SEE SHEET 2 FOR
INDEX OF SHEETS
AND LIST OF STANDARDS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF BRAINTREE

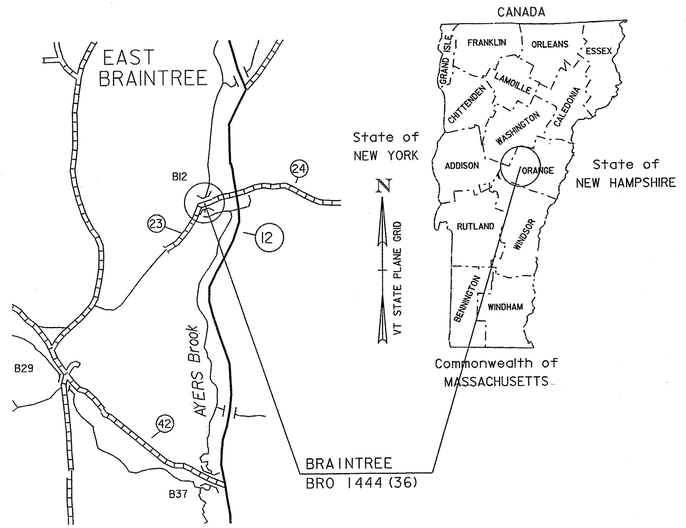
COUNTY OF ORANGE

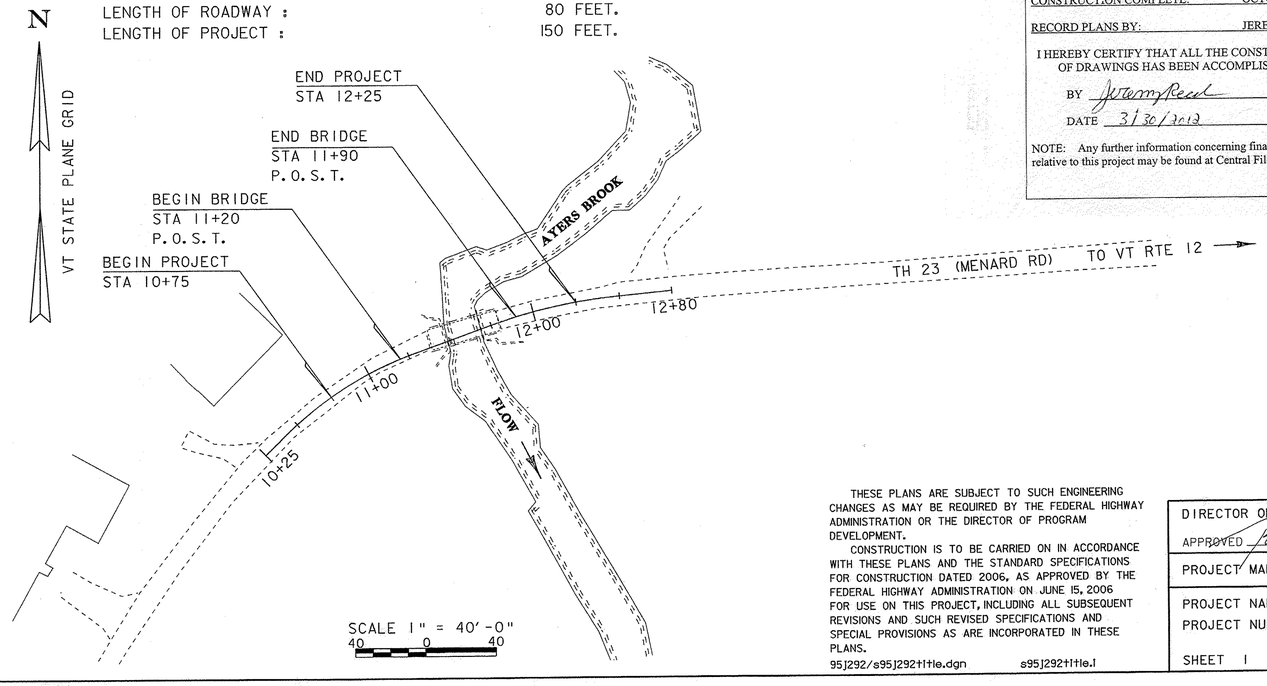
ROUTE NO : TH 23 CLASS III BRIDGE NO : 12

PROJECT LOCATION : LOCATED ON TH 23 APPROXIMATELY 0.1 MILES FROM ITS JUNCTION WITH VT ROUTE 12.

PROJECT DESCRIPTION : REPLACEMENT OF BRIDGE 12 WITH RELATED ROADWAY APPROACH WORK.

LENGTH OF STRUCTURE : 70 FEET.
LENGTH OF ROADWAY : 80 FEET.
LENGTH OF PROJECT : 150 FEET.





RECORD PLANS

CONTRACTOR: RENAUD BROTHERS, INC. - VERNON, VT

RESIDENT ENGINEER: JEREMY REED

CONSTRUCTION BEGAN: SEPTEMBER 14, 2010

CONSTRUCTION COMPLETE: OCTOBER 13, 2010

RECORD PLANS BY: JEREMY REED & NICK GARBACIK

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

BY Jeremy Reed RESIDENT ENGINEER

DATE 3/30/2013

NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

CONVENTIONAL SYMBOLS

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

SURVEYED BY : GILMAN/MOREAU
SURVEYED DATE : 10/03/1996

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83 (92)

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

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2006, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 15, 2006 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

95J292/s95J292title.dgn s95J292title.i

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED Kirk Thibault DATE 12-29-09

PROJECT MANAGER : K.M. HIGGINS

PROJECT NAME : BRAINTREE
PROJECT NUMBER : BRO 1444 (36)

SHEET 1 OF 26 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version 09.02.02

LRFD

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PLAN SHEETS

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SB-R6-82	BRIDGE RAILING - HEAVY DUTY STEEL BEAM	6-Jan-95

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Sept 2009

DRAINAGE AREA : 18.8 sq. mi.
CHARACTER OF TERRAIN : Rural, mixed forest and open, moderate to steep slopes
STREAM CHARACTERISTICS : Incised, unstable stream banks
NATURE OF STREAMBED : Sand, gravel and cobbles

PEAK FLOW DATA

Q 2.33 =	700 cfs	Q 50 =	2275 cfs
Q 10 =	1400 cfs	Q 100 =	2700 cfs
Q 25 =	1850 cfs	Q 500 =	3500 cfs

DATE OF FLOOD OF RECORD: November 1927
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ Q25 = 10.2 fps
ICE CONDITIONS : Moderate
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Yes
IS ORDINARY RISE RAPID? Yes
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE: N/A

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Temporary Mabey bridge
YEAR BUILT: Original structure built in 1929
CLEAR SPAN(NORMAL TO STREAM): 21'
VERTICAL CLEARANCE ABOVE STREAMBED: ~11'
WATERWAY OF FULL OPENING: 220 sq. ft.
DISPOSITION OF STRUCTURE: Remove and replace superstructure
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 =	697.8'	VELOCITY =	7.2 fps
Q10 =	700.5'	"	11.8 fps
Q25 =	701.7'	"	14.2 fps
Q50 =	702.3'	"	14.6 fps
Q100 =	703.7'	"	11.2 fps

LONG TERM STREAMBED CHANGES: Channel has moved laterally within floodplain over time.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
FREQUENCY: Q25
RELIEF ELEVATION: 701.1'
DISCHARGE OVER ROAD @Q100: 1290 cfs

UPSTREAM STRUCTURE

TOWN: Braintree — DISTANCE: 5700'
HIGHWAY # : VT 12 — STRUCTURE #: BR 47
CLEAR SPAN: 25' — CLEAR HEIGHT: 11.5'
YEAR BUILT: 1928, reconstructed in 1969 — FULL WATERWAY:
STRUCTURE TYPE: T beam bridge and multiplate arch

DOWNSTREAM STRUCTURE

TOWN: Randolph — DISTANCE: 9500'
HIGHWAY # : TH 42 — STRUCTURE #: BR 37
CLEAR SPAN: 37' — CLEAR HEIGHT: 11'
YEAR BUILT: 1985 — FULL WATERWAY:
STRUCTURE TYPE: Concrete Slab

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY	1.67	1.07					
POSTING							
OPERATING	2.17	1.38	1.83	1.10	1.54	1.38	1.53
COMMENTS:							

PILE DRIVING AND TESTING REQUIREMENTS

1. NOMINAL PILE DRIVING CAPACITY — R_{ndr}: 465.00 KIP
2. PILE TEST RESISTANCE FACTOR — ϕ: 0.40
3. MAXIMUM PILE TIP ELEVATION: SEE BORING LOGS
4. 0

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span

CLEAR SPAN(NORMAL TO STREAM): 21'
VERTICAL CLEARANCE ABOVE STREAMBED: ~12'
WATERWAY OF FULL OPENING: 225 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	697.8'	VELOCITY=	7.3 fps
Q10 =	700.5'	"	11.9 fps
Q25 =	701.7'	"	14.2 fps
Q50 =	702.3'	"	14.6 fps
Q100 =	703.7'	"	11.2 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
FREQUENCY: Q25
RELIEF ELEVATION: 701.1'
DISCHARGE OVER ROAD @Q100: 1290 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 702.7'
VERTICAL CLEARANCE: @ Q25 = 1.0'

SCOUR: Contraction scour of 6.0' at Q25

REQUIRED CHANNEL PROTECTION: None required.

PERMIT INFORMATION

AVERAGE DAILY FLOW:	40 cfs	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	20 cfs	0.5' *
ORDINARY HIGH WATER:	300 cfs	2.5' *

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: None
CLEAR SPAN (NORMAL TO STREAM):
VERTICAL CLEARANCE ABOVE STREAMBED:
WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

Elevations based on NAVD88
Existing abutments will be retained with the new bridge constructed over and behind them.
* Water depths given are those where no scour holes occur in river.

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	2.0 INCH
3. DESIGN SPAN	L:	67.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	1.56 INCH
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f_y:	270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	7.0 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	5.5 KSI
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'_c:	4.0 KSI
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'_c:	4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'_c:	3.5 KSI
11. CONCRETE, CLASS C	f'_c:	3.0 KSI
12. REINFORCING STEEL	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:	9.0 KSF
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
17. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
19. NOMINAL AXIAL PILE RESISTANCE	q_n:	465.0 KIPS
20. PILE YIELD STRENGTH ASTM A572	f_y:	50 KSI
21. PILE SIZE		HP 12X53
22. EST. PILE LENGTH SEE BORING LOGS	L_p:	
23. PILE RESISTANCE FACTOR	ϕ:	0.40
24. LATERAL PILE DEFLECTION	Δ:	0.25 INCH
25. BASIC WIND SPEED	V_{3s}:	---
26. MINIMUM GROUND SNOW LOAD	P_g:	---
27. SEISMIC DATA PGA ---	S_s:	---
	S_1:	---

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2009	20	5	52	4	6
2029	30	5	52	4	6

20 year ESAL for flexible pavement from 2009 to 2029 : < 50000
40 year ESAL for flexible pavement from 2009 to 2049 : <50000
Design Speed : 30 mph

PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95j292pi.xls — PLOT DATE: 12/29/2009
PROJECT LEADER: K. HIGGINS — DRAWN BY: R. PELLETT
DESIGNED BY: T. FILLBACH — CHECKED BY: T. FILLBACH
PRELIMINARY INFORMATION (BRIDGE) — SHEET 2 OF 26

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT, AGENCY OF TRANSPORATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2006, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOURTH EDITION, AND ITS LATEST REVISIONS AND THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, SECOND EDITION, AND ITS LATEST REVISIONS.

2. THE BRIDGE IS DESIGNED FOR HL-93 LIVE LOAD WITH AN ALLOWANCE FOR 2 INCHES OF FUTURE PAVEMENT.

3. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.

4. ANY STRUCTURE SUCH AS STEEL PANELS OR WOOD PANELS USED TO BRIDGE EXCAVATIONS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.

5. ITEM 529.15 "REMOVAL OF STRUCTURE" IS FOR THE REMOVAL OF THE EXISTING MABEY BRIDGE SUPERSTRUCTURE AND ANY EXISTING SUBSTRUCTURE COMPONENTS REQUIRED TO COMPLETE THE PROPOSED WORK. SEE SPECIAL PROVISIONS FOR REQUIREMENTS ON THE REMOVAL AND DELIVERY OF THE MABEY BRIDGE COMPONENTS.

6. THE BID PRICE FOR ITEM 620.55 REMOVAL OF EXISTING FENCE SHALL INCLUDE STOCKPILING THE FENCE IN A LOCATION ACCEPTABLE TO THE PROPERTY OWNER.

7. SEE THE UTILITY SPECIAL PROVISIONS FOR A DESCRIPTION OF WHEN AND WHERE ITEM 204.22 TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.) MAY BE REQUIRED.

CONCRETE

8. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1 INCH X 1 INCH.

9. ITEM 514.10 "WATER REPELLENT, SILANE", SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES.

10. JOINTS AND SCORE MARKS IN CONCRETE SHALL BE CONSTRUCTED AS SHOWN IN THE PLANS OR AS DIRECTED BY THE RESIDENT ENGINEER.

PRESTRESSED BOX BEAMS & PRECAST ABUTMENTS

11. ITEM 510.21 "PRESTRESSED CONCRETE BOX BEAMS" SHALL:
    A. CONFORM TO SECTION 510 "PRESTRESSED CONCRETE".
    B. HAVE THE ENDS OF THE STRANDS RECESSED AND GROUTED ACCORDING TO STANDARD PRACTICE.
    C. INCLUDE COLD POURED JOINT FILLER, AND TRANSVERSE TENDONS.
    D. GALVANIZE TRANSVERSE TENDONS PLATES AND CHUCKS AFTER FABRICATION ACCORDING TO AASHTO M 232M/M 232.

12. ITEM 510.24 "GROUTING SHEAR KEYS": FILL THE JOINTS BETWEEN THE BEAMS WITH MORTAR, TYPE IV, AS DESCRIBED IN SUBSECTION 510.13.

13. DESIGN VALUES
    A. CONCRETE: f'c = 7 ksi AND fc = 5.5 ksi
    B. LIVE LOAD: AASHTO HL-93
    C. PRESTRESSING STRANDS: 0.6" DIAMETER, 270 ksi, LOW-RELAXATION 7-WIRE STRANDS PULLED TO 75% OF THEIR YIELD STRENGTH
    D. POST-TENSIONING STRANDS: 0.5" DIAMETER, 270 ksi, LOW-RELAXATION 7-WIRE STRANDS.
    E. THE ASSUMED MODULUS OF ELASTICITY FOR THE STRAND IS 28,500 KSI.
    F. THERE SHALL BE TWO (2) STRANDS PER POST-TENSION DUCT.
    G. TRANSVERSE TENDONS SHALL BE COVERED BY SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF THE STRAND. TIES SHALL BE TENSIONED TO 33 KIPS FOR EACH 0.5" DIAMETER STRAND AND 47 KIPS FOR EACH 0.6" DIAMETER STRAND.
    H. SERVICE LOADS

MEMBER MOMENT	523 & 635 K-FT
SUPERIMPOSED DEAD LOAD MOMENT	66 K-FT
LIVE LOAD & IMPACT MOMENT	860 K-FT
DEAD LOAD REACTION	35 & 42 K
LIVE LOAD & IMPACT REACTION	56 K
TOTAL REACTION	91 & 98 K
FINAL CAMBER	1.2 & 1.7 IN

14. THE FABRICATOR MAY, WITH THE APPROVAL OF THE PROJECT MANAGER, ALTER THE DESIGN AS DETAILED TO MEET THE PLANT'S PRESTRESSING OPERATION AND MATERIAL REQUIREMENTS. ALTERNATE STRAND, TRANSVERSE TIE AND CROSS-SLOPE CONFIGURATIONS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL. ANY DESIGN CHANGES SHALL MEET ALL OF THE APPLICABLE DESIGN CRITERIA, LOADINGS AND CODES AND SHALL BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT.

15. THE PRECASTER SHALL SANDBLAST SHEAR KEY FACES PRIOR TO DELIVERY.

16. IF THE SUBSTRUCTURE UNITS ARE PROVIDED IN MULTIPLE PIECES, THE SHEAR KEYS SHALL BE PROVIDED AT THE JOINTS AND THE PIECES SHALL BE MATCH CAST BY THE FABRICATOR.

17. ALL TIES AND STIRRUPS IN THE BOX BEAMS SHALL BE EPOXY COATED.

18. ½" SACRIFICIAL WEARING SURFACE HAS BEEN ADDED TO THE TOP OF THE BOX BEAMS. SEE THE SPECIAL PROVISIONS FOR DETAILS ON PROVIDING TEXTURING.

PROPOSED CONSTRUCTION SEQUENCE FOR PRECAST ABUTMENTS

19. PREPARE AND GRADE FOUNDATION TO REQUIRED ELEVATION.

20. PLACE SUBSTRUCTURE UNIT(S) OVER PILES.
    A. PLUG GROUT HOLES
    B. CONSTRUCTION JOINTS (IF REQUIRED) SHALL BE KEYED AND MATCH CAST.

21. INSTALL TRANSVERSE TENDONS (IF USING MORE THAN ONE SUBSTRUCTURE UNIT)
    A. FEED TWO TENDONS THROUGH EACH OF THE SIX DUCTS.
    B. USING A CALIBRATED JACK, POST-TENSION TO 3 KIPS TO REMOVE SAG IN THE TENDON

22. GROUT SHEAR KEY

23. POST-TENSION TRANSVERSE TENDONS:
    A. GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 psi, BASED ON THE MANUFACTURER'S RECOMMENDATIONS, PRIOR TO STRESSING. THE GROUT NEED NOT BE CURED FOR THREE DAYS PRIOR TO THE COMMENCING OF POST-TENSIONING.
    B. PROVIDE APPROPRIATE CUBE MOLDS AS DESCRIBED IN AASHTO T106 FOR 3 SETS OF 3 DAY CUBES, 3 SETS OF 28 DAY CUBES AND AT A MINIMUM OF 3 MORE CUBES TO TEST FOR THE 1500 psi MINIMUM COMPRESSIVE STRENGTH.
    C. POST-TENSION TENDONS TO 33 KIPS USING A CALIBRATED JACK OPERATED BY QUALIFIED PERSONNEL.

24. GROUT PILE CAVITIES
    A. UNCOVER DUCTS
    B. PLACE THE CONCRETE THROUGH FILL DUCTS INTO PILE CAVITIES.
    C. MONITOR THE QUALITY OF THE GROUT THROUGH THE VENT DUCT.
    D. CONTINUE GROUTING UNTIL THE CONCRETE COMPLETELY FILLS THE CAVITY AND BOTH DUCTS.
    E. THE GROUT FOR FILLING THE PILE CAVITIES SHALL MEET THE REQUIREMENTS OF SELF-CONSOLIDATING CONCRETE. SEE THE SPECIAL PROVISIONS FOR DETAILS. ALL COSTS ASSOCIATED WITH GROUTING THE PILE CAVITIES SHALL BE INCLUDED IN THE BID PRICE FOR ITEMS 540.10 PRECAST CONCRETE STRUCTURE (ABUTMENT #1) AND 540.10 PRECAST CONCRETE STRUCTURE (ABUTMENT #2).

25. BACKFILL ABUTMENT

PROPOSED CONSTRUCTION SEQUENCE FOR PRESTRESSED BOX BEAMS

26. LAY OUT WORKING LINES:
    A. LAY OUT WORKING LINES FOR THE ENTIRE BRIDGE WIDTH ON THE BEAM SEAT.
    B. MEASURE ALL WORKING LINES FROM A COMMON WORKING POINT.
    C. BASE THE WORKING LINES ON THE NOMINAL BEAM WIDTHS.

27. VERIFY BEAM SEAT ELEVATIONS:
    A. MEASURE ELEVATIONS AT BEAM SEATS.
    B. IF SEATS ARE HIGH OR LOW, TAKE CORRECTIVE ACTION.
    C. INSTALL BEARINGS.

28. ERECT BEAMS:
    A. PLACE BEAMS TO FIT WITHIN THE WORKING LINES.
    B. AS WORK PROGRESSES, INSTALL HARDWOOD WEDGES BETWEEN ADJACENT BEAMS TO MAINTAIN PROPER JOINT OPENING (A MINIMUM OF ONE WEDGE AT EACH TRANSVERSE TENDON).
    C. DRILL ANCHOR BOLT HOLES.
    D. PLACE ANCHOR BOLTS.

29. INSTALL BACKER ROD: PLACE FILLER BELOW THE KEYWAY BOTTOM, AS SHOWN ON THE PLANS.

30. INSTALL TRANSVERSE TENDONS:
    A. FEED TENDONS THROUGH DUCTS.
    B. VERIFY THAT HARDWOOD WEDGES ARE IN PLACE AS REQUIRED TO PREVENT SLIPPAGE OF BEAMS.
    C. USING A CALIBRATED JACK, POST-TENSION TENDONS TO APPROXIMATELY 3 KIPS TO REMOVE SAG IN THE TENDON AND TO SEAT THE CHUCK.

31. GROUT SHEAR KEYS:
    A. CLEAN JOINTS WITH AN OIL FREE AIR-BLAST IMMEDIATELY BEFORE GROUT PLACEMENT. VERIFY THAT THE BACKER ROD IS STILL IN PLACE.
    B. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR ADDITIONAL JOINT PREPARATION AND GROUT PLACEMENT.
    C. CAREFULLY ROD JOINTS TO ELIMINATE ANY POSSIBILITY OF VOIDS.

32. POST-TENSION TRANSVERSE TENDONS:
    A. GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 psi, BASED ON THE MANUFACTURER'S RECOMMENDATIONS, PRIOR TO STRESSING. THE GROUT NEED NOT BE CURED FOR THREE DAYS PRIOR TO THE COMMENCING OF POST-TENSIONING.
    B. PROVIDE APPROPRIATE CUBE MOLDS AS DESCRIBED IN AASHTO T106 FOR 3 SETS OF 3 DAY CUBES, 3 SETS OF 28 DAY CUBES AND AT A MINIMUM OF 3 MORE CUBES TO TEST FOR THE 1500 psi MINIMUM COMPRESSIVE STRENGTH.
    C. POST-TENSION TENDONS TO 30 KIPS USING A CALIBRATED JACK OPERATED BY QUALIFIED PERSONNEL.

33. END DETAILS:
    A. GROUT ANCHOR BOLTS INTO THE SLEEVES IN THE PRESTRESSED UNITS AT THE FIXED ENDS. BEFORE THE GROUT CURES, PLACE THE WASHER PLATE, AND INSTALL THE NUT ON TOP AND TIGHTEN.
    B. PLACE THE COLD POURED JOINT SEALER IN THE SLEEVES IN THE PRESTRESSED UNITS AT THE EXPANSION ENDS. PLACE THE WASHER PLATE AND INSTALL THE NUT ON TOP. HAND TIGHTEN AND THEN LOOSEN 1/2 TURN.
    C. GROUT OVER THE NUT AND BOLT IN THE ANCHOR BOLT BLOCK OUTS ON THE FIXED ENDS. FILL THE ANCHOR BOLT BLOCK OUTS ON THE EXPANSION ENDS WITH COLD POURED JOINT SEALER.

34. FINISH WORK: REMOVE WEDGES, AND PATCH SURFACE AND FASCIA BEAMS AT TRANSVERSE TENDONS.

PILES

35. THE PILES SHALL BE HP 12 X 53.

36. PILES SHALL BE DRIVEN TO A NOMINAL RESISTANCE OF 465 KIP. TO PREVENT DAMAGE TO THE PILES, PILE SHOES SHALL BE REQUIRED AND SHALL CONFORM TO SECTION 505.

37. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED AS SHOWN ON THE BORING LOGS. THE ACTUAL IN PLACE LENGTHS MAY VARY.

38. NO DYNAMIC LOAD TESTING IS REQUIRED FOR THIS PROJECT. THUS, PER SUBSECTION 505.04(C)(3) "THE ENGINEER WILL DETERMINE THE ULTIMATE CAPACITY BASED ON THE AGENCY'S WAVE EQUATION ANALYSIS". PER SUBSECTION 504.02(A) THE CONTRACTOR WILL STILL HAVE TO SUBMIT THE PILE AND DRIVING EQUIPMENT DATA FORM 14 DAYS PRIOR TO DRIVING.

TRAFFIC CONTROL

39. FOR ADDITIONAL SIGNING INSTRUCTIONS SEE STANDARDS E-100, E-100A, E-107, & E-107A.

40. THE CONTRACTOR WILL BE PERMITTED TO CLOSE THE BRIDGE TO TRAFFIC FOR THE FIRST 20 CALENDAR DAYS THAT THE PROJECT IS UNDER CONSTRUCTION. DURING THIS TIME, MENARD ROAD SHALL REMAIN OPEN TO VEHICULAR TRAFFIC WHEN THE CONTRACTOR IS NOT ON-SITE.

41. THE TRAFFIC CONTROL PLAN SHALL INCLUDE PROVISIONS TO ALLOW EMERGENCY VEHICLE ACCESS TO THE PROPERTIES ON MENARD ROAD WITHIN 15 MINUTES OF RECEIVING NOTICE THAT EMERGENCY VEHICLES ARE ON ROUTE OR FROM WHEN THE EMERGENCY VEHICLE ARRIVES ON SITE WITHOUT PRIOR NOTICE, EVEN DURING ANY BRIDGE CLOSURES. AN EXCEPTION, TO THE EMERGENCY VEHICLE PROVISION, SHALL BE ALLOWED FOR THE TIME WHEN THE EXISTING BRIDGE IS BEING REMOVED AND THE NEW SUPERSTRUCTURE IS BEING PLACED.

42. A SCHEDULE OF CLOSURE TIMES AND EXPECTED DURATIONS SHALL BE SUBMITTED TO THE RESIDENT ENGINEER, PROPERTY OWNERS AND EMERGENCY PERSONNEL 14 DAYS PRIOR TO ANY CLOSURES. THE RESIDENT ENGINEER SHALL HAVE 7 DAYS TO APPROVE THOSE TIMES.

43. ALL WORK ASSOCIATED WITH PROVIDING VEHICULAR ACCESS WHEN THE CONTRACTOR IS NOT ON-SITE AND PROVIDING EMERGENCY VEHICLE ACCESS SHALL BE INCIDENTAL TO ITEM 900.645 (TRAFFIC CONTROL, ALL- INCLUSIVE).

44. WORK OUTSIDE THE RIGHT OF WAY AND INSIDE THE TEMPORARY EASEMENT SHALL BE CONDITIONED UPON RESTORING THE PROPERTY TO ITS ORIGINAL CONDITION. THE COST FOR ANY RESTORATION SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 900.645 (TRAFFIC CONTROL, ALL-INCLUSIVE).

45. THE CONTRACTOR SHALL REFER TO SECTION 900 - TRAFFIC CONTROL (ALL-INCLUSIVE) OF THE SPECIAL PROVISIONS FOR ADDITIONAL TRAFFIC CONTROL REQUIREMENTS.

PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95j292gennote.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
GENERAL NOTES

PLOT DATE: 31-DEC-2009
DRAWN BY: T. FILLBACH
CHECKED BY: J. LACROIX

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES									TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
						ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
						1				1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10				
						220				220		CY	COMMON EXCAVATION	203.15				
						1				1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22				
								90		90		CY	STRUCTURE EXCAVATION	204.25				
								50		50		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				
						150				150		CY	SUBBASE OF CRUSHED GRAVEL, COARSE GRADED	301.25				
						40				40		CY	AGGREGATE SURFACE COURSE	401.10				
								1		1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10				
								368		368		LF	STEEL PILING FOR INTEGRAL ABUTMENTS, HP 12 X 53	505.25				
								140		140		LF	PRESTRESSED CONCRETE BOX BEAMS (27 1/2" - 28 1/2" X 48")	510.21				
								140		140		LF	PRESTRESSED CONCRETE BOX BEAMS (28 1/2" - 29 1/2" X 48")	510.21				
								210		210		LF	GROUTING SHEAR KEYS	510.24				
								27		27		GAL	WATER REPELLENT, SILANE	514.10				
						1				1		LS	MAINTENANCE OF STRUCTURES AND APPROACHES	527.10				
						1				1		EACH	REMOVAL OF STRUCTURE (675 SF - EST.)	529.15				
								16		16		EACH	BEARING DEVICE ASSEMBLY, ELASTOMERIC PAD	531.11				
								1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #1)	540.10				
								1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #2)	540.10				
						1				1		MGAL	DUST CONTROL WITH WATER	609.10				
						70				70		CY	STONE FILL, TYPE II	613.11				
						162				162		LF	REMOVAL OF EXISTING FENCE	620.55				
						180				180		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS	621.215				
						4				4		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
						143				143		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
									1	1		LS	FIELD OFFICE, ENGINEERS	631.10				
						1				1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
						60	70			130		SY	GEOTEXTILE UNDER STONE FILL	649.31				
							5			5		LB	SEED	651.15				
							5			5		LB	SEED, WINTER RYE	651.17				
							20			20		LB	FERTILIZER	651.18				
							0.1			0.1		TON	AGRICULTURAL LIMESTONE	651.20				
							0.25			0.25		TON	HAYMULCH	651.25				
							10			10		CY	TOPSOIL	651.35				
							70			70		SY	GRUBBING MATERIAL	651.40				
									1000	1000		DL	SPECIAL PROVISION (FIELD OFFICE TELEPHONE) (N.A.B.I.)	900.615				
							50			50		HR	SPECIAL PROVISION (MONITORING EPSC PLAN)	900.630				
								150		150		LF	SPECIAL PROVISION (BRIDGE RAILING, GALVANIZED HDSB/FASCIA MOUNTED/STEEL TUBING)	900.640				
							1			1		LS	SPECIAL PROVISION (EPSC PLAN)	900.645				
						1				1		LS	SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)	900.645				

PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95J292exqty.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
QUANTITY SHEET

PLOT DATE: 14-JAN-2010
DRAWN BY: K. PATTERSON
CHECKED BY: T. FILLBACH
SHEET 4 OF 26

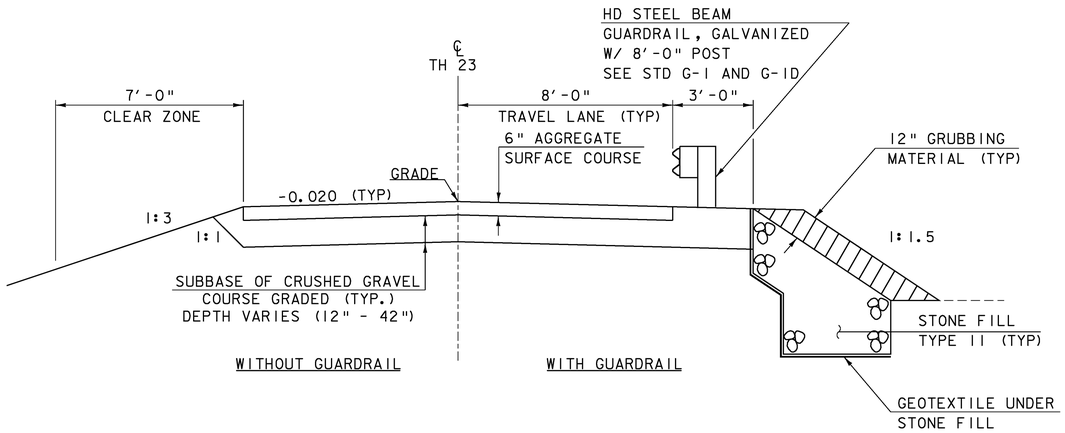
STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES									TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
						ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							1			1		LU	SPECIAL PROVISION (EROSION PREVENTION AND SEDIMENT CONTROL MEASURES) (N.A.B.I.)	900.650				
							1			1		LU	SPECIAL PROVISION (MAINTENANCE OF EPSC PLAN) (N.A.B.I.)	900.650				
						88.5				88.5		SF	SPECIAL PROVISION (RETAINING WALL)	900.670				

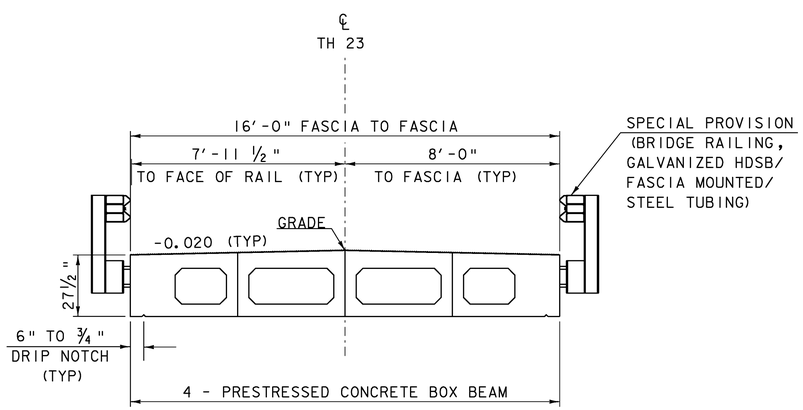
PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

FILE NAME: s95j292exqty.dgn	PLOT DATE: 14-JAN-2010
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
QUANTITY SHEET	SHEET 5 OF 26



TH 23 TYPICAL SECTION

SCALE 3/8" = 1'-0"

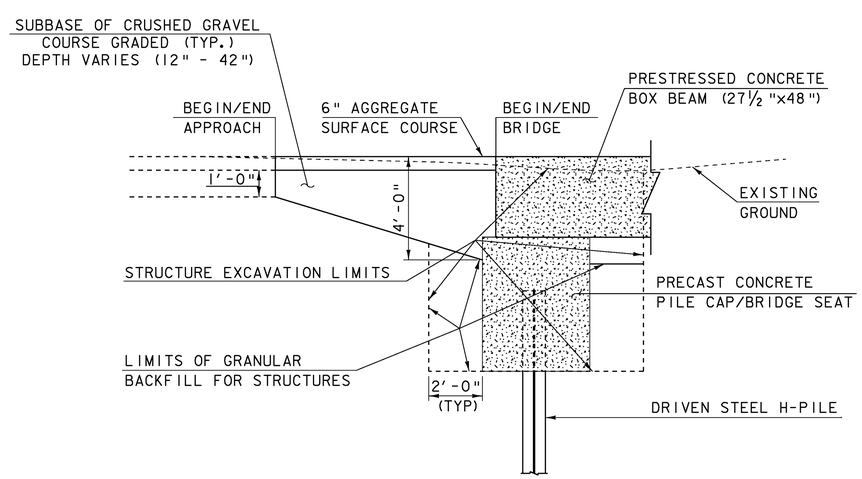


BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

MATERIAL TOLERANCES
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
BASE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"
GRANULAR BORROW	+/- 1"



END BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)
FILE NAME: s95j292typ.dgn	PLOT DATE: 14-JAN-2010
PROJECT LEADER: K. HIGGINS	DRAWN BY: T. FILLBACH
DESIGNED BY: T. FILLBACH	CHECKED BY: R. PELLETT
TYPICAL SECTIONS	SHEET 6 OF 26

GPS CONTROL POINTS

HVCTRL #1

SNOWSVILLE AZ MK

NORTH = 548570.766
EAST = 1599864.917
ELEV. = 781.69

DESCRIBED BY VERMONT AGENCY OF TRANSPORTATION 1996 (DJM) GENERAL LOCATION - THE STATION IS LOCATED IN THE TOWN OF EAST BRAINTREE, 0.6 MI (1.0 KM) NORTH OF EAST BRAINTREE VILLAGE, 5.8 MI (9.3 KM) NORTH NORTHEAST OF RANDOLPH, AND 11.3 MI (18.2 KM) SOUTH OF NORTHFIELD. TO REACH FROM THE JUNCTION OF VERMONT ROUTE 12 AND VERMONT ROUTE 66 IN RANDOLPH, PROCEED NORTHERLY ALONG ROUTE 12 FOR 5.7 MI (9.2 KM) TO THE MARK ON THE RIGHT. TO REACH FROM THE JUNCTION OF VERMONT ROUTE 12 AND THE ROAD TO WEST BROOKFIELD, PROCEED SOUTH ALONG ROUTE 12 FOR 0.75 MI (1.21 KM) TO THE MARK ON THE LEFT. THE MARK IS A STATE OF VERMONT SURVEY DISK SET IN THE TOP OF A CONCRETE MONUMENT 30 CM IN DIAMETER, FLUSH WITH THE GROUND SURFACE. IT IS LOCATED 141 FT (43.0 M) NORTH NORTHEAST OF UTILITY POLE 136/19, 129 FT (39.3 M) SOUTH OF A SIGN (BRAINTREE / BROOKFIELD) , 60.5 FT (18.4 M) SOUTH OF A MAILBOX, 22 FT (6.7 M) SOUTHEAST OF THE CENTERLINE OF VERMONT ROUTE 12, AND 3 FT (0.9 M) NORTHWEST OF A FIBERGLASS WITNESS POST. OWNERSHIP IS THE STATE OF VERMONT.

HVCTRL #2

SNOWSVILLE

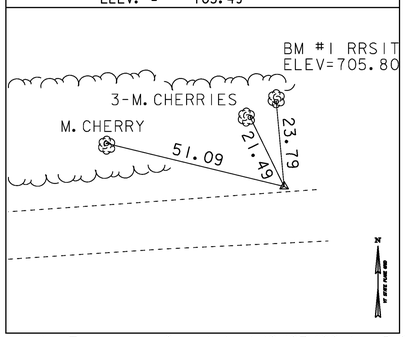
NORTH = 546460.357
EAST = 1600026.324
ELEV. = 753.84

EAST BRAINTREE VILLAGE, 5.3 MI (8.5 KM) NORTH NORTHEAST OF RANDOLPH, AND 11.8 MI (19.0 KM) SOUTH OF NORTHFIELD. TO REACH FROM THE JUNCTION OF VERMONT ROUTE 66 AND VERMONT ROUTE 12 IN RANDOLPH, PROCEED NORTHERLY ALONG ROUTE 12 FOR 5.3 MI (8.5 KM) TO THE MARK ON THE RIGHT. TO REACH FROM THE JUNCTION OF VERMONT ROUTE 12 AND THE ROAD TO WEST BROOKFIELD, PROCEED 1.15 MI (1.85 KM) SOUTH ALONG ROUTE 12 TO THE MARK ON THE LEFT. THE MARK IS A STATE OF VERMONT SURVEY DISK SET IN THE TOP OF A CONCRETE MONUMENT 30 CM IN DIAMETER, FLUSH WITH THE GROUND SURFACE. IT IS LOCATED 130 FT (39.6 M) NORTH OF A HIGHWAY SIGN (EAST BRAINTREE) , 68.5 FT (20.9 M) SOUTH SOUTHEAST OF UTILITY POLE 13 1/2 / 130X, 36.5 FT (11.1 M) SOUTHWEST OF HIGHWAY SIGN (REDUCED SPEED AHEAD) , 17.5 FT (5.3 M) EAST OF THE CENTERLINE OF VERMONT ROUTE 12, 5 FT (1.5 M) WEST OF A WOODEN FENCE, AND 3 FT (0.9 M) WEST OF A FIBERGLASS WITNESS POST. OWNERSHIP IS THE STATE OF VERMONT

TRAVERSE TIES

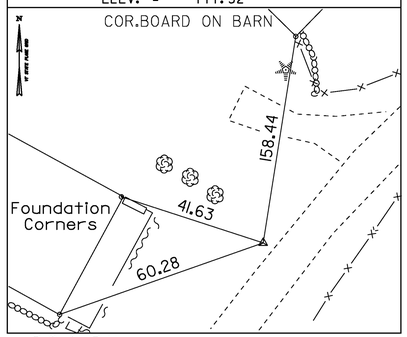
HVCTRL #10

NORTH = 540530.06
EAST = 1601022.37
ELEV. = 703.49



HVCTRL #11

NORTH = 540381.03
EAST = 1600487.57
ELEV. = 711.52



NORTH = / EAST = / ELEV. =

NORTH = / EAST = / ELEV. =

NORTH = / EAST = / ELEV. =

* Main Traverse Completed 10/03/06 by R.Gilman P.C. & R.Moreau

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: Braintree

PROJECT NUMBER: BRO 1444 (36)

FILE NAME: survey\x95j292t1.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: SURVEY
TIE SHEET

PLOT DATE: 31-DEC-2009
DRAWN BY: R. Bullock
CHECKED BY: SURVEY
SHEET 7 OF 26

CURVE #1

DELTA = 24°55'00"
D = 28°38'52"
R = 200.00'
T = 44.19'
L = 86.98'
E = 4.82'

CURVE #2

DELTA = 14°02'00"
D = 19°05'55"
R = 300.00'
T = 36.92'
L = 73.48'
E = 2.26'

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 11+04.3 - 11+38.8 LT
STA 11+07.0 - 11+37.4 RT
STA 11+80.1 - 12+17.8 LT
STA 11+80.3 - 12+18.9 RT

REMOVAL OF EXISTING FENCE
STA 10+50.0 - 11+25.0 RT
STA 10+75.0 - 11+00.0 LT

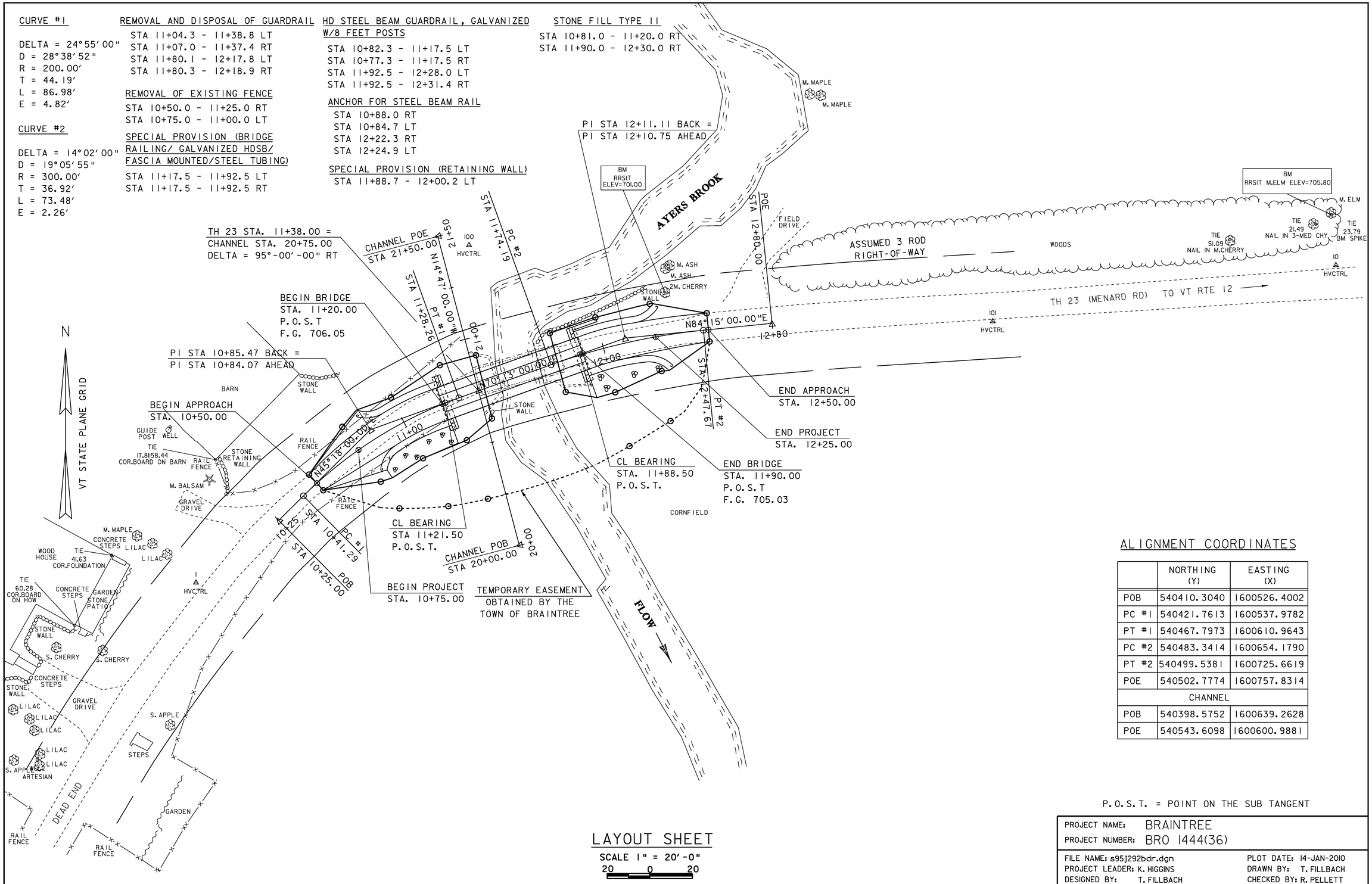
SPECIAL PROVISION (BRIDGE RAILING/ GALVANIZED HDSB/ FASCIA MOUNTED/STEEL TUBING)
STA 11+17.5 - 11+92.5 LT
STA 11+17.5 - 11+92.5 RT

HD STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS
STA 10+82.3 - 11+17.5 LT
STA 10+77.3 - 11+17.5 RT
STA 11+92.5 - 12+28.0 LT
STA 11+92.5 - 12+31.4 RT

ANCHOR FOR STEEL BEAM RAIL
STA 10+88.0 RT
STA 10+84.7 LT
STA 12+22.3 RT
STA 12+24.9 LT

SPECIAL PROVISION (RETAINING WALL)
STA 11+88.7 - 12+00.2 LT

STONE FILL TYPE II
STA 10+81.0 - 11+20.0 RT
STA 11+90.0 - 12+30.0 RT



LAYOUT SHEET

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

ALIGNMENT COORDINATES

	NORTHING (Y)	EASTING (X)
POB	540410.3040	1600526.4002
PC #1	540421.7613	1600537.9782
PT #1	540467.7973	1600610.9643
PC #2	540483.3414	1600654.1790
PT #2	540499.5381	1600725.6619
POE	540502.7774	1600757.8314
CHANNEL		
POB	540398.5752	1600639.2628
POE	540543.6098	1600600.9881

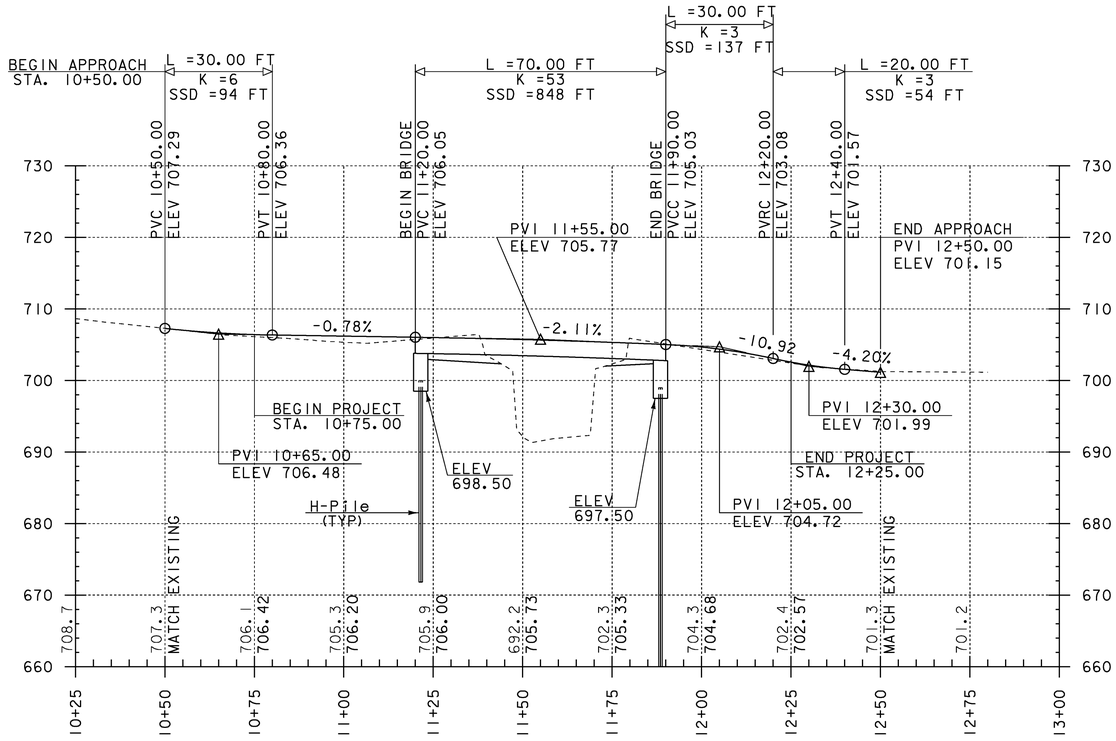
P.O.S.T. = POINT ON THE SUB TANGENT

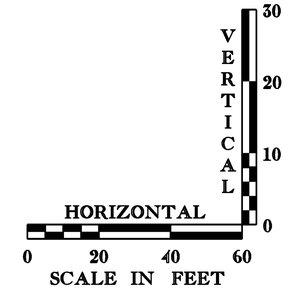
PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95j292bdr.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
LAYOUT SHEET

PLOT DATE: 14-JAN-2010
DRAWN BY: T. FILLBACH
CHECKED BY: R. PELLETT
SHEET 8 OF 26

TH 23 (MENARD ROAD)





THE GRADES SHOWN TO THE NEAREST TENTH ARE THE ORIGINAL GROUND ELEVATIONS ALONG THE PROPOSED ALIGNMENT.

THE GRADES SHOWN TO THE NEAREST HUNDREDTH ARE THE FINISH GRADES ALONG THE PROPOSED ALIGNMENT.

SEE CROSS SECTIONS FOR MATERIAL TRANSITION INFORMATION.

PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95j292pro.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
PROFILE SHEET

PLOT DATE: 31-DEC-2009
DRAWN BY: K. PATTERSON
CHECKED BY: T. FILLBACH
SHEET 9 OF 26

EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REPLACEMENT OF BRIDGE 12 ON TH 23. THE NEW STRUCTURE WILL BE 70 FEET IN LENGTH AND BE SET ON PILES AND PRECAST CONCRETE PILE CAPS OVER AYERS BROOK. THIS PROJECT IS LOCATED IN THE TOWN OF BRAINTREE.

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

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.15 ACRES.

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

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS A SADDLE THAT IS MOSTLY OPEN FIELDS AND PASTURES WITH SOME FORESTED AREA. MENARD RD IS IN THE PROJECT SITE. THERE IS A RESIDENCE ON THE WEST SIDE OF THE PROJECT WITH A SMALL FARM.

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

THE AYERS BROOK IS THE ONLY WATER SOURCE ON THE PROJECT SITE. THE BROOK IS CLASSIFIED AS INCISED WITH UNSTABLE STREAM BANKS. THE STREAM BEDS ARE SAND, GRAVEL AND COBBLES.

1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF HARDWOOD TREES AND UNDERGROWTH TO THE NORTHWEST AND OPEN FIELDS TO THE SOUTH AND EAST. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY REPLACEMENT OF THE BRIDGE. DISTURBED VEGETATION WILL BE RE-ESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES.

1.2.4 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF ORANGE, VERMONT. SOILS ON THE PROJECT SITE ARE HADLEY VERY FINE SANDY LOAM, MERRIMAC FINE SANDY LOAM WITH 0% TO 3% SLOPES AND VERSHIRE-GLOVER-ROCK OUTCROP COMPLEX WITH 8% TO 25% SLOPES. THE "K FACTOR" FOR HADLEY IS 0.49, MERRIMAC IS 0.24 AND VERSHIRE-GLOVER-ROCK IS 0.24. THE SOIL IS CONSIDERED HIGHLY ERODIBLE DUE TO SIGNIFICANT SLOPES.

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:
0.0-0.23 = LOW EROSION POTENTIAL
0.24-0.36 = MODERATE EROSION POTENTIAL
0.37 AND HIGHER = HIGH EROSION POTENTIAL

1.2.5 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: NO
HISTORICAL OR ARCHEOLOGICAL AREAS: NO
PRIME AGRICULTURAL LAND: NO (AG LAND SURROUNDS THE PROJECT)
THREATENED AND ENDANGERED SPECIES: NO
WATER RESOURCE: AYERS BROOK
WETLANDS: NO

1.3 RISK EVALUATION

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

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLLUTION PREVENTION PRACTICES. 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 APPPROVED 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 MNIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE.

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

1.4.4 INSTALL SEDIMENT BARRIERS

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

1.4.5 DIVERT UPLAND RUNOFF

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

1.4.6 SLOW DOWN CHANNELIZED RUNOFF

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

1.4.7 CONSTRUCT PERMANENT CONTROLS

PERMANENT STORMWATER TREATMENT DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH PERMIT CONDITIONS.

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

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

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

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

1.4.9 WINTER STABILIZATION

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

1.4.10 STABILIZE SOIL AT FINAL GRADE

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

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

1.4.11 DE-WATERING ACTIVITIES

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

1.4.12 INSPECT YOUR SITE

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

1.5 SEQUENCE AND STAGING

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

1.5.1 CONSTRUCTION SEQUENCE

1.5.2 OFF-SITE ACTIVITIES

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

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

FILE NAME: s95j292epsc_narrative.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: R. PELLETT
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
EPSC NARRATIVE	SHEET 10 OF 26

N

VT STATE PLANE GRID

VgD

MeA

Wo

Ha

AYERS BROOK

TH 23 (MENARD RD) TO VT RTE 12

11+00

12+00

12+80

FLOOD PLAIN

WELL

ARTESIAN WELL

LEGEND

AG	AGRICULTURAL LAND
ARCH	ARCHEOLICAL SIGNNIFICANT AREA
FLOOD PLAIN	FLOOD PLAIN
	RIGHT-OF-WAY LINE
	SOIL BOUNDARY

SOIL LEGEND

Ha -HADLEY VERY FINE SANDY LOAM
Wo -WINOOSKI VERY FINE SANDY LOAM
MeA - MERRIMAC FINE SANDY LOAM
0 TO 3 PERCENT SLOPES
VgD - VIRSHIRE-GLOVER-ROCK OUTCROP COMPLEX,
8 TO 25 PERCENT SLOPES

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

PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95j292epscbdr.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
EPSC EXISTING CONDITIONS

PLOT DATE: 31-DEC-2009
DRAWN BY: T. FILLBACH
CHECKED BY: R. PELLETT
SHEET 11 OF 26

SOIL CLASSIFICATION

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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

COMMONLY USED SYMBOLS

▼	Water Elevation
⊗	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O.D. Sampler 1⅜" I.D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1⅛"
BX	Core Size 1⅝"
NX	Core Size 2 ⅛"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	To Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)

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		

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 12 inches.

COBBLE - Rock fragments with an average dimension between 3 and 12 inches.

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

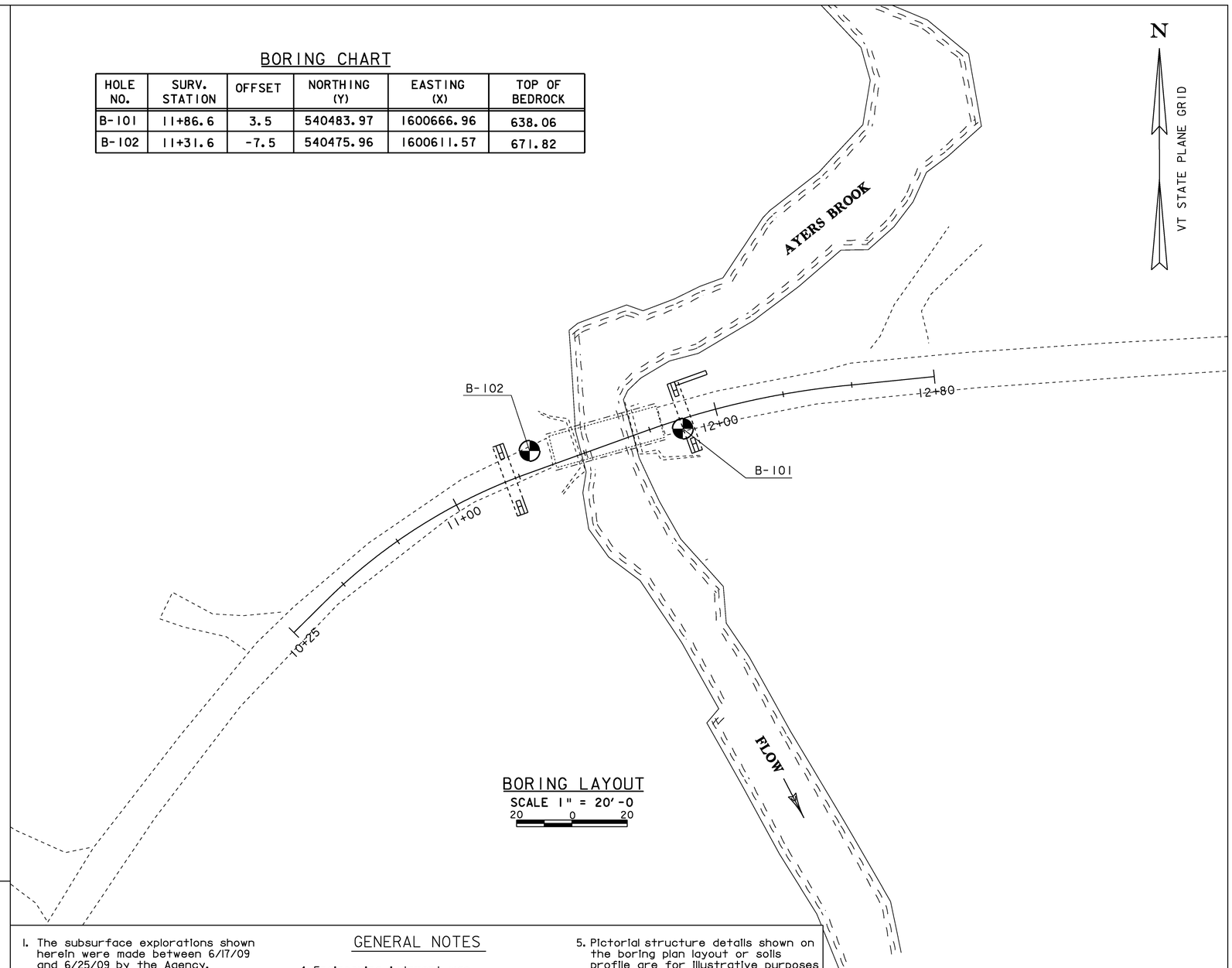
FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	NORTHING (Y)	EASTING (X)	TOP OF BEDROCK
B-101	11+86.6	3.5	540483.97	1600666.96	638.06
B-102	11+31.6	-7.5	540475.96	1600611.57	671.82



BORING LAYOUT

SCALE 1" = 20'-0

20 0 20

GENERAL NOTES

1. The subsurface explorations shown herein were made between 6/17/09 and 6/25/09 by the Agency.

2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.

3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.

4. Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.

5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.

6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

PROJECT NAME: BRAINTREE

PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95j292bor.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
BORING LAYOUT SHEET

PLOT DATE: 31-DEC-2009
DRAWN BY: R. PELLETT
CHECKED BY: T. FILLBACH
SHEET 12 OF 26

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

BORING NUMBER: B-101
SHEET 1 of 1
DATE STARTED: 6/17/09
DATE COMPLETED: 6/19/09

PROJECT NAME: BRAINTREE
SITE NAME: TH-23
STATION: 11+86.6
OFFSET: 3.50
VTSPG NAD83: N 540483.97 ft E 1600666.96 ft

PROJECT NUMBER: BRO 1444(36)
SITE NUMBER: BR-12
GROUND ELEVATION: 705.06 ft
GROUNDWATER DEPTH: NONE TAKEN
PROJECT PIN NUMBER: 95J292

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: WERNER

BORING RIG: LAG TRACK RIG #09 w/AUTO HAMMER
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: NSM

BOTTOM OF ABUT. 2
ELEV. 697.50

PILE DEPTH
(ESTIMATED)
ELEV. 638.00
@ ABUT. 2

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT / RUN	M.C. (%) / REC (%)	GRAVEL (%) / RQD (%)	SAND (%) / Dip (deg)	FINES (%) / Drill Rate (min/ft)	LL (%)	PI (%)
10		A-1-a, SaGr, brn, Moist, Rec. = 1.4 ft	14	4.4	52.6	35.2	12.2		
		A-1-b, SiGrSa, brn, Moist, Rec. = 1.6 ft	17	7.0	36.7	43.2	20.1		
		A-1-b, SiGrSa, brn, Moist, Rec. = 1.3 ft	10	8.6	33.7	43.6	22.7		
		A-1-a, SaGr, brn-gry, Moist, Rec. = 1.3 ft	35	8.9	60.4	24.2	15.4		
		A-1-a, SaGr, gry, Wet, Rec. = 1.1 ft	11	12.7	51.1	34.2	14.7		
		A-1-a, SaGr, gry, Wet, Rec. = 1.3 ft	11	11.3	54.8	33.1	12.1		
		A-4, Si, gry, Wet, Rec. = 1.0 ft	5	29.6	8.5	6.6	84.9		
		A-4, Si, gry, Wet	2	30.3	0.0	2.7	97.3		
		Visual Classification, Si, gry, Wet, Rec. = 1.3 ft	2	33.8					
20		Visual Classification, Si, gry, Wet, Rec. = 1.4 ft	3	34.0					
		A-4, Si, gry, Wet, Rec. = 2.0 ft	3	35.4	0.0	0.3	99.7		
30		Visual Classification, Si, gry, Wet, Rec. = 2.0 ft	2	36.0					
		A-4, Si, gry, Wet, Rec. = 2.0 ft	4	36.9	0.0	1.1	98.9		
40		Visual Classification, Si, gry, Wet, Rec. = 2.0 ft	WH	37.3					
		A-4, Si, gry, Wet, Rec. = 0.9 ft	WH	40.8	0.0	0.6	99.4	35	2
50		Visual Classification, Si, gry, Wet, Rec. = 2.0 ft	1	38.2					
		Visual Classification, Si, gry, Wet, Rec. = 2.0 ft	1	41.3					
60		A-4, Si, gry, Wet, Rec. = 1.1 ft	WH	40.1	0.0	0.8	99.2		
		A-1-a, SaGr, gry, Wet, Rec. = 0.7 ft, Broken Rock was within sample.	35	11.8	61.8	26.0	12.2		
		Top of Bedrock @ 67.0 ft							
70		Dark gray, Phyllite, with ocassional pyrite rich zones. Competent. Low RQD possibly due to mechanical breakage during drilling, Moderately soft, Unweathered, BXMDC, 67.0 ft – 72.0 ft, Rec. = 4.6 ft	1	92	18	50	8 8 11 10 10		
			2	99	60	50			
		Dark gray, Phyllite, with ocassional pyrite rich zones. Competent. Low RQD possibly due to mechanical breakage during drilling, Moderately soft, Unweathered, BXMDC, 72.0 ft – 77.0 ft, Rec. = 4.95 ft					10 10 10 11 11		
80		Hole stopped @ 77.0 ft							

LOG OF BORING BRAINTREE BRO 1444(36).GPJ VT AOT.GDT 12/4/09

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

BORING NUMBER: B-102
SHEET 1 of 1
DATE STARTED: 6/23/09
DATE COMPLETED: 6/25/09

PROJECT NAME: BRAINTREE
SITE NAME: TH-23
STATION: 11+31.6
OFFSET: -7.50
VTSPG NAD83: N 540475.96 ft E 1600611.57 ft

PROJECT NUMBER: BRO 1444(36)
SITE NUMBER: BR-12
GROUND ELEVATION: 706.32 ft
GROUNDWATER DEPTH: 9.5 ft 6/25/09
PROJECT PIN NUMBER: 95J292

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: WERNER

BORING RIG: LAG TRACK RIG #09 w/AUTO HAMMER
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: NSM

BOTTOM OF ABUT. 1
ELEV. 698.50

PILE DEPTH
(ESTIMATED)
ELEV. 671.50
@ ABUT. 1

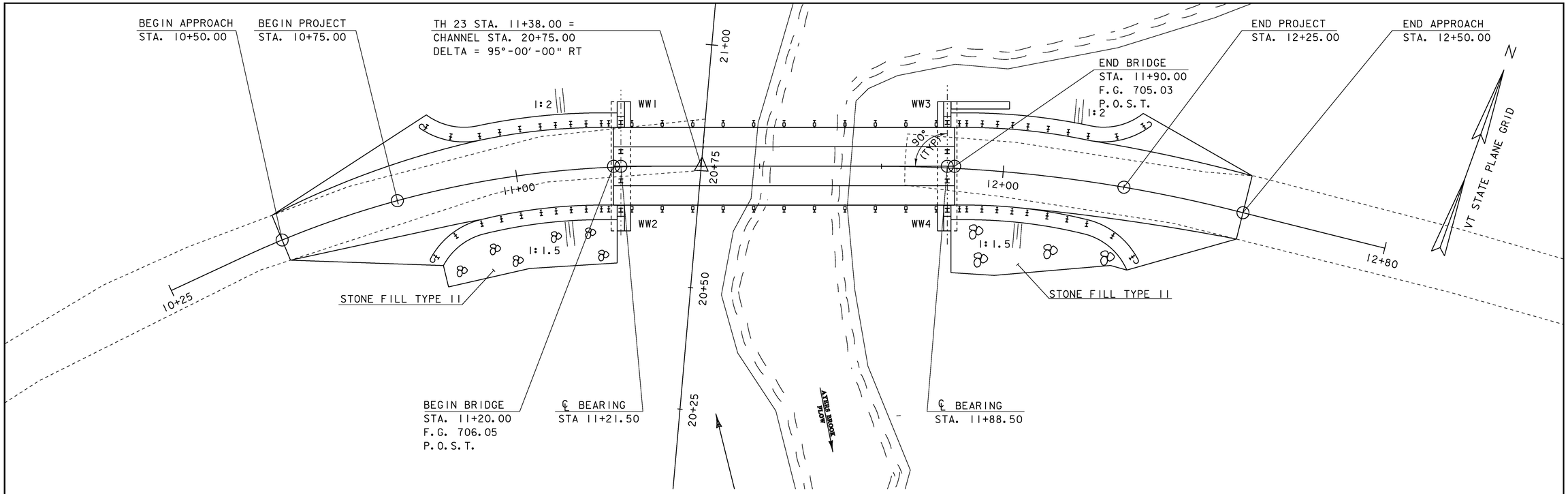
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT / RUN	M.C. (%) / REC (%)	GRAVEL (%) / RQD (%)	SAND (%) / Dip (deg)	FINES (%) / Drill Rate (min/ft)
10		A-1-a, SaGr, brn, Moist, Rec. = 1.4 ft	19	3.2	54.3	32.4	13.3
		A-2-4, SiGrSa, brn, Moist, Rec. = 1.6 ft	20	7.9	33.3	40.7	26.0
		A-2-4, SiGrSa, brn, Moist, Rec. = 1.4 ft	10	9.1	30.9	44.6	24.5
		A-1-b, SiGrSa, brn, Moist, Rec. = 1.2 ft	4	9.2	35.3	43.9	20.8
		A-1-b, SaGr, brn, Wet, Rec. = 0.9 ft	3	14.6	42.5	39.9	17.6
		A-4, SaSi, brn, Wet, Rec. = 1.3 ft	7	24.1	18.5	30.6	50.9
		Field Note:, No Recovery, Appears to be silt	3				
		Visual Classification, Si, gry, Wet, Rec. = 0.8 ft	3	31.7			
		A-4, Si, gry, Wet, Rec. = 1.5 ft	3	34.1	0.0	1.1	98.9
20		A-4, Si, gry, Wet, Rec. = 1.6 ft	3	35.1	0.0	0.5	99.5
		Visual Classification, Si, gry, Wet, Rec. = 2.0 ft	3	35.8			
		A-2-4, SiSaGr, gry, Wet, Rec. = 1.4 ft	11	11.2	38.8	34.0	27.2
30		Field Class:, Cobbles, BXDC, Cleaned out casing					
		A-1-b, SaGr, gry, Wet, Rec. = 0.8 ft	68	9.4	55.1	29.2	15.7
		Top of Bedrock @ 34.5 ft					
		Dark gray, Meta-Limestone, grading to phyllite. Competent. Low RQD possibly due to mechanical breakage during drilling, Moderately soft to moderately hard, Unweathered, BXMDC, 34.5 ft – 38.5 ft, Rec. = 3.4 ft	1	85	29	50	7 6 9 16
40		Dark gray, Phyllite, Competent. Low RQD possibly due to mechanical breakage during drilling, Moderately soft, Unweathered, BXMDC, 38.5 ft – 41.5 ft, Rec. = 2.7 ft	2	90	11	50	7 7 15
		Dark gray, Phyllite, Competent. Low RQD possibly due to mechanical breakage during drilling, Moderately soft, Unweathered, BXMDC, 41.5 ft – 42.5 ft, Rec. = 1.0 ft	3	100	0	50	12
50		Hole stopped @ 42.5 ft					

LOG OF BORING BRAINTREE BRO 1444(36).GPJ VT AOT.GDT 12/4/09

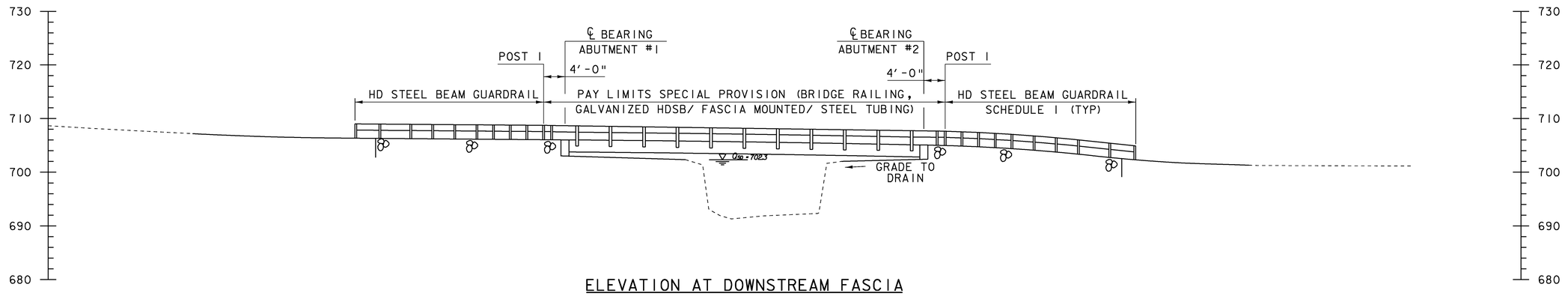
PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95J292borlogs.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: MATERIALS & RESEARCH
BORING LOGS

PLOT DATE: 31-DEC-2009
DRAWN BY: K. PATTERSON
CHECKED BY: T. FILLBACH
SHEET 13 OF 26



PLAN

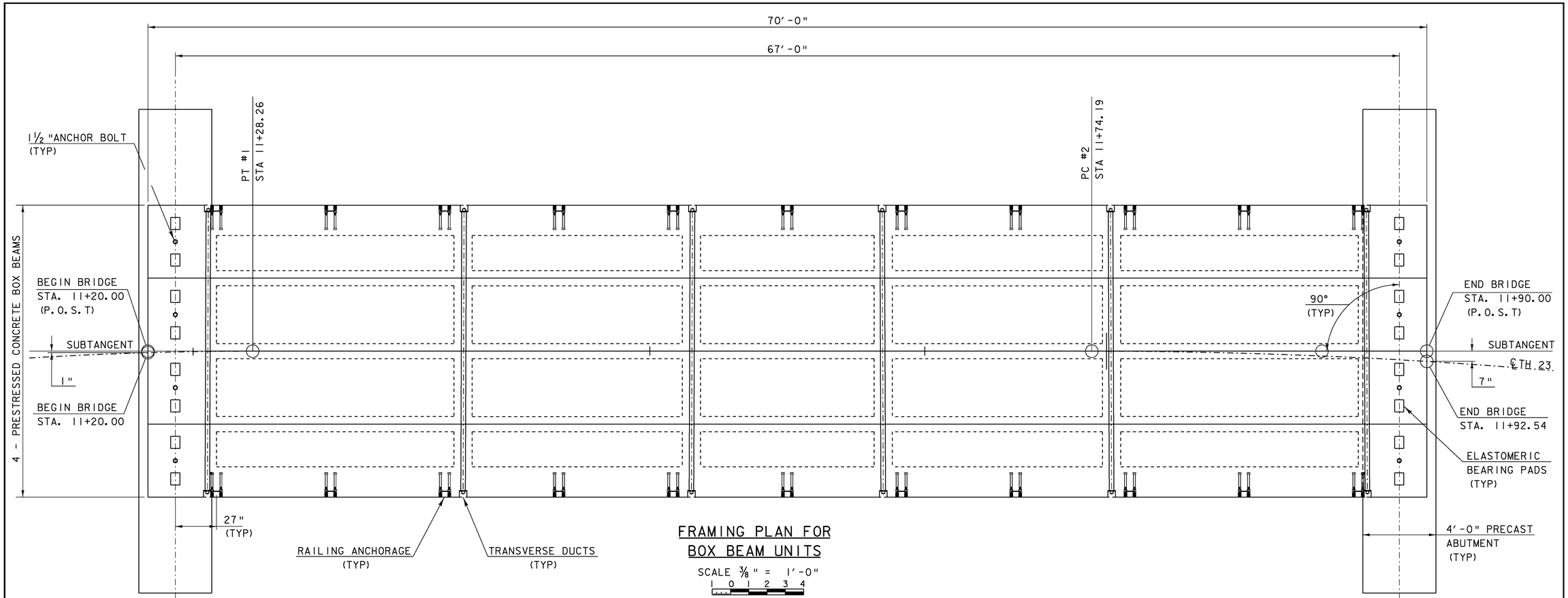


ELEVATION AT DOWNSTREAM FASCIA

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

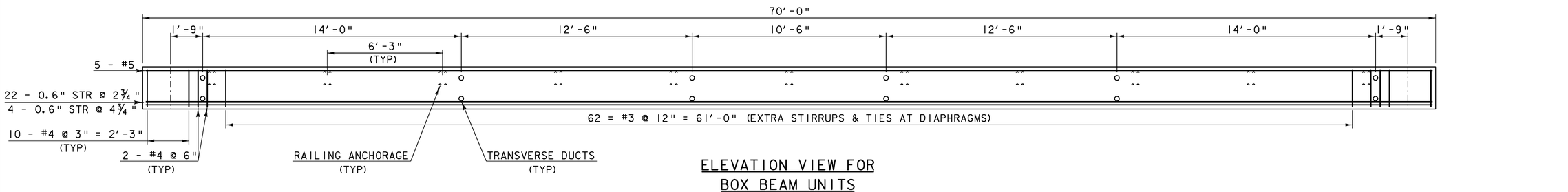
PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

FILE NAME: s95j292pe.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: R. PELLETT
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
PLAN AND ELEVATION	SHEET 14 OF 26



