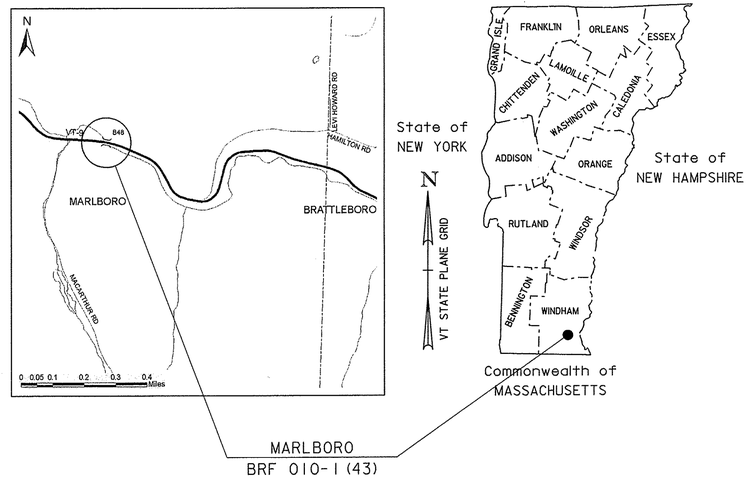
STATE OF VERMONT
AGENCY OF TRANSPORTATION

PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF MARLBORO
COUNTY OF WINDHAM

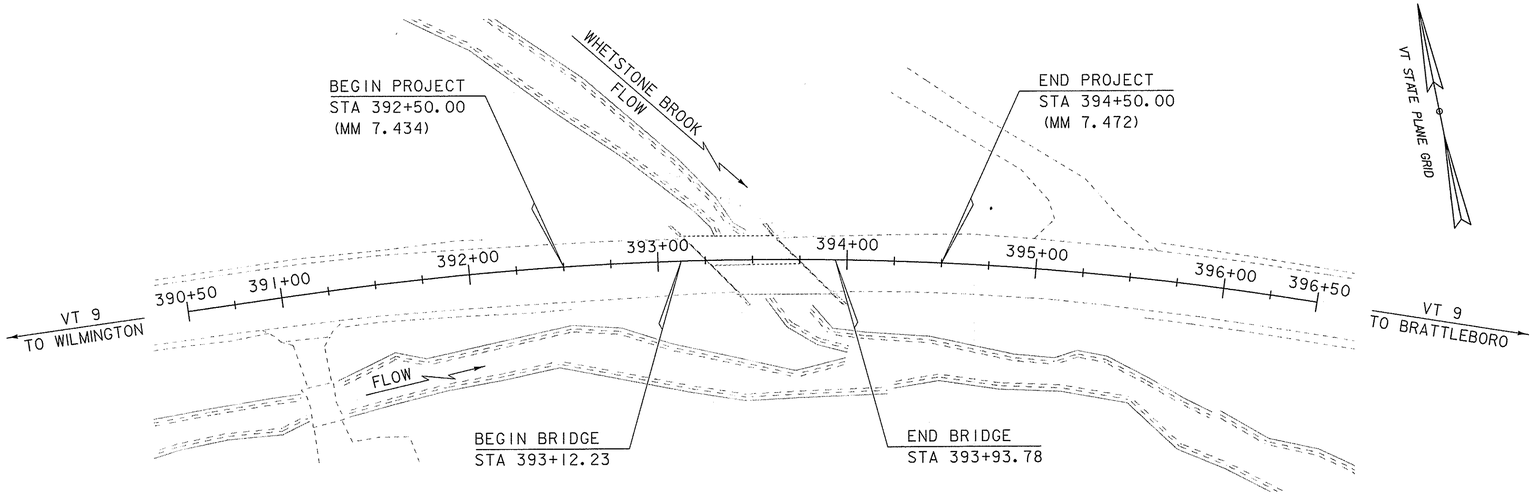
ROUTE NO : VT 9, PRINCIPAL ARTERIAL-NHS BRIDGE NO : 48



PROJECT LOCATION: BEGINNING ON VT RT 9 APPROXIMATELY 0.870 MILES WESTERLY OF THE MARLBORO AND BRATTLEBORO TOWN LINE AND EXTENDING EASTERLY ALONG VT RT 9 FOR 200 FEET.

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

LENGTH OF STRUCTURE:	81.55 FEET
LENGTH OF ROADWAY:	118.45 FEET
LENGTH OF PROJECT:	200.00 FEET



QUALITY ASSURANCE PROGRAM: LEVEL 2

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

SR SR SR

SURVEYED BY : R. GILMAN
SURVEYED DATE : 6/16/2011

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83(96)

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

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

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

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED _____ DATE 8-27-13

PROJECT MANAGER : KRISTIN HIGGINS, P.E.

PROJECT NAME : MARLBORO
PROJECT NUMBER : BRF 010-1(43)

SHEET 1 OF 50 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version 09.02.03

LRFD

INDEX OF SHEETS

PLAN SHEETS

STANDARDS LIST

STRUCTURES DETAILS

AS BUILT "REBAR" DETAIL

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

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2014	5300	730	52	11.1	590
2034	5600	770	52	15.5	870

20 year ESAL for flexible pavement from 2014 to 2034 : 3994000

40 year ESAL for flexible pavement from 2014 to 2054 : 8745000

Design Speed : 50 mph

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: August 2013

DRAINAGE AREA : 3.3 sq. mi.
CHARACTER OF TERRAIN : Mostly forested, rural, mountainous, ponds
STREAM CHARACTERISTICS : Sinuous
NATURE OF STREAMBED : Gravel and cobbles

PEAK FLOW DATA

Q 2.33 =	190 cfs	Q 50 =	590 cfs
Q 10 =	370 cfs	Q 100 =	680 cfs
Q 25 =	485 cfs	Q 500 =	880 cfs

DATE OF FLOOD OF RECORD: Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ Q50 = 9.9 fps
ICE CONDITIONS : Moderate
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No
IS ORDINARY RISE RAPID? No
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Maybe
IF YES, DESCRIBE: May be affected by confluence with downstream brook

WATERSHED STORAGE: 2%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single span rolled beam bridge
YEAR BUILT: 1940, reconstructed in 1969
CLEAR SPAN(NORMAL TO STREAM): 36'
VERTICAL CLEARANCE ABOVE STREAMBED: 7'
WATERWAY OF FULL OPENING: 170 sq. ft.
DISPOSITION OF STRUCTURE: Replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 =	1290.5'	VELOCITY =	6.2 fps
Q10 =	1291.5'	"	7.0 fps
Q25 =	1291.9'	"	7.8 fps
Q50 =	1292.2'	"	8.6 fps
Q100 =	1292.5'	"	9.3 fps

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY:
RELIEF ELEVATION: 1294.0'
DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: Marlboro
HIGHWAY # : TH 20
CLEAR SPAN:
YEAR BUILT: 1945
STRUCTURE TYPE: Timber
DISTANCE: 5000'
STRUCTURE #: BR 11
CLEAR HEIