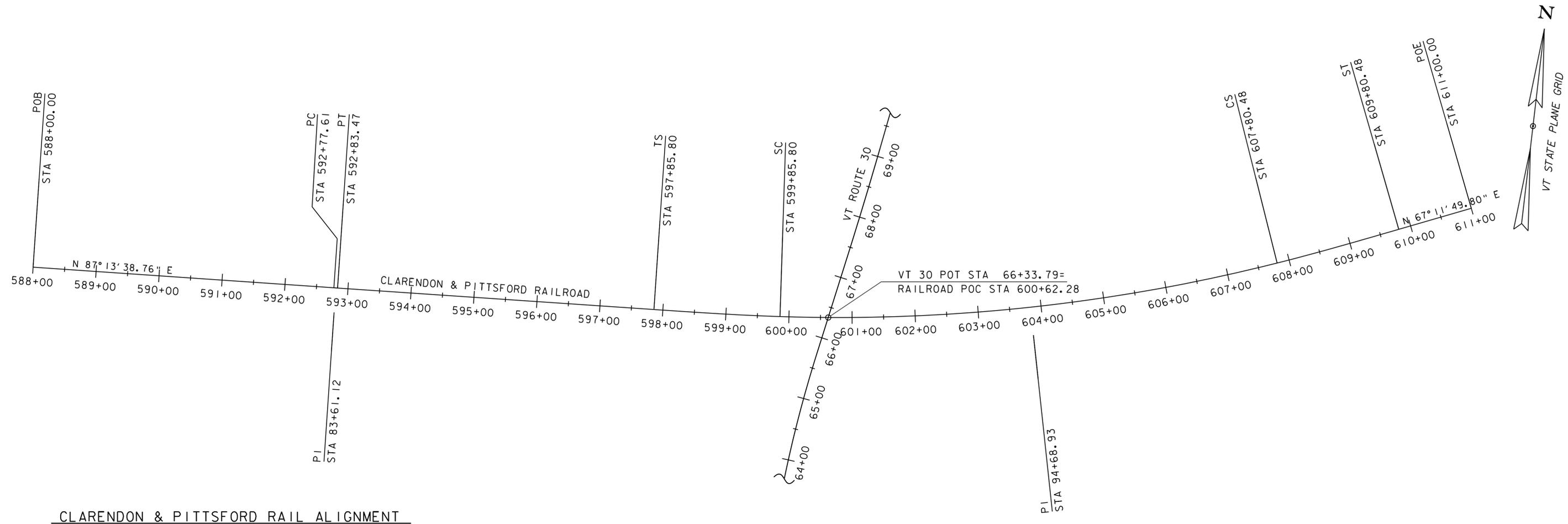


**VT ROUTE 30 ALIGNMENT**

HORIZONTAL ALIGNMENT NAME: VT30 PROPOSED			
ELEMENT:	STATION	NORTHING	EASTING
ELEMENT: LINEAR			
POB	62+97.00	402991.7138	1452481.9272
PC	63+36.03	403030.6415	1452484.6987
TANGENT LENGTH:		39.03	
ELEMENT: CIRCULAR			
PC	63+36.03	403030.6415	1452484.6987
PI	64+54.29	403148.6076	1452493.0972
PT	65+72.28	403264.7618	1452515.3398
RADIUS:		2000.00	
DELTA:		06° 46' 05.47" RIGHT	
DEGREE OF CURVATURE (ARC):		02° 51' 53.24"	
LENGTH:		236.25	
TANGENT:		118.26	
CHORD:		236.12	
MIDDLE ORDINATE:		3.49	
EXTERNAL:		3.49	
ELEMENT: LINEAR			
PT	65+72.28	403264.7618	1452515.3398
PC	67+32.61	403422.2280	1452545.4933
TANGENT LENGTH:		160.33	
ELEMENT: CIRCULAR			
PC	67+32.61	403422.2280	1452545.4933
PI	68+22.58	403510.5944	1452562.4147
PT	69+12.54	403599.3412	145257.2115
RADIUS:		7500.00	
DELTA:		01° 22' 28.57" LEFT	
DEGREE OF CURVATURE (ARC):		00° 45' 50.20"	
LENGTH:		179.94	
TANGENT:		89.97	
CHORD:		179.93	
MIDDLE ORDINATE:		0.54	
EXTERNAL:		0.54	
ELEMENT: LINEAR			
PT	69+12.54	403599.3412	1452577.2115
POE	70+16.00	403701.3895	1452594.2260
TANGENT LENGTH:		103.46	

PROJECT NAME:	CASTLETON
PROJECT NUMBER:	BRF 015-2(10)
FILE NAME:	z12b138align.dgn
PROJECT LEADER:	S.E. BURBANK
DESIGNED BY:	E.A. FIALA
ROADWAY ALIGNMENT LAYOUT SHEET	
PLOT DATE:	9/19/2014
DRAWN BY:	E.A. FIALA
CHECKED BY:	S.E. BURBANK
SHEET	14 OF 82





**CLARENDON & PITTSFORD RAIL ALIGNMENT**

PROJECT NAME: Z12B138  
 DESCRIPTION: VT30 MATCH  
 HORIZONTAL ALIGNMENT NAME: RAIL CL  
 DESCRIPTION: MATCH EXISTING  
 STYLE: ALIGN1

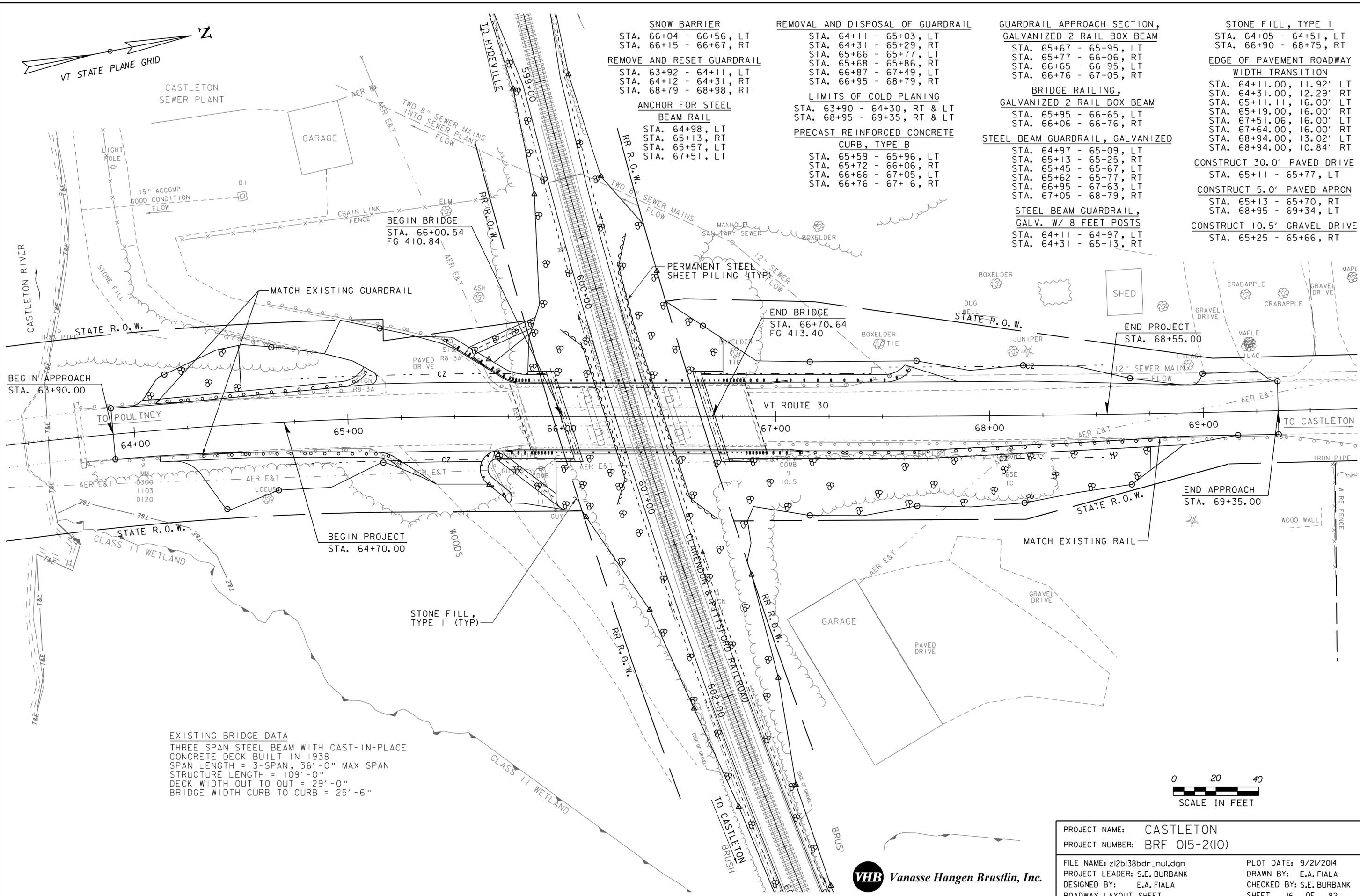
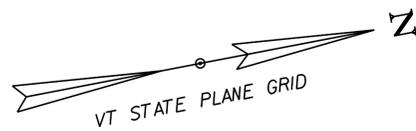
	STATION	NORTHING	EASTING
<b>ELEMENT: LINEAR</b>			
POB	588+00.00	403257.6281	1451266.5376
PC	592+77.61	403280.7309	1451743.5902
TANGENT DIRECTION:	N 87° 13' 38.76" E		
TANGENT LENGTH:	483.19		
<b>ELEMENT: CIRCULAR</b>			
PC	592+77.61	403280.7309	1451743.5902
PI	592+80.54	403280.8725	1451746.5136
CC		413269.0251	1451259.8748
PT	592+83.54	403281.0158	1451749.4370
RADIUS:	10000.00		
DELTA:	0° 02' 00.74" LEFT		
DEGREE OF CURVATURE (ARC):	0° 34' 22.65"		
LENGTH:	5.85		
TANGENT:	2.93		
CHORD:	5.85		
MIDDLE ORDINATE:	0.00		
EXTERNAL:	0.00		
<b>ELEMENT: LINEAR</b>			
PT	592+83.47	403281.0158	1451749.4370
TS	597+85.80	403305.6084	1452251.1725
TANGENT DIRECTION:	N 87° 11' 38.02" E		
TANGENT LENGTH:	502.34		

	STATION	NORTHING	EASTING
<b>ELEMENT: CLOTHOID</b>			
TS	597+85.80	403305.6084	1452251.1725
SPI	599+19.15	403312.1363	1452384.3545
SC	599+85.80	403317.7346	1452450.7935
ENTRANCE RADIUS:	0.00		
EXIT RADIUS:	2850.00		
LENGTH:	200.00		
ANGLE:	2° 00' 37.36" LEFT		
CONSTANT:	754.98		
LONG TANGENT:	133.34		
SHORT TANGENT:	66.67		
LONG CHORD:	199.99		
XS:	199.98		
YS:	2.34		
P:	0.58		
K:	100.00		
<b>ELEMENT: CIRCULAR</b>			
SC	599+85.80	403317.7346	1452450.7935
PI	603+85.74	403351.3147	1452849.3132
CC		406157.6705	1452211.4946
CS	607+80.48	403493.2841	1453223.1986
RADIUS:	2850.00		
DELTA:	15° 58' 33.49" LEFT		
DEGREE OF CURVATURE (ARC):	2° 00' 37.36"		
LENGTH:	794.67		
TANGENT:	399.93		
CHORD:	792.10		
MIDDLE ORDINATE:	27.65		
EXTERNAL:	27.92		

	STATION	NORTHING	EASTING
<b>ELEMENT: CLOTHOID</b>			
CS	607+80.48	403493.2841	1453223.1986
SPI	608+47.15	403516.9524	1453285.5307
ST	609+80.48	403568.6306	1453408.4512
ENTRANCE RADIUS:	2850.00		
EXIT RADIUS:	0.00		
LENGTH:	200.00		
ANGLE:	2° 00' 37.36" LEFT		
CONSTANT:	754.98		
LONG TANGENT:	133.34		
SHORT TANGENT:	66.67		
LONG CHORD:	199.99		
XS:	199.98		
YS:	2.34		
P:	0.58		
K:	100.00		
<b>ELEMENT: LINEAR</b>			
ST	609+80.48	403568.6306	1453408.4512
POE	611+00.00	403612.7901	1453513.4879
TANGENT DIRECTION:	N 67° 11' 49.80" E		
TANGENT LENGTH:	119.52		

PROJECT NAME:	CASTLETON	PLOT DATE:	9/19/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	C.J. HAKY
FILE NAME:	z12b138align_rail.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	SHEET	15 OF 82
DESIGNED BY:	E.A. FIALA		
RAIL ALIGNMENT LAYOUT SHEET			





**SNOW BARRIER**  
 STA. 66+04 - 66+56, LT  
 STA. 66+15 - 66+67, RT

**REMOVE AND RESET GUARDRAIL**  
 STA. 63+92 - 64+11, LT  
 STA. 64+12 - 64+31, RT  
 STA. 68+79 - 68+98, RT

**REMOVAL AND DISPOSAL OF GUARDRAIL**  
 STA. 64+11 - 65+03, LT  
 STA. 64+31 - 65+29, RT  
 STA. 65+66 - 65+77, LT  
 STA. 65+68 - 65+86, RT  
 STA. 66+87 - 67+49, LT  
 STA. 66+95 - 68+79, RT

**LIMITS OF COLD PLANING**  
 STA. 63+90 - 64+30, RT & LT  
 STA. 68+95 - 69+35, RT & LT

**GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM**  
 STA. 65+67 - 65+95, LT  
 STA. 65+77 - 66+06, RT  
 STA. 66+65 - 66+95, LT  
 STA. 66+76 - 67+05, RT

**STONE FILL, TYPE I**  
 STA. 64+05 - 64+51, LT  
 STA. 66+90 - 68+75, RT

**EDGE OF PAVEMENT ROADWAY WIDTH TRANSITION**  
 STA. 64+11.00, 11.92' LT  
 STA. 64+31.00, 12.29' RT  
 STA. 65+11.11, 16.00' LT  
 STA. 65+19.00, 16.00' RT  
 STA. 67+51.06, 16.00' LT  
 STA. 67+64.00, 16.00' RT  
 STA. 68+94.00, 13.02' LT  
 STA. 68+94.00, 10.84' RT

**ANCHOR FOR STEEL BEAM RAIL**  
 STA. 64+98, LT  
 STA. 65+13, RT  
 STA. 65+57, LT  
 STA. 67+51, LT

**PRECAST REINFORCED CONCRETE CURB, TYPE B**  
 STA. 65+59 - 65+96, LT  
 STA. 65+72 - 66+06, RT  
 STA. 66+66 - 67+05, LT  
 STA. 66+76 - 67+16, RT

**BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM**  
 STA. 65+95 - 66+65, LT  
 STA. 66+06 - 66+76, RT

**STEEL BEAM GUARDRAIL, GALVANIZED**  
 STA. 64+97 - 65+09, LT  
 STA. 65+13 - 65+25, RT  
 STA. 65+45 - 65+67, LT  
 STA. 65+62 - 65+77, RT  
 STA. 66+95 - 67+63, LT  
 STA. 67+05 - 68+79, RT

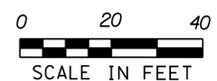
**STEEL BEAM GUARDRAIL, GALV. W/ 8 FEET POSTS**  
 STA. 64+11 - 64+97, LT  
 STA. 64+31 - 65+13, RT

**CONSTRUCT 30.0' PAVED DRIVE**  
 STA. 65+11 - 65+77, LT

**CONSTRUCT 5.0' PAVED APRON**  
 STA. 65+13 - 65+70, RT  
 STA. 68+95 - 69+34, LT

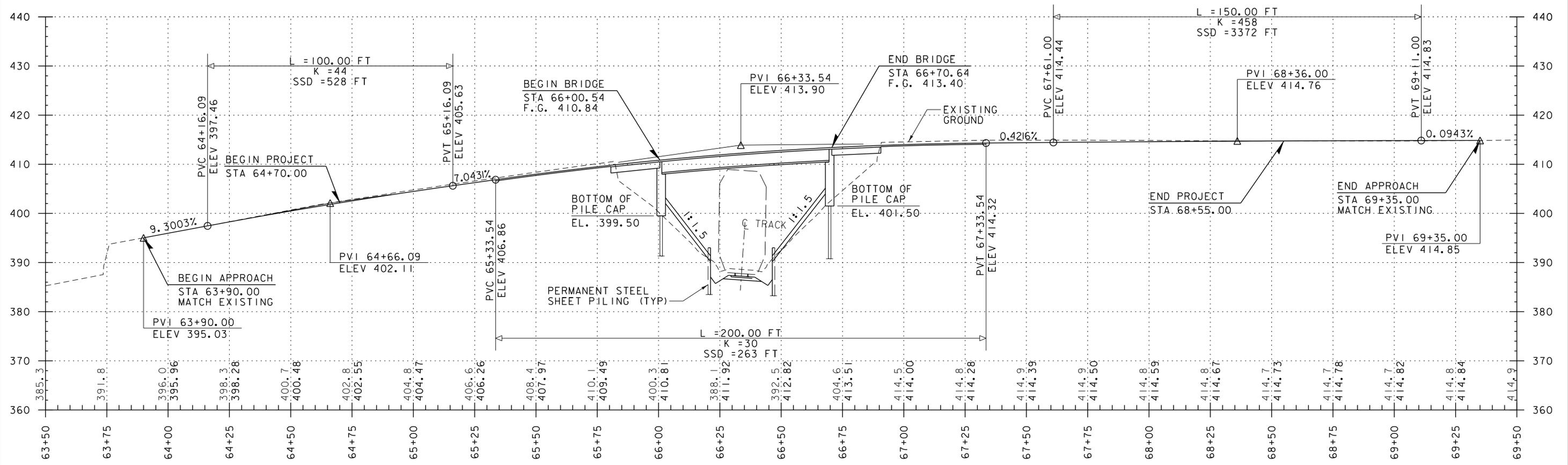
**CONSTRUCT 10.5' GRAVEL DRIVE**  
 STA. 65+25 - 65+66, RT

**EXISTING BRIDGE DATA**  
 THREE SPAN STEEL BEAM WITH CAST-IN-PLACE CONCRETE DECK BUILT IN 1938  
 SPAN LENGTH = 3-SPAN, 36'-0" MAX SPAN  
 STRUCTURE LENGTH = 109'-0"  
 DECK WIDTH OUT TO OUT = 29'-0"  
 BRIDGE WIDTH CURB TO CURB = 25'-6"



PROJECT NAME:	CASTLETON	PLOT DATE:	9/21/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	E.A. FIALA
FILE NAME:	z12b138bdr_nu1.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	SHEET	16 OF 82
DESIGNED BY:	E.A. FIALA		
ROADWAY LAYOUT SHEET			



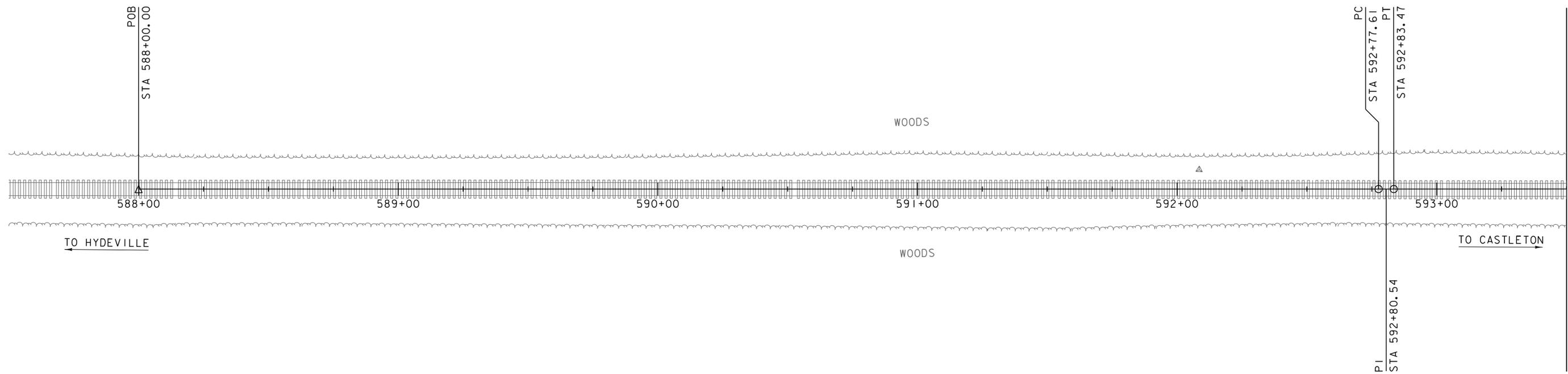
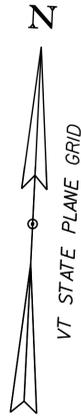


VT 30 PROFILE  
 SCALE 1" = 20' VERTICAL  
 1" = 10' HORIZONTAL

NOTE:  
 GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GRADE ALONG CL  
 GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG CL

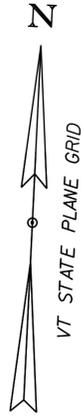
PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12bl38pro.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
ROADWAY PROFILE SHEET	SHEET 17 OF 82



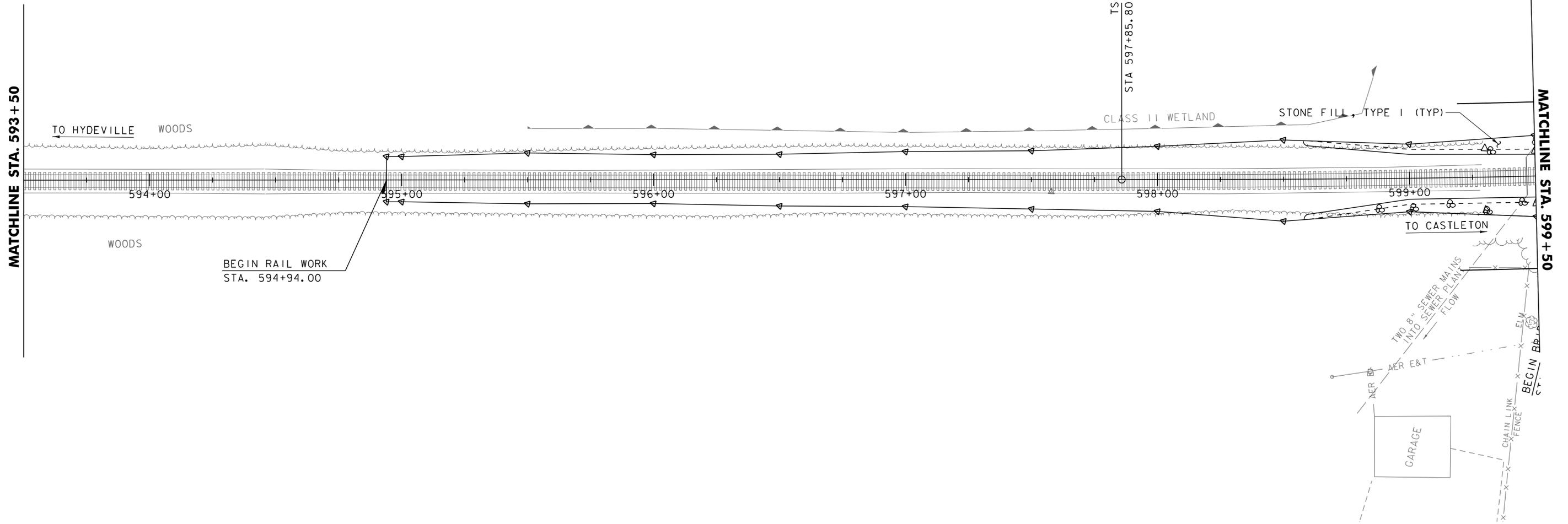


PROJECT NAME:	CASTLETON
PROJECT NUMBER:	BRF 015-2(10)
FILE NAME:	z12bl38bdr_nu1.dgn
PROJECT LEADER:	S.E. BURBANK
DESIGNED BY:	E.A. FIALA
RAIL LAYOUT SHEET (1 OF 4)	
PLOT DATE:	9/19/2014
DRAWN BY:	E.A. FIALA
CHECKED BY:	S.E. BURBANK
SHEET	18 OF 82





STONE FILL, TYPE I  
 STA. 598+58 - 599+50, LT & RT



BEGIN RAIL WORK  
 STA. 594+94.00

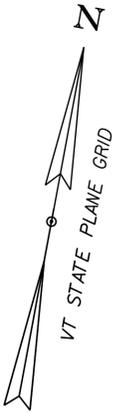
MATCHLINE STA. 593 + 50

MATCHLINE STA. 599 + 50

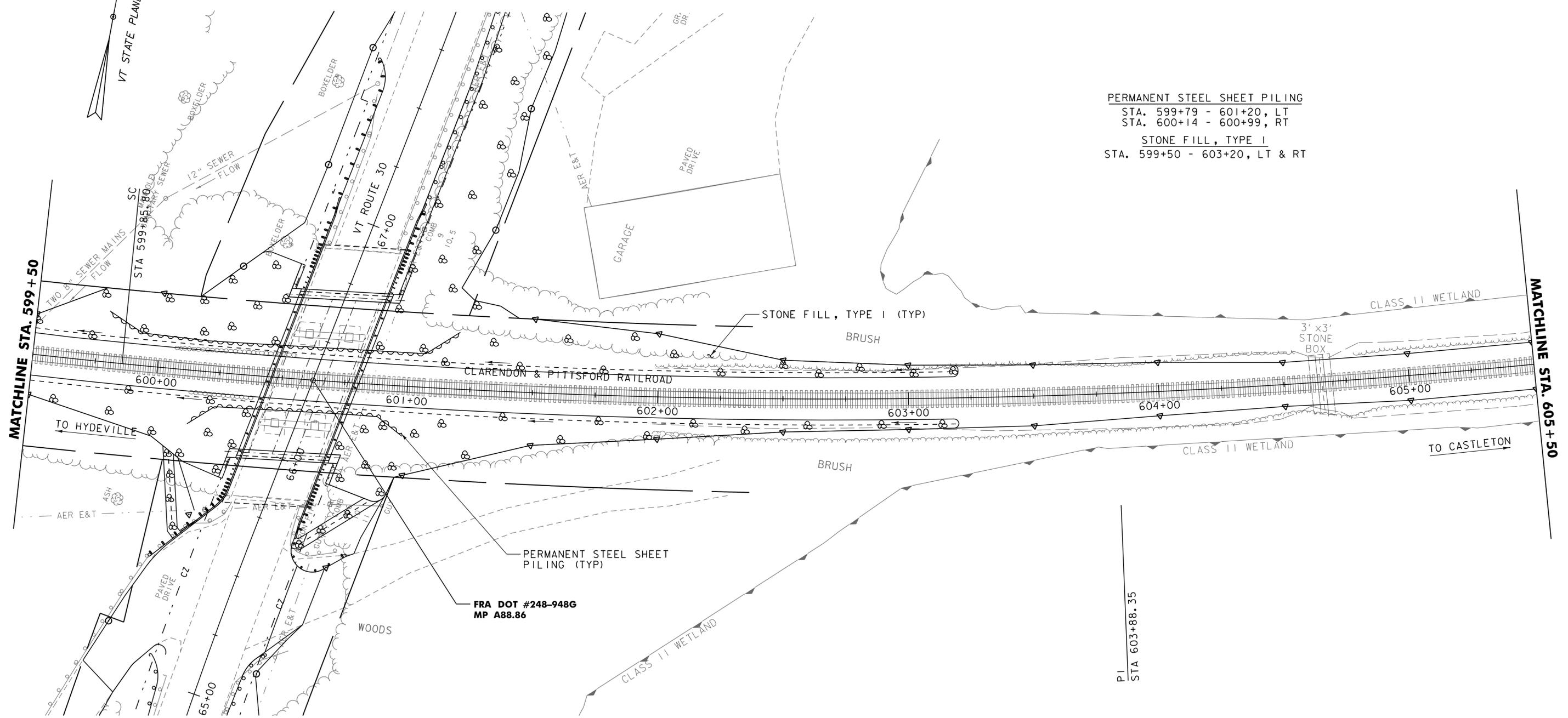


PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_nu1.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL LAYOUT SHEET (2 OF 4)	SHEET 19 OF 82





PERMANENT STEEL SHEET PILING  
 STA. 599+79 - 601+20, LT  
 STA. 600+14 - 600+99, RT  
 STONE FILL, TYPE I  
 STA. 599+50 - 603+20, LT & RT



MATCHLINE STA. 599+50

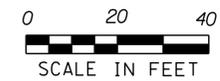
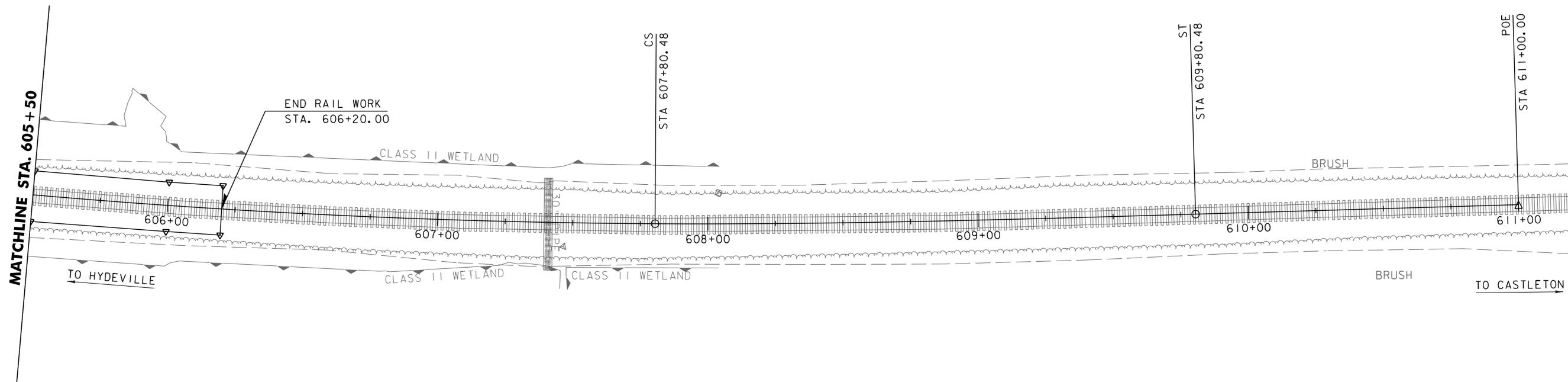
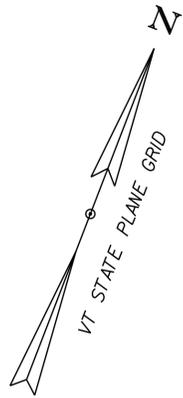
MATCHLINE STA. 605+50

PI  
 STA 603+88.35



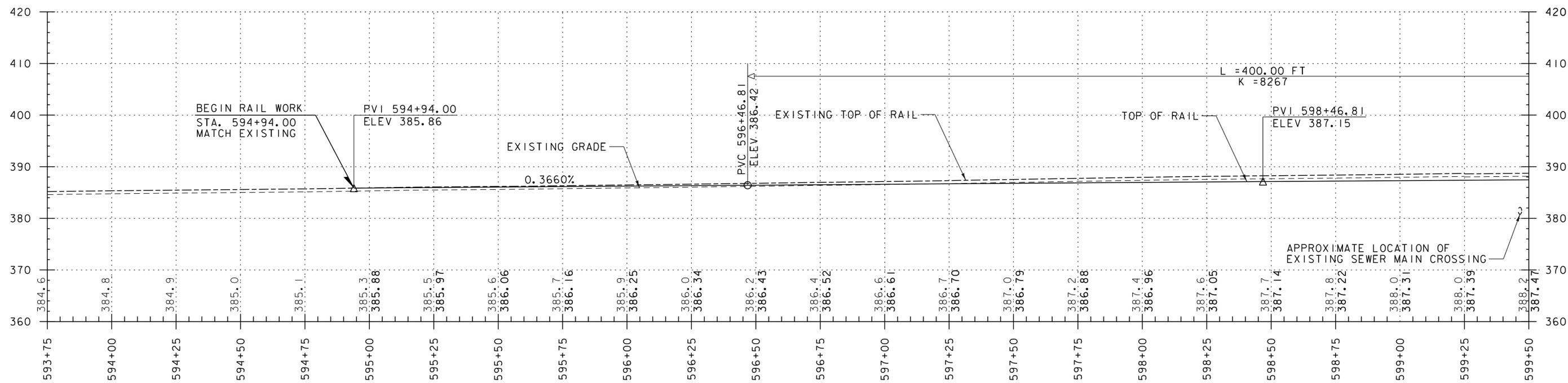
PROJECT NAME:	CASTLETON	PLOT DATE:	9/19/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	E.A. FIALA
FILE NAME:	z12bl38bdr_nu1.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	SHEET	20 OF 82
DESIGNED BY:	E.A. FIALA		
RAIL LAYOUT SHEET (3 OF 4)			





PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_nu1.dgn	PLOT DATE: 9/21/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL LAYOUT SHEET (4 OF 4)	SHEET 21 OF 82





**RAIL PROFILE**  
 SCALE 1" = 20' VERTICAL  
 1" = 10' HORIZONTAL

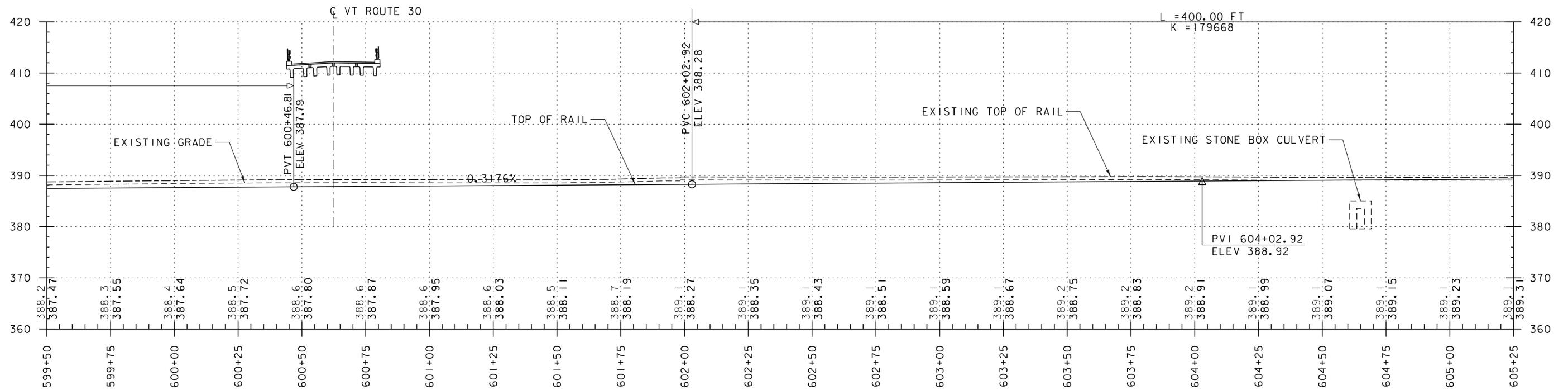
**NOTE:**

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GRADE ALONG CL

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE HIGHEST TOP OF RAIL ALONG CL

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138pro.rail.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL PROFILE SHEET (1 OF 3)	SHEET 22 OF 82





**RAIL PROFILE**

SCALE 1" = 20' VERTICAL  
 1" = 10' HORIZONTAL

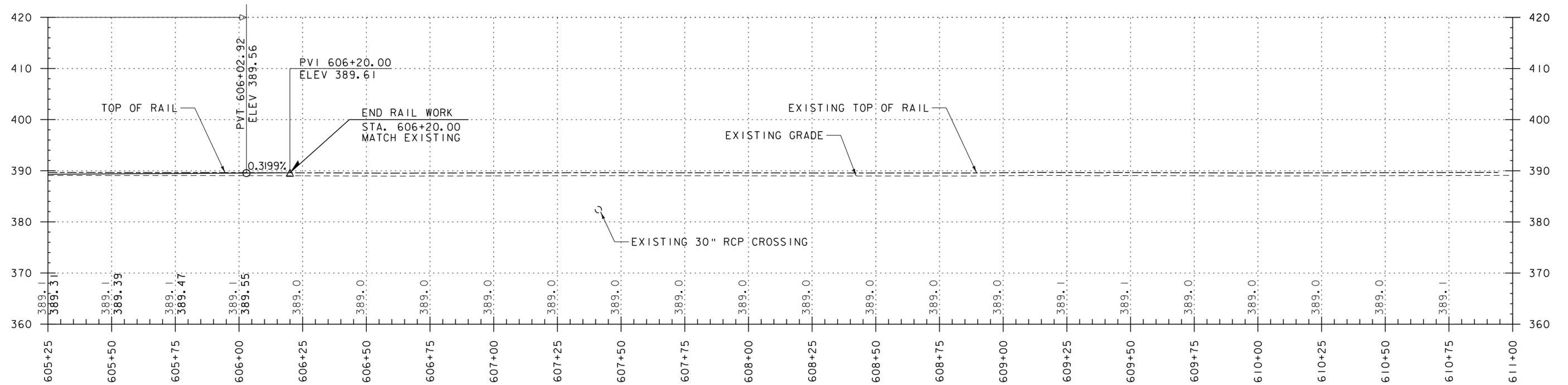
**NOTE:**

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GRADE ALONG  $\text{CL}$

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE HIGHEST TOP OF RAIL ALONG  $\text{CL}$

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138pro.rail.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL PROFILE SHEET (2 OF 3)	SHEET 23 OF 82





**RAIL PROFILE**  
 SCALE 1" = 20' VERTICAL  
 1" = 10' HORIZONTAL

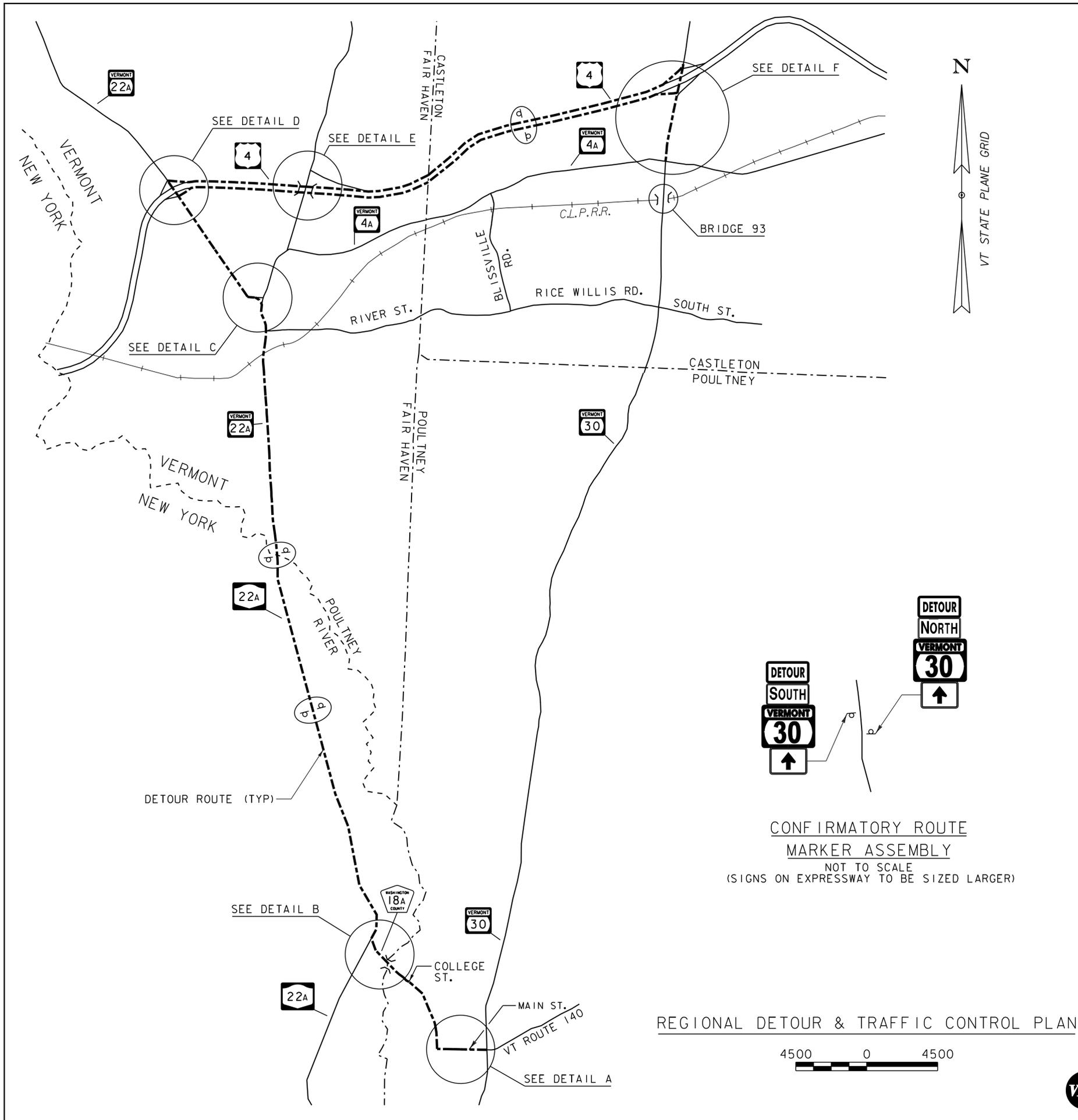
**NOTE:**

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GRADE ALONG  $\text{CL}$

GRADES SHOWN TO THE NEAREST HUNDREDTH ARE HIGHEST TOP OF RAIL ALONG  $\text{CL}$

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138pro.rail.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL PROFILE SHEET (3 OF 3)	SHEET 24 OF 82





**TRAFFIC CONTROL NOTES:**

1. INSTALL CONFIRMATORY ROUTE MARKER ASSEMBLIES ALONG THE DETOUR ROUTE AT THE INTERSECTIONS AND MILE MARKERS AS INDICATED ON THIS PLAN.
2. WHEN EXISTING ROUTE MARKER ASSEMBLIES ARE LOCATED AT THE INTERSECTIONS OR ALONG THE DETOUR ROUTE THE DETOUR ROUTE MARKER ASSEMBLIES SHALL BE INSTALLED ADJACENT TO THE EXISTING ROUTE MARKER ASSEMBLIES.
3. SEE TCP (2 OF 6) AND TCP (3 OF 6) FOR DETAILS A THROUGH F.
4. THE REGIONAL DETOUR FOR THIS PROJECT EXTENDS INTO NEW YORK STATE AND UTILIZES WASHINGTON COUNTY ROUTE 18A AND NEW YORK STATE ROUTE 22A. VTRANS HAS COORDINATED WITH THE WASHINGTON COUNTY DEPARTMENT OF PUBLIC WORKS AND THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION (NYSOT) AND HAVE BEEN AUTHORIZED TO DETOUR TRAFFIC FROM VERMONT ONTO THESE ROUTES. IN ORDER TO PERFORM ANY WORK (INSTALLATION OF THE DETOUR SIGNS, ETC.) ON THESE ROADWAYS, THE CONTRACTOR WILL NEED AUTHORIZATION FROM BOTH THE WASHINGTON COUNTY DEPARTMENT OF PUBLIC WORKS AND NYSOT. THE CONTRACTOR SHALL SUBMIT THE FOLLOWING FORMS:

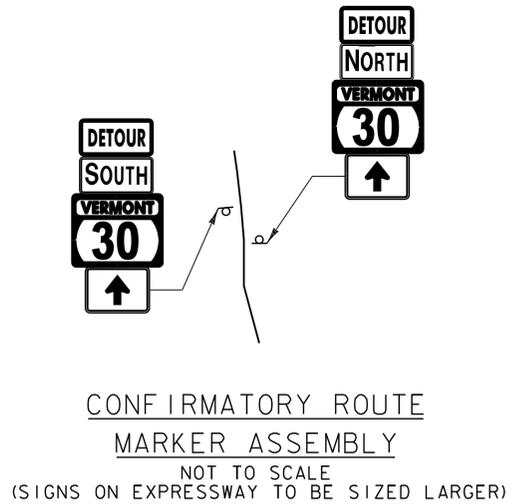
WASHINGTON COUNTY DEPARTMENT OF PUBLIC WORKS PERMIT. POINT OF CONTACT SHOULD BE SCOTT TRACY, DEPUTY SUPERINTENDENT OF THE DEPARTMENT OF PUBLIC WORKS. PHONE NUMBER IS 518-746-2440.

NYSOT HIGHWAY WORK PERMIT APPLICATION FOR NON-UTILITY WORK (FORM PERM 33) AND NYSOT CERTIFICATE OF INSURANCE FOR HIGHWAY WORK PERMIT (PERM 17). POINT OF CONTACT SHOULD BE JOE THOMPSON, NYSOT ASSISTANT RESIDENT ENGINEER IN WASHINGTON COUNTY. PHONE NUMBER IS 518-747-4724.

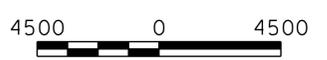
THE ABOVE LISTED FORMS ARE INCLUDED IN THE PROPOSAL DOCUMENTS AND SHALL BE SUBMITTED A MINIMUM OF FOUR (4) WEEKS PRIOR TO THE ANTICIPATED DATE WORK (INSTALLATION OF SIGNS) SHALL START AND A MINIMUM OF SIX (6) WEEKS PRIOR TO THE BRIDGE CLOSURE PERIOD. THE CONTRACTOR SHALL PERFORM THE SHOULDER CLOSURE FOR THE INSTALLATION AND REMOVAL OF THE DETOUR SIGNS ON NY STATE ROUTE 22A IN ACCORDANCE WITH THE T&T-C7 DOCUMENT INCLUDED IN THE PROPOSAL DOCUMENTS. THIS DOCUMENT SHOULD BE INCLUDED IN THE HIGHWAY WORK PERMIT APPLICATION TO NYSOT.

**LEGEND**

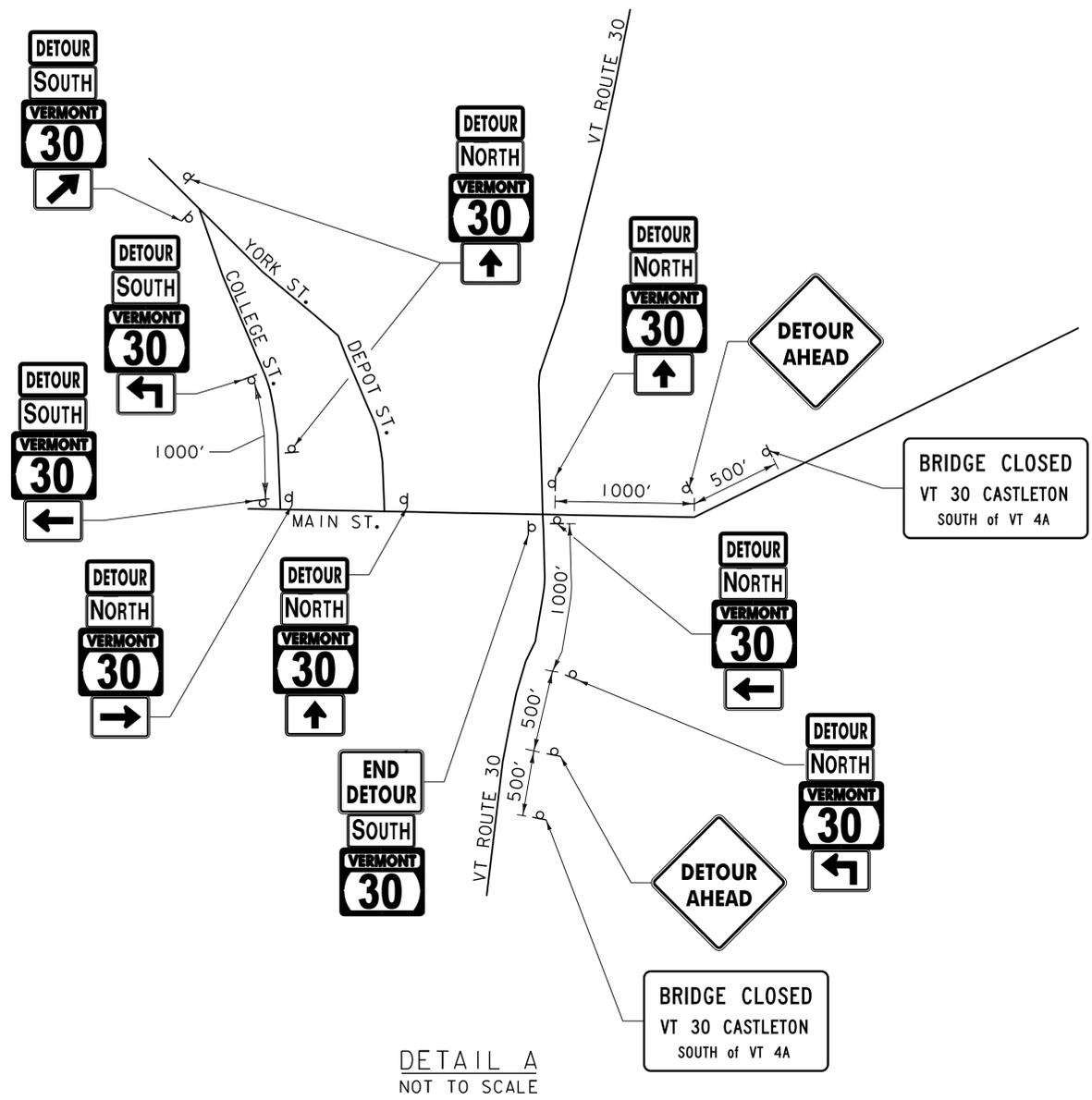
CONFIRMATORY ROUTE MARKER ASSEMBLY (SEE NOTES 1 & 2 ABOVE)



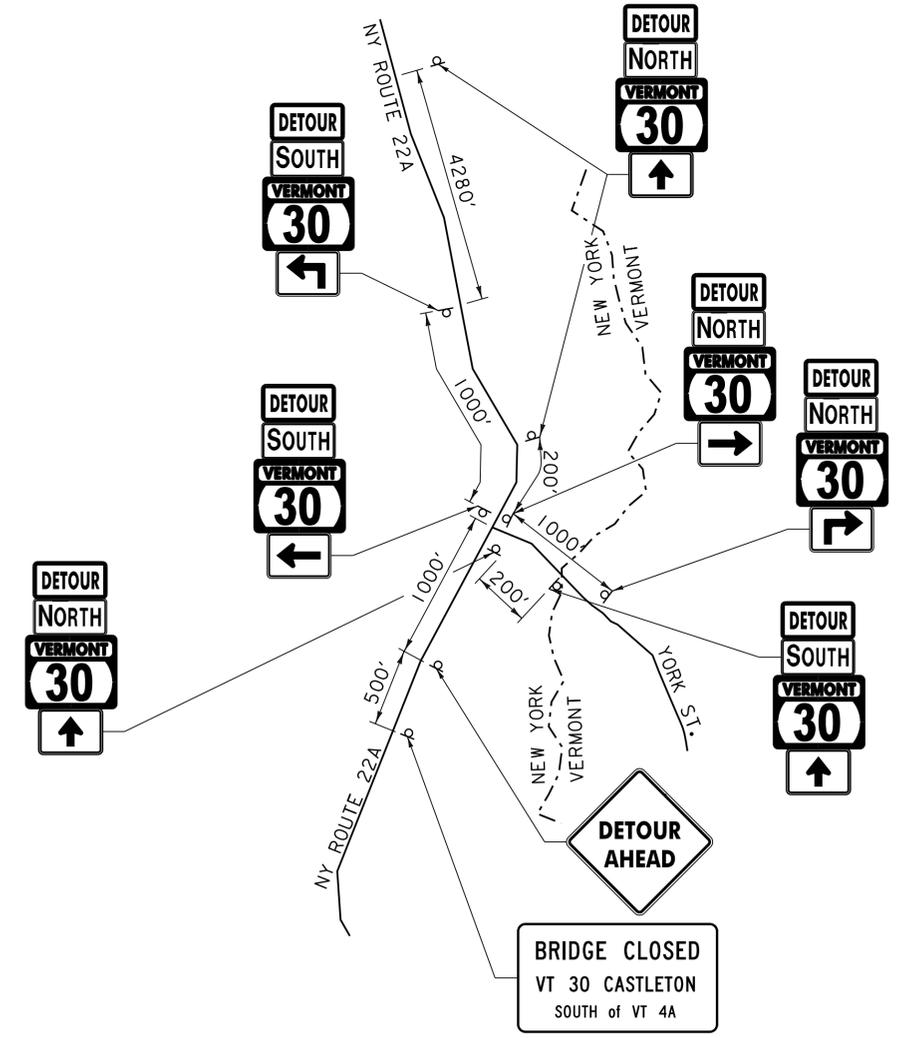
**REGIONAL DETOUR & TRAFFIC CONTROL PLAN**



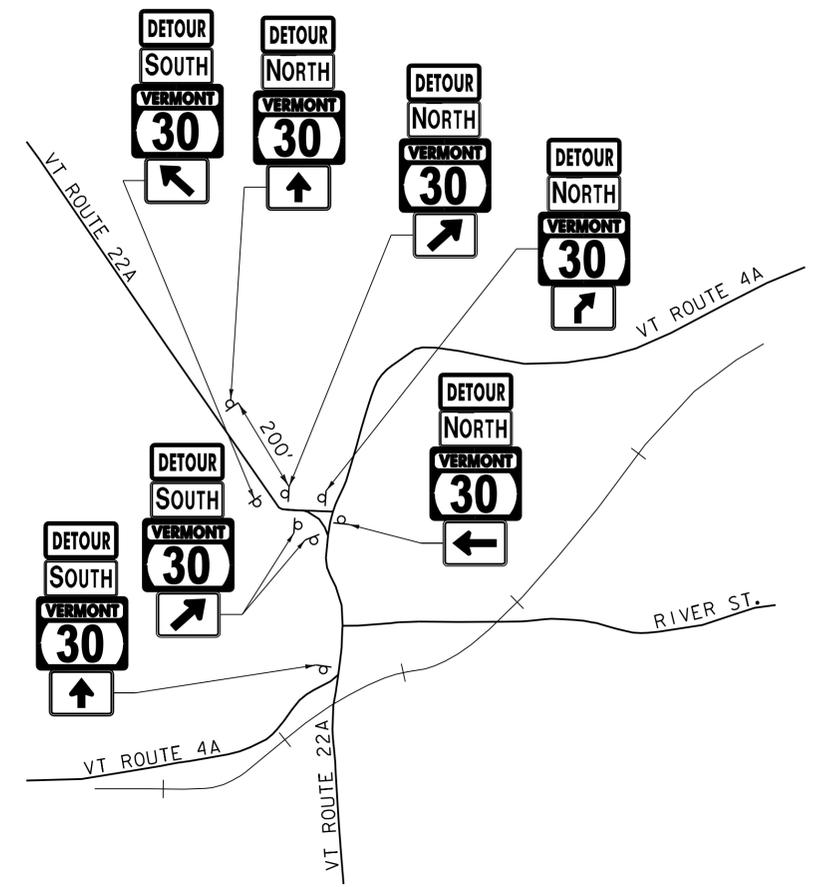
PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138+cp.dgn	PLOT DATE: 10/29/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: D.A. GINGRAS
DESIGNED BY: VTRANS	CHECKED BY: S.E. BURBANK
TRAFFIC CONTROL PLAN (1 OF 6)	SHEET 25 OF 82



DETAIL A  
NOT TO SCALE



DETAIL B  
NOT TO SCALE

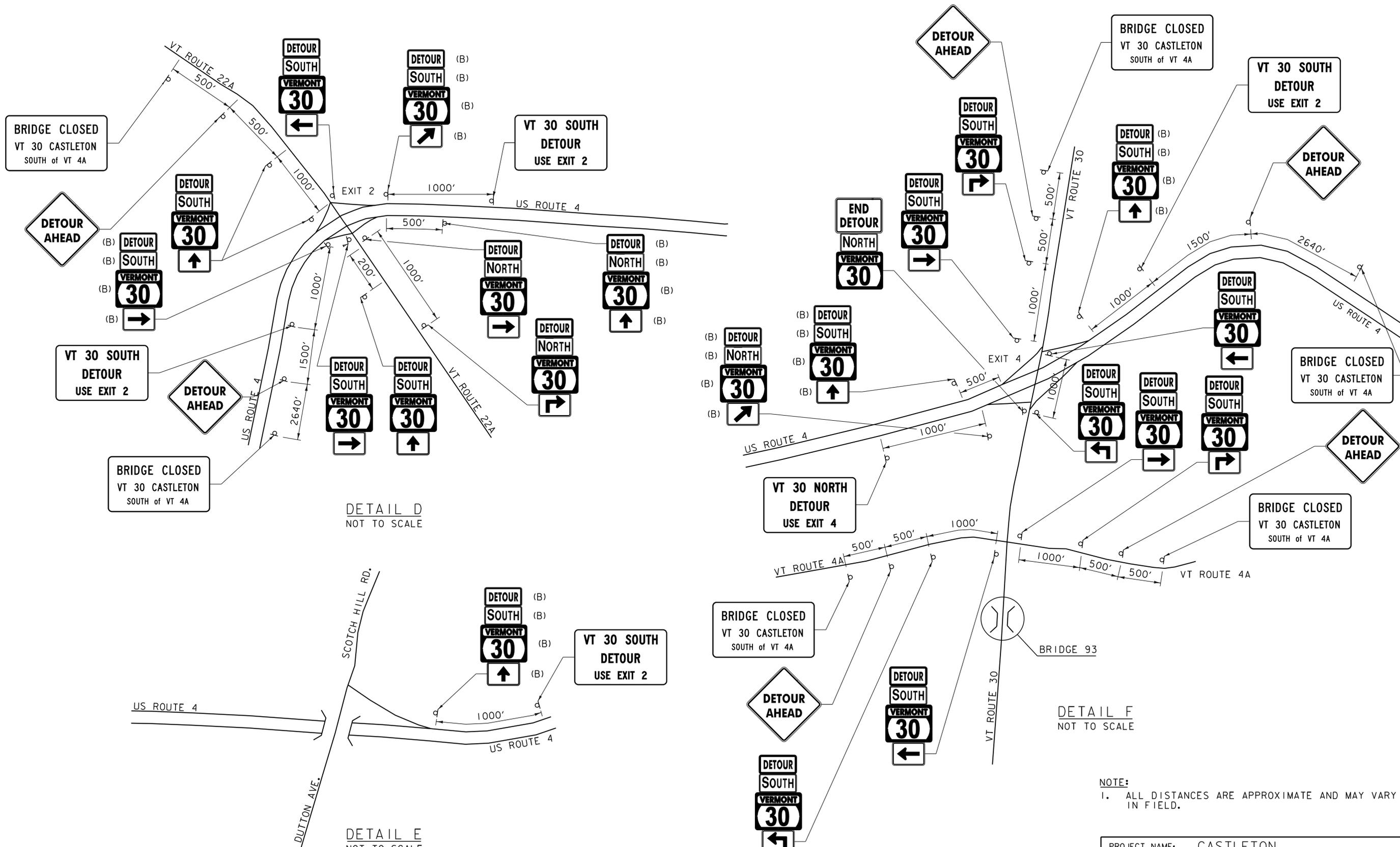


DETAIL C  
NOT TO SCALE

NOTE:  
1. ALL DISTANCES ARE APPROXIMATE AND MAY VARY IN FIELD.

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138+cp.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: D.A. GINGRAS
DESIGNED BY: D.A. GINGRAS	CHECKED BY: S.E. BURBANK
TRAFFIC CONTROL PLAN (2 OF 6)	SHEET 26 OF 82





DETAIL D  
NOT TO SCALE

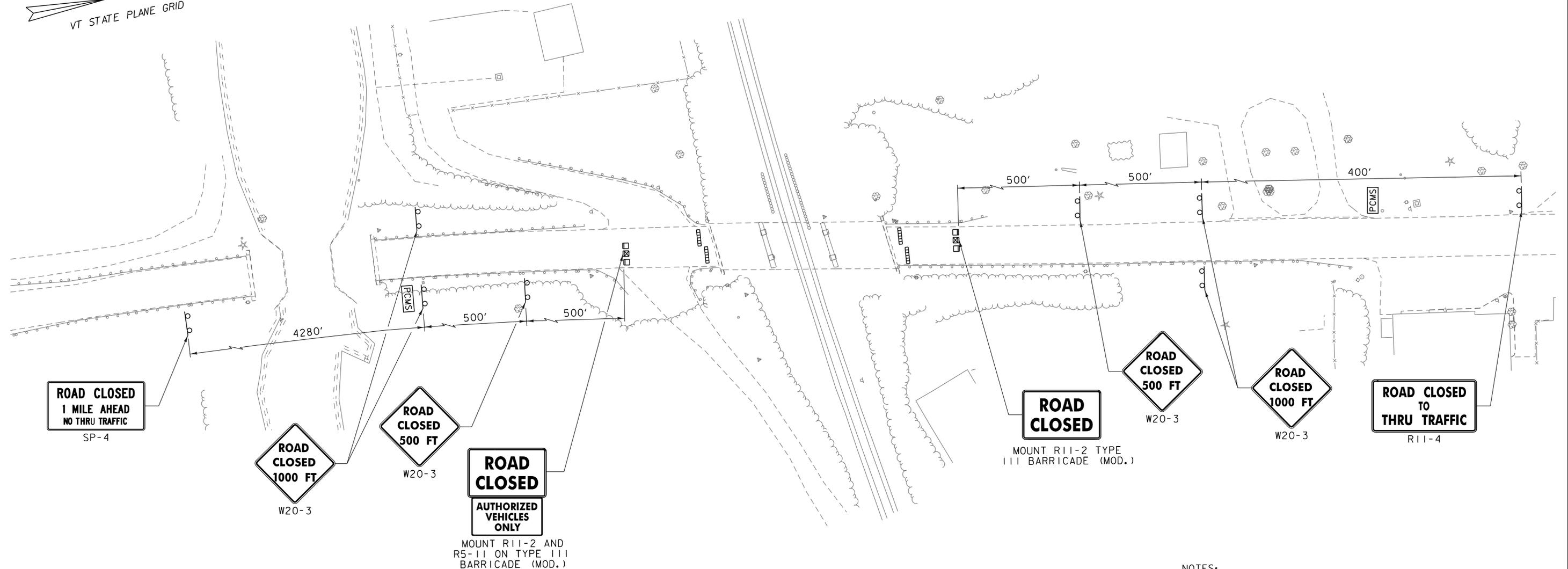
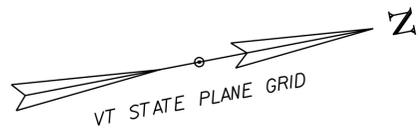
DETAIL E  
NOT TO SCALE

DETAIL F  
NOT TO SCALE

NOTE:  
1. ALL DISTANCES ARE APPROXIMATE AND MAY VARY IN FIELD.

PROJECT NAME:	CASTLETON
PROJECT NUMBER:	BRF 015-2(10)
FILE NAME:	z12b138+cp.dgn
PROJECT LEADER:	S.E. BURBANK
DESIGNED BY:	D.A. GINGRAS
TRAFFIC CONTROL PLAN (3 OF 6)	
PLOT DATE:	9/19/2014
DRAWN BY:	D.A. GINGRAS
CHECKED BY:	S.E. BURBANK
SHEET	27 OF 82





**LOCAL TRAFFIC CONTROL PLAN**  
NOT TO SCALE

**LEGEND**

- TYPE III BARRICADE
- ⊠ TYPE III BARRICADE (MOD.)
- ▬▬▬ TEMPORARY TRAFFIC BARRIER
- PCMS PORTABLE CHANGEABLE MESSAGE SIGN

**NOTES:**

1. SEE TRAFFIC CONTROL PLAN (1 OF 6) FOR ADDITIONAL NOTES.
2. THE COSTS OF TEMPORARY TRAFFIC CONTROL DEVICES INCLUDING BUT NOT LIMITED TO ALL SIGNS, SIGN POSTS, TYPE III BARRICADES, AND TEMPORARY TRAFFIC BARRIERS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 641.10 "TRAFFIC CONTROL". PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) WILL BE PAID FOR SEPARATELY UNDER CONTRACT ITEM 641.15.
3. THE PCMS SHALL DISPLAY THE MESSAGES SHOWN ON TRAFFIC CONTROL PLAN (5 OF 6) ONE WEEK (7 DAYS) PRIOR TO THE CLOSURE OF THE BRIDGE. THE PCMS SHALL REMAIN IN PLACE FOR THE DURATION OF CONSTRUCTION, UNTIL THE ROAD IS OPEN TO TRAFFIC.
4. THE NUMBER OF TYPE III BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED ARE TO BE DETERMINED BASED ON INDIVIDUAL ROADWAY CLOSURE REQUIREMENTS.
5. SEE THE PROJECT SPECIAL PROVISIONS FOR ALLOWABLE BRIDGE CLOSURE PERIOD.

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12bl38+cp.dgn	PLOT DATE: 9/21/2014
PROJECT LEADER: S.E.BURBANK	DRAWN BY: D.A. GINGRAS
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
TRAFFIC CONTROL PLAN (4 OF 6)	SHEET 28 OF 82



IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	NUMBER OF SIGNS REQ'D	REMARKS
	WIDTH (IN)	HEIGHT (IN)			
M1-5	24	24		47*	SEE NOTE 5
M1-5 (B)	36	36		9*	SEE NOTE 5
M3-2	24	12		21*	SEE NOTE 5
M3-2 (B)	36	18		3*	SEE NOTE 5
M3-4	24	12		26*	SEE NOTE 5
M3-4 (B)	36	18		6*	SEE NOTE 5
M4-8	24	12		45*	MOUNT ABOVE THE M3-2 OR M3-4
M4-8 (B)	36	18		9*	MOUNT ABOVE THE M3-2 OR M3-4
M4-8A	24	18		2	MOUNT ON ONE POST
M5-1L	21	15		5	MOUNT BELOW THE MI-5
M5-1R	21	15		4	MOUNT BELOW THE MI-5
M5-2R	21	15		1	MOUNT BELOW THE MI-5
M6-1L	21	15		7	MOUNT BELOW THE MI-5
M6-1L	21	15		5	MOUNT BELOW THE MI-5
M6-1L (B)	30	21		1	MOUNT BELOW THE MI-5
M6-2L	21	15		1	MOUNT BELOW THE MI-5
M6-2R	21	15		4	MOUNT BELOW THE MI-5

* - NUMBER OF SIGNS REQUIRED ASSUMING APPROXIMATELY 3 LOCATIONS OF CONFIRMATORY ROUTE MARKER ASSEMBLY DETAIL

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	NUMBER OF SIGNS REQ'D	REMARKS
	WIDTH (IN)	HEIGHT (IN)			
M6-2R (B)	30	21		2	MOUNT BELOW THE MI-5
M6-3	21	15		17*	MOUNT BELOW THE MI-5
M6-3 (B)	30	21		6*	MOUNT BELOW THE MI-5
R5-11	30	24		1	MOUNT BELOW R11-2
R11-2	48	24		2	MOUNT ON TYPE III BARRICADE (MOD.)
R11-4	60	30		1	MOUNT ON TWO POSTS
SP-1	66	36		9	MOUNT ON TWO POSTS
SP-2	60	36		4	MOUNT ON TWO POSTS
SP-3	60	36		1	MOUNT ON TWO POSTS
SP-4	60	30		1	MOUNT ON TWO POSTS
W20-2	48	48		9	MOUNT ON TWO POSTS
W20-3	48	48		2	MOUNT ON TWO POSTS
W20-3	48	48		4	MOUNT ON TWO POSTS

NOTES:

- COLORS FOR THE M1-5, M1-5 (B), M3-2, M3-2 (B), M3-4, AND M3-4 (B) SIGNS SHALL MATCH THE COLORS SHOWN ON VTRANS STD. E-136B.
- COLORS FOR THE M5-1L, M5-1R, M5-2R, M6-1L, M6-1L (B), M6-1R, M6-2L, M6-2R, M6-2R (B), M6-3 AND THE M6-3 (B) SIGNS SHALL BE A BLACK ARROW AND BORDER ON RETROREFLECTIVE FLUORESCENT ORANGE BACKGROUND.
- COLORS FOR THE M4-8, M4-8, AND M4-8 (B) SIGNS SHALL BE BLACK TEXT AND BORDER ON RETROREFLECTIVE FLUORESCENT ORANGE BACKGROUND.
- COLORS FOR THE SP-1, SP-2, AND SP-3 SIGNS SHALL BE BLACK TEXT AND BORDER ON RETROREFLECTIVE FLUORESCENT ORANGE BACKGROUND.
- THE M1-5, M1-5B, M3-2, M3-2 (B), M3-4 AND THE M3-4 (B) SIGNS SHALL BECOME THE PROPERTY OF THE STATE AFTER THEY ARE REMOVED FROM THE DETOUR. THE CONTRACTOR SHALL DELIVER THE SIGNS TO THE STATE GARAGE ON VT-30 IN CASTLETON, JUST NORTH OF THE PROJECT. ALL COSTS ASSOCIATED WITH PROVIDING THE SIGNS TO THE STATE SHALL BE INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".
- ALL DETOUR SIGNS SHALL BE COVERED COMPLETELY WHEN THE DETOUR IS NOT IN USE.
- SEE NEXT SHEET FOR DIMENSIONS FOR SP-1, SP-2, SP-3 AND SP-4 SIGNS.

MESSAGES FOR PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) - AT BRIDGE

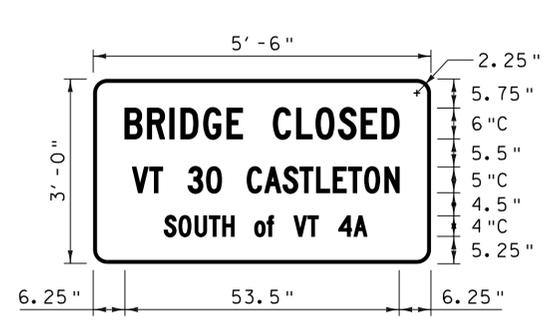
MESSAGE 1	MESSAGE 2
<b>VT 30</b>	<b>MMMM DD</b> (DATE) **
<b>BRIDGE</b>	<b>TO</b>
<b>CLOSED</b>	<b>MMMM DD</b> (DATE) **

** - MONTH SHALL BE SPELLED OUT - JUNE 10 NOT 6/10

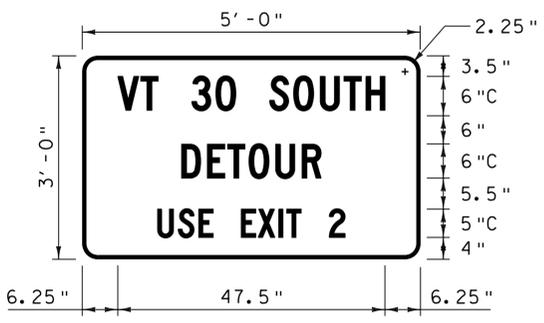
PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138+cp.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
TRAFFIC CONTROL PLAN (5 OF 6)

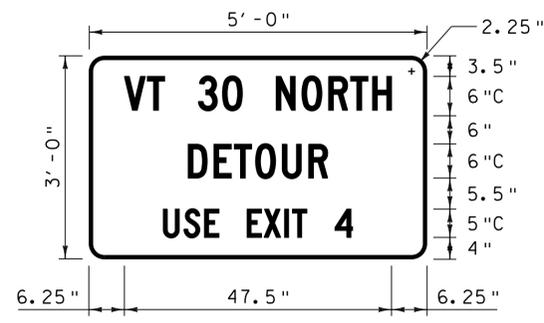
PLOT DATE: 9/19/2014  
DRAWN BY: D.A. GINGRAS  
CHECKED BY: S.E. BURBANK  
SHEET 29 OF 82



SP-1  
NOT TO SCALE



SP-2  
NOT TO SCALE



SP-3  
NOT TO SCALE

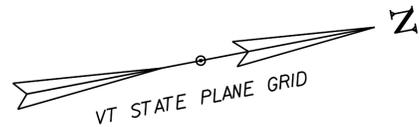


SP-4  
NOT TO SCALE

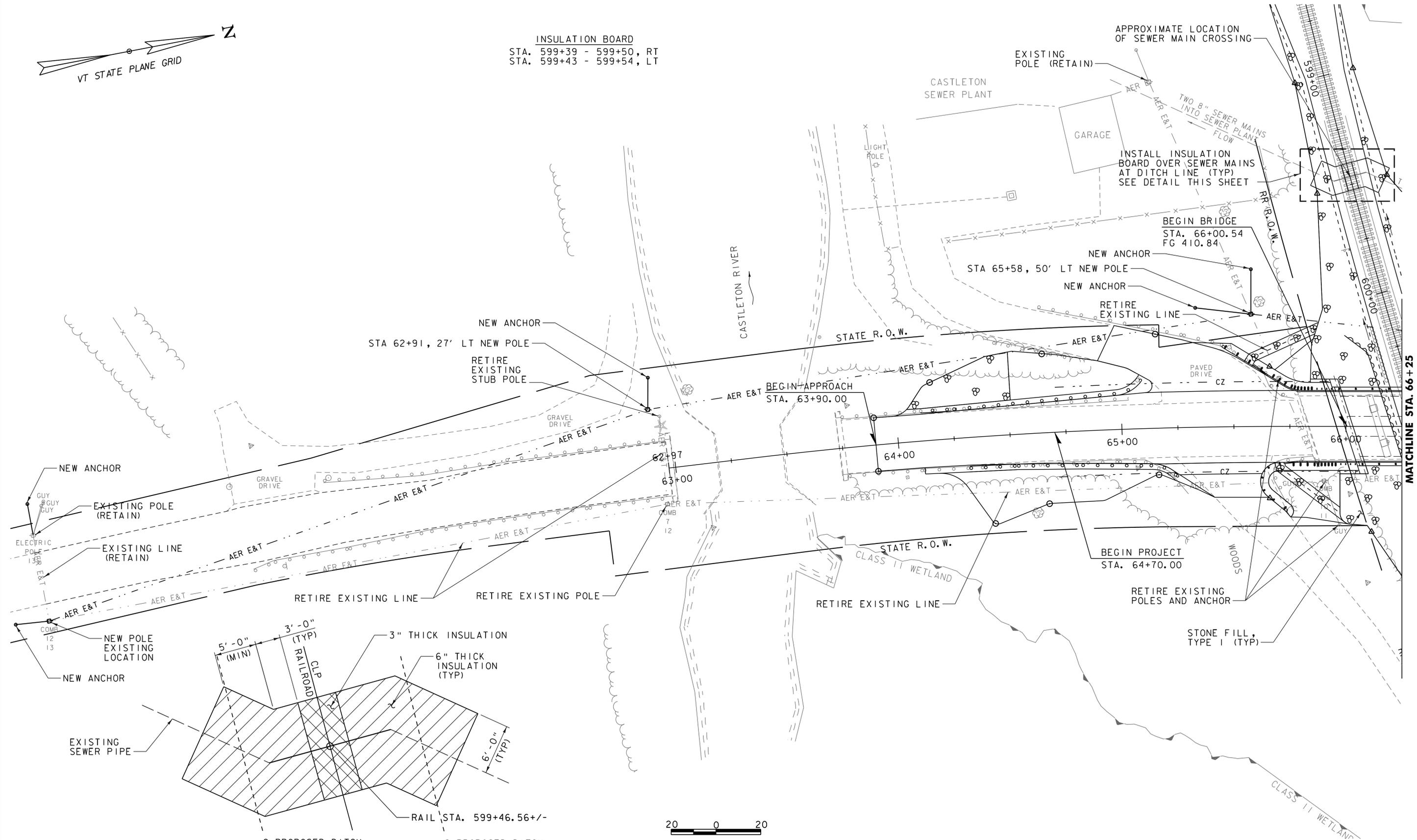
**NOTE:** COLORS FOR THE SP-4 SIGN SHALL BE BLACK TEXT AND BORDER ON RETROREFLECTIVE FLORESCENT WHITE BACKGROUND. TWO ORANGE FLAGS (ONE EACH SIDE) SHALL BE PLACED AT THE TOP OF THE SP-2 SIGNS. BORDER SHALL BE 0.075" AND INDENT SHALL BE 0.50".

PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138+cp.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: D.A. GINGRAS
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
TRAFFIC CONTROL PLAN (6 OF 6)	SHEET 30 OF 82

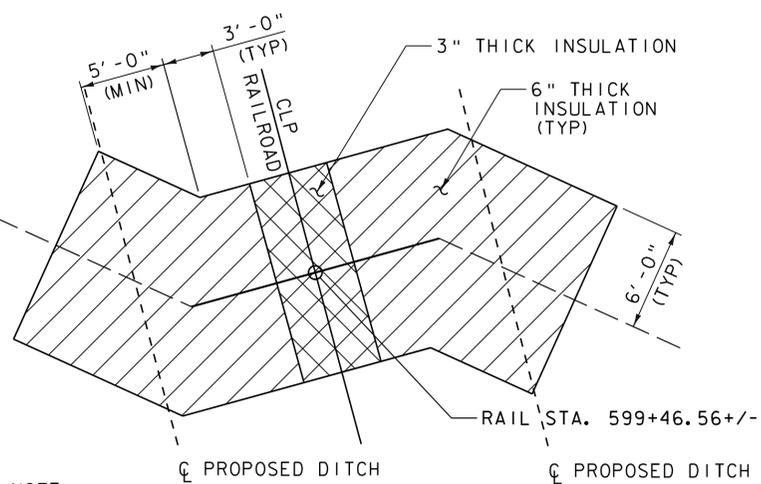




INSULATION BOARD  
 STA. 599+39 - 599+50, RT  
 STA. 599+43 - 599+54, LT

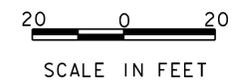


MATCHLINE STA. 66+25



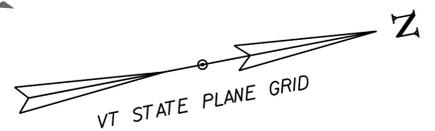
NOTE:  
 1. STAGGER INSULATION JOINTS TO PROVIDE OVERLAPPING LAYERS.  
 2. INSULATION BOARD SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 60 PSI AND BE IN ACCORDANCE WITH ASTM D1621.

INSULATION BOARD DETAIL  
 SCALE 3/16" = 1'-0"

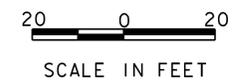
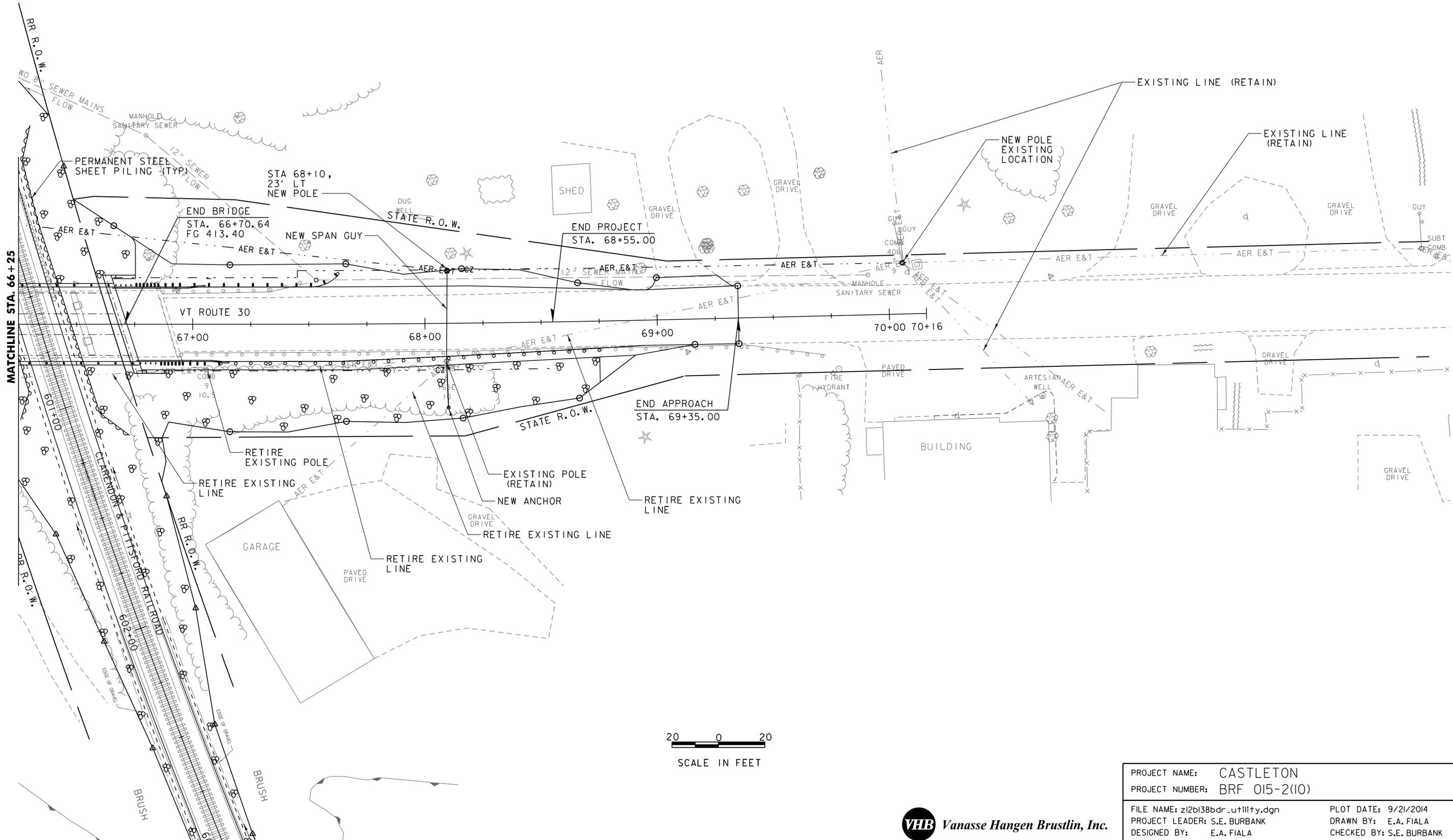


PROJECT NAME:	CASTLETON	PLOT DATE:	9/21/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	E.A. FIALA
FILE NAME:	z12bl38bdr_utility.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	UTILITY LAYOUT SHEET (1 OF 2)	SHEET 31 OF 82
DESIGNED BY:	E.A. FIALA		



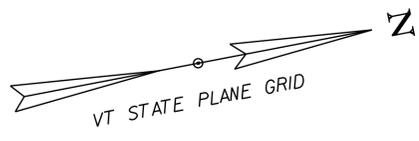


CHANGING ELEVATION  
OF SEWER MANHOLES  
STA. 67+53, LT

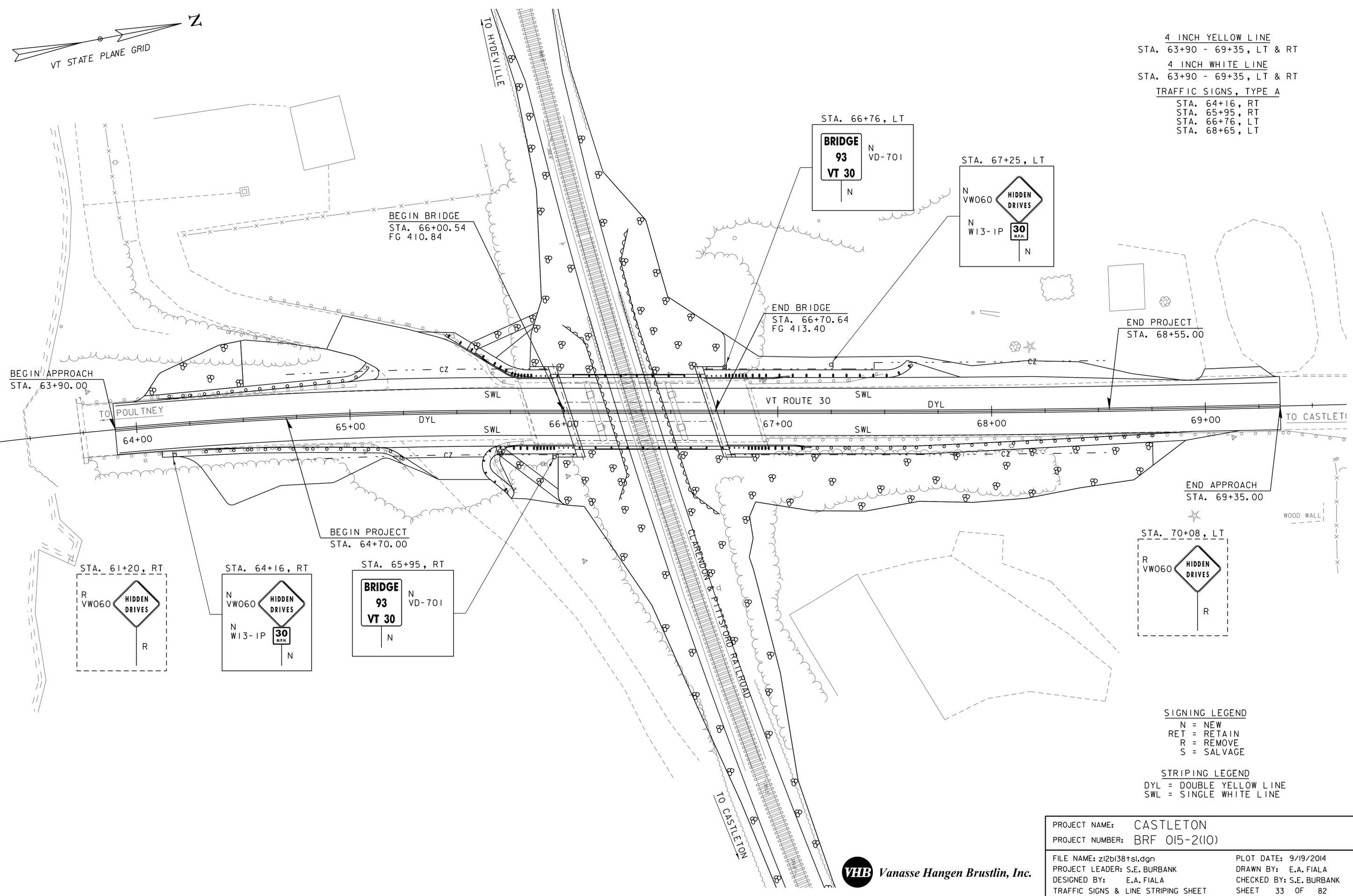


PROJECT NAME:	CASTLETON	PLOT DATE:	9/21/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	E.A. FIALA
FILE NAME:	z12b138bdr_utility.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	UTILITY LAYOUT SHEET (2 OF 2)	SHEET 32 OF 82





4 INCH YELLOW LINE  
 STA. 63+90 - 69+35, LT & RT  
 4 INCH WHITE LINE  
 STA. 63+90 - 69+35, LT & RT  
 TRAFFIC SIGNS, TYPE A  
 STA. 64+16, RT  
 STA. 65+95, RT  
 STA. 66+76, LT  
 STA. 68+65, LT



**SIGNING LEGEND**  
 N = NEW  
 RET = RETAIN  
 R = REMOVE  
 S = SALVAGE

**STRIPING LEGEND**  
 DYL = DOUBLE YELLOW LINE  
 SWL = SINGLE WHITE LINE

PROJECT NAME:	CASTLETON
PROJECT NUMBER:	BRF 015-2(10)
FILE NAME:	z12bl38+sl.dgn
PROJECT LEADER:	S.E. BURBANK
DESIGNED BY:	E.A. FIALA
TRAFFIC SIGNS & LINE STRIPING SHEET	
PLOT DATE:	9/19/2014
DRAWN BY:	E.A. FIALA
CHECKED BY:	S.E. BURBANK
SHEET	33 OF 82





**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.O.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**

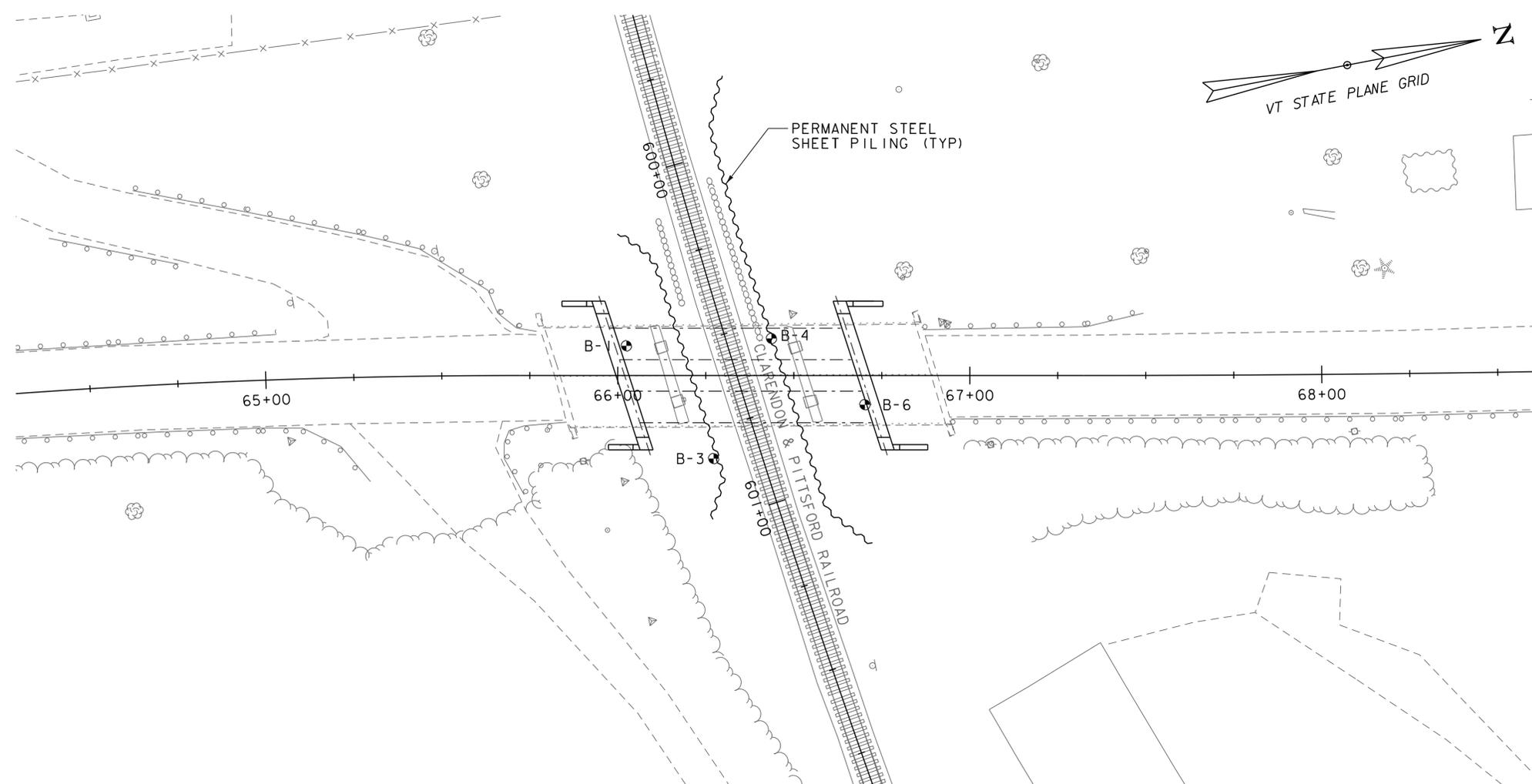
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

**COMMONLY USED SYMBOLS**

- ▼ Water Elevation
- ⊙ Standard Penetration Boring
- ⊕ Auger Boring
- ⊙ Rod Sounding
- S 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 Core Size 1 1/8"
- AX Core Size 1 1/8"
- BX Core Size 1 3/8"
- NX Core Size 2 1/8"
- M Double Tube Core Barrel Used
- LL Liquid Limit
- PL Plastic Limit
- PI Plasticity Index
- NP Non Plastic
- M 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
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		



**BORING CHART**

HOLE NO.	SURV. STATION	OFFSET (FEET)	GROUND ELEVATION	ELEVATION TLOB
B-1	66+02.45	8.42 LT	410.9	N/A
B-3	66+27.73	23.55 RT	389.3	N/A
B-4	66+43.65	10.50 LT	388.9	N/A
B-6	66+70.19	8.28 RT	413.4	N/A

**BORING LAYOUT**



**GENERAL NOTES**

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

**DEFINITIONS (AASHTO)**

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

PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12bl38bor.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
BORING INFORMATION SHEET

PLOT DATE: 9/19/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 35 OF 82



STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-1					
Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)		Page No.: 1 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations ⁽¹⁾		Notes					
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)		Type: FJ	SS						
Date Started: 10/18/13 Date Finished: 10/22/13		I.D.: 4 in	2 in						
VTSPG NAD83: N 403295.98 ft E 1452512.75 ft		Hammer Wt: 140 lb.	140 lb.						
Station: 18+86 Offset: 8.40		Hammer Fall: 30 in.	30 in.						
Ground Elevation: 410.9 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV	C _g = -1.5						
Depth (ft)	Strata ⁽¹⁾	Classification of Materials (Description)	Blowlog ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0		Existing Bridge Deck (Approx.)							
0		Air Space Between Bridge Deck and Ground Surface (See Remark 5).							
15	S1 (15' to 17'): Very loose, brown fine to coarse SAND, some silt, little fine gravel, trace Root Fibers, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-2.4.)	WOH-WOH-1-1	14.8	26.0	43.2	30.8	NP	NP	
17	S2 (17' to 19'): Loose, brown fine to coarse SAND, some silt, little fine gravel, wet. Rec. = 0.5 ft (AASHTO M145 Classification: A-2.4.)	2-2-2-2-2	14.8	26.9	41.3	31.8	NP	NP	
19	S3 (19' to 21'): Medium dense, brown fine to coarse SAND, some silt, little fine to coarse gravel, wet. Rec. = 0.7 ft (AASHTO M145 Classification: A-2.4.)	4-2-3-4-4	14.0	33.0	39.3	27.7	NP	NP	
21	S4 (21' to 23'): Very loose, brown fine to coarse SAND, some silt, some fine gravel, wet. Rec. = 0.4 ft (AASHTO M145 Classification: A-1-b.)	2-2-1-2	13.1	33.6	41.9	24.5	NP	NP	
23	S5 (23' to 25'): Soft, tan with gray seams, SILT & CLAY, trace fine to coarse sand, trace fine gravel, wet. Rec. = 0.9 ft (AASHTO M145 Classification: A-4.)	1-1-1-1	37.7	0.6	2.8	96.6	32	8	
30	S6 (29' to 31'): Medium dense, gray fine to coarse SAND and SILT & CLAY, little fine to coarse gravel, wet. Rec. = 1.2 ft (AASHTO M145 Classification: A-4.)	4-17-11-12	11.4	29.9	31.6	38.5	22	5	
35	S7 (34' to 36'): Medium dense, gray fine to coarse SAND and clayey SILT, trace fine gravel, wet. Rec. = 1.2 ft	5-7-12-17	11.8						Testing Not Performed
40	S8 (39' to 41'): Medium dense, no recovery. Rec. = 0.0 ft	8-14-13-14	11.3						Testing Not Performed
45	S9 (44' to 46'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 1.2 ft (AASHTO M145 Classification: A-4.)	7-11-14-29	11.2	29.6	26.1	44.3	25	6	
49	S10 (49' to 51'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little	9-10-15-	11.4						Testing Not Performed

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-1					
Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)		Page No.: 2 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations ⁽¹⁾		Notes					
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)		Type: FJ	SS						
Date Started: 10/18/13 Date Finished: 10/22/13		I.D.: 4 in	2 in						
VTSPG NAD83: N 403295.98 ft E 1452512.75 ft		Hammer Wt: 140 lb.	140 lb.						
Station: 18+86 Offset: 8.40		Hammer Fall: 30 in.	30 in.						
Ground Elevation: 410.9 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV	C _g = -1.5						
Depth (ft)	Strata ⁽¹⁾	Classification of Materials (Description)	Blowlog ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
55	S11 (54' to 56'): Dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 0.7 ft	9-13-18-20	13.0						Testing Not Performed
60	S12 (59' to 61'): Dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 0.9 ft (AASHTO M145 Classification: A-4.)	11-18-20-26	11.3	28.1	26.1	45.8	25	6	
65	S13 (64' to 66'): Dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse gravel, wet. Rec. = 1.2 ft	8-14-17-23	11.5						Testing Not Performed
75	S14 (74' to 76'): Dense, gray clayey SILT, some fine to coarse sand, little fine gravel, wet. Rec. = 1.5 ft (AASHTO M145 Classification: A-4.)	11-20-19-25	13.2	23.7	22.8	53.5	24	4	
85	S15 (84' to 86'): Dense, gray clayey SILT, some fine to coarse sand, little fine gravel, wet. Rec. = 1.0 ft	11-15-18-25	10.9						Testing Not Performed
95	S16 (94' to 96'): Dense, gray SILT & CLAY, some fine to coarse sand, trace fine gravel, wet. Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)	10-16-25-36	15.1	17.7	23.7	58.6	26	6	

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-1					
Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)		Page No.: 3 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations ⁽¹⁾		Notes					
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)		Type: FJ	SS						
Date Started: 10/18/13 Date Finished: 10/22/13		I.D.: 4 in	2 in						
VTSPG NAD83: N 403295.98 ft E 1452512.75 ft		Hammer Wt: 140 lb.	140 lb.						
Station: 18+86 Offset: 8.40		Hammer Fall: 30 in.	30 in.						
Ground Elevation: 410.9 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV	C _g = -1.5						
Depth (ft)	Strata ⁽¹⁾	Classification of Materials (Description)	Blowlog ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
105	S17 (104' to 106'): Refusal, gray SILT & CLAY and fine to coarse SAND, little fine gravel, wet. Rec. = 0.9 ft	26-52-50/3*	13.8						Testing Not Performed
115	S18 (114' to 116'): Refusal, gray SILT & CLAY and fine to coarse SAND, little fine gravel, wet. Rec. = 0.9 ft (AASHTO M145 Classification: A-4.)	30-51-50/3*	10.0	30.2	26.5	43.3	24	6	
120	S19 (120' to 122'): Very dense, gray SILT & CLAY and fine to coarse SAND, little fine gravel, wet. Rec. = 1.0 ft	38-46-54-50/3*	8.7						Testing Not Performed
Hole stopped @ 122.0 ft Boring terminated at 122 feet deep with no refusal.									
Remarks: 1. Exploration locations were taped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by VHB. 2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. 3. Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145. 4. Samples S2 and S4 were not sampled in accordance with ASTM D 1586 procedures (borehole was not advanced between consecutive samples). 5. Boring was drilled through 6 inch core hole (performed by VTrans 10/16/13) and depths are were measured from the bridge deck. Distance from deck to ground surface below was approximately 15 feet. 6. Driller advanced casing to 30 feet deep and then open hole below 30 feet deep; noted loss of water when drilling between 40 and 45 feet; drove casing to 50 feet deep. 7. Driller noted excessive rig chatter while advancing roller bit from 71 to 72 feet deep (possible cobble/gravel). 8. At end of day on 10/18/13 borehole advanced to 76 feet deep. On 10/21/13, casing advanced to 60 feet deep. 9. Driller reported borehole instability while attempting to sample 84 to 86 feet deep (cave in -5'). Therefore, driller advanced casing to 80 feet. 10. At end of day on 10/21/13 borehole advanced to 96 feet deep with casing at 95 feet deep. 11. Soil samples were tested by VTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs.									

PROJECT NAME: CASTLETON  
 PROJECT NUMBER: BR# 015-2(10)  
 FILE NAME: z12b138borlog.dgn  
 PROJECT LEADER: S.E. BURBANK  
 DESIGNED BY: GEODESIGN  
 BORING LOGS (1 OF 4)  
 PLOT DATE: 9/19/2014  
 DRAWN BY: E.A. FIALA  
 CHECKED BY: S.E. BURBANK  
 SHEET 36 OF 82



STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-3</b>					
Bridge No. 93 over C&P Railroad Castleton BRF 015-2(10) (GeoDesign #750-09.14)		Page No.: 1 of 1		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations (1)		Date					
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)		Type: FJ SS	Date	Depth (ft)	Notes				
Date Started: 10/24/13 Date Finished: 10/24/13		I.D.: 4 in 2 in	10/24/13	See Remark 2					
VTSPG NAD83: N 403314.31 ft E 1452548.87 ft		Hammer Wt: 140 lb. 140 lb.							
Station: 19+08 Offset: 10.50		Hammer Fall: 30 in. 30 in.							
Ground Elevation: 389.3 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV C _g = -1.5							
Depth (ft)	Strat ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Blow ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0-2	S1	(0' to 2'): Loose, brown to gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, trace Wood, trace Glass, moist. Rec. = 0.9 ft (AASHTO M145 Classification: A-4.)	1-1-5-5 (6)	13.7	29.1	25.1	45.8	25	6
2-4	S2	(2' to 4'): Loose, gray fine to coarse SAND and SILT, little fine to coarse Gravel, moist. Rec. = 1.8 ft (AASHTO M145 Classification: A-4.)	4-5-4-5 (9)	9.6	30.1	31.7	38.2	NP	NP
4-6	S3	(4' to 6'): Medium dense, gray SILT & CLAY, some fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)	4-6-11-12 (17)	11.7	31.1	24.5	44.4	24	6
6-7	S4	(6' to 8'): Medium dense, gray SILT & CLAY and fine to coarse SAND, trace fine Gravel, trace Glass, wet. Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)	6-7-11-12 (18)	19.7	15.1	30.4	54.5	27	5
7-11	S5	(8' to 10'): Dense, gray SILT & CLAY and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft	5-33-11-12 (44)	11.3	Testing Not Performed				
14-16	S6	(14' to 16'): Medium dense, gray SILT & CLAY and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)	6-8-20-18 (28)	11.4	33.5	25.6	40.9	25	6
19-21	S7	(19' to 21'): Medium dense, gray SILT & CLAY and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft	5-9-13-15 (22)	11.9	Testing Not Performed				
24-26	S8	(24' to 26'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 0.3 ft	7-10-13-17 (23)	15.7	Testing Not Performed				
29-31	S9	(29' to 31'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.4 ft (AASHTO M145 Classification: A-4.)	7-11-13-16 (24)	12.8	29.5	25.5	45.0	25	6
34-36	S10	(34' to 36'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.3 ft	15-12-16-20 (28)	11.8	Testing Not Performed				
Hole stopped @ 36.0 ft Boring terminated at 36 feet deep with no refusal.									
Remarks: 1. Exploration locations were taped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by VHB. 2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. Unable to discern ground water elevation due to continuously adding water to the borehole during roller bit advance. 3. Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145. 4. Samples S2 and S4 were not sampled in accordance with ASTM D 1586 procedures (borehole was not advanced between consecutive samples). 5. Soil samples were tested by VTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs.									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _g is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-4</b>					
Bridge No. 93 over C&P Railroad Castleton BRF 015-2(10) (GeoDesign #750-09.14)		Page No.: 1 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations (1)		Date					
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)		Type: FJ SS	Date	Depth (ft)	Notes				
Date Started: 10/16/13 Date Finished: 10/17/13		I.D.: 4 in 2 in	10/17/13	See Remark 2					
VTSPG NAD83: N 403336.83 ft E 1452518.45 ft		Hammer Wt: 140 lb. 140 lb.							
Station: 19+28 Offset: 10.50		Hammer Fall: 30 in. 30 in.							
Ground Elevation: 388.9 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV C _g = -1.5							
Depth (ft)	Strat ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Blow ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0-2	S1	(0' to 2'): Medium dense, dark brown SILT, some fine to coarse Sand, some fine to coarse Gravel, trace Root Fibers/Wood, moist. Rec. = 0.6 ft (AASHTO M145 Classification: A-4.)	2-5-5-13 (10)	7.3	37.3	26.2	36.5	NP	NP
2-4	S2	(2' to 4'): Medium dense, brown fine to coarse SAND, some fine to coarse Gravel, some Silt, dry. Rec. = 1.8 ft (AASHTO M145 Classification: A-1-b.)	12-12-14-17 (26)	7.6	38.1	40.0	21.9	NP	NP
4-5	S3	(4' to 6'): Stiff, gray with dark gray seams, SILT & CLAY, trace fine Gravel, trace fine to coarse Sand, wet (dark seams higher plasticity). Rec. = 1.2 ft	4-5-5-30 (10)	30.5	1.5	0.9	97.6	Remark 11	
6-8	S4	(6' to 8'): Medium dense, gray SILT & CLAY, some fine to coarse Sand, little fine to coarse Gravel, wet (Top 3" similar description as S3). Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)	12-10-10-14 (20)	15.5	23.2	24.2	52.6	23	5
6-8	S5	(8' to 10'): Medium dense, gray SILT & CLAY, some fine to coarse Sand, little fine to coarse Gravel, wet. Rec. = 0.4 ft	6-6-8-14 (14)	11.2	Testing Not Performed				
14-16	S6	(14' to 16'): Medium dense, gray fine to coarse SAND, some fine to coarse Gravel, some Clayey Silt, wet. Rec. = 0.2 ft	6-8-11-15 (19)		Testing Not Performed				
19-21	S7	(19' to 21'): Medium dense, gray SILT and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)	6-10-12-15 (22)	12.4	30.4	27.3	42.3	NP	NP
24-26	S8	(24' to 26'): Medium dense, no recovery. Rec. = 0.0 ft	14-12-16-16 (28)		Testing Not Performed				
29-31	S9	(29' to 31'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.5 ft (AASHTO M145 Classification: A-4.)	7-9-12-19 (21)	12.1	23.2	26.6	50.2	26	6
34-36	S10	(34' to 36'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.0 ft	7-12-17-19 (29)	11.8	Testing Not Performed				
39-41	S11	(39' to 41'): Medium dense, gray SILT & CLAY and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.4 ft	6-9-15-18 (24)		Testing Not Performed				
44-46	S12	(44' to 46'): Dense, gray SILT, some fine to coarse Sand, some fine to coarse Gravel, wet. Rec. = 0.8 ft (AASHTO M145 Classification: A-4.)	8-12-18-21 (30)	11.2	30.2	26.0	43.8	NP	NP
49-51	S13	(49' to 51'): Dense, no recovery. Rec. = 0.0 ft	16-13-		Testing Not Performed				
Hole stopped @ 96.0 ft Boring terminated at 96 feet deep with no refusal.									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _g is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-4</b>					
Bridge No. 93 over C&P Railroad Castleton BRF 015-2(10) (GeoDesign #750-09.14)		Page No.: 2 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations (1)		Date					
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)		Type: FJ SS	Date	Depth (ft)	Notes				
Date Started: 10/16/13 Date Finished: 10/17/13		I.D.: 4 in 2 in	10/17/13	See Remark 2					
VTSPG NAD83: N 403336.83 ft E 1452518.45 ft		Hammer Wt: 140 lb. 140 lb.							
Station: 19+28 Offset: 10.50		Hammer Fall: 30 in. 30 in.							
Ground Elevation: 388.9 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV C _g = -1.5							
Depth (ft)	Strat ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Blow ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
18-24	S14	(59' to 61'): Dense, gray fine to coarse SAND, some Clayey Silt, wet. Rec. = 0.1 ft	18-24 (31)		Testing Not Performed				
60-61	S15	(64' to 65'): Hard, gray SILT & CLAY, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.3 ft (AASHTO M145 Classification: A-4.)	11-16-22-26 (38)	13.5	22.8	25.4	51.8	26	6
74-76	S16	(74' to 76'): Hard, gray SILT & CLAY, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.3 ft	10-13-19-22 (32)	17.2	Testing Not Performed				
84-86	S17	(84' to 86'): Refusal, gray Clayey SILT, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.1 ft (AASHTO M145 Classification: A-4.)	12-17-22-25 (39)	13.6	12.8	21.9	65.3	20	3
94-96	S18	(94' to 96'): Very dense, gray Clayey SILT, some fine to coarse Sand, little fine Gravel, wet. Rec. = 1.3 ft	18-30-50/2 (R)	9.7	Testing Not Performed				
Hole stopped @ 96.0 ft Boring terminated at 96 feet deep with no refusal.									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _g is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138borlog.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: GEODESIGN  
BORING LOGS (2 OF 4)

PLOT DATE: 9/19/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 37 OF 82



STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-4</b>					
Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)		Page No.: 3 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations (1)							
Boring Crew: J. Leonhardt (TransTech), J. Gilman (GeoDesign)		Type: FJ SS							
Date Started: 10/16/13 Date Finished: 10/17/13		I.D.: 4 in 2 in							
VTSPG NAD83: N 403336.83 ft E 1452518.45 ft		Hammer Wt: 140 lb. 140 lb.							
Station: 19+28 Offset: 10.50		Hammer Fall: 30 in. 30 in.							
Ground Elevation: 388.9 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV C _g = -1.5							
Depth (ft)	Strat ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Blow ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
Remarks: 1. Exploration locations were taped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by VHB. 2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. Unable to discern ground water elevation due to continuously adding water to the borehole during roller bit advance. 3. Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145. 4. Samples S2 and S4 were not sampled in accordance with ASTM D 1586 procedures (borehole was not advanced between consecutive samples). 5. Driller advanced casing to 9 feet deep and then open hole below 9 feet deep. 6. At end of day on 10/16/13, borehole advanced to 46 feet deep. 7. Borehole caved to approximately 25 feet deep overnight. Driller advanced casing to 19 feet deep and cleaned out to resume advance. 8. Driller noted rig chatter when advancing roller bit 48 to 49 feet deep, and 71 to 71.5 feet deep (possible cobble/gravel). 9. Driller drove split spoon samples S15 and S16 and waited 5 minutes to withdraw to improve recovery. 10. Soil samples were tested by VTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs. 11. While cohesive soils were present in sample S3 at 4' deep, not enough was available to perform Atterberg Limits testing.									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _g is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-6</b>					
Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)		Page No.: 1 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations (1)							
Boring Crew: Leonhardt (TransTech), JDG/JFW (GeoDesign)		Type: FJ SS							
Date Started: 10/22/13 Date Finished: 10/24/13		I.D.: 4 in 2 in							
VTSPG NAD83: N 403359.36 ft E 1452541.92 ft		Hammer Wt: 140 lb. 140 lb.							
Station: 19+54 Offset: 8.30		Hammer Fall: 30 in. 30 in.							
Ground Elevation: 413.4 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV C _g = -1.5							
Depth (ft)	Strat ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Blow ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
Existing Bridge Deck (Approx). Air Space Between Bridge Deck and Ground Surface (See Remark 4).									
S1 (13' to 15'): Very loose, tan brown fine to coarse SAND, some Silt, little fine to coarse Gravel, trace Asphalt, dry. Rec. = 0.8 ft (AASHTO M145 Classification: A-2-4.)									
S2 (15' to 17'): Loose, tan brown SILT, some fine to coarse Sand, little fine Gravel, little Asphalt, dry. Rec. = 1.0 ft (AASHTO M145 Classification: A-4.)									
S3 (17' to 19'): Very loose, brown fine to coarse SAND, some Silt, little fine to coarse Gravel, wet. Rec. = 0.5 ft (AASHTO M145 Classification: A-1-b.)									
S4 (19' to 21'): Loose, tan brown SILT and fine to coarse SAND, little fine Gravel, wet. Rec. = 0.8 ft (AASHTO M145 Classification: A-4.)									
S5 (21' to 23'): Loose, (Top 10") similar description as S4; (Bottom 12") tan brown with reddish layers Clayey SILT, trace fine to medium Sand, wet. Rec. = 1.8 ft (AASHTO M145 Classification: A-4.)									
S6 (24' to 26'): Medium, gray with dark gray layers, SILT & CLAY, trace fine to coarse Sand, trace fine Gravel, wet. Rec. = 2.0 ft (AASHTO M145 Classification: A-4.)									
S7 (29' to 31'): Medium dense, gray Clayey SILT and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 0.7 ft									
S8 (34' to 36'): Medium dense, gray fine to coarse SAND, some Silt, some fine to coarse Gravel, wet. Rec. = 0.3 ft (AASHTO M145 Classification: A-2-4.)									
S9 (39' to 41'): Medium dense, gray Clayey SILT and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.1 ft (AASHTO M145 Classification: A-4.)									
S10 (44' to 46'): Dense, gray layered Clayey SILT (grading locally to SILT & CLAY) and fine to coarse SAND, little fine to coarse Gravel (occasionally decomposed), wet. Rec. = 0.75 ft									
S11 (49' to 51'): Medium dense, gray SILT & CLAY (grading locally to Clayey Silt)									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _g is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: <b>B-6</b>					
Bridge No. 93 over C&P Railroad Castleton BR# 015-2(10) (GeoDesign #750-09.14)		Page No.: 2 of 3		Pin No.: 12b138					
Checked By: SPK		Groundwater Observations (1)							
Boring Crew: Leonhardt (TransTech), JDG/JFW (GeoDesign)		Type: FJ SS							
Date Started: 10/22/13 Date Finished: 10/24/13		I.D.: 4 in 2 in							
VTSPG NAD83: N 403359.36 ft E 1452541.92 ft		Hammer Wt: 140 lb. 140 lb.							
Station: 19+54 Offset: 8.30		Hammer Fall: 30 in. 30 in.							
Ground Elevation: 413.4 ft		Hammer/Rod Type: Auto/NWJ							
		Rig: CME 550X ATV C _g = -1.5							
Depth (ft)	Strat ⁽¹⁾	CLASSIFICATION OF MATERIALS (Description)	Blow ⁽²⁾ (N Value) ⁽³⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.5 ft									
S12 (59' to 61'): Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 0.83 ft (AASHTO M145 Classification: A-4.)									
S13 (69' to 71'): Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse SAND, some fine to coarse Gravel, wet. Rec. = 1.33 ft									
S14 (78' to 81'): Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse Sand, little fine to coarse Gravel, wet. Rec. = 1.17 ft (AASHTO M145 Classification: A-4.)									
S15 (89' to 91'): Dense, gray SILT & CLAY (grading locally to Clayey SILT) and fine to coarse SAND, little fine to coarse Gravel, wet. Rec. = 1.0 ft									
Hole stopped @ 91.0 ft Boring terminated at 91 feet deep with no refusal.									
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. C _g is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

PROJECT NAME: CASTLETON  
PROJECT NUMBER: BR# 015-2(10)

FILE NAME: z12b138borlog.dgn  
PROJECT LEADER: BR# 015-2(10)  
DESIGNED BY: GEODESIGN  
BORING LOGS (3 OF 4)

PLOT DATE: 9/19/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 38 OF 82





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

**BORING LOG**

Bridge No. 93 over C&P Railroad  
Castleton BR# 015-2(10)  
(GeoDesign #750-09.14)

Boring No.: **B-6**  
Page No.: 3 of 3  
Pin No.: 12b138  
Checked By: SPK

Boring Crew: Leonhardt (TransTech), JDG/JFW (GeoDesign)  
Date Started: 10/22/13 Date Finished: 10/24/13  
VTSPG NAD83: N 403359.36 ft E 1452541.92 ft  
Station: 19+54 Offset: 8.30  
Ground Elevation: 413.4 ft

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

Groundwater Observations⁽¹⁾  
Date Depth (ft) Notes  
10/24/13 See Remark 2

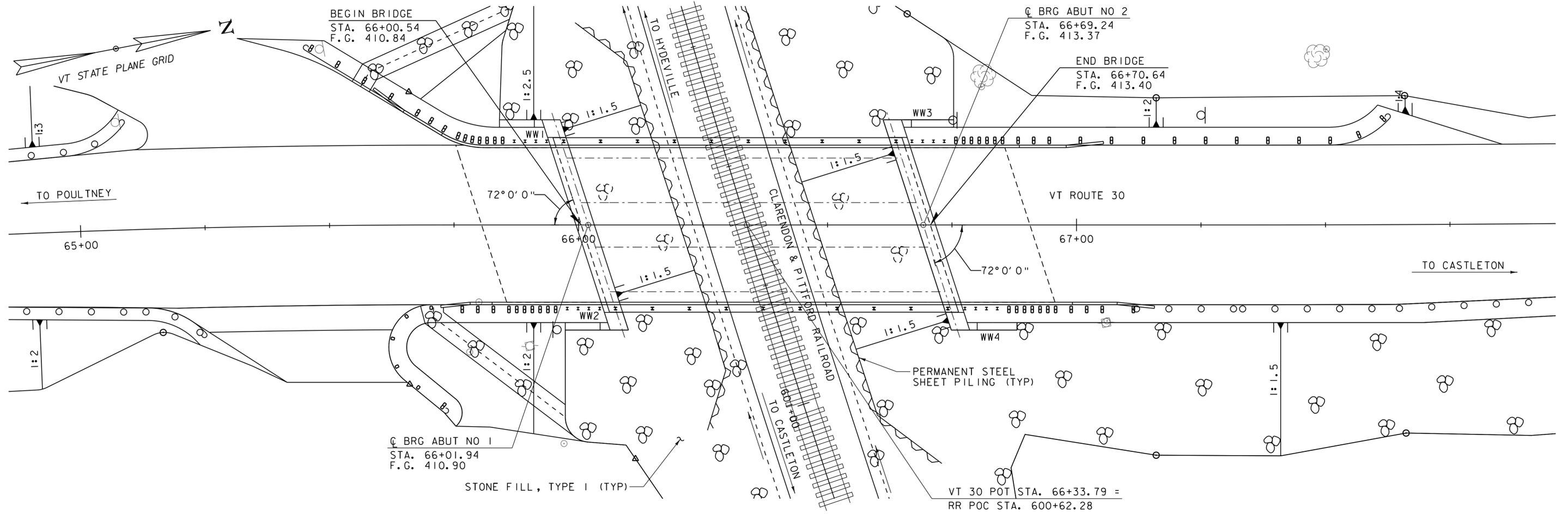
Depth (ft)	Strata ⁽²⁾	CLASSIFICATION OF MATERIALS (Description)	Blows/ft ⁽³⁾ (N Value) ⁽⁴⁾	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
105		Remarks: 1. Exploration locations were taped in the field by GeoDesign. Elevations were estimated based on topographic plan provided by VHB. 2. Sample moisture descriptions may not accurately reflect in-situ conditions due to wash-drive drilling methods. Unable to discern ground water elevation due to continuously adding water to the borehole during roller bit advance. 3. Samples S2 and S4 were not sampled in accordance with ASTM D 1586 procedures (borehole was not advanced between consecutive samples). 4. Boring was drilled through 6 inch core hole (performed by VTrans 10/16/13) and depths are were measured from the bridge deck. Distance from deck to ground surface below was 13 feet. 5. At end of day on 10/22/13, borehole advanced to 41 feet deep. 6. After sampling S13 at 69' deep noted rods beginning to bind on inferred cobbles between 50' and 60' deep. Driller advanced casing to 60' deep prior to continuing with borehole advance to S14 at 79' deep. 7. At end of day on 10/23/13, borehole advanced to 91 feet deep. 8. Soil samples were tested by VTrans soil laboratory and results were transmitted to GeoDesign for incorporation into boring logs.							
110									
115									
120									
125									
130									
135									
140									
145									

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

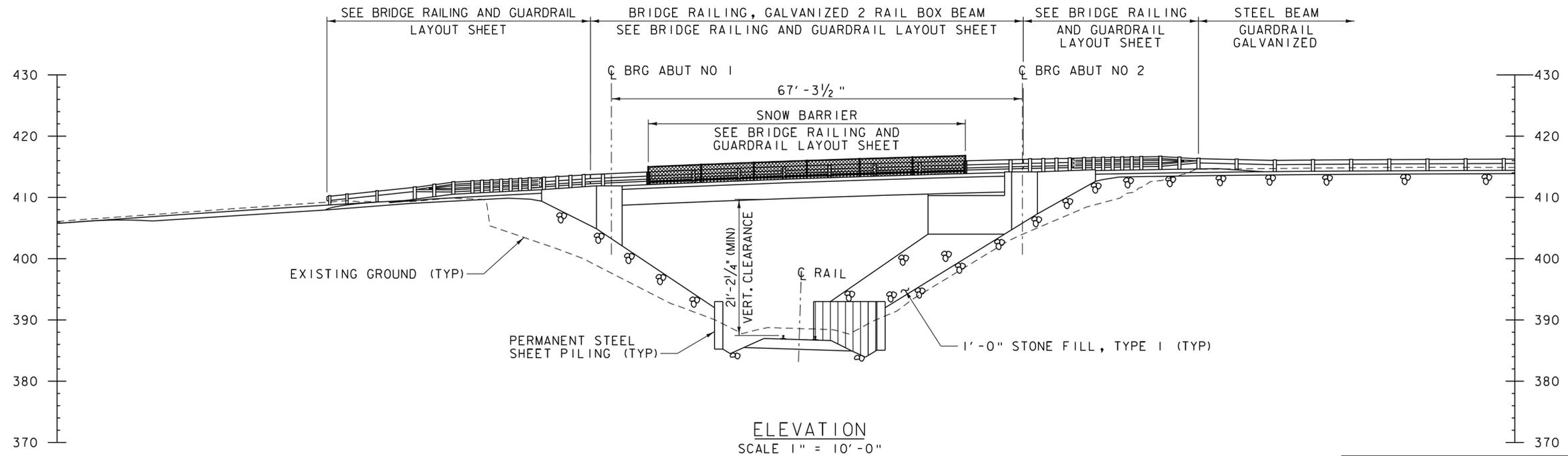
GEODESIGN BORING LOG 750-09.14-CASTLETON BR# 015-2(10).GPJ VERMONT AOT.GDT 12/4/13

PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BR# 015-2(10)	DRAWN BY: E.A. FIALA
FILE NAME: z12b138borlog.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: BR# 015-2(10)	SHEET 39 OF 82
DESIGNED BY: GEODESIGN	
BORING LOGS (4 OF 4)	



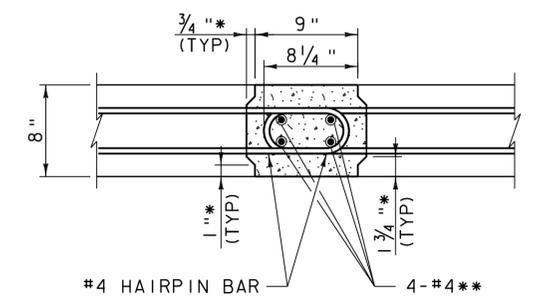
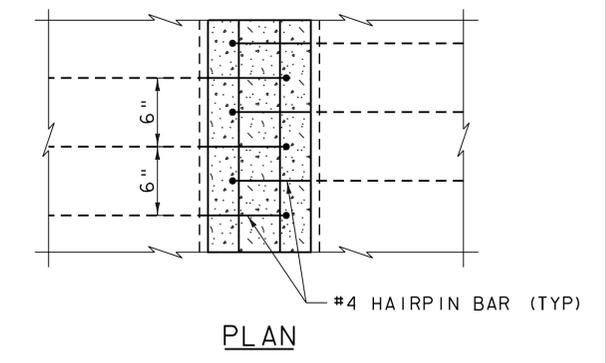
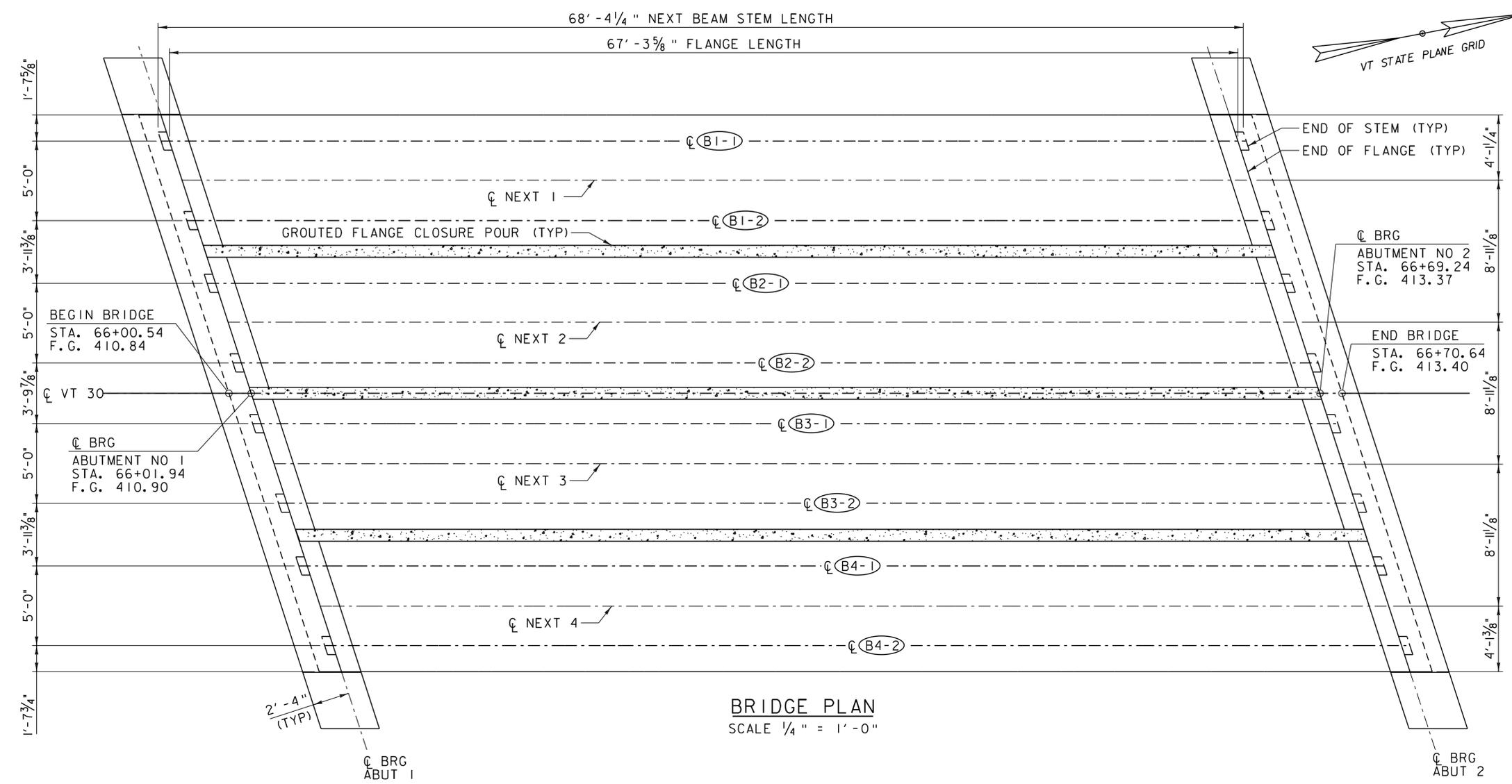
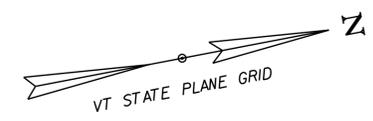


PLAN  
 SCALE 1" = 10'-0"



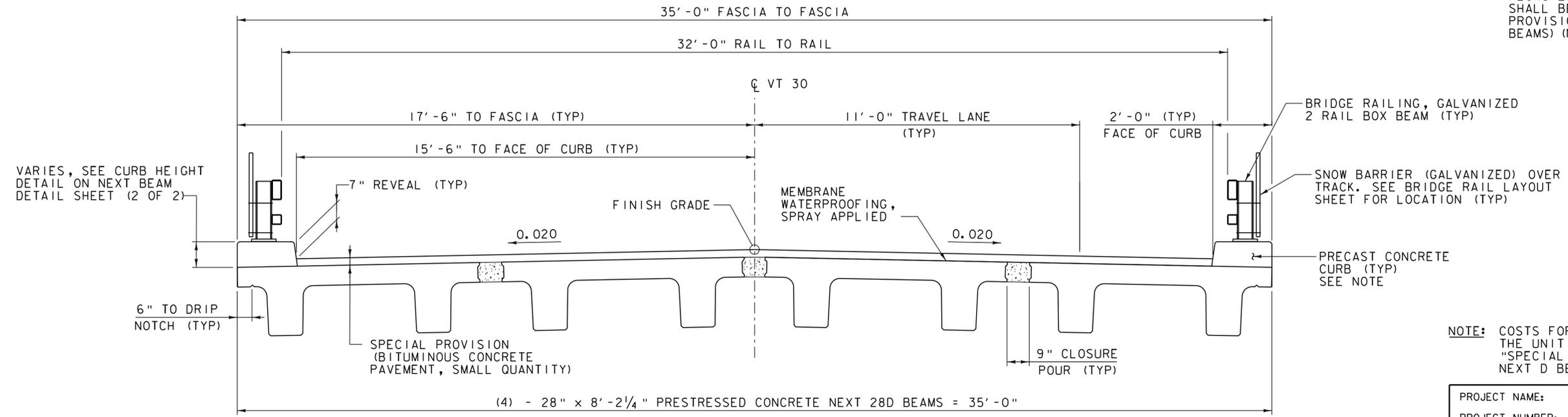
PROJECT NAME:	CASTLETON	PLOT DATE:	9/21/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	E.A. FIALA
FILE NAME:	z12b138pe.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	SHEET	40 OF 82
DESIGNED BY:	E.A. FIALA		
PLAN AND ELEVATION			





FLANGE CONNECTION DETAILS  
SCALE 1/2" = 1'-0"

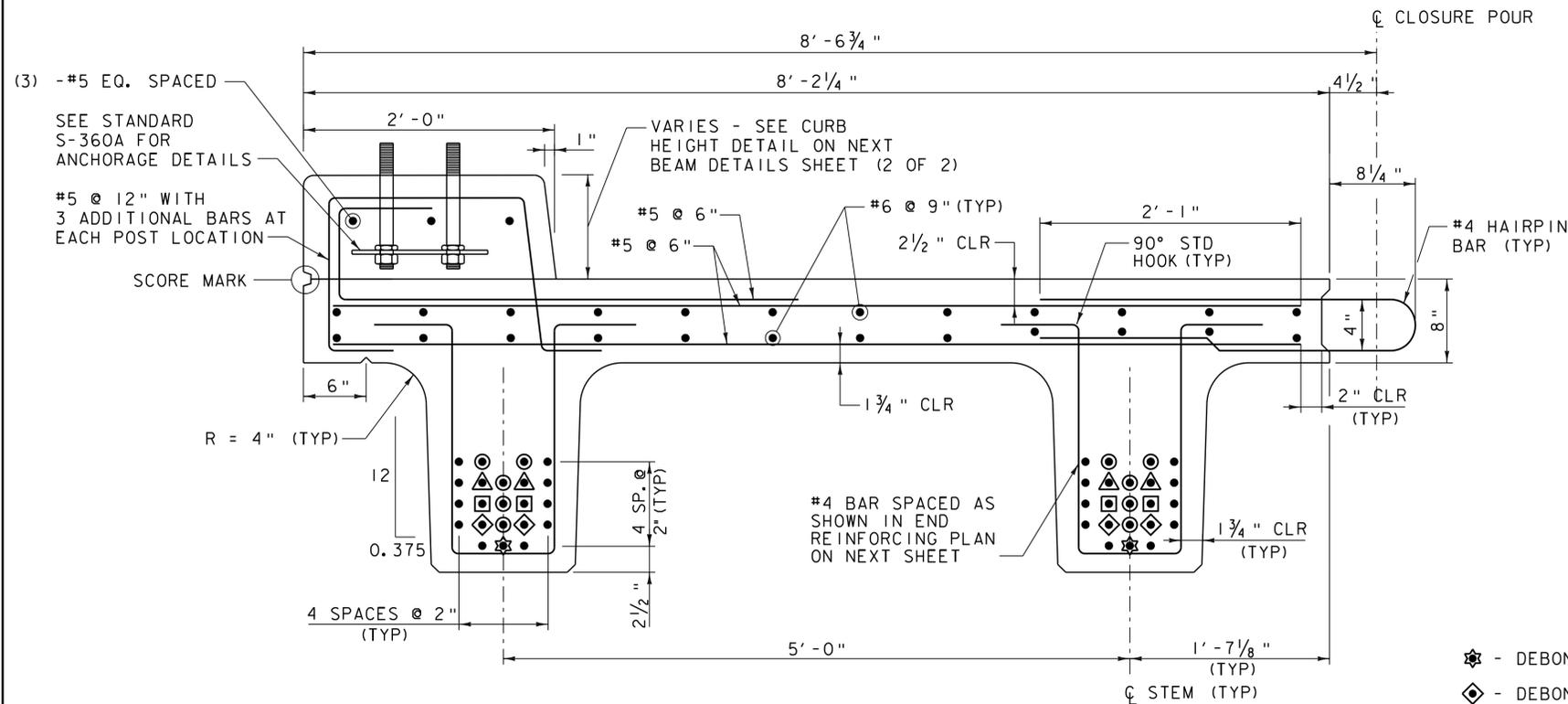
- = SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)
- * DIMENSIONS ARE TO KEY IN JOINT
- ** FOUR #4 BARS SHALL BE PLACED AS SHOWN ALONG ENTIRE LENGTH OF JOINT. PAYMENT SHALL BE INCIDENTAL TO "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS) (NEXT 28D)".



NOTE: COSTS FOR PRECAST CURB TO BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 900.640, "SPECIAL PROVISION (PRESTRESSED CONCRETE NEXT D BEAMS) (NEXT 28 D)".

PROJECT NAME:	CASTLETON	PLOT DATE:	9/21/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	M.C. SCOTT
FILE NAME:	z12bl38sup.dgn	DESIGNED BY:	E.A. FIALA
PROJECT LEADER:	S.E. BURBANK	CHECKED BY:	S.E. BURBANK
BRIDGE FRAMING PLAN		SHEET	41 OF 82

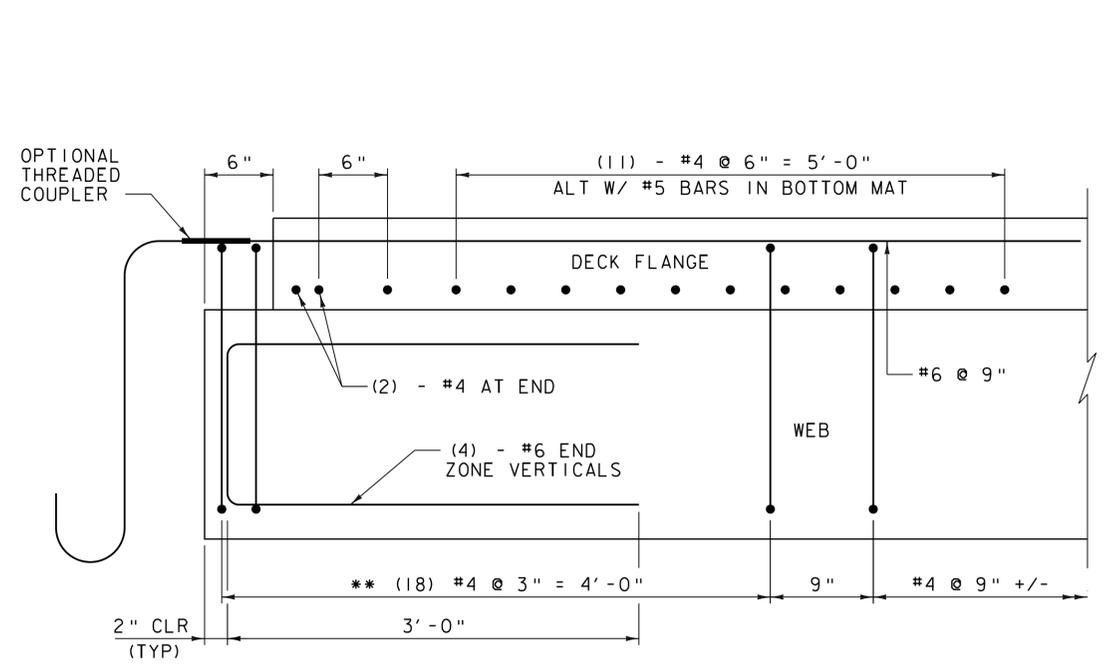




NOTE: CONTRACTOR TO PROVIDE THREADED INSERT IN NEXT BEAM FOR FLANGE CONNECTION. THREADED INSERT SHALL BE DESIGNED BY THE CONTRACTOR. (NOT SHOWN FOR CLARITY.)

**NEXT 1 & 4**

(BEAM 1 SHOWN, BEAM 4 HAS CURB OPPOSITE HAND)  
SCALE 1/2" = 1'-0"



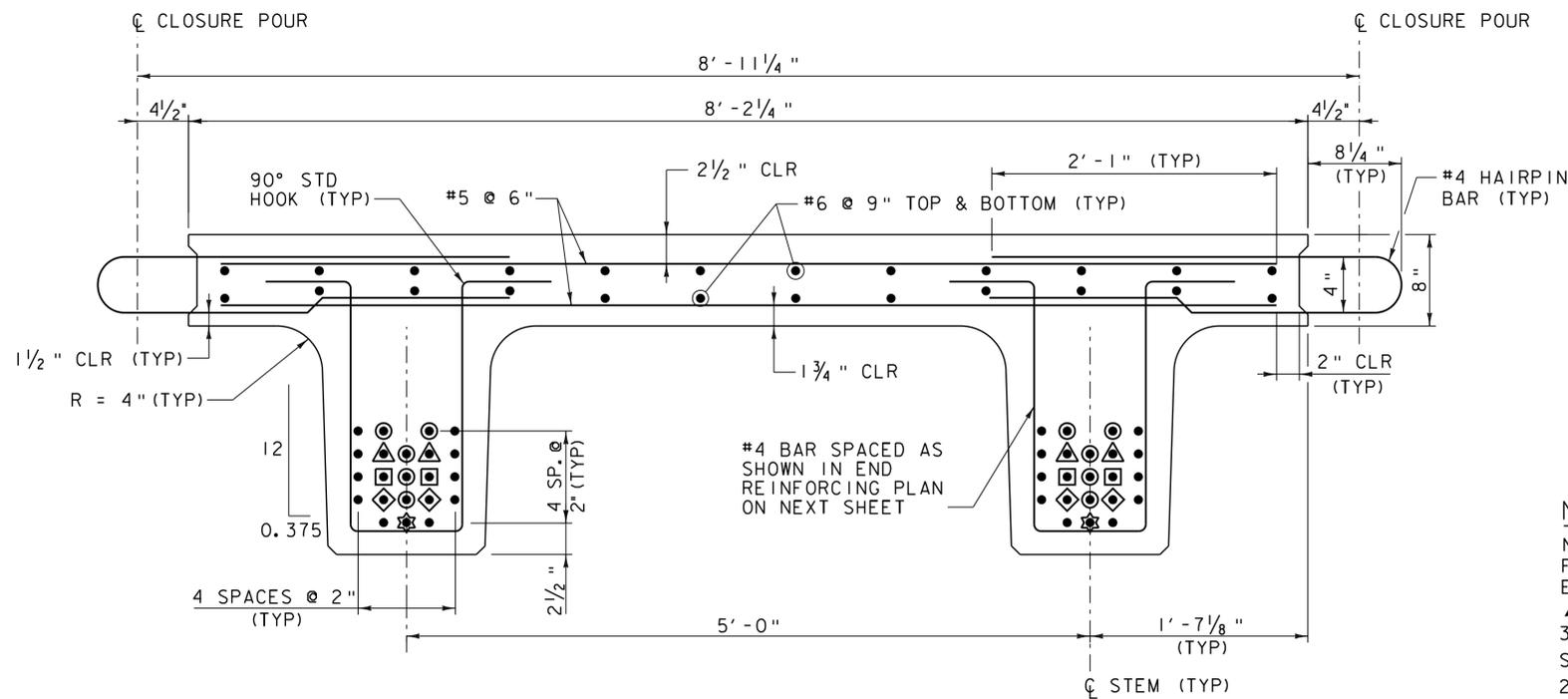
**ADDITIONAL END BEAM REINFORCING**

**LONGITUDINAL SECTION**

BARS IN DECK FLANGE OMITTED FOR CLARITY

SCALE 1/2" = 1'-0"

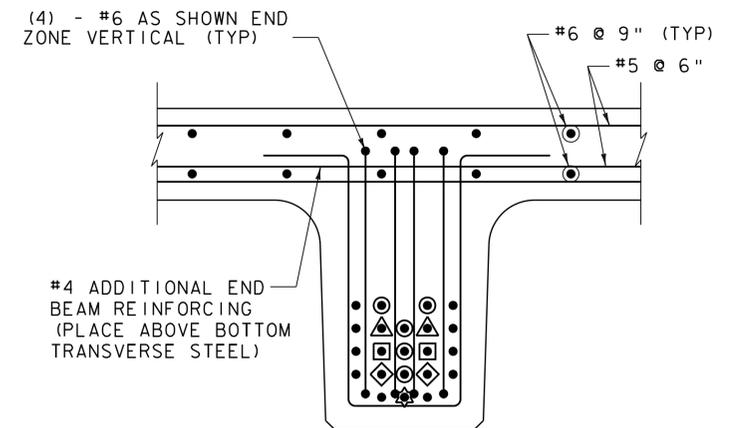
- ⊛ - DEBONDED 10'
- ◆ - DEBONDED 8'
- ◻ - DEBONDED 6'
- ▲ - DEBONDED 4'
- - DEBONDED 6"



NOTE: CONTRACTOR TO PROVIDE THREADED INSERT IN NEXT BEAM FOR FLANGE CONNECTION. THREADED INSERT SHALL BE DESIGNED BY THE CONTRACTOR. (NOT SHOWN FOR CLARITY.)

**NEXT 2 & 3**

SCALE 1/2" = 1'-0"



**END SECTION**

SCALE 1/2" = 1'-0"

**NOTE:**

NF = NEAR FACE  
FF = FAR FACE  
EF = EACH FACE  
▲ = CUT TO FIT IN FIELD  
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

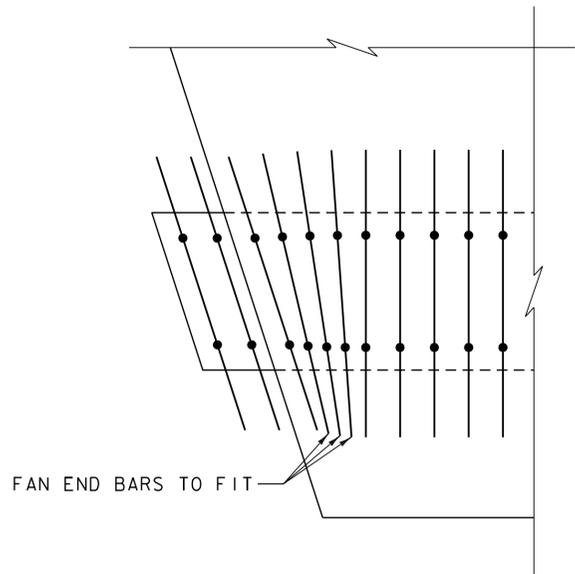
NOTE: SEE NEXT SHEET FOR SKEWED END DETAIL.

PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12bi38sup.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
NEXT BEAM DETAILS (1 OF 2)

PLOT DATE: 9/21/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 42 OF 82

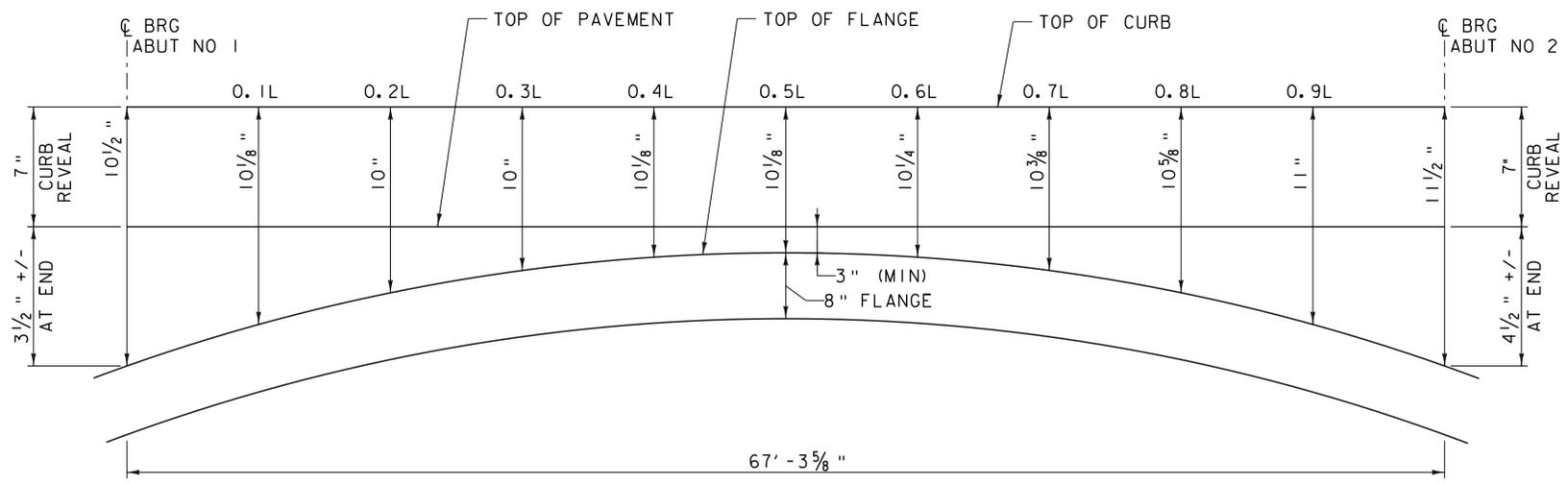




**SKEWED END DETAIL**  
SCALE 1/2" = 1'-0"

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

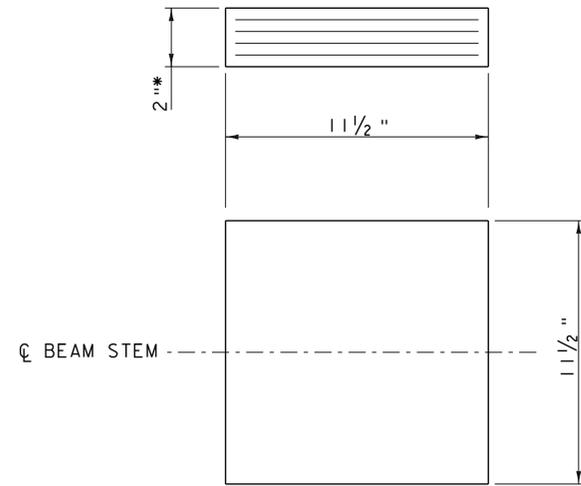
- NOTE:**
- NF = NEAR FACE
  - FF = FAR FACE
  - EF = EACH FACE
  - ▲ = CUT TO FIT IN FIELD
  - 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
  - 2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.