FRAMING PLAN FOR
BOX BEAM UNITS

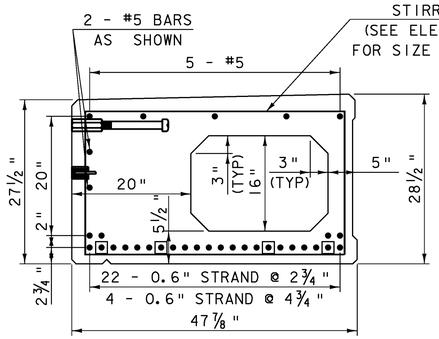
SCALE ⅜" = 1'-0"
1 0 1 2 3 4



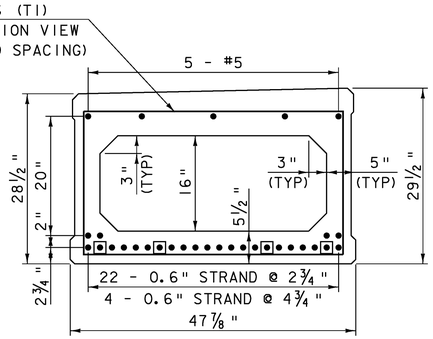
ELEVATION VIEW FOR
BOX BEAM UNITS

SCALE ⅜" = 1'-0"
1 0 1 2 3 4

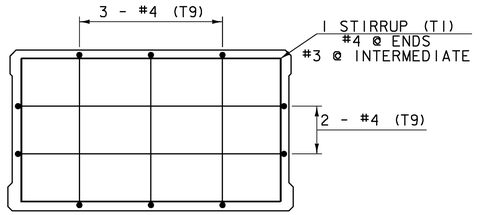
PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)
FILE NAME: s95J292sup.dgn	PLOT DATE: 14-JAN-2010
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
FRAMING PLAN	SHEET 15 OF 26



PRESTRESSED CONCRETE BOX BEAM
(27 ½" - 28 ½" x 48")
EXTERIOR



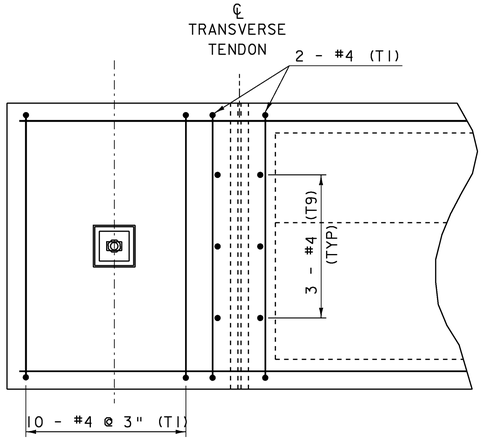
PRESTRESSED CONCRETE BOX BEAM
(28 ½" - 29 ½" x 48")
INTERIOR



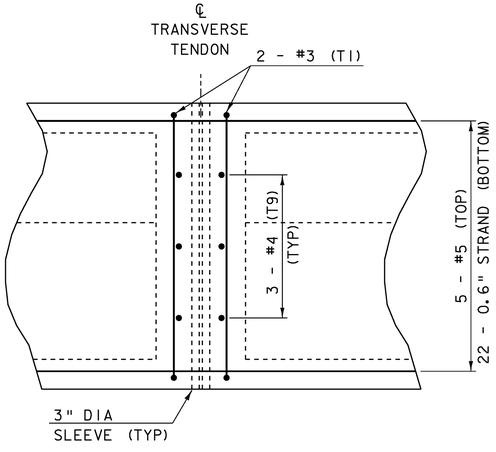
DIAPHRAGM REINFORCING
(INTERIOR & EXTERIOR)

1 MAT EACH SIDE OF TRANVERSE DUCTS

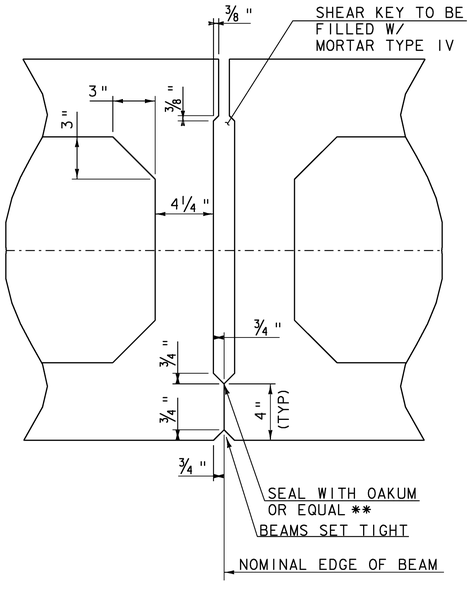
▣ - SHIELDED AT ENDS FOR 6'



END DIAPHRAGM REINFORCING
(INTERIOR & EXTERIOR)



INTERMEDIATE DIAPHRAGM
REINFORCING
(INTERIOR & EXTERIOR)



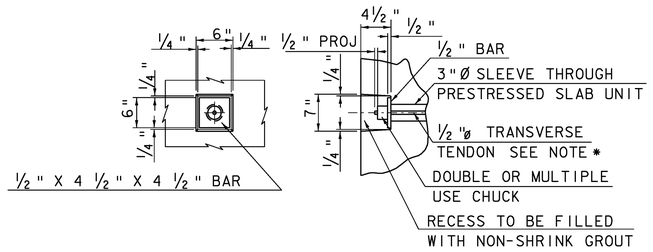
SHEAR KEY DETAIL
FOR BOX BEAM

NTS

** NOTE: INSTALL OAKUM AFTER UNITS HAVE BEEN PLACED

SCALE 1" = 1'-0"
1 9 6 3 0 1 2

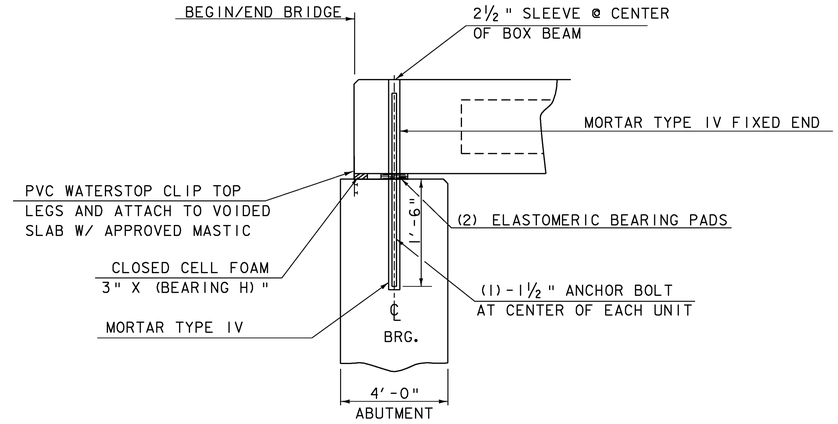
PROJECT NAME: BRAINTREE	
PROJECT NUMBER: BRO 1444(36)	
FILE NAME: s95J292sup.dgn	PLOT DATE: 14-JAN-2010
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
BOX BEAM DETAILS #1	SHEET 16 OF 26



1/2 "Ø TRANSVERSE TENDON DETAIL

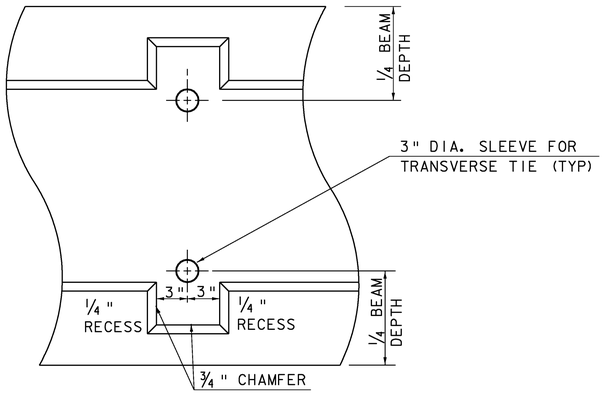
(NOT TO SCALE)

* TRANSVERSE TIES SHALL BE COVERED BY SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITER GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF STRAND, EXCEPT AT ANCHORAGE LOCATIONS, EACH STRAND SHALL BE TENSIONED TO 33 KIPS



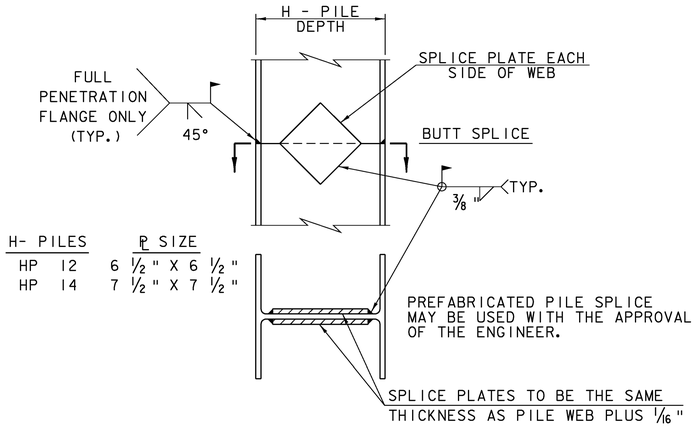
VOIDED SLAB/BOX BEAM
NO PAVEMENT/NO APPROACH SLAB

(NOT TO SCALE)



TYPICAL BEAM ELEVATION AT TRANSVERSE TIE LOCATIONS

(NOT TO SCALE)



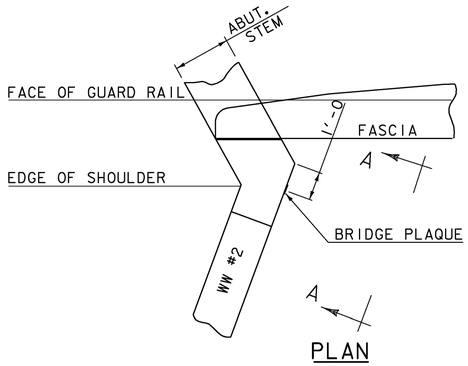
H- PILES	PL SIZE
HP 12	6 1/2 " X 6 1/2 "
HP 14	7 1/2 " X 7 1/2 "

DETAIL OF PILE SPLICE

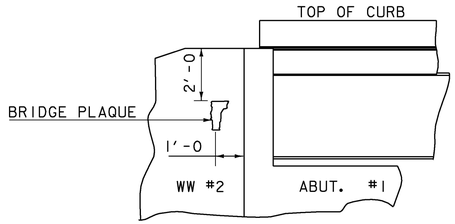
(NOT TO SCALE)

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

FILE NAME: s95j292sup.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
BOX BEAM DETAILS #2	SHEET 17 OF 26



PLAN

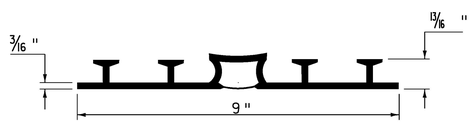


VIEW "A - A"

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.

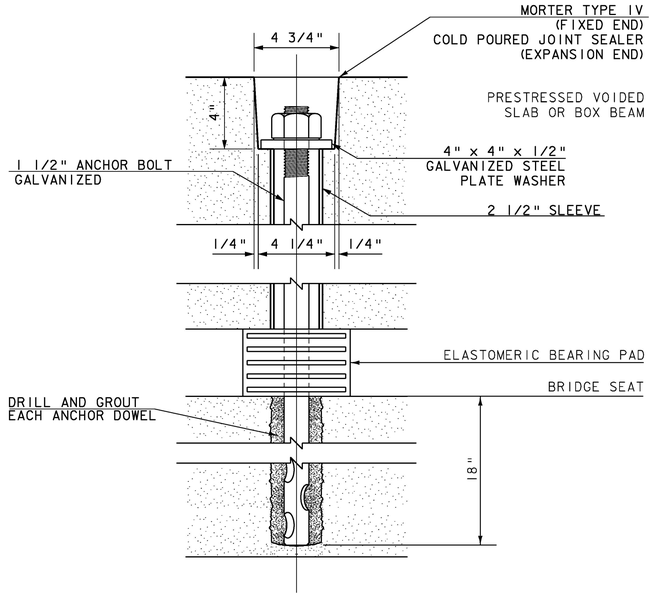
PAYMENT FOR INSTALLATION OF THE BRIDGE PLAQUE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.



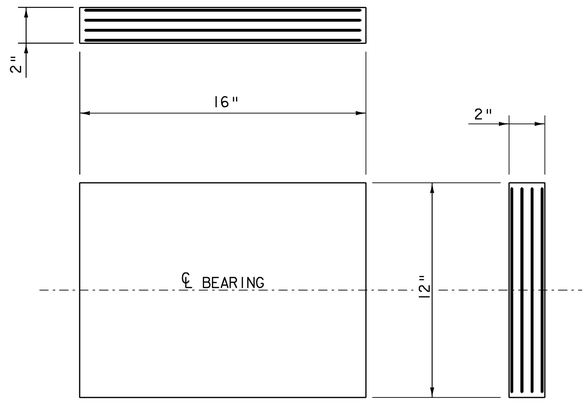
P.V.C. WATERSTOP FOR EXPANSION JOINTS
(NOT TO SCALE)

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.



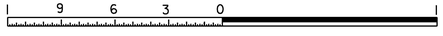
ANCHOR BOLT DETAIL
(NOT TO SCALE)



ELASTOMERIC BEARING DETAIL

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

SCALE 3" = 1'-0"



Bearing Notes

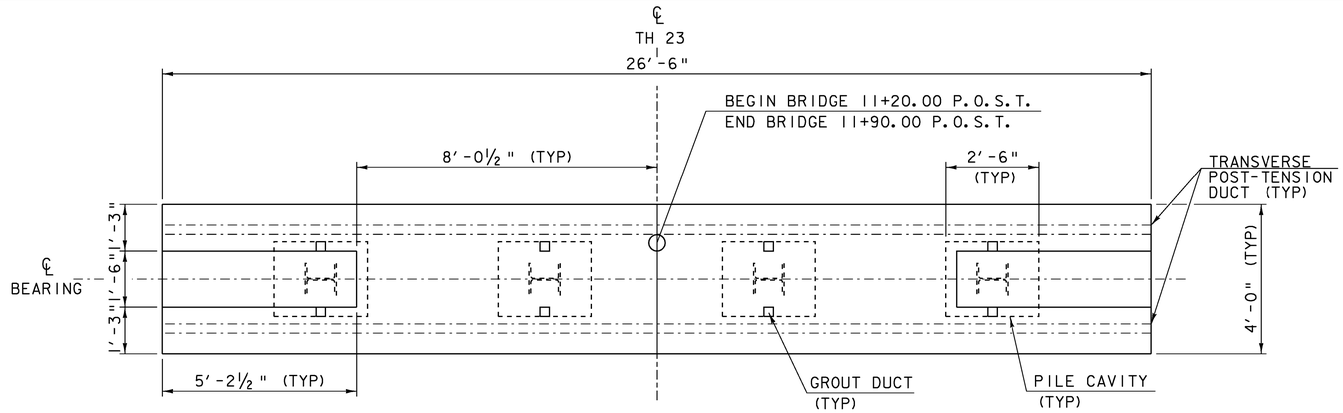
1. Bearings shall conform to the applicable subsections of Standard Specifications sections 531 and 731.
2. The bearings, including anchor bolts, drilling and grouting, washers and nuts shall be paid for under the item 531.11 "Bearing Device Assembly, Elastomeric Pad."
3. All washers shall be 1/2" plate (minimum).
4. All plates, nuts, washers and anchor bolts, unless noted otherwise, shall be galvanized or metalized as per subsections 531.04(b) and 506.15 of the Standard Specifications. If the bearings are metalized, they shall be sealed with an approved sealer as specified in subsection 506.15(b) of the standard specifications. Areas of galvanizing or metalizing damaged by field welding or handling shall be repaired in conformance with standard specification 513.
5. All steel in the bearing devices shall be AASHTO M270M/M270 Grade 50, unless noted otherwise.
6. Anchor bolts shall be ASTM A-449, type 1 with a yield strength of 58 ksi and have a minimum embedment of 18" into the concrete and shall conform to subsection 714.08.
7. All reinforcement between layers of elastomer shall be steel AASHTO M270M/M270 Grade 36. 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.
8. Steel reinforced elastomeric bearings shall have a minimum 1/8" edge seal of elastomer integral with bearing over all internal plates.
9. The elastomer was designed with a shear modulus of 100 psi +/- 15%
10. The elastomer shall meet the requirements of Low Temperature Zone D, Grade 4.
11. The concrete under the bearing device shall be level.
12. All designs done for the bearings shall be per the AASHTO LRFD Bridge Design Specifications 4th edition and its latest revisions.
13. Alternate configurations for bearings may be submitted for approval. Any alternate submitted shall be designed and certified to meet the design loads and criteria shown on the plans.
14. Bridge seat elevations may be revised to accommodate an alternative configuration.

Design Load (kip)	Service Limit State	Vertical	Max	74.4
			Min	28.4
			Permanent	30.6
			Transverse	6.7
			Longitudinal	2.5
	Strength Limit State		Vertical	113.1
			Transverse	22.9
			Longitudinal	16.5
Translation (in)	Service Limit State	Irreversible	Transverse	0
			Longitudinal	1/16
		Reversible	Transverse	1/8
			Longitudinal	1/2
Rotation (rad)	Service Limit State	Irreversible	Transverse	0.000
			Longitudinal	0.018
		Reversible	Transverse	0.000
			Longitudinal	0.009

PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

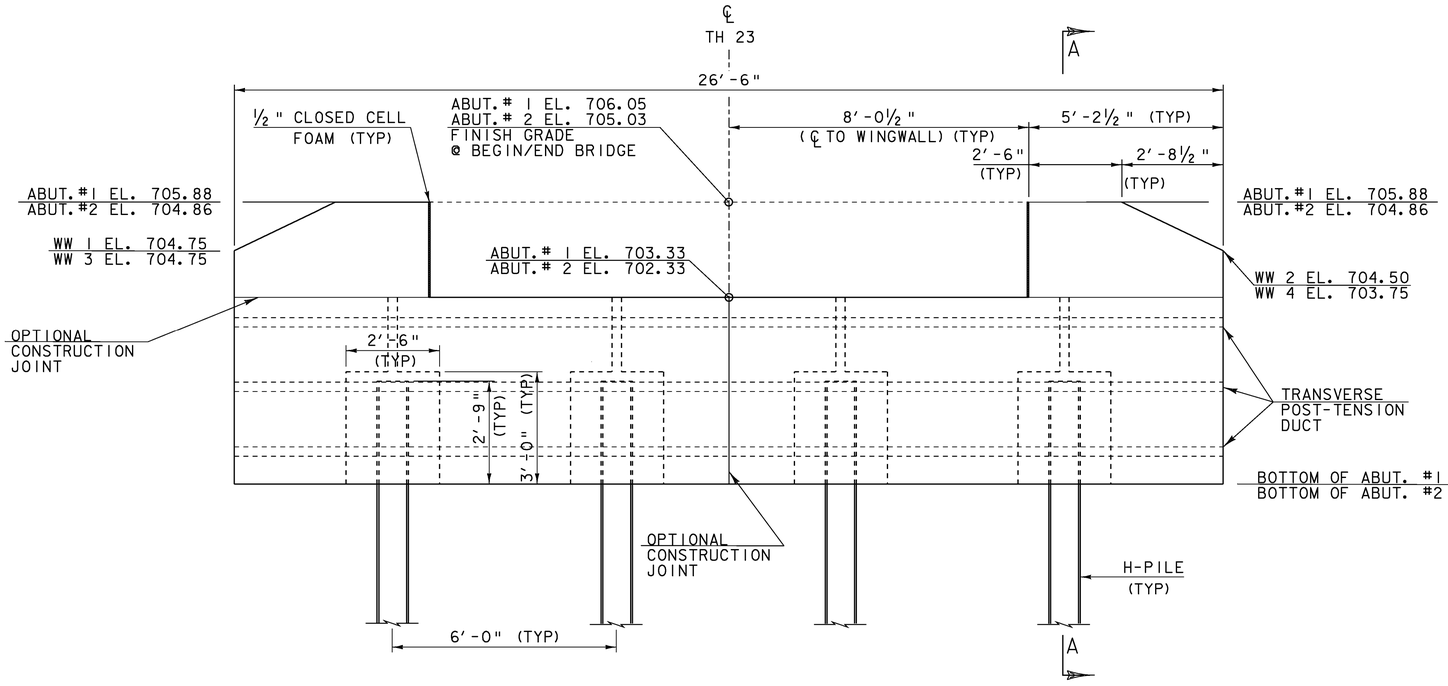
FILE NAME: s951292sup.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
BEARING DETAILS

PLOT DATE: 31-DEC-2009
DRAWN BY: T. FILLBACH
CHECKED BY: J. LACROIX
SHEET 18 OF 26



TYPICAL ABUTMENT PLAN

SCALE ½" = 1'-0"



TYPICAL ABUTMENT ELEVATION

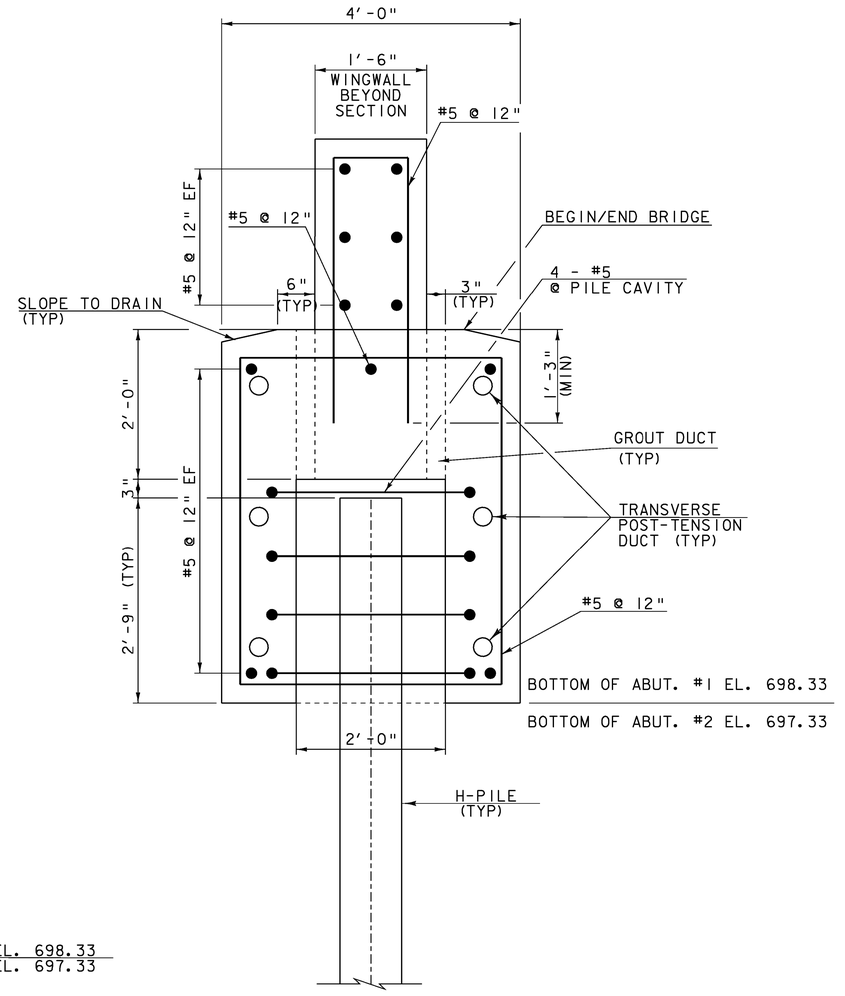
SCALE ½" = 1'-0"

NOTES:
ONCE PILES HAVE BEEN CUT TO THEIR FINAL ELEVATIONS, 1" x 12" x 12" STEEL PLATES SHALL BE WELDED TO THE TOP OF THE PILES.

PILE CAVITY GROUT (FILL AND VENT) DUCTS SHALL BE CORRUGATED.

SEE GENERAL NOTES FOR ADDITIONAL FABRICATION, CONSTRUCTION AND SEQUENCE NOTES.

NOT BUILT. USED CAST-IN-PLACE
SEE SHOP DRAWINGS FOR DETAILS

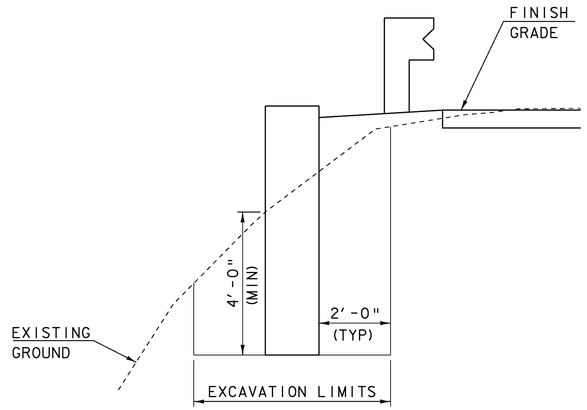


SECTION A-A

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.

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)
FILE NAME: s95J292sub.dgn	PLOT DATE: 14-JAN-2010
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
ABUTMENTS	SHEET 19 OF 26



TYPICAL RETAINING WALL EARTHWORKS DETAIL

SCALE ½" = 1'-0"

RETAINING WALL NOTES:

1. THE DETAILS SHOWN ARE CONCEPTUAL IN NATURE AND ARE INTENDED TO PROVIDE OVERALL INFORMATION SUCH AS BEGINNING AND END OF WALL AND APPROXIMATE TOP AND BOTTOM PROFILE OF THE WALL.

2. THE WALL SHALL BE SELECTED FROM THE LIST OF WALLS IN THE APPROVED RETAINING WALL DOCUMENT AVAILABLE FROM VAOT MATERIALS & RESEARCH WEB SITE.

3. THE BOTTOM OF WALL SHALL BE A MINIMUM OF 4 FEET BELOW THE FINISH GRADE IN THE FRONT OF WALL.

4. THE WALL SHALL BE DESIGNED IN ACCORDANCE WITH THE 2009 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND ITS LATEST REVISIONS.