**CURB HEIGHT DETAIL**  
NOT TO SCALE  
(BEAM 1 SHOWN, BEAM 4 SIMILAR BY 180° ROTATION)

PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: M.C. SCOTT
FILE NAME: z12b138sup.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: S.E. BURBANK	SHEET 43 OF 82
DESIGNED BY: E.A. FIALA	
NEXT BEAM DETAILS (2 OF 2)	

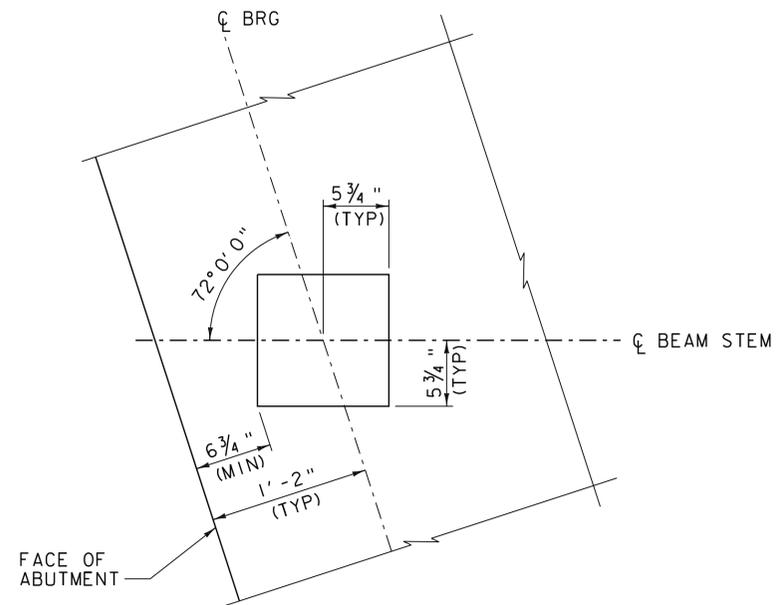




- * 2 - 1/8" EXTERIOR LAYERS OF ELASTOMER
- 3 - 1/2" INTERIOR LAYERS OF ELASTOMER
- 4 - 1/16" STEEL REINFORCING PLATES

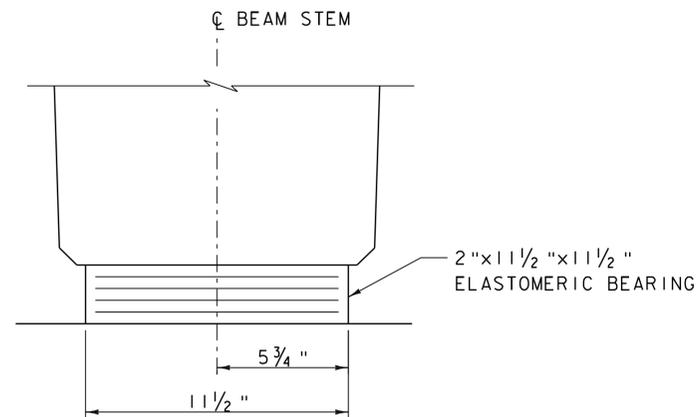
**ELASTOMERIC BEARING DETAIL**

SCALE 3" = 1'-0"

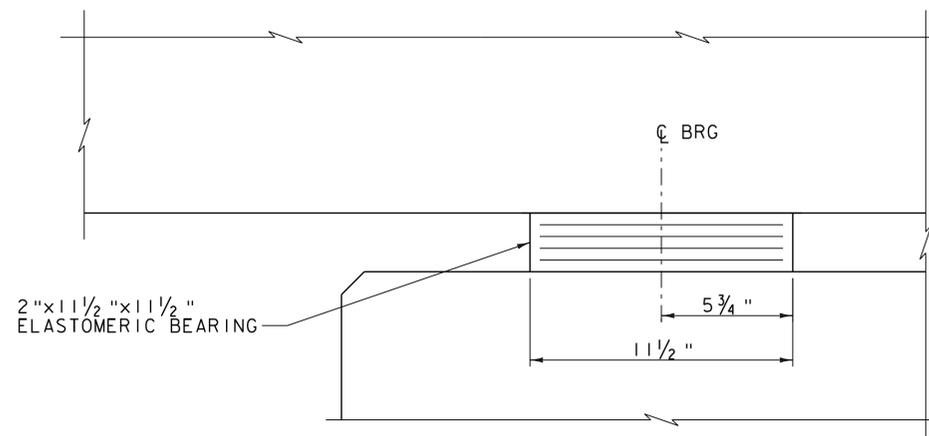


**PLAN**

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



**FRONT ELEVATION**



**SIDE ELEVATION**

**ELASTOMERIC BEARING DETAILS**

SCALE 3" = 1'-0"

**BEARING NOTES**

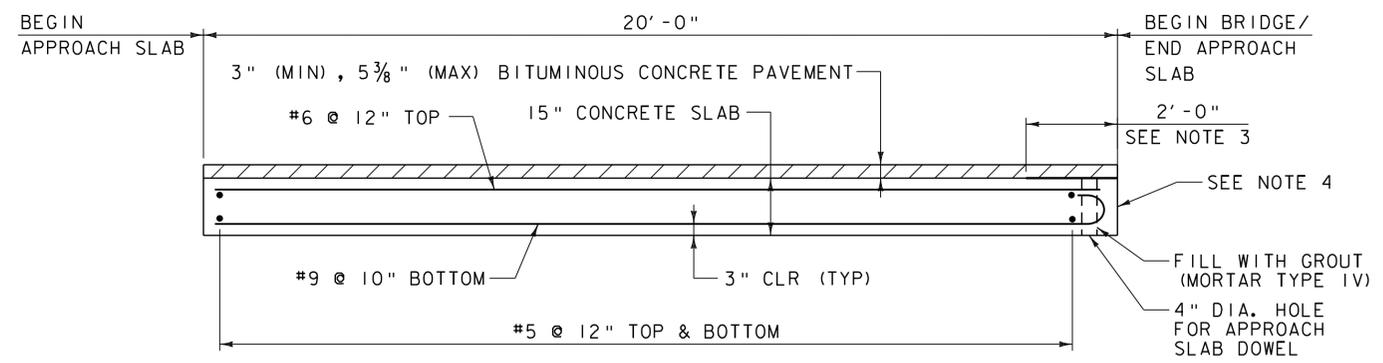
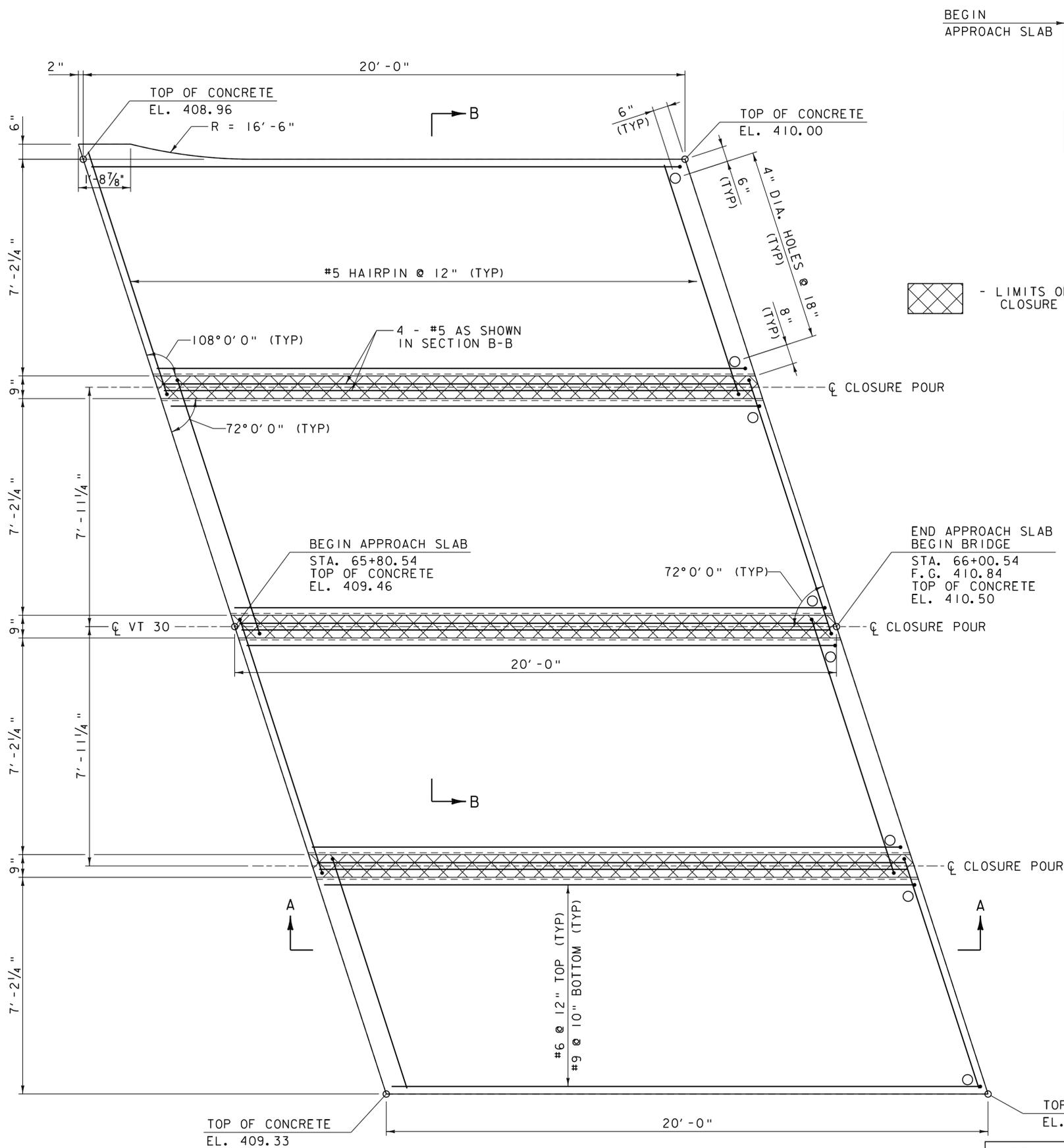
1. BEARINGS SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF SECTIONS 531 AND 731.
2. ALL REINFORCEMENT BETWEEN LAYERS OF ELASTOMER SHALL BE STEEL MEETING THE REQUIREMENTS OF SUBSECTION 714.02. ALL INTERNAL STEEL PLATES SHALL BE SAND BLASTED AND FREE OF COATINGS, RUST, AND MILL SCALE. THE PLATES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. STEEL REINFORCED ELASTOMERIC BEARINGS SHALL HAVE A MINIMUM 1/8" EDGE SEAL OF ELASTOMER INTEGRAL WITH BEARING OVER ALL INTERNAL PLATES.
4. THE ELASTOMER SHALL BE GRADE 60 SHORE A DUROMETER.
5. THE CONCRETE UNDER THE BEARING DEVICE SHALL BE LEVEL.
6. THE CONTRACTOR IS ADVISED TO HAVE A MINIMUM OF 16 - 1/4" x 1 1/2" x 1 1/2" GALVANIZED STEEL SHIMS AVAILABLE FOR USE FOR ELEVATION ADJUSTMENTS UPON THE SETTING OF THE SUPERSTRUCTURE UNITS. THE SHIMS SHALL BE FABRICATED ACCORDING TO SECTION 531 AND PAYMENT SHALL BE INCLUDED UNDER ITEM 531.17, "BEARING DEVICE ASSEMBLY, STEEL REINFORCED ELASTOMERIC PAD".

PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138brg.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
BEARING DETAILS

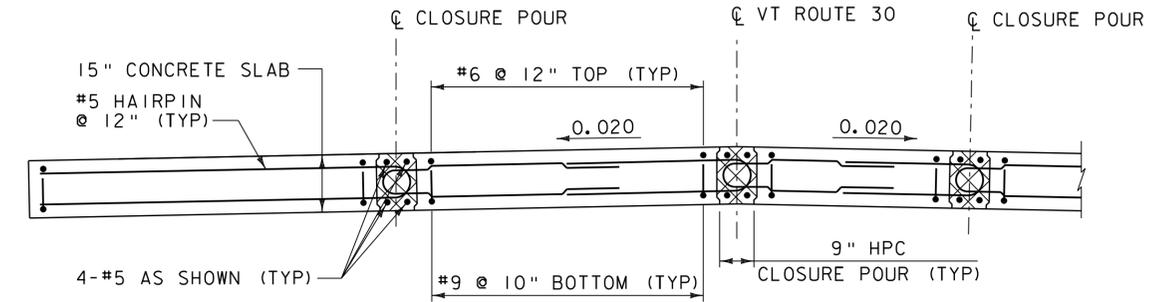
PLOT DATE: 9/19/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 44 OF 82



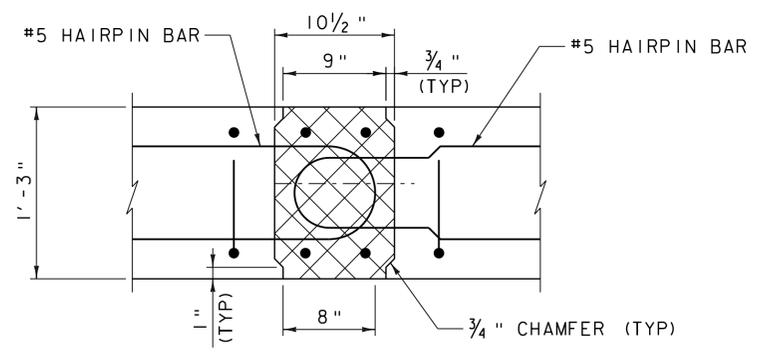


SECTION A-A  
SCALE 1/2" = 1'-0"

LIMITS OF HPC CLOSURE POUR



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



JOINT DETAIL  
SCALE 1 1/2" = 1'-0"

**NOTE:**  
 NF = NEAR FACE  
 FF = FAR FACE  
 EF = EACH FACE  
 ▲ = CUT TO FIT IN FIELD  
 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
 2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

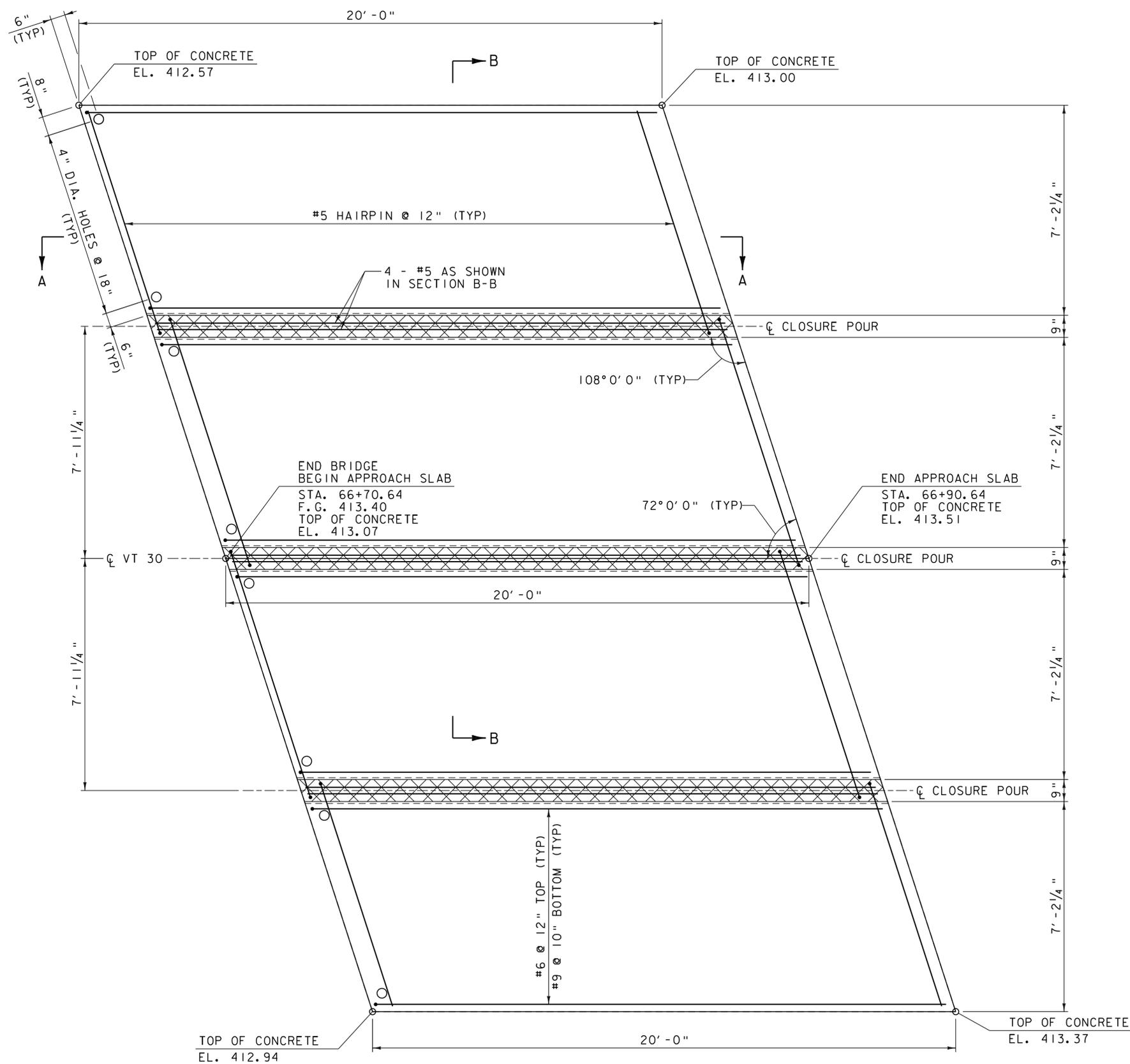
- NOTES:**
- LIFTING POINTS IN APPROACH SLABS TO BE LOCATED BY PRECASTER.
  - CONTRACTOR SHALL INCLUDE IN THE FABRICATION DRAWINGS THE METHOD AND DETAILS FOR ESTABLISHING CONTINUOUS CONTACT WITH SUBGRADE AND SUPPORT FOR PRECAST APPROACH SLABS.
  - MEMBRANE WATERPROOFING, SPRAY APPLIED SHALL BE APPLIED 2'-0" ONTO APPROACH SLAB FROM BEGIN/END BRIDGE.
  - FRONT FACE OF APPROACH SLAB SHALL BE VERTICAL WHEN PLACED ON APPROACH SLAB SEAT.
  - BURIED FRONT FACE OF PRECAST CONCRETE CURB AT APPROACH SLAB SHALL BE VERTICAL BELOW PAVEMENT TO AVOID CONFLICT WITH APPROACH SLAB.

APPROACH SLAB NO. 1 PLAN  
SCALE 1/2" = 1'-0"

REV.	DESCRIPTION	DATE
1	CONTRACTOR-FABRICATED PRECAST	12/01/2014

**VHB** Vanasse Hangen Brustlin, Inc.

PROJECT NAME: CASTLETON	PLOT DATE: 12/1/2014
PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: E.A. FIALA
FILE NAME: z12b138slab.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: S.E. BURBANK	SHEET 45 OF 82
DESIGNED BY: E.A. FIALA	
PRECAST APPROACH SLABS (1 OF 2)	



**NOTE:**

- NF = NEAR FACE
- FF = FAR FACE
- EF = EACH FACE
- ▲ = CUT TO FIT IN FIELD
- 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- 2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

- LIMITS OF HPC CLOSURE POUR

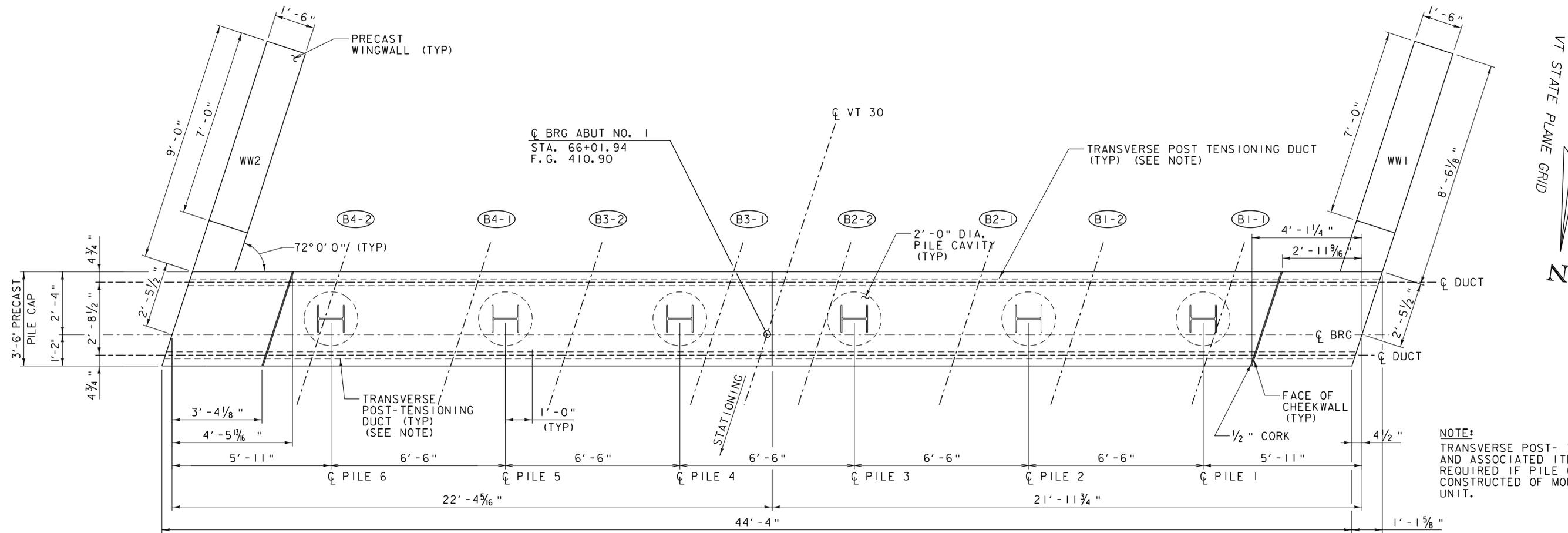
**NOTES:**

1. LIFTING POINTS IN APPROACH SLABS TO BE LOCATED BY PRECASTER.
2. CONTRACTOR SHALL INCLUDE IN THE FABRICATION DRAWINGS THE METHOD AND DETAILS FOR ESTABLISHING CONTINUOUS CONTACT WITH SUBGRADE AND SUPPORT FOR PRECAST APPROACH SLABS.
3. MEMBRANE WATERPROOFING, SPRAY APPLIED SHALL BE APPLIED 2'-0" ONTO APPROACH SLAB FROM BEGIN/END BRIDGE.
4. FRONT FACE OF APPROACH SLAB SHALL BE VERTICAL WHEN PLACED ON APPROACH SLAB SEAT.
5. BURIED FRONT FACE OF PRECAST CONCRETE CURB AT APPROACH SLAB SHALL BE VERTICAL BELOW PAVEMENT TO AVOID CONFLICT WITH APPROACH SLAB.
6. SEE PRECAST APPROACH SLAB (1 OF 2) FOR JOINT DETAIL, SECTION A-A, AND SECTION B-B.

APPROACH SLAB NO 2 PLAN  
SCALE 1/2" = 1'-0"

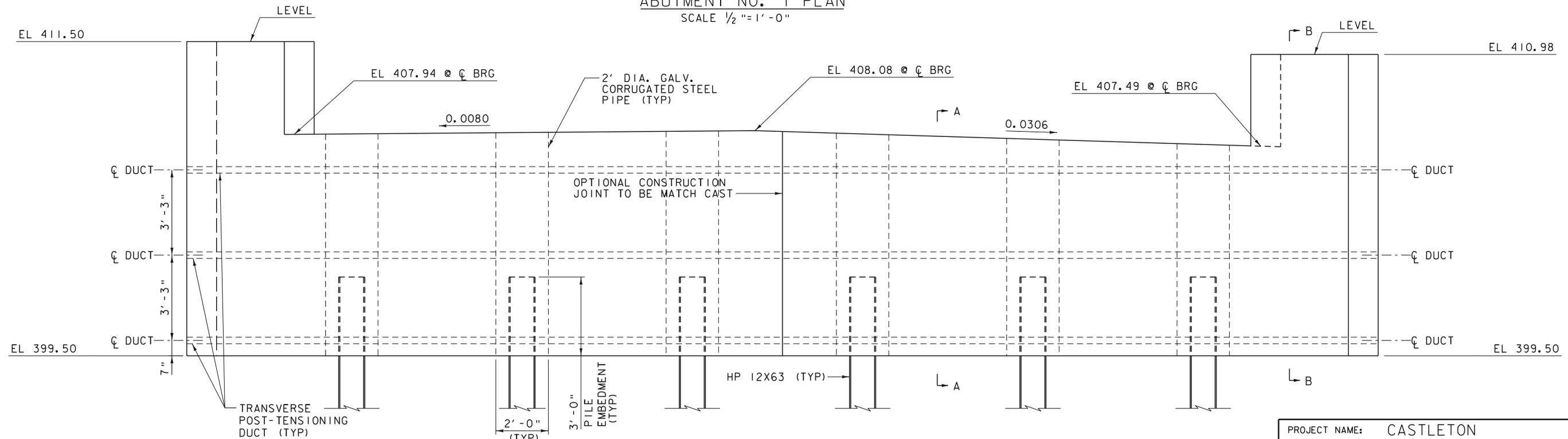


REV.	DESCRIPTION	DATE
▲	CONTRACTOR-FABRICATED PRECAST	12/01/2014
PROJECT NAME: CASTLETON		
PROJECT NUMBER: BRF 015-2(10)		
FILE NAME: z12bl38slab.dgn		PLOT DATE: 12/1/2014
PROJECT LEADER: S.E. BURBANK		DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA		CHECKED BY: S.E. BURBANK
PRECAST APPROACH SLABS (2 OF 2)		SHEET 46 OF 82



**NOTE:**  
 TRANSVERSE POST-TENSIONING AND ASSOCIATED ITEMS ONLY REQUIRED IF PILE CAP IS CONSTRUCTED OF MORE THAN ONE UNIT.

**ABUTMENT NO. 1 PLAN**  
 SCALE 1/2" = 1'-0"

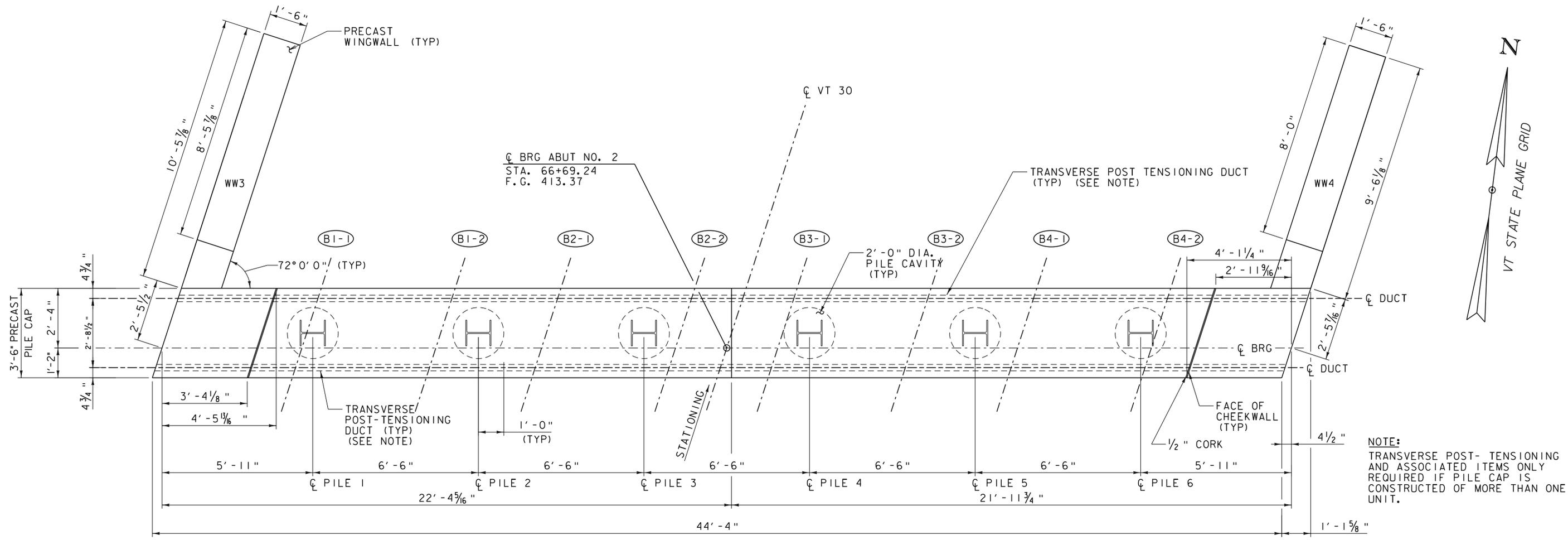


**ABUTMENT NO. 1 ELEVATION**  
 SCALE 1/2" = 1'-0"

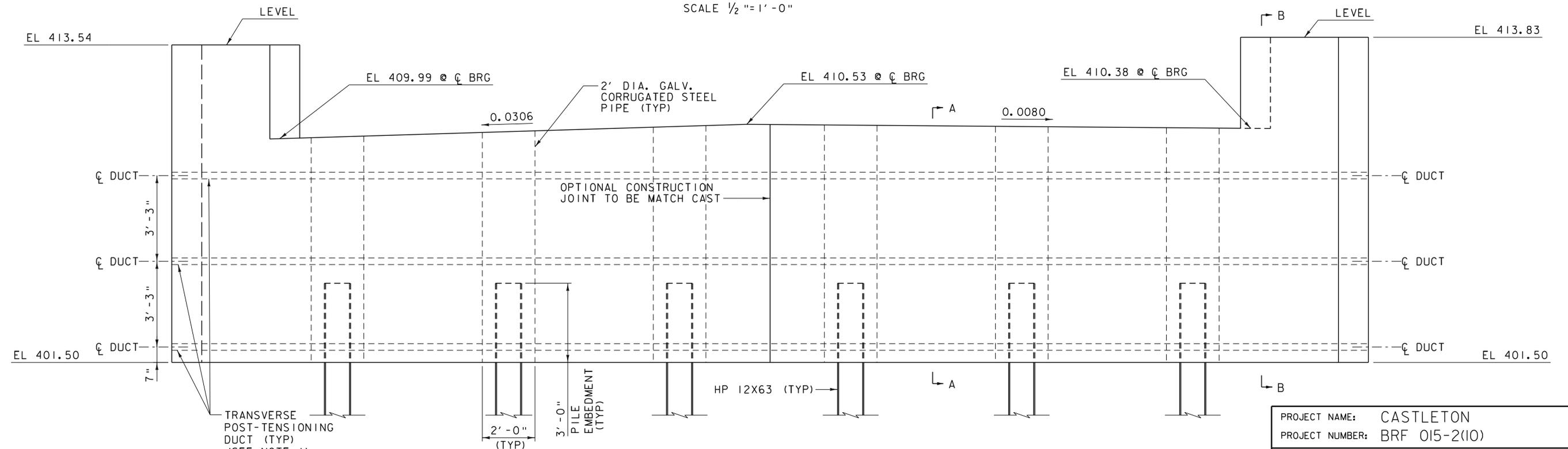
SEE ABUTMENT SECTIONS SHEET FOR SECTIONS A-A AND B-B.

PROJECT NAME:	CASTLETON	PLOT DATE:	9/19/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	M.C. SCOTT
FILE NAME:	z12b138sub.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	ABUTMENT NO 1 PLAN & ELEVATION	SHEET 47 OF 82
DESIGNED BY:	E.A. FIALA		





ABUTMENT NO. 2 PLAN  
SCALE 1/2" = 1'-0"



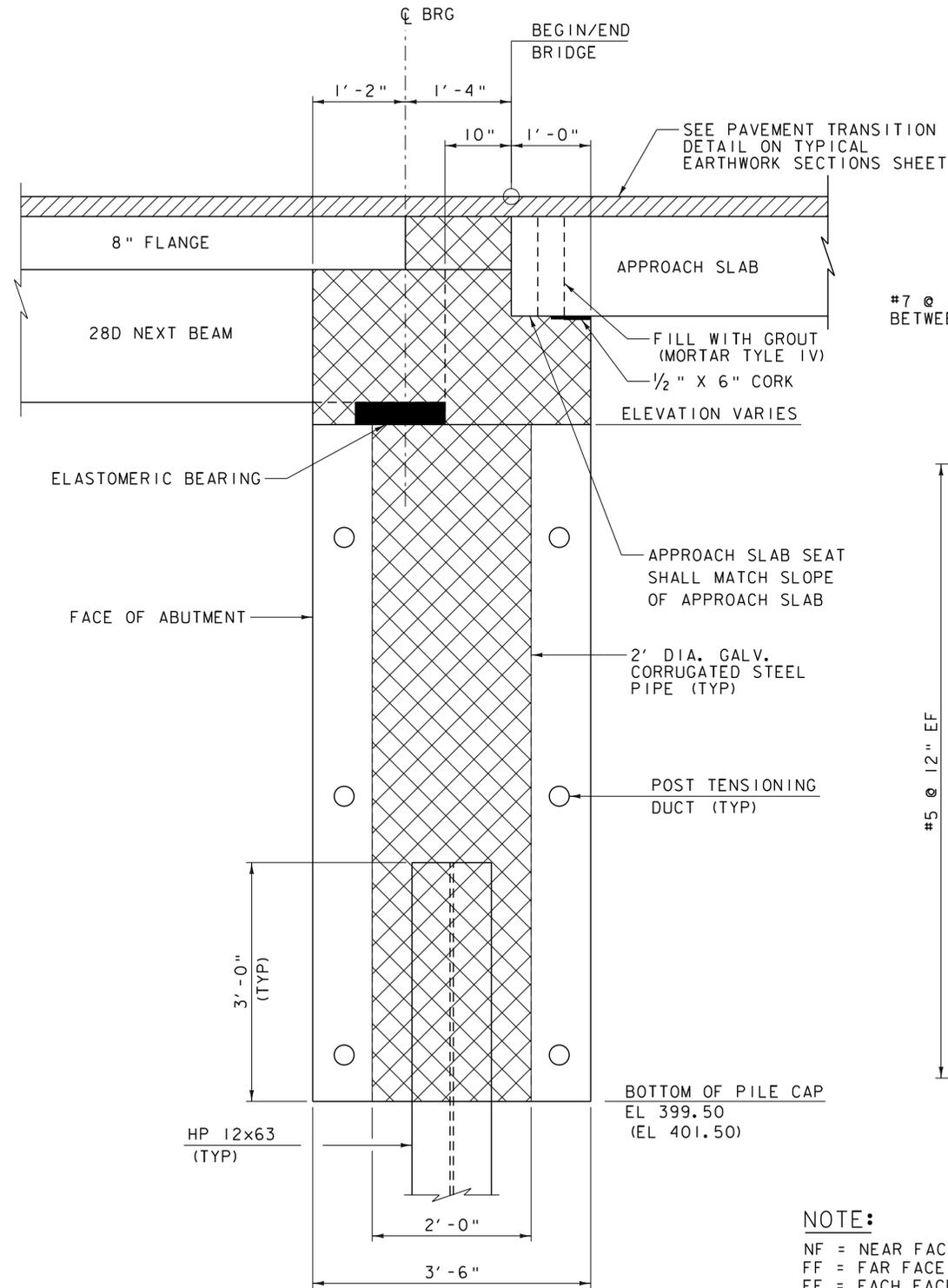
ABUTMENT NO. 2 ELEVATION  
SCALE 1/2" = 1'-0"  
SEE ABUTMENT SECTIONS SHEET FOR SECTIONS A-A AND B-B.



PROJECT NAME:	CASTLETON	PLOT DATE:	9/19/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	M.C. SCOTT
FILE NAME:	z12b138sub.dgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	DESIGNED BY:	E.A. FIALA
DESIGNED BY:	E.A. FIALA	ABUTMENT NO 2 PLAN & ELEVATION	SHEET 48 OF 82

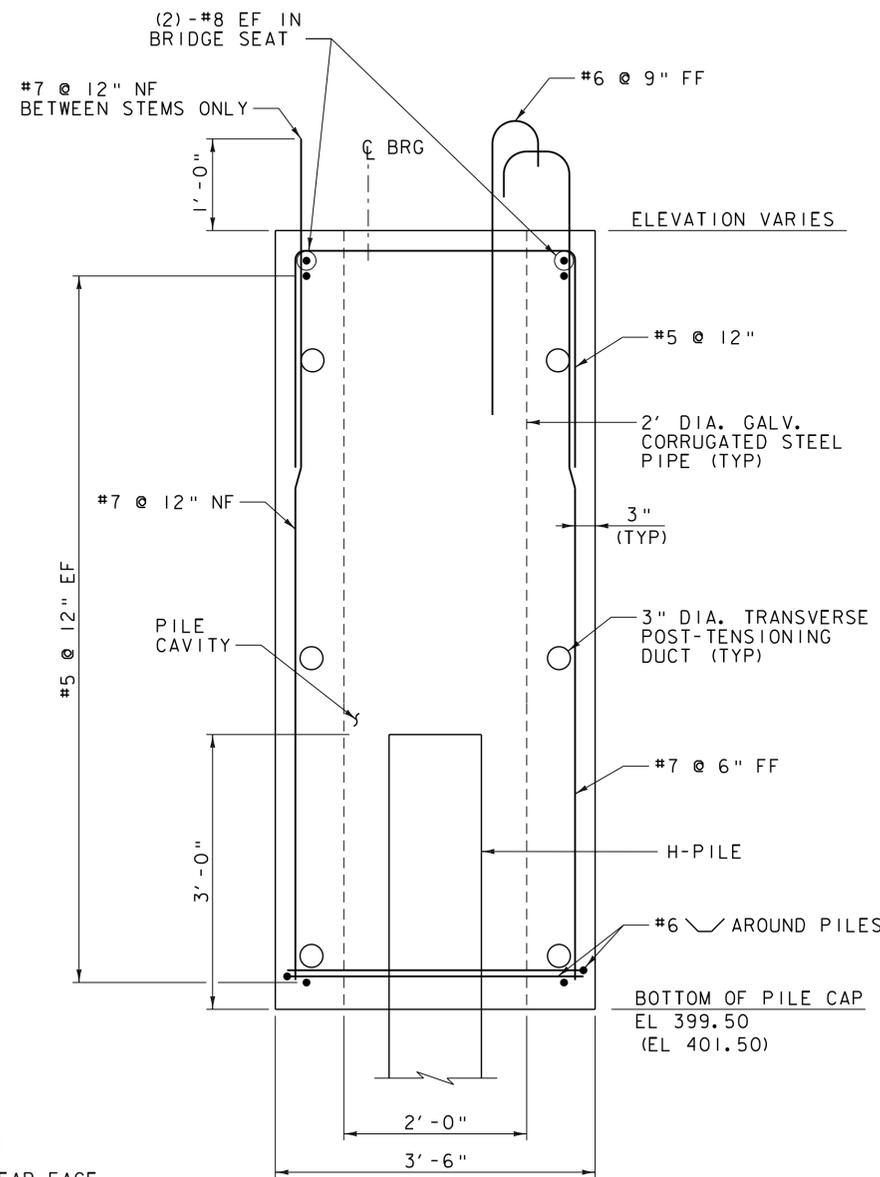
- NOTES:**
1. ABUTMENTS SHALL BE PRECAST CONCRETE ACCORDING TO THE APPROPRIATE PRECAST ITEM.
  2. SEE PROJECT NOTES FOR ADDITIONAL FABRICATION, CONSTRUCTION, AND SEQUENCE NOTES.
  3. ELEVATIONS SHOWN ARE FOR ABUTMENT NO 1. (ELEVATIONS FOR ABUTMENT NO 2 SHOWN IN PARENTHESIS.)

 LIMITS OF HPC CLOSURE POUR

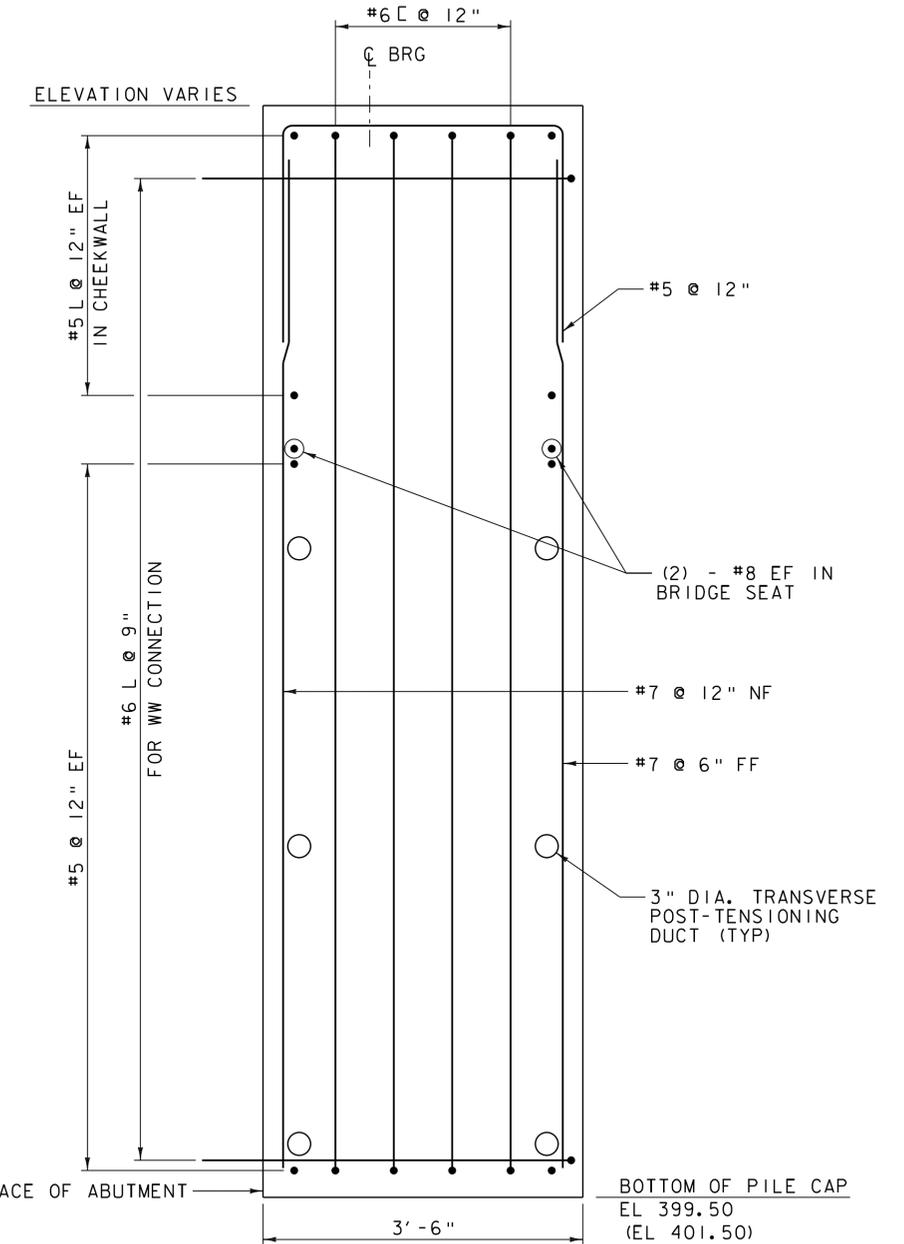


**BRIDGE END DETAIL**  
 (ABUT NO 1 SHOWN, ABUT NO 2 SIMILAR, OPPOSITE HAND)  
 (DIMENSIONS ARE NORMAL TO  $\phi$  BRG)  
 SCALE 1" = 1'-0"

**NOTE:**  
 NF = NEAR FACE  
 FF = FAR FACE  
 EF = EACH FACE  
 ▲ = CUT TO FIT IN FIELD  
 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
 2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.



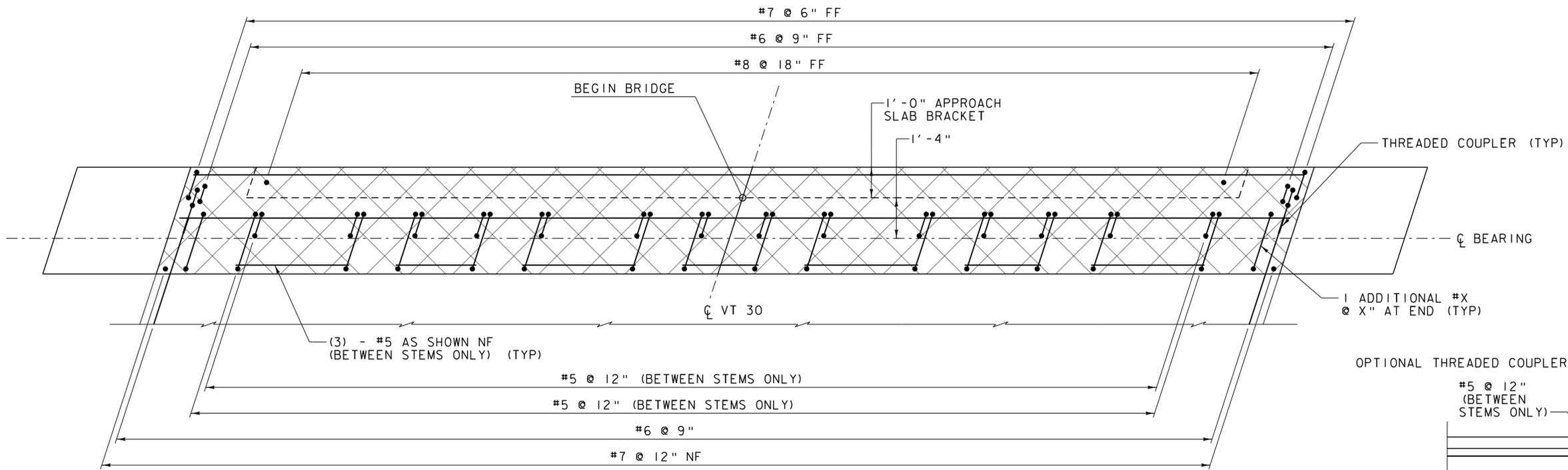
**SECTION A-A**  
 SCALE 1" = 1'-0"



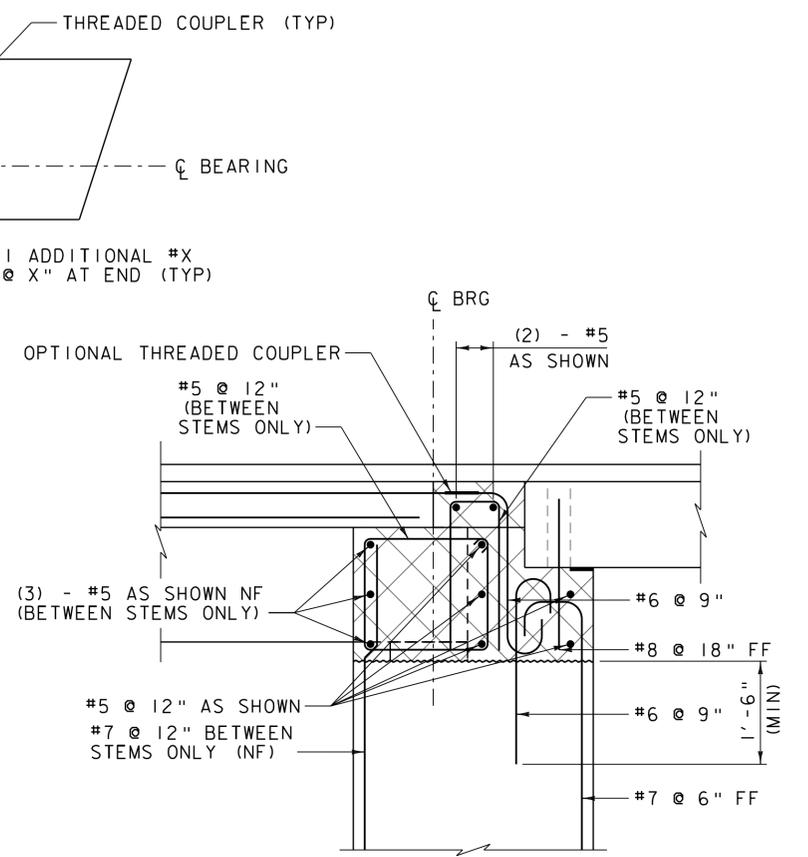
**SECTION B-B**  
 SCALE 1" = 1'-0"

REV.	DESCRIPTION	DATE
1	CONTRACTOR-FABRICATED PRECAST	12/01/2014
PROJECT NAME: CASTLETON		
PROJECT NUMBER: BRP 015-2(10)		
FILE NAME: z12b138sub.dgn		PLOT DATE: 12/1/2014
PROJECT LEADER: S.E. BURBANK		DRAWN BY: M.C. SCOTT
DESIGNED BY: E.A. FIALA		CHECKED BY: S.E. BURBANK
ABUTMENT SECTIONS		SHEET 49 OF 82





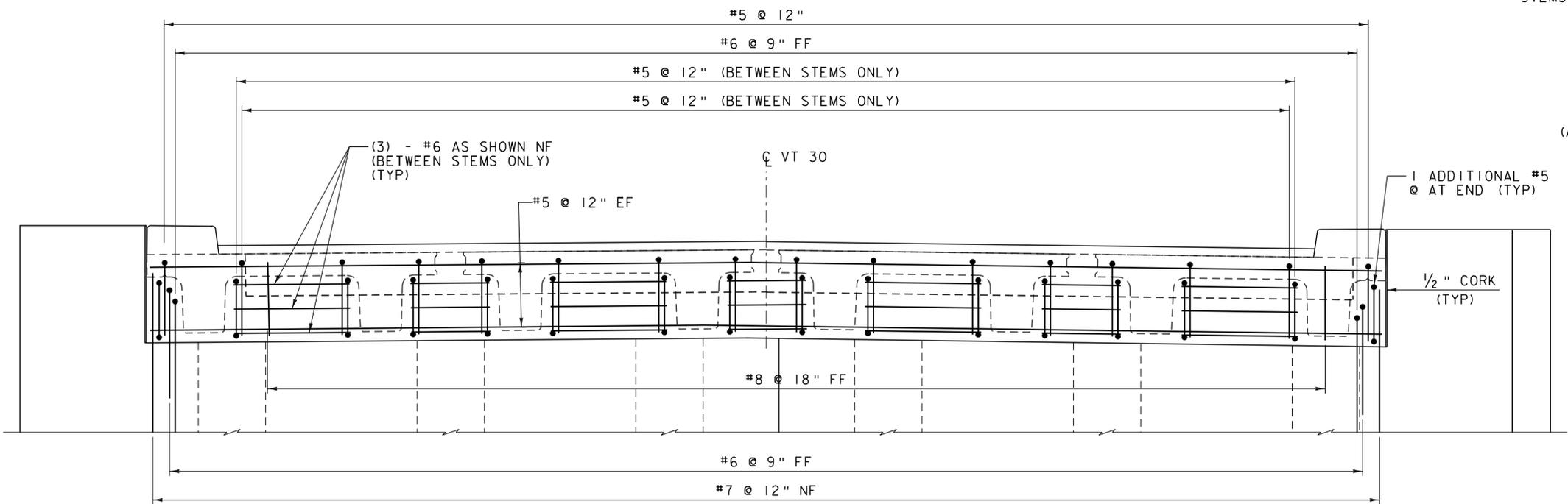
**ABUTMENT NO. 1  
DECK CLOSURE POUR REINFORCING PLAN**  
(TRANSVERSE POST-TENSIONING DUCTS & GROUT DUCTS NOT SHOWN FOR CLARIFY)  
(ABUTMENT NO. 2 SIMILAR)  
SCALE 1/2" = 1'-0"



**BRIDGE END DETAIL**  
(ABUT. NO. 1 SHOWN, ABUT. NO. 2 SIMILAR, OPPOSITE HAND)  
(DIMENSIONS ARE NORMAL TO CL BRG)  
SCALE 3/4" = 1'-0"



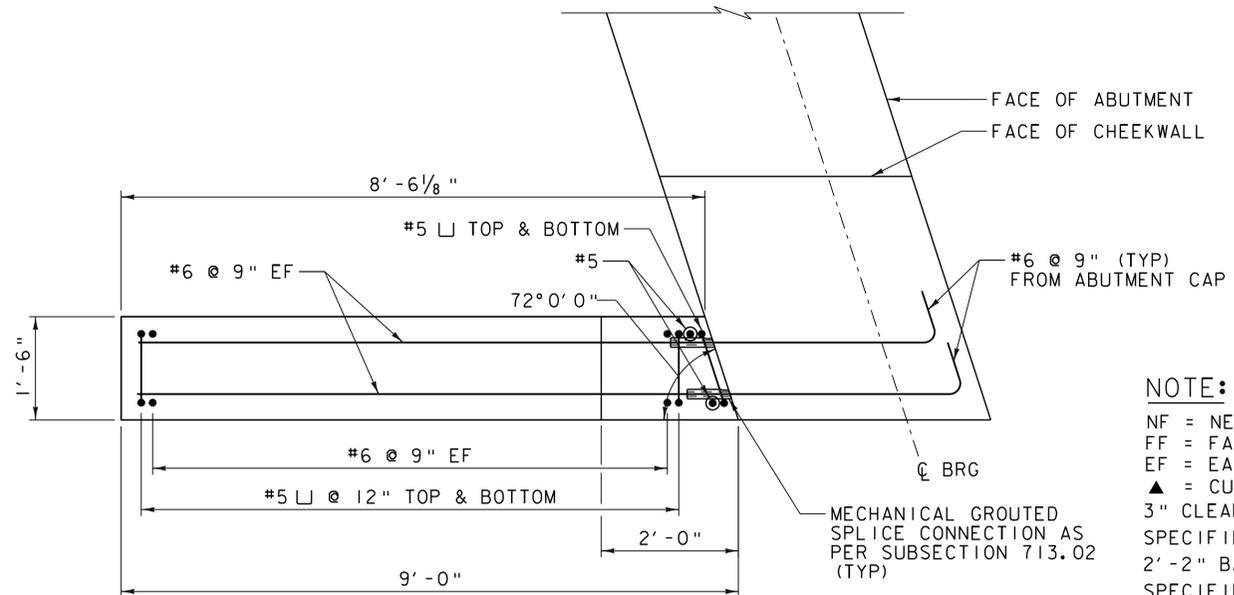
**NOTE:**  
NF = NEAR FACE  
FF = FAR FACE  
EF = EACH FACE  
▲ = CUT TO FIT IN FIELD  
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.



**ABUTMENT NO. 1  
DECK CLOSURE POUR REINFORCING ELEVATION**  
(TRANSVERSE POST-TENSIONING DUCTS NOT SHOWN FOR CLARIFY)  
(ABUTMENT NO. 2 SIMILAR)  
SCALE 1/2" = 1'-0"

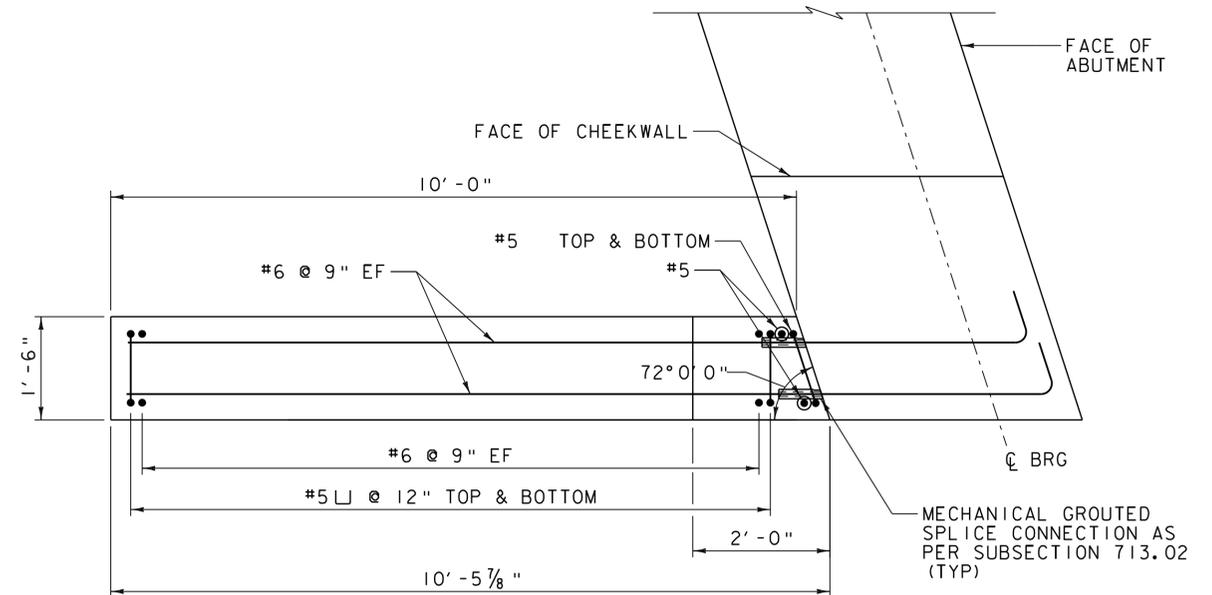


PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: E.A. FIALA
FILE NAME: z12b138sub.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: S.E. BURBANK	SHEET 51 OF 82
DESIGNED BY: E.A. FIALA	
DECK CLOSURE POUR	

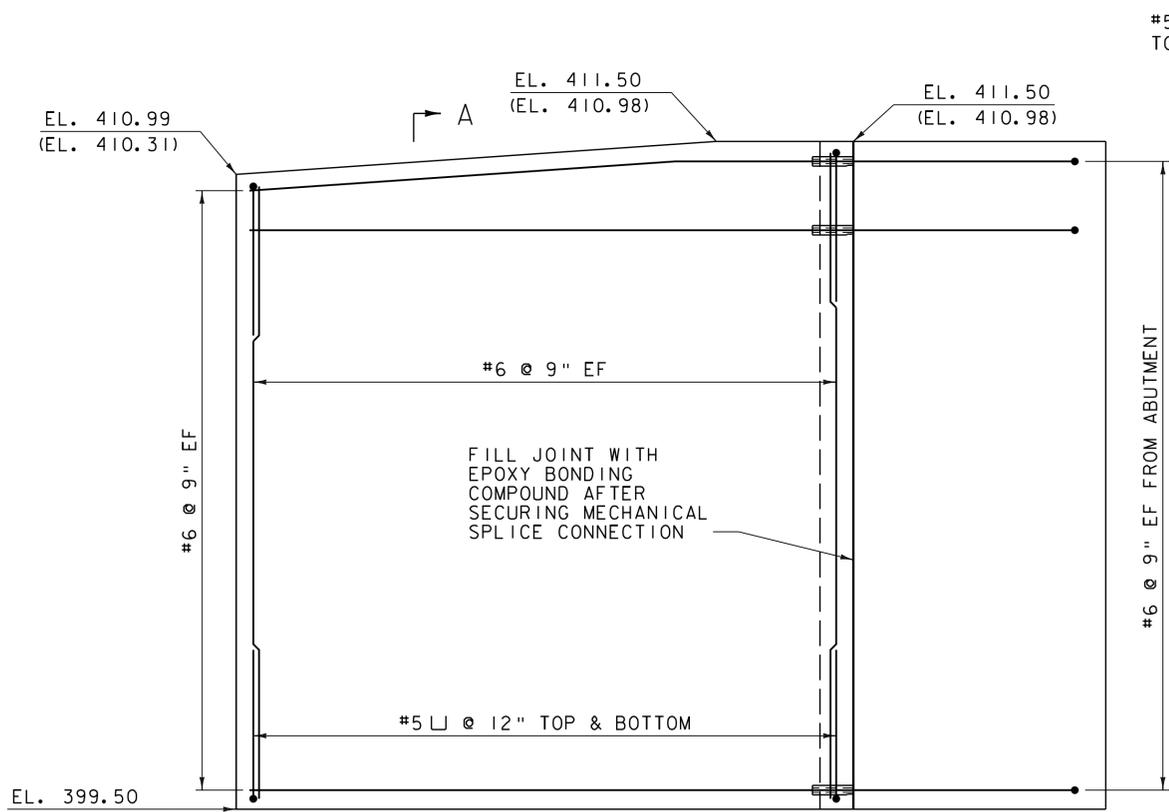


WINGWALL NO. 1 & 2 PLAN  
SCALE 3/4" = 1'-0"

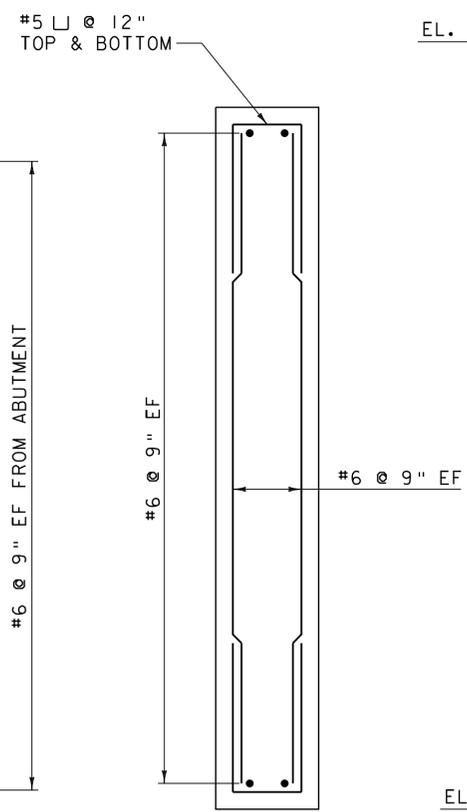
NOTE:  
NF = NEAR FACE  
FF = FAR FACE  
EF = EACH FACE  
▲ = CUT TO FIT IN FIELD  
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.



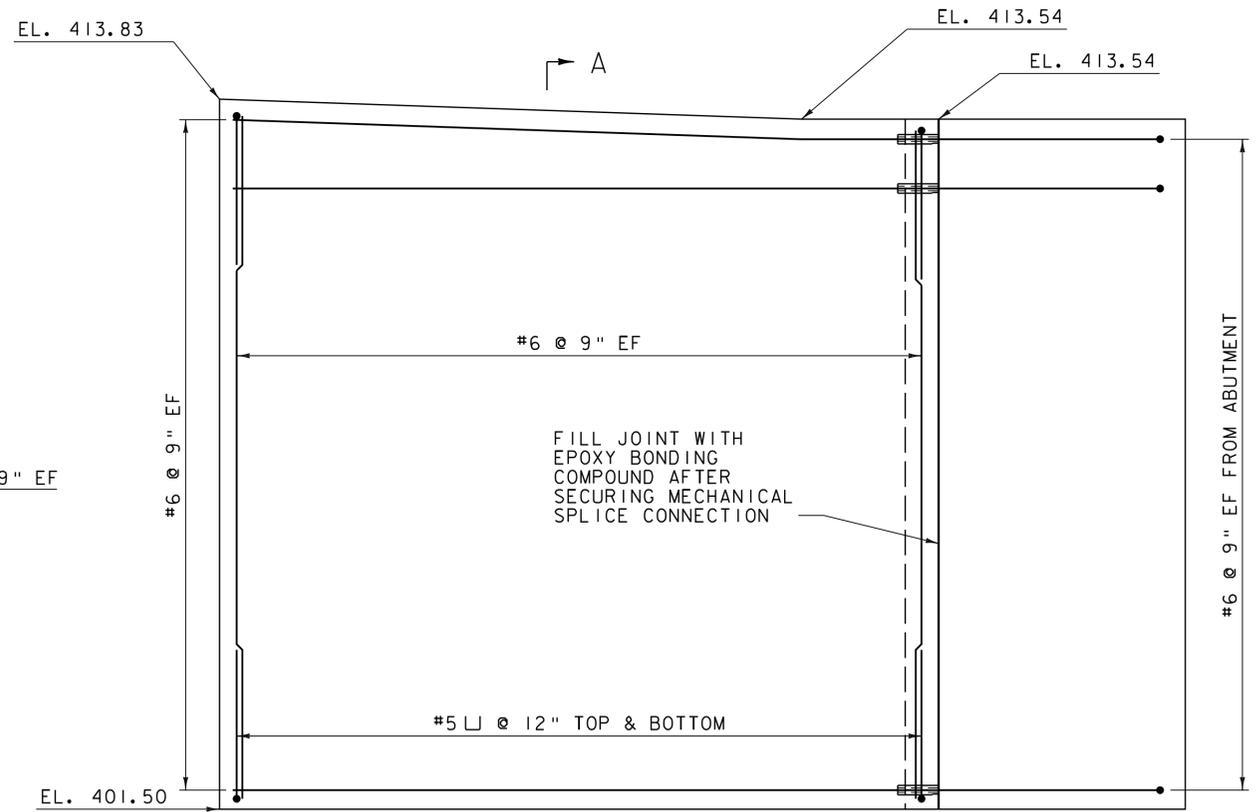
WINGWALL NO. 3 PLAN  
SCALE 3/4" = 1'-0"



WINGWALL NO. 2 ELEVATION  
(WINGWALL NO. 1 ELEVATIONS SHOWN IN PARENTHESES)  
SCALE 3/4" = 1'-0"



SECTION A-A  
SCALE 3/4" = 1'-0"

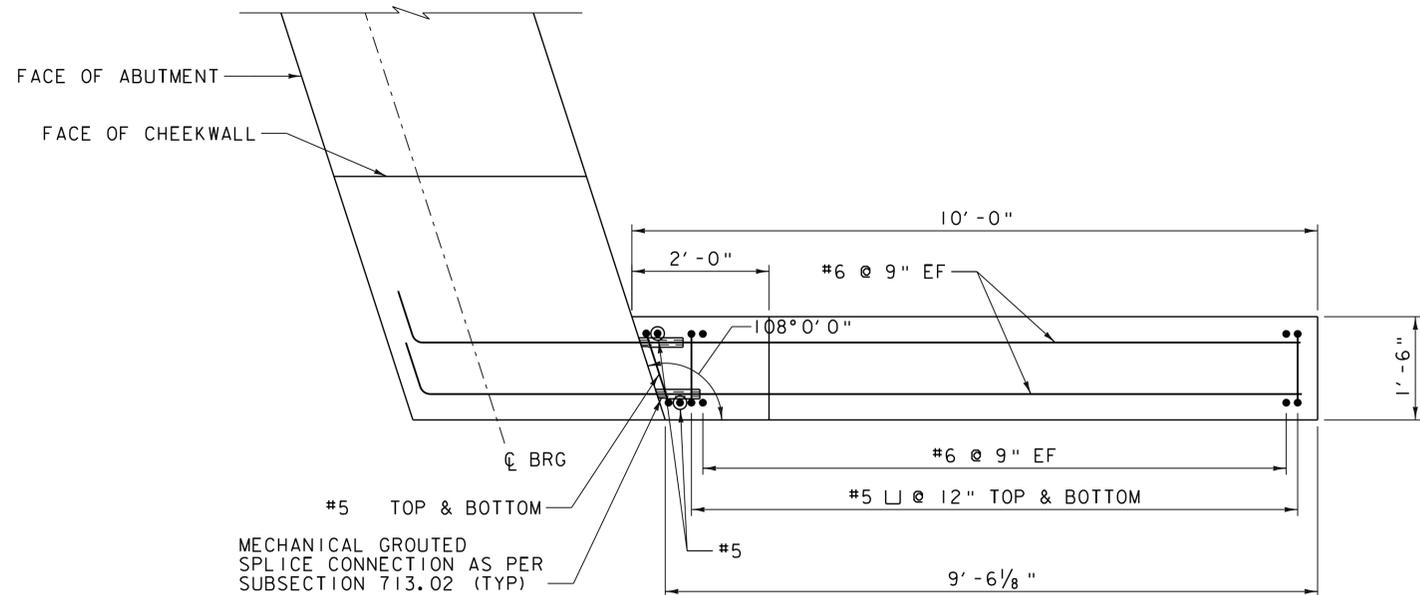


WINGWALL NO. 3 ELEVATION  
SCALE 3/4" = 1'-0"

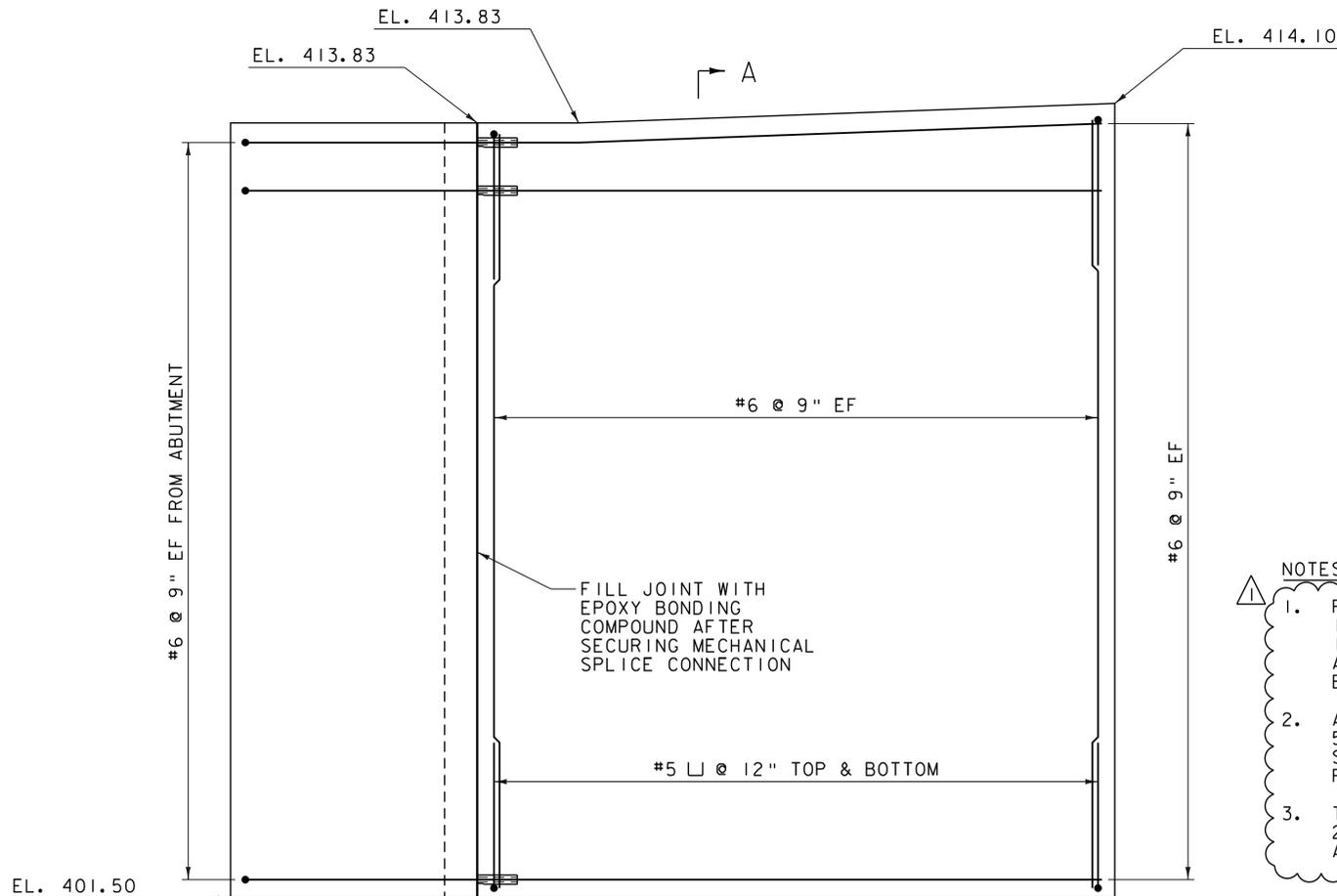
NOTE: SEE WINGWALL NOTES ON NEXT SHEET.



PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: E.A. FIALA
FILE NAME: z12b138sub.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: S.E. BURBANK	SHEET 52 OF 82
DESIGNED BY: E.A. FIALA	
WINGWALL DETAILS (1 OF 2)	



WINGWALL NO. 4 PLAN  
SCALE 3/4" = 1'-0"

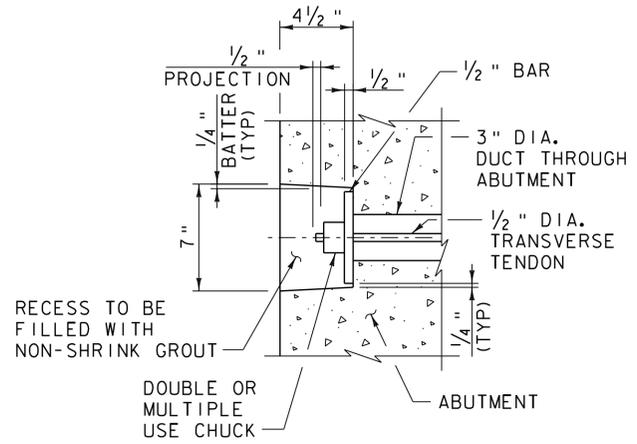
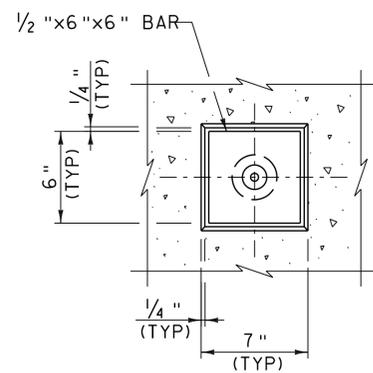


WINGWALL NO. 4 ELEVATION  
SCALE 3/4" = 1'-0"

NOTE: SEE SECTION A-A ON PREVIOUS SHEET.

NOTE:

- NF = NEAR FACE
- FF = FAR FACE
- EF = EACH FACE
- ▲ = CUT TO FIT IN FIELD
- 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- 2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.