5. THE DESIGN SHALL CONSIDER THE EFFECTS OF ALL LOADS INCLUDING BUT NOT LIMITED TO LOADS FROM THE GUARDRAIL, EARTH SURCHARGE, LIVE LOAD SURCHARGE, AND HYDROSTATIC PRESSURE.

6. THE TYPE OF WALL SELECTED SHALL BE COMPATIBLE WITH THE GUARD RAIL SYSTEM SHOWN ON THE PLANS AND SHALL CONSIDER THE EFFECT OF 8 FOOT GUARD RAIL POSTS ON ANY REINFORCING OR ANCHORING SYSTEM.

7. THE FOLLOWING SOIL PROPERTIES SHALL BE USED IN THE DESIGN:

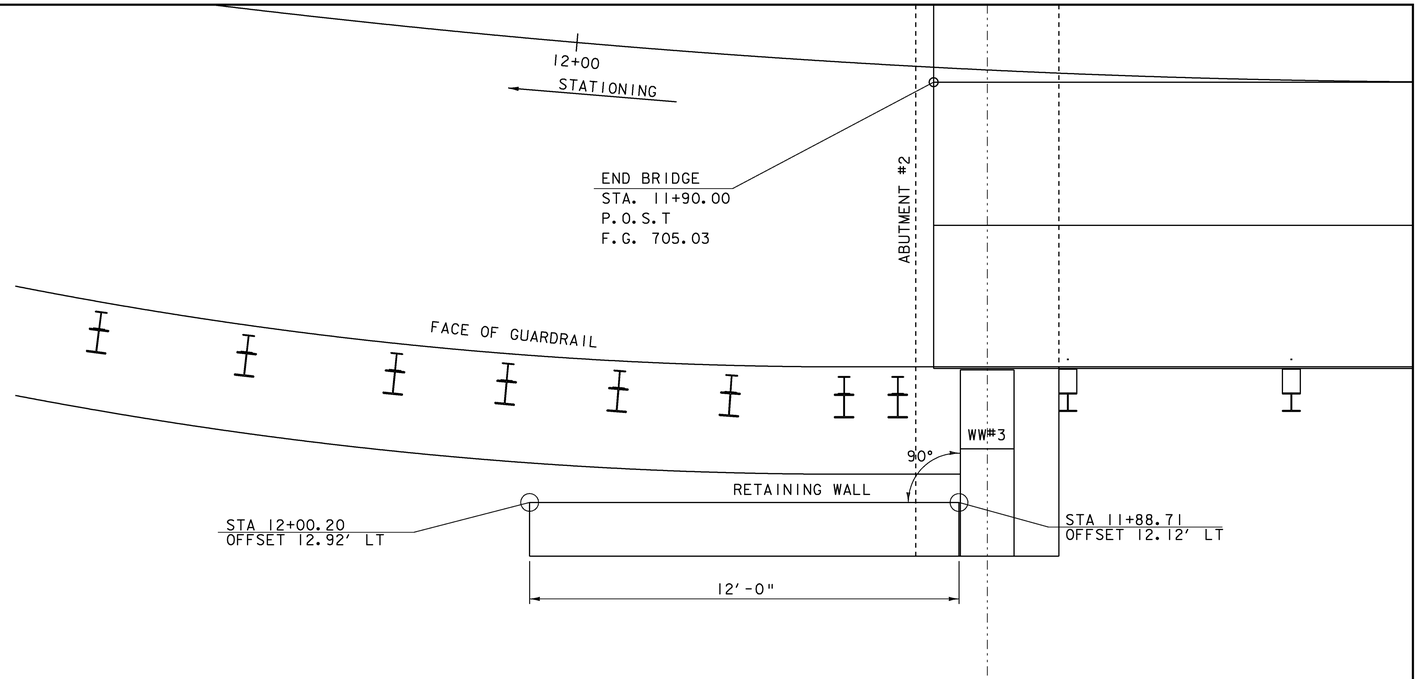
   a. SELECT BACKFILL (GRANULAR BACKFILL FOR STRUCTURES)
      i. UNIT WEIGHT: 140 PCF
      ii. FRICTION ANGLE: 34 DEGREES
      iii. COHESION, c: 0

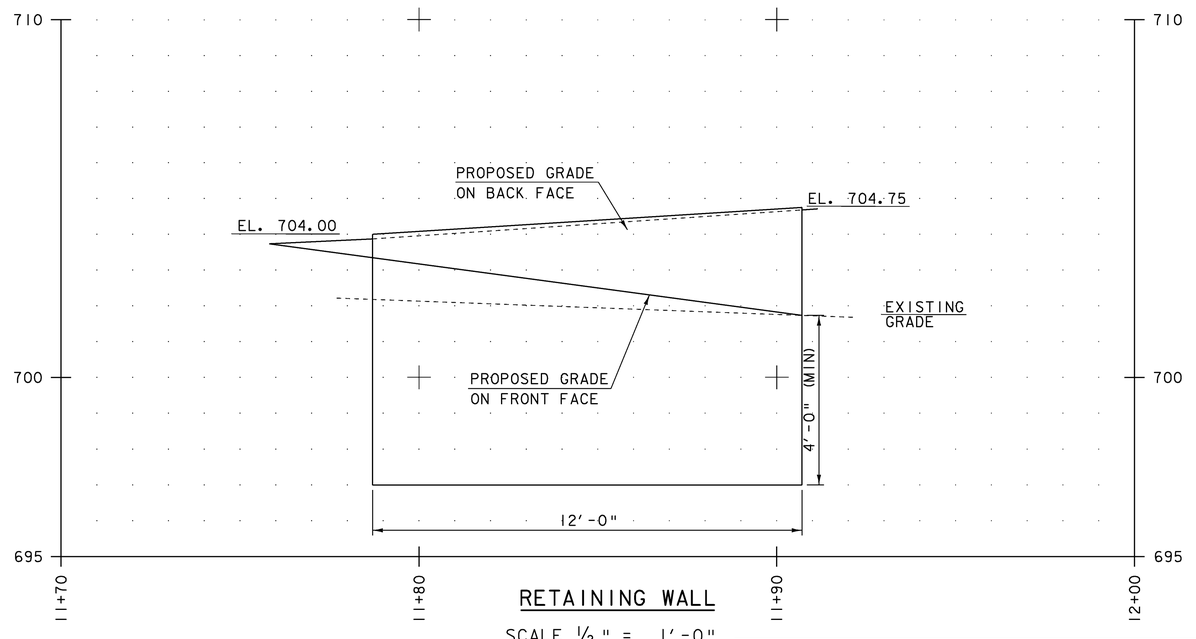
   b. RETAINED SOIL
      i. UNIT WEIGHT: 130 PCF
      ii. FRICTION ANGLE: 32 DEGREES
      iii. COHESION, c: 0

   c. FOUNDATION SOIL
      i. UNIT WEIGHT: 115 PCF
      ii. FRICTION ANGLE: 30 DEGREES
      iii. COHESION, c: 0
      iv. NOMINAL BEARING RESISTANCE: 9 KSF

8. THE INTERFACE BETWEEN THE RETAINING WALL AND THE ABUTMENT STEM SHALL BE DESIGNED AND SUBMITTED TO THE PROJECT MANAGER FOR REVIEW AND APPROVAL.

9. THE WALL, INCLUDING ALL COMPONENTS, EXCAVATION AND BACKFILL, NECESSARY TO CONSTRUCT THE WALL, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 900.670 "SPECIAL PROVISION (RETAINING WALL)".





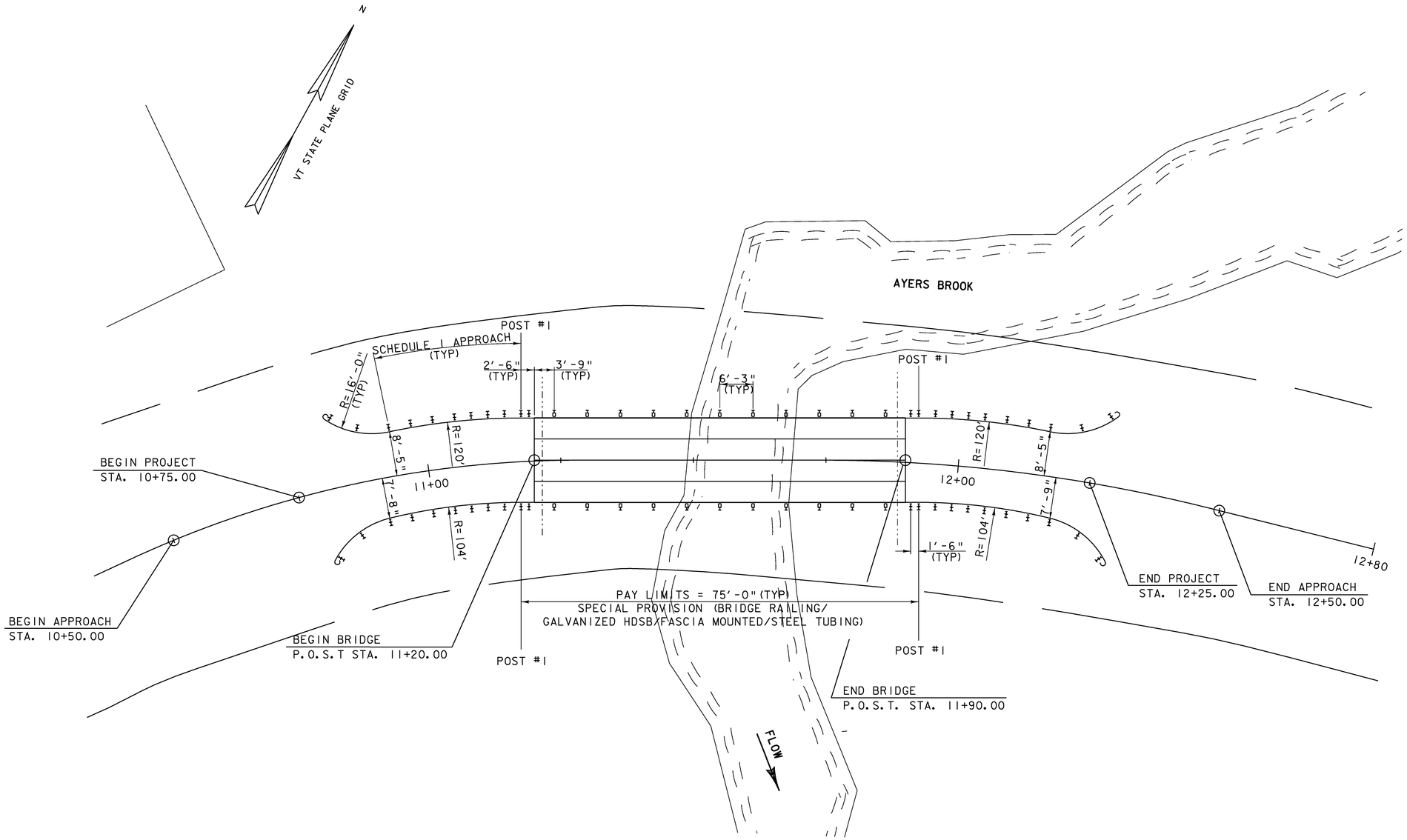
RETAINING WALL

SCALE ½" = 1'-0"

0 1 2

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

FILE NAME: s95j292sub.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
RETAINING WALL	SHEET 20 OF 26

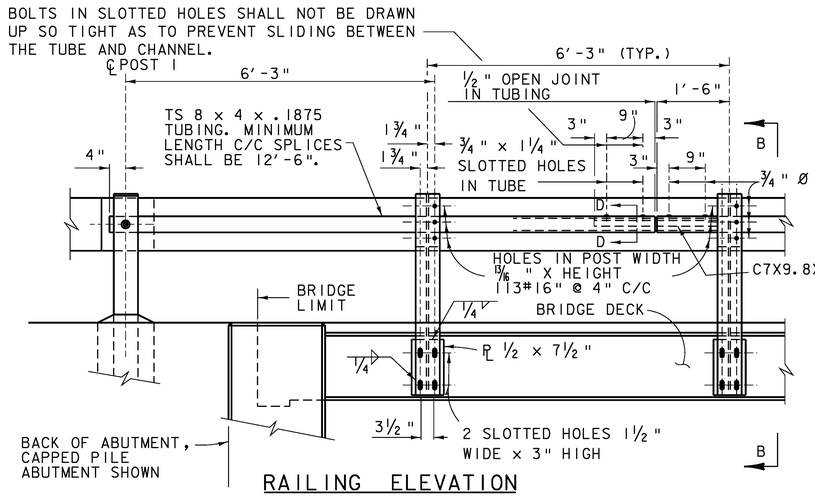


RAIL LAYOUT

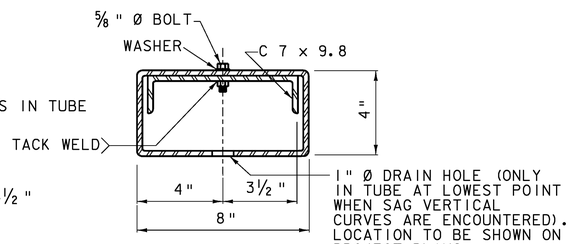
SCALE 1" = 10'-0"

10 0 10

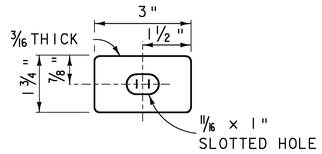
PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)
FILE NAME: s95J292rail.dgn	PLOT DATE: 14-JAN-2010
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
RAIL LAYOUT SHEET	SHEET 21 OF 26



RAILING ELEVATION



SECTION D-D

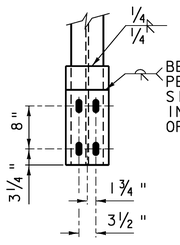


SPECIAL WASHER

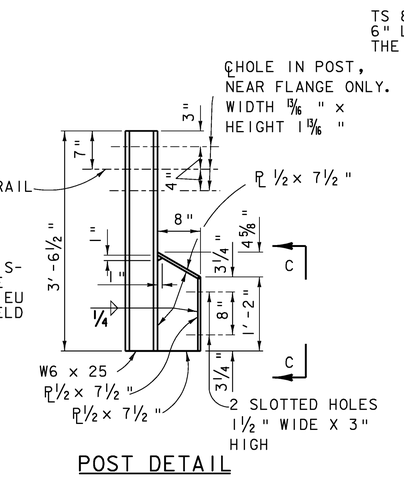
PLACE WASHER BETWEEN BOLT HEAD AND FACE OF RAIL.

FASCIA MOUNTED WITHOUT CURB NOTES

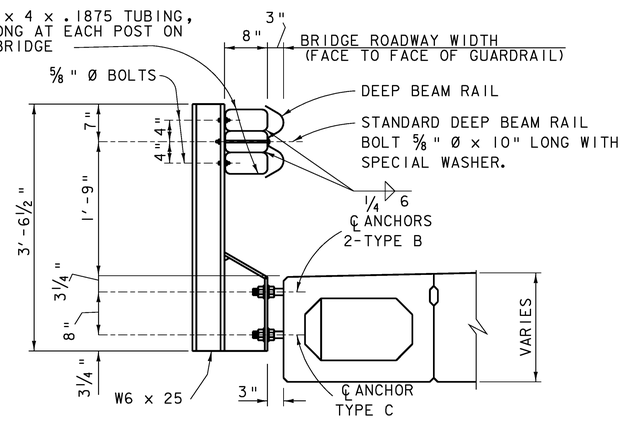
1. HEAVY DUTY STEEL BEAM GUARD RAIL SHALL CONFORM TO VT. SPECIFICATION SECTION 732.
2. STRUCTURAL STEEL TUBING SHALL CONFORM TO VT. SPECIFICATION SECTION 732 GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111M/M111.
3. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232M/M232 AND SHALL CONFORM TO VT. SPECIFICATION SECTION 714 UNLESS OTHERWISE NOTED.
4. BRIDGE RAIL POSTS, SPECIAL WASHERS, PLATE WASHERS AND SPLICE BARS SHALL CONFORM TO AASHTO M223M/M223 GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111M/M111.
5. ALL BOLTS AND RELATED HARDWARE SHALL CONFORM TO AASHTO M164 TYPE 1 BOLTS, HOT DIPPED OR MECHANICALLY GALVANIZED PER SPECIFICATION.
6. SEE STANDARD DRAWING G-1 AND G-1d FOR ADDITIONAL DETAILS CONCERNING GUARD RAIL.
7. SEE STANDARD DRAWING SB-R6-82 FOR APPROACH RAIL DETAILS AND FOR INFORMATION RELATIVE TO SCHEDULE I AND SCHEDUKE II. ALL APPROACH RAIL SHALL BE HEAVY DUTY STEEL BEAM GUARD RAIL. ALSO SEE STD. DRWG. SB-R6-82 FOR HANDRAIL DETAILS (EXCEPT END DETAILS) IF HAND RAIL IS REQUIRED.
8. ALL POSTS SHALL BE SET NORMAL TO GRADE.
9. SPLICES FOR THE STEEL BEAM GUARD RAIL SHALL LAP IN THE DIRECTION OF TRAFFIC.
10. SEE STANDARD DRAWING G-1 FOR DETAILS OF DELINEATORS. A DELINEATOR SHALL BE LOCATED AT EVERY FIFTH POST. PAYMENT SHALL BE INCIDENTAL TO OTHER ITEMS.
11. A RAILING JOINT SPLICE SHALL BE PROVIDED AT EACH SUPERSTRUCTURE EXPANSION JOINT.
12. ALL FIELD CUT OR DRILLED AREAS SHALL BE REPAIRED PER SECTION 513.
13. FOR RADII LESS THAN 950 FEET, THE STEEL TUBING SHALL BE SHOP BENT TO FIT THE APPLICABLE CURVE.
14. THE DROP-WEIGHT TEAR TEST IN SECTION 732 SHALL NOT APPLY TO THE STRUCTURAL TUBING.



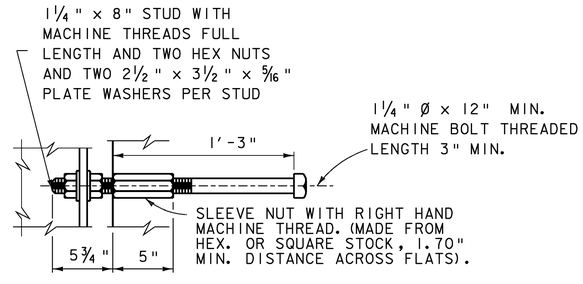
VIEW C-C



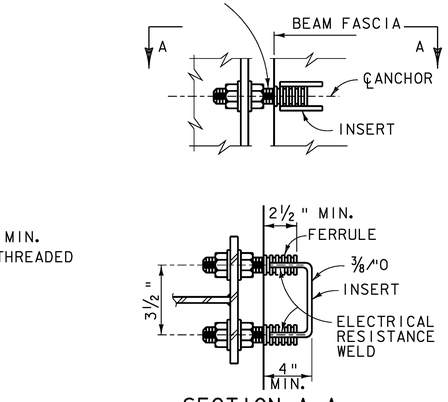
POST DETAIL



SECTION B-B



TYPE B ANCHOR DETAIL



SECTION A-A

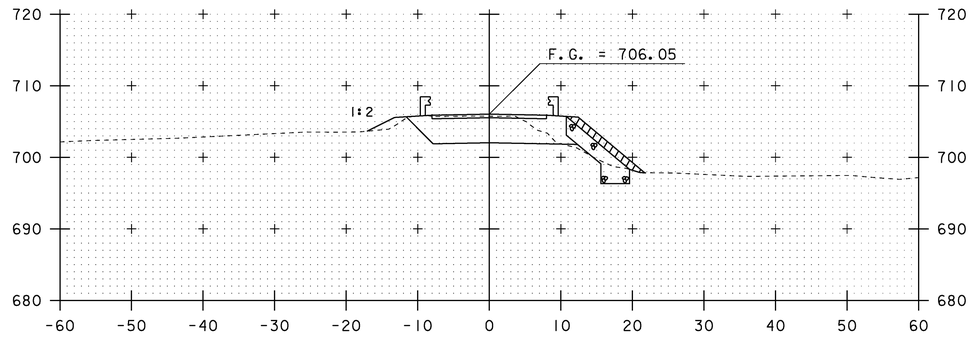
TYPE C ANCHOR DETAIL

NOTE:
ALTERNATE TYPE C ANCHOR MAY BE SUBMITTED FOR ACCEPTANCE. FERRULE SHALL BE DAYTON SUPERIOR F-43 PLAIN OR EQUIVALENT.

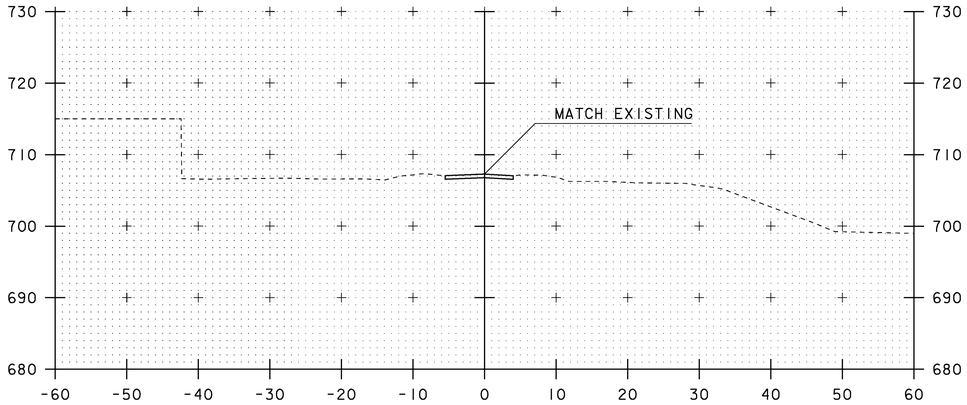
N. T. S.