TRANSVERSE TENDON DETAIL  
NOT TO SCALE

TRANSVERSE TENDON NOTES:

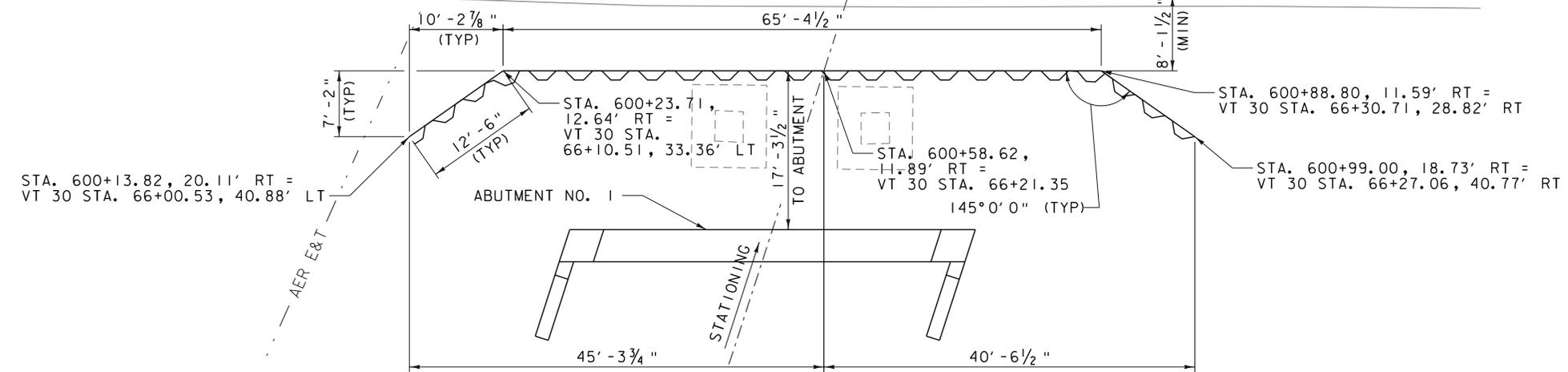
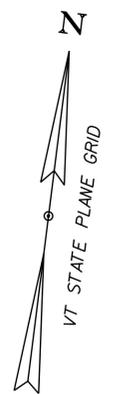
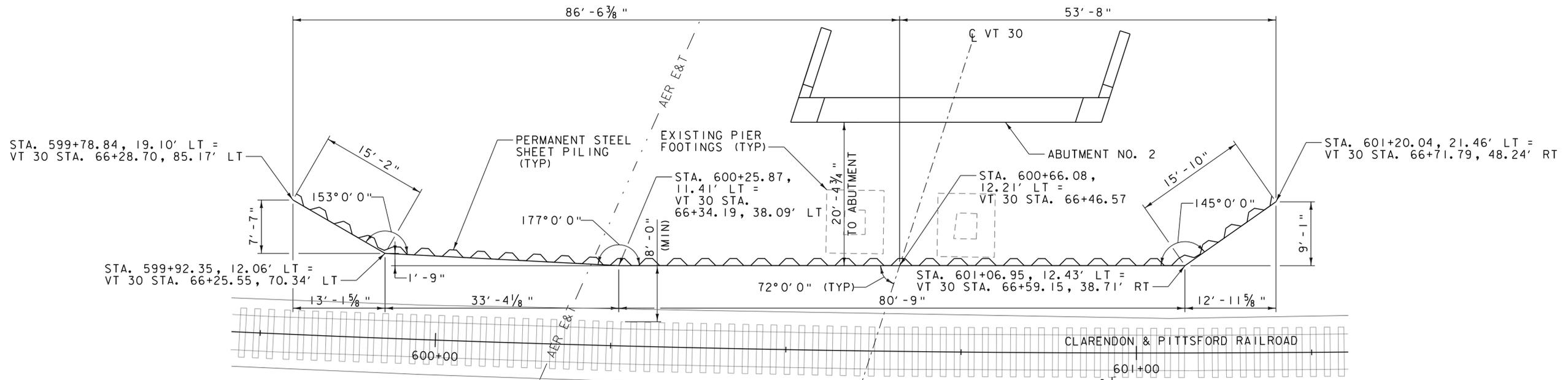
1. MORTAR FOR EXTERIOR POCKETS SHALL BE THE SAME COLOR AND TEXTURE AS THE ABUTMENT CONCRETE.
2. OTHER ANCHORAGE SYSTEMS MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. ALTERNATE ANCHORAGE SYSTEMS SHALL BE WATER TIGHT AND CORROSION PROOF.
3. TRANSVERSE TENDONS SHALL BE COVERED BY A SEAMLESS POLYPROPYLENE SHEATH (WITH CORRSION INHIBITING GREASE BETWEEN THE STRAND/ANCHOR AND THE SHEATH) FOR THE FULL LENGTH OF THE TENDON/ANCHOR, EXCEPT AT THE ANCHORAGE LOCATION.

NOTES:

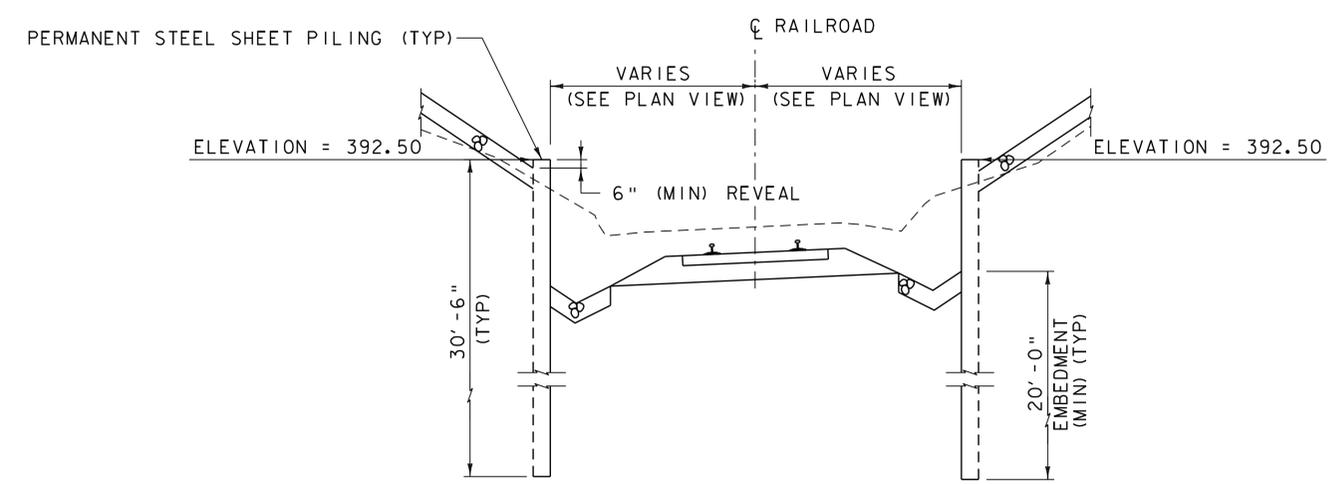
1. PAYMENT FOR ALL REINFORCING STEEL AND MECHANICAL CONNECTORS WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST CONTRACT ITEM. THE CONTRACTOR SHALL PROVIDE THREE (3) MECHANICAL CONNECTORS ASSEMBLED PER SPLICE SIZE FOR TESTING. THE ASSEMBLY SHALL BE WITNESSED BY THE ENGINEER.
2. ALL REINFORCING STEEL IN WINGWALLS SHALL MEET REQUIREMENTS OF SECTION 507 FOR LEVEL II REINFORCING. ALL MECHANICAL CONNECTORS IN WINGWALLS SHALL MEET THE REQUIREMENTS OF SECTION 507 FOR LEVEL I (EPOXY COATED) REINFORCING.
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 APPROPRIATE PRECAST CONTRACT ITEM. SEE SD-502.00 FOR FURTHER DETAILS.

REV.	DESCRIPTION	DATE
△	CONTRACTOR-FABRICATED PRECAST	12/01/2014
PROJECT NAME: CASTLETON		
PROJECT NUMBER: BRP 015-2(10)		
FILE NAME: z12b138sub.dgn		PLOT DATE: 12/1/2014
PROJECT LEADER: S.E. BURBANK		DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA		CHECKED BY: S.E. BURBANK
WINGWALL DETAILS (2 OF 2)		SHEET 53 OF 82





PLAN VIEW  
SCALE 1/8" = 1'-0"

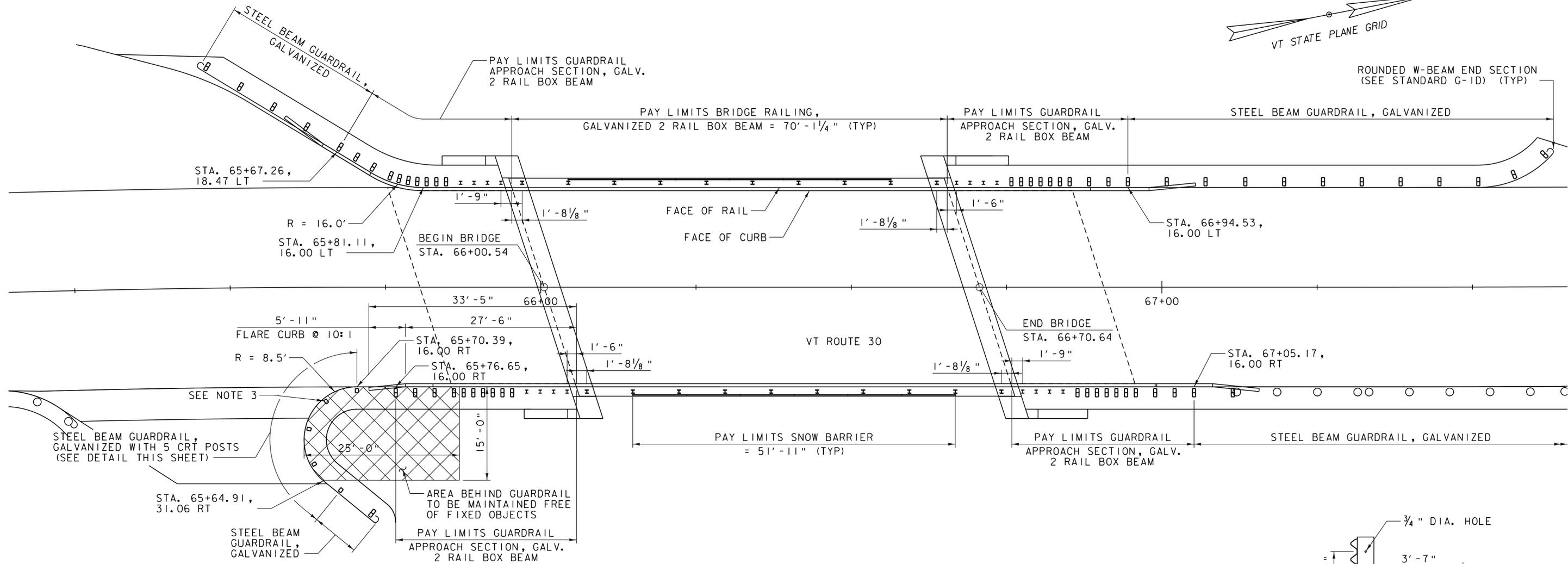
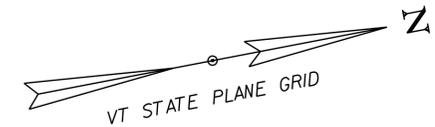


SHEET PILING TYPICAL SECTION  
SCALE 3/16" = 1'-0"

- NOTES:**
- IT IS BROUGHT TO THE CONTRACTOR'S ATTENTION THAT POWER LINES WILL BE RELOCATED TO THE WEST SIDE OF THE BRIDGE. THE CONTRACTOR IS RESPONSIBLE FOR THE SAFE INTSTALLATION OF THE SHEETING UNDER THE POWER LINES USING APPROPRIATE MEANS AND METHODS OF INSTALLATION.
  - EXISTING PIER FOOTINGS ARE SHOWN PER FIELD SURVEY. PIER FOOTINGS SHALL BE REMOVED A MINIMUM OF 1'-0" BELOW FINISH GRADE TO ALLOW FOR THE INSTALLATION OF THE STONE FILL. CONTRACTOR SHALL DETERMINE IF THE COMPLETE REMOVAL OF THE PIER FOOTINGS IS REQUIRED FOR THE INSTALLATION OF THE PERMANENT STEEL SHEET PILING.

PROJECT NAME:	CASTLETON	PLOT DATE:	10/23/2014
PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	E.A. FIALA
FILE NAME:	z12b138shstpiledgn	CHECKED BY:	S.E. BURBANK
PROJECT LEADER:	S.E. BURBANK	SHEET	54 OF 82
DESIGNED BY:	E.A. FIALA		
SHEET PILE DETAILS			

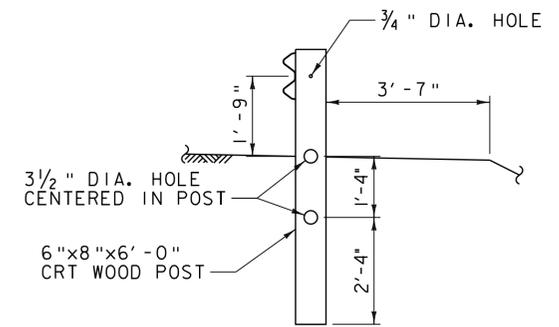




NOTE: SEE STANDARD S-360B FOR APPROACH SECTION LAYOUT.

**BRIDGE RAIL LAYOUT**

SCALE 1/8" = 1'-0"



**CRT POST DETAIL**

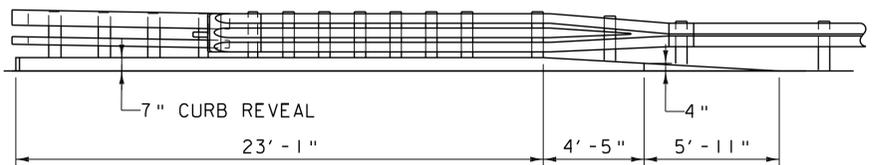
SCALE 1/2" = 1'-0"

**NOTES:**

1. SEE FHWA TECHNICAL ADVISORY T5040.32 CURVED W-BEAM GUARDRAIL INSTALLATIONS AT MINOR ROADWAY INTERSECTIONS FOR ADDITIONAL INFORMATION.
2. NO WASHERS ARE USED ON THE 5/8" BUTTON HEAD BOLTS (F-3[10"]-76) CONNECTING THE RAIL TO THE CONTROLLED RELEASING TERMINAL (CRT) POSTS.
3. THIS RAIL IS NOT BOLTED TO THE CRT POSTS.
4. THE CURVED GUARDRAIL SECTION SHALL BE SHOP BENT.
5. SEE STANDARD G-1 FOR ADDITIONAL INFORMATION.



PLAN VIEW



ELEVATION VIEW

**CURB DETAIL AT STA. 65+70 - 66+06, RT**

SEE STANDARD S-360B FOR INFORMATION NOT SHOWN

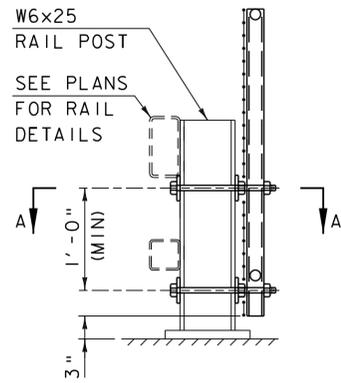
SCALE 1/4" = 1'-0"

PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

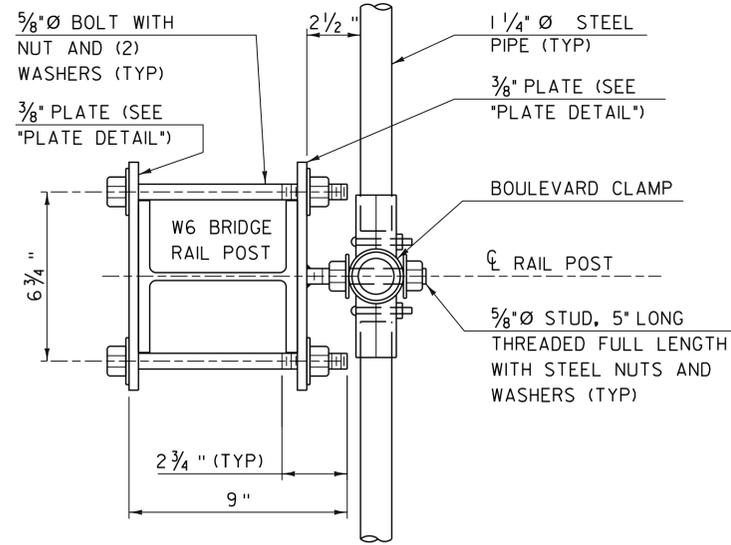
FILE NAME: z12b138rail.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
BRIDGE RAILING AND GUARDRAIL LAYOUT

PLOT DATE: 9/19/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 55 OF 82

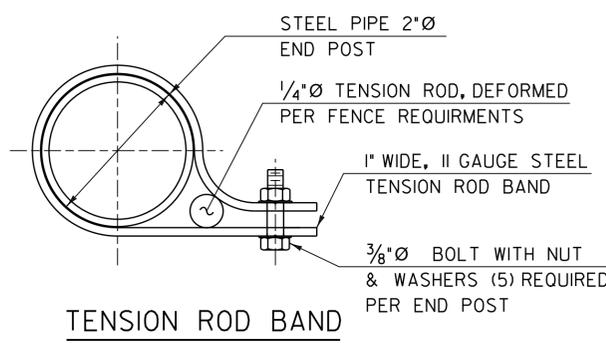




TYPICAL SECTION  
FOR SPECIFIC RAIL CONFIGURATION  
AND SIZES SEE PLAN SET



SECTION A-A



TENSION ROD BAND

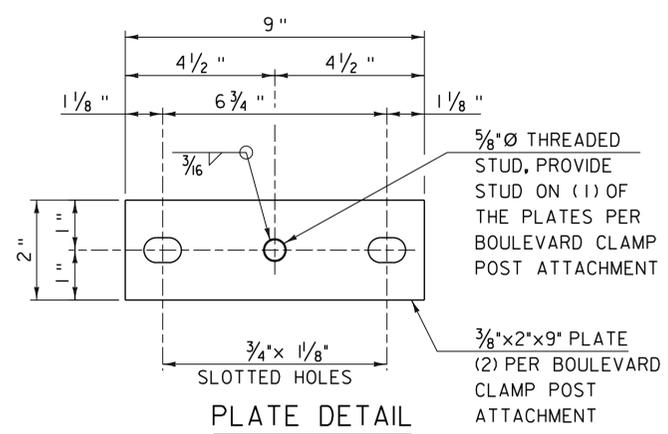
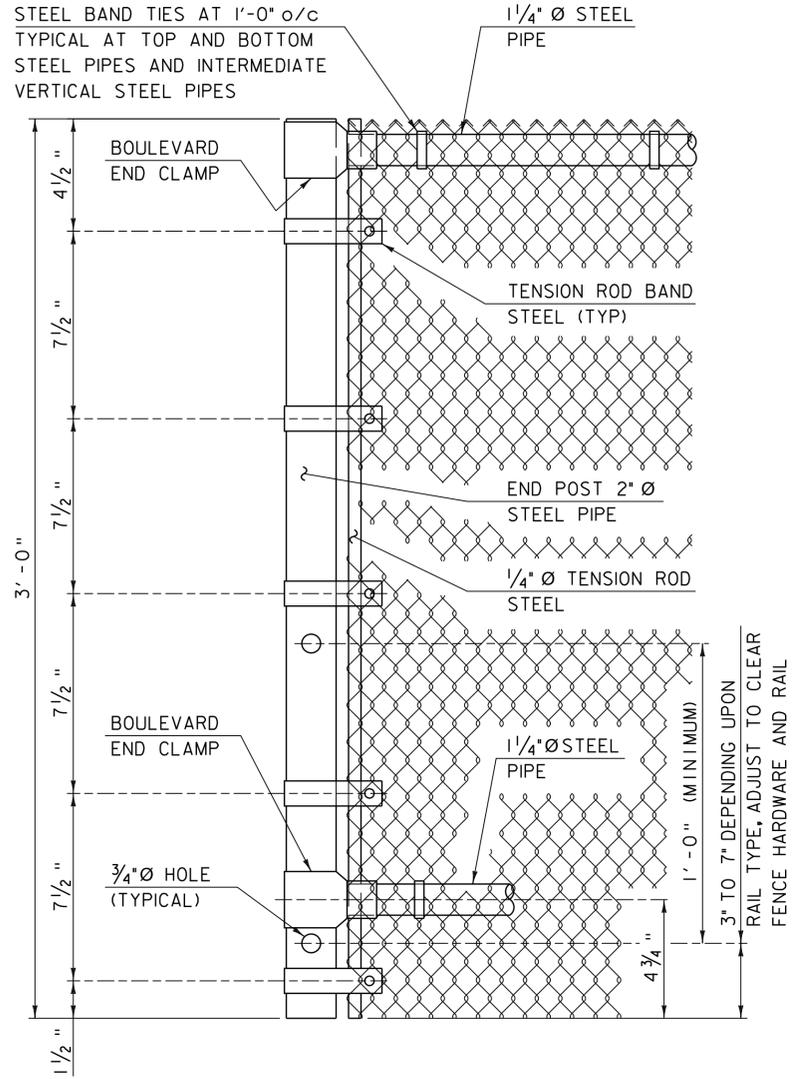
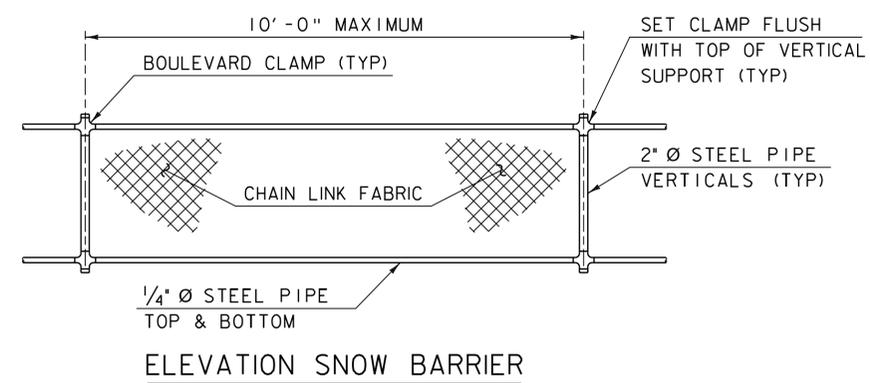


PLATE DETAIL

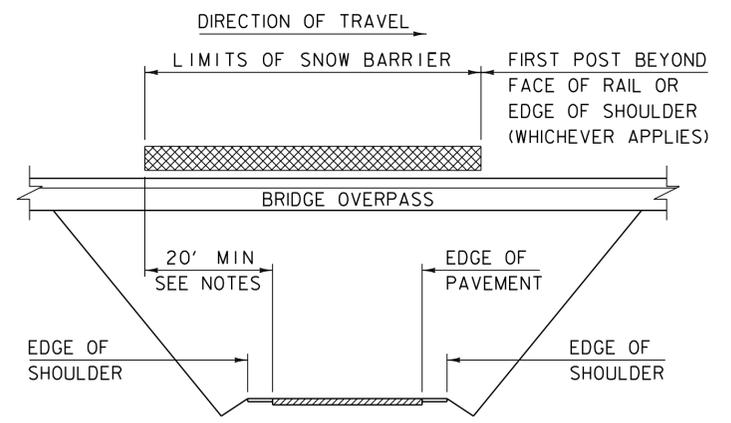


END POST DETAILS



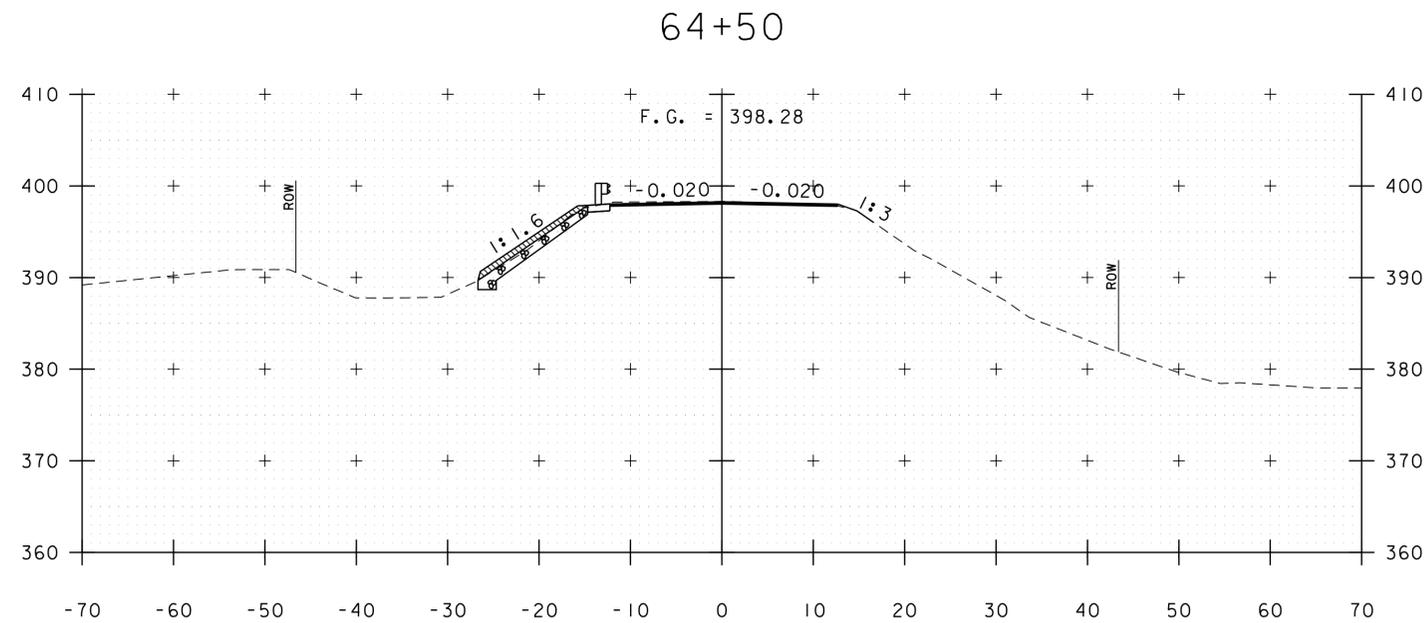
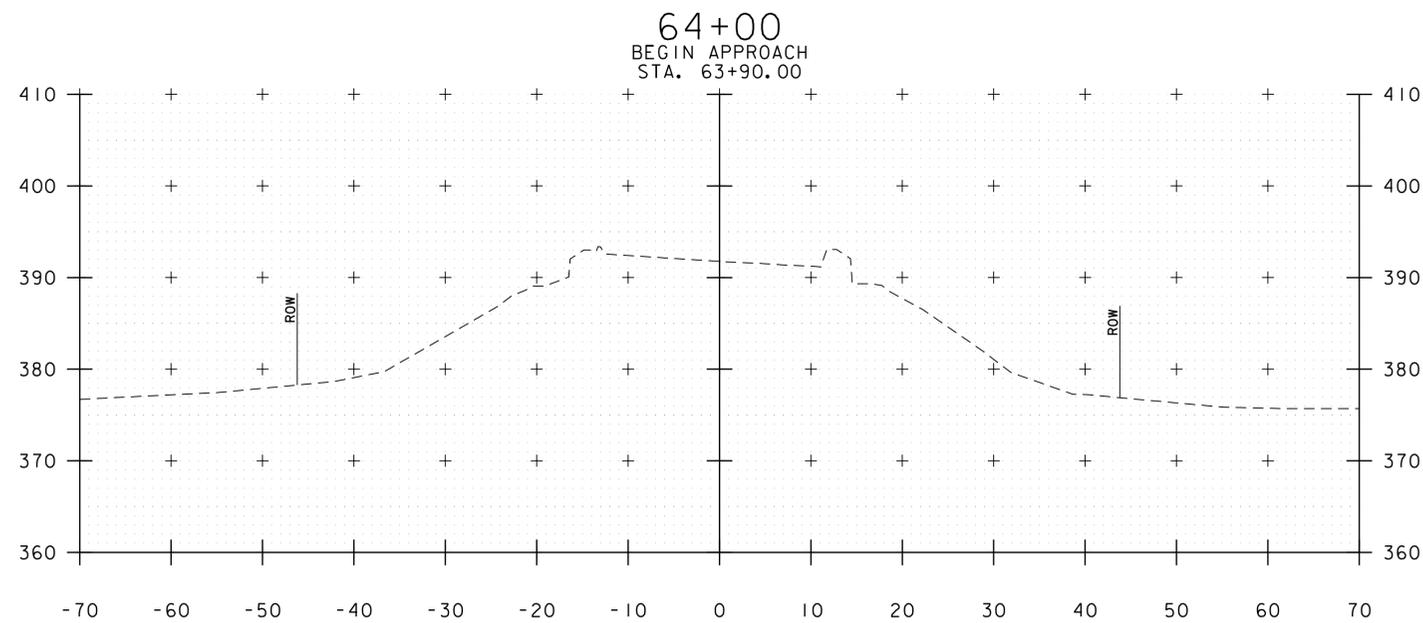
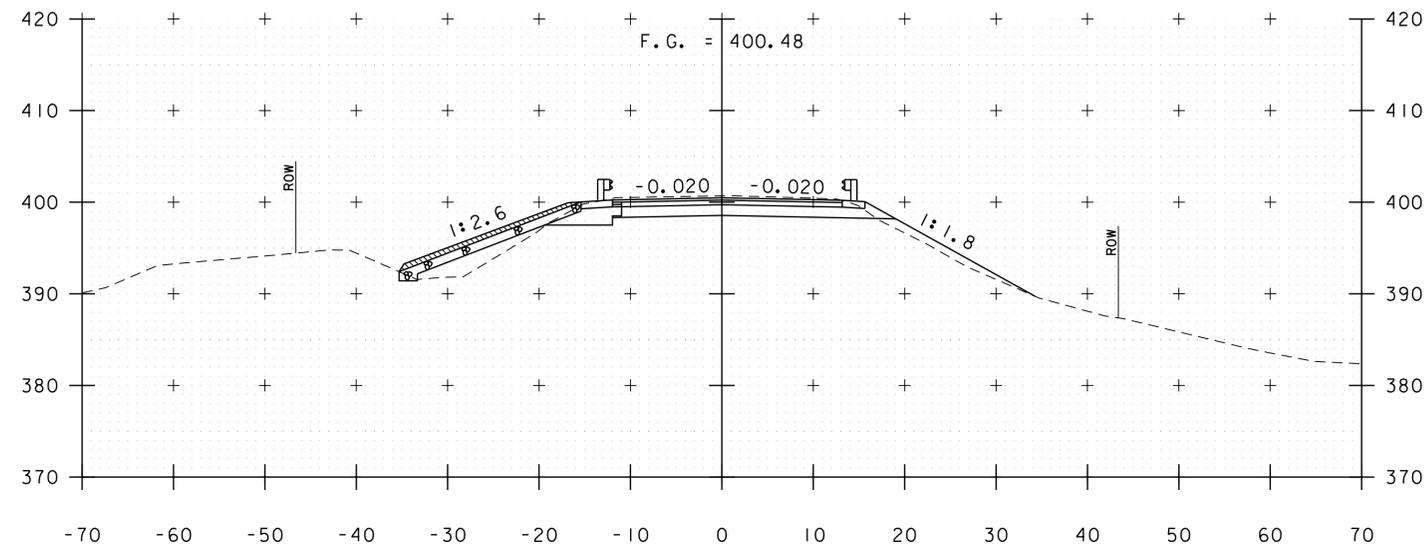
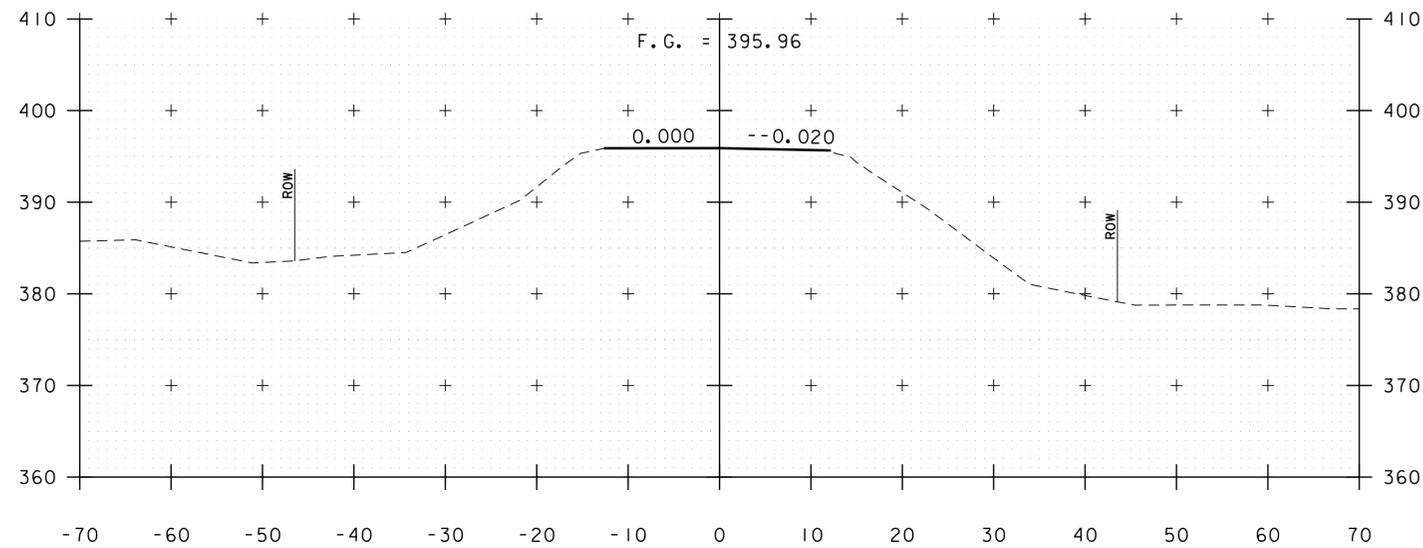
ELEVATION SNOW BARRIER

- ### NOTES
1. ALL WORK AND MATERIAL SHALL CONFORM TO SECTION 620.
  2. THIS SNOW BARRIER CAN BE USED WITH GALVANIZED 2, 3, AND 4 RAIL BOX BEAM.
  3. 1 1/4" PIPE LENGTH SHALL BE FIELD CUT TO FIT POST SPACING.
  4. CHAIN LINK FABRIC TO BE KNUCKLED TOP AND BOTTOM.
  5. ALL STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36.
  6. SNOW BARRIER SHALL BEGIN AT THE BRIDGE RAIL POST WHICH WILL PROVIDE A MINIMUM DISTANCE OF 20' (AS SHOWN) OR AS DIRECTED BY THE ENGINEER.
  7. ALL REFERENCES TO THE DIAMETERS OF GALVANIZED STEEL PIPE SHALL REFER TO THE OUTSIDE DIAMETER (O.D.).
  8. ALL STEEL COMPONENTS OF SNOW BARRIER SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 726.08.



SCHEMATIC SNOW BARRIER LIMITS

PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: A.J. GOUDREAU
FILE NAME: z12bl38snowbarrier.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: S.E. BURBANK	DESIGNED BY: VTRANS
SNOW BARRIER DETAILS	SHEET 56 OF 82



64+00  
BEGIN APPROACH  
STA. 63+90.00

64+50

63+75

STA. 64+05, LT  
BEGIN GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I  
GRUBBING MATERIAL

64+25

ROADWAY CROSS SECTIONS

SCALE 1" = 10'-0"

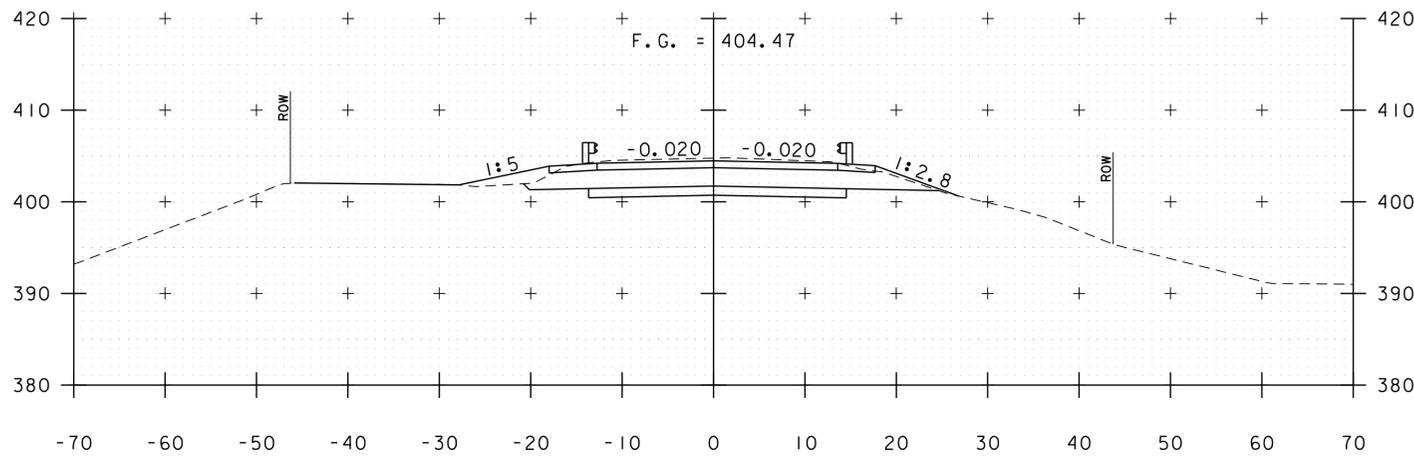
STA. 63+75 - 64+50



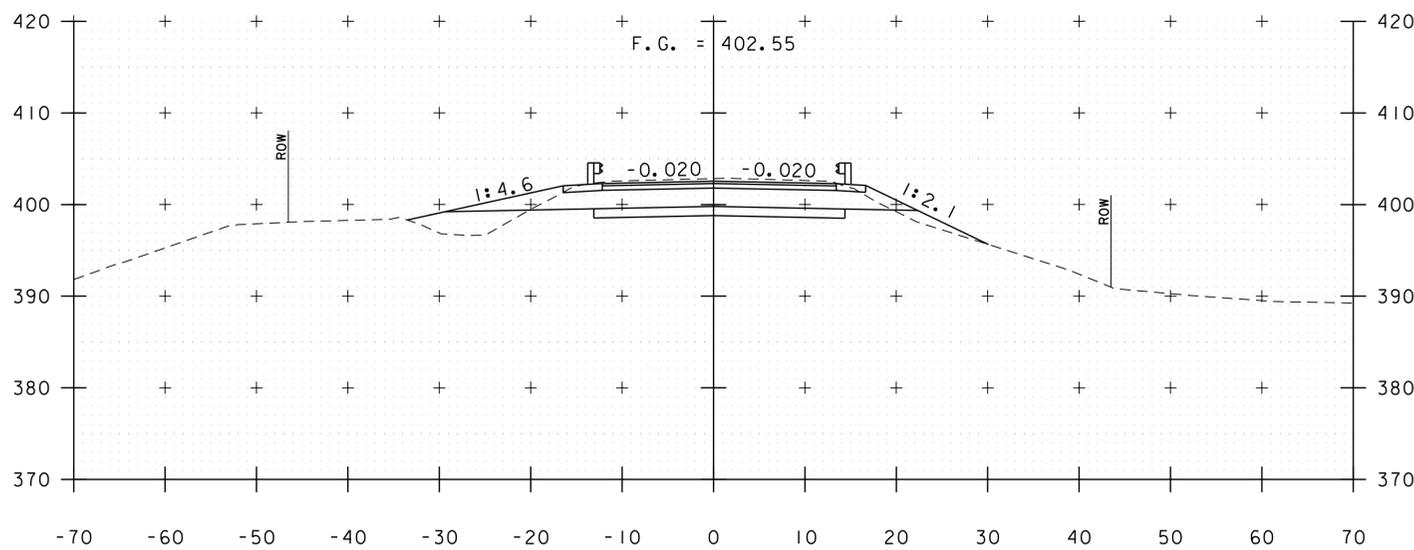
PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138xs.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
ROADWAY CROSS SECTIONS (1 OF 6)

PLOT DATE: 9/19/2014  
DRAWN BY: M.C. SCOTT  
CHECKED BY: E.A. FIALA  
SHEET 57 OF 82



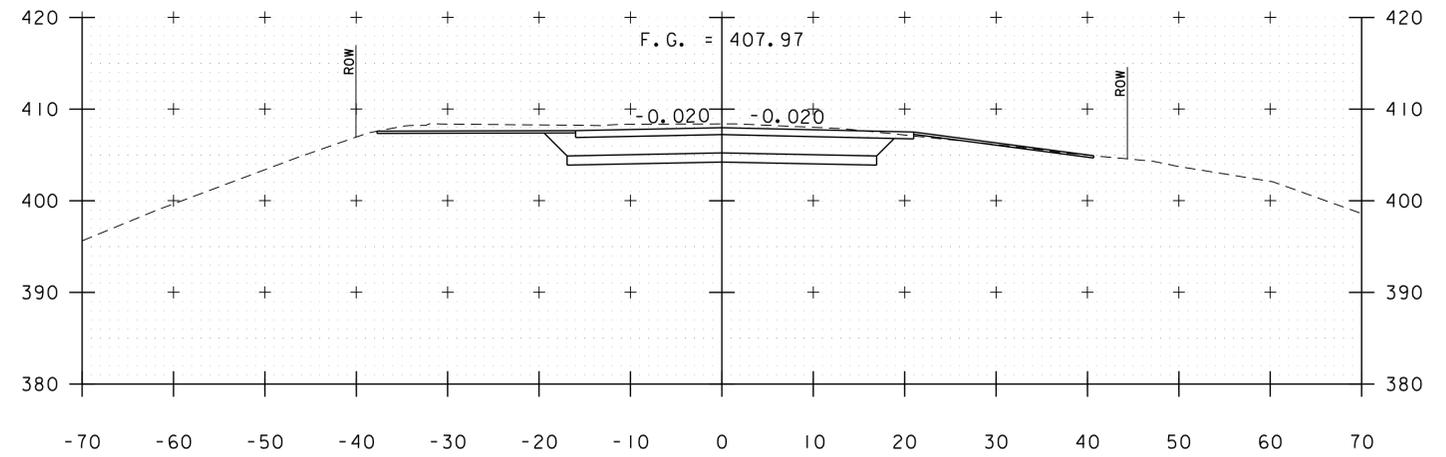
65+00



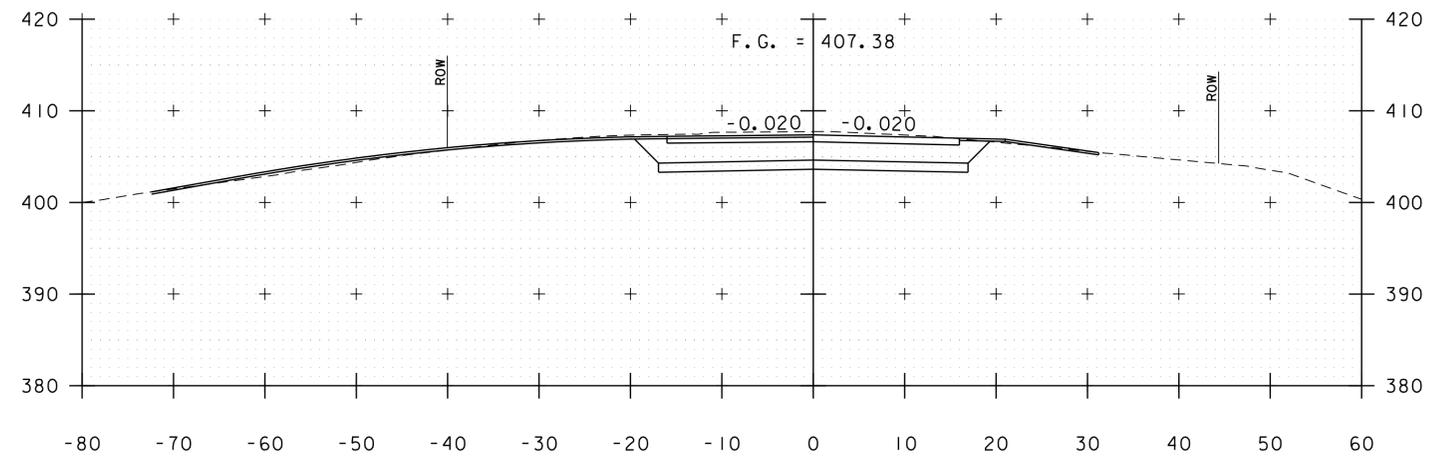
64+75

STA. 64+51, LT  
END GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I  
GRUBBING MATERIAL

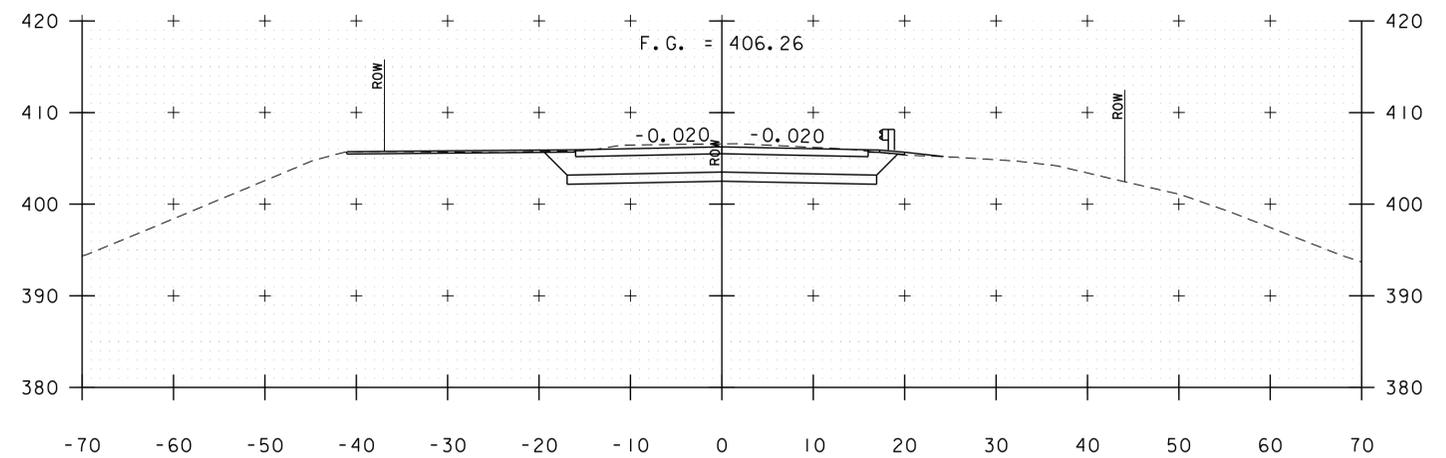
BEGIN PROJECT  
STA. 64+70.00



65+50



Drive, 65+41 LT



65+25

ROADWAY CROSS SECTIONS

SCALE 1" = 10'-0"

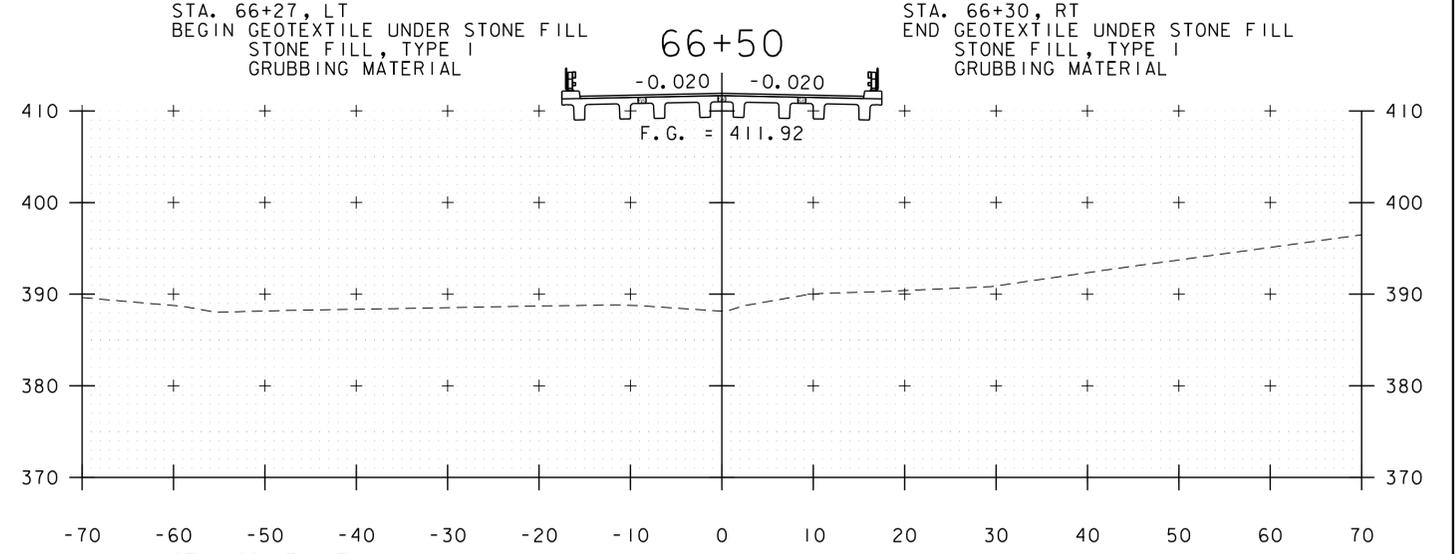
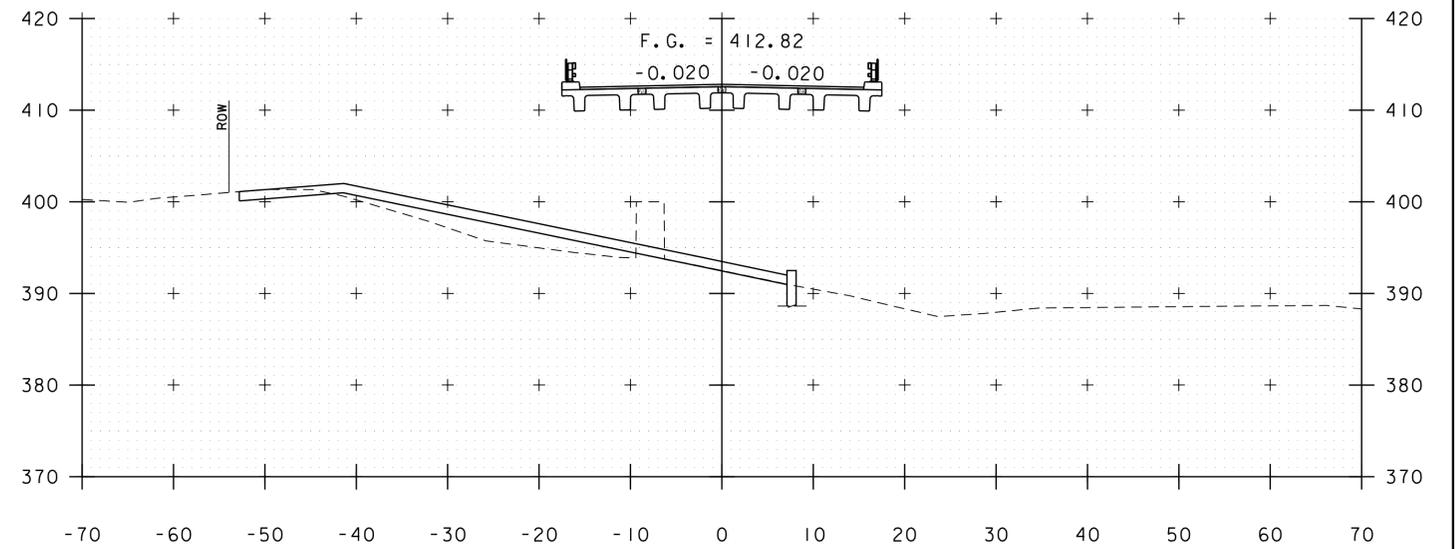
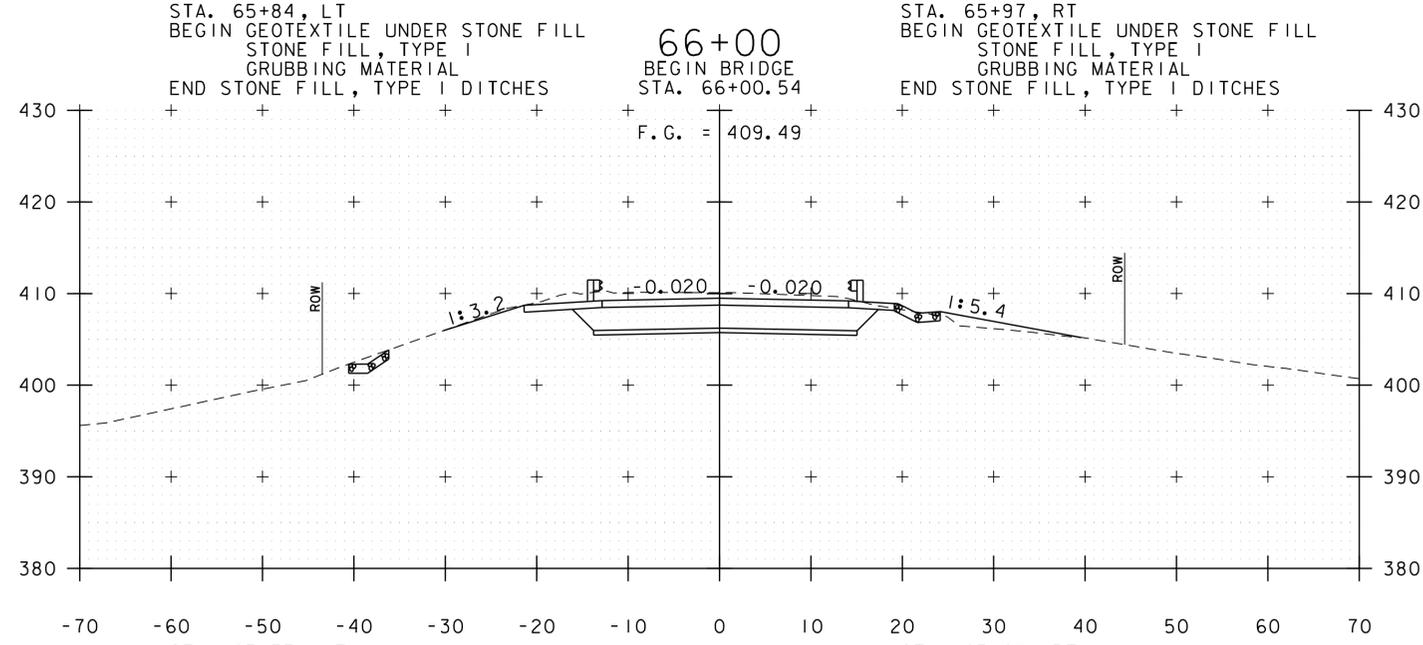
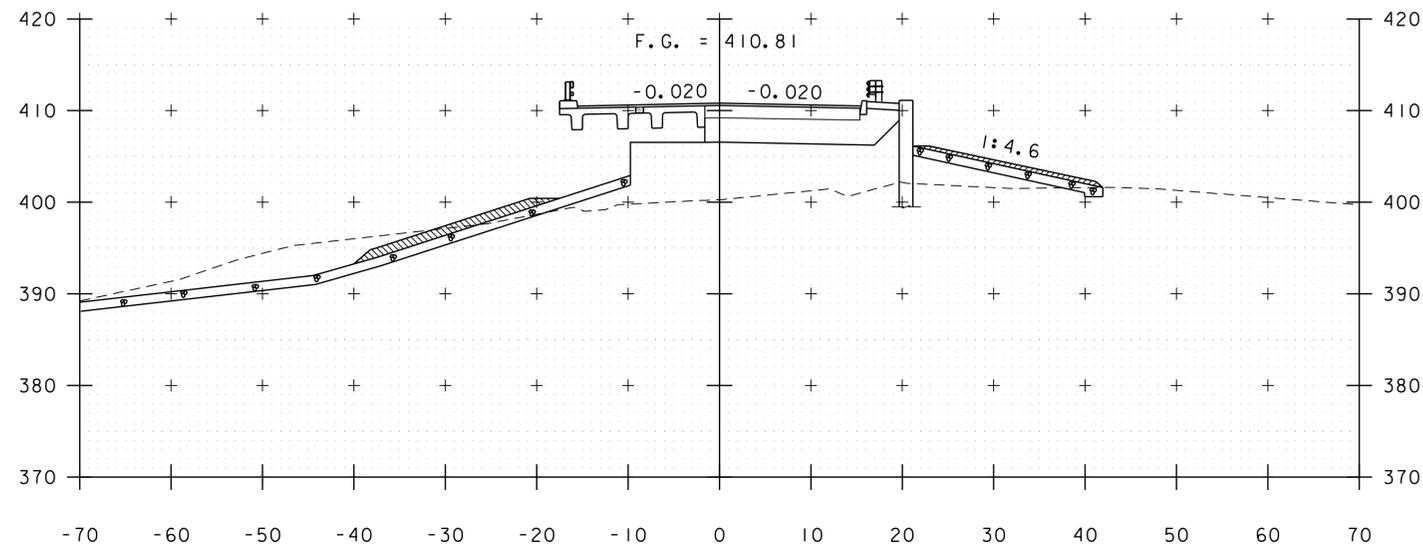
STA. 64+75 - 65+50



PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138xs.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
ROADWAY CROSS SECTIONS (2 OF 6)

PLOT DATE: 9/19/2014  
DRAWN BY: M.C. SCOTT  
CHECKED BY: E.A. FIALA  
SHEET 58 OF 82



ROADWAY CROSS SECTIONS

SCALE 1" = 10'-0"

STA. 65+75 - 66+50



PROJECT NAME: CASTLETON

PROJECT NUMBER: BRF 015-(2)

FILE NAME: z12b138xs.dgn

PROJECT LEADER: S.E. BURBANK

DESIGNED BY: E.A. FIALA

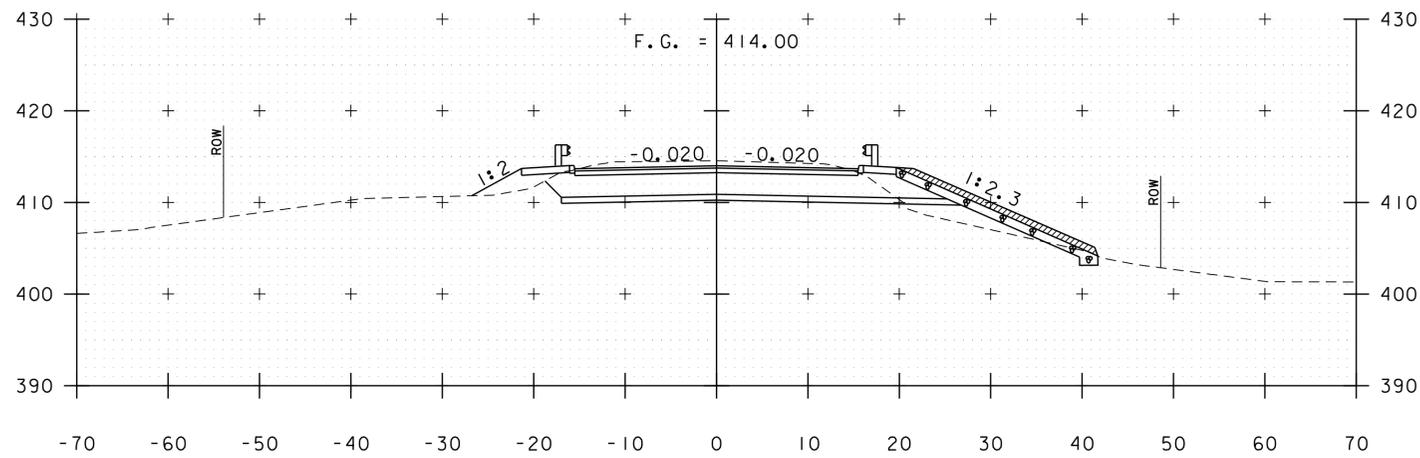
ROADWAY CROSS SECTIONS (3 OF 6)

PLOT DATE: 9/19/2014

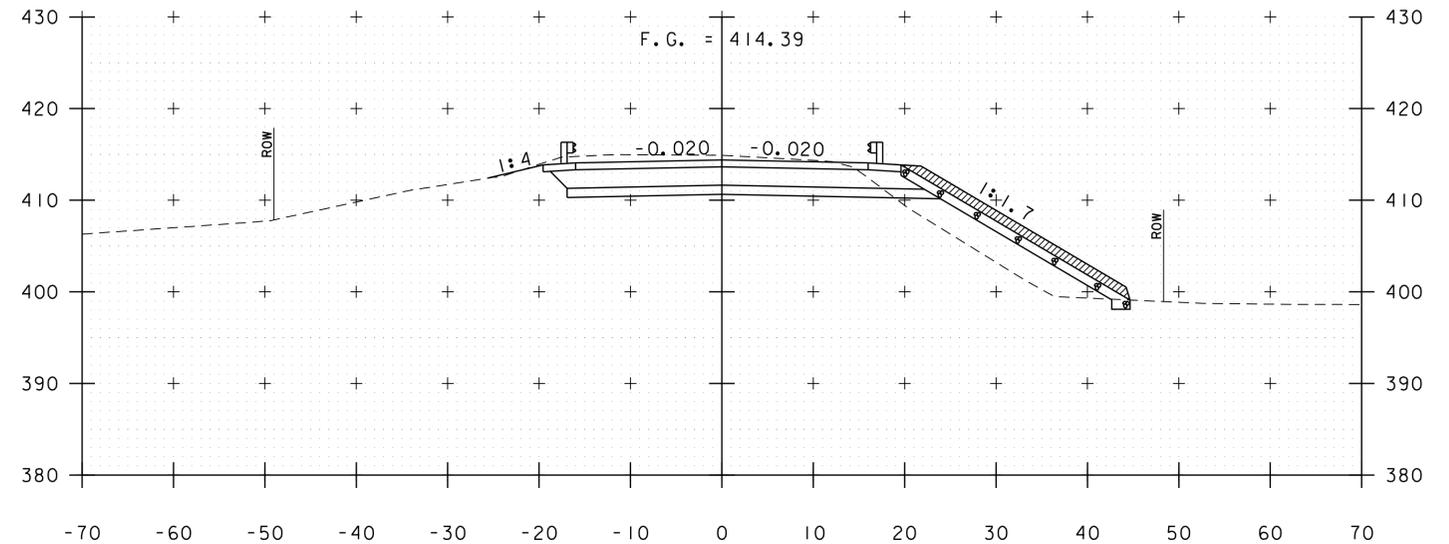
DRAWN BY: M.C. SCOTT

CHECKED BY: E.A. FIALA

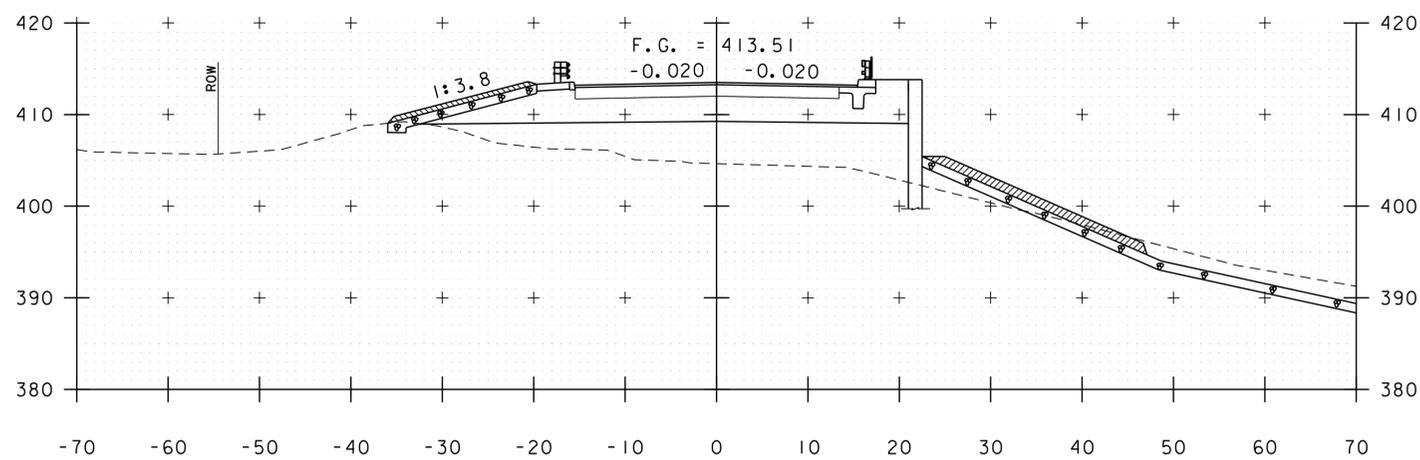
SHEET 59 OF 82



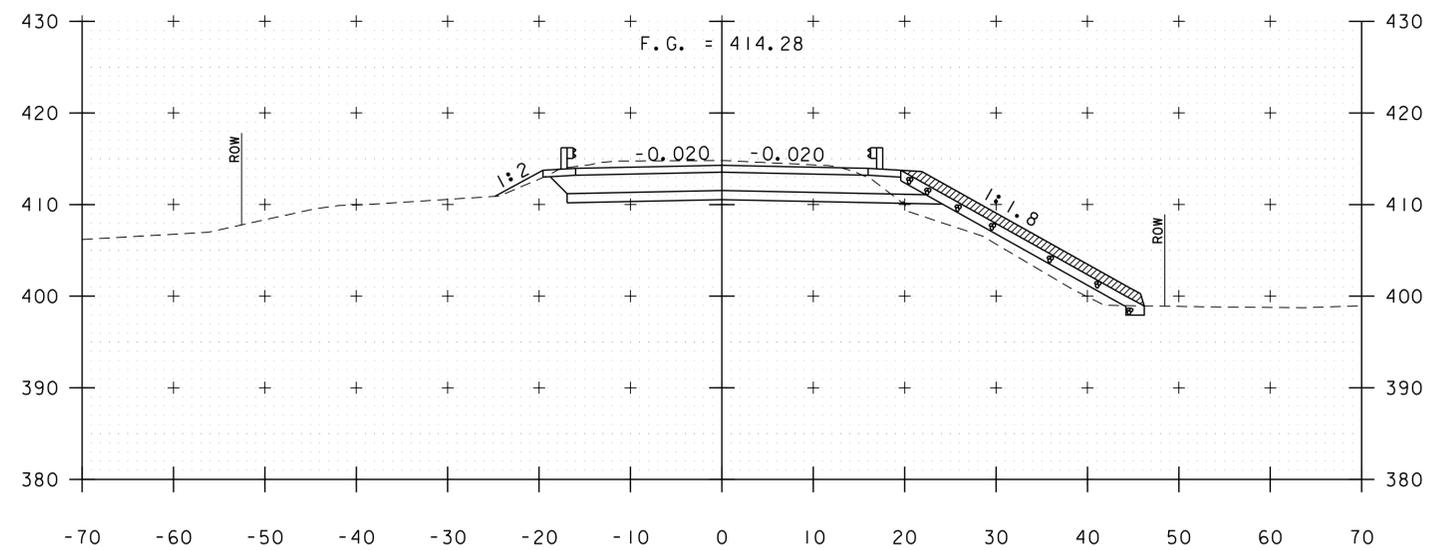
67+00



67+50



66+75



67+25

STA. 66+75, LT  
END GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I  
GRUBBING MATERIAL

END BRIDGE  
STA. 66+70.64

STA. 66+53, RT  
BEGIN GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I  
GRUBBING MATERIAL

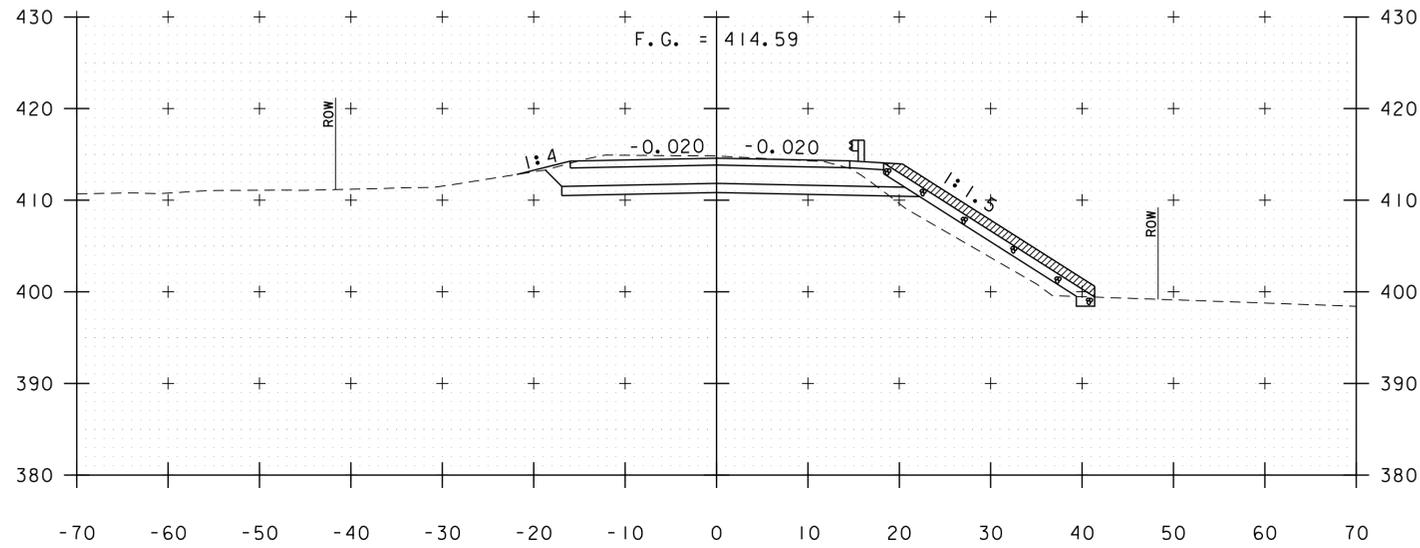
ROADWAY CROSS SECTIONS

SCALE 1" = 10'-0"

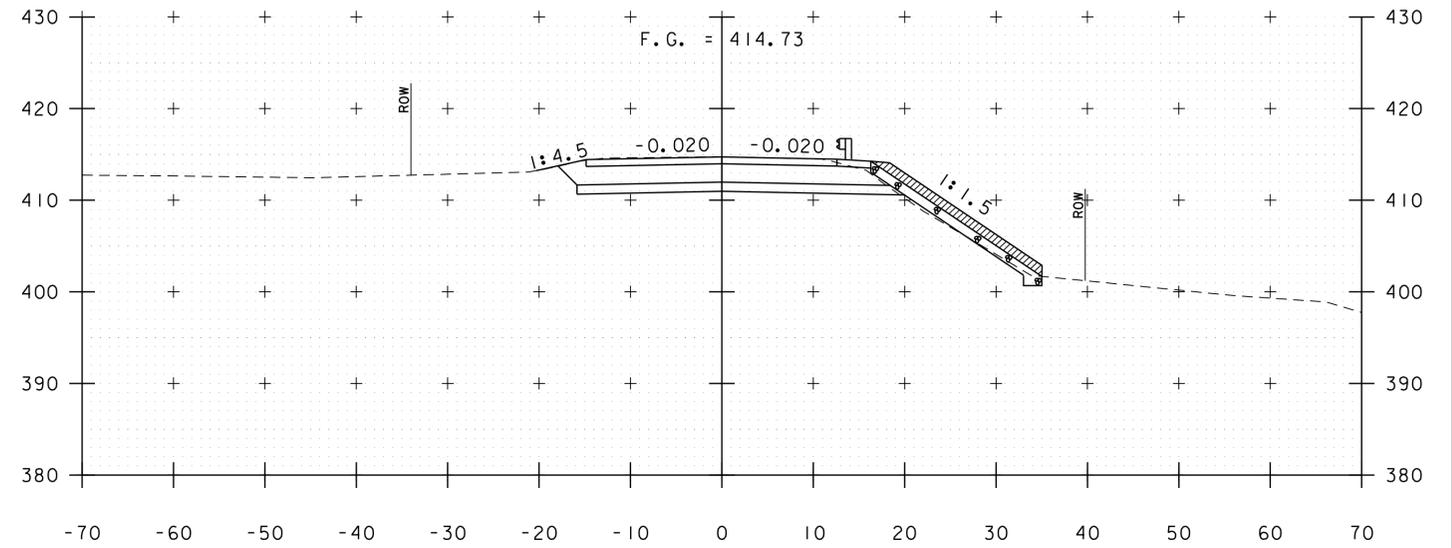
STA. 66+75 - 67+50



PROJECT NAME:	CASTLETON	PLOT DATE:	9/19/2014
PROJECT NUMBER:	BRF 015-(2)	DRAWN BY:	M.C. SCOTT
FILE NAME:	z12b138xs.dgn	CHECKED BY:	E.A. FIALA
PROJECT LEADER:	S.E. BURBANK	SHEET	60 OF 82
DESIGNED BY:	M.C. SCOTT		
ROADWAY CROSS SECTIONS (4 OF 6)			

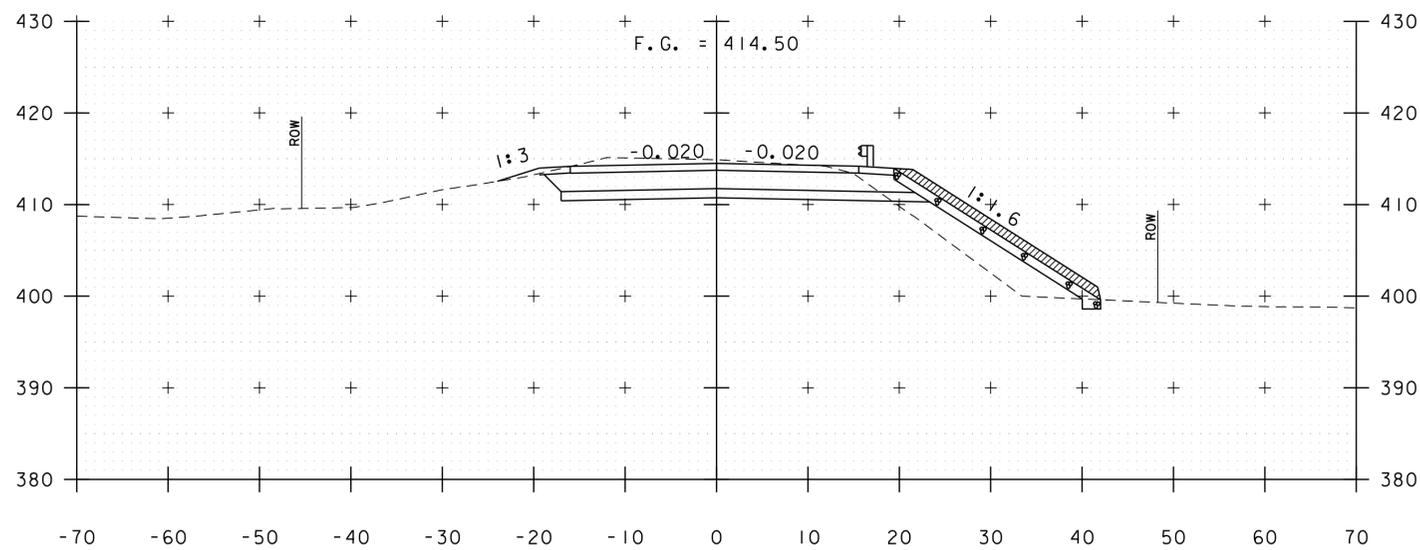


68+00

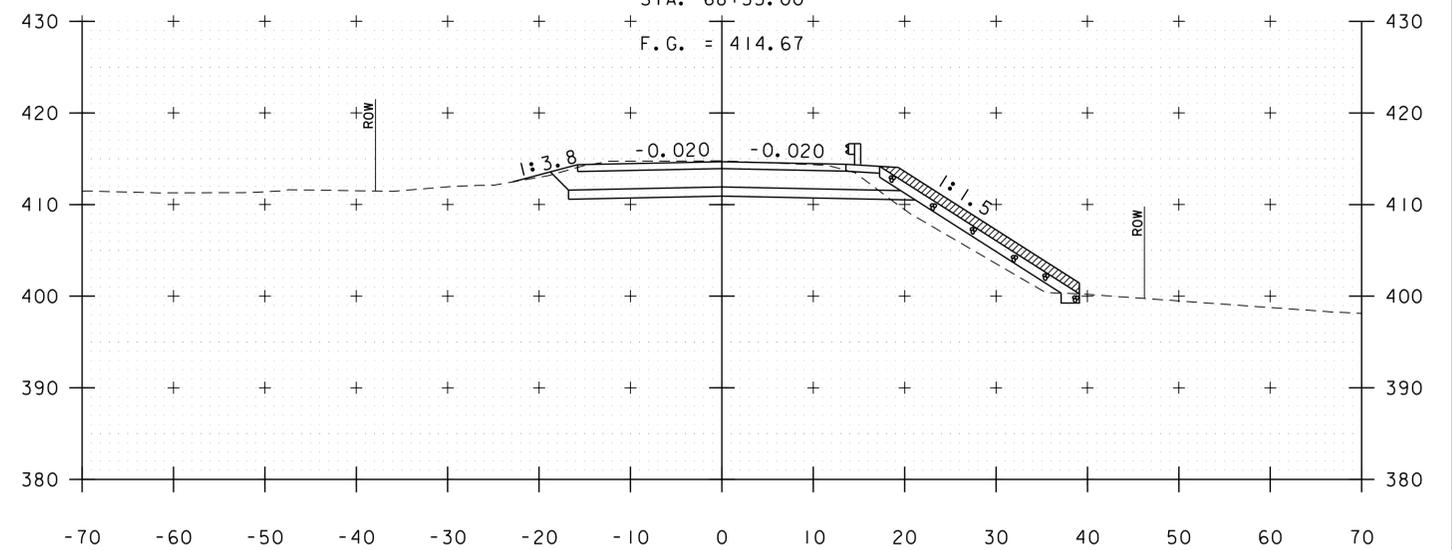


68+50

END PROJECT  
STA. 68+55.00



67+75



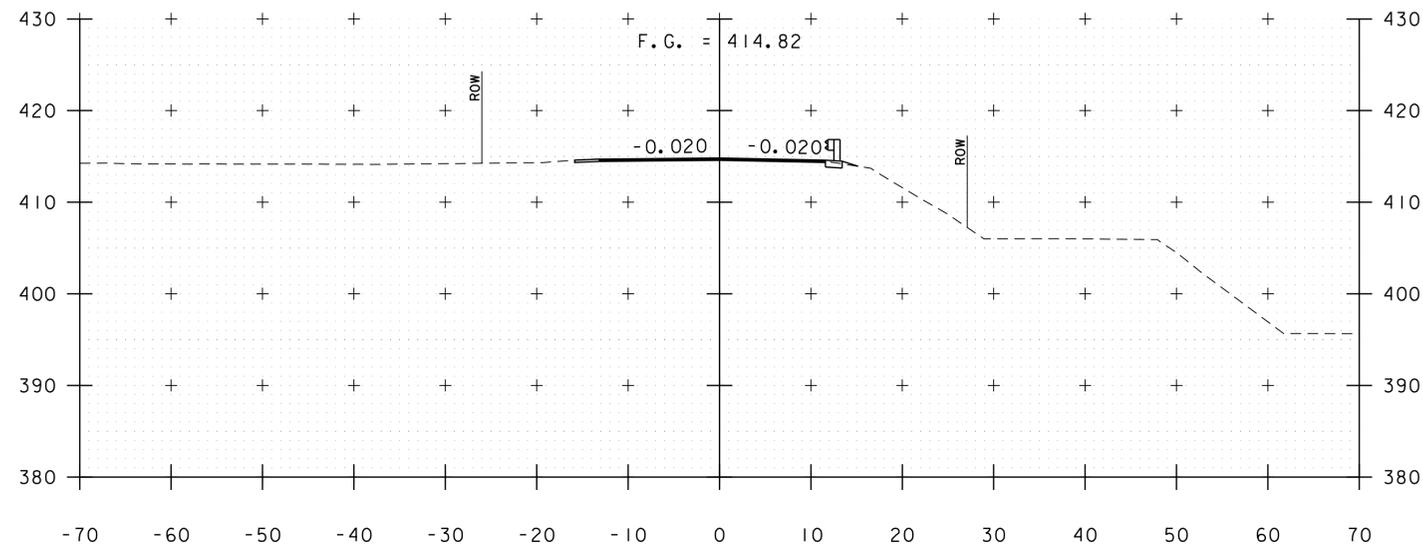
68+25

ROADWAY CROSS SECTIONS

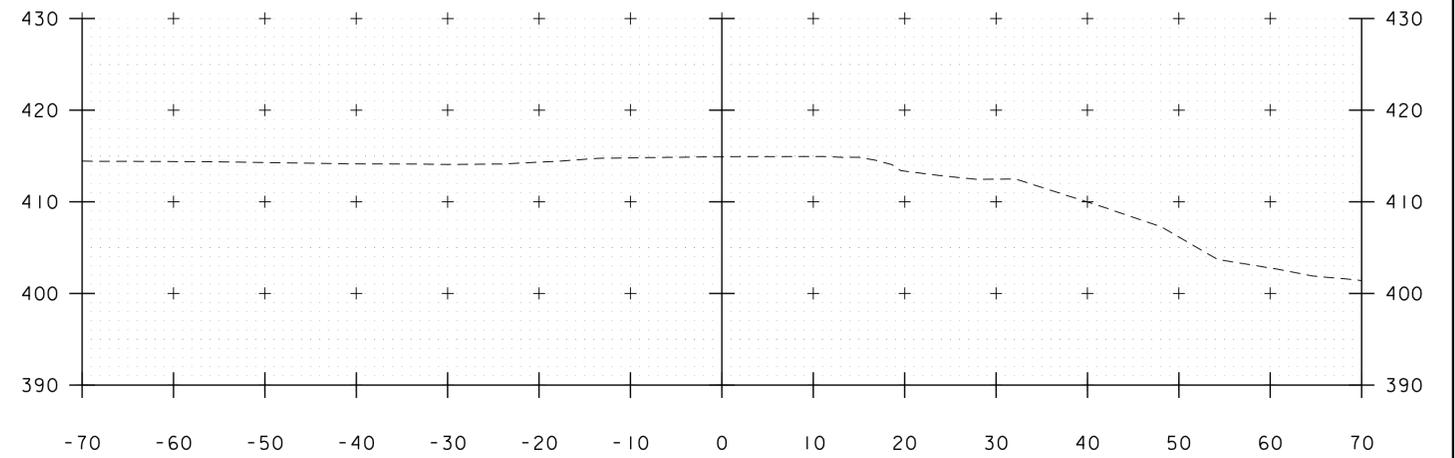
SCALE 1" = 10'-0"  
STA. 67+75 - 68+50



PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-(2)	DRAWN BY: M.C. SCOTT
FILE NAME: z12b138xs.dgn	CHECKED BY: E.A. FIALA
PROJECT LEADER: S.E. BURBANK	SHEET 61 OF 82
DESIGNED BY: E.A. FIALA	
ROADWAY CROSS SECTIONS (5 OF 6)	

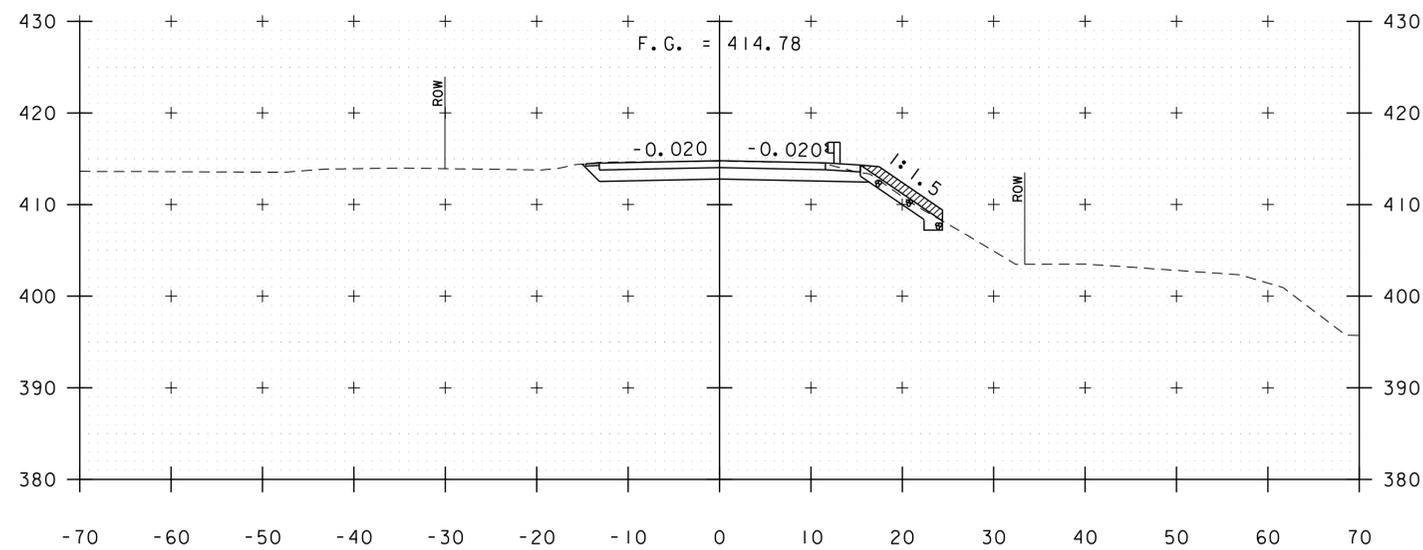


69+00



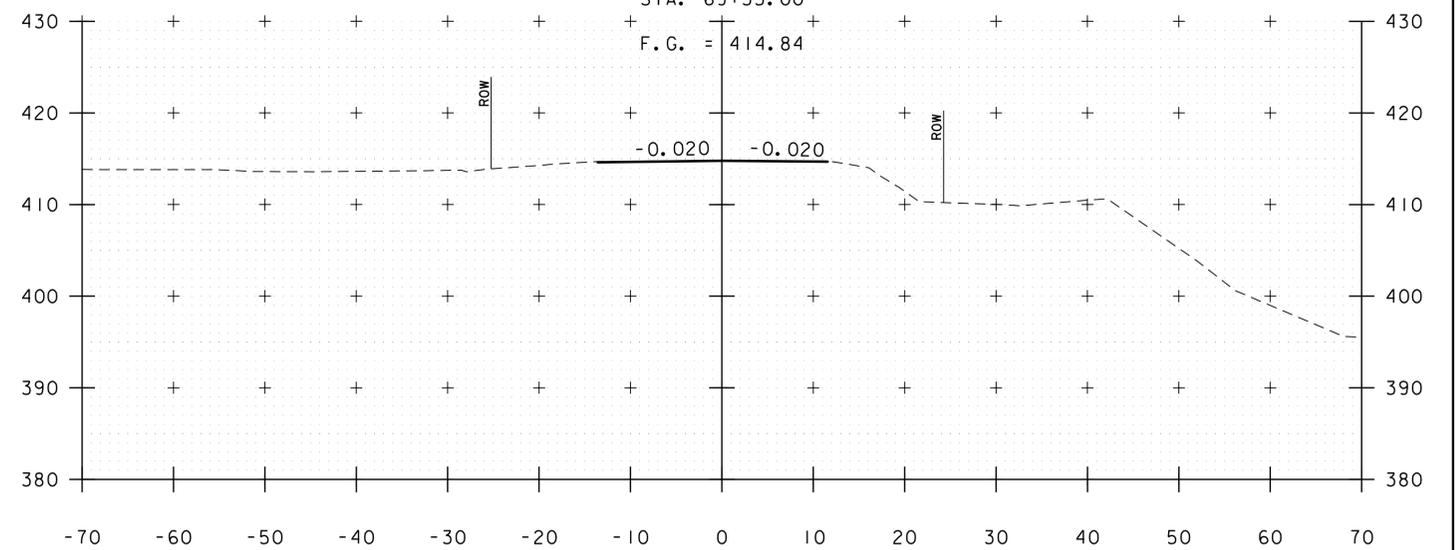
69+50

END APPROACH  
STA. 69+35.00



68+75

STA. 68+75, RT  
END GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I  
GRUBBING MATERIAL



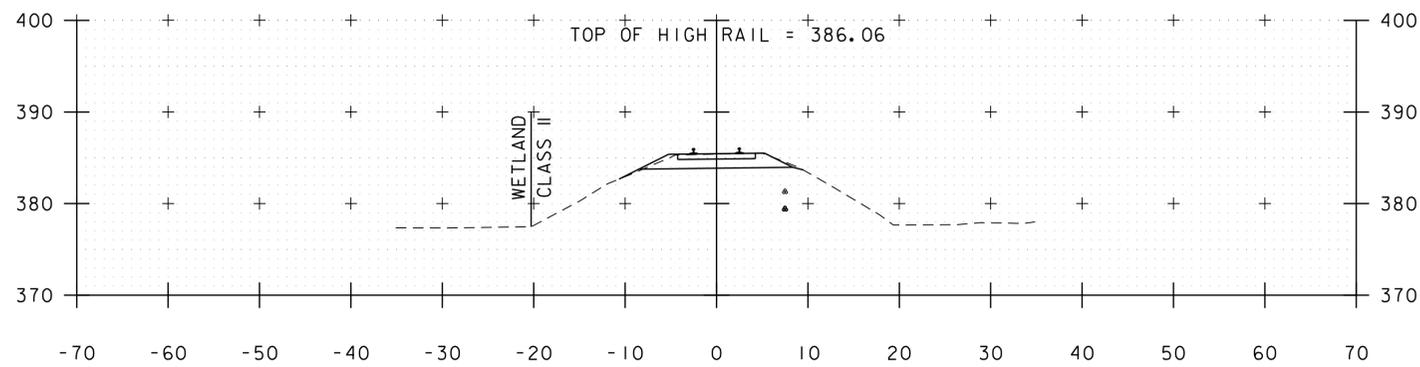
69+25

ROADWAY CROSS SECTIONS

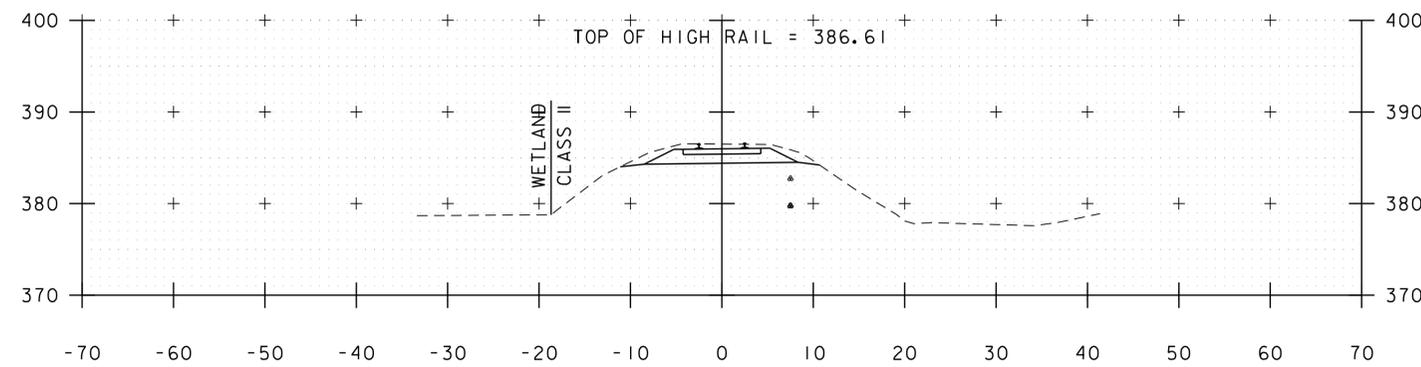
SCALE 1" = 10'-0"  
STA. 68+75 - 69+50



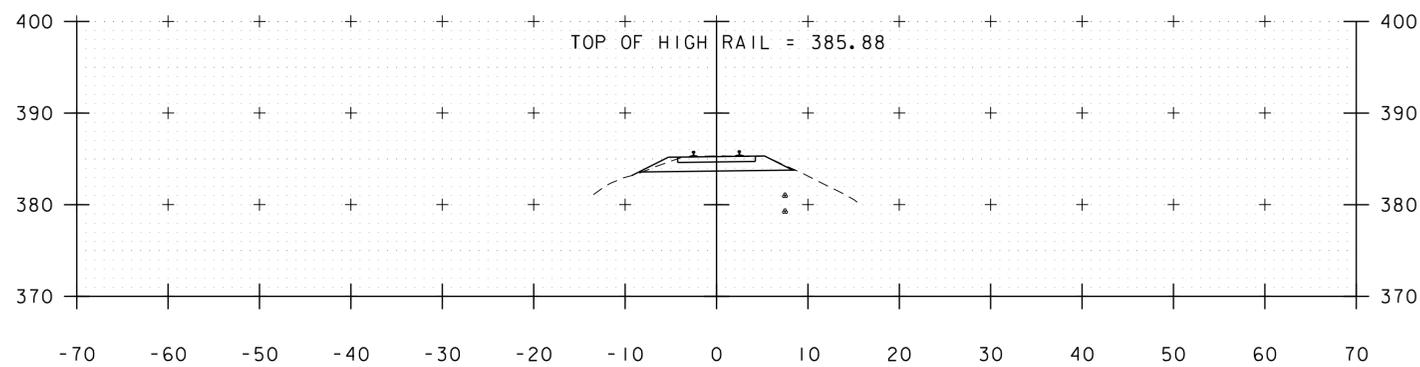
PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-(2)	DRAWN BY: M.C. SCOTT
FILE NAME: z12b138xs.dgn	CHECKED BY: E.A. FIALA
PROJECT LEADER: S.E. BURBANK	SHEET 62 OF 82
DESIGNED BY: E.A. FIALA	
ROADWAY CROSS SECTIONS (6 OF 6)	



595+50

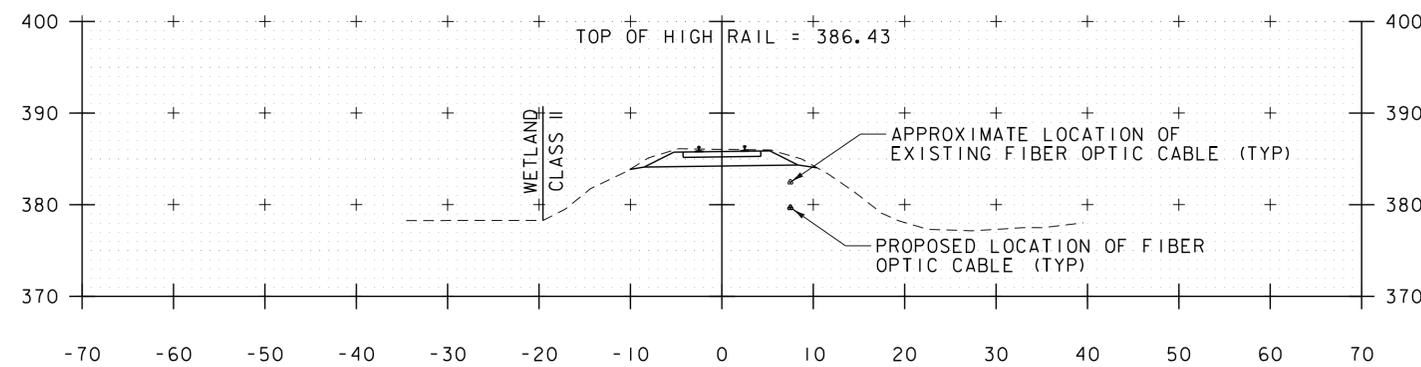


597+00

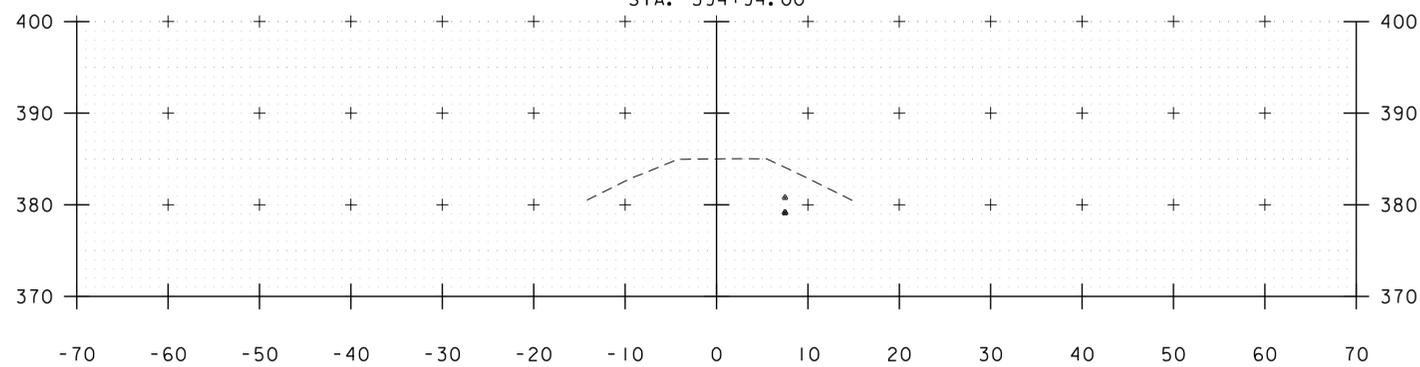


595+00  
BEGIN RAIL WORK  
STA. 594+94.00

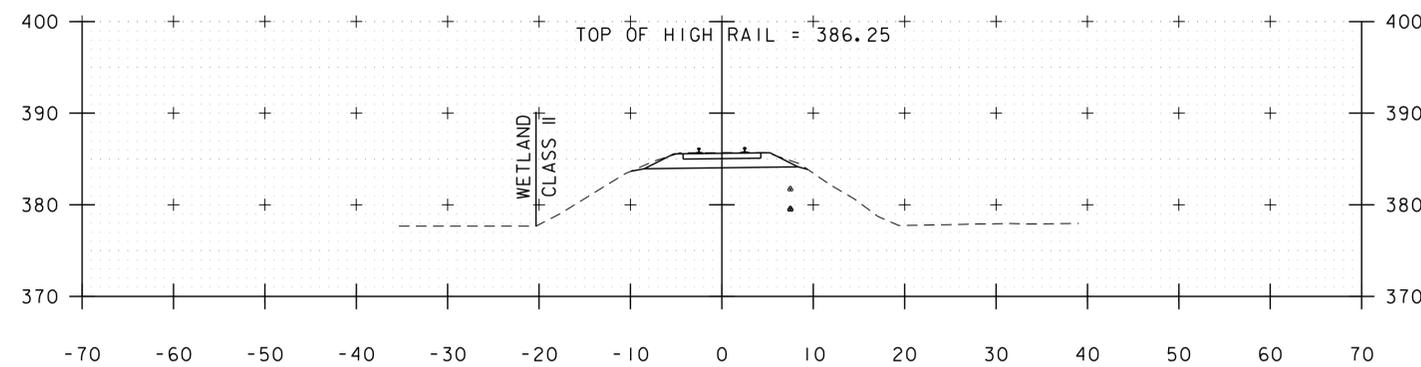
594+50



596+50



594+50



596+00

RAILROAD CROSS SECTIONS

SCALE 1" = 10'-0"

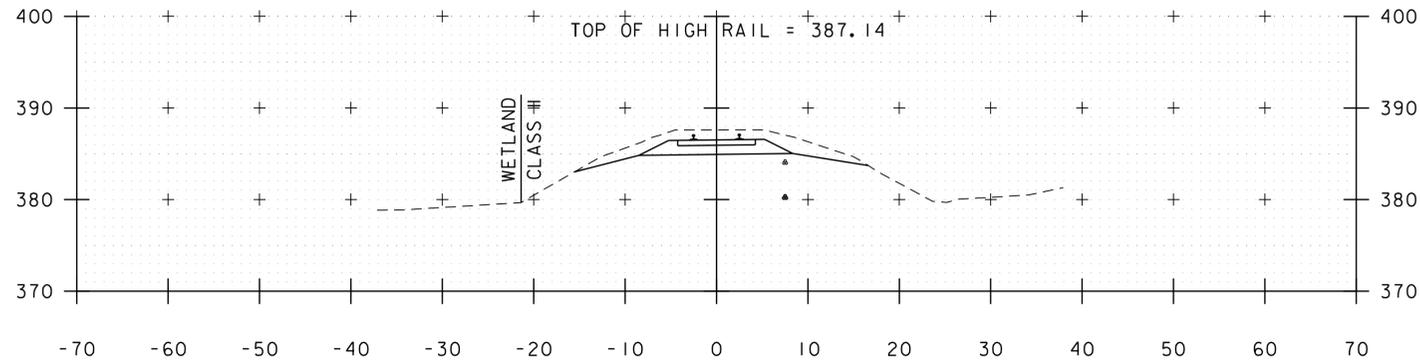
STA. 594+50 - 597+00



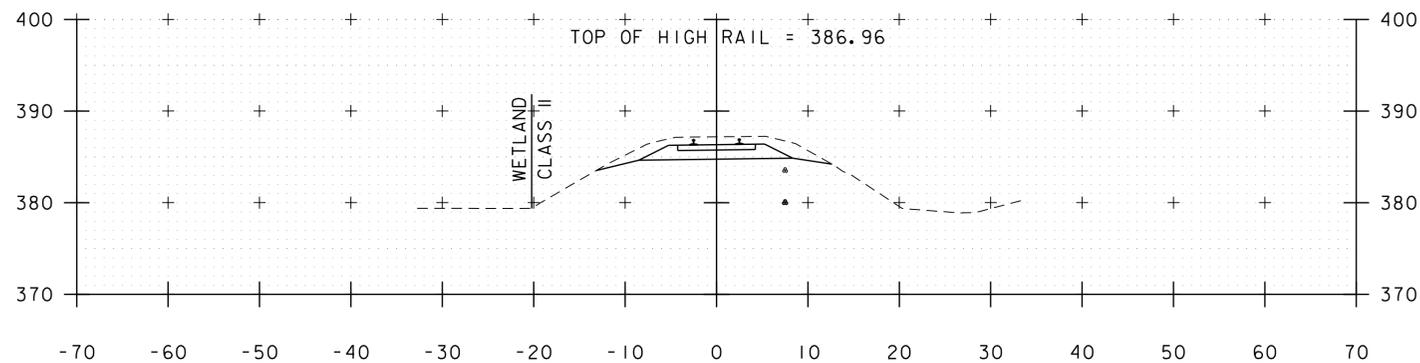
PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138xs.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
RAILROAD CROSS SECTIONS (10 OF 5)

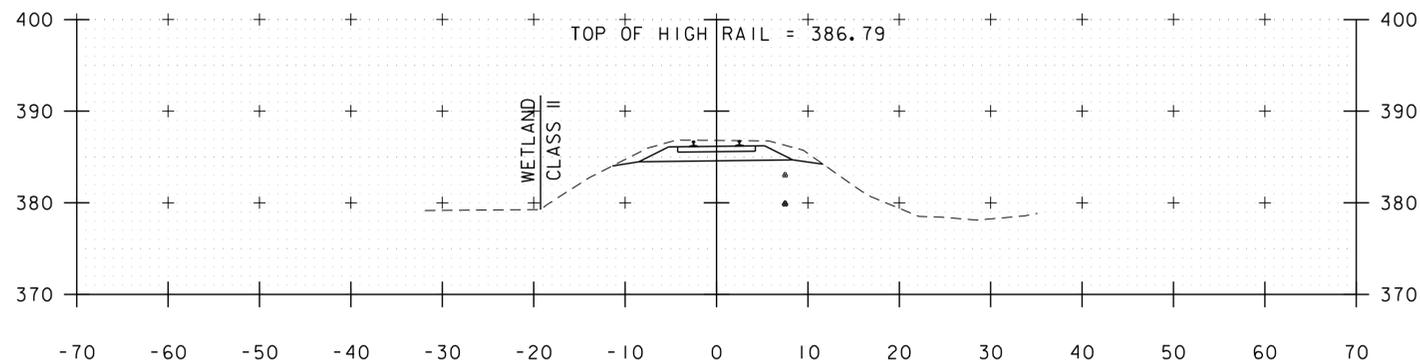
PLOT DATE: 9/19/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 63 OF 82



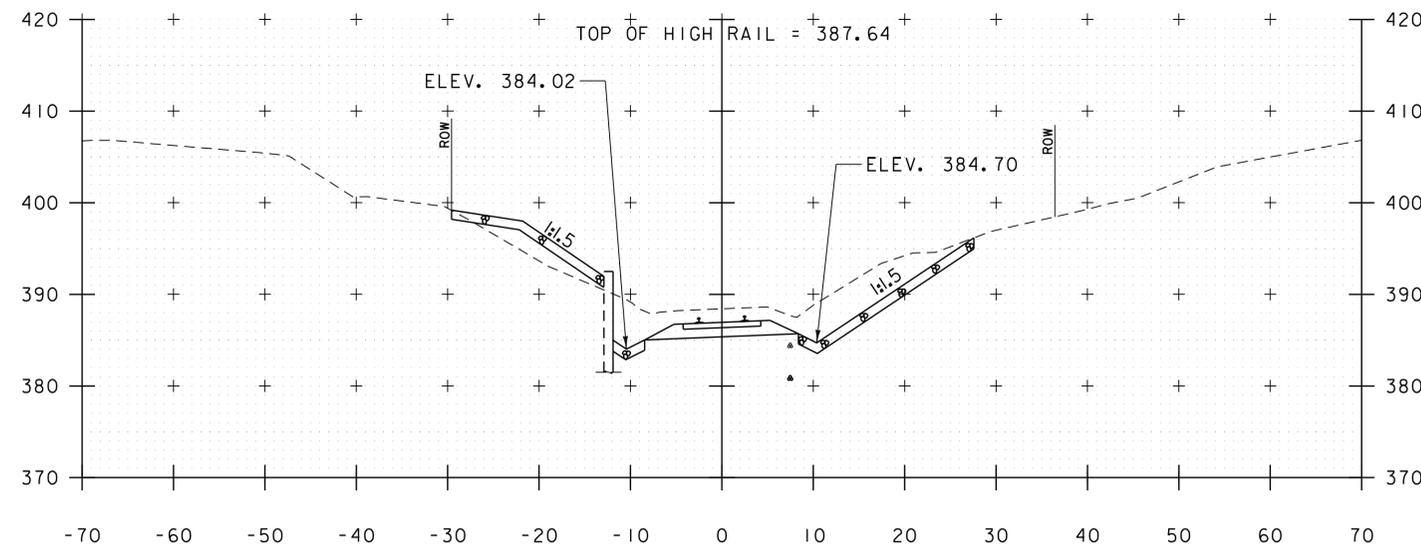
598+50



598+00

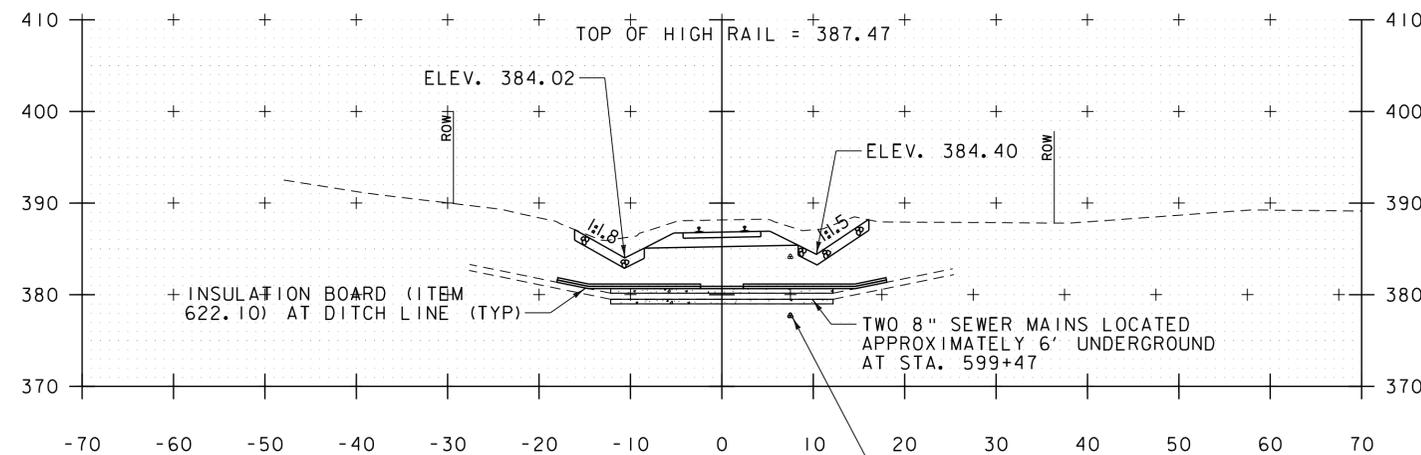


597+50

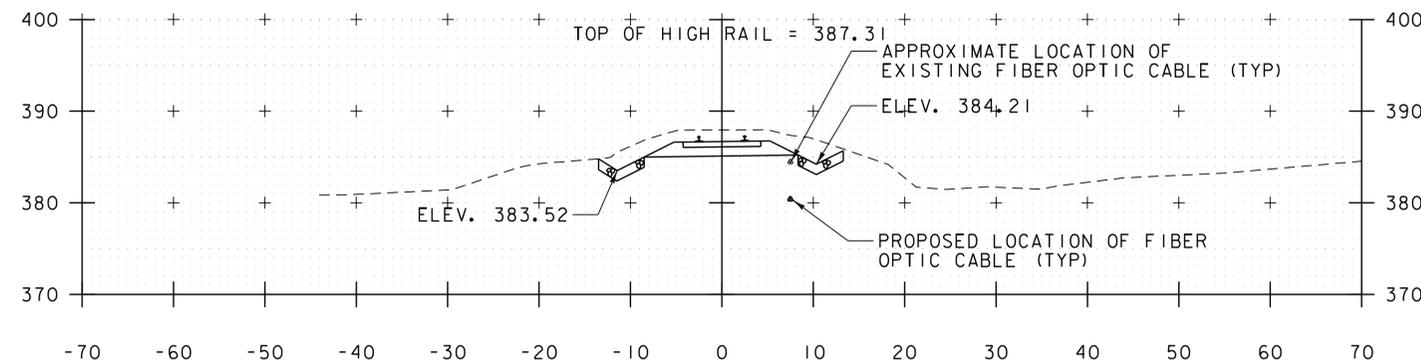


600+00

STA. 599+79, LT  
BEGIN PERMANENT STEEL SHEET PILING



599+50



599+00

STA. 598+58, LT  
BEGIN GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I

STA. 598+58, RT  
BEGIN GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I

RAILROAD CROSS SECTIONS

SCALE 1" = 10'-0"

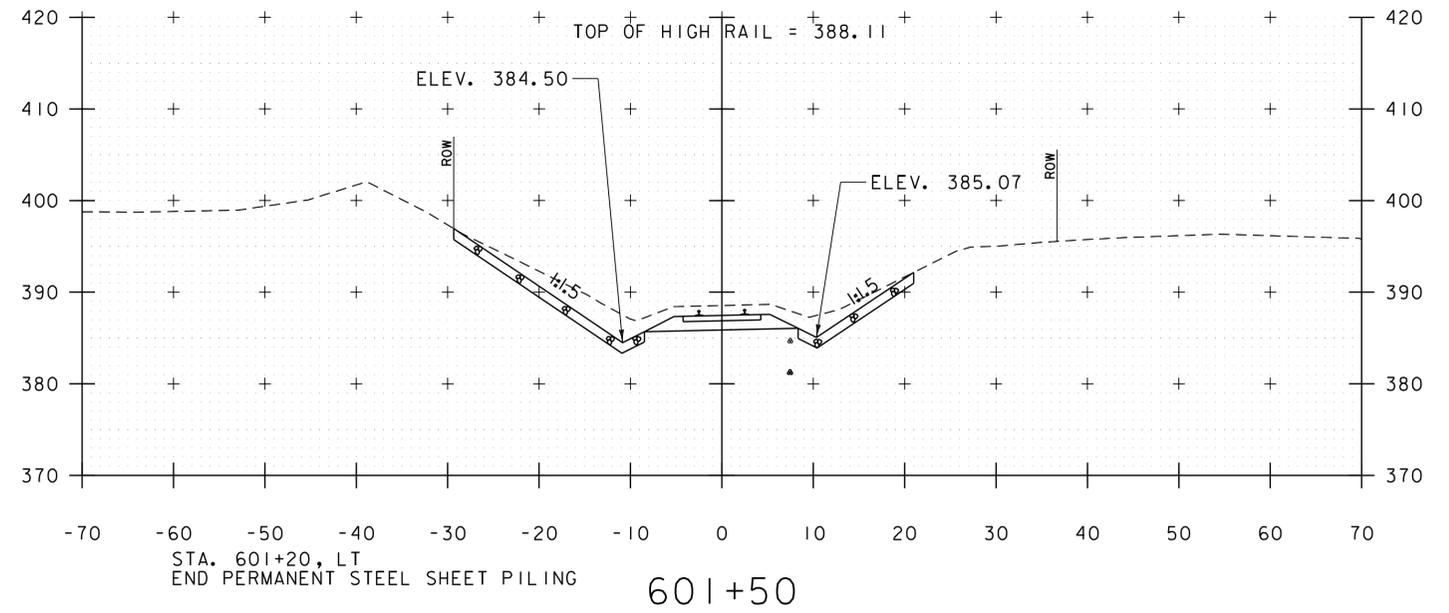
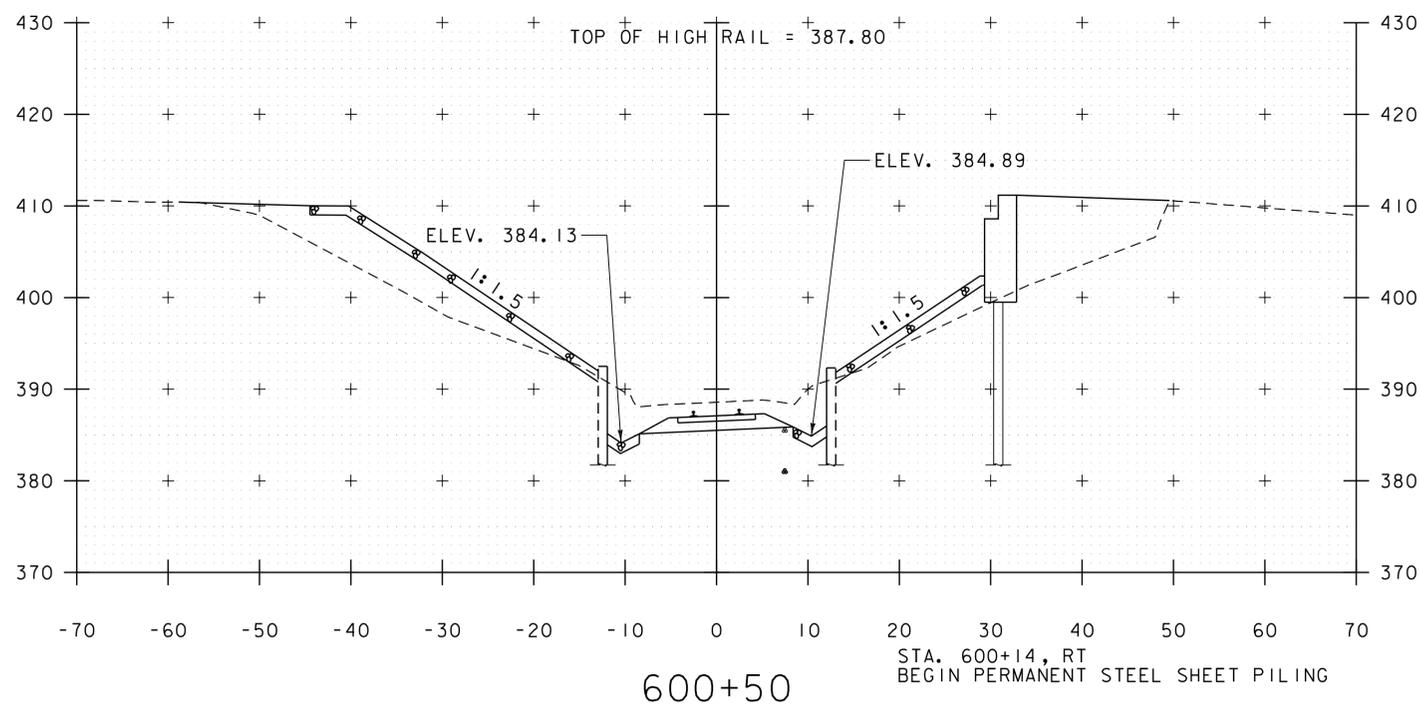
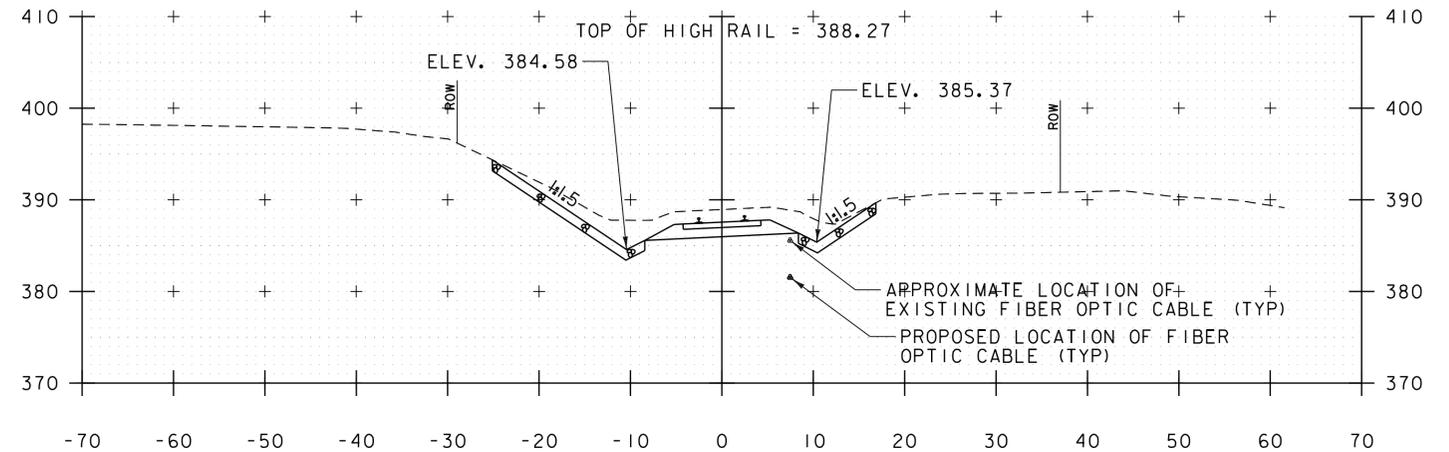
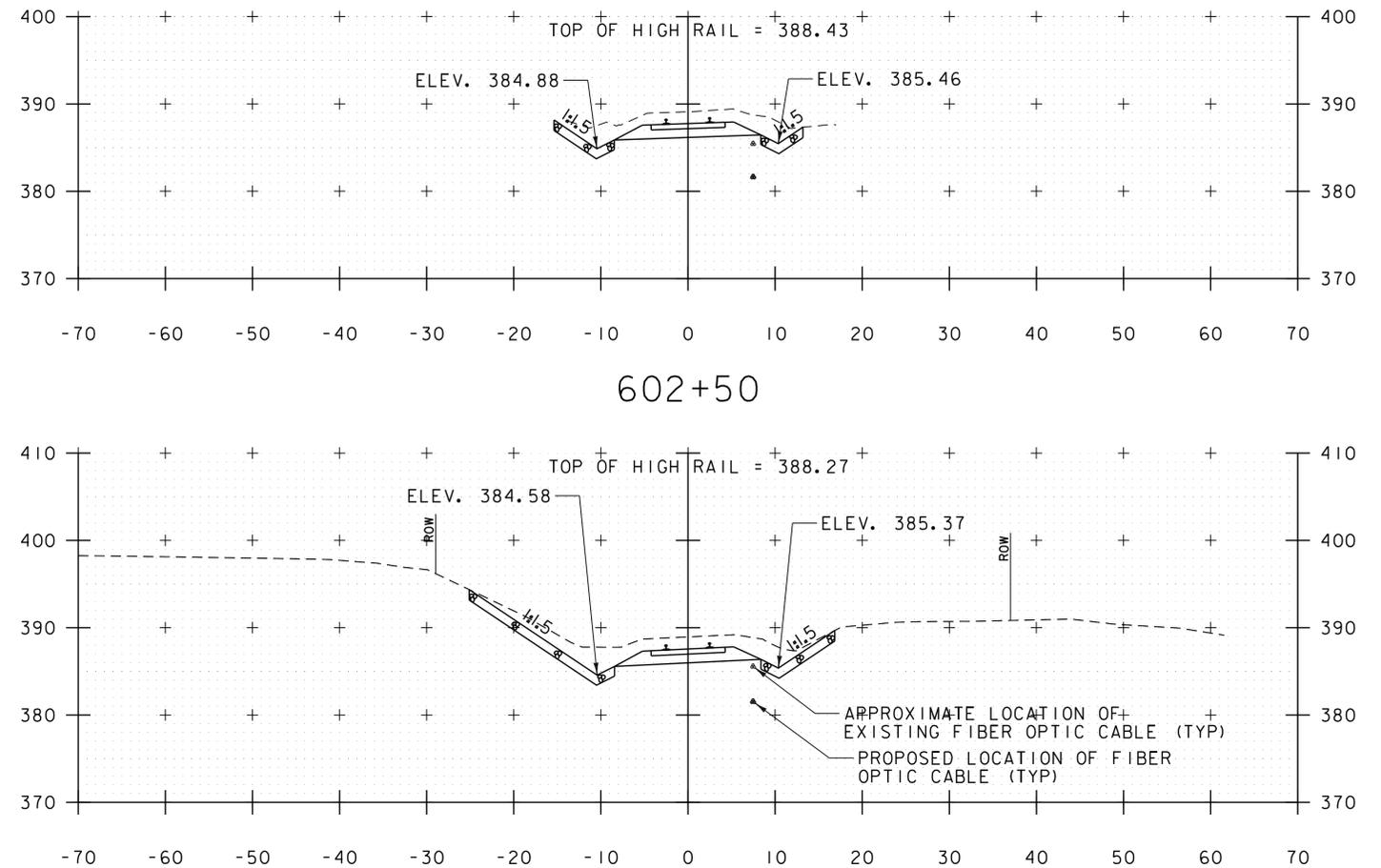
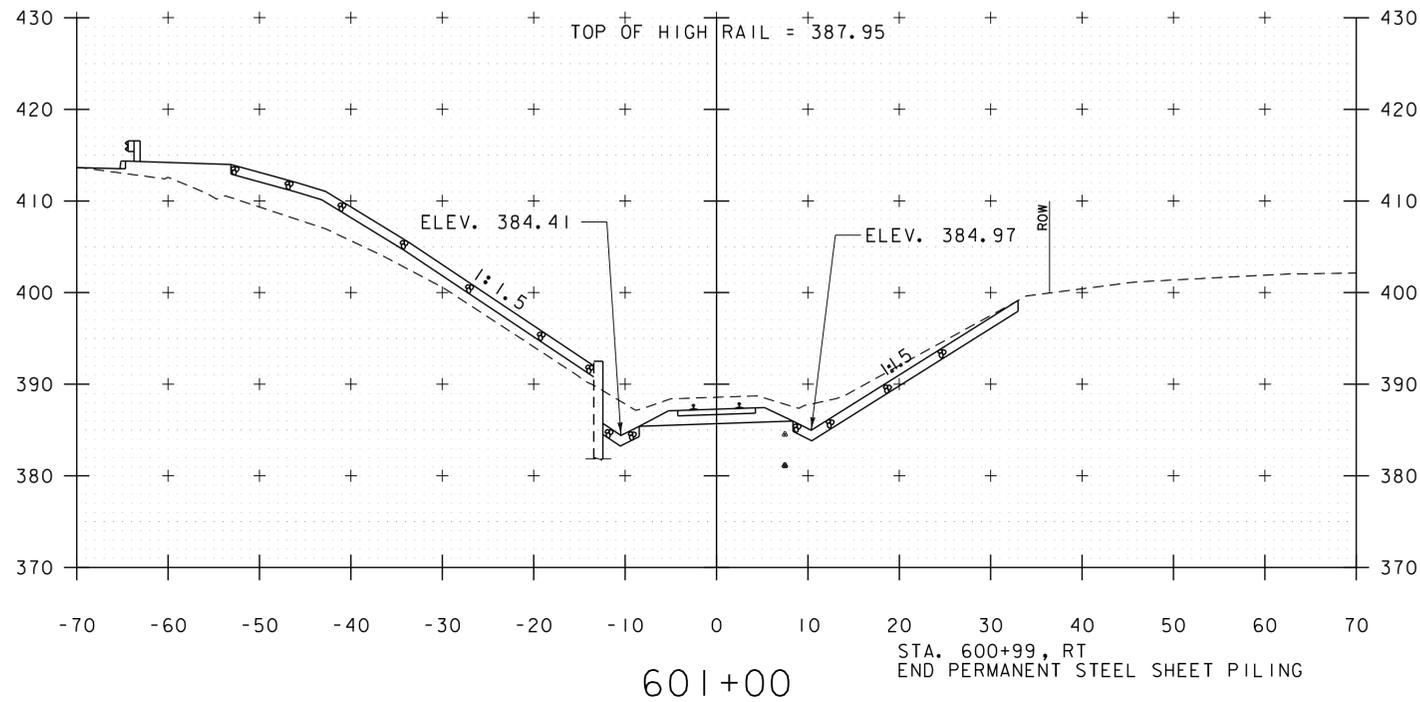
STA. 597+50 - 600+00



PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138xs.dgn  
PROJECT LEADER: S.E. BURBANK  
DESIGNED BY: E.A. FIALA  
RAILROAD CROSS SECTIONS (2 OF 5)

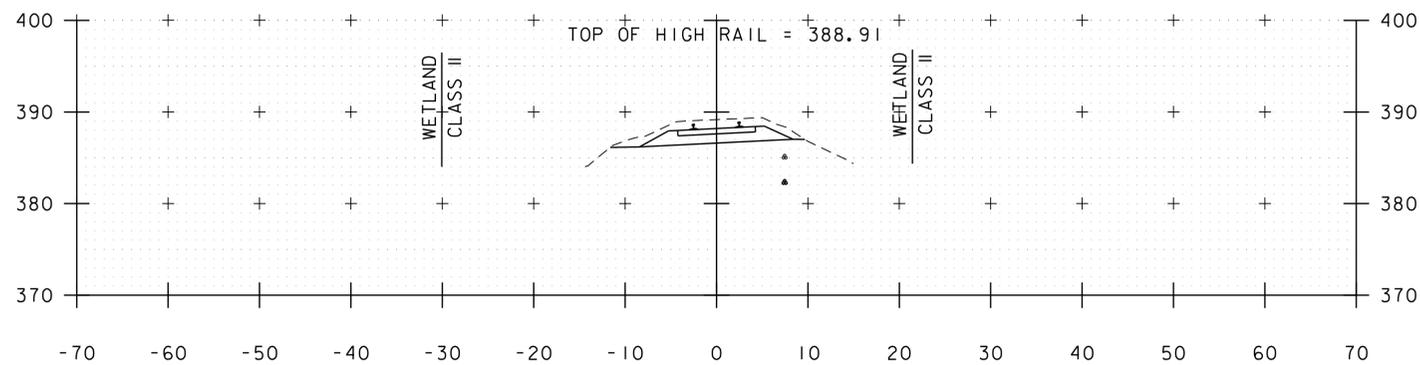
PLOT DATE: 9/19/2014  
DRAWN BY: E.A. FIALA  
CHECKED BY: S.E. BURBANK  
SHEET 64 OF 82



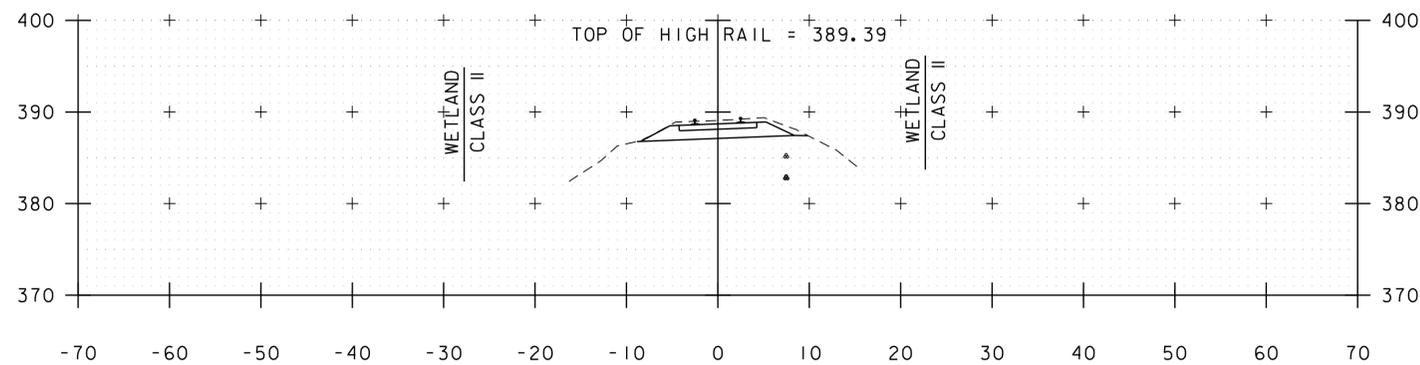
RAILROAD CROSS SECTIONS  
SCALE 1" = 10'-0"  
STA. 600+50 - 602+50



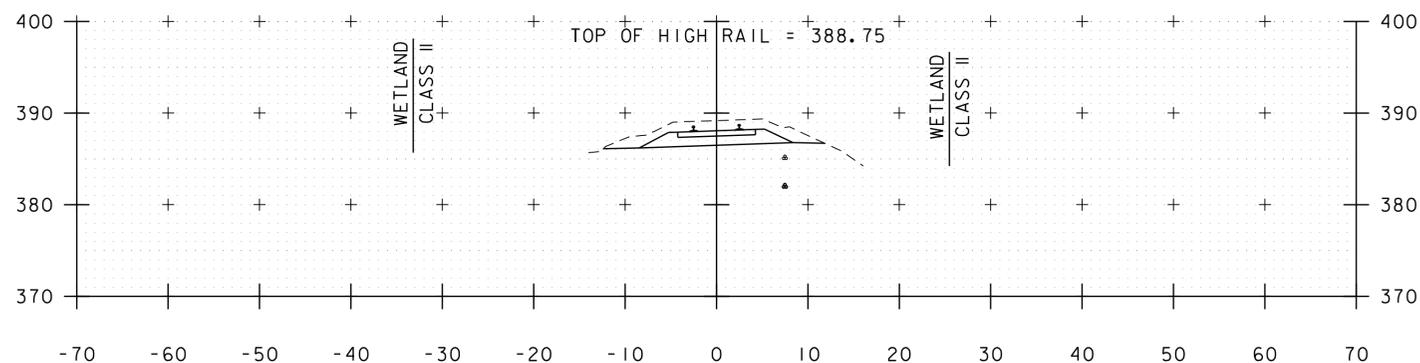
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PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: E.A. FIALA
FILE NAME: z12bl38xs.dgn	DESIGNED BY: E.A. FIALA
PROJECT LEADER: S.E. BURBANK	CHECKED BY: S.E. BURBANK
RAILROAD CROSS SECTIONS (3 OF 5)	SHEET 65 OF 82



604+00

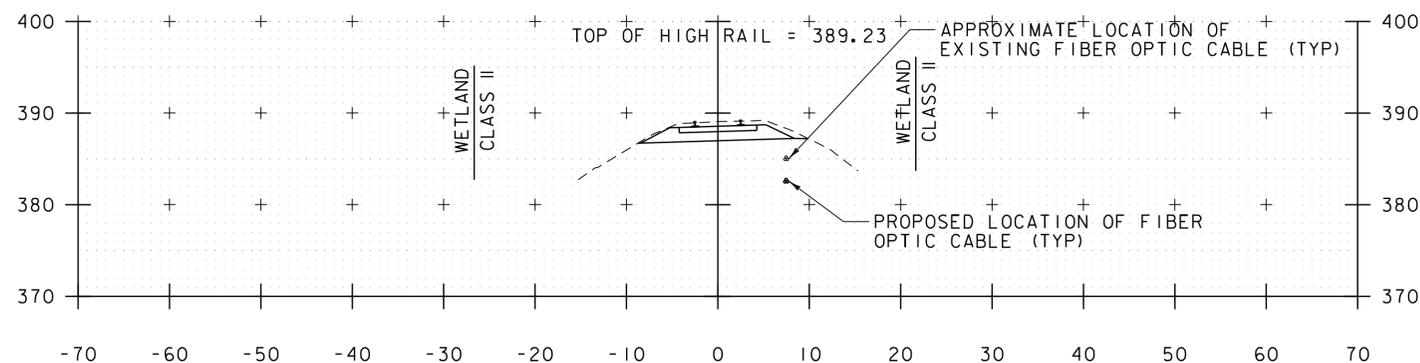


605+50

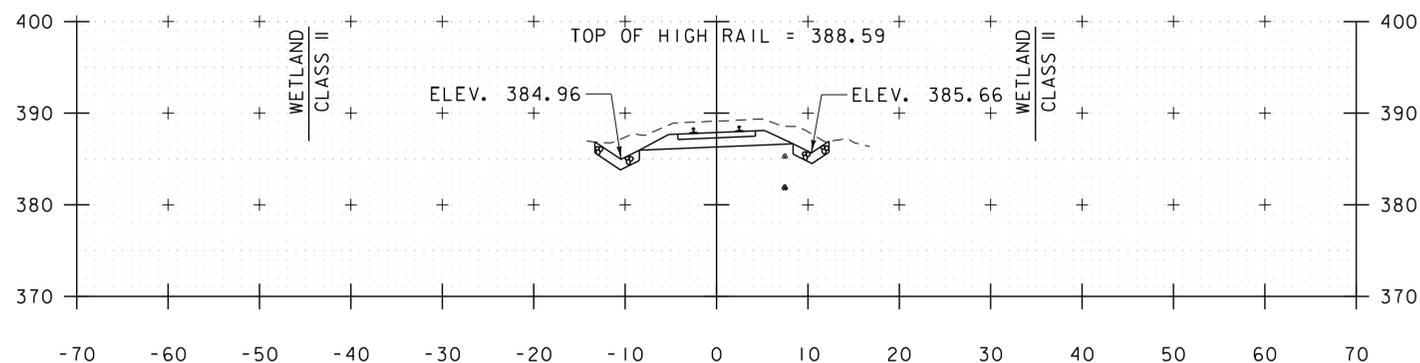


603+50

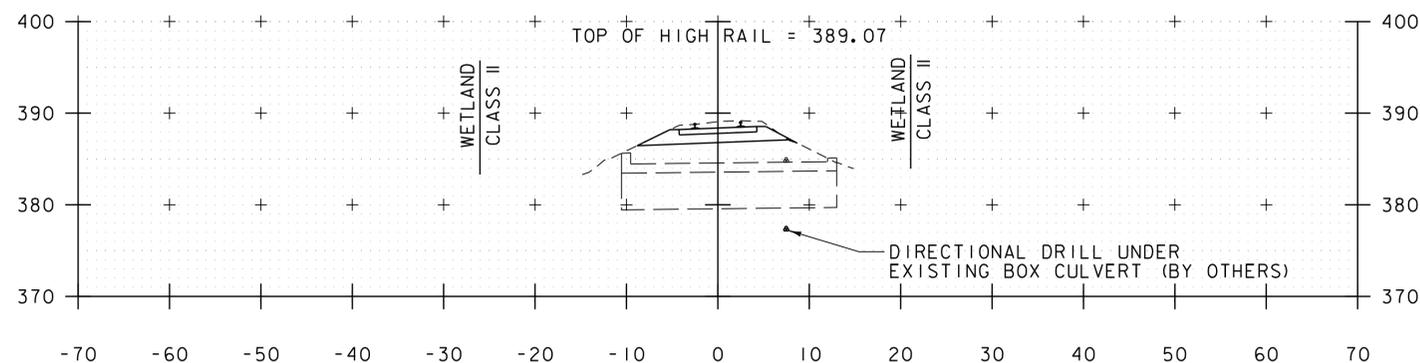
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END GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE I



605+00



603+00



604+50

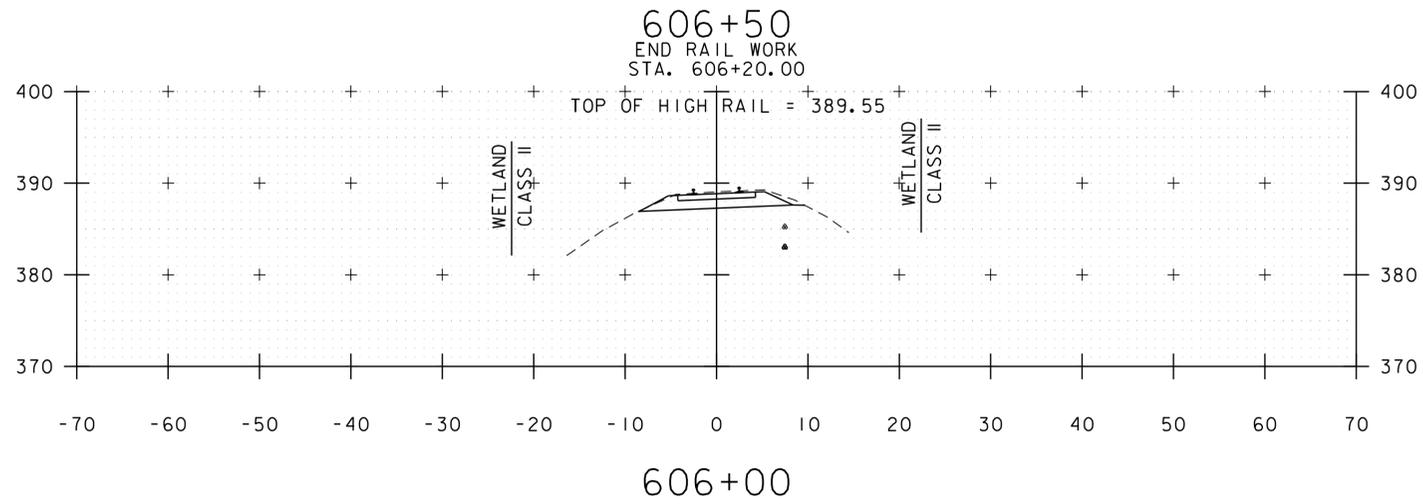
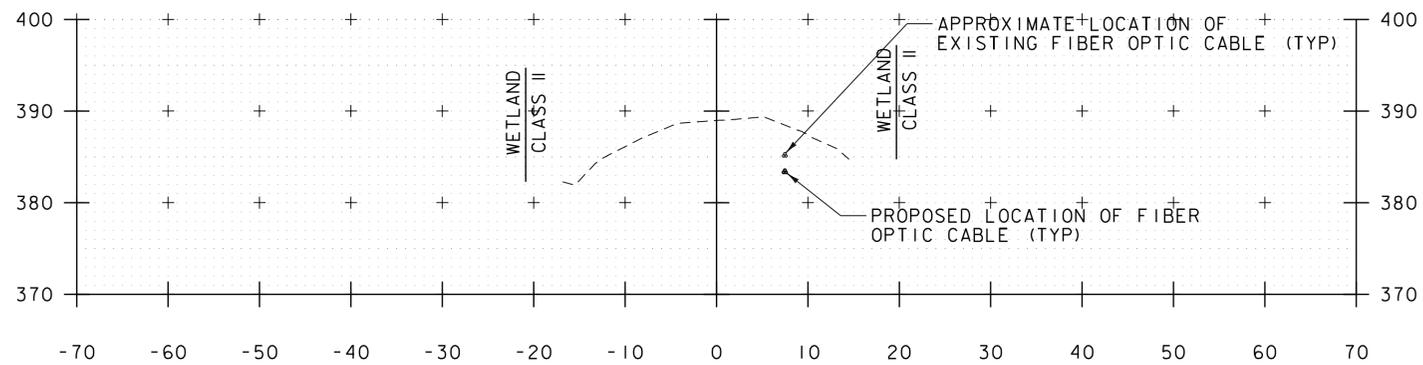
RAILROAD CROSS SECTIONS

SCALE 1" = 10'-0"

STA. 603+00 - 605+50



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138xs.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAILROAD CROSS SECTIONS (4 OF 5)	SHEET 66 OF 82



RAILROAD CROSS SECTIONS

SCALE 1" = 10'-0"

STA. 606+00 - 606+50



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138xs.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAILROAD CROSS SECTIONS (5 OF 5)	SHEET 67 OF 82

# EPSC PLAN NARRATIVE

## 1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REMOVAL AND REPLACEMENT OF THE EXISTING STEEL BEAM AND CONCRETE DECK SUPERSTRUCTURE, CONCRETE ABUTMENTS, AND CONCRETE PIERS WITH RELATED APPROACH AND RAIL WORK. DURING CONSTRUCTION TRAFFIC WILL BE MAINTAINED ON AN OFF-SITE DETOUR. THIS PROJECT IS LOCATED ON VT 30, OVER THE CLARENDON AND PITTSFORD RAILROAD, APPROXIMATELY 0.3 MILES SOUTH OF THE JUNCTION WITH VT 4A IN THE TOWN OF CASTLETON. THE EXISTING BRIDGE HAS A 36 FOOT MAXIMUM SPAN FOR TOTAL BRIDGE LENGTH OF APPROXIMATELY 109 FEET AND HAS AN OVERALL WIDTH OF 29.0 FEET. THE EXISTING SUBSTRUCTURE CONSISTS OF CONCRETE STUB ABUTMENTS AND PIERS ON SPREAD FOOTINGS.

THE BRIDGE REPLACEMENT INCLUDES THE REMOVAL OF THE EXISTING STRUCTURE IN ITS ENTIRETY AND THE CONSTRUCTION OF A NEW 70.10' SINGLE SPAN BRIDGE WITH PRECAST PRESTRESSED CONCRETE NEXT BEAMS TO CREATE A NEW BRIDGE WIDTH OF 35'-0". NEW INTEGRAL ABUTMENTS, EACH ON A SINGLE ROW OF PILES, AND WINGWALLS WILL BE PRECAST. STEEL SHEET PILING WILL BE DRIVEN IN FRONT OF THE ABUTMENTS TO ALLOW FOR PRESENT AND FUTURE LOWERING OF THE RAIL TRACKS. ASSOCIATED ROADWAY APPROACH WORK INCLUDES PRECAST BRIDGE APPROACH SLABS, WIDENING OF ROADWAY, AND NEW GUARDRAIL. ASSOCIATED RAIL APPROACH WORK INCLUDES LOWERING THE ROAD 1' AND LOWERING THE RAIL TO ACHIEVE 21'-2 1/4" VERTICAL CLEARANCE.

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 1.70 ACRES.

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

## 1.2 SITE INVENTORY

### 1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS HILLY WITH A MOSTLY WELL ESTABLISHED FOREST AND OCCASIONAL OPEN AREAS. VT ROUTE 30 HAS PAVED DRIVEWAYS WITHIN THE PROJECT SITE. THERE IS A RESIDENCE AND SEWAGE TREATMENT PLANT ON THE WEST SIDE OF THE PROJECT, AND A VTRANS GARAGE AND BUSINESS TO THE EAST WITH GRASS AND TREE BUFFERS.

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

THERE IS NO WATER SOURCE ON THE PROJECT SITE. WETLANDS ARE TO THE SOUTH AND EAST OF THE BRIDGE.

### 1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF MARSH NEAR THE RAILROAD TRACKS AND HARDWOOD TREES NEAR THE ROAD. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY REPLACEMENT OF THE BRIDGE AND LOWERING OF THE RAIL. UPON PROJECT COMPLETION, SLOPES UP TO THE ABUTMENT WILL BE ARMORED WITH STONE FILL TYPE I 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 RUTLAND, VERMONT. THE PRIMARY SOILS ON THE PROJECT SITE ARE WINDSOR LOAMY SAND, 15% TO 25% SLOPES, "K FACTOR" = 0.17 AND IS CONSIDERED TO HAVE LOW EROSION POTENTIAL DUE TO INSIGNIFICANT SLOPES; AND LIMERICK SILT LOAM, "K FACTOR" = 0.49 AND IS CONSIDERED TO HAVE HIGH EROSION POTENTIAL.

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

HISTORICAL OR ARCHEOLOGICAL AREAS: NO  
PRIME AGRICULTURAL LAND: NO  
THREATENED AND ENDANGERED SPECIES: NO  
WATER RESOURCE: NONE  
WETLANDS: YES; LOCATED ADJACENT TO THE RAILROAD

## 1.3 RISK EVALUATION

THIS PROJECT FALLS UNDER THE JURISDICTION OF GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES FOR LOW RISK PROJECTS. ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. 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 CONTRACTOR'S PROGRESS SCHEDULE.

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

### 1.4.4 INSTALL SEDIMENT BARRIERS

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

SILT FENCE 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.

DIVERSION MEASURES ARE NOT ANTICIPATED FOR THIS PROJECT.

### 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 ARE NOT ANTICIPATED FOR THIS PROJECT.

### 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 FOR 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.

### 1.4.9 WINTER STABILIZATION

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

### 1.4.10 STABILIZE SOIL AT FINAL GRADE

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

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

### 1.4.11 DE-WATERING ACTIVITIES

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

TREATMENT OF DEWATERING COFFERDAM IS NOT ANTICIPATED.

### 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

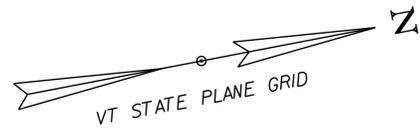
### 1.5.2 OFF-SITE ACTIVITIES

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.