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

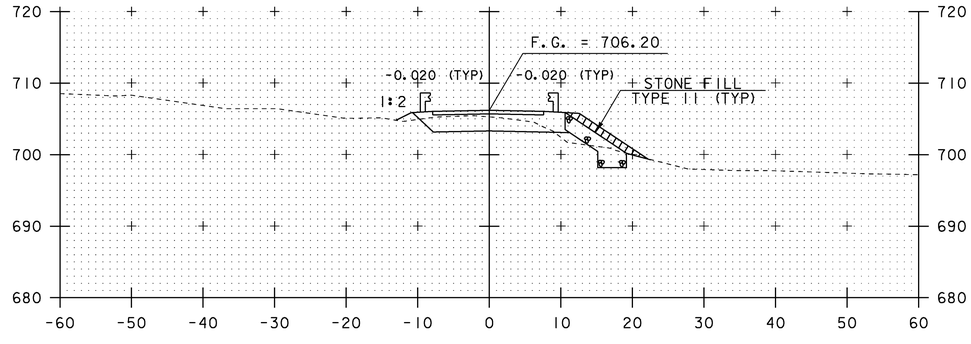
FILE NAME: s95J292Raildet.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: G. LAROCHE
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
RAIL DETAIL	SHEET 22 OF 26



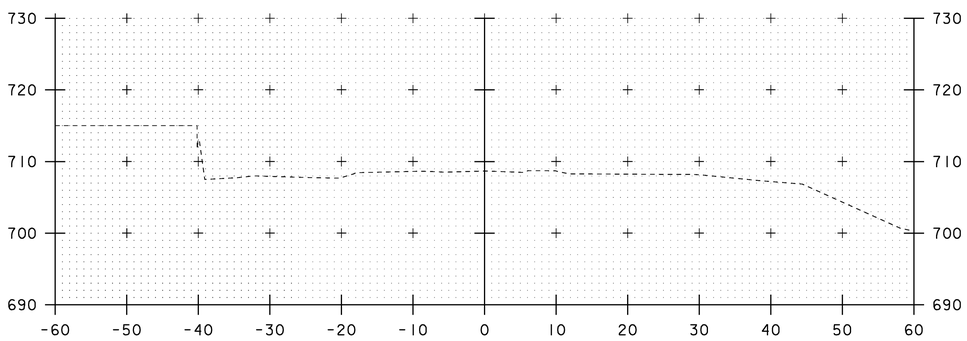
BEGIN BRIDGE
11+20



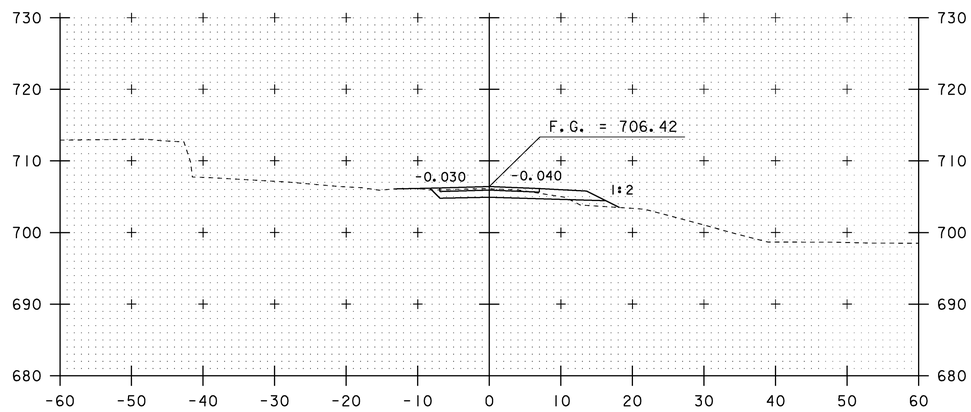
BEGIN APPROACH
10+50



11+00



10+25



BEGIN PROJECT
10+75

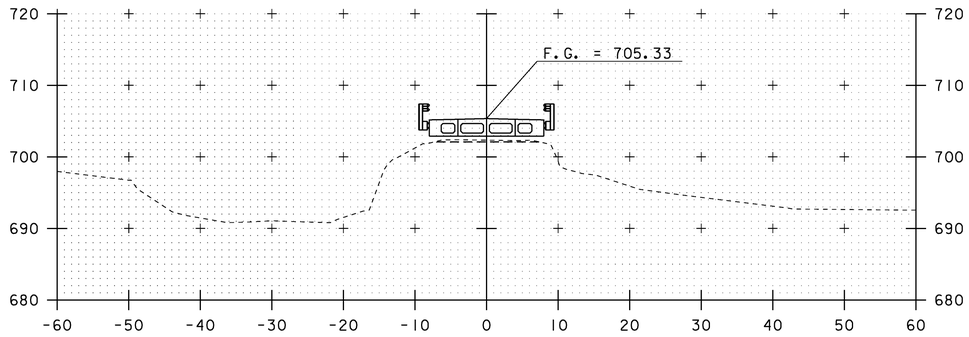
SCALE 1" = 10'-0"
10 0 10

STA. 10+25 TO STA. 11+20

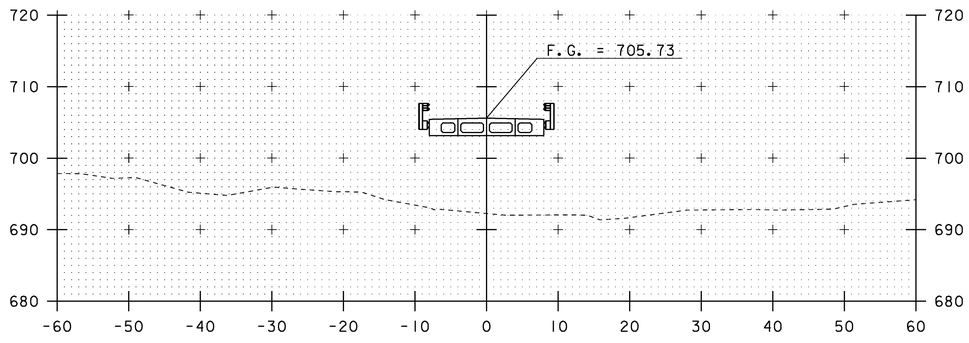
PROJECT NAME: BRAINTREE
PROJECT NUMBER: BRO 1444(36)

FILE NAME: s95J292xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: T. FILLBACH
MAINLINE SECTIONS

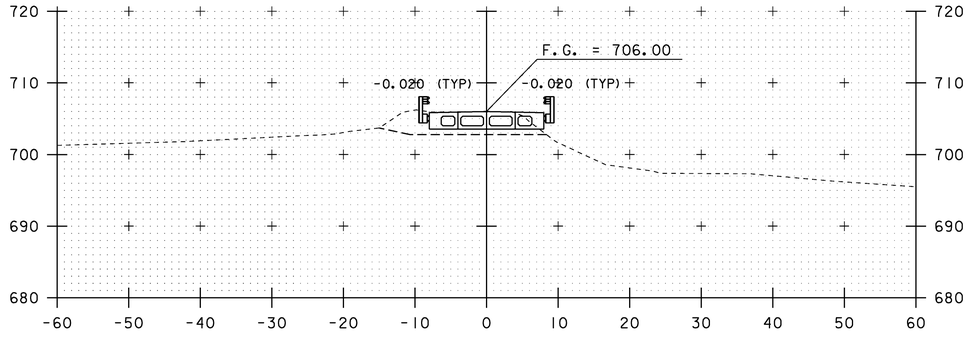
PLOT DATE: 31-DEC-2009
DRAWN BY: T. FILLBACH
CHECKED BY: R. PELLETT
SHEET 23 OF 26



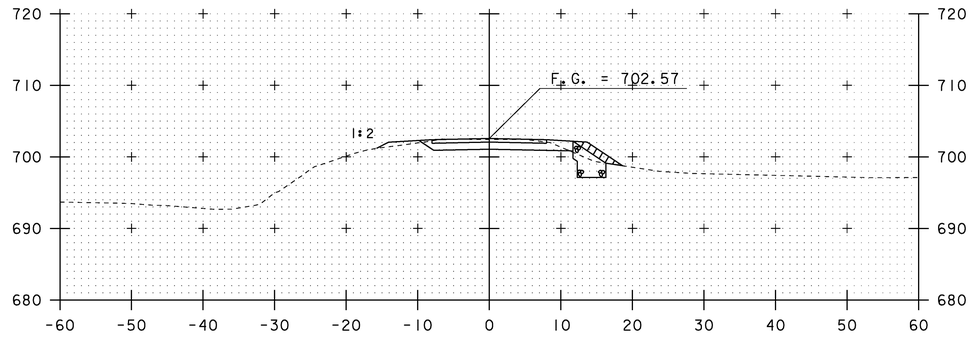
11+75



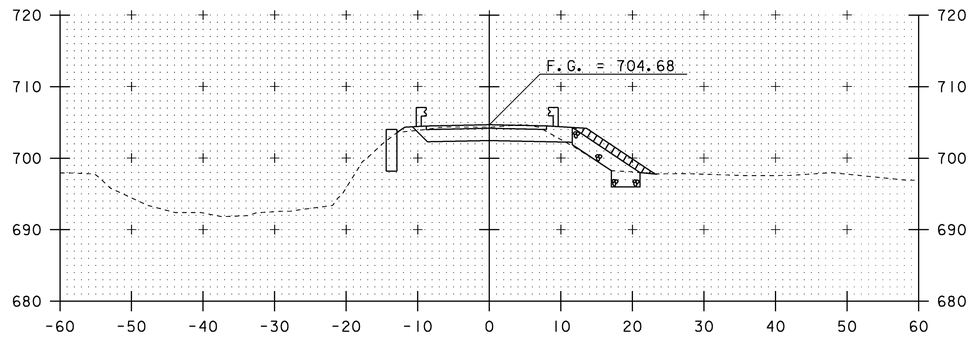
11+50



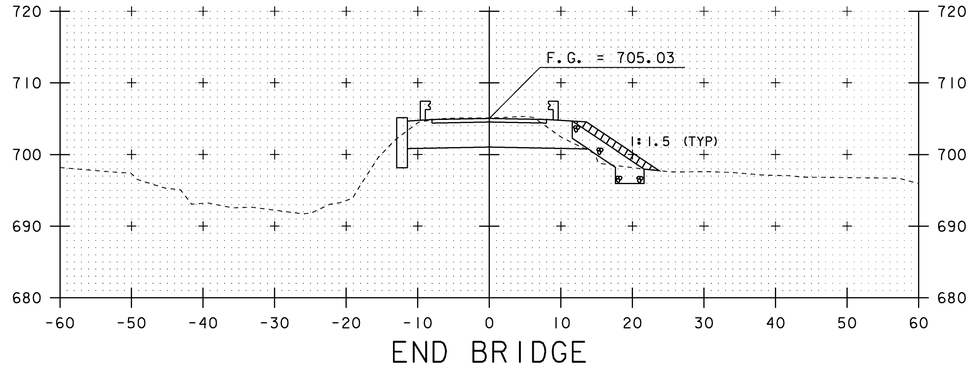
11+25



END PROJECT
12+25



12+00



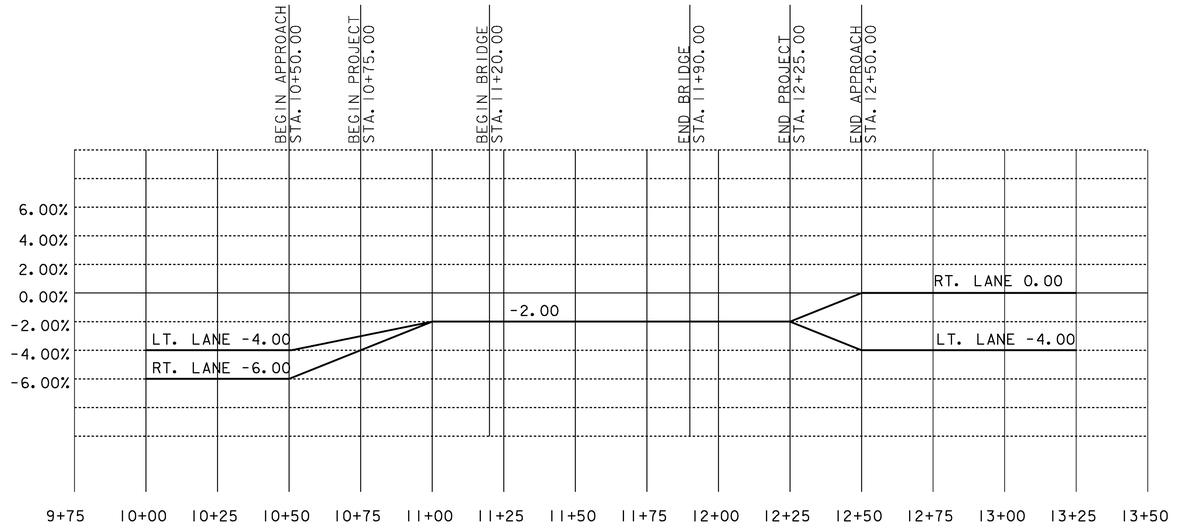
END BRIDGE
11+90

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

STA. 11+25 TO STA. 12+25

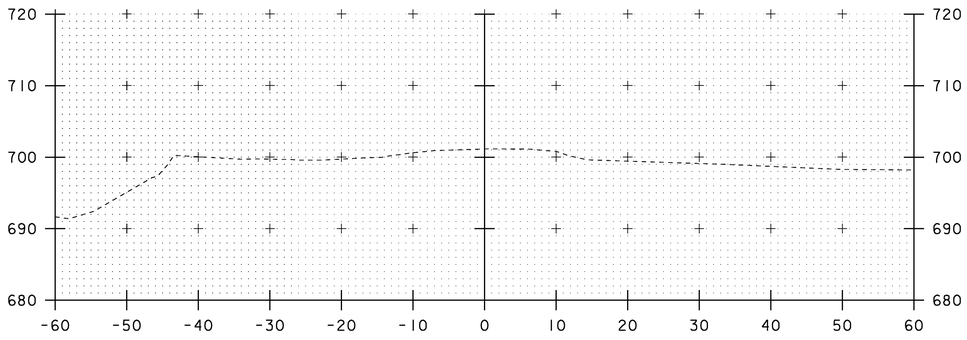
PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

FILE NAME: s95J292xsl.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: T. FILLBACH
DESIGNED BY: T. FILLBACH	CHECKED BY: R. PELLETT
MAINLINE SECTIONS	SHEET 24 OF 26

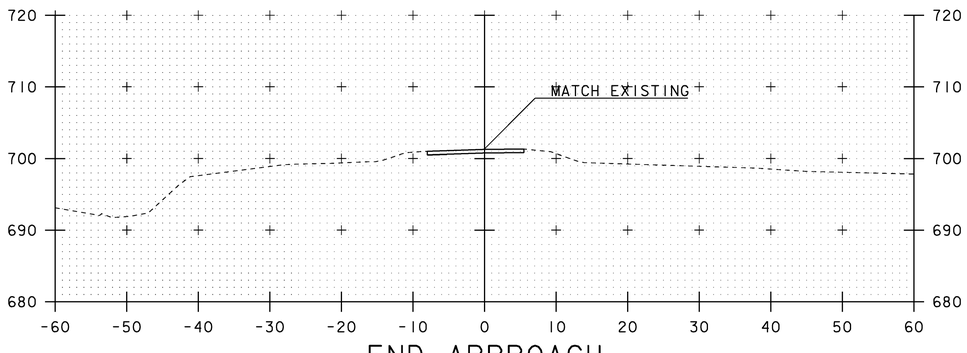


SUPERELEVATION DIAGRAM

NOT TO SCALE



12+75

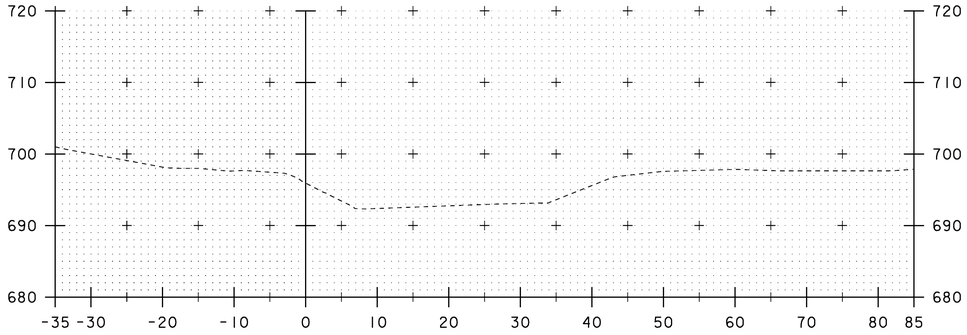


END APPROACH
12+50

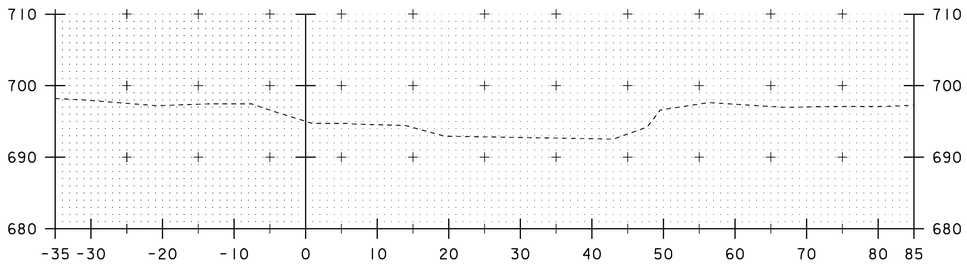
SCALE 1" = 10'-0"
10 0 10

STA. 12+50 TO STA. 12+75

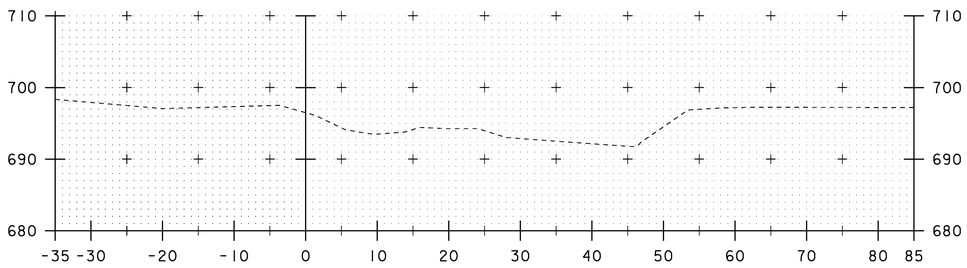
PROJECT NAME: BRAINTREE	
PROJECT NUMBER: BRO 1444(36)	
FILE NAME: s95J292xsl.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: T. FILLBACH
DESIGNED BY: T. FILLBACH	CHECKED BY: R. PELLETT
MAINLINE SECTIONS	SHEET 25 OF 26



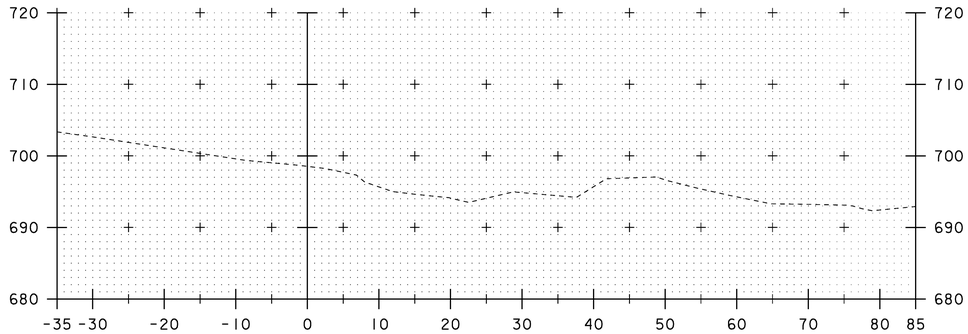
20+50



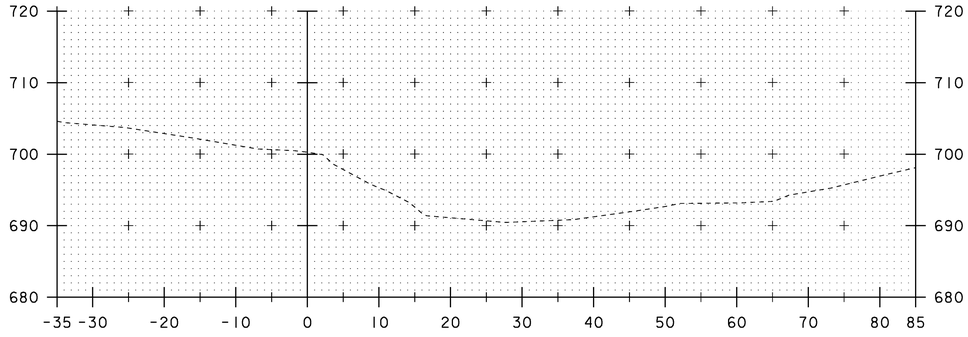
20+25



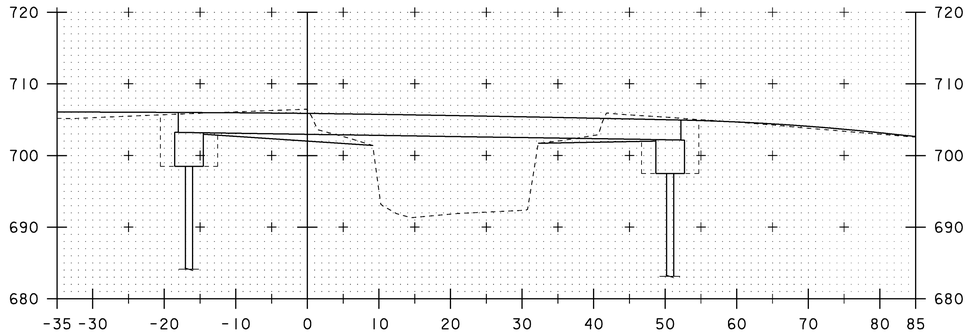
20+00



21+25



21+00



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

20+75

STA. 20+00 TO STA. 21+25

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)

FILE NAME: s95j292xsl.dgn	PLOT DATE: 31-DEC-2009
PROJECT LEADER: K. HIGGINS	DRAWN BY: T. FILLBACH
DESIGNED BY: T. FILLBACH	CHECKED BY: R. PELLETT
CHANNEL SECTIONS	SHEET 26 OF 26

VERMONT

State of Vermont
PDD/Structures Design Section
One National Life Drive
Montpelier, VT 05633-5001
www.aot.state.vt.us

Agency of Transportation

[phone] 802-828-2621
[fax] 802-828-3566
[tld] 800-253-0191

July 12, 2010

Renaud Bros. Construction
283 Fort Bridgeman Rd #2
Vernon, VT 05354

Project Name: Braintree BRO 1444(36)

Structure Identification: Bridge 12 over Ayers Brook

The following Bridge Abutment Plans [Incidental to Items 540.10 Precast Concrete Structure (Abutment #1) and 540.10 Precast Concrete Structure (Abutment #2) for the above project received in this office on June 29, 2010 has been reviewed and is being returned herewith.

All details are approved as noted. The details for the retaining wall have not been received as of this time.

Sincerely,

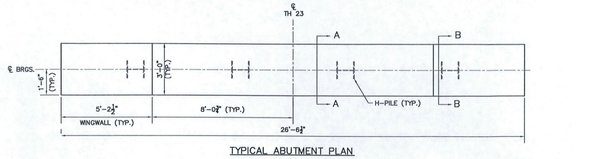
Kristin M. Higgins, P.E.
Structures Project Manager

Attachments
cc: [X] Jeremy Reed - Resident Engineer - letter and plans
[X] Renaud Bros Construction. - Contractor - letter and Plans
[X] Construction Division - letter only
[X] Files (KMH)

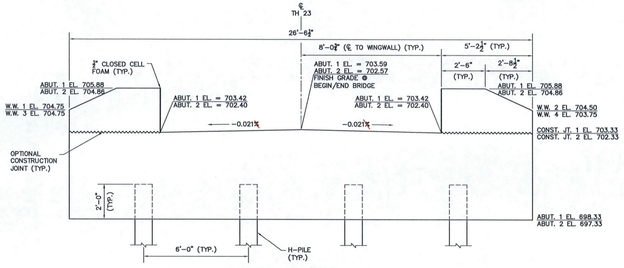
Abutment Details_Approval_0712.doc

VERMONT

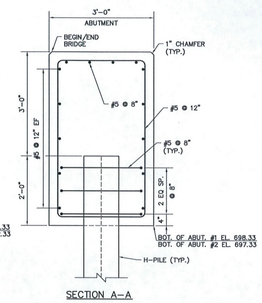
02.7-ABJT



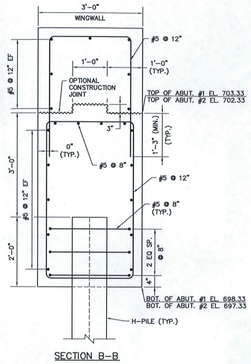
TYPICAL ABUTMENT PLAN



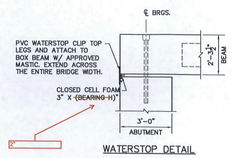
TYPICAL ABUTMENT ELEVATION



SECTION A–A



SECTION B–B



WATERSTOP DETAIL

NOTE:
1. LAP LENGTH FOR ALL #5 BARS SHALL BE 2'-2"
2. ALL CONCRETE SHALL BE HIGH PERFORMANCE CLASS B MEETING SECTION 501 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION

VERMONT

State of Vermont
PDD/Structures Design Section
National Life Building – Drawer 33
Montpelier, VT 05633-5001
www.aot.state.vt.us

[phone] 802-828-2621
[fax] 802-828-3566
[ttd] 800-253-0191

Agency of Transportation

April 23, 2010

Cosmec, Inc.
1501 Rocky Ridge Road
P.O. Box 2159
Athens, Texas 75751

Project Name: Braintree Project #: BRO 1444 (36)

Structure Identification: Bridge 12 over Ayers Brook

The following Bridge Bearing fabrication drawings, for the above project (General Contractor – Renaud Bros., Inc.), have been reviewed and are being returned herewith.

Bearing fabrication drawings are approved.

You must provide notice to our fabrication inspector, Jeff Clark, as to the date fabrication represented by these drawings will begin. That notice must be received and acknowledged at least seven days prior to that date, as per Specification 506.03. Jeff may be contacted by phone at (802)828-0044 or email at jeff.clark@state.vt.us. Any material fabricated prior to the notification date is subject to rejection without further cause.

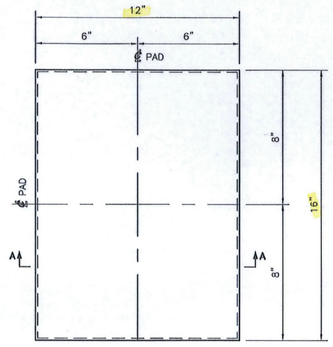
Sincerely,

Kristin Higgins
Structures Project Manager

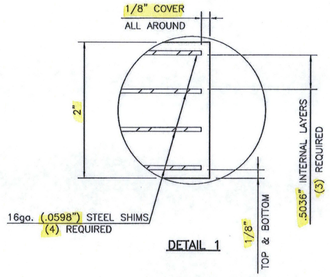
Attachments
cc: [X] Resident Engineer w/prints – Jeremy Reed
[X] Shop Inspector w/prints – Jeff Clark
[X] Contractor w/prints – Renaud Bros., Inc.
[X] Construction Divison – letter only
[X] Materials & Research Section (C&IA Unit) – letter only
[X] Files

VTrans Working to Get You There

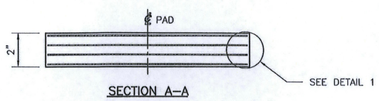
029 Bearing



PLAN VIEW



DETAIL 1



SECTION A–A

(16) LAMINATED ELASTOMERIC BEARING PADS
LOCATE @ ABUTMENTS

SHOP NOTES:

1. BEARINGS SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF STANDARD SPECIFICATIONS SECTIONS 531 & 731.
2. ELASTOMER – 50 DUROMETER NATURAL RUBBER.
3. INTERNAL STEEL LAMINATES (SHIMS) SHALL BE AASHTO M270M/M270 GRADE 36.
4. ELASTOMER SHALL HAVE A SHEAR MODULUS OF 100 psi ± 15% AND MEET THE REQUIREMENTS OF LOW TEMPERATURE ZONE D, GRADE 4.

RECEIVED
CK'D'BY AT COMP'BY KMH
APR 16 2010
RESUBMIT____ APPROVED ✓
BY KMH DATE 4/23/10

LAMINATED ELASTOMERIC BEARING PADS
STATE OF VERMONT
AGENCY OF TRANSPORTATION
TOWN OF BRAINTREE
REPLACEMENT OF BRIDGE NO: 12

STATE	COUNTY	CONTROL NO.
VT	ORANGE	N/A

PROJECT NO.: BRO-1444 (36)

DYNAMIC RUBBER:
LAMINATED BEARING ASSEMBLIES

Cosmec
1501 ROCKY RIDGE ROAD
P.O. BOX 2156
ATHENS, TEXAS 75751

SCALE: NONE	DRAWN BY: RP DATE: 4/9/10	CHECKED BY: WJB DATE: 4/12/10
SHEET 1 OF 1	JOB NO.: 10631	
CONSULTANT: RENAUD BROS., INC.		DRAWING NUMBER REV. 10631-01 0

REV.	DESCRIPTION	BY	DATE	CK'D	DATE

DZ# Bearing

VERMONT

State of Vermont
PDD/Structures Design Section
National Life Building – Drawer 33
Montpelier, VT 05633-5001
www.aot.state.vt.us

Agency of Transportation

[phone] 802-828-2621
[fax] 802-828-2566
[ttd] 800-253-0191

July 22, 2010

Wm. E. Dailey Inc.
Airport Rd
Shaftsbury, VT 05262

Project Name: Braintree **Project #: BRO 1444 (36)**

Structure Identification: Bridge #12 over Ayers Brook

The Prestressed Concrete Box Beam fabrication drawings [Item 510.21 Prestressed Concrete Box Beams] for the above project (General Contractor – Renaud Bros., Inc.) have been reviewed and are being returned herewith.

All sheets are approved or approved as noted.

You must provide notice to our fabrication inspector, Jim Wild, as to the date fabrication represented by these drawings will begin. Jim must receive and acknowledge your notice at least seven days prior to that date. You may contact Jim by phone at (802)828-6931 or email at jim.wild@state.vt.us. Any material fabricated prior to the notification date is subject to rejection without further cause.

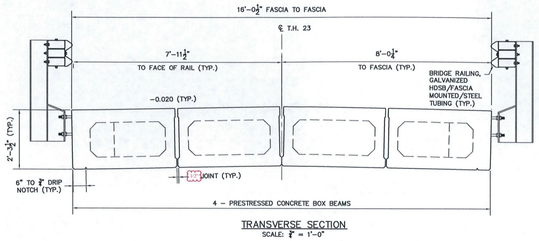
Sincerely,

Kristin M. Higgins P.E.
Project Manager

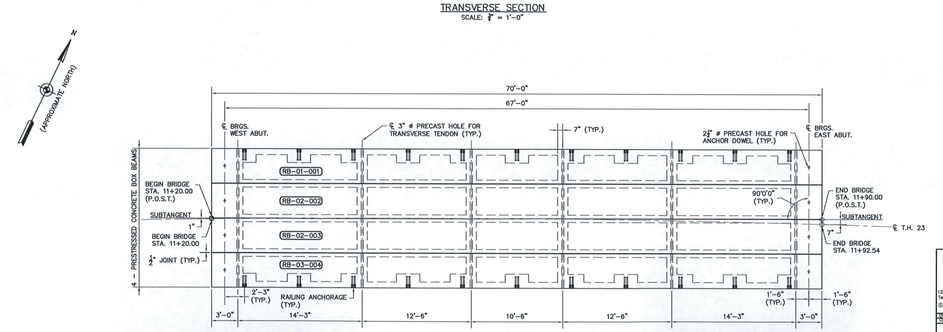
Attachments
cc: [x] Resident Engineer – Jeremy Reed w/prints
[x] Shop Inspector – Jim Wild w/prints
[x] Contractor – Renaud Bros., Inc. w/prints
[x] Construction Division – letter only
[x] Materials & Research Section (C&IA Unit) – letter only
[x] Files (Structures & Central)

VTrans Working to Get You There!

031 Box Beam



TRANSVERSE SECTION
SCALE: ¾" = 1'-0"



BEAM LAYOUT PLAN
SCALE: ¼" = 1'-0"

Vermont Agency of Transportation
RECEIVED
CK'D BY Timothy Fitbach OK'D BY KMH
3:26 pm, Jul 21, 2010
RESUBMIT KMH APPROVED AS NOTED
BY DATE 7-22-2010

STATE OF VERMONT
TIMOTHY J. FITBACH
No. 9128
Structural
REGISTERED PROFESSIONAL ENGINEER

Hoyle, Tanner & Associates, Inc.
125 College Street, 4th Floor Burlington,VT 05401
tel (802)860-1331 • fax (802)860-6499 • www.hoyletanner.com

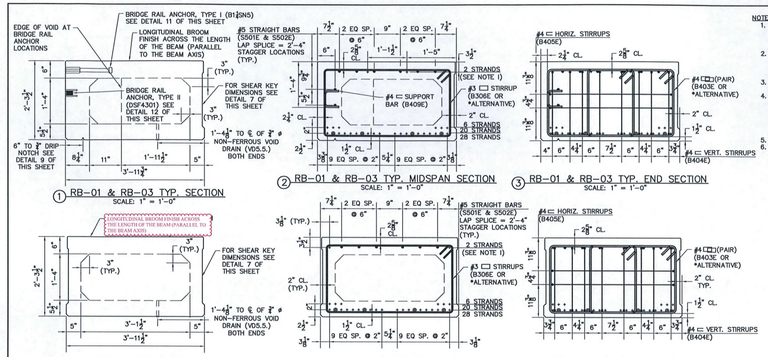
DRAWN BY KAB DATE: JULY 2010
CHECKED BY TJW PROJECT NO. 1444(36)

W.E. DAILEY, INC.
PRECAST CONCRETE PRODUCTS
St. Johnsbury, Vermont
PRECAST CONCRETE PRODUCTS
St. (802) 748-1418 FAX (802) 748-8119

BRAINTREE, VT
T.H. 23 CLASS III
BRIDGE #12
PROJECT NO.: BRO 1444 (36)

SHEET 1 OF 5

032 Box Beam



① RB–01 & RB–03 TYP. SECTION
SCALE: 1" = 1'–0"

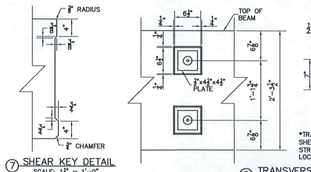
② RB–01 & RB–03 TYP. MIDSPAN SECTION
SCALE: 1" = 1'–0"

③ RB–01 & RB–03 TYP. END SECTION
SCALE: 1" = 1'–0"

④ RB–02 TYP. SECTION
SCALE: 1" = 1'–0"

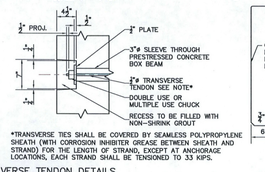
⑤ RB–02 TYP. MIDSPAN SECTION
SCALE: 1" = 1'–0"

⑥ RB–02 TYP. END SECTION
SCALE: 1" = 1'–0"

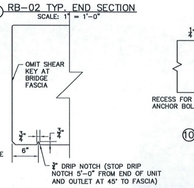


⑦ SHEAR KEY DETAIL
SCALE: 1½" = 1'–0"

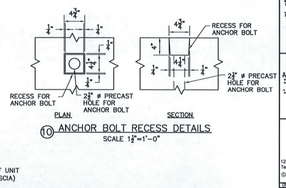
⑧ TRANSVERSE TENDON DETAILS
SCALE 1½"=1'–0"



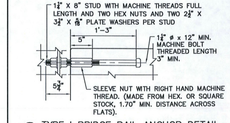
*TRANSVERSE TIES SHALL BE COVERED BY SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITER GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF STRAND, EXCEPT AT ANCHORAGE LOCATIONS, EACH STRAND SHALL BE TENSIONED TO 33 KIPS.



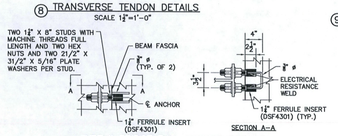
⑨ DRIP NOTCH DETAIL
SCALE 1½"=1'–0"



⑩ ANCHOR BOLT RECESS DETAILS
SCALE 1½"=1'–0"



⑪ TYPE I BRIDGE RAIL ANCHOR DETAIL
SCALE 1½"=1'–0"



⑫ TYPE II BRIDGE RAIL ANCHOR DETAILS
SCALE 1½"=1'–0"

NOTES:
1. (+) INDICATES 0.6" ø LOW RELAXATION STRAIGHT STRAND, AASHTO M203, BOTTOM ROWS OF STRANDS INITIAL TENSION 44 KIPS. TOP ROW OF STRANDS INITIAL TENSION 2 KIPS. 270 KSI MINIMUM ULTIMATE TENSILE STRENGTH.
2. (D) INDICATES 0.6" ø LOW RELAXATION DEBONDED STRAND AASHTO M203. DEBOND 6'–0" FROM END OF BEAM. INITIAL TENSION 44 KIPS. 270 KSI MINIMUM ULTIMATE TENSILE STRENGTH.
3. CONCRETE COMPRESSIVE STRENGTH TESTED BY CYLINDER BREAK TEST.
4. EACH STRAND SHALL BE FINALLY BURNED OR CUT OFF AT A DEPTH OF 3" INTO THE END OF THE BEAM AND THE RECESSED AREA AROUND THE STRAND SHALL BE FILLED WITH CONSPEC 100 NON–SHRINK, NON–METALLIC GROUT MANUFACTURED BY DAYTON SUPERIOR (THIS PRODUCT CAN BE FOUND ON THE PRE–APPROVED PRODUCTS LIST).
5. OMIT SHEAR KEY ON EXPOSED EDGES.
6. THE PRECASTER SHALL SANDBLAST SHEAR KEY FACES PRIOR TO DELIVERY.

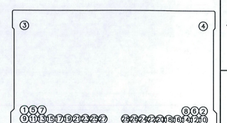
MATERIAL SPECIFICATION
CONCRETE MIX:
28 DAY STRENGTH: 7000 PSI
RELEASE STRENGTH: 5500 PSI
STRAND: AASHTO M203
MILD REINFORCING: ASTM A615M, GR 60 EPOXY COATED

FINISHES
TOP: LONGITUDINAL BROOM FINISH
SIDES: STEEL FORM
BOTTOM: STEEL FORM
ENDS: FORM (SEE NOTE 4)

CUNNAGE
STORAGE: BELOW LIFTING LOOPS
SHIPPING: BELOW LIFTING LOOPS

EXTERIOR BEAM
TOTAL WEIGHT: 70,149 LBS
CONC. YARDAGE: 17.32 CY

INTERIOR BEAM
TOTAL WEIGHT: 63,215 LBS
CONC. YARDAGE: 15.61 CY



DETENSION SCHEDULE

Vermont Agency of Transportation
RECEIVED
CK'D BY Timothy Fillbach OK'D BY KMH
3:26 pm, Jul 21, 2010
RESUBMIT BY KMH APPROVED AS NOTED DATE 7-22-2010

PARTS & PART NUMBERS

B402E
B407E
S501E
S502E
S408E
B403E
B409E
B404E
B402E* (*ALTERNATIVE)
B405E
B403E* (*ALTERNATIVE)
B309E
B306E* (*ALTERNATIVE)

Hoyle, Tanner & Associates, Inc.
125 College Street, 4th Floor Burlington,VT 05401
Tel (802)860–1331 • Fax (802)860–6499 • www.hoylетanner.com

TYPICAL BRIDGE
CHECKED BY: DW
PROJECT NO: 52248.15

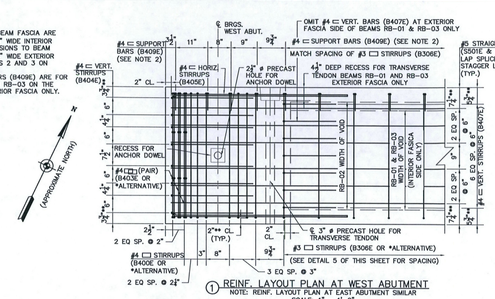
W.E. DAILEY, INC.
PRECAST CONCRETE PRODUCTS
TEL. (802) 442-1418 FAX (802) 442-4219

BRAINTREE, VT
T.H. 23 CLASS III
BRIDGE #12
PROJECT NO.: BRO 1444 (36)

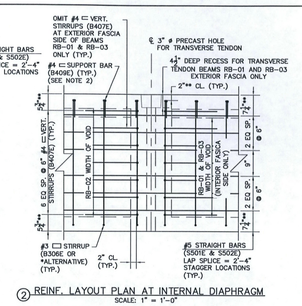
SHEET 2 OF 5

033 Bob Becm

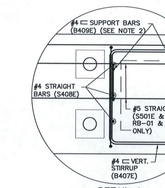
NOTES:
1. **DIMENSIONS TO BEAM FASCIA ARE SHOWN FOR 3'-11½" WIDE INTERIOR BEAMS. FOR DIMENSIONS TO BEAM FASCIA FOR 3'-11½" WIDE EXTERIOR BEAMS SEE DETAILS 2 AND 3 ON SHEET 2.
2. #4 ⊂ SUPPORT BARS (B409E) ARE FOR BEAMS RB-01 AND RB-03 ON THE SIDE OF THE EXTERIOR FASCIA ONLY.



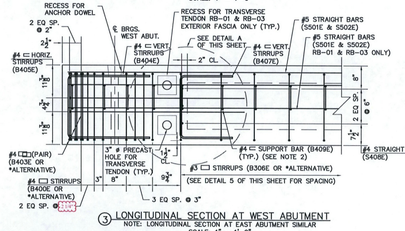
① REINF. LAYOUT PLAN AT WEST ABUTMENT
NOTE: REINF. LAYOUT PLAN AT EAST ABUTMENT SIMILAR
SCALE: 1" = 1'-0"



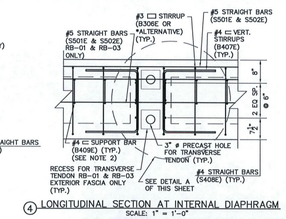
② REINF. LAYOUT PLAN AT INTERNAL DIAPHRAGM
SCALE: 1" = 1'-0"



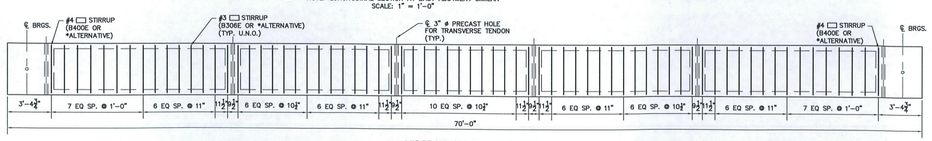
DETAIL A
SCALE: 1½" = 1'-0"



③ LONGITUDINAL SECTION AT WEST ABUTMENT
NOTE: LONGITUDINAL SECTION AT EAST ABUTMENT SIMILAR
SCALE: 1" = 1'-0"



④ LONGITUDINAL SECTION AT INTERNAL DIAPHRAGM
SCALE: 1" = 1'-0"



⑤ MIDSPAN STIRRUP SPACING
SCALE: ½" = 1'-0"

Vermont Agency of Transportation
RECEIVED
CK'D BY Timothy Fitbach OK'D BY KMH
3:26 pm, Jul 21, 2010
RESUBMIT BY KMH APPROVED AS NOTED DATE 7-23-2010

Hoyle, Tanner Associates, Inc.
125 College Street, 4th Floor Burlington,VT 05401
Tel (802)860-1331 • Fax (802)860-6499 • www.hoyletanner.com

DESIGNED BY KAS DRAWN BY JPS
CHECKED BY KMH PROJECT NO. 1444(36)

W.E. DAILEY INC.
PRECAST CONCRETE PRODUCTS
TEL (802) 442-4918 FAX (802) 442-4119

BRAINTREE, VT
T.H. 23 CLASS III
BRIDGE #12

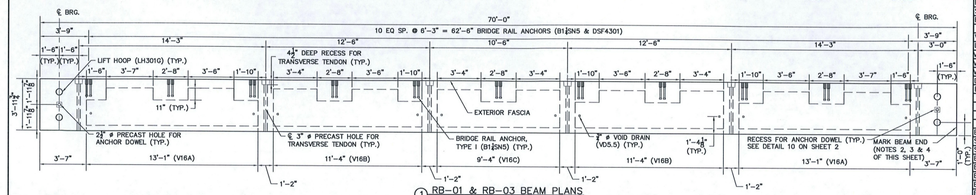
PROJECT NO.: BRO 1444 (36)

SHEET 3 OF 5

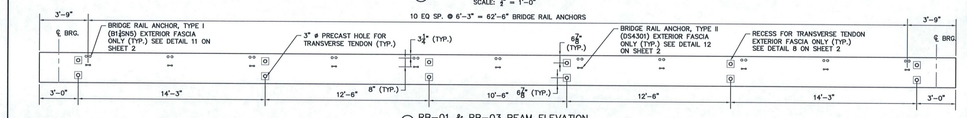
034 Bar Beam

GENERAL NOTES:

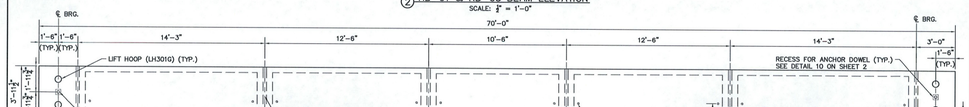
1. SEE DRAWINGS 1, 2, & 3 FOR PLANS AND DETAILS.
2. ALL BEAMS ARE LABELED AS FOLLOWS:
   PRODUCT TYPE-IDENTIFICATION NUMBER-SEQUENCE NUMBER
3. MARK BEAMS RB-01 & RB-02 ENDS "EAST END" FOLLOWED BY THE CORRESPONDING BEAM LABEL.
4. MARK BEAM RB-03 END "WEST END" FOLLOWED BY THE CORRESPONDING BEAM LABEL.
5. THE BAR QUANTITIES LISTED ARE FOR THE SELECTED SOLID HOOP STIRRUP CONFIGURATION. IF IT IS DECIDED TO USE THE BAR ALTERNATIVES OF 2 INTERLOCKING "U" BARS THAN THE BAR QUANTITIES FOR THOSE BARS WILL NEED TO BE DOUBLED. SEE SHEET 2 OF 4 FOR BAR CONFIGURATIONS.



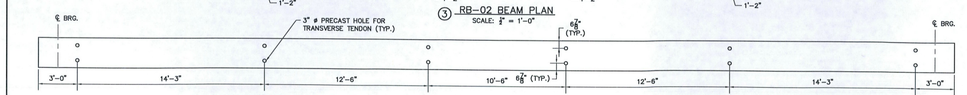
① RB-01 & RB-03 BEAM PLANS
SCALE: ½" = 1'-0"



② RB-01 & RB-03 BEAM ELEVATION
SCALE: ½" = 1'-0"



③ RB-02 BEAM PLAN
SCALE: ½" = 1'-0"



④ RB-02 BEAM ELEVATION
SCALE: ½" = 1'-0"

PART NO.	DESCRIPTION	QTY.
	RB-01 & RB-03 BEAMS	
B400E	#4 BENT	16
S501E	#5 STRAIGHT	8
S502E	#5 STRAIGHT	8
B403E	#4 BENT	12
B404E	#4 BENT	16
B405E	#4 BENT	4
B306E	#3 BENT	80
B407E	#4 BENT	50
S408E	#4 STRAIGHT	30
B409E	#4 BENT	90
VD5.5	2" ø VOID DRAIN 5'-4" LONG	10
LH301G	LIFT HOOP (3) #3 STRANDS	4
V16A	16" VOID, 13'-1" LONG	2
V16B	16" VOID, 11'-4" LONG	2
V16C	16" VOID, 9'-4" LONG	1
DSF4301	1½" FERRULE INSERT	22
B1ΔSN5	1½" BOLT, 1'-0" LONG, WITH 3" SLEEVE NUT	22
	VERMONT STATE MIX DESIGN	1
	RB-02 BEAM	
B400E	#4 BENT	16
S501E	#5 STRAIGHT	6
S502E	#5 STRAIGHT	6
B403E	#4 BENT	12
B404E	#4 BENT	16
B405E	#4 BENT	4
B306E	#3 BENT	80
B407E	#4 BENT	70
S408E	#4 STRAIGHT	30
VD5.5	2" ø VOID DRAIN 5'-4" LONG	10
LH301G	LIFT HOOP (3) #3 STRANDS	4
V16X37½A	16"X37½" VOID, 13'-1" LONG	2
V16X37½B	16"X37½" VOID, 11'-4" LONG	2
V16X37½C	16"X37½" VOID, 9'-4" LONG	1
	VERMONT STATE MIX DESIGN	1

Hoyle, Tanner & Associates, Inc.
125 College Street, 4th Floor Burlington,VT 05401
Tel (802)860-1320 • Fax (802)860-6499 • www.hoyletanner.com

DESIGNED BY: DBA | DRAWN BY: DBA | CHECKED BY: DBA | PROJECT NO.: 1221A.76

W.E. DAILEY
PRECAST CONCRETE PRODUCTS
TEL: (802) 442-4418 FAX: (802) 442-4719

BRAINTREE, VT
T.H. 23 CLASS III
BRIDGE #12

PROJECT NO.: BRO 1444 (36)

SHEET 4 OF 5

035 Bot Beam

1. CONCRETE MIX DESIGN

MIX DESIGNATION: MASS-3 (3,000 PSI @ 6% AIR)

MIX COMPONENTS	PRODUCT DESCRIPTION	LBS PER CY	DENSITY
CEMENT	LAFARGE SF BLEND	757	3.15
POZZOLAN	CLASS F FLY ASH	134	2.3
SAND	W.E. DAILEY NATURAL	1259	2.7
STONE	W.E. DAILEY #67	1470	2.73
WATER	DAILEY WELL	242	1
HIGH-RANGE WATER-REDUCING ADMIXTURE	GLENIUM 3400	91	
AIR-ENTRAINING ADMIXTURE	MB-AE90	8	
CORROSION-INHIBITING ADMIXTURE	RHEOCRETE CNI	704	
DESIGN AIR	AIR	6.0%	

VARIOUS PROPERTIES

UNIT WEIGHT:	144 LB/CF
WATER/CEMENT RATIO:	0.32
AIR SPEC:	6% ± 1.5%
SLUMP/SPREAD:	NOT MORE THAN 29"

ADMIXTURE NOTE:
THE AMOUNT AND TYPE OF WATER REDUCING ADMIXTURES MAY VARY SLIGHTLY FROM DAY TO DAY DEPENDING ON ALLOWABLE VARIATIONS IN RAW MATERIALS (E.G., MOISTURE CONTENT, TEMPERATURE, GRADATIONS, ETC.) VARIATIONS IN ADMIXTURES ARE MADE TO MAINTAIN A FAVORABLE WATER CEMENT RATIO WHILE MAINTAINING A WORKABLE MIXTURE. THEREFORE WHEN THERE IS AN INCREASE IN THE HIGH RANGE WATER REDUCER THERE IS A CORRESPONDING DECREASE IN THE AMOUNT OF WATER REQUIRED. THIS IN TURN INCREASES SLIGHTLY THE AMOUNT OF SAND AND STONE REQUIRED TO MAINTAIN A 1.0 CUBIC YARD YIELD.

GENERAL NOTE:
MODIFICATIONS OR DEVIATIONS FROM THE ORIGINAL MIX AT ANY TIME AFTER THE SHOP DRAWINGS HAVE BEEN APPROVED WILL BE SUBJECT TO THE ACCEPTANCE OF THE ENGINEER.

2. CURING METHOD

UNDER SECTION 510-10 CURING OF PRESTRESSED CONCRETE THE CURING OF METHOD OF RADIANT HEAT IS CITED. WITH CONTROLLED ENVIRONMENT AT DAILEY PRECAST, INC. WITH BURLAP AND BLANKETS ENCAPSULATION THE BRIDGE BEAM, THE BEAM ITSELF IS A SOURCE OF RADIANT HEAT FOR ITSELF.

DAILEY PRECAST, INC. REQUESTS THAT THE RADIANT HEAT OF THE BEAM IS COVERED BY WET BURLAP AND BLANKETS BE CONSIDERED AN ACCEPTABLE METHOD OF CURING.

3. GROUTING PROCEDURES

GROUTING OF SHEAR KEYS:
A. CLEAN JOINTS WITH AN OIL FREE AIR-BLAST IMMEDIATELY BEFORE GROUT PLACEMENT. VERIFY THAT THE BACKER ROD IS STILL IN PLACE.
B. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR ADDITIONAL JOINT PREPARATION AND GROUT PLACEMENT.

GROUTING OF POST-TENSION TRANSVERSE TENDONS:
A. GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI, BASED ON THE MANUFACTURER'S RECOMMENDATIONS, PRIOR TO STRESSING. THE GROUT NEED NOT BE CURED FOR THREE DAYS PRIOR TO THE COMMENCING OF POST-TENSIONING.
B. PROVIDED APPROPRIATE CUBE MOLDS AS DESCRIBED IN AASHTO T106 FOR 3 SETS OF 3 DAY CUBES, 3 SETS OF 28 DAY CUBES AND AT A MINIMUM OF 3 MORE CUBES TO TEST FOR THE 1500 PSI MINIMUM COMPRESSIVE STRENGTH.

GROUTING OF END DETAILS:
A. GROUT ANCHOR BOLTS INTO THE SLEEVES IN THE PRESTRESSED UNITS AT THE FIXED ENDS. BEFORE THE GROUT CURES, PLACE THE WASHER PLATE, AND INSTALL THE NUT ON TOP AND TIGHTEN.
B. PLACE THE COLD POURED JOINT SEALER IN THE SLEEVES IN THE PRESTRESSED UNITS AS THE EXPANSION ENDS. PLACE THE WASHER PLATE AND INSTALL THE NUT ON TOP. HAND TIGHTEN AND THEN LOOSEN ¼ TURN.
C. GROUT OVER THE NUT AND BOLT IN THE ANCHOR BOLT BLOCK OUTS ON THE FIXED ENDS. FILL THE ANCHOR BOLT BLOCK OUTS ON THE EXPANSION ENDS WITH COLD POURED JOINT SEALER.