PROJECT NAME: CASTLETON  
PROJECT NUMBER: BRF 015-2(10)

FILE NAME: z12b138EPSC.Narrative.dgn PLOT DATE: 9/19/2014  
PROJECT LEADER: S.E. BURBANK DRAWN BY: E.A. FIALA  
DESIGNED BY: E.A. FIALA CHECKED BY: A.J. GOUDREAU  
EPSC NARRATIVE SHEET 68 OF 82

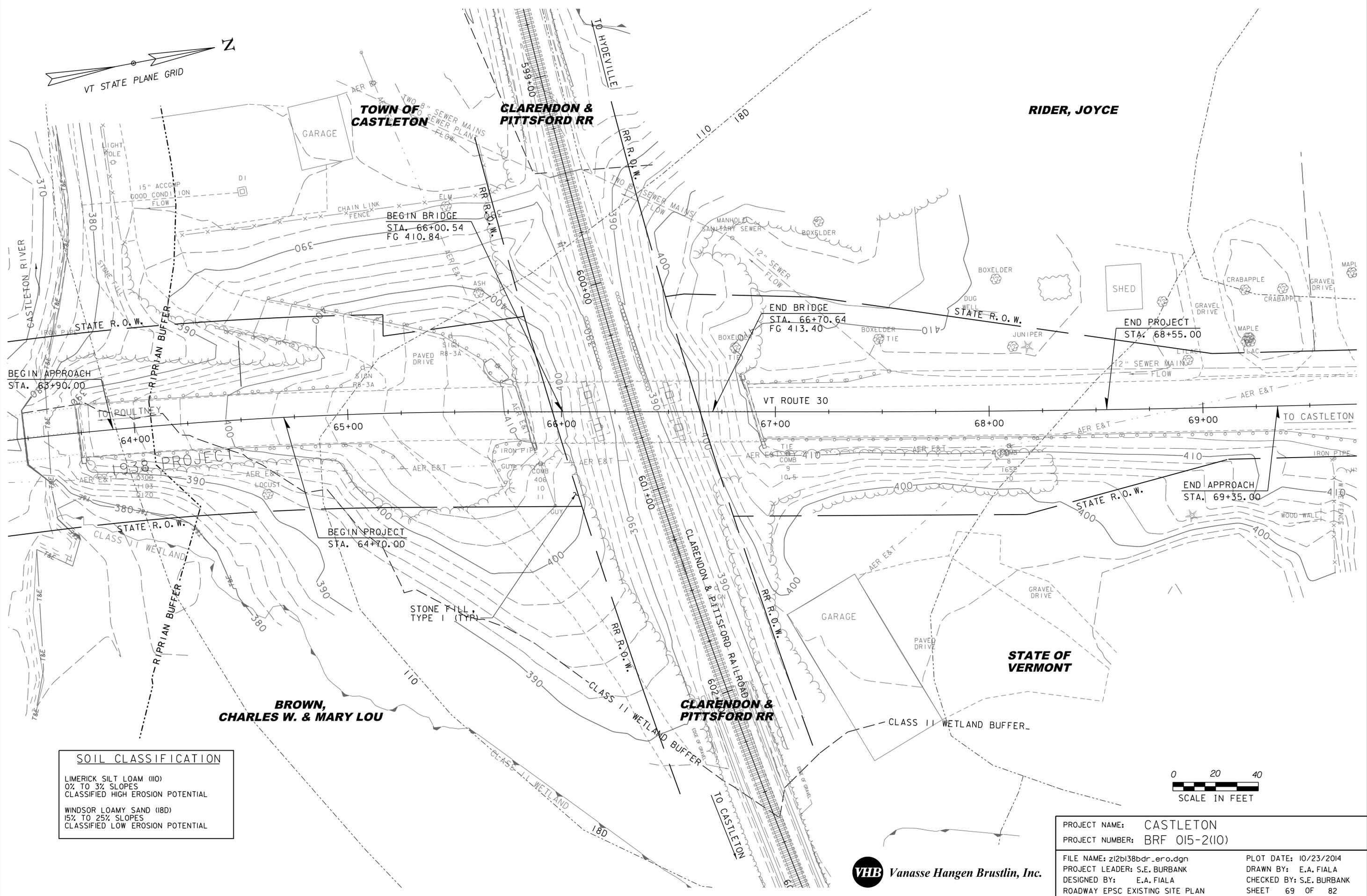




**TOWN OF CASTLETON**

**CLARENDON & PITTSFORD RR**

**RIDER, JOYCE**



BEGIN APPROACH  
STA. 63+90.00

BEGIN BRIDGE  
STA. 66+00.54  
FG 410.84

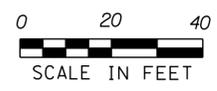
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END PROJECT  
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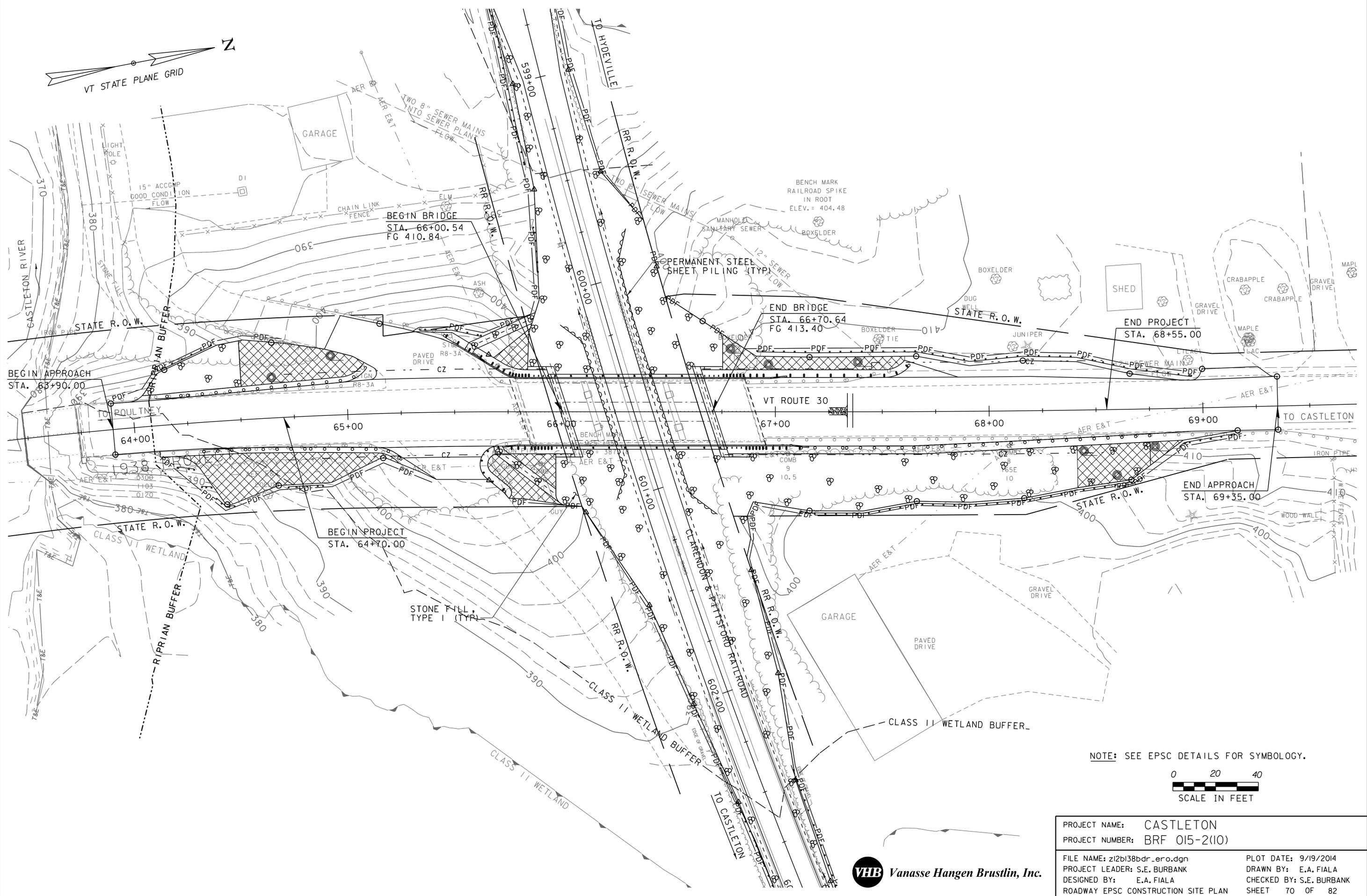
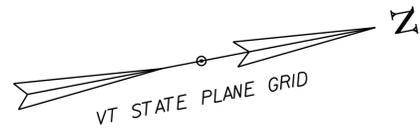
BEGIN PROJECT  
STA. 64+70.00

SOIL CLASSIFICATION	
LIMERICK SILT LOAM (110)	0% TO 3% SLOPES
	CLASSIFIED HIGH EROSION POTENTIAL
WINDSOR LOAMY SAND (18D)	15% TO 25% SLOPES
	CLASSIFIED LOW EROSION POTENTIAL

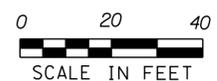


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PROJECT NUMBER:	BRF 015-2(10)	DRAWN BY:	E.A. FIALA
FILE NAME:	z12b138bdr_ero.dgn	DESIGNED BY:	E.A. FIALA
PROJECT LEADER:	S.E. BURBANK	CHECKED BY:	S.E. BURBANK
ROADWAY EPSC EXISTING SITE PLAN		SHEET	69 OF 82



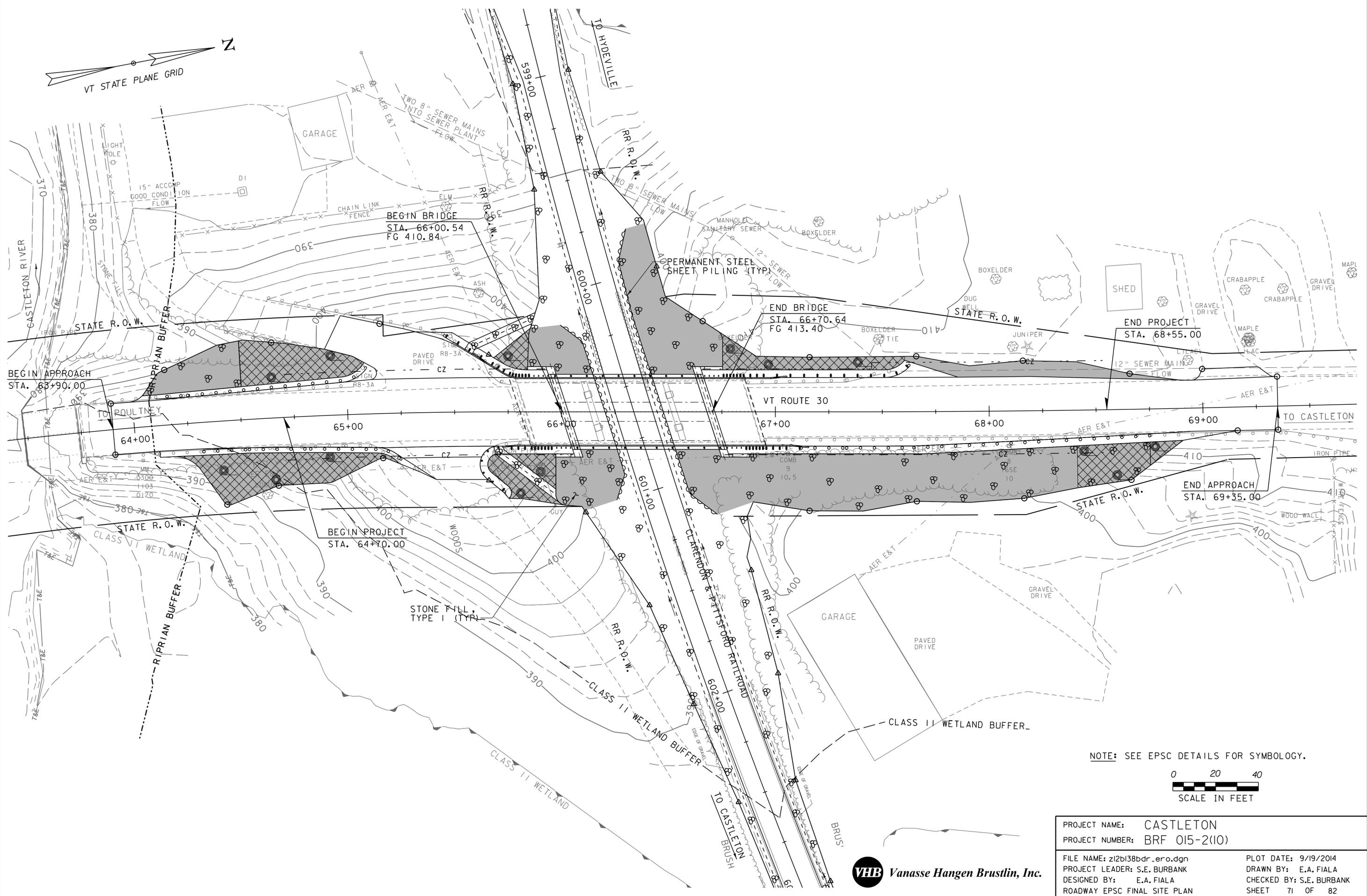
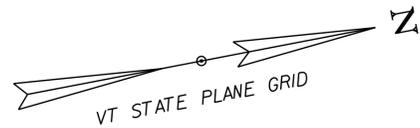


NOTE: SEE EPSC DETAILS FOR SYMBOLOLOGY.

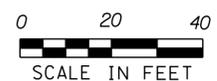


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PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12bl38bdr_ero.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
ROADWAY EPSC CONSTRUCTION SITE PLAN	SHEET 70 OF 82



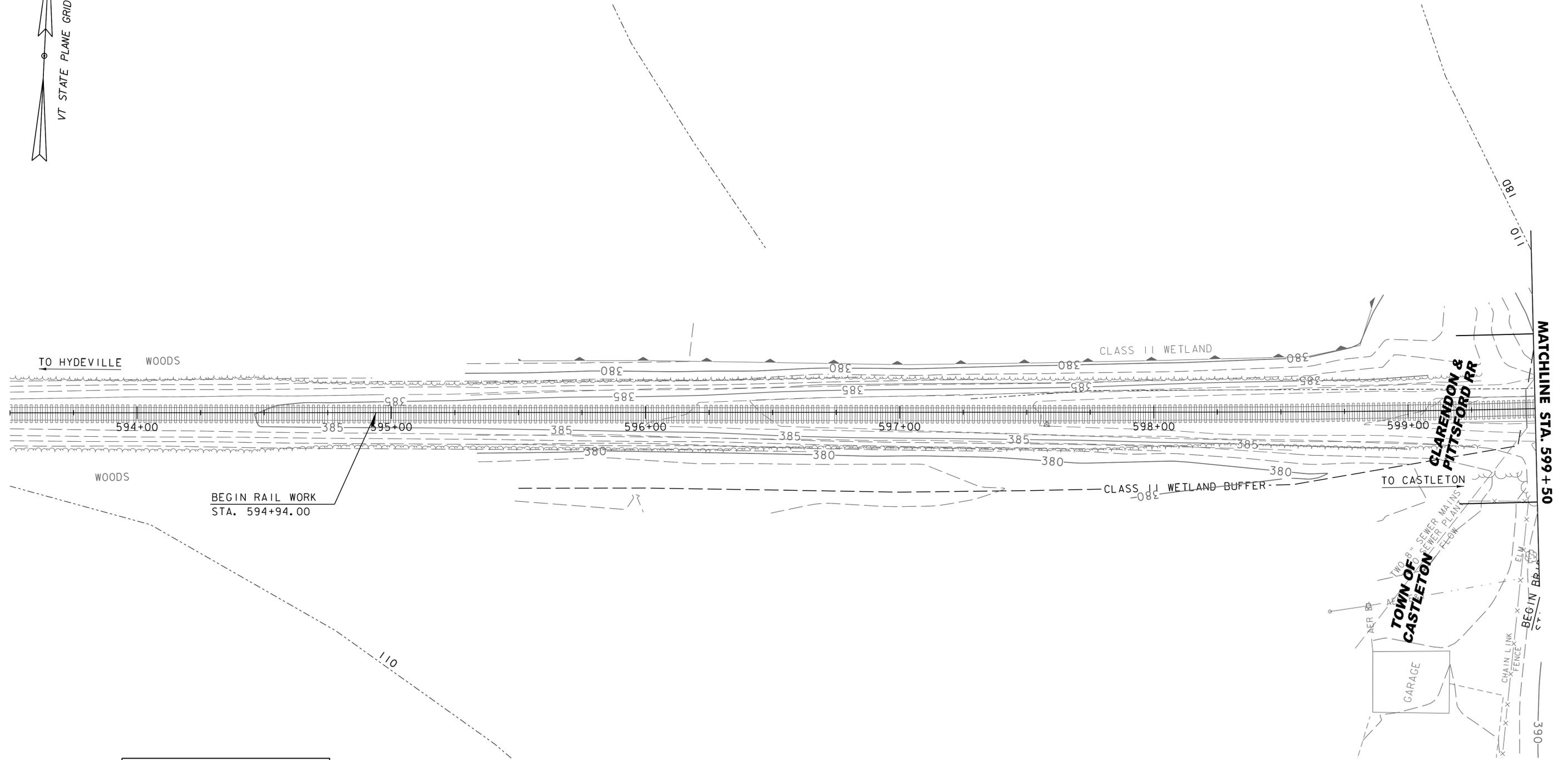
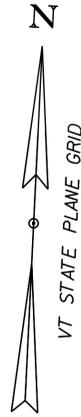


NOTE: SEE EPSC DETAILS FOR SYMBOLOLOGY.



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12bl38bdr_ero.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
ROADWAY EPSC FINAL SITE PLAN	SHEET 71 OF 82

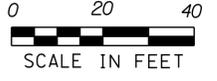




**SOIL CLASSIFICATION**

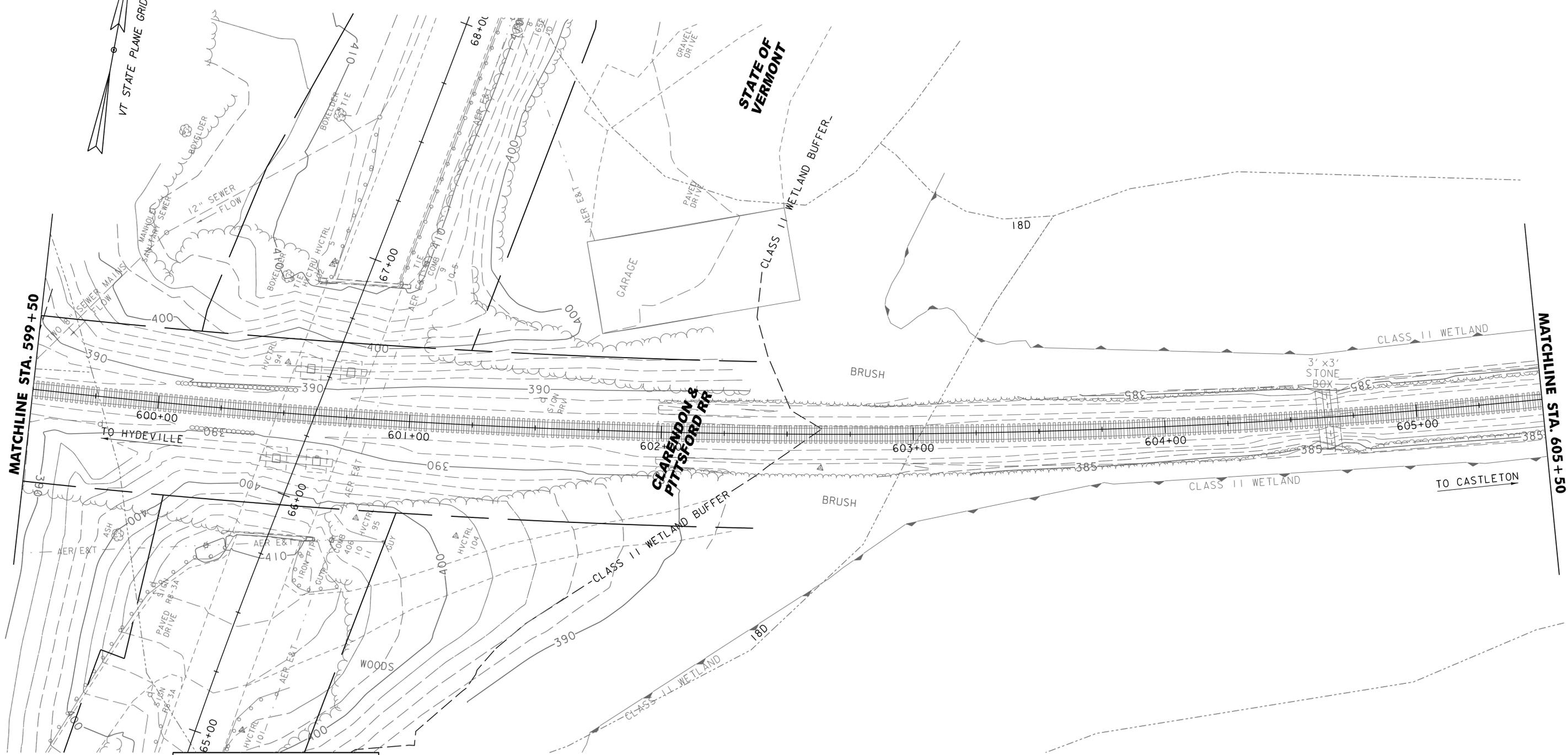
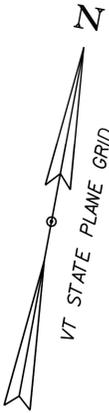
LIMERICK SILT LOAM (110)  
 0% TO 3% SLOPES  
 CLASSIFIED HIGH EROSION POTENTIAL

WINDSOR LOAMY SAND (18D)  
 15% TO 25% SLOPES  
 CLASSIFIED LOW EROSION POTENTIAL



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_ero.dgn	PLOT DATE: 10/23/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC EXISTING SITE PLAN (1 OF 3)	SHEET 72 OF 82





**SOIL CLASSIFICATION**

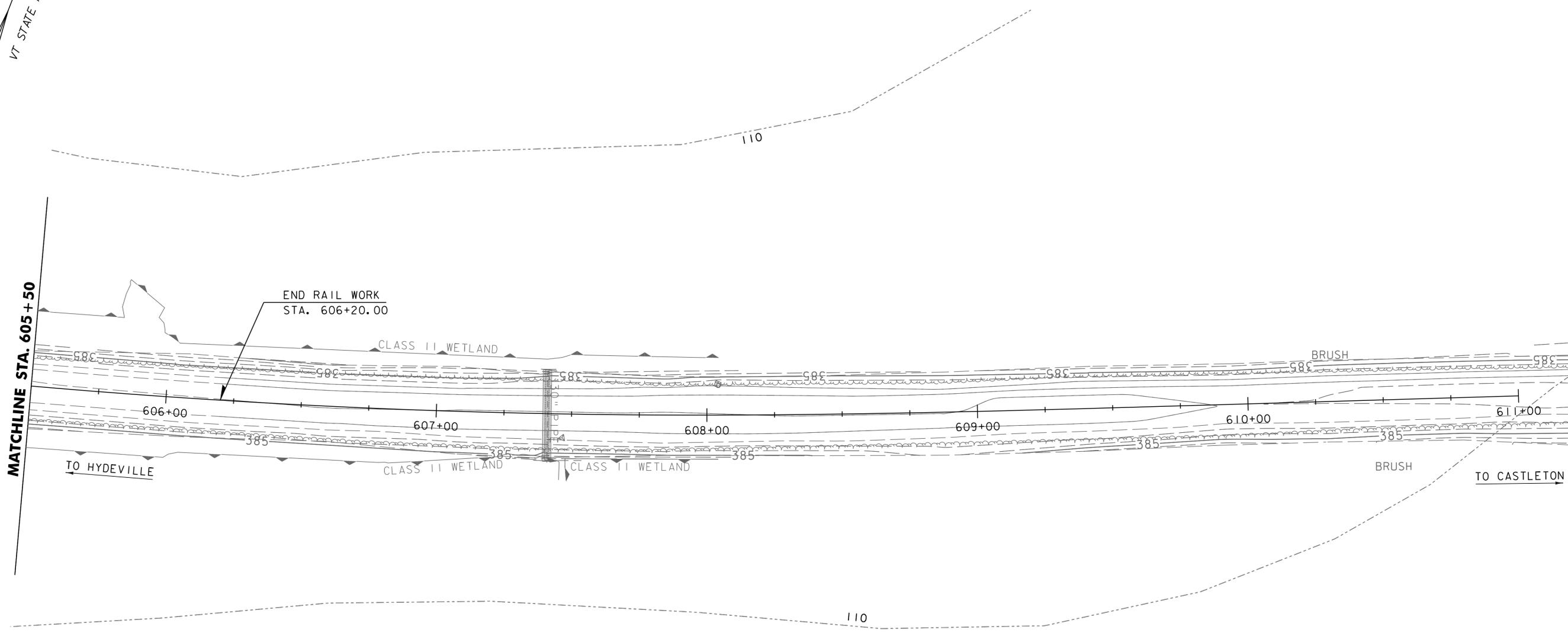
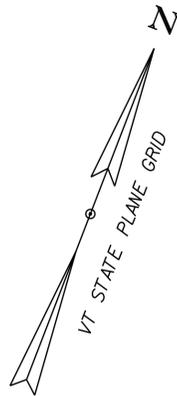
LIMERICK SILT LOAM (110)  
 0% TO 3% SLOPES  
 CLASSIFIED HIGH EROSION POTENTIAL

WINDSOR LOAMY SAND (18D)  
 15% TO 25% SLOPES  
 CLASSIFIED LOW EROSION POTENTIAL



PROJECT NAME:	CASTLETON
PROJECT NUMBER:	BRF 015-2(10)
FILE NAME:	z12b138bdr_ero.dgn
PROJECT LEADER:	S.E. BURBANK
DESIGNED BY:	E.A. FIALA
RAIL EPSC EXISTING SITE PLAN (2 OF 3)	
PLOT DATE:	10/24/2014
DRAWN BY:	E.A. FIALA
CHECKED BY:	S.E. BURBANK
SHEET	73 OF 82





**SOIL CLASSIFICATION**

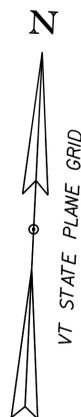
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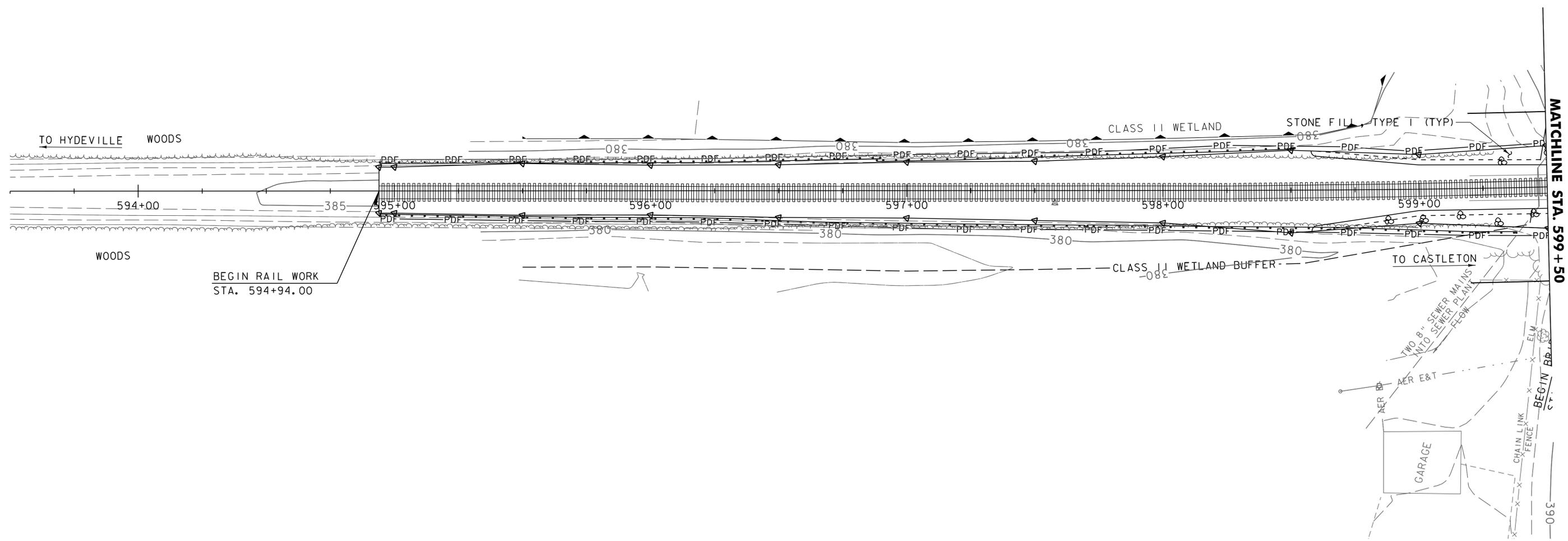


PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_ero.dgn	PLOT DATE: 10/24/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC EXISTING SITE PLAN (3 OF 3)	SHEET 74 OF 82



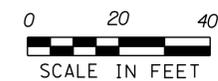


STONE FILL, TYPE I  
 STA. 598+58 - 599+50, LT & RT



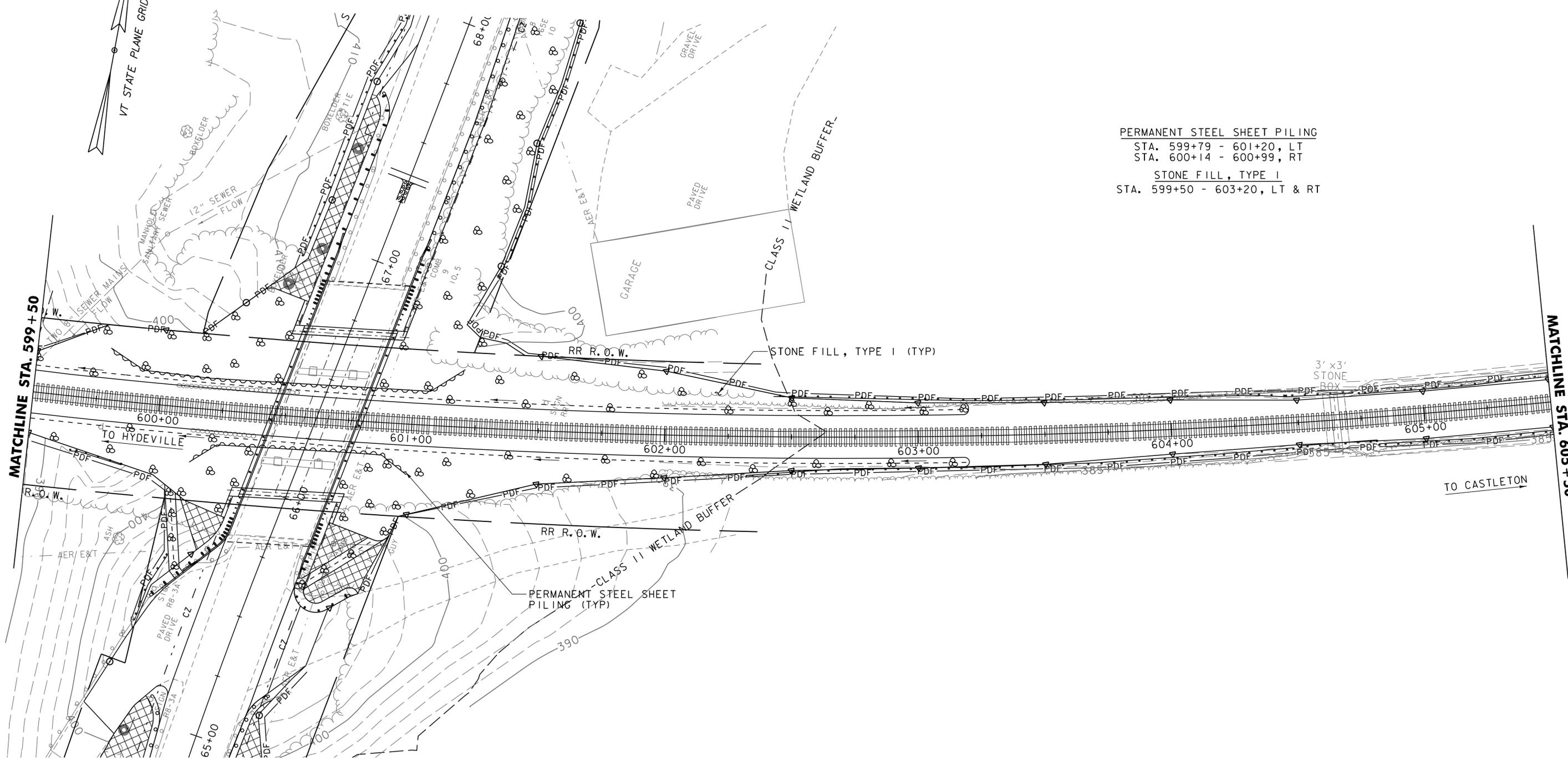
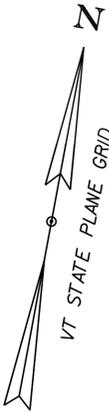
BEGIN RAIL WORK  
 STA. 594+94.00

NOTE: SEE EPSC DETAILS FOR SYMBOLOGY.



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_ero.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC CONSTRUCTION SITE PLAN (1 OF 3) SHEET 75 OF 82	





PERMANENT STEEL SHEET PILING  
 STA. 599+79 - 601+20, LT  
 STA. 600+14 - 600+99, RT  
 STONE FILL, TYPE I  
 STA. 599+50 - 603+20, LT & RT

MATCHLINE STA. 599 + 50

MATCHLINE STA. 605 + 50

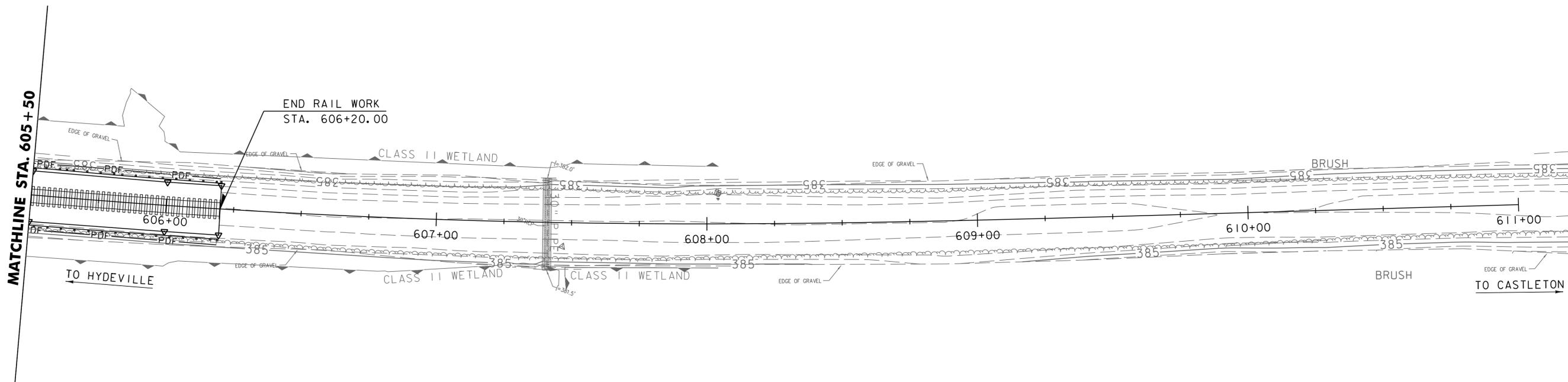
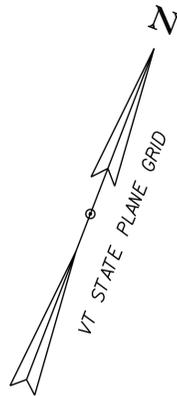
TO CASTLETON

NOTE: SEE EPSC DETAILS FOR SYMBOLOLOGY.



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12bl38bdr_ero.dgn	PLOT DATE: 10/24/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC CONSTRUCTION SITE PLAN (2 OF 3) SHEET	76 OF 82



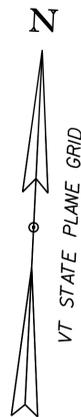


NOTE: SEE EPSC DETAILS FOR SYMBOLOLOGY.

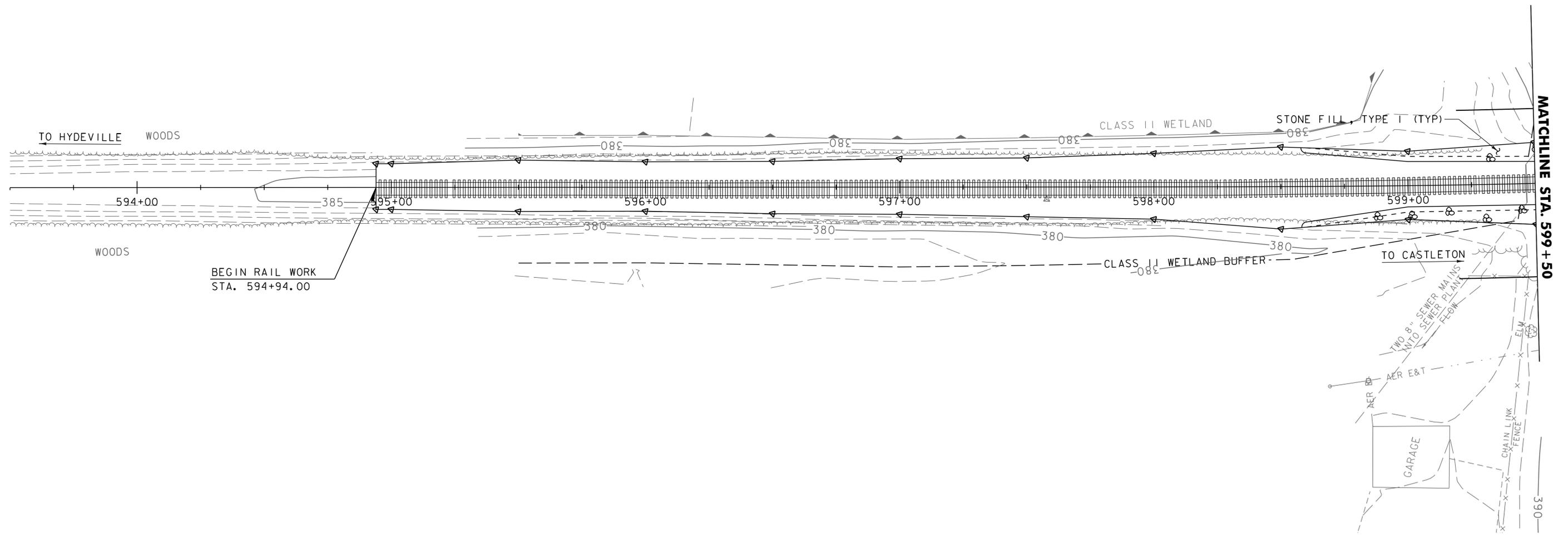


PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_ero.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC CONSTRUCTION SITE PLAN (3 OF 3) SHEET 77 OF 82	





STONE FILL, TYPE I  
 STA. 598+58 - 599+50, LT & RT



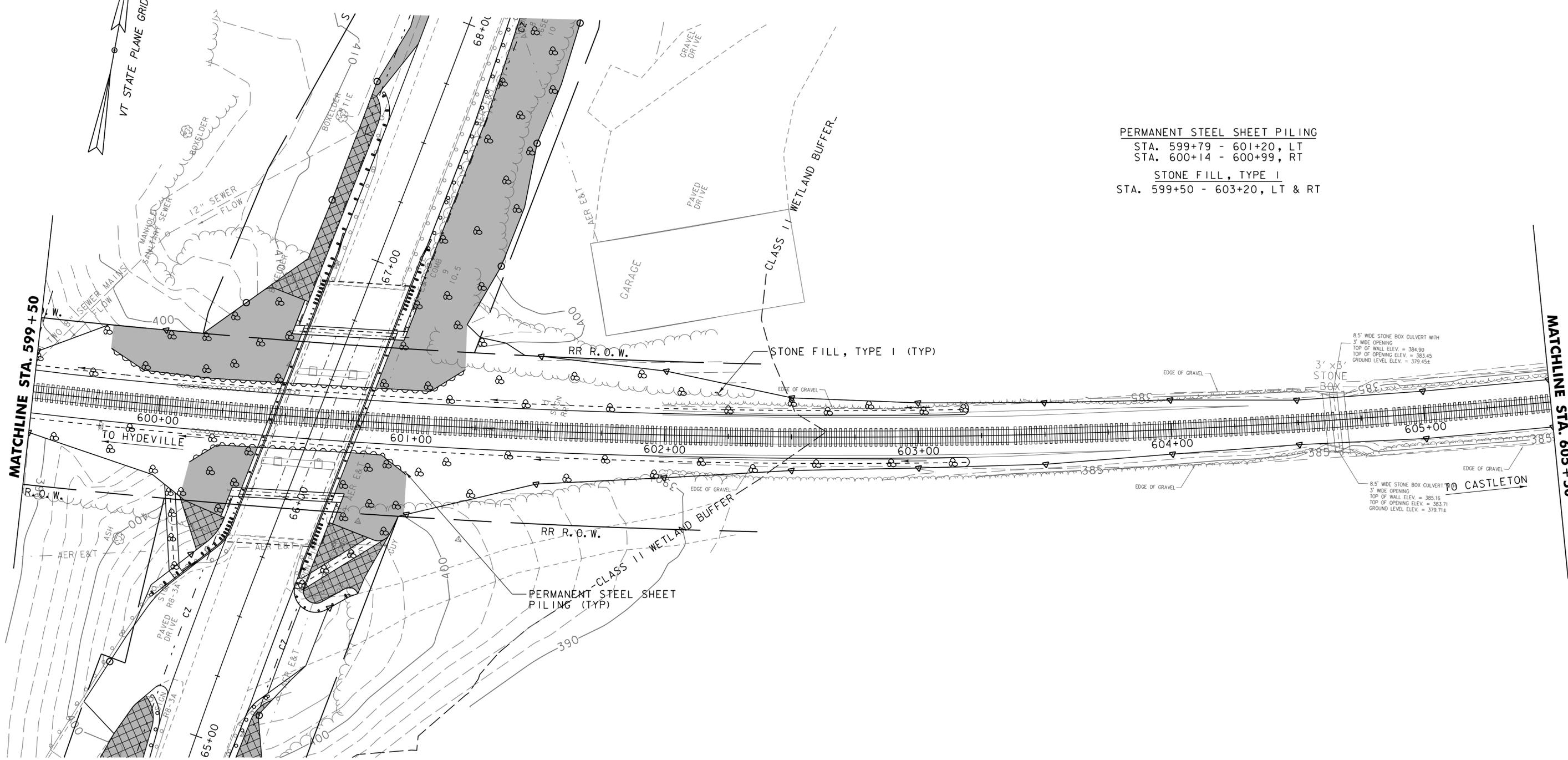
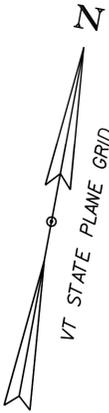
BEGIN RAIL WORK  
 STA. 594+94.00

NOTE: SEE EPSC DETAILS FOR SYMBOLOGY.



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_ero.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC FINAL SITE PLAN (1 OF 3)	SHEET 78 OF 82





PERMANENT STEEL SHEET PILING  
 STA. 599+79 - 601+20, LT  
 STA. 600+14 - 600+99, RT  
 STONE FILL, TYPE I  
 STA. 599+50 - 603+20, LT & RT

8.5' WIDE STONE BOX CULVERT WITH  
 3' WIDE OPENING  
 TOP OF WALL ELEV. = 384.90  
 TOP OF OPENING ELEV. = 383.45  
 GROUND LEVEL ELEV. = 379.45±

3' x 3' STONE BOX

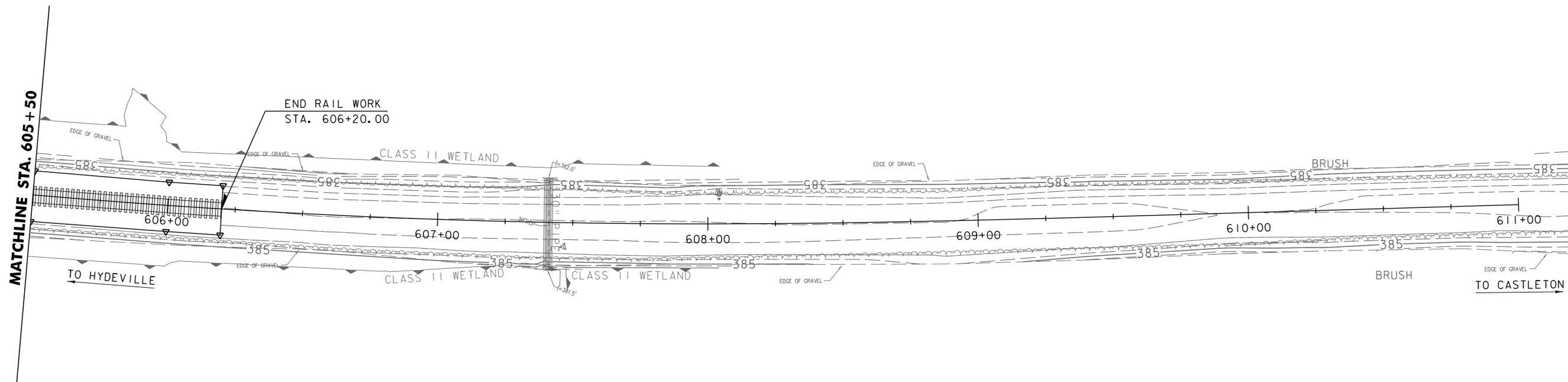
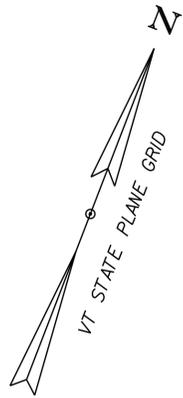
8.5' WIDE STONE BOX CULVERT WITH  
 3' WIDE OPENING  
 TOP OF WALL ELEV. = 385.16  
 TOP OF OPENING ELEV. = 383.71  
 GROUND LEVEL ELEV. = 379.71±

NOTE: SEE EPSC DETAILS FOR SYMBOLOLOGY.

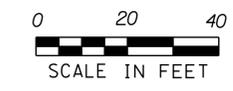


PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12bl38bdr_ero.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC FINAL SITE PLAN (2 OF 3)	SHEET 79 OF 82



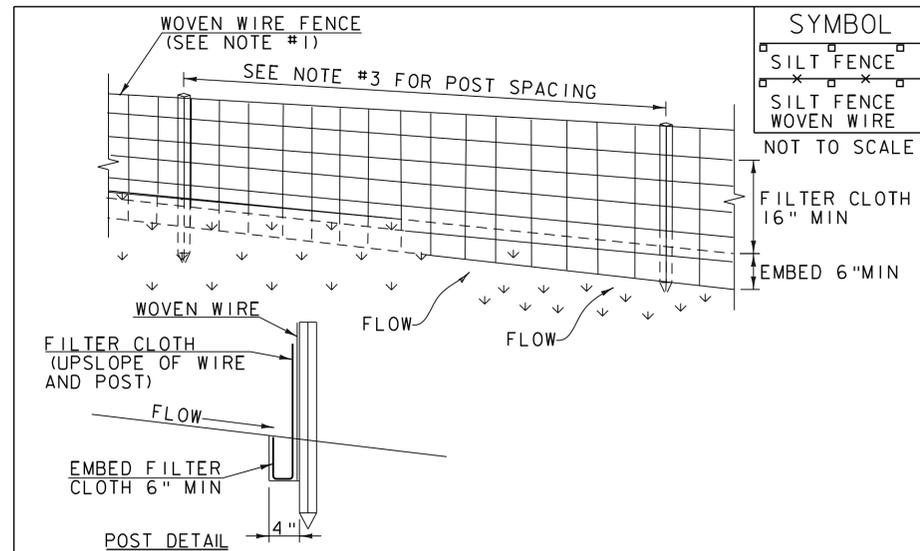


NOTE: SEE EPSC DETAILS FOR SYMBOLOLOGY.



PROJECT NAME: CASTLETON	
PROJECT NUMBER: BRF 015-2(10)	
FILE NAME: z12b138bdr_ero.dgn	PLOT DATE: 9/19/2014
PROJECT LEADER: S.E. BURBANK	DRAWN BY: E.A. FIALA
DESIGNED BY: E.A. FIALA	CHECKED BY: S.E. BURBANK
RAIL EPSC FINAL SITE PLAN (3 OF 3)	SHEET 80 OF 82





**CONSTRUCTION SPECIFICATIONS**

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

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

**SILT FENCE**

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

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH  
SECTION 649 AND AS SHOWN IN THE PLANS FOR GEOTEXTILE  
FOR SILT FENCE (PAY ITEM 649.51) OR GEOTEXTILE FOR  
SILT FENCE, WOVEN WIRE REINFORCED (PAY ITEM 649.515).

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

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

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

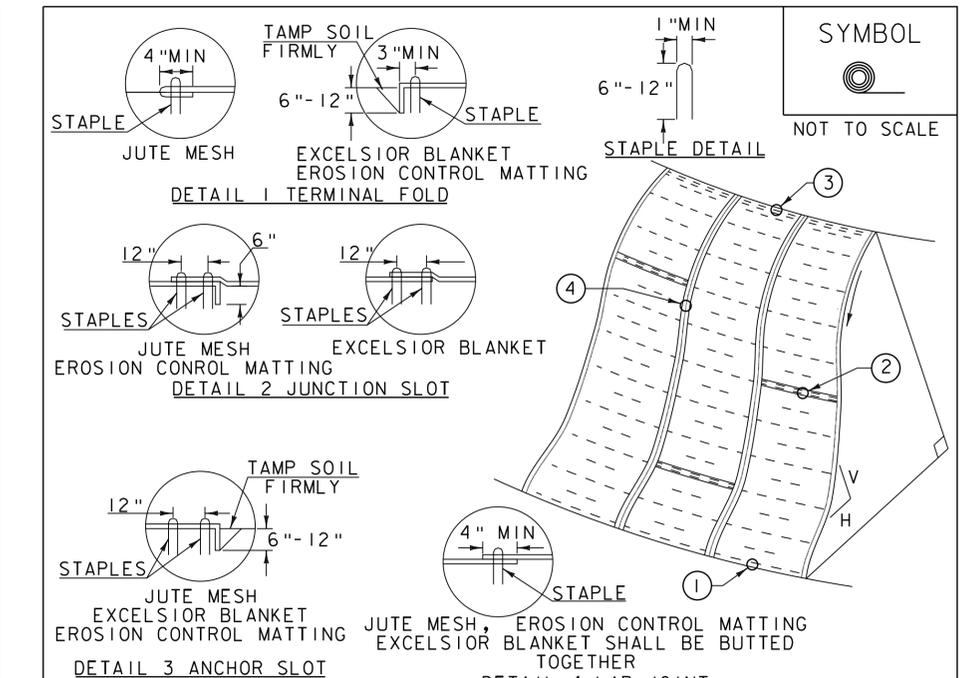
**CONSTRUCTION GUIDANCE**

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

ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR  
ROADWAYS AND TRANSPORTATION FACILITIES

**TURF ESTABLISHMENT**

REVISIONS	
JUNE 23, 2009	WHF
JANUARY 15, 2010	WHF
FEBRUARY 16, 2011	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' X 225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4' X 150' ROLL OF MATERIAL.
4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

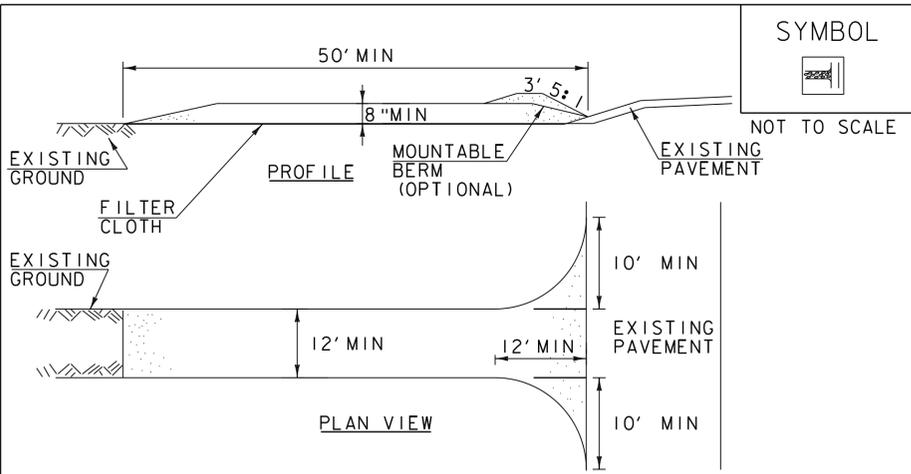
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

**ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE**

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

REVISIONS	
APRIL 16, 2007	JMF
JANUARY 13, 2009	WHF

PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: E.A. FIALA
FILE NAME: z12b138details_ero.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: S.E. BURBANK	SHEET 81 OF 82
DESIGNED BY: VTRANS	
EROSION CONTROL DETAILS (10F 2)	



SYMBOL  


NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

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

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

**STABILIZED  
 CONSTRUCTION  
 ENTRANCE**

NOTES:  
 REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.  
  
 THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR VEHICLE TRACKING PAD (PAY ITEM 653.35) OR AS SPECIFIED IN THE CONTRACT.

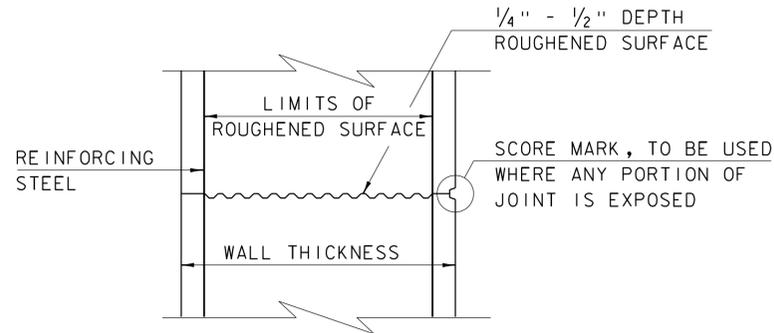
REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF

PROJECT NAME: CASTLETON	PLOT DATE: 9/19/2014
PROJECT NUMBER: BRF 015-2(10)	DRAWN BY: E.A. FIALA
FILE NAME: z12b138details_ero.dgn	CHECKED BY: S.E. BURBANK
PROJECT LEADER: S.E. BURBANK	SHEET 82 OF 82
DESIGNED BY: VTRANS	
EROSION CONTROL DETAILS (2 OF 2)	



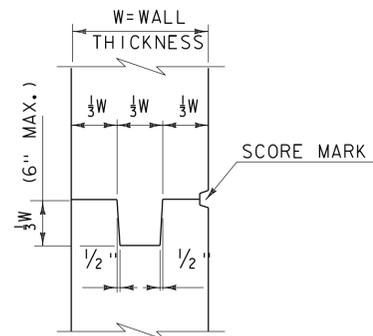
**CONCRETE GENERAL NOTES**

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.

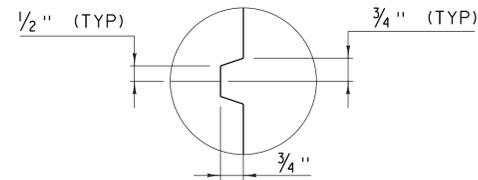


**TYPICAL HORIZONTAL CONSTRUCTION JOINT**  
(NOT TO SCALE)

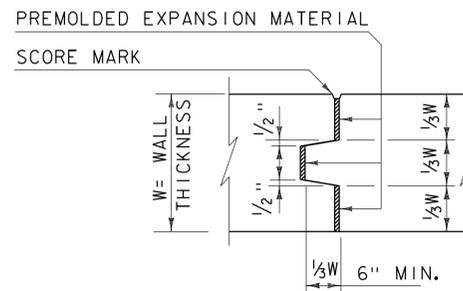
1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



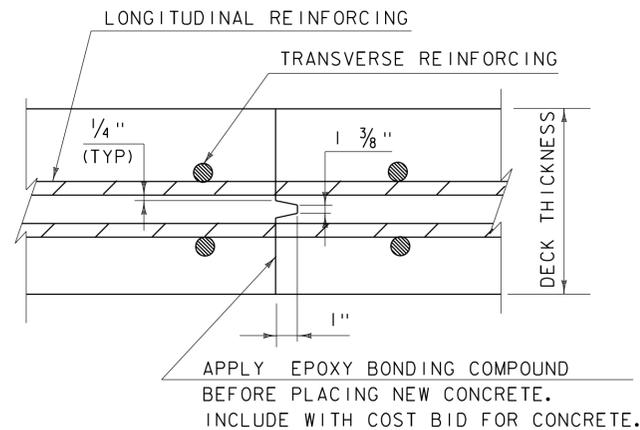
**TYPICAL CONCRETE CONSTRUCTION JOINT**  
(NOT TO SCALE)



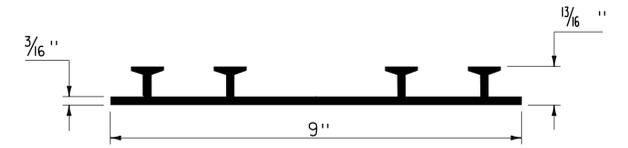
**SCORE MARK DETAIL**  
(NOT TO SCALE)



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



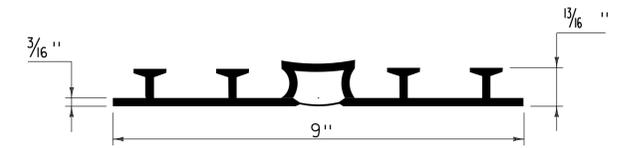
**TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS**  
(NOT TO SCALE)



**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.

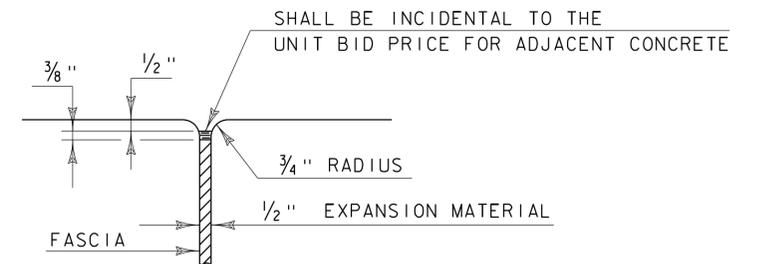
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



**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.



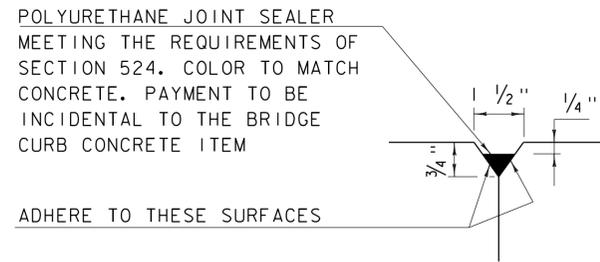
**JOINT BETWEEN FASCIA AND WINGWALL**  
(NOT TO SCALE)

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

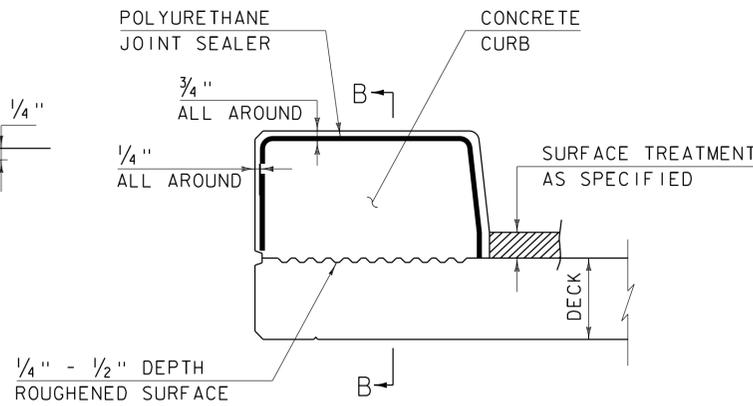
**CONCRETE  
DETAILS AND NOTES**



**STRUCTURES  
DETAIL  
SD-501.00**

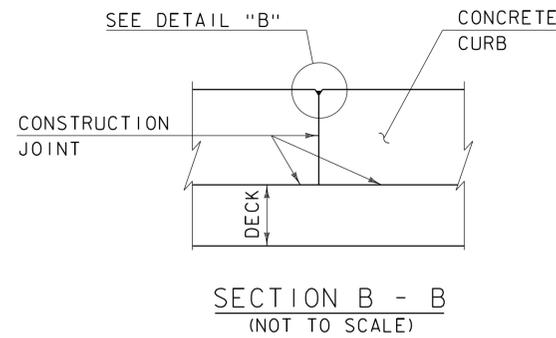


DETAIL "B"  
(NOT TO SCALE)

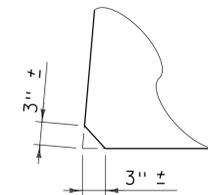


CONCRETE CURB JOINT SECTION  
(NOT TO SCALE)

1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION



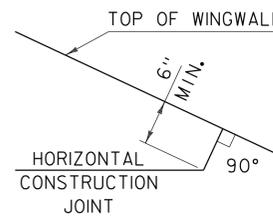
SECTION B - B  
(NOT TO SCALE)



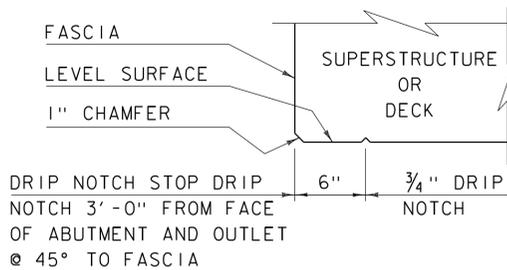
ACUTE ANGLE  
CLIP DETAIL  
(NOT TO SCALE)

CONCRETE CURB JOINT NOTES

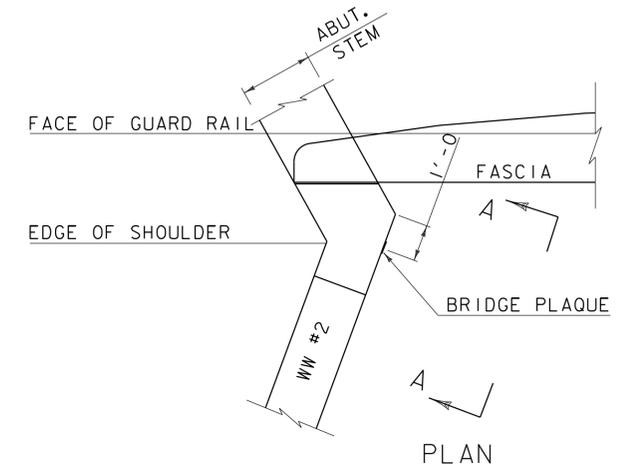
1. CONCRETE CURBS MAY BE PLACED IN ONE CONTINUOUS OPERATION IF AN APPROVED SHRINKAGE REDUCING ADMIXTURE LISTED IN THE SPECIAL PROVISIONS IS USED WITH THE CONCRETE MIX DESIGN. PAYMENT FOR THE SHRINKAGE REDUCING ADMIXTURE WILL BE INCIDENTAL TO THE BRIDGE CURB CONCRETE ITEM.
2. IF THE CONTRACTOR CHOOSES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



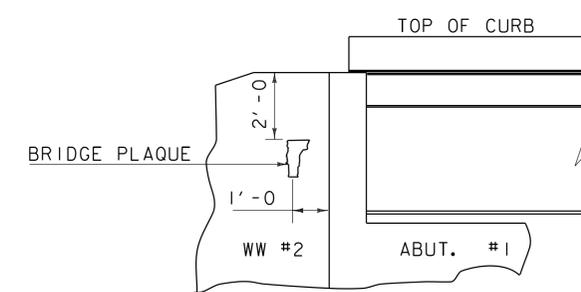
HORIZONTAL WINGWALL  
CONSTRUCTION JOINT  
(NOT TO SCALE)



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

ASPHALTIC PLUG JOINT NOTES

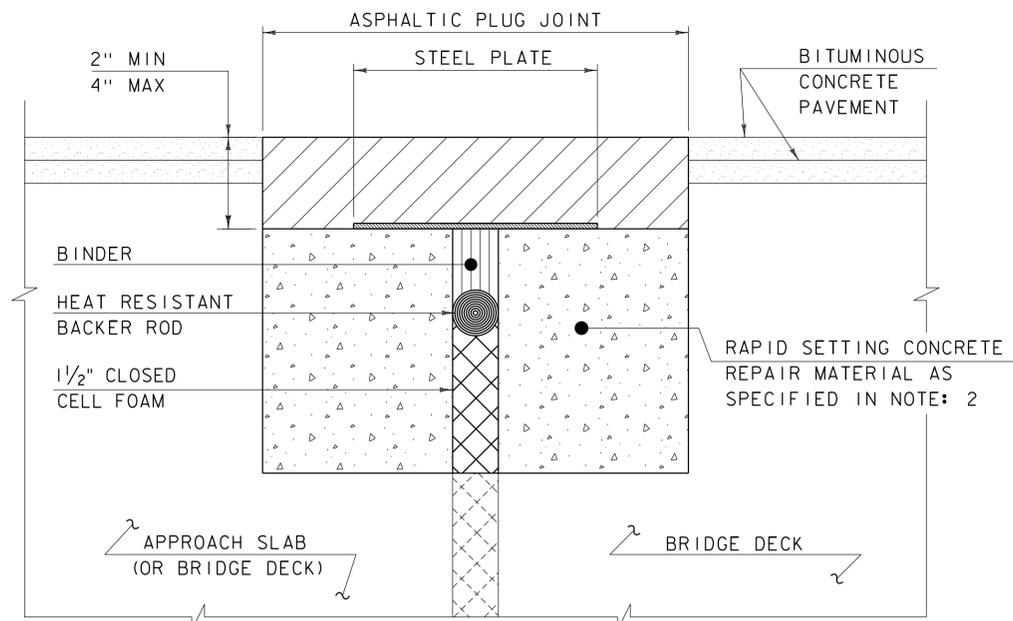
INSTALLATION:

1. LOCATE THE JOINT CENTRALLY OVER THE DECK OVERLAY EXPANSION GAP OR FIXED JOINT, MARKED OUT TO THE MANUFACTURER'S RECOMMENDED WIDTH.
2. REMOVE THE BITUMINOUS CONCRETE PAVEMENT FULL DEPTH AS SHOWN ON THE PLANS. THE PAVEMENT SHALL BE DRY AND SAW CUT TO THE LIMITS REQUIRED TO PLACE THE JOINT. A PNEUMATIC HAMMER AND CHISEL MAY BE USED ADJACENT TO THE CURB ONLY WHEN SAW CUTTING IS NOT POSSIBLE.
3. BLAST CLEAN THE JOINT AREA OF DEBRIS, ASPHALT AND SHEET MEMBRANE. THOROUGHLY DRY THE JOINT AREA WITH COMPRESSED AIR PRIOR TO APPLYING BINDER MATERIAL.
4. PLACE PROPERLY SIZED HEAT RESISTANT BACKER ROD IN THE MOVEMENT GAP ALLOWING FOR 1" +/- OF BINDER ABOVE THE ROD.
5. HEAT AND PLACE THE BINDER MATERIAL AS RECOMMENDED BY THE MANUFACTURER.
6. IMMEDIATELY AFTER TOP COATING, CAST AN ANTI-SKID MATERIAL OVER THE JOINT TO REDUCE THE RISK OF TRACKING.

WEATHER LIMITATIONS

APPLY BINDER MATERIAL ONLY WHEN THE FOLLOWING CONDITIONS PREVAIL OR AS RECOMMENDED BY THE MANUFACTURER:

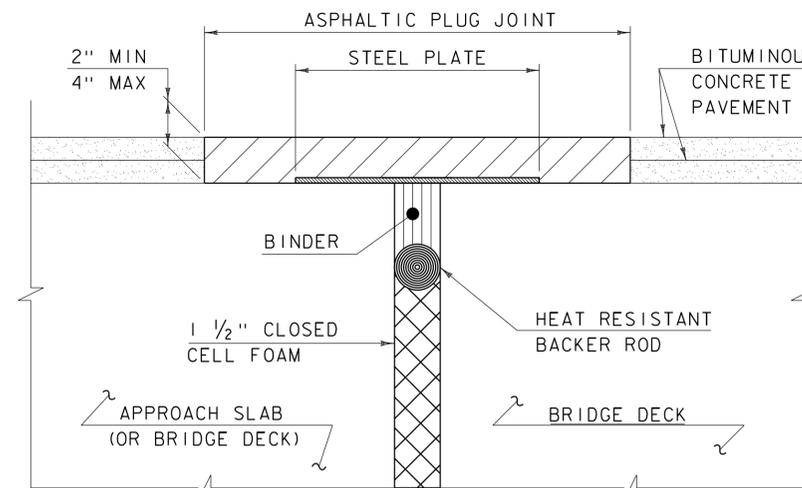
1. THE AMBIENT AIR TEMPERATURE IS AT LEAST 10 DEG C (50 DEG F) AND RISING.
2. THE ROAD SURFACE IS DRY.
3. WEATHER CONDITIONS OR OTHER CONDITIONS ARE FAVORABLE AND ARE EXPECTED TO REMAIN SO FOR THE PERFORMANCE OF SATISFACTORY WORK.



ASPHALTIC PLUG JOINT DETAIL - REHAB

NOTES:

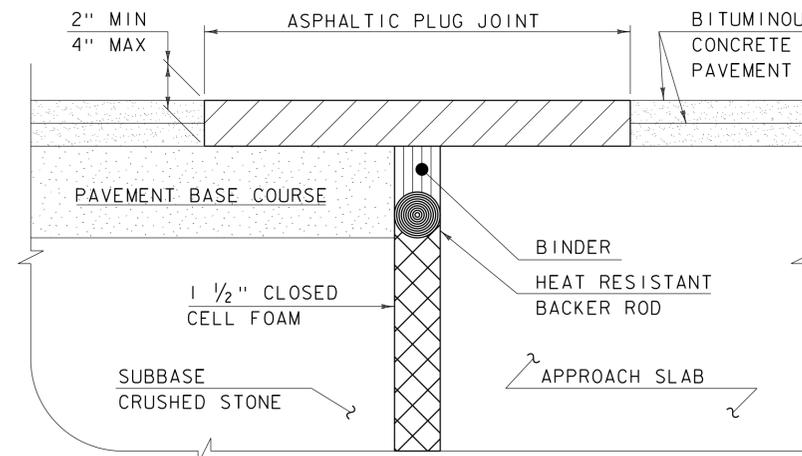
1. THE CONTRACTOR SHALL REMOVE ALL ASPHALTIC PLUG JOINT MATERIAL AND DETERIORATED CONCRETE AS DIRECTED BY THE ENGINEER. REMOVAL OF THE FIRST 4 INCHES OF MATERIAL SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 516.10 BRIDGE EXPANSION JOINT, ASPHALTIC PLUG. ANY REMOVAL OF MATERIAL GREATER THAN 4 INCHES SHALL BE INCLUDED IN THE BID PRICE OF ITEM 580.20 RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE.
2. THE CONTRACTOR SHALL REPLACE REMOVED MATERIAL THAT IS LESS THAN 4" FROM FINISHED GRADE WITH ASPHALTIC PLUG JOINT MATERIAL MEETING THE REQUIREMENTS OF SUBSECTION 707.15. ALL REMOVED MATERIAL THAT IS GREATER THAN 4 INCHES FROM FINISHED GRADE SHALL BE REPLACED WITH RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE MEETING THE REQUIREMENTS OF SUBSECTION 780.04.
3. REINFORCING STEEL NOT SHOWN FOR CLARITY.
4. PLACE 1/4" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRE-STAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER. THE STEEL PLATES MAY BE OMITTED WHERE THE ENGINEER DETERMINES THAT THE APPROACH SLAB OR BRIDGE DECK WILL PROVIDE INADEQUATE SUPPORT AND WHERE VERTICAL MOVEMENT OF THE PLATES MIGHT OCCUR.



ASPHALTIC PLUG JOINT DETAIL "A" - NEW

NOTE:

PLACE 1/4" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRE-STAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER.