4. TRANSPORTATION, HANDLING, AND STORAGE DETAILS

1. DEFECTS, WHICH THE SAFETY OF EMPLOYEES AND THE PROTECTIVE CARE OF THE PRODUCT BEING HANDLED, ARE THE CRITICAL FACTORS EACH TIME ANY PRODUCT IS MOVED.
2. THE RECOMMENDED METHOD FOR ANY HANDLING IS TO USE EMBEDDED LIFTING DEVICES WHENEVER POSSIBLE.
3. SPECIAL CARE SHOULD BE TAKEN WHEN FORKLIFT EQUIPMENT IS USED TO PREVENT DAMAGE BY THE FORKS. LIFTING FORKS SHALL HAVE RUBBER PADS OR LUAN TO PROTECT THE CONCRETE FROM DAMAGE.
4. TRUCKS AND OTHER CONVEYANCES USED TO TRANSPORT PRECAST CONCRETE PRODUCTS FROM THE PLANT TO THE ERECTION SITE SHALL BE EQUIPPED AND MAINTAINED TO DELIVER THE PRODUCTS WITHOUT DAMAGE.
5. SOME FORM OF PADDING FOR TIE-DOWN SHALL BE USED TO PROTECT THE EDGE OF THE PRODUCT.
6. SHIPPING RECORDS SHALL BE KEPT OF ALL PRODUCTS AND ACCESSORIES. TRANSPORTATION DAMAGE SHOULD BE RECORDED ON THE SHIPPING RECORDS. SHIPPING MANAGER OR QUALITY ASSURANCE IS TO PREPARE A CERTIFICATION AND AUTHORIZING OF EACH SHIPMENT.

5. INSTALLATION PROCEDURE

1. LAY OUT WORKING LINES:
   A. LAY OUT WORKING LINES FOR THE ENTIRE BRIDGE WIDTH ON THE BEAM SEAT.
   B. MEASURE ALL WORKING LINES FROM A COMMON WORKING POINT.
   C. BASE THE WORKING LINES ON THE NOMINAL BEAM WIDTHS.

2. VERIFY BEAM SEAT ELEVATIONS:
   A. MEASURE ELEVATIONS AT BEAM SEATS.
   B. IF SEATS ARE HIGH OR LOW, TAKE CORRECTIVE ACTION.
   C. INSTALL BEARINGS.

3. ERECT BEAMS:
   A. PLACE BEAMS TO FIT WITHIN THE WORKING LINES.
   B. AS WORK PROGRESSES, INSTALL HARDWOOD WEDGES BETWEEN ADJACENT BEAMS TO MAINTAIN PROPER JOINT OPENING (A MINIMUM OF ONE WEDGE AT EACH TRANSVERSE TENDON).
   C. DRILL ANCHOR BOLT HOLES.
   D. PLACE ANCHOR BOLTS.

4. INSTALL BACKER ROD: PLACE FILLER BELOW THE KEYWAY BOTTOM.

5. INSTALL TRANSVERSE TENDONS:
   A. FEED TENDONS THROUGH DUCTS.
   B. VERIFY THAT HARDWOOD WEDGES ARE IN PLACE AS REQUIRED TO PREVENT SLIPPAGE OF BEAMS.
   C. TRANSVERSE TENDONS SHALL BE COVERED BY SEAMLESS POLYPROPYLENE SHEATH WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND FOR THE LENGTH OF THE STRAND, EXCEPT AT ANCHORAGE LOCATIONS.

6. GROUT SHEAR KEYS:
   A. REFERENCE ITEM 3. GROUTING PROCEDURES.
   B. AFTER GROUTING, CAREFULLY ROD JOINTS TO ELIMINATE ANY POSSIBILITY OF VOIDS.

7. POST-TENSION TRANSVERSE TENDONS:
   A. REFERENCE ITEM 3. GROUTING PROCEDURES.
   B. AFTER GROUTING, POST-TENSION TENDONS TO 30 KIPS USING A CALIBRATED JACK OPERATED BY QUALIFIED PERSONNEL.

8. GROUT END DETAILS:
   A. REFERENCE ITEM 3. GROUTING PROCEDURES.

9. FINISH WORK: REMOVE WEDGES AND PATCH SURFACE AND FASCIA BEAMS AT TRANSVERSE TENDONS.

6. QUALITY CONTROL PROCEDURES

QUALITY ASSURANCE

1. WM. E DAILEY PRECAST LLC. HAS AN ENTIRE DEPARTMENT DEVOTED TO QUALITY CONTROL. THE QUALITY ASSURANCE DEPARTMENT MONITORS, TESTS, AND INSPECTS ALL PRODUCTION IN THE PLANT AND REPORTS DIRECTLY TO THE PLANT MANAGER. IT IS THE POLICY OF THE QUALITY CONTROL DEPARTMENT TO FOLLOW ALL PCI STANDARDS AND TEST PROCEDURES AND ALL APPLICABLE ACI AND ASTM STANDARDS.
2. WM. E DAILEY PRECAST LLC. EMPLOYS A QUALITY ASSURANCE INSPECTOR TO MAINTAIN DAILY OVERVIEW AND INSPECTION OF ALL PRODUCTION. RESPONSIBILITIES INCLUDE THE FOLLOWING:
   - PLANT TESTING OF MATERIALS
   - ACCEPTANCE TESTING OF MATERIALS
   - MIX DESIGN
   - PRE-POUR INSPECTION
   - GENERAL CONDITION OF MOLD, CHAMFERS
   - DIMENSIONAL VERIFICATION
   - SIZE, POSITION OF STRANDS
   - SIZE, POSITION OF REINFORCING STEEL
   - POSITION OF INSERTS
   - SIZE, POSITION OF VOIDS, BLOCKOUTS, ETC.
   - POSITION OF INTEGRAL ITEMS AND ACCESSORIES
   - INSPECTION OF BATCHING, MIXING AND CONVEYING CONCRETE
   - PLACEMENT AND CONSOLIDATION OF CONCRETE
   - FINISHING OF CONCRETE
   - INTEGRAL ITEMS, ACCESSORIES, PLATES, LIFTERS
   - POSTPOUR INSPECTION
   - OVERALL DIMENSIONS
   - INSERT TYPE AND LOCATION
   - VOIDS
   - CONCRETE TESTING
   - SURFACE FINISHES, APPEARANCE
   - CRACKS, DAMAGE
   - IDENTIFICATION OF PIECE
   - HANDLING AND STORAGE
   - PRE-SHIP INSPECTION

ACCEPTANCE TESTING

WM. E DAILEY PRECAST LLC. EMPLOYS ACI CERTIFIED CONCRETE TESTERS TO MONITOR AND TEST CONCRETE DELIVERIES. THE CONCRETE TESTER AND THE INSPECTOR CHECK ALL MATERIAL CERTIFICATES FOR CONTRACT COMPLIANCE AND CONFORMANCE TO STANDARDS.

SAMPLING OF CONCRETE FOR COMPRESSIVE STRENGTH

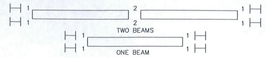
1. ONCE ALL INGREDIENTS ARE BATCHED AND MIXED FOR A MINIMUM OF 90 SECONDS, THE CONCRETE SHALL BE PLACED INTO A 4 CUBIC YARD BUCKET FOR PLACEMENT INTO FORM. PRIOR TO DELIVERING TO FORM, A SAMPLE OF CONCRETE SHALL BE OBTAINED BY AN ACI GRADE 1 FIELD TECHNICIAN.
2. ONCE SAMPLE IS OBTAINED TESTING FOR TEMPERATURE (ASTM C1064), AIR CONTENT (ASTM C231), SLUMP/SPREAD (ASTM C143) AS WELL AS UNIT WEIGHT (ASTM 138) SHALL BEGIN.
3. ONCE ALL TESTING HAS BEEN COMPLETED CONCRETE CYLINDERS SHALL BE CAST WITH SAME CONCRETE AS ABOVE TESTS. AS THE CYLINDERS ARE BEING CAST, FORK TRUCK DRIVER SHALL BE INFORMED BY FIELD TECHNICIAN THAT THE CONCRETE HAS EITHER PASSED OR FAILED. IF PASSED FORK TRUCK DRIVER SHALL DELIVER TO THE BED, IF FAILED CONCRETE SHALL BE REJECTED AND DEPOSITED ELSEWHERE.

7. CAMBER

DAILEY PRECAST, INC. TAKES PRIDE IN ABILITY AND DUE DILIGENCE IN PROVIDING QUALITY PRODUCTS WITH CONSISTENT CAMBER THAT ARE WELL WITHIN THE RANGE OF PCI TOLERANCES. THAT BEING SAID, CAMBER WILL BE CHECKED. IF NEEDED, AN ARRAY OF WEIGHTS WILL BE ON SITE TO ENSURE THAT ALL BEAMS ARE AT THE SAME CAMBER PRIOR TO THE GROUT AND POST-TENSIONING PROCESSES.

8. TRANSFER OF PRESTRESSING FORCE PROCEDURE

DETENSIONING THE STRANDS WILL BE PERFORMED WITH TWO SETS OF OXYGEN ACETYLENE TORCHES SIMULTANEOUSLY AT THE LOCATIONS SHOWN BELOW, DEPENDING ON NUMBER OF BEAMS CAST. THE STRANDS WILL BE CUT SYMMETRICALLY AROUND THE VERTICAL CENTERLINE OF THE STRAND PATTERN.



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DESIGN BY: KAS DATE: JULY 2010
CHECKED BY: DSH PROJECT NO: 10HT6.75

W.E. DAILEY INC
PRECAST CONCRETE PRODUCTS
So. Barre, Vt. (802) 476-4118 FAX (802) 476-4119

BRAINTREE, VT
T.H. 23 CLASS III
BRIDGE #12

PROJECT NO.: BRO 1444 (36)

SHEET 5 OF 5

038 Box Beam

VERMONT

State of Vermont
PDD/Structures Design Section
One National Life Drive
Montpelier, VT 05633-5001
www.aot.state.vt.us

Agency of Transportation

[phone] 802-828-2621
[fax] 802-828-3566
[ttd] 800-253-0191

May 5, 2010

DI Highway Sign & Structure Corporation
P.O. Box 123 (40 Greenman Ave)
New York Mills, N.Y. 13417

Project Name: Braintree BRO 1444(36)

Structure Identification: Bridge 12 over Ayers Brook

The Bridge Railing, Item 900.640 Special Provision (Bridge Railing, Galvanized HDSB/Fascia Mounted/Steel Tubing) fabrication drawings, for the above-referenced bridge project (General Contractor – Renaud Brothers, Inc.), have been reviewed and are being returned herewith.

All Sheets and welding procedures are approved.

You must provide notice to our fabrication inspector, Jeff Clark, as to the date fabrication represented by these drawings will begin. Jeff may be contacted by phone at (802)828-0044 or email at jeff.clark@state.vt.us. Any material fabricated prior to the notification date is subject to rejection without further cause.

Sincerely,
Kristin M. Higgins

Kristin M. Higgins PE
Structures Project Manager

Attachments

cc: [x] Resident Engineer – Jeremy Reed
[x] Shop Inspector – Jeff Clark
[x] Contractor – Renaud Brothers, Inc.
[x] Construction Division letter only
[x] Materials & Research Section (C&IA Unit) letter only
[x] Files (Structures)

VERMONT

037 Bridge Rail

WELDING PROCEDURE SPECIFICATION

MATERIAL SPECIFICATION **A572 GR 50, A709 GR 50, AASHTO M270-50**
WELDING PROCESS **FCAW**
MANUAL, SEMIAUTOMATIC, AUTOMATIC **SEMIAUTOMATIC**
POSITON OF WELDING 1F (**FLAT**)
FILLERMETAL SPECIFICATIONS **AWS 5.20**
FILLER METAL CLASSIFICATION **E71T-1**
ELECTRODE & MANUFACTURE **Ultracore 71C** (Lincoln)
FLUX & MANUFACTURE **N/A**
SHIELDING GAS **100%CO2** DEW POINT **-40°F** FLOW RATE **MIN 49.5 CFH MAX 60 CFH**
SINGLE OR MULTIPLE PASS **SINGLE**
SINGLE OR MULTIPLE ARC **N/A**
WELDING CURRENT **DC** POLARITY **DCEP** (REVERSE)
WELDING PROGRESSION **N/A**
ROOT TREATMENT **CLEAN TO REMOVE ALL CONTAMINANTS**
PREHEATAND INTERPASS **3/4 TO 1 ½ = 70°F, 1 ½ TO 2 ½= 150°F >2 ½ = 225°F**
350°F MAX INTERPASS TEMP.
POSTHEAT TREATMENT **NONE**

WELDING PROCEDURE

PASS NO.	ELECTRODE SIZE	AMPS	VOLTS	TRAVEL SPEED IN/MIN
ALL	1/16"	300	27	11.6
		Max 330	Max 29	Max 12.7
		Min 270	Min 25	Min 10.5

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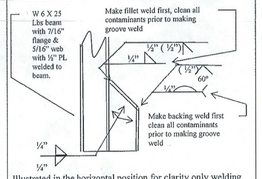
CK'D BY ____ DWG BY JWC
APR 23 2010
RESUBMIT ____ APPROVED ✓
BY ____ DATE 5/4/10

JOINT DETAIL

Bridge post

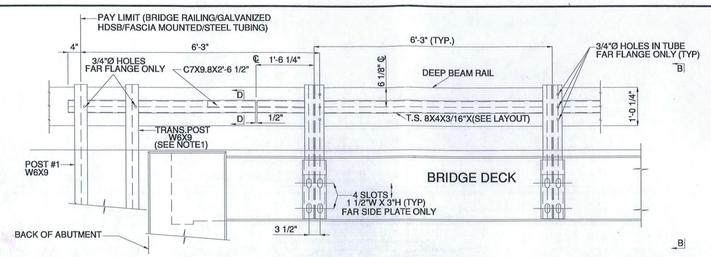


Illustrated in the horizontal position for clarity only welding to be completed in the flat position.

PROCEDURE NO: DI-01 FABRICATOR **DI-HIGHWAY SIGN & STRUCTURE**
OUR JOB NO. V04-02 Bridge Post AUTHORIZED BY
PQR REF NO. **DI-01-09a** DATE 4/22/10

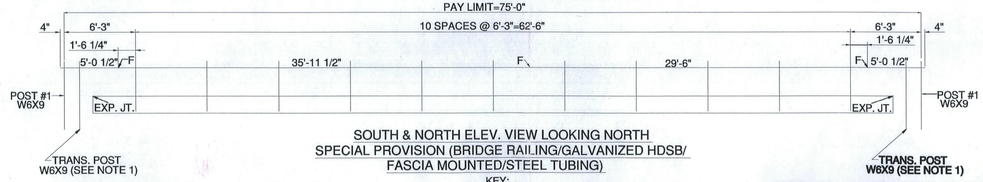
JOEL W. SIMS
CWI 96030971
QC1 EXP. 03/01/11

038 Bridge Rail



NOTE 1: LOCATE TRANSITION POST AS CLOSE TO ABUTMENT WALL AS PRACTICAL

RAILING ELEVATION



SOUTH & NORTH ELEV. VIEW LOOKING NORTH
SPECIAL PROVISION (BRIDGE RAILING/GALVANIZED HDSB/ FASCIA MOUNTED/STEEL TUBING)

KEY:
F=1/2" SPL. JT.

NOTES: FOR SECTION VIEWS B-B & D-D SEE SHEET 2 OF 3.

Vermont Agency of Transportation
RECEIVED
CK'D BY TCF OK'D BY JTS
9:09 am, Apr 27, 2010
RESUBMIT APPROVED X
BY KMH DATE 4-27-10

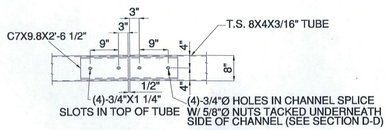
ALL DIMENSIONS MUST BE FIELD VERIFIED BY CONTRACTOR PRIOR TO FABRICATION

DRAWN BY: JJP	DATE 4/9/10	CHECKED BY: DCK	SHEET NO. 1 OF 3

BRIDGE RAILING LAYOUT
VERMONT AGENCY OF TRANSPORTATION
MENARD ROAD BRIDGE (STA. 11+55.00)
OVER AYERS BROOK IN THE TOWN OF BRAINTREE
IN THE COUNTY OF ORANGE

CONT. NO. BRO 1444(36)	REGION NO. N/A
GEN. CONT. RENAUD BROTHERS, INC.	
ERECTOR: VERMONT RECREATIONAL SURFACING & FENCING, INC.	
FABRICATOR: DI HIGHWAY SIGN & STRUCTURE CORPORATION P.O. BOX 123(40 GREENMAN AVE.) NEW YORK MILLS, N.Y. 13417 PH. (315)736-8312	JOB NO. V04-02

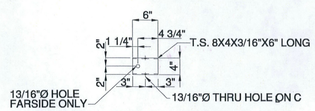
039 Bridge Rail



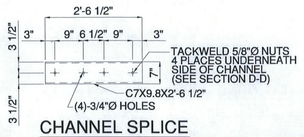
SPLICE JOINT ASSEMBLY

SPECIAL WASHER

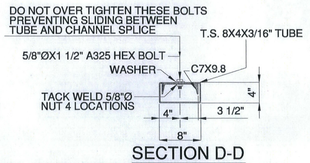
PLACE WASHER BETWEEN BOLT
HEAD AND FACE OF RAIL.



FRONT VIEW OF BLOCKOUT

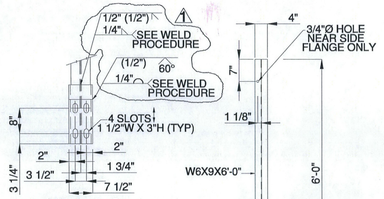


CHANNEL SPLICE



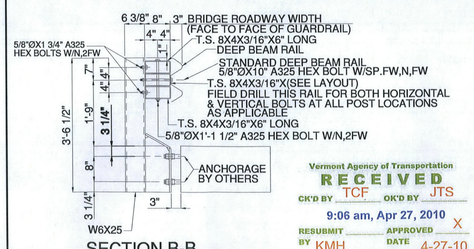
SECTION D-D

SEE SHEET 1 FOR WHERE SECTION WAS TAKEN



VIEW C-C

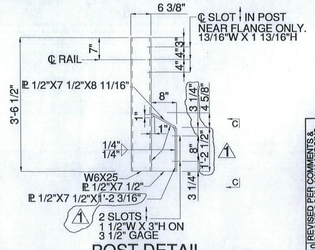
FRONT FACE STEEL POST



SECTION B-B

SEE SHEET 1 FOR WHERE SECTION WAS TAKEN

Vermont Agency of Transportation
RECEIVED
CK'D BY TCF OK'D BY JTS
9:06 am, Apr 27, 2010
RESUBMIT BY KMH APPROVED DATE 4-27-10
X



POST DETAIL

ALL DIMENSIONS MUST BE FIELD VERIFIED BY CONTRACTOR PRIOR TO FABRICATION

DRAWN BY: JJP	DATE 4/9/10	CHECKED BY: DCK	SHEET NO. 2 OF 3

BRIDGE RAILING DETAILS
VERMONT AGENCY OF TRANSPORTATION
MENARD ROAD BRIDGE (STA. 11+55.00)
OVER AYER'S BROOK IN THE TOWN OF BRAINTREE
IN THE COUNTY OF ORANGE

CONT. NO. BRO 1444(36)	REGION NO. N/A
GEN. CONT. RENAUD BROTHERS, INC.	
ERECTOR: VERMONT RECREATIONAL SURFACING & FENCING, INC.	
FABRICATOR: DI HIGHWAY SIGN & STRUCTURE CORPORATION P.O. BOX 123(40 GREENMAN AVE.) NEW YORK MILLS, N.Y. 13417 PH: (315)736-8312	JOB NO. V04-02

1 4/28/10 REVISED DRW COMMENTS & PREDRILL WW HOLES

540 Bridge Rail

FASCIA MOUNTED WITHOUT CURB NOTES

1. HEAVY DUTY STEEL BEAM GUARD RAIL SHALL CONFORM TO VT. SPECIFICATION SECTION 732.
2. STRUCTURAL STEEL TUBING SHALL CONFORM TO VT. SPECIFICATION SECTION 732 GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH (AASHTO M111) ASTM A123.
3. BRIDGE RAIL POSTS, SPECIAL WASHERS, PLATE WASHERS AND SPLICE BARS SHALL CONFORM TO (AASHTO M223) A572 GR50 GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH (AASHTO M111) ASTM A123.
4. ALL BOLTS AND RELATED HARDWARE SHALL CONFORM TO (AASHTO M164) ASTM A325 TYPE 1 BOLTS, HOT DIPPED OR MECHANICALLY GALVANIZED PER SPECIFICATION.
5. ALL POSTS SHALL BE SET NORMAL GRADE.
6. SPLICES FOR THE STEEL BEAM GUARD RAIL SHALL LAP IN THE DIRECTION OF TRAFFIC.
7. ALL FIELD CUT OR DRILLED AREAS SHALL BE REPAIRED PER SECTION 513.
8. ALL FLAT WASHERS SHALL CONFORM TO ASTM F436. ⚠
9. ALL NUTS SHALL CONFORM TO ASTM A563, GRADE H.

BILL OF MATERIAL

	MARK OR USE	QTY.	SHAPE	SHAPE FT.	SHAPE IN.	REMARKS
*	RAIL	2	T.S. 8"X4"X3/16" WALL	35	11 1/2	ASTM A500GRB
*	RAIL	2	T.S. 8"X4"X3/16" WALL	29	6	ASTM A500GRB
*	RAIL	4	T.S. 8"X4"X3/16" WALL	5	0 1/2	ASTM A500GRB
	CHANNEL SPLICE	6	C7X9.8	2	6 1/2	ASTM A36 ⚠2 ⚠1 W/4-5/8"Ø H.S. NUTS
	SPLICE BOLT	24	5/8"Ø HEX BOLT		1 1/2	ASTM A325(AASHTO M164)TYPE1 W/FW
*	BLOCKOUT	44	T.S. 8"X4"X3/16" WALL		6	ASTM A500GRB
	BLOCKOUT BOLT	44	5/8"Ø HEX BOLT		1 3/4	ASTM A325(AASHTO M164)TYPE1 W/N,2FW
	POST BOLT	30	5/8"Ø HEX BOLT		10	ASTM A325(AASHTO M164)TYPE1 W/SP.FW,N,FW
	RAIL BOLT	22	5/8"Ø HEX BOLT	1	1 1/2	ASTM A325(AASHTO M164)TYPE1 W/N,2FW
	CORRUGATED RAIL	12	⚠1 (10 GAGE CORRUGATED	13	6	(AASHTO M180(CLASS B, TYPE 2) ⚠1
	POST ASS'Y.	22			⚠1	
	FASCIA PLATE	22	PL 1/2"X7 1/2"	1	2 3/16	ASTM A36(AASHTO M183)
	TOP PLATE	22	PL 1/2"X7 1/2"		8 11/16	ASTM A36(AASHTO M183)
	WEB PLATE	22	PL 1/2"X7 1/2"	AS	REQ'D	ASTM A36(AASHTO M183)
	POST	22	W6X25	3	6 1/2	ASTM A572 GR50(AASHTO M223)
	POST	8	W6X9	6	0	⚠1 ASTM(A709 GR36(AASHTO M270 GR 250)
	CORRUGATED BOLT	96	5/8"Ø BUTTON HEAD OVAL SHOULDER CORRUGATED SPLICE BOLT		1 1/4	ASTM A307 W/DBL.REC. N

* THE DROP-WEIGHT TEAR TEST IN SECTION 732 SHALL NOT APPLY TO THE STRUCTURAL TUBING.

Vermont Agency of Transportation
RECEIVED
CK'D BY TCF OK'D BY JTS
1:43 pm, Apr 27, 2010
RESUBMIT BY KMH APPROVED X DATE 4-27-10

ALL DIMENSIONS MUST BE FIELD VERIFIED BY CONTRACTOR PRIOR TO FABRICATION

PAY LIMIT FOR SPECIAL PROVISION RAIL=150.0000FT.(APPROX.)

DRAWN BY:	DATE	CHECKED BY:	SHEET NO.
JJP	4/9/10	DCK	3 OF 3

BRIDGE RAILING LAYOUT B.O.M
VERMONT AGENCY OF TRANSPORTATION
MENARD ROAD BRIDGE (STA. 11+85.00)
OVER AYERS BROOK IN THE TOWN OF BRAINTREE
IN THE COUNTY OF ORANGE

CONT. NO. BRO 1444(36)	REGION NO. N/A
GEN. CONT. RENAUD BROTHERS, INC.	
ERECTOR: VERMONT RECREATIONAL SURFACING & FENCING, INC.	
FABRICATOR: PH. (315)736-8312 DI HIGHWAY SIGN & STRUCTURE CORPORATION P.O. BOX 123(40 GREENMAN AVE.) NEW YORK MILLS, N.Y. 13417	JOB NO. V04-02

⚠2 4-27-10 REVISED PER PENCIL CONV. W/K HIGGINS
⚠1 4-26-10 REVISED PER PENCIL CONV. W/K HIGGINS

041 Bridge Rail