ASPHALTIC PLUG JOINT DETAIL "B" - NEW

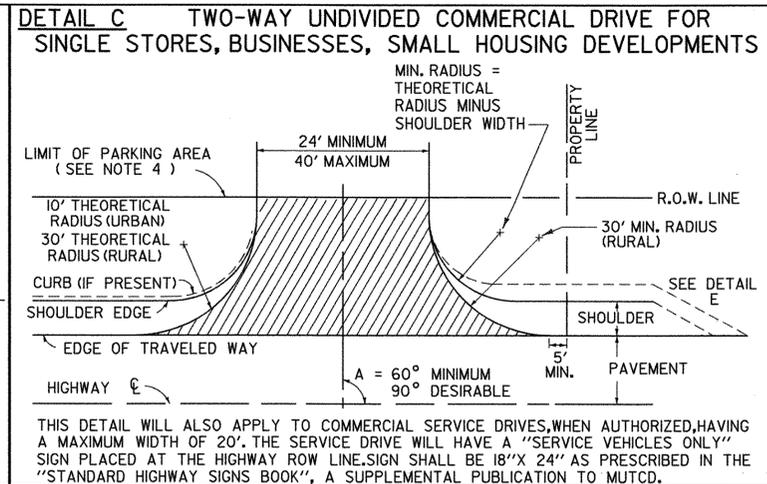
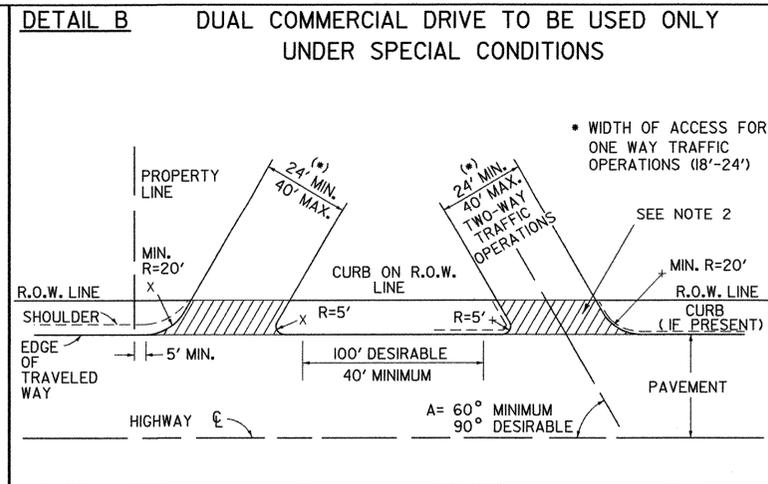
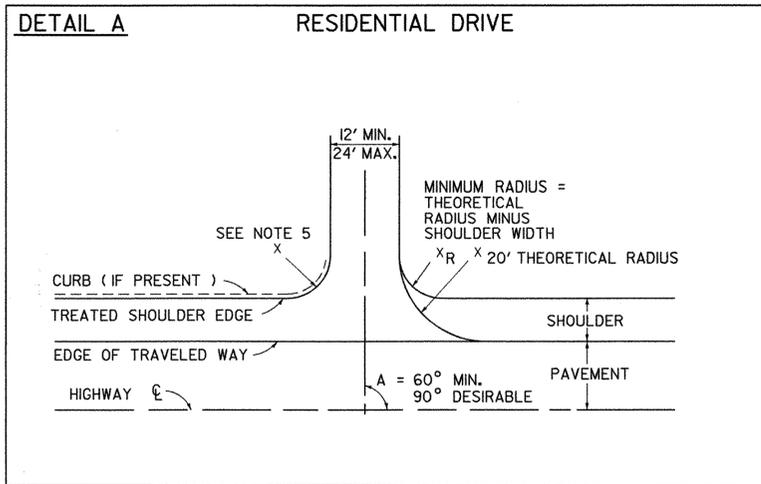
DETAILS ON THIS SHEET ARE NOT TO SCALE.

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
AUGUST 29, 2011	ADD DETAIL "B" AND REV. NOTES

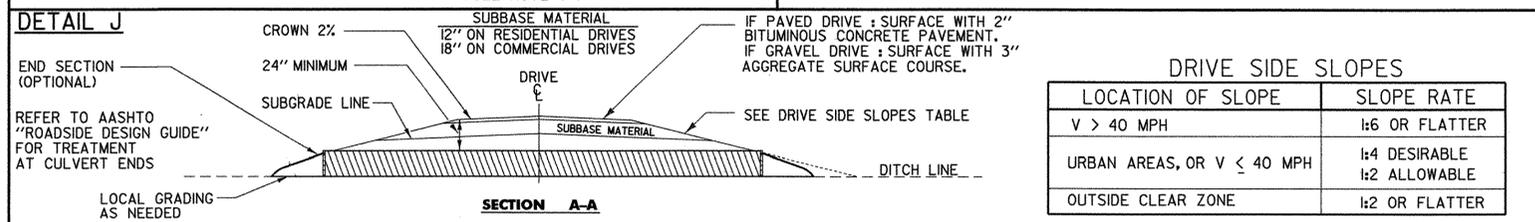
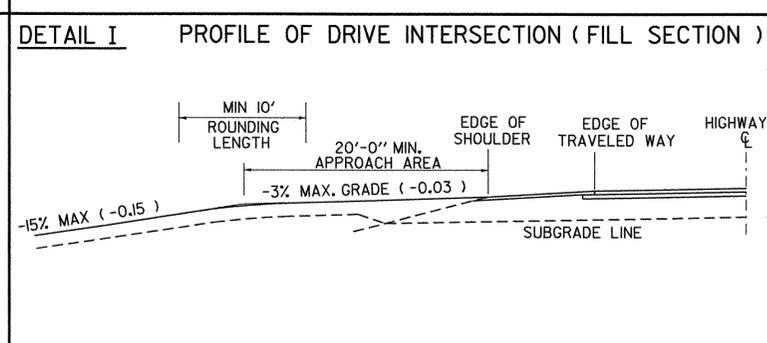
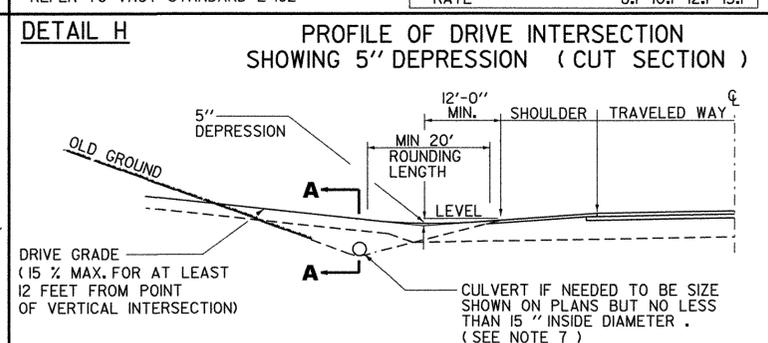
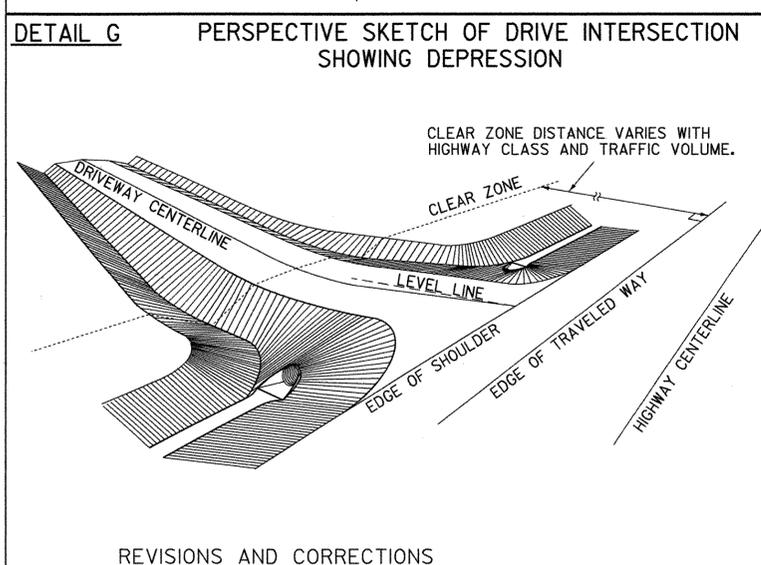
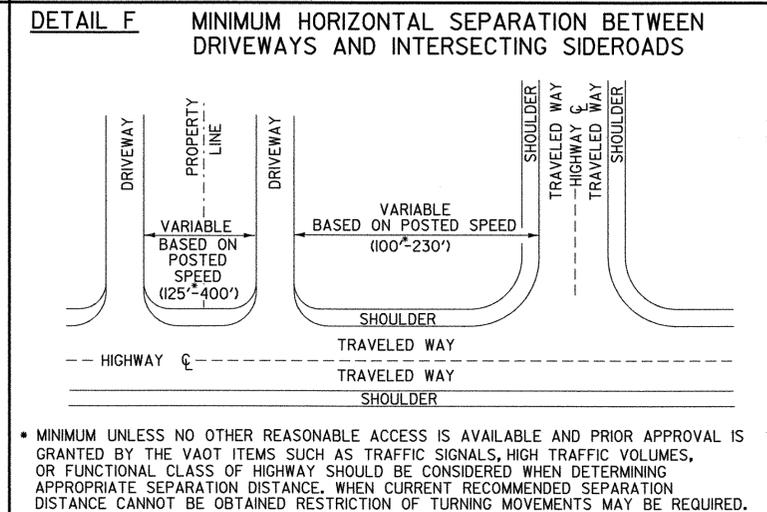
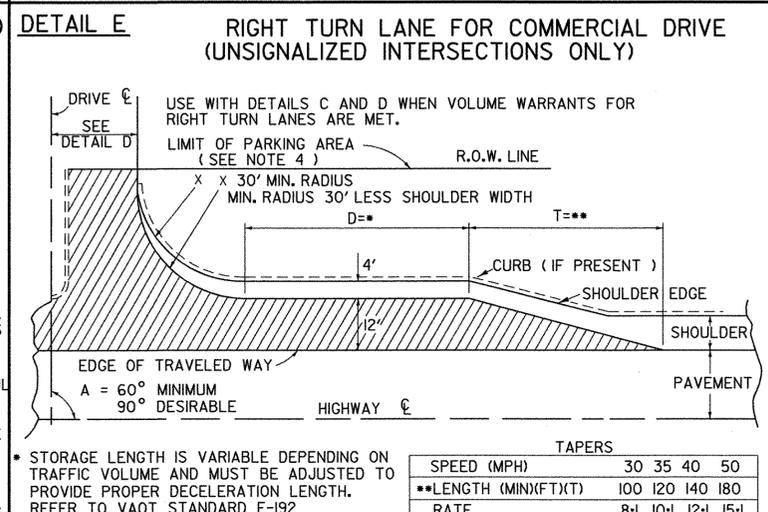
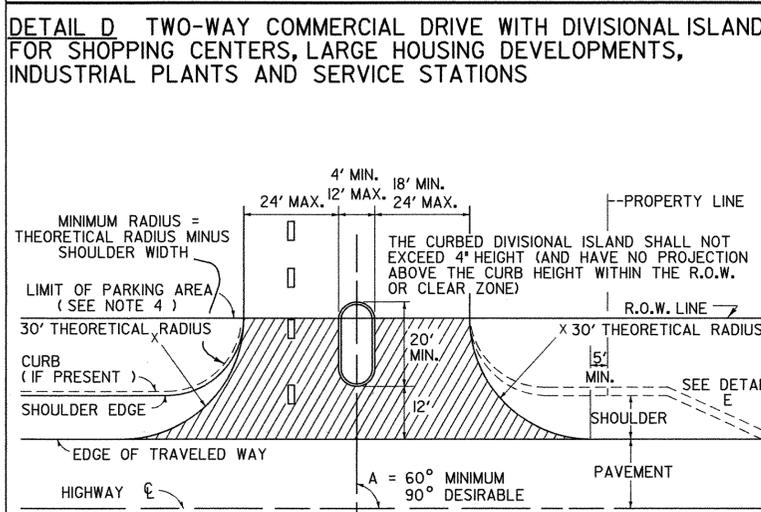
BRIDGE JOINT  
ASPHALTIC PLUG



STRUCTURES  
DETAIL  
SD-516.10



- NOTES:**
- THIS SHEET IS INTENDED FOR USE BY DESIGNERS ON HIGHWAY PROJECTS AND IN CONJUNCTION WITH A PERMIT FOR WORK WITHIN HIGHWAY RIGHTS OF WAY (FORM TA 210). ALL CONSTRUCTION REQUIRED BY THE PERMIT AND INDICATED ON THIS SHEET SHALL BE THE RESPONSIBILITY OF THE APPLICANT AND IS SUBJECT TO THE APPROVAL OF THE VT. AGENCY OF TRANSPORTATION. WHEN USED WITH THE PLANS FOR A HIGHWAY CONSTRUCTION PROJECT, THIS SHEET IS INTENDED TO BE A GUIDE FOR THE DESIGNER CONCERNING DRIVE WIDTHS, HORIZONTAL, VERTICAL AND GEOMETRIC CHARACTERISTICS.
  - ALL COMMERCIAL DRIVES SHALL BE PAVED FROM THE EDGE OF THE TRAVELED WAY TO THE HIGHWAY RIGHT-OF-WAY. TO THE FARTHEST POINT OF CURVATURE ON THE DRIVEWAY EDGE OR AS DIRECTED BY THE DISTRICT TRANSPORTATION ADMINISTRATOR. THIS PAVING IS INDICATED IN DETAILS (B THRU E) BY HATCHING.
  - DEPTH OF SUBBASE AND PAVEMENT TO BE THE SAME AS HIGHWAY OR AS SHOWN IN DETAIL J WITHIN THE LIMITS OF THE HIGHWAY RIGHT-OF-WAY.
  - VEHICULAR ACCESS FROM PARKING AREAS TO THE RIGHT-OF-WAY AT OTHER THAN APPROVED ACCESS POINTS WILL BE PREVENTED BY THE CONSTRUCTION OF CURBING OR OTHER SUITABLE PHYSICAL BARRIER.
  - IF CURB IS PRESENT, SEE APPROPRIATE CURB DETAIL STANDARD OR MATCH TOWN/CITY STANDARD CURB TREATMENT.
  - WHERE TRAFFIC VOLUME FOR A PROJECT IS SUBSTANTIAL THE AGENCY MAY REQUIRE SPECIAL LANES FOR TURNING, SIGNALS OR OTHER MODIFICATIONS. BASED ON TRAFFIC STUDIES THE AGENCY WILL DETERMINE SPECIFIC TREATMENT TO BE USED. ON DEVELOPER PROJECTS THE AGENCY WILL WORK WITH THE APPLICANT TO IMPLEMENT CHANGES TO THE STATE HIGHWAY.
  - CIRCULAR DRAINAGE CULVERTS UNDER DRIVES SHALL HAVE A MINIMUM INSIDE DIAMETER (I.D.) OF 15". PIPE ARCHES USED UNDER DRIVES SHALL HAVE A MINIMUM INSIDE CROSS-SECTIONAL AREA EQUIVALENT TO THAT PROVIDED BY A 15" CIRCULAR PIPE.
  - THE OFFSET BETWEEN THE PROPERTY LINE AND THE EDGE OF THE DRIVEWAY MAY BE GOVERNED BY LOCAL ZONING LAWS. DRIVEWAY WIDTH RESTRICTIONS SHOWN PERTAIN ONLY TO THE AREA WITHIN THE HIGHWAY R.O.W. OR THE END OF THE TURNING RADIUS WHICHEVER IS GREATEST.
  - DRIVEWAY GRADES STEEPER THAN THOSE SHOWN MAY BE ALLOWED AS LONG AS A 20' APPROACH AREA IS ACHIEVED FOR THE VEHICLE TO PAUSE BEFORE ENTERING THE HIGHWAY. (WHERE CURB & SIDEWALKS EXIST, SEE STANDARDS C-2A & C-2B)
  - INTERSECTION SIGHT DISTANCES, EQUAL TO OR GREATER THAN THOSE SHOWN BELOW, SHOULD BE PROVIDED IN BOTH DIRECTIONS FOR ALL DRIVES ENTERING ON PUBLIC HIGHWAYS, UNLESS OTHERWISE APPROVED BY THE AGENCY OF TRANSPORTATION. INTERSECTION SIGHT DISTANCE IS MEASURED FROM A POINT ON THE DRIVE AT LEAST 15 FEET FROM THE EDGE OF TRAVELED WAY OF THE ADJACENT ROADWAY AND MEASURED FROM A HEIGHT OF EYE OF 3.5 FEET ON THE DRIVE TO A HEIGHT OF 3.5 FEET ON THE ROADWAY.



**SIGHT DISTANCE CHART**

POSTED SPEED OR DESIGN SPEED (M.P.H.)	MINIMUM STOPPING SIGHT DISTANCE (FT)	MINIMUM INTERSECTION SIGHT DISTANCE (FT)
25	155	280
30	200	335
35	250	390
40	305	445
45	360	500
50	425	555
55	495	610
60	570	665
65	645	720

THE ABOVE VALUES ARE TAKEN FROM THE 2004 AASHTO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS & STREETS."

NOTE: ADVANCE WARNING SIGNS WILL BE REQUIRED IF OBTAINABLE INTERSECTION SIGHT DISTANCES ARE BELOW MINIMUM STOPPING SIGHT DISTANCES.

THE CHART IS ENTERED TO SELECT DESIGN VALUES BASED ON THE POSTED SPEED LIMIT IN MPH. VALUES FOR DESIGN ARE CALCULATED BASED ON THE DESIGN SPEED IN MPH.

• ASSUMES A GAP OF 7.5 SECONDS IN THE TRAFFIC STREAM ON THE HIGHWAY MAINLINE BASED ON THE HIGHWAY DESIGN SPEED IN MPH. THIS ALLOWS A STOPPED PASSENGER VEHICLE TO ENTER THE MAINLINE FROM THE DRIVE WITHOUT UNDULY INTERFERING WITH THE HIGHWAY OPERATIONS.

- REVISIONS AND CORRECTIONS**
- DEC. 11, 1992 - THIS STANDARD SUPERCEDES B-71 (7/23/80R), B-71A (3/12/90), AND B-13 (12/14/71).
  - JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.
  - MAR. 10, 1995 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.
  - NOV. 16, 2000 - CHANGES MADE TO CONFORM WITH LANGUAGE AND DIMENSIONS IN ACCESS MANAGEMENT PROGRAM GUIDELINES.
  - FEB 1, 2004 - CHANGES MADE TO SIGHT DISTANCE CHART TO CONFORM WITH NEWEST AASHTO CRITERIA.
  - JULY 8, 2005 - CHANGE MADE TO OBJECT HEIGHT TO CONFORM WITH NEWEST AASHTO CRITERIA

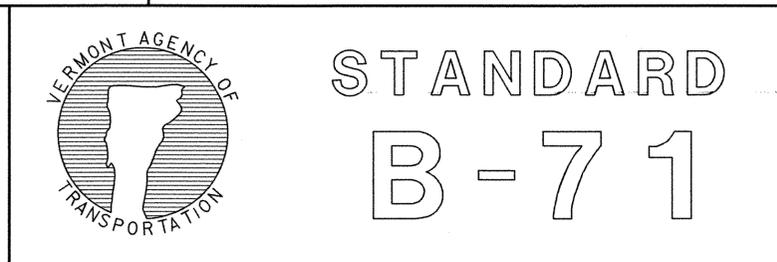
APPROVED

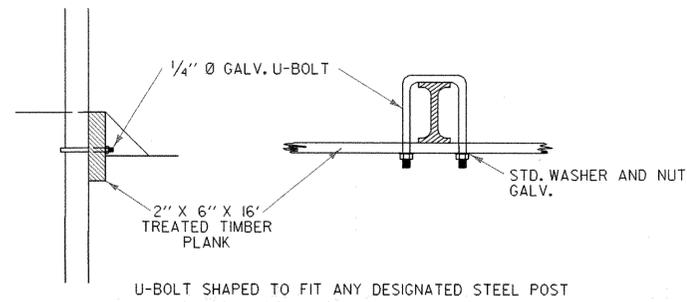
*Richard F. Stewart*  
DIRECTOR OF PROGRAM DEVELOPMENT

*Wm. S. Kelly*  
CHIEF OF UTILITIES AND PERMITS

*Michael Conner*  
FEDERAL HIGHWAY ADMINISTRATION

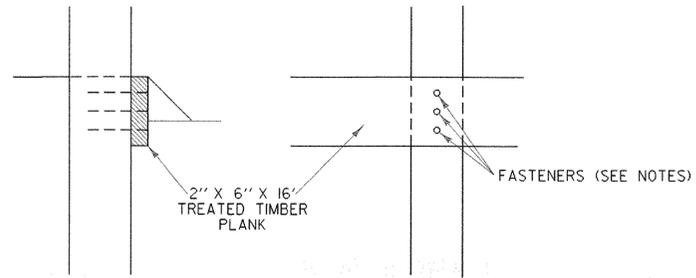
# STANDARDS FOR RESIDENTIAL AND COMMERCIAL DRIVES



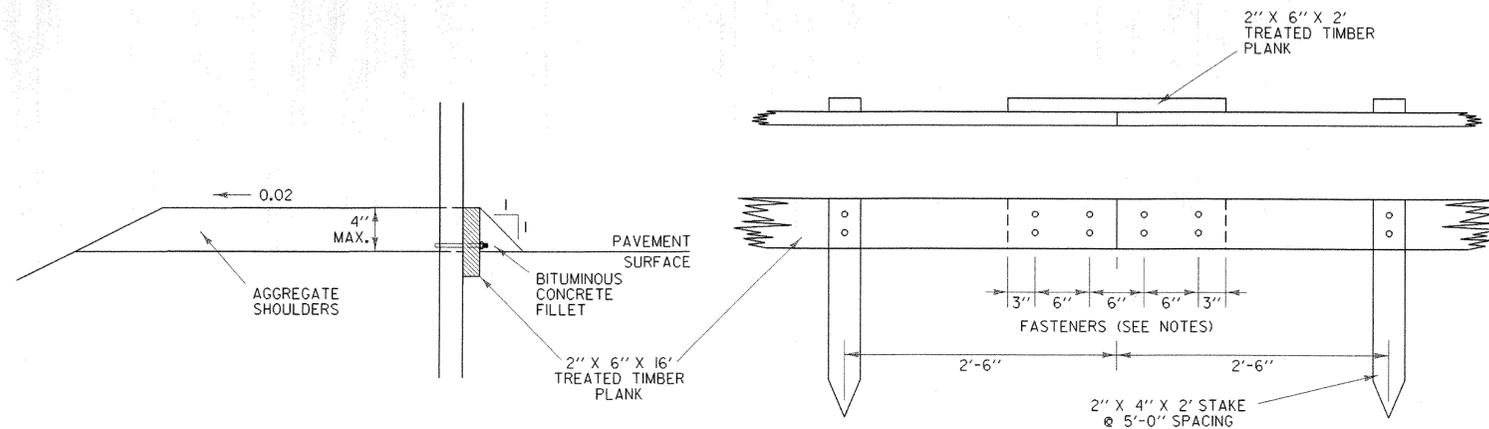


U-BOLT SHAPED TO FIT ANY DESIGNATED STEEL POST

WITH STEEL POSTS



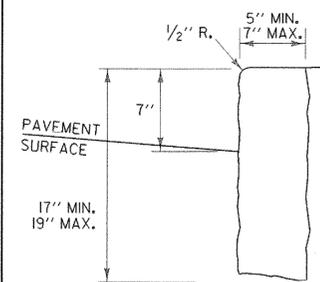
WITH WOOD POSTS (EXISTING CONDITION)



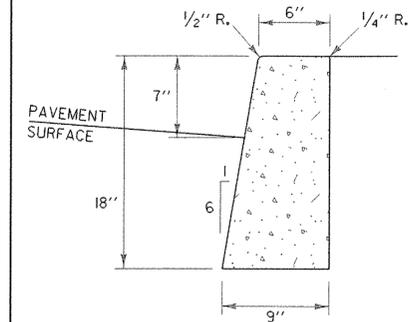
BITUMINOUS CONCRETE FILLET DETAIL

TREATED TIMBER CURB

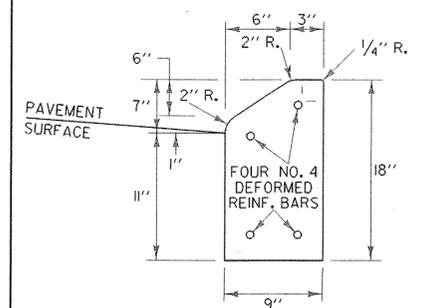
SPLICE DETAIL



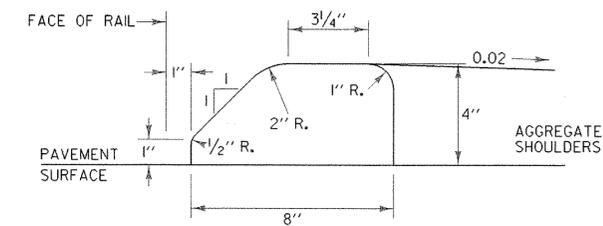
VERTICAL GRANITE CURB



CAST IN PLACE CONCRETE CURB, TYPE B

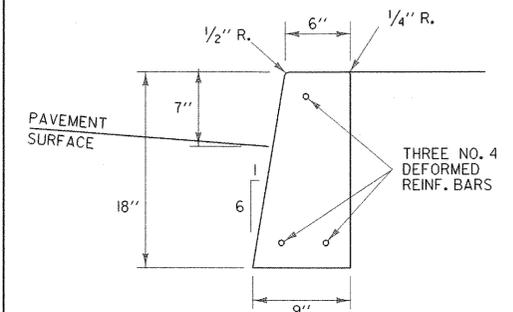


PRECAST REINFORCED CONCRETE CURB, TYPE A

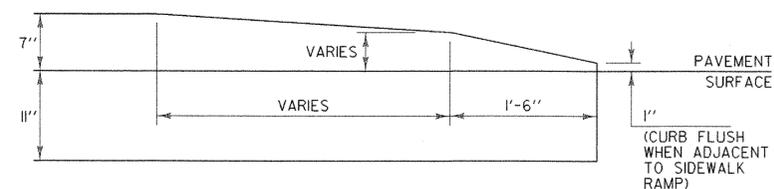


USE ONLY WITH STEEL BEAM GUARDRAIL

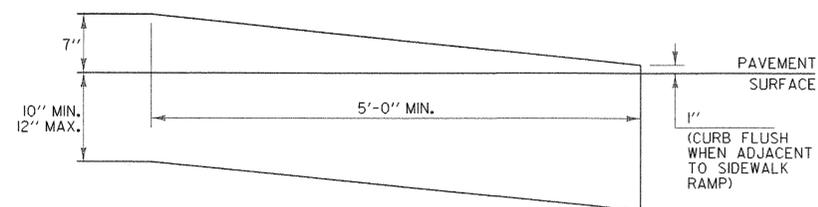
BITUMINOUS CONCRETE CURB, TYPE A



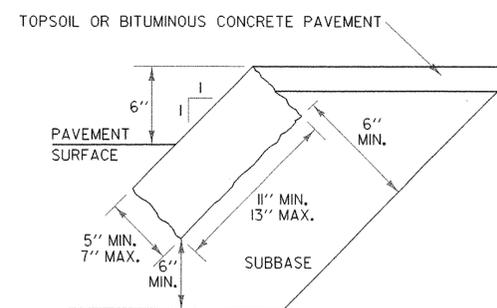
PRECAST REINFORCED CONCRETE CURB, TYPE B



CONCRETE CURB END



VERTICAL GRANITE CURB END



EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.

GRANITE SLOPE EDGING

**GENERAL NOTES:**

- HEIGHT OF REVEAL OF CURB SHALL NOT EXCEED FOUR INCHES WHERE DESIGN OR POSTED SPEED IS EQUAL TO OR GREATER THAN 40 MPH AND WHEN INSTALLED WITH GUARDRAIL (STANDARD SHAPE TO BE BURIED TO THIS DEPTH).
- WHEN CONCRETE SIDEWALK IS CONSTRUCTED ADJACENT TO CONCRETE OR VERTICAL GRANITE CURB, ASPHALT TREATED FELT SHALL BE PLACED BETWEEN THE SIDEWALK AND CURB FOR THE TOTAL DEPTH OF THE SIDEWALK.
- FASTENERS (20d NAILS OR SCREWS) SHALL BE CORROSION RESISTANT TO THE TREATED LUMBER.
- FOR SPECIFICATIONS FOR EXPANSION/CONTRACTION JOINTS AND LENGTHS OF SECTIONS, SEE SECTION 616.
- JOINTS BETWEEN CURB SECTIONS SHALL BE MORTARED IN CONFORMANCE WITH SECTION 616.
- BITUMINOUS CONCRETE AND TREATED TIMBER CURB SHALL BE IN CONFORMANCE WITH SECTION 616.
- TWO INCH MINIMUM CLEARANCE FROM FACE OF CONCRETE TO EDGE OF REINFORCING STEEL.

**OTHER STDS. REQUIRED: NONE**

REVISIONS AND CORRECTIONS  
FEB. II, 2008 - ORIGINAL APPROVAL DATE

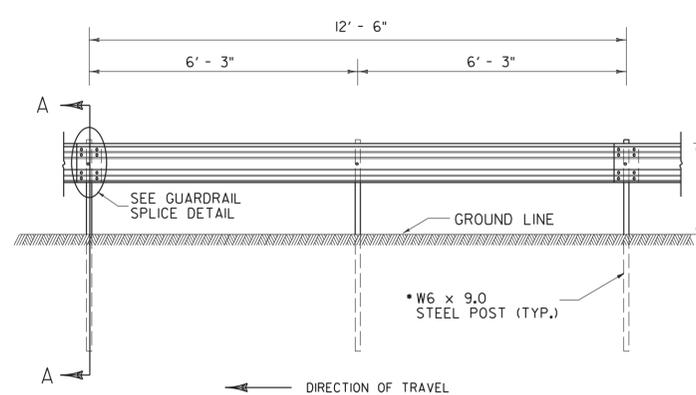
APPROVED  
*Kevin J. Marshie*  
ROADWAY, TRAFFIC & SAFETY ENGINEER  
*Richard Stearns*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*Mark D. Kuebler*  
FEDERAL HIGHWAY ADMINISTRATION

**CURBING**

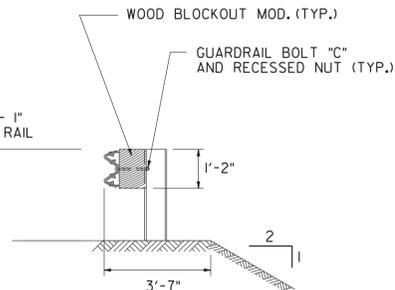


**STANDARD  
C-10**

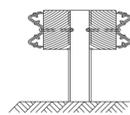
"W" BEAM GUARDRAIL WITH STEEL POSTS



ELEVATION FROM CL OF ROAD

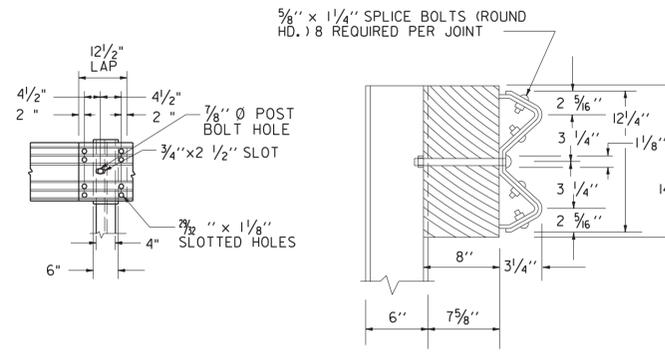


SINGLE - FACED BARRIER

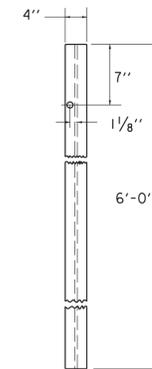


DOUBLE - FACED BARRIER

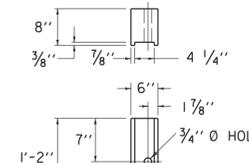
SECTION A - A



GUARDRAIL SPLICE DETAIL



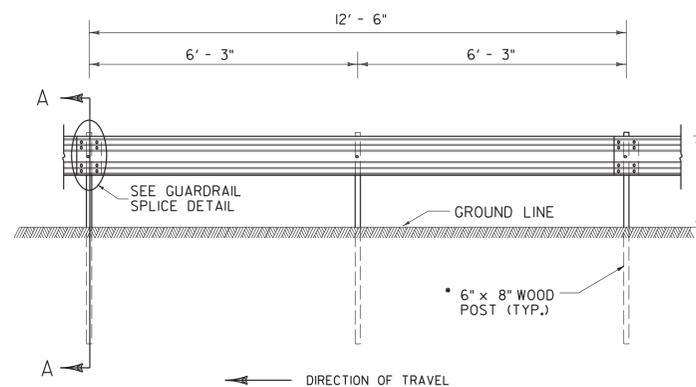
FRONT FACE STEEL POST



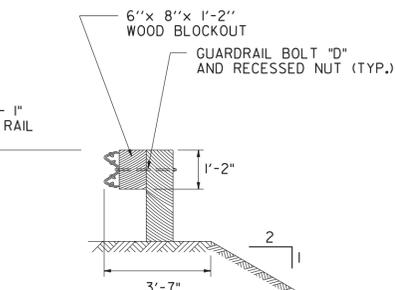
POST FACE  
MODIFIED WOOD BLOCKOUT - ROUTED  
6" x 8" x 1'-2"  
FOR USE W/ STEEL POSTS ONLY

- NOTES:
- BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSI OR 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.

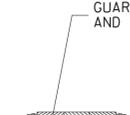
"W" BEAM GUARDRAIL WITH WOOD POSTS



ELEVATION FROM CL OF ROAD

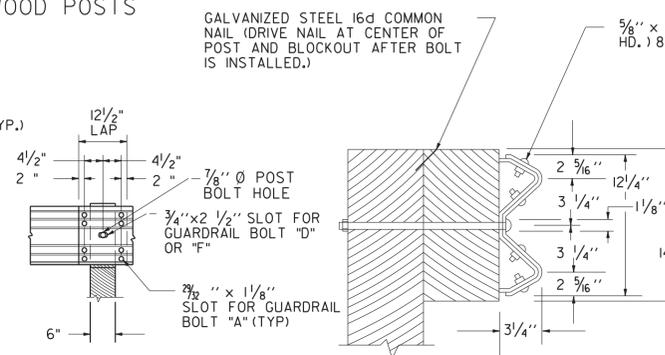


SINGLE - FACED BARRIER

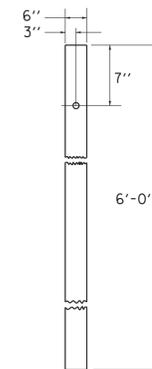


DOUBLE - FACED BARRIER

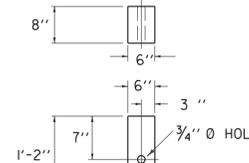
SECTION A - A



GUARDRAIL SPLICE DETAIL



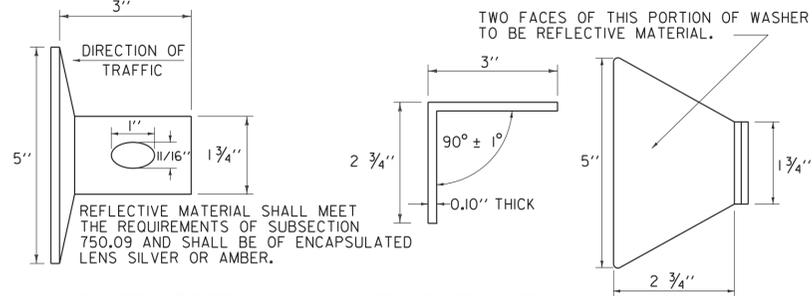
FRONT FACE WOOD POST



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

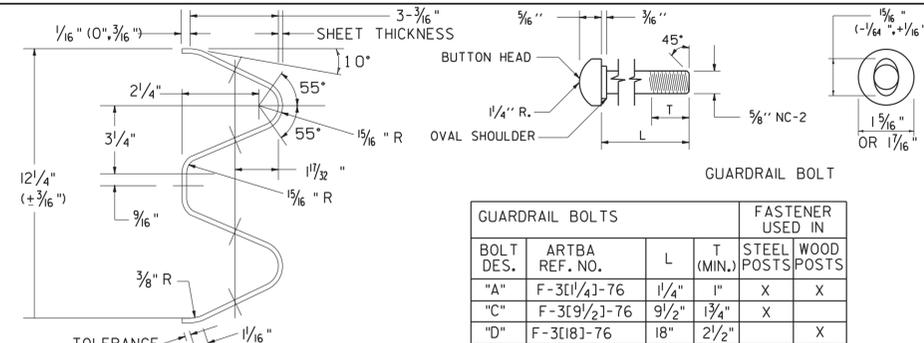
- NOTES:
- BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSI OR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE 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



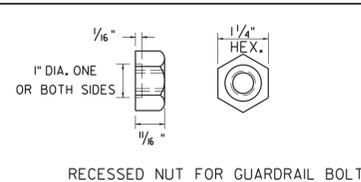
REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.

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.

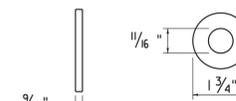


ARTBA RE-3[206]-3'-12'-6" CLASS A, TYPE 13-73  
TYPICAL GUARDRAIL SECTION

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

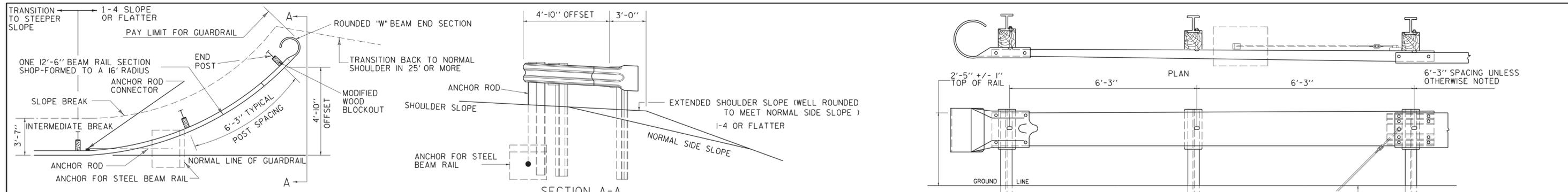
APPROVED

*Richard Thraut*  
HIGHWAY SAFETY & DESIGN ENGINEER  
*Mark D. Richter*  
DIRECTOR OF PROGRAM DEVELOPMENT  
FEDERAL HIGHWAY ADMINISTRATION

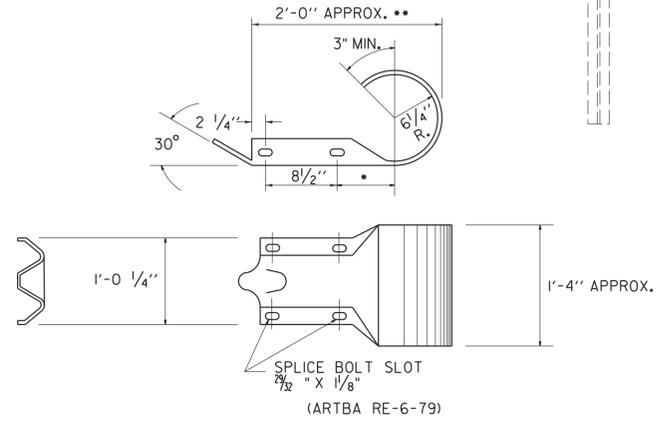
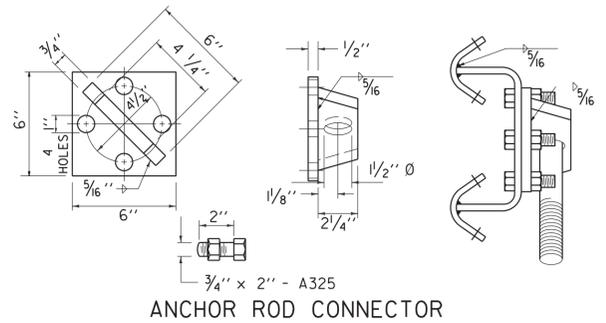
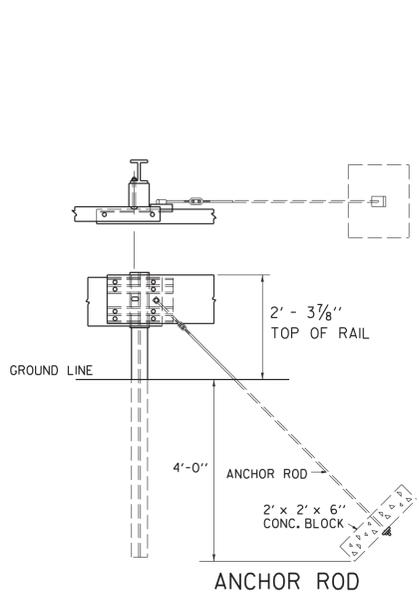
STEEL BEAM GUARDRAIL WITH STEEL POSTS  
STEEL BEAM GUARDRAIL WITH WOOD POSTS



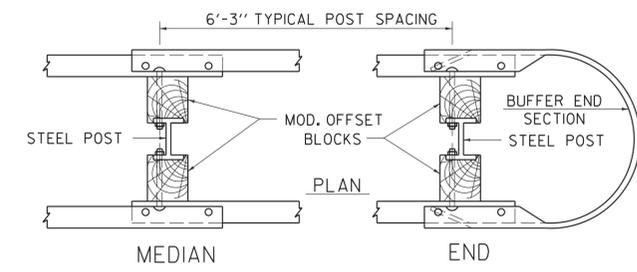
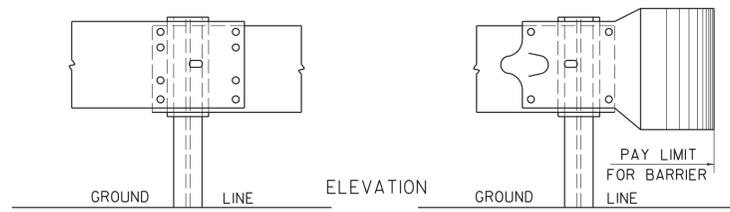
STANDARD  
G-1



**APPROACH END DETAIL**  
 NHS APPROVED FOR USE WHERE DESIGN SPEED IS 40 OR LESS MPH  
 NON-NHS APPROVED FOR USE WHERE DESIGN SPEED IS 50 OR LESS MPH



**ROUNDED "W" BEAM END SECTION**  
 * THIS DIMENSION IS 7 1/2" IN RE-7-79. IF THE DIMENSION IS USED IN THIS PART, IT WILL GIVE AN ACCEPTABLE OVERALL LENGTH (**) OF APPROXIMATELY 2'- 11/2."

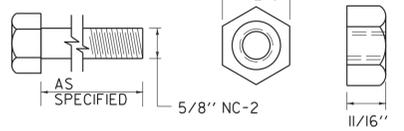
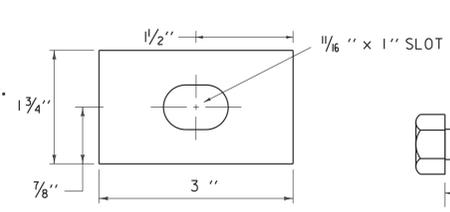
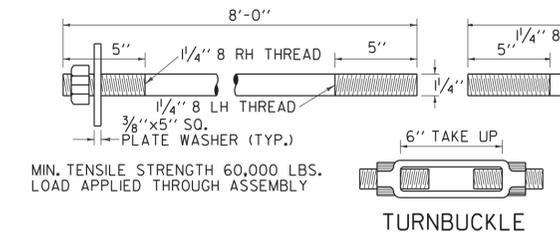


ASSEMBLY ELEVATION

TRAILING END TERMINAL FOR USE ON ONE-WAY HIGHWAYS

**GENERAL NOTES:**

1. ALL METAL PARTS SHALL BE GALVANIZED
2. ALL WOOD POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT
3. DETAILS PERTINENT TO THE STANDARD INSTALLATION OF "W" BEAM SECTIONS WILL BE FOUND ON STANDARD DRAWING G-1.
4. FOR DESCRIPTION AND SPECIFICATIONS OF PARTS IDENTIFIED BY "ARTBA..." AND OTHER DETAILS OF POSTS, POST ACCESSORIES, FASTENERS AND RAIL ELEMENTS, SEE AASHTO-ACC-ARTBA JOINT TASK FORCE NO. 13, TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE", LATEST EDITION.
5. THE TRANSITION FROM THE APPROACH END TO THE STANDARD STEEL BEAM GUARDRAIL SHALL BE 25'-0" UNLESS OTHERWISE SPECIFIED.
6. WHEN STANDARD STEEL BEAM CONNECTS TO BRIDGE APPROACH RAIL OF A DIFFERENT HEIGHT THE LENGTH NEEDED TO TRANSITION THE HEIGHT OF STANDARD STEEL BEAM TO MATCH THE BRIDGE APPROACH RAIL SHALL BE 25'-0" UNLESS OTHERWISE SPECIFIED.
7. WHEN STANDARD STEEL BEAM CONNECTS TO A MANUFACTURED TERMINAL SECTION OF A DIFFERENT HEIGHT THE LENGTH NEEDED TO TRANSITION THE HEIGHT OF STANDARD STEEL BEAM TO MATCH THE MANUFACTURED TERMINAL SECTION SHALL BE 25'-0" UNLESS OTHERWISE SPECIFIED.



FASTENER DETAILS

STEEL BEAM MEDIAN BARRIER  
 NOTE: TO BE USED OUTSIDE CLEAR-ZONE ONLY.

**OTHER STANDARD REQUIRED: G-1**

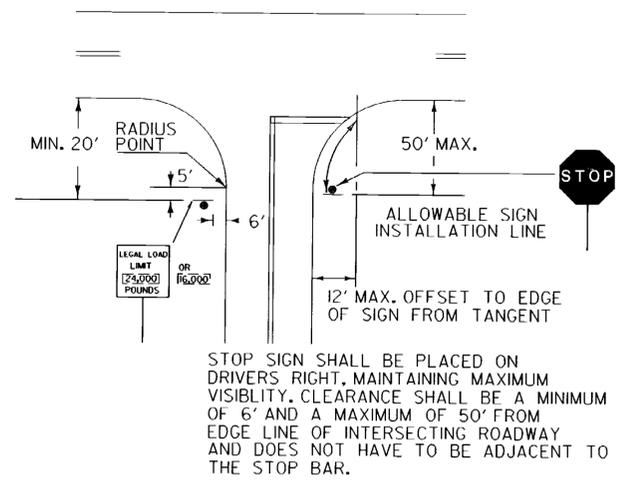
**REVISIONS AND CORRECTIONS**  
 JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.  
 JAN. 3, 2000 - UPDATED TO REFLECT METRIC STD. CHANGES  
 FEB. 10, 2014 - UPDATED TO REFLECT GUARDRAIL HEIGHT OF 29"; AS NOTED IN FHWA LETTER DATED MAY 17, 2010

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

**STEEL BEAM GUARDRAIL APPROACH END TERMINAL**  
**STEEL BEAM GUARDRAIL TRAILING END TERMINAL**  
**ANCHOR FOR STEEL BEAM GUARDRAIL**  
**STEEL BEAM MEDIAN BARRIER**

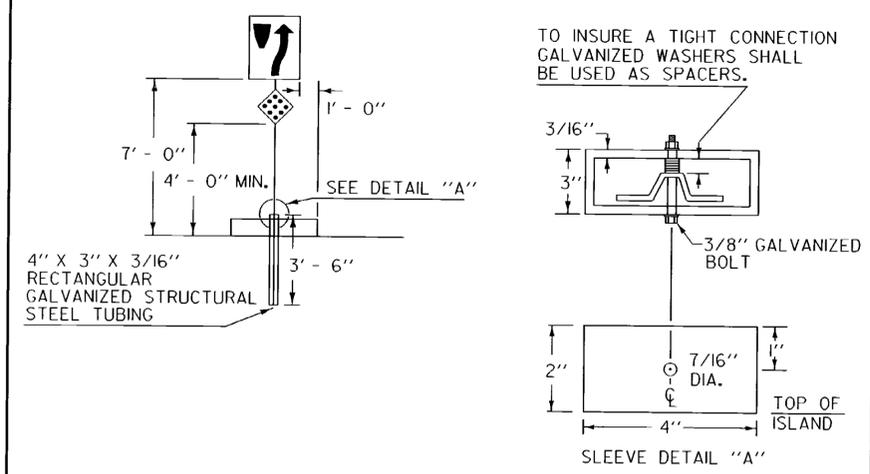


**STANDARD**  
**G-1d**



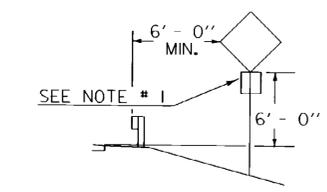
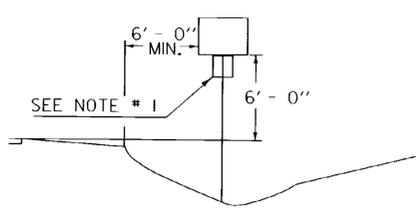
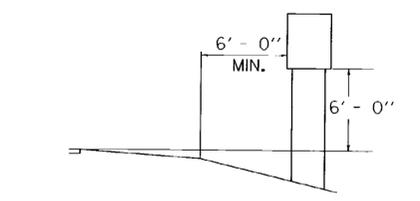
**LEGAL LOAD LIMIT AND STOP SIGNS AT INTERSECTIONS WITH TOWN HIGHWAYS**

STOP SIGN SHALL BE PLACED ON DRIVERS RIGHT, MAINTAINING MAXIMUM VISIBILITY. CLEARANCE SHALL BE A MINIMUM OF 6' AND A MAXIMUM OF 50' FROM EDGE LINE OF INTERSECTING ROADWAY AND DOES NOT HAVE TO BE ADJACENT TO THE STOP BAR.

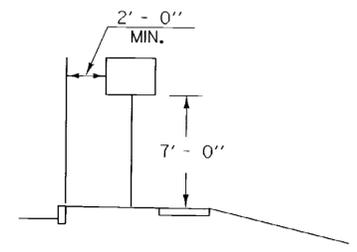
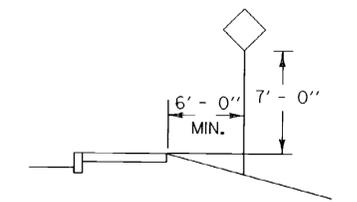


**SIGNS ON MEDIAN ISLANDS IN THE LINE OF TRAFFIC**

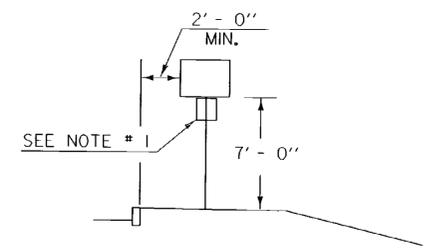
INCREASE VERTICAL CLEARANCE TO 7' IN AREAS OF FREQUENT ROADSIDE PARKING OR PEDESTRIAN ACTIVITY



**RURAL**



IF SUFFICIENT CLEARANCE IS NOT AVAILABLE BETWEEN CURB AND SIDEWALK MOUNT SIGN BEHIND SIDEWALK AS SHOWN AT TOP. CHECK FOR ADEQUATE R.O.W..



**URBAN**

**NOTES:**

1. IN BOTH RURAL AND URBAN LOCATIONS, IF A SECONDARY SIGN IS MOUNTED BELOW ANOTHER SIGN, THE MINIMUM CLEARANCE MAY BE REDUCED BY ONE FOOT.
2. IN RURAL AREAS WITH NO OR MINIMAL SHOULDER, THE LATERAL CLEARANCE TO THE EDGE OF A SIGN SHOULD BE A MINIMUM OF 12' FROM THE EDGE OF THE TRAVELED WAY.
3. ALSO SEE OTHER STANDARD SHEETS FOR MOUNTING CLEARANCE AND SPACING OF DESTINATION AND ROUTE MARKER ASSEMBLIES AND TOWN LINE SIGNS.

POST REFERENCE:  
REFER TO THE DETAILS ON THE APPROPRIATE STANDARD DRAWING FOR INFORMATION CONCERNING THE PROPER MOUNTING OF SIGNS ON APPROPRIATE POSTS.

**OTHER STDS. REQUIRED:** E-160 E-161 E-162 E-163 E-164

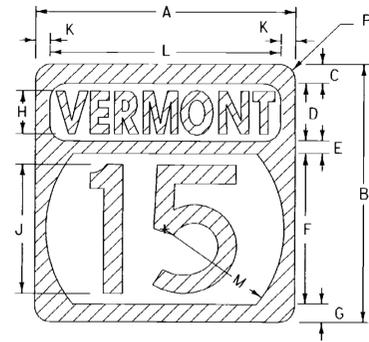
REVISIONS AND CORRECTIONS  
JAN. 23, 1995 - DATE OF ORIGINAL ISSUE  
AUG. 08, 1995 - VARIOUS MINOR NOTE REVISIONS

APPROVED  
*Stephen D. MacArthur*  
DIRECTOR OF ENGINEERING  
*David A. Ross*  
TRAFFIC AND SAFETY ENGINEER

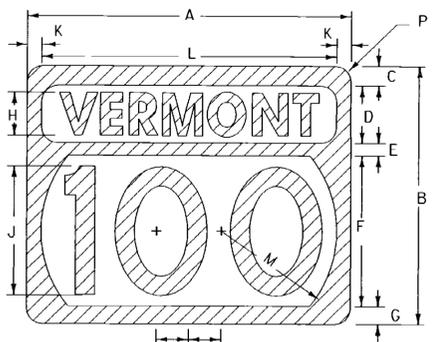
**STANDARD SIGN PLACEMENT  
CONVENTIONAL ROAD**



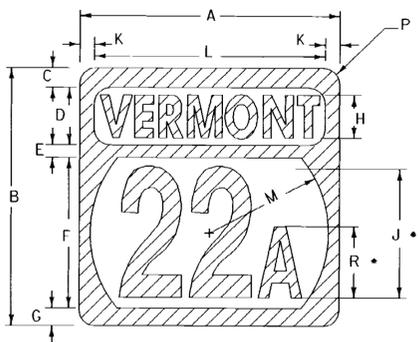
**STANDARD  
E-121**



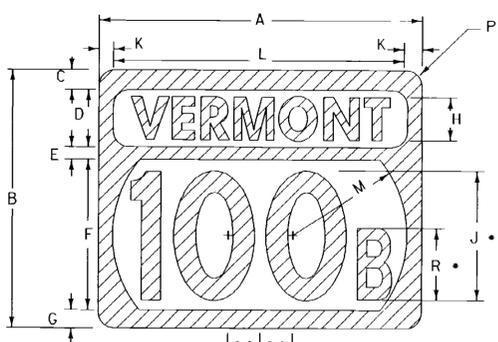
1 OR 2 DIGIT STATE ROUTE MARKER



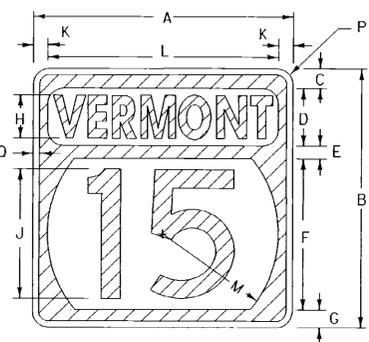
3 DIGIT STATE ROUTE MARKER



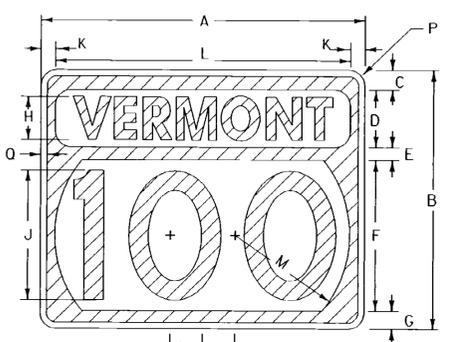
1 OR 2 DIGIT ALTERNATE STATE ROUTE MARKER



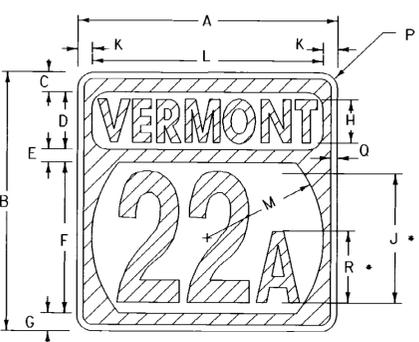
3 DIGIT ALTERNATE STATE ROUTE MARKER



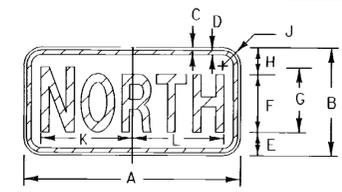
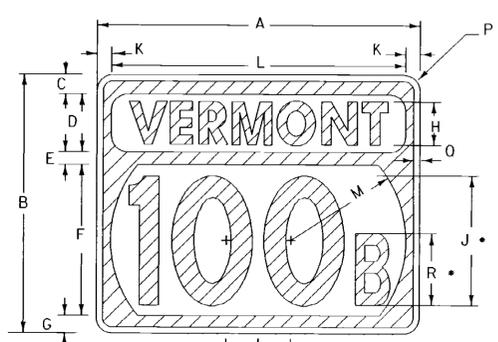
STATE ROUTE MARKER FOR GUIDE SIGN USE (INTERSTATE TYPICAL)



ALTERNATE ROUTE SIGNS: OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTER-LINE AND REDUCE SPACING AS NECESSARY FOR EACH ROUTE



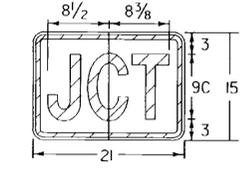
ALTERNATE STATE ROUTE MARKER FOR GUIDE SIGN USE (INTERSTATE TYPICAL)



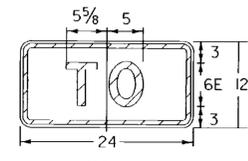
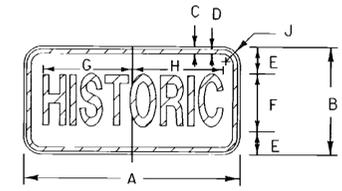
M3-1 M3-3 M3-2 M3-4

SIGN	DIMENSIONS (INCHES)										NORTH	SOUTH	EAST	WEST			
	A	B	C	D	E	F	G	H	J	K							
MIN. & STD.	24	12	3/8	5/8	2 3/4	6C	7C	3 3/4	1 1/2	10 1/4	10 1/4	10 1/4	9 3/4	7 7/8	8 3/8	8 3/4	8 3/4
SPECIAL	30	15	3/8	5/8	3 1/4	8C	9C	3 3/4	1 1/2	12 1/4	12 1/4	12 1/4	12 1/2	10 3/8	11 1/8	11 3/8	11 3/8

M2-1



CARDINAL DIRECTION MARKER



M4-5 TRAILBLAZER

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	
MIN. & STD.	24	12	3/8	5/8	3 1/2	5B	10 1/8	9 3/8	1 1/2	
SPECIAL	30	15	3/8	5/8	4	7B*	12 3/8	12 3/8	1 1/2	

* REDUCE SPACING 35%

**MATERIALS**

THE SIGN BASE MATERIAL MAY BE ANY OF THE FOLLOWING, WITH THE MINIMUM THICKNESSES AS NOTED:

MATERIAL	THICKNESS
FLAT SHEET ALUMINUM	
LESS THAN 24" X 24"	0.060"
WHEN USED ON GUIDE SIGNS	0.060"
24" X 24" - 30" X 24"	0.080"
36" X 36" - 45" X 36"	0.100"
GALVANIZED FLAT SHEET STEEL	
LESS THAN 24" X 24"	18 GAGE
WHEN USED ON GUIDE SIGNS	18 GAGE
24" X 24" - 30" X 24"	16 GAGE
36" X 36" - 45" X 36"	14 GAGE

THE REFLECTIVE MATERIAL SHALL BE WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND. THE TEXTS MAY BE LETTERING FILM, SILK SCREENED, OR HAND PAINTED.

**COLORS**

COLORS FOR GUIDE USE: TEXT AND SHIELD - GREEN (REFL.) BACKGROUND AND BORDER - WHITE (REFL.) STATE ROUTE MARKERS SHALL HAVE REFLECTIVE GREEN TEXT AND BORDERS ON REFLECTORIZED WHITE BACKGROUNDS. GREEN AREAS ARE INDICATED BY SINGLE LINE CROSSHATCHING

**LETTERING**

LETTERS AND DIGITS SHALL CONFORM WITH THE "STANDARD ALPHABET FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" ADOPTED BY THE U.S. DEPARTMENT OF TRANSPORTATION AND FHWA.

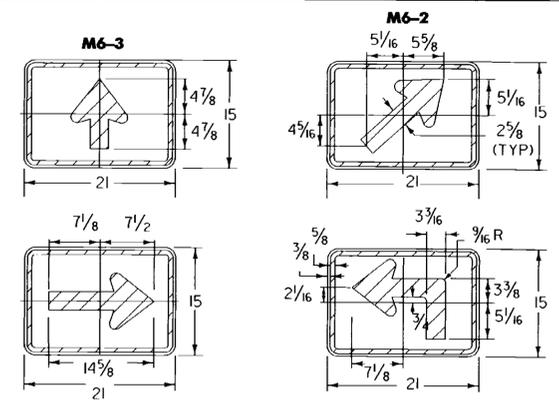
**SPECIFICATIONS**

STATE ROUTE MARKERS AND AUXILIARY ROUTE MARKERS SHALL MEET THE STANDARD STATE SPECIFICATIONS FOR TRAFFIC SIGNS.

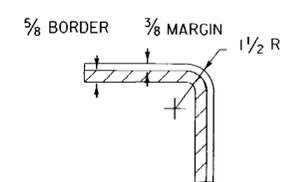
**DESIGNS**

THE DESIGNS OF STATE ROUTE MARKERS AND AUXILIARY MARKERS SHALL CONFORM WITH THE REQUIREMENTS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" ADOPTED BY THE U.S. DEPARTMENT OF TRANSPORTATION AND FHWA.

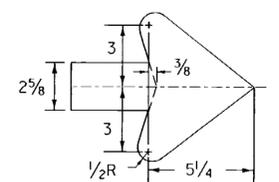
SIGN	DIMENSIONS (INCHES)																
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	
1,2-digits	24	24	1 1/2	6	1	14	1 1/2	4C	12D	1	22	11	-	1 1/2	1/2	7B	
1,2-digits	36	36	2 3/8	8	1 3/4	21	2 3/8	6C	18D	2	32	16 1/2	-	2 1/4	3/8	10B	
3,-digits	30	24	1 1/2	6	1	14	1 1/2	4D	12D	1	28	11	3	1 1/2	1/2	7B	
3,-digits	45	36	2 5/8	8	1 3/4	21	2 5/8	6D	18D	2	41	16 1/2	4 1/2	2 1/4	3/8	10B	



M6-3 M6-2 M6-1 M5-1 DIRECTION ARROW OR ADVANCE TURN ARROWS



TYPICAL RADIUS DETAIL



TYPICAL ARROW DETAIL

(ALL DIMENSIONS IN INCHES)

REVISIONS AND CORRECTIONS  
AUG. 08, 1995 - DATE OF ORIGINAL ISSUE

APPROVED  
*Ernest S. MacArthur*  
DIRECTOR OF ENGINEERING  
*David A. Ross*  
TRAFFIC AND SAFETY ENGINEER

STATE ROUTE MARKER SIGN DETAILS

OTHER STDS. REQUIRED:



STANDARD E-136 B

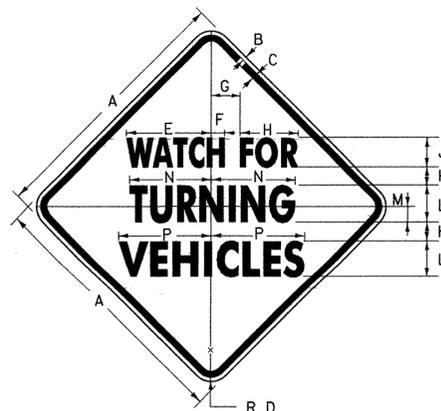
APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION. FHWA FINAL APPROVAL PENDING.



**W5-1**

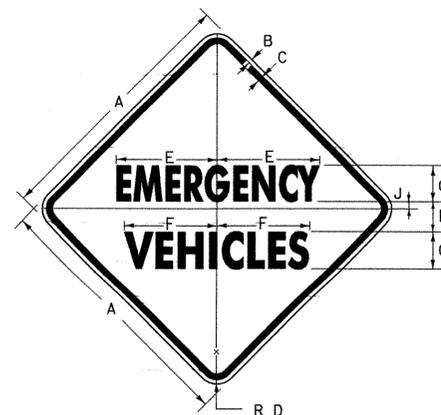
• REDUCE SPACING 25%

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
MIN.	30	1/2	3/4	5D	3	1 3/4	7 7/8	8 5/8	14 3/4	15 1/8	1 7/8
STD.	36	5/8	7/8	6D	3 1/2	2	9 1/2	10 5/16	17 5/8	18 1/4	2 1/4
SPECIAL	48	3/4	1 1/4	8D	4	3	12 1/16	13 3/4	23 1/2	23 3/8	3



**VW-205**

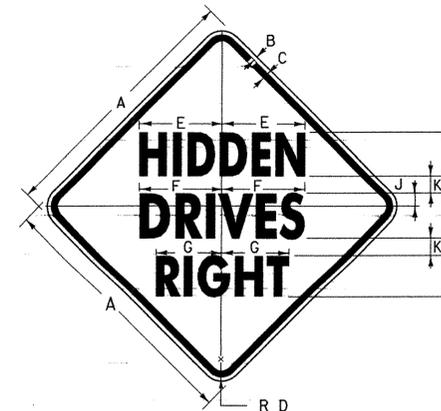
SIGN	DIMENSIONS (INCHES)													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MIN.	30	1/2	3/4	1 7/8	9 5/8	1 1/2	3 3/8	6 3/8	4B	2	5B	2	9 1/4	10 1/4
STD.	36	5/8	7/8	2 1/4	11 3/4	1 7/8	4	8	4C	2 1/2	5C	2	11 1/2	12 7/8
SPECIAL	48	3/4	1 1/4	3	14 3/4	2 3/8	5 3/8	10	5C	3 3/8	8B	2 5/8	14 5/16	16 7/16



**VW-544**

• REDUCE SPACING 50%

SIGN	DIMENSIONS (INCHES)								
	A	B	C	D	E	F	G	H	J
MIN.	30	1/2	3/4	1 7/8	12 3/4	9 1/16	4C*	3 3/8	7/8
STD.	36	5/8	7/8	2 1/4	14 3/16	11 1/16	5C*	4	I
SPECIAL	48	3/4	1 1/4	3	19 1/8	15 7/16	6C	5 3/8	1 3/8



**VW-054**

SIGN	DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	L	M	
PATH	18	3/8	5/8	1 3/8	5 5/8	5 5/8	4 7/16	3C	7/8	1 1/16	4 3/16	3 5/16	
MIN.	24	3/8	5/8	1 1/2	7 1/16	7 5/8	6 3/16	4C	1 3/16	2	6 3/16	4 7/8	
STD.	30	1/2	3/4	1 7/8	9 9/16	9 1/2	7 1/16	5C	1 1/2	2	7 3/4	6 1/8	
EXPWY.	36	5/8	7/8	2 1/4	11 1/16	11 1/16	9 3/16	6C	1 3/16	2 3/8	9 5/16	7 3/8	
SPECIAL	48	3/4	1 1/4	3	15 3/8	15 1/4	12 5/16	8C	2 3/8	3 3/16	12 3/8	9 3/16	

DRIVE  
LEFT

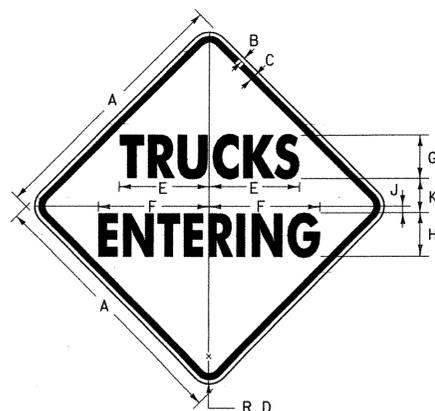
**VW-133**



**W5-2**

• REDUCE SPACING 20%

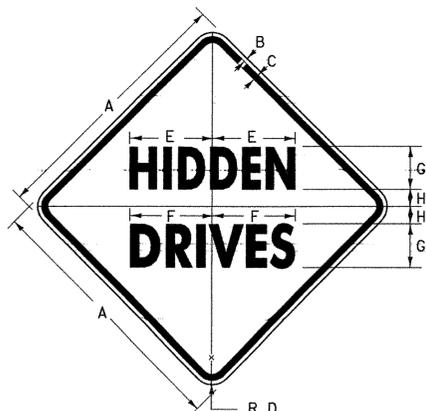
SIGN	DIMENSIONS (INCHES)								
	A	B	C	D	E	F	G	J	
PATH	18	3/8	5/8	3D	1/4	1 3/8	7 5/8	6 1/4	1 3/8
MIN.	24	3/8	5/8	4D	1/4	2	10 1/16	8 3/4	1 1/2
STD.	30	1/2	3/4	5D	1/2	2 1/2	13 1/16	10 7/8	1 7/8
SPECIAL	36	5/8	7/8	6D	3/4	3	15 1/16	13 1/16	2 1/4



**VW-202**

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	
MIN.	30	1/2	3/4	1 7/8	14 7/16	6 1/16	5C	5C	3/4	4	
STD.	36	5/8	7/8	2 1/4	17 3/8	8	6C	6C	7/8	4 3/16	
SPECIAL	48	3/4	1 1/4	3	23 1/8	10 1/16	8B	8C	1 1/8	6 3/8	

(ALL DIMENSIONS SHOWN IN INCHES EXCEPT WHERE NOTED)



**VW-060**

SIGN	DIMENSIONS (INCHES)							
	A	B	C	D	E	F	G	H
PATH	18	3/8	1/2	1 1/8	5 3/4	5 1/2	3C	1 1/8
MIN.	24	3/8	5/8	1 1/2	7 1/16	7 5/8	4C	2
STD.	30	1/2	3/4	1 7/8	9 9/16	9 1/2	5C	2
EXPWY.	36	5/8	7/8	2 1/4	11 1/2	11 1/16	6C	2 3/8
SPECIAL	48	3/4	1 1/4	3	15 3/8	15 1/4	8C	3 3/8



**VW-622**

• REDUCE SPACING 50%

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	
MIN.	24	3/8	5/8	1 1/2	11 3/16	5 5/16	2 1/16	3 5/16	4C	
STD.	30	1/2	3/4	1 7/8	14 7/16	6 1/16	3 3/16	4 3/16	5C	
SPECIAL	36	5/8	7/8	2 1/4	17 3/8	8	4	5	6C	

**NOTES**

**DESIGN**

LETTERS, DIGITS, ARROWS, SYMBOLS, SPACINGS AND TEXT SHALL CONFORM WITH THE "STANDARD HIGHWAY SIGNS BOOK" AND DESIGNS PRESCRIBED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) ADOPTED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION (FHWA).

**MATERIALS**

THE SIGN BASE MATERIALS USED FOR THE WARNING SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING, OF THE MINIMUM THICKNESS NOTED:

FLAT SHEET ALUMINUM	24" x 24"	36" x 36"	48" x 48"
	18" x 18"	30" x 30"	36" x 36"
	0.060"	0.080"	0.100"
			0.125"

**REFLECTORIZATION**

THE BACKGROUND RETROREFLECTIVE MATERIAL SHALL BE ASTM TYPE III, TYPE VIII, OR TYPE IX RETROREFLECTIVE SHEETING APPLIED TO THE ENTIRE SIGN. THE TEXT, BORDER, AND SYMBOLS SHALL BE LETTERING FILM OR SILK SCREENED.

**COLORS**

ALL OF THE WARNING SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT AND SYMBOLS ON RETROREFLECTORIZED YELLOW BACKGROUND, UNLESS OTHERWISE NOTED. THE COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA.

**SPECIFICATIONS**

WARNING SIGNS SHALL MEET THE VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION "TRAFFIC SIGNS".

**OTHER STDS. REQUIRED:**

**REVISIONS AND CORRECTIONS**

AUG. 08, 1995 - DATE OF ORIGINAL ISSUE

MAY 01, 2004 - CHANGED REFLECTIVE SHEETING TO TYPE III  
MINOR NOTE CHANGES ADDED PATH DIMENSIONS

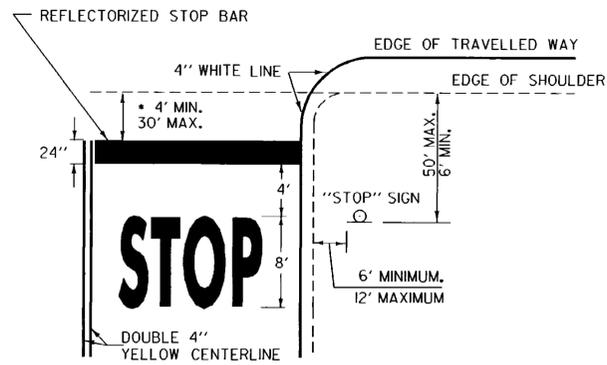
**APPROVED**

DIRECTOR OF PROGRAM DEVELOPMENT  
*John A. Kelly*  
TRAFFIC OPERATIONS ENGINEER  
*Michael J. ...*  
FEDERAL HIGHWAY ADMINISTRATION

**WARNING SIGN  
DETAILS**

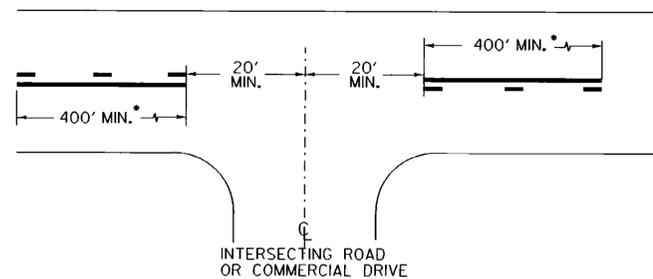


**STANDARD  
E-154**



* THE "DESIRED STOPPING POINT" IS THE LOCATION BASED ON SITE CONDITIONS THAT BEST ALLOWS THE STOPPED VEHICLE TO VIEW THE APPROACHING TRAFFIC.

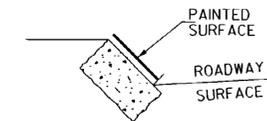
**STOP BAR LAYOUT**



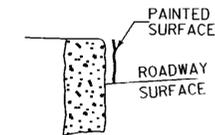
* THE SOLID LINE SHALL BE PAIRED WITH EITHER A SOLID OR DASHED LINE DEPENDING ON SIGHT DISTANCE AVAILABILITY IN THE OPPOSING DIRECTION. ADJUSTMENTS TO THE 40 FOOT CENTERLINE OPENING MAY BE MADE TO ACCOMMODATE SKEWED INTERSECTIONS.

- CENTERLINE BREAKS:
- AT ALL STATE HIGHWAYS AND TOWN HIGHWAYS, INCLUDING CLASS 4 TH'S, THAT HAVE STOP AND LEGAL LOAD LIMIT SIGNS INSTALLED
  - COMMERCIAL DRIVES:
    - WHERE A SEPERATE TURN LANE EXISTS ON THE MAIN LINE (LT. OR RT.)
    - SIGNIFICANT TRAFFIC VOLUMES EXISTS.
    - IF MOTORISTS NEED ASSISTANCE TO DEFINE ENTRANCE POINTS.

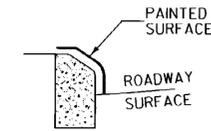
**CENTERLINE LAYOUT**



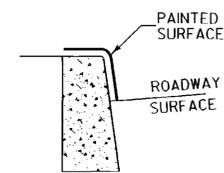
**GRANITE SLOPE EDGING**



**VERTICAL GRANITE CURB**

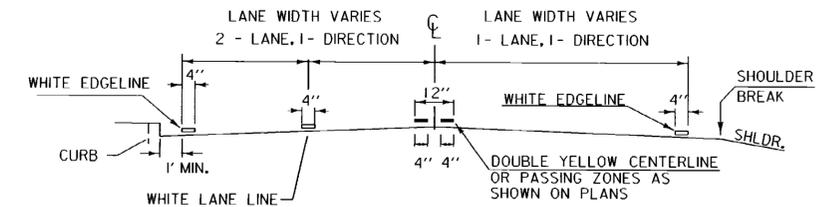


**TYPE A (CONCRETE)**

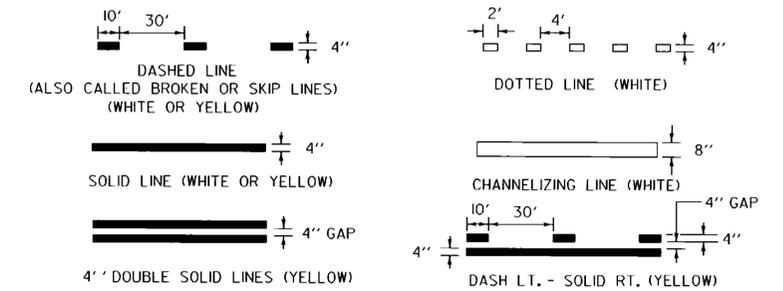


**TYPE B (CONCRETE)**

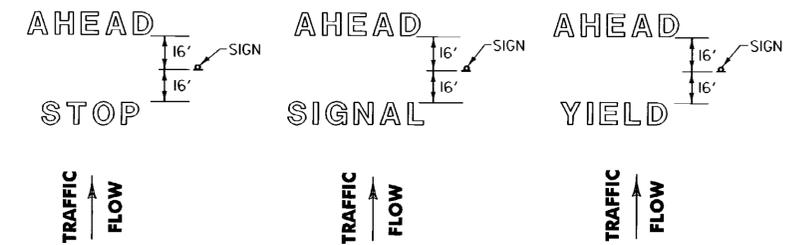
**PAINTED CURB**



**PAVEMENT MARKING PLACEMENT DETAIL**

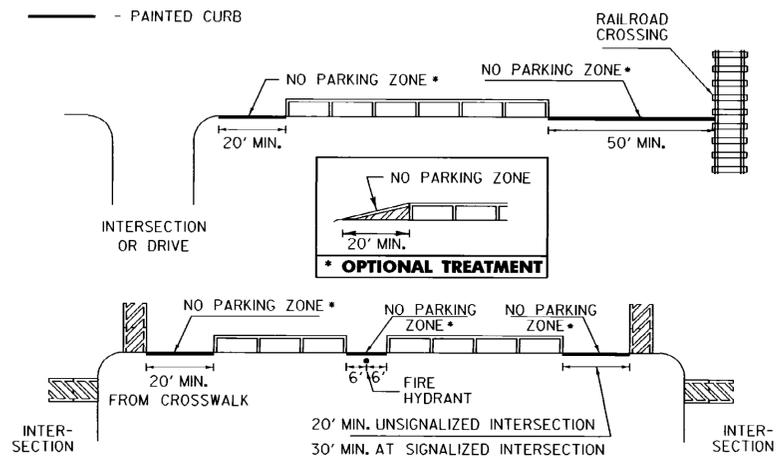


**PAVEMENT MARKING LINE DETAILS**

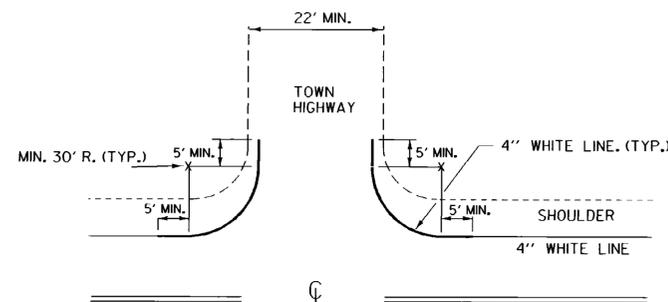


**LETTER IN WORD MARKING SPACING DETAIL**

NOTE: SINGLE WORDS CENTERED ON SIGN ie: SCHOOL OR YIELD



**NO PARKING LAYOUT DETAILS**

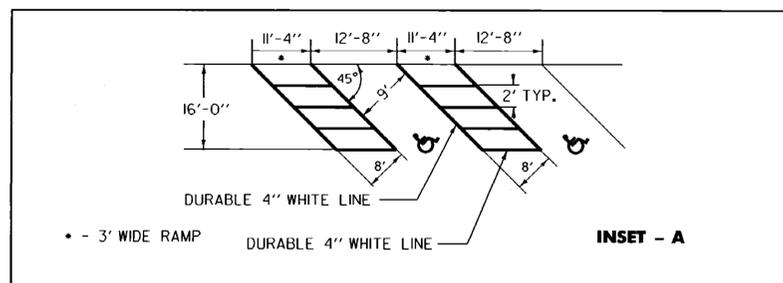


EDGELINES SHALL BE APPLIED TO ALL STATE HIGHWAYS AND SHOULD BE MAINTAINED AT A CONSTANT DISTANCE FROM THE CENTERLINE UNLESS PAVEMENT WIDTH INCREASES TO ALLOW WIDER LANES.

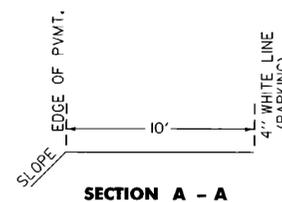
APPLY EDGELINE AS DETAILED ON ALL PAVED CLASS 1 & CLASS 2 TOWN HIGHWAYS AND ANY CLASS 3 TOWN HIGHWAY 22 FEET OR MORE IN WIDTH.

IF MIN. 30 FOOT RADIUS CANNOT BE OBTAINED, OR THE TOWN HIGHWAY IS NOT PAVED, BREAK THE EDGELINE USING AN 80 FOOT GAP AT INTERSECTION.

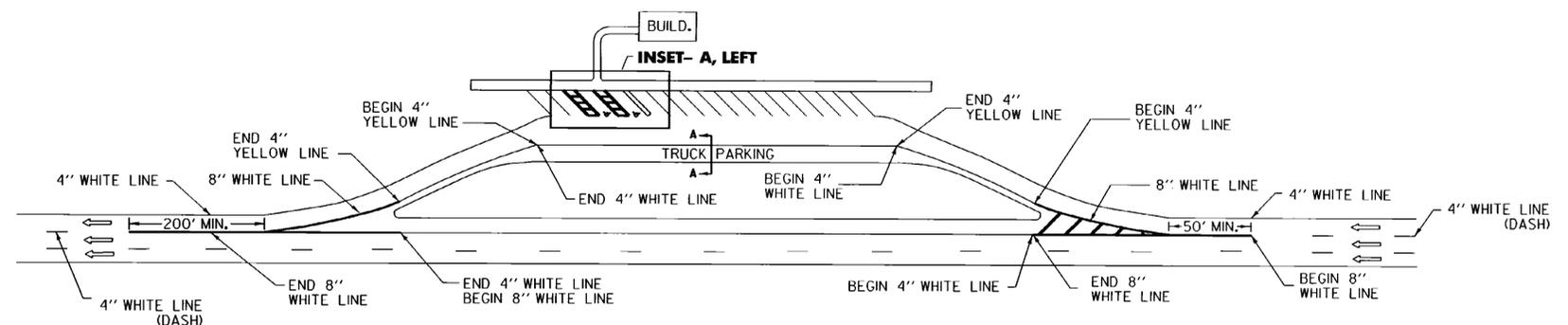
**EDGELINE LAYOUTS**



NOTE:  
SEE STANDARD SHEET E-191 FOR  
HANDICAP SYMBOL POSITIONING AND DETAIL.



**TRUCK PARKING DETAIL**



**REST AREA PARKING DETAILS**

THIS SHEET IS  
NOT TO SCALE

OTHER STDS. E - 191, E - 192  
REQUIRED

**REVISIONS AND CORRECTIONS**

AUG. 18, 1995 - DATE OF ORIGINAL ISSUE

**APPROVED**

*Sandra S. McCutchen*  
DIRECTOR OF ENGINEERING

*David A. Ross*  
TRAFFIC AND SAFETY ENGINEER

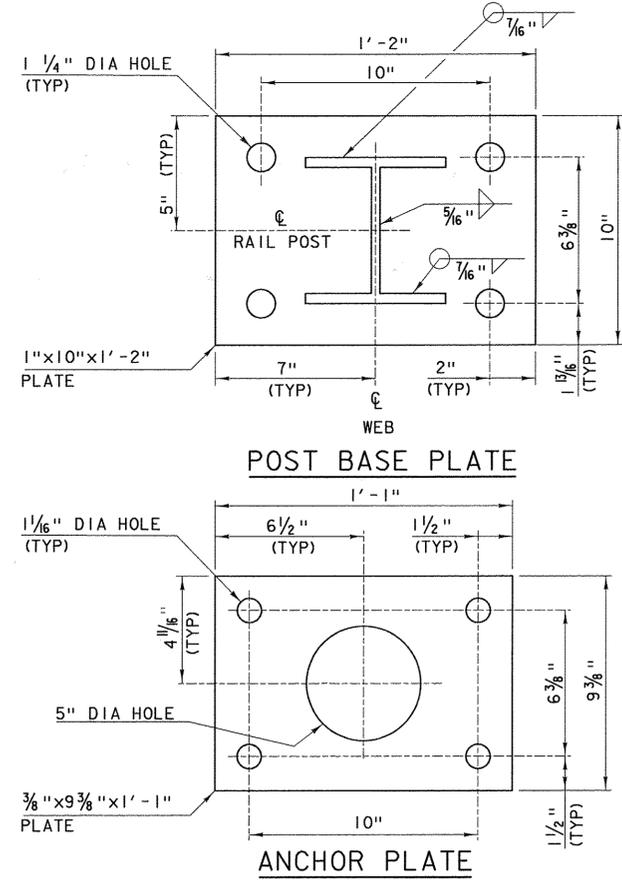
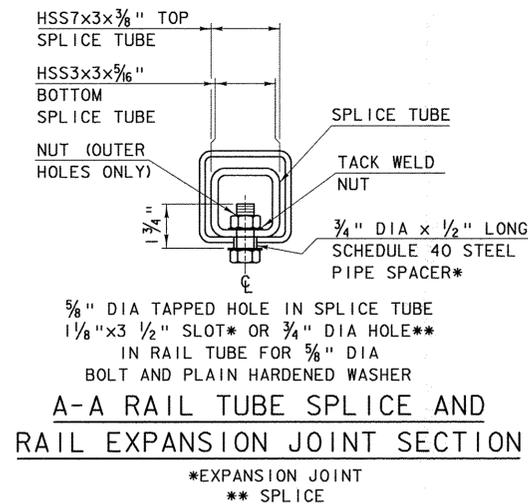
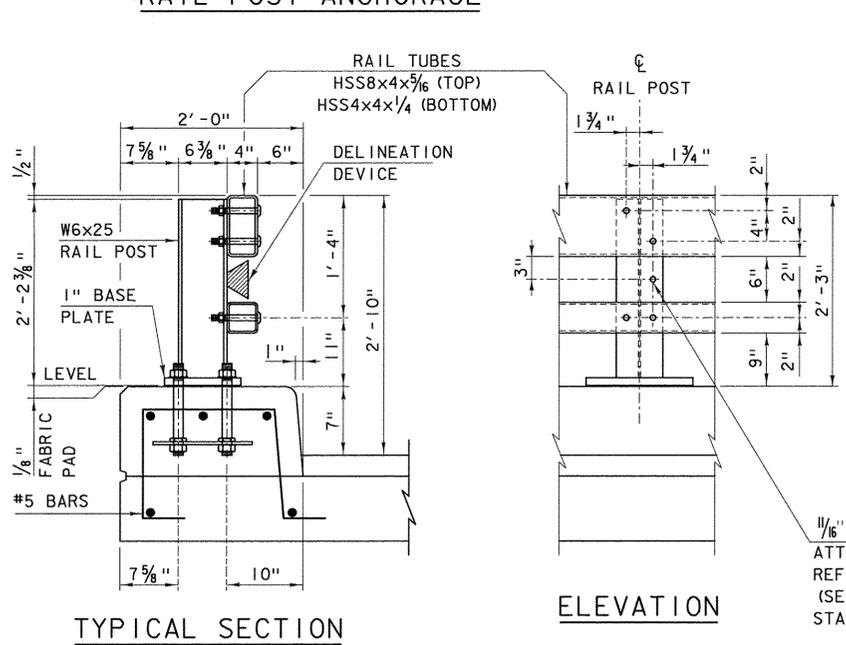
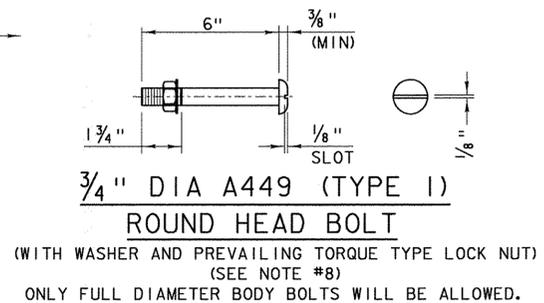
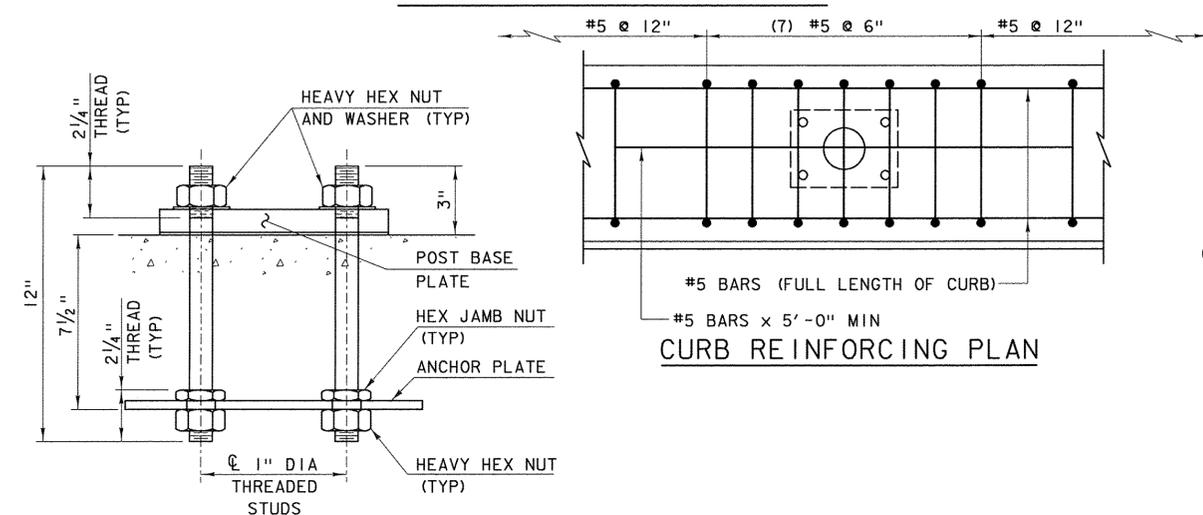
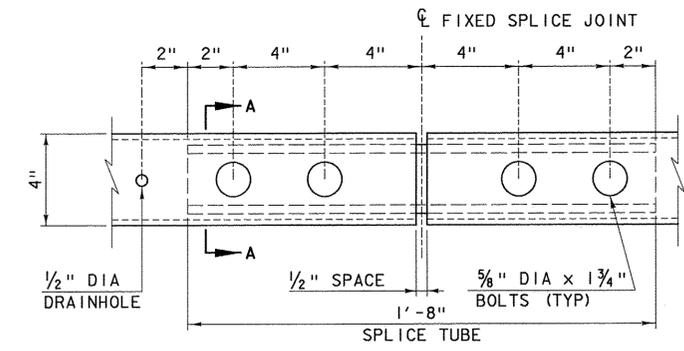
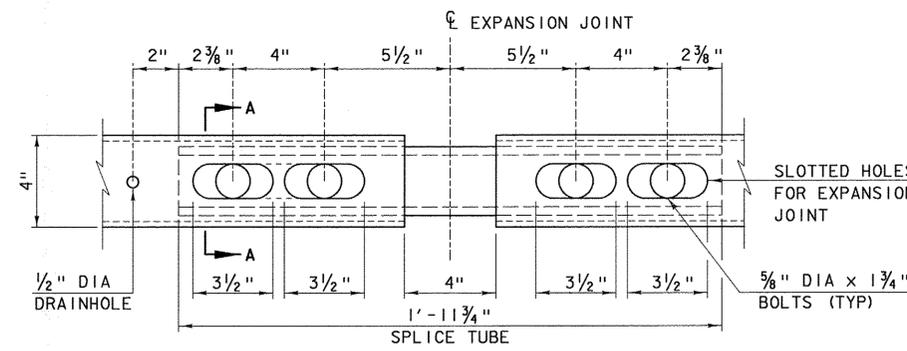
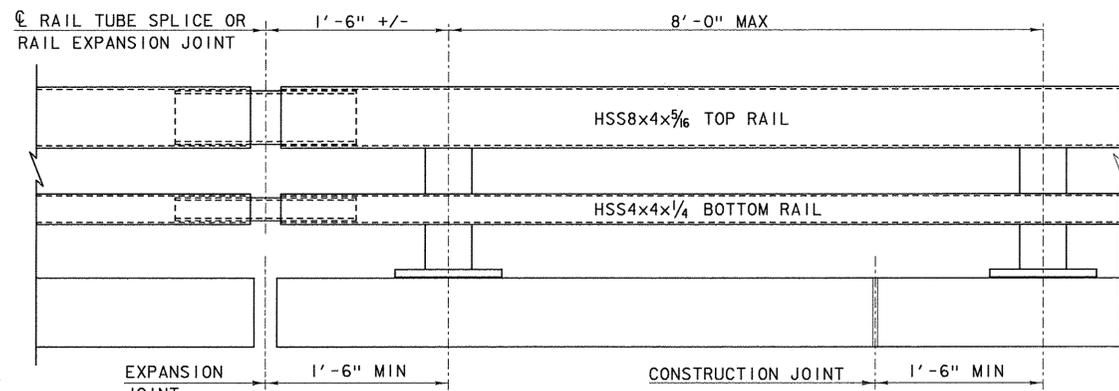
APPROVED FOR THIS PROJECT  
AND/OR DESIGN IMPLEMENTATION.  
FHWA FINAL APPROVAL PENDING.

**PAVEMENT MARKING DETAILS**



**STANDARD  
E-193**

/traf/std/stdel93.dgn/stdel93.i



**NOTES**

- ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 525.
- PRIOR TO GALVANIZING THE ASSEMBLED POST, GRIND ALL EDGES TO A MINIMUM RADIUS OF 1/16".
- ALL POSTS SHALL BE SET NORMAL TO GRADE.
- SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO BRIDGE RAIL POSTS AND PREFERABLY TO AT LEAST FOUR POSTS.
- 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" AT 45°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.
- HOLES IN RAILS FOR RAIL TUBE ATTACHMENT MAY BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO INSTALLATION.
- RAIL POST ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
- RAIL TUBES SHALL BE ATTACHED USING 3/4" FULL DIAMETER BODY ASTM A 449 (TYPE 1) ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 1/16" LARGER THAN THE BOLT SIZE.
- ANY BENDING OF RAIL SHALL BE DONE AT A FABRICATION PLANT ACCORDING TO A PROCEDURE PROVIDED BY THE FABRICATOR.
- 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.
- SEE STANDARD DRAWING G-1 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.
- THIS RAILING MEETS THE REQUIREMENTS FOR A TL-4 SERVICE LEVEL.

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

REVISIONS AND CORRECTIONS

DECEMBER 14, 2009 - ORIGINAL APPROVAL DATE  
APRIL 23, 2012 - GENERAL UPDATE 2012

APPROVED

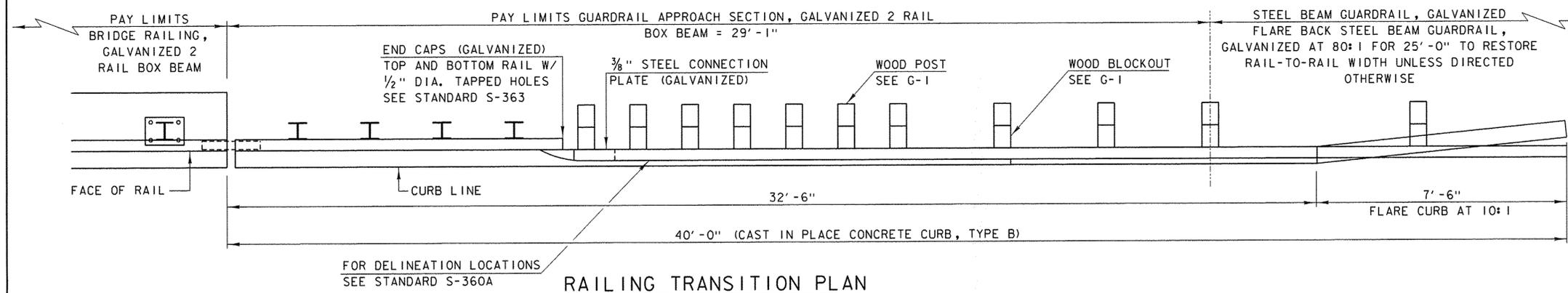
*Dr. Michael Hedgys*  
STRUCTURES PROGRAM MANAGER

*Richard Johnson*  
DIRECTOR OF PROGRAM DEVELOPMENT

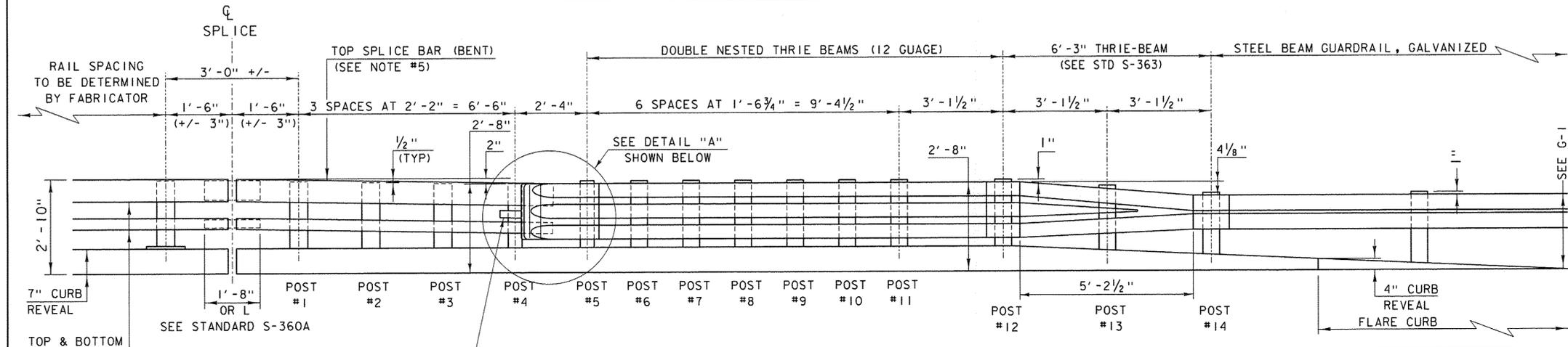
*Mark D. Kishner*  
FEDERAL HIGHWAY ADMINISTRATION

BRIDGE RAILING,  
GALVANIZED 2 RAIL  
BOX BEAM

STANDARD  
S-360A

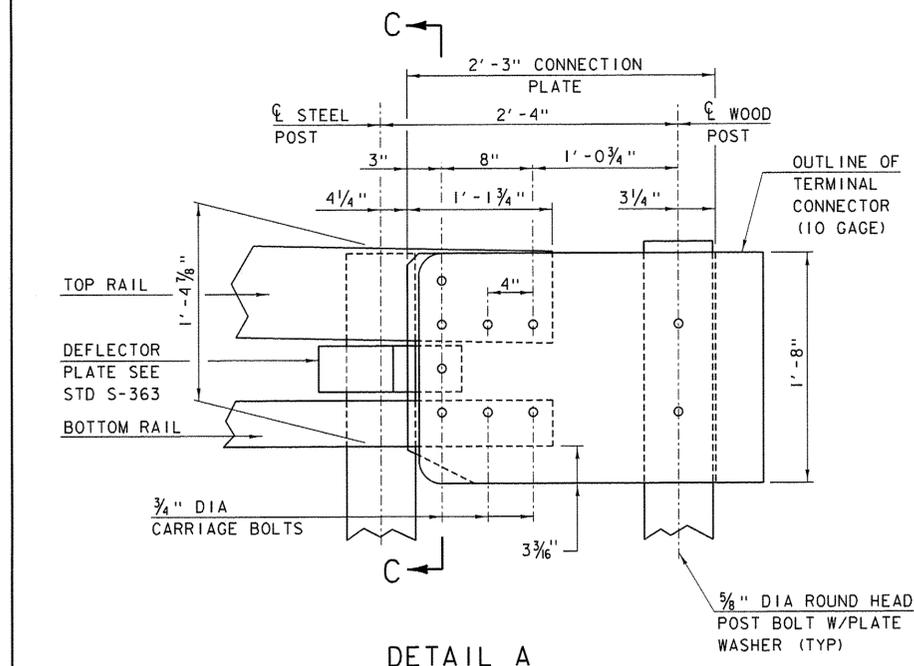


**RAILING TRANSITION PLAN**

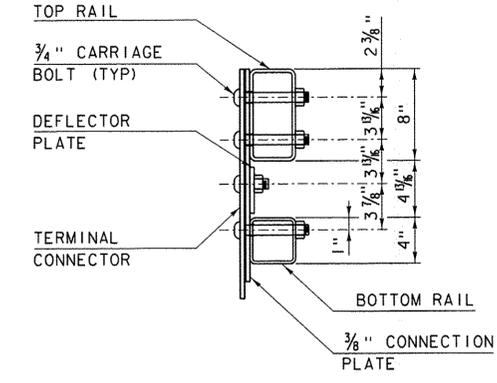


**RAILING TRANSITION ELEVATION**

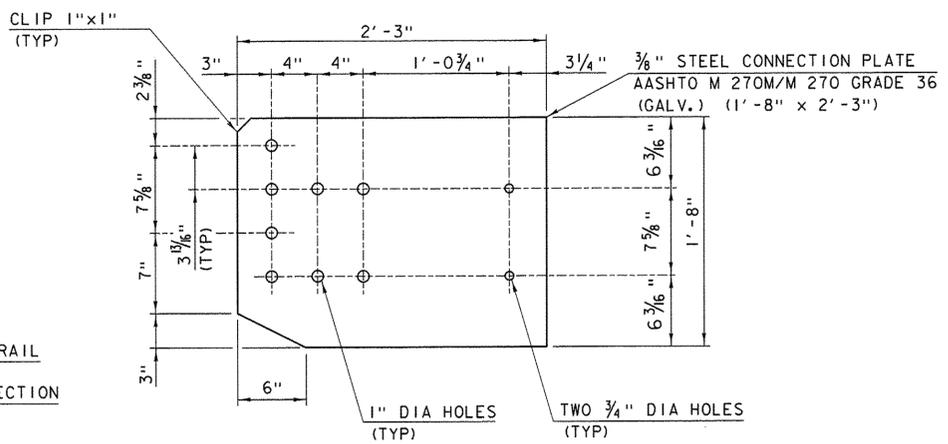
POST NUMBER	RAIL HEIGHT (A)	RAIL SPACING (B)	RAIL HEIGHT (C)
1	2' - 9 1/2"	1' - 3 3/4"	1' - 5 3/4"
2	2' - 9"	1' - 3 1/2"	1' - 5 1/2"
3	2' - 8 1/2"	1' - 3 5/8"	1' - 5 5/8"
4	2' - 8"	1' - 2 7/8"	1' - 5 1/8"



**DETAIL A**



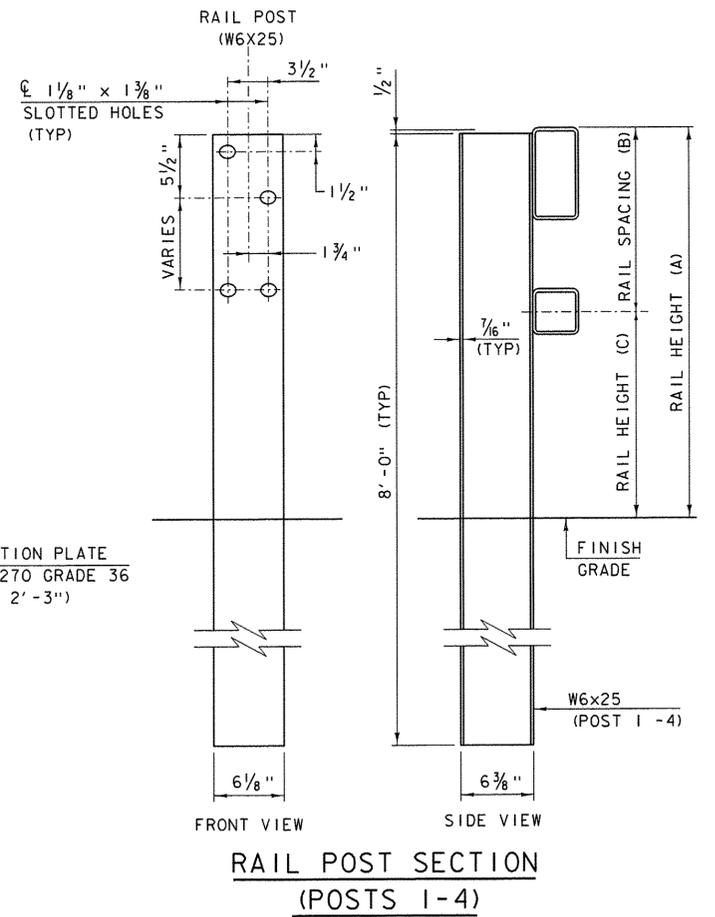
**SECTION C-C (CONNECTION PLATE)**



**CONNECTION PLATE**

**NOTES**

1. PAYMENT FOR GUARDRAIL APPROACH SECTION - GALVANIZED 2 RAIL BOX BEAM SHALL INCLUDE THE TERMINAL CONNECTOR, THE CONNECTION PLATE, THE DEFLECTOR PLATE, RAIL, POSTS, BLOCKS AND ATTACHMENT HARDWARE.
2. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.
3. TUBE AND STEEL POST MATERIALS, DIMENSION SIZES AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL, UNLESS OTHERWISE NOTED.
4. APPROACH RAIL BOLTS SHALL BE ASTM A307 GRADE A AND NUTS SHALL BE AASHTO M291 (ASTM A563 GRADE A OR BETTER) (GALVANIZED). WASHERS SHALL BE ASTM F844.
5. WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD (B-U2).



**RAIL POST SECTION (POSTS 1-4)**

**OTHER STDS. REQUIRED: G-1, S-363**

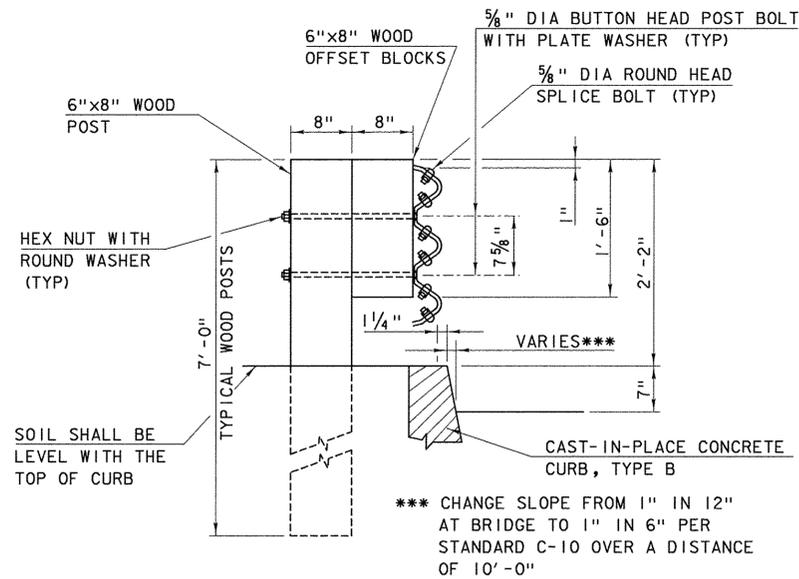
REVISIONS AND CORRECTIONS  
 DECEMBER 14, 2009 - ORIGINAL APPROVAL DATE  
 APRIL 23, 2012 - GENERAL UPDATE 2012

APPROVED  
*Dr. Michael Hedger*  
 STRUCTURES ENGINEER  
*Richard Johnson*  
 DIRECTOR OF PROGRAM DEVELOPMENT  
*Mark D. Richter*  
 FEDERAL HIGHWAY ADMINISTRATION

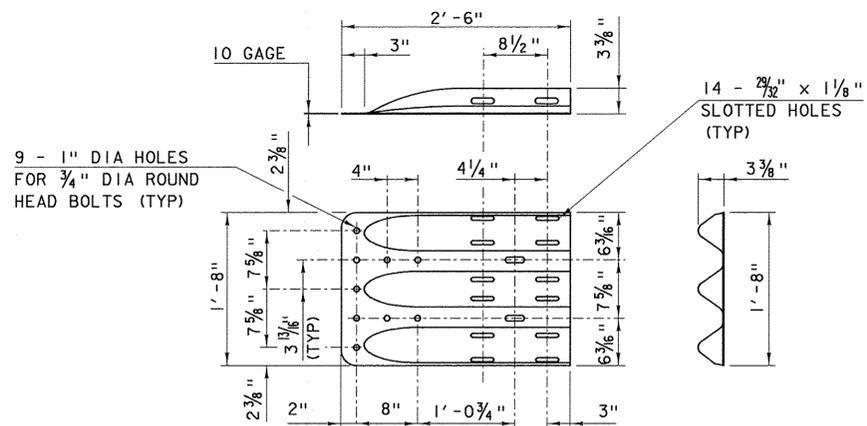
**GUARDRAIL APPROACH SECTION,  
 GALVANIZED 2 RAIL BOX BEAM**



**STANDARD  
 S - 360B**



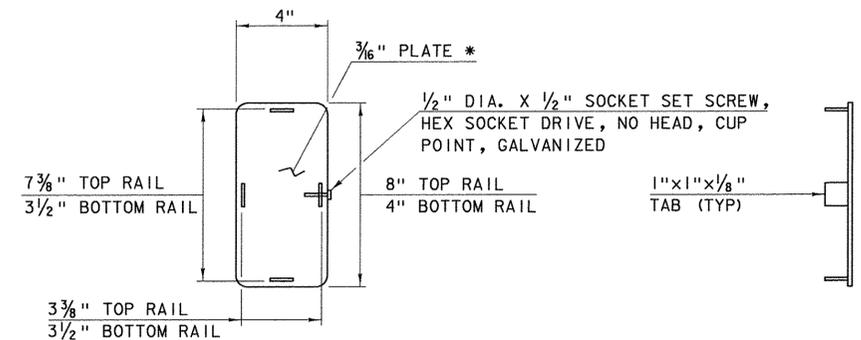
**WOOD POST AND THRIE-BEAM RAIL ASSEMBLY**



**THRIE-BEAM TERMINAL CONNECTOR (HM-TF-13/RE-67)**

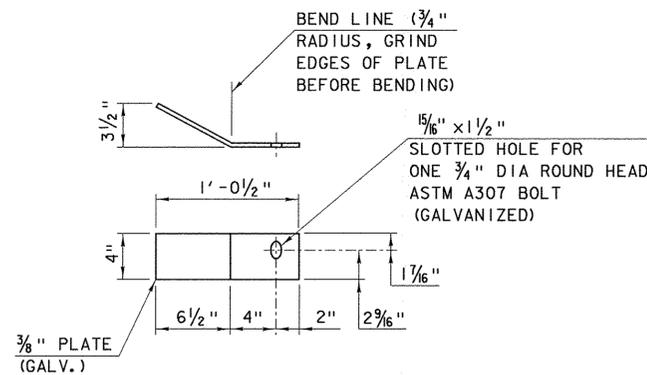
**NOTES**

1. DELINEATOR DEVICES SHALL BE INSTALLED PER BRIDGE RAIL AND OR GUARDRAIL STANDARD REQUIREMENTS.
2. ON BRIDGES WITH A SIDEWALK, DELINEATORS ARE NOT TO BE INSTALLED ON THE SIDEWALK SIDE OF THE BRIDGE.

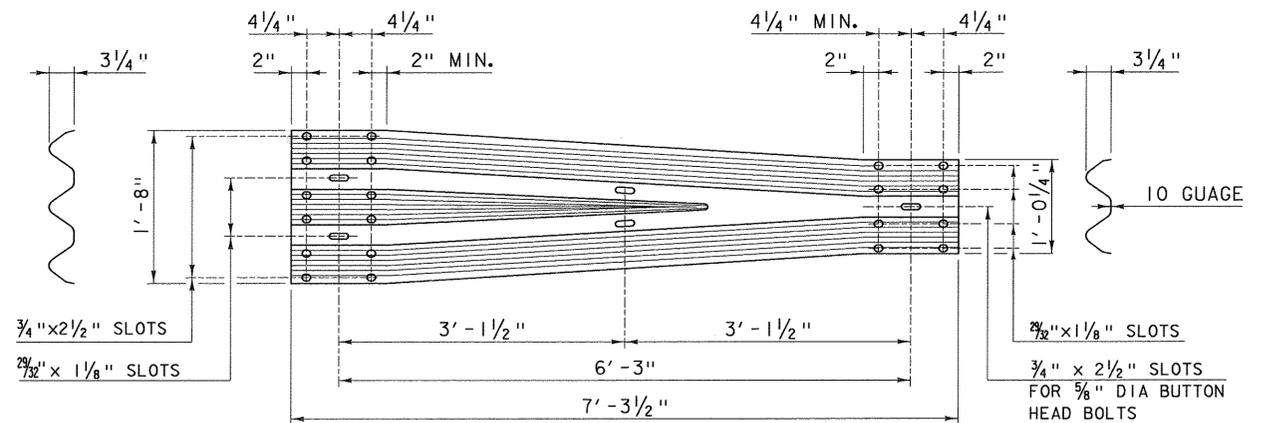


**END CAP DETAIL**

* ROUND CORNERS 1/2" RADIUS (TYP)



**DEFLECTOR PLATE DETAIL**



**THRIE-BEAM TO STANDARD STEEL BEAM TRANSITION SECTION (HM-TF-13/RE-69)**

**REVISIONS AND CORRECTIONS**

DECEMBER 14, 2009 - ORIGINAL APPROVAL DATE  
APRIL 23, 2012 - GENERAL UPDATE 2012

**APPROVED**

*Dr. Michael Hedys*  
STRUCTURES ENGINEER

*Richard Schaub*  
DIRECTOR OF PROGRAM DEVELOPMENT

*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

**THRIE BEAM TO STANDARD STEEL BEAM TRANSITION SECTION**

**OTHER STDS. REQUIRED: C-10**



**STANDARD S-363**

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

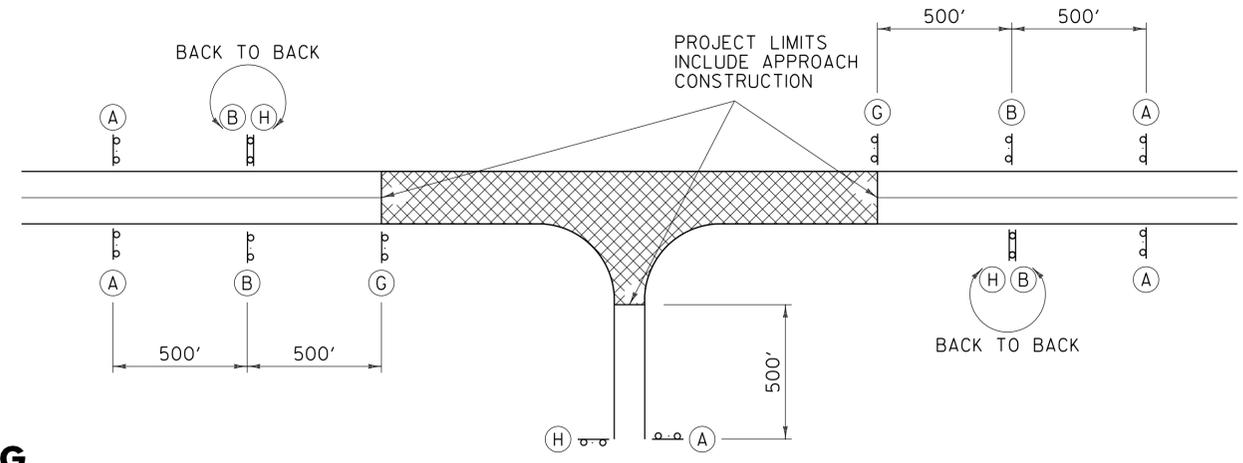
## TRAFFIC CONTROL GENERAL NOTES



# STANDARD T-1

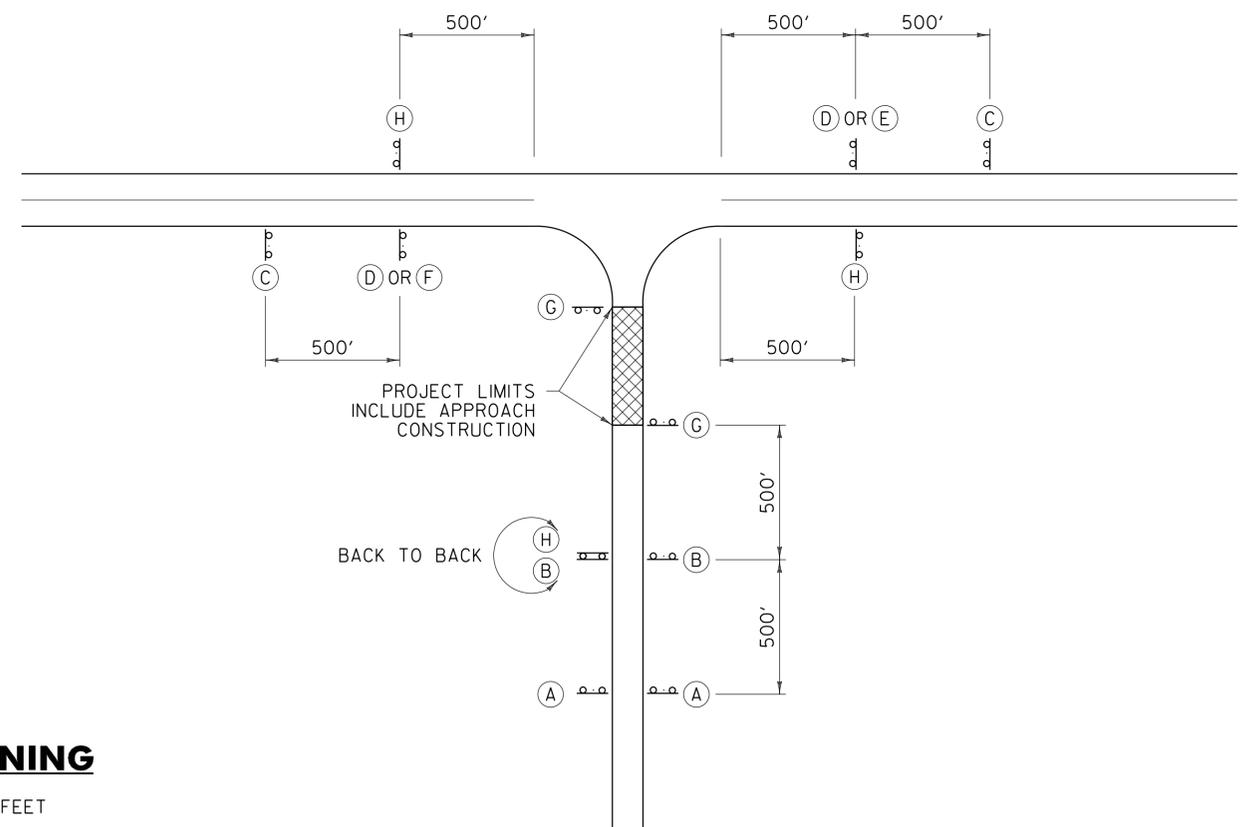
**LEGEND**

- (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**

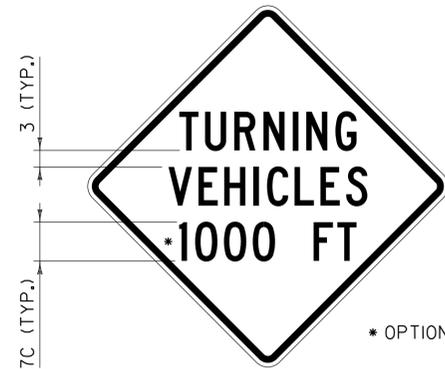
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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

**CONVENTIONAL ROADS  
CONSTRUCTION APPROACH  
SIGNING**

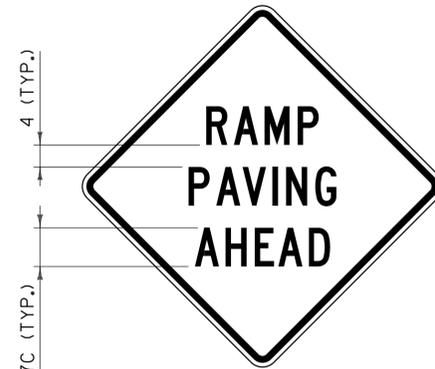


STANDARD  
**T-10**

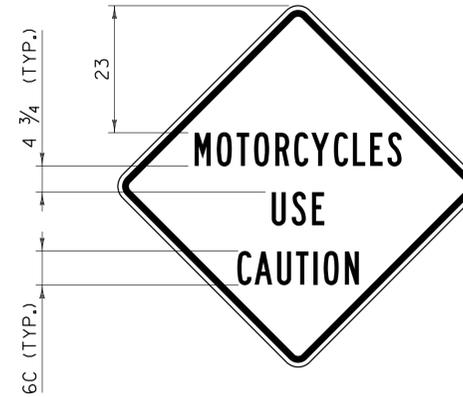


**VC-001**

* OPTIONS { 500  
1500



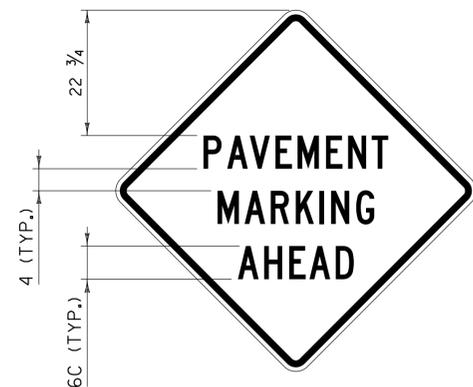
**VC-003**



**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**

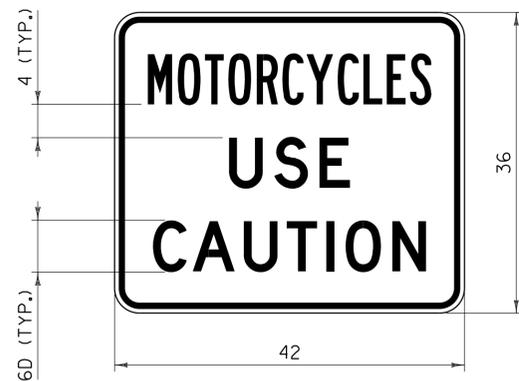
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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CONSTRUCTION SIGN  
DETAILS



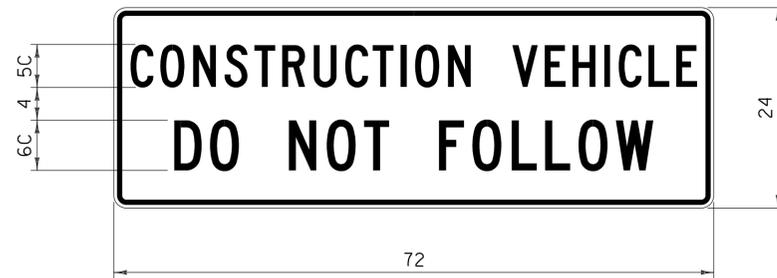
STANDARD  
T-28



**VC-004P**

**NOTES:**

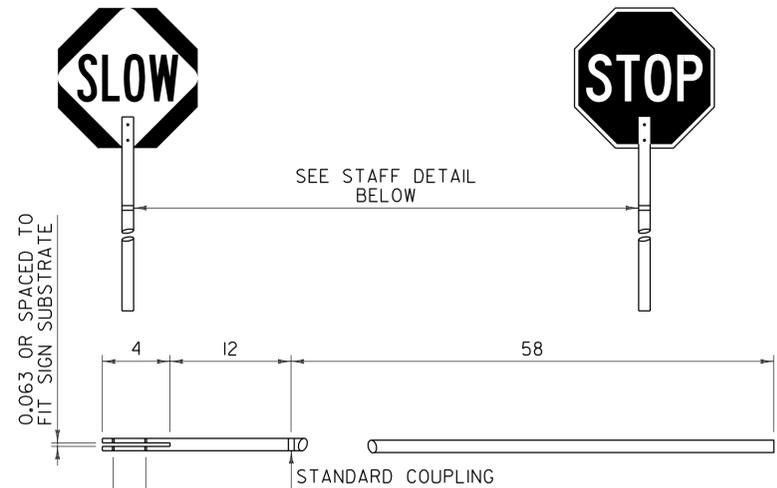
1. CORNERS SHALL BE ROUNDED TO A THREE INCH RADIUS.
2. THE BORDER SHALL BE 3/4 INCH WIDE WITH A 1/2 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "MOTORCYCLES" SHALL HAVE A SPECIFIED WIDTH OF 34 INCHES.
4. "USE" SHALL HAVE A SPECIFIED WIDTH OF 14 1/2 INCHES.
5. "CAUTION" SHALL HAVE A SPECIFIED WIDTH OF 32 3/4 INCHES.
6. SIGN SHALL ONLY BE INSTALLED AS A SUPPLEMENTAL TO A PARENT WARNING SIGN AND SHALL NOT BE INSTALLED BY ITSELF.



**VC-007**

**NOTES:**

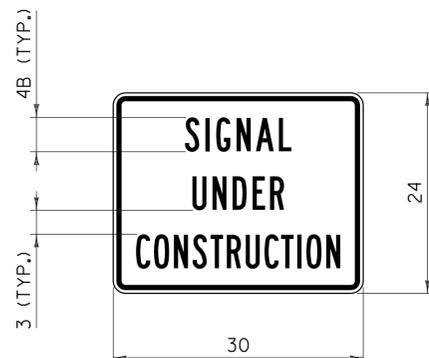
1. CORNERS SHALL BE ROUNDED TO A 1 1/2 INCH RADIUS.
2. THE BORDER SHALL BE 5/8 INCH WIDE WITH A 3/8 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "CONSTRUCTION VEHICLE" SHALL HAVE A SPECIFIED WIDTH OF 68 INCHES.
4. "DO NOT FOLLOW" SHALL HAVE A SPECIFIED WIDTH OF 57 1/2 INCHES.
5. SIGN SHALL BE MOUNTED IN A CONSPICUOUS LOCATION ON THE REAR OF THE CONSTRUCTION VEHICLE.
6. THE SIGN SHALL BE MOUNTED AS NOT TO INTERFERE WITH THE VISIBILITY OF DIRECTIONAL SIGNALS OR TAIL LIGHTS AS REQUIRED BY LAW.
7. SIGN SHALL BE COVERED OR REMOVED WHEN NOT IN USE.



**STOP-SLOW PADDLE & STAFF DETAIL**

**NOTES:**

1. REFER TO THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK (SHSM) "TEMPORARY TRAFFIC CONTROL - WARNING SIGNS" FOR THE STOP-SLOW PADDLE DESIGN.
2. COLORS FOR THE SLOW SIDE OF THE PADDLE SHALL BE BLACK LEGEND AND BORDER ON A FLUORESCENT ORANGE DIAMOND WITH RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 [ASTM D 4956] TYPE VII, VIII OR IX REQUIREMENTS.
3. COLORS FOR THE STOP SIDE OF THE PADDLE SHALL BE WHITE RETROREFLECTIVE LEGEND AND BORDER ON A RED RETROREFLECTIVE OCTAGON. BOTH COLORS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING AASHTO M 268 [ASTM D 4956] TYPE III.
4. SIGN SUBSTRATE MATERIALS SHALL BE ALUMINUM, ACRYLONITRILE BUTADIENE STYRENE (ABS) PLASTIC OR EQUIVALENT.
5. THE STAFF MAY BE RIGID ABS PLASTIC OR WOOD WITH A ONE TO 1 1/2 INCH DIAMETER.
6. SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACTED OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.



**VC-820**

**NOTES:**

1. CORNERS SHALL BE ROUNDED TO A 1 1/2 INCH RADIUS.
2. THE BORDER SHALL BE 5/8 INCH WIDE WITH A 3/8 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "SIGNAL" SHALL HAVE A SPECIFIED WIDTH OF 12 3/4 INCHES.
4. "UNDER" SHALL HAVE A SPECIFIED WIDTH OF 11 INCHES.
5. "CONSTRUCTION" SHALL HAVE A SPECIFIED WIDTH OF 24 1/2 INCHES.
6. SIGN SHALL ONLY BE INSTALLED AS A SUPPLEMENTAL TO A PARENT WARNING SIGN AND SHALL NOT BE INSTALLED BY ITSELF.

**GENERAL NOTES:**

1. ALL LEGEND SHALL BE CENTERED VERTICALLY AND HORIZONTALLY UNLESS OTHERWISE NOTED.
2. COLORS FOR SIGNS SHALL BE BLACK LEGEND AND BORDER ON FLUORESCENT ORANGE BACKGROUND UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS IN INCHES.

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

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

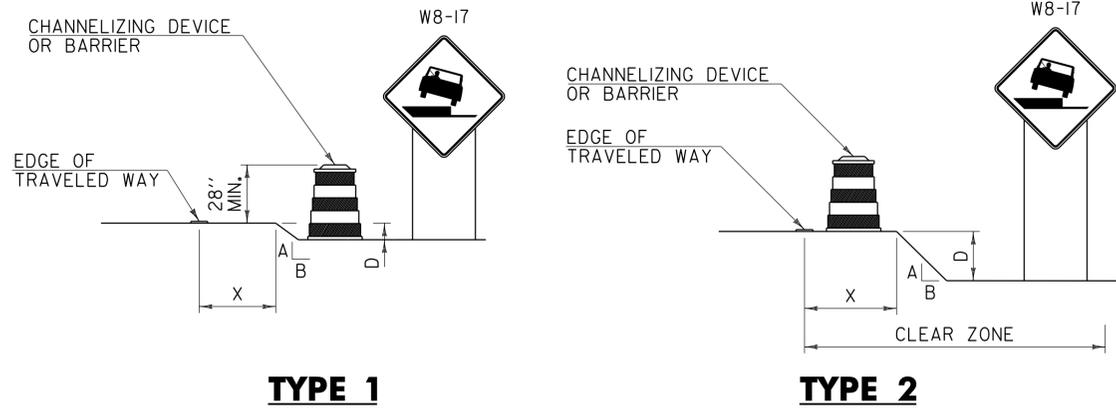
APPROVED  
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CONSTRUCTION SIGN  
DETAILS



STANDARD  
T-30

**DROP-OFF ADJACENT TO TRAVELED WAY**



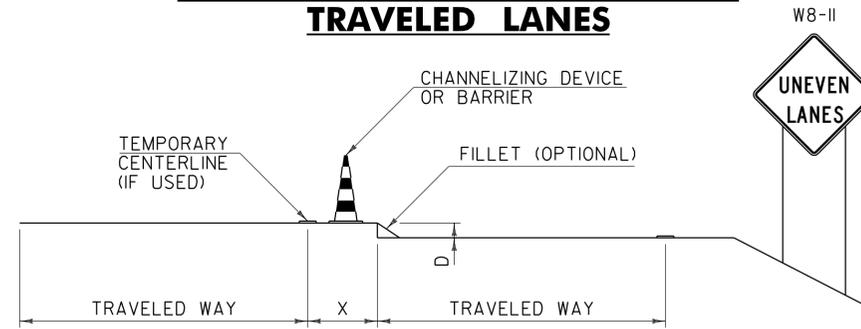
**TYPE 1**

**TYPE 2**

**NOTES:**

1. CHANNELIZING DEVICES OR BARRIER SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELED WAY.
2. SEE CHART "A" FOR SPECIFIC REQUIREMENTS.
3. IF THE DROP-OFF REQUIRES CHANNELIZING DEVICES TO REMAIN IN PLACE OVERNIGHT, THEN "SHOULDER DROP-OFF SYMBOL" (W8-17) SIGNS SHOULD BE INSTALLED.

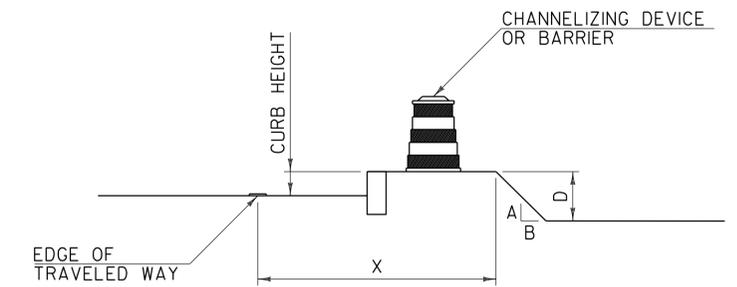
**DROP-OFF BETWEEN ADJACENT TRAVELED LANES**



**NOTES:**

1. WHENEVER A LONGITUDINAL DROP-OFF BETWEEN ADJACENT TRAVELED LANES IS TO BE LEFT OVERNIGHT, THEN "UNEVEN LANES" (W8-11) SIGNS AND CHANNELIZING DEVICES SHOULD BE INSTALLED.
2. IF REQUIRED, THE CHANNELIZING DEVICES USED SHOULD BE THOSE WHICH MAXIMIZE THE WIDTH OF THE TRAVELED LANE (I.E. CONES, VERTICAL PANELS OR TUBULAR MARKERS).
3. A BITUMINOUS CONCRETE FILLET WITH A 1.5:1 SLOPE MAY BE USED IN PLACE OF CHANNELIZING DEVICES, HOWEVER THE "UNEVEN LANES" (W8-11) SIGNS SHOULD STILL BE INSTALLED.
4. SEE CHART "A" FOR SPECIFIC REQUIREMENTS.

**DROP-OFF BEYOND SHOULDER OR CURB**



**NOTES:**

1. USE CHART "A" FOR VERTICAL CURBS UNDER SIX INCHES, MOUNTABLE CURBS OR ROADWAYS WITH A POSTED SPEED ABOVE 40 MPH.
2. USE CHART "B" FOR VERTICAL CURBS SIX INCHES OR GREATER.

**CHART "A"  
ALL SPEEDS WITH NO CURB  
OR MOUNTABLE CURB**

X (FEET)	DROP (D) (INCHES)	A:B SLOPE	RECOMMENDED DEVICE
0 TO 4'	LESS THAN 2"	ANY	NONE
	2" TO 6"	1:1.5 OR FLATTER	NONE
		STEEPER THAN 1:1.5	CHANNELIZING DEVICE
4' TO 10'	LESS THAN 6"	ANY	NONE
	6" TO 12"	1:3 OR FLATTER	NONE
		STEEPER THAN 1:3	BARRIER
10' TO CZ	LESS THAN OR EQUAL TO 12"	ANY	NONE
	GREATER THAN 12"	1:3 OR FLATTER	NONE
		STEEPER THAN 1:3	BARRIER

**NOTES:**

1. THE MINIMUM CLEAR ZONE FOR FREEWAYS IS TO BE DETERMINED PER THE CURRENT AASHTO ROADSIDE DESIGN GUIDE. ALL OTHER HIGHWAYS WILL BE DETERMINED PER THE CURRENT "VERMONT STATE STANDARDS" BOOK.
2. CHANNELIZING DEVICES MAY BE USED INSTEAD OF BARRIER FOR SHORT TERM OPERATIONS.
3. ON BORDERLINE CONDITIONS, THE ENGINEER SHOULD DETERMINE WHICH TREATMENT IS ADEQUATE FOR THE EXISTING CONDITIONS.

**CHART "B"  
40 MPH OR LESS WITH VERTICAL CURB**

X (FEET)	DROP (D) (INCHES)	DEVICE REQUIRED
0-10'	LESS THAN OR EQUAL TO 12"	NONE
0-10'	GREATER THAN 12"	CHANNELIZING DEVICE
GREATER THAN 10'	ANY	NONE

**GENERAL NOTES:**

1. THESE CONDITIONS AND TREATMENTS ARE ONLY PART OF THE TRAFFIC CONTROL SYSTEM AND SHOULD BE USED IN ADDITION TO THE PROPER WORK ZONE SIGNING.
2. THE FOLLOWING ARE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) COMPLIANT CHANNELIZING DEVICES:
  - A. VERTICAL PANEL
  - B. TYPE I OR TYPE II BARRICADE
  - C. PLASTIC DRUM
  - D. CONE - WHERE APPLICABLE
  - E. TUBULAR MARKERS

IF CHANNELIZING DEVICES ARE REQUIRED TO STAY IN PLACE DURING NIGHTTIME HOURS, THEY SHALL BE STABILIZED WHILE UNATTENDED IN ACCORDANCE WITH THE MUTCD.
3. WHERE BARRIER IS NECESSARY, THE BARRIER SHALL BE TAPERED BEYOND THE CLEAR ZONE. WHEN THE BARRIER CANNOT BE TAPERED BEYOND THE CLEAR ZONE, A MUTCD COMPLIANT END TREATMENT SHALL BE USED. BARRIER AND END TREATMENT SHALL MEET "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 OR THE "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH). THE APPROPRIATE RESOURCE SHALL BE DETERMINED AS DESCRIBED IN THE MASH PUBLICATION.
4. CHANNELIZING DEVICE SPACING ALONG A LONGITUDINAL DROP-OFF (TANGENT) SHALL BE AS FOLLOWS:
  - TANGENT - CHANNELIZING DEVICES SHALL BE SPACED "2S" ("S" IS EQUAL TO THE POSTED SPEED LIMIT IN FEET) APART.
5. "LOW SHOULDER" (W8-9) AND "SHOULDER DROP-OFF SYMBOL" (W8-17) SIGNS, WHEN USED, SHOULD BEGIN PRIOR TO THE DROP-OFF CONDITION AND SHOULD BE REPEATED EVERY 1500 FEET.

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

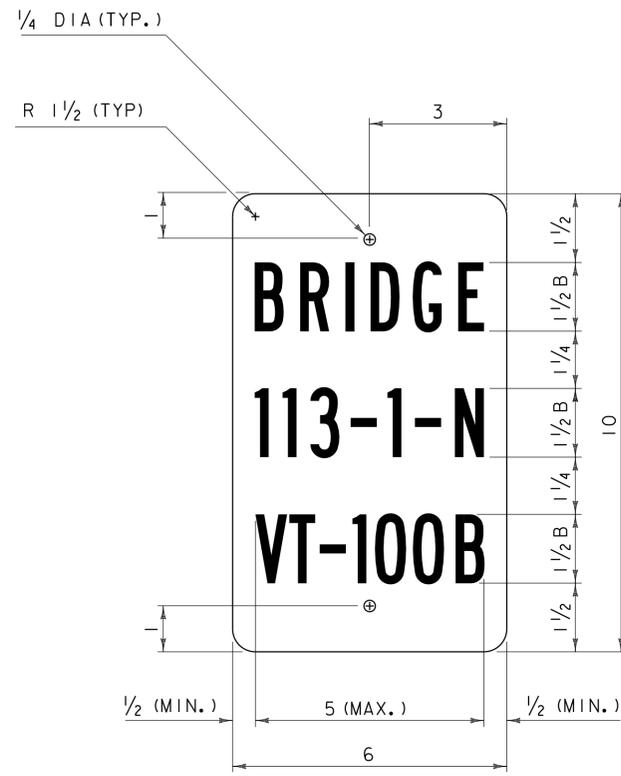
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

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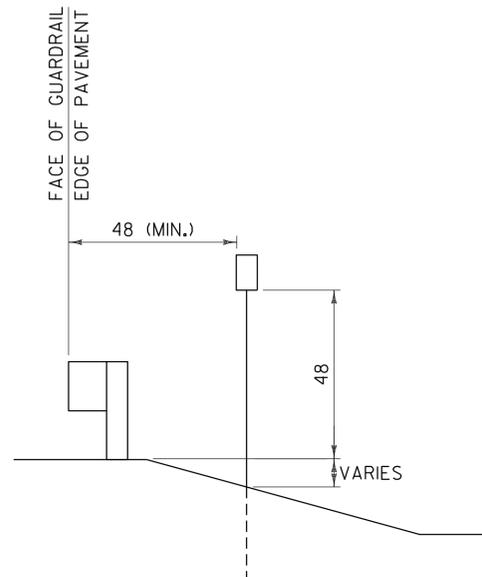
**CONSTRUCTION ZONE  
LONGITUDINAL DROP-OFFS**



**STANDARD  
T-35**



**VD-701**



**VD-701 INSTALLATION DETAIL**

**GENERAL NOTES:**

- BRIDGE NUMBER PLAQUES ARE TO BE INSTALLED ALONG THE FEDERAL AID HIGHWAY SYSTEM INCLUDING ALL STATE HIGHWAYS AND TOWN HIGHWAYS ON THE FEDERAL AID HIGHWAY SYSTEM.
- BRIDGE NUMBER PLAQUES SHALL BE LOCATED ON BOTH BRIDGE APPROACHES AT THE NEAREST VISIBLE LOCATION.
- THE SIGN BASE MATERIAL SHALL BE 0.063 INCH FLAT SHEET ALUMINUM.
- THE SIGN SHALL BE WHITE RETROREFLECTIVE LEGEND ON A GREEN RETROREFLECTIVE BACKGROUND, BOTH 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.
- THE SECOND LINE OF TEXT INDICATES THE BRIDGE NUMBER. THE BRIDGE NUMBER CAN BE OBTAINED USING THE VERMONT AGENCY OF TRANSPORTATION (VAOT) ROUTE LOGS OR BY CONSULTING WITH THE VAOT STRUCTURES SECTION.
- THE THIRD LINE OF TEXT INDICATES THE STATE ROUTE NUMBER. IN ALL CASES THIS WILL BE DEPICTED USING THE LETTER ABBREVIATION, FOLLOWED BY A HYPHEN, FOLLOWED BY THE ROUTE NUMBER. FOR EXAMPLE US ROUTE 2 WOULD BE IDENTIFIED USING US-2.
- THE SECOND AND THIRD LINES OF TEXT SHALL BE CENTERED HORIZONTALLY AND SHALL BE AS DEFINED IN THE PLANS.
- 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.
- ALL DIMENSIONS SHOWN IN INCHES.

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

REVISIONS AND CORRECTIONS  
APRIL 9, 2014 - ORIGINAL APPROVAL DATE

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**BRIDGE NUMBER PLAQUE**



STANDARD  
T-42

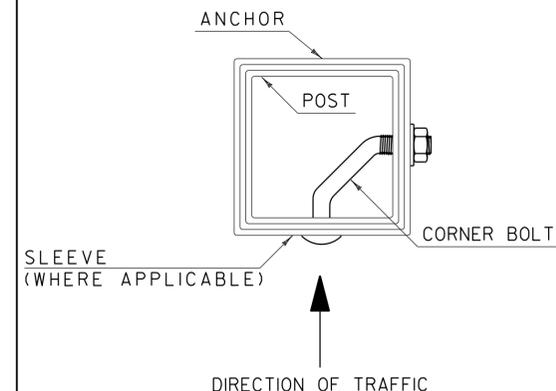
## POST AND ANCHOR SELECTION CHART

POST SIZE (IN.)	POST THICKNESS (IN.)	POST WEIGHT (LBS./FT.)	POST GAGE	SECTION MODULUS (IN. ³ )	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 FY).

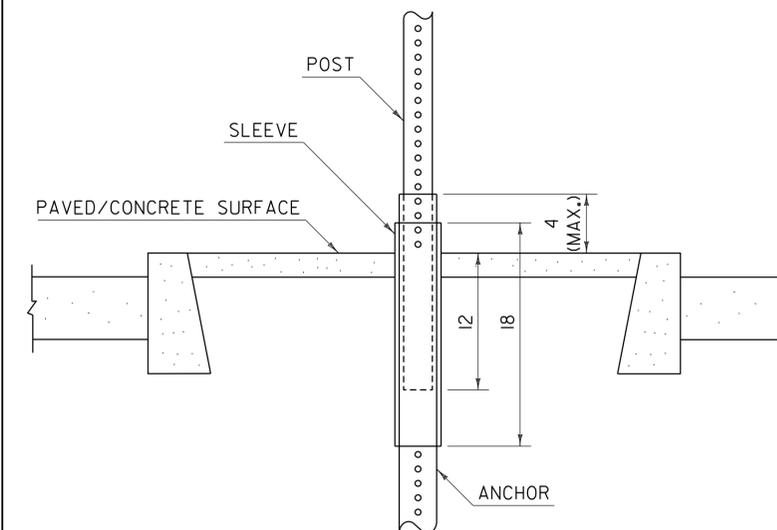
### CORNER BOLT INSTALLATION DETAIL



### 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.

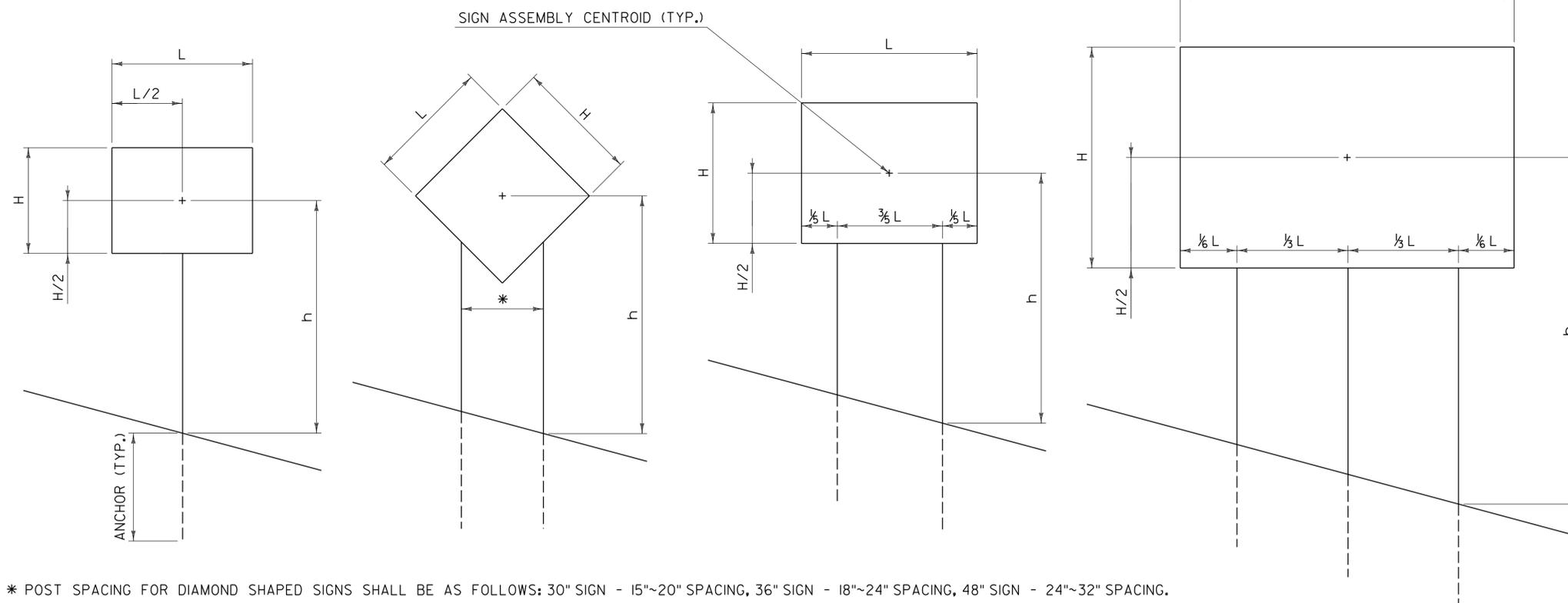
### SLEEVE / ANCHOR INSTALLATION DETAIL



### 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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## SQUARE TUBE SIGN POST AND ANCHOR



# STANDARD T-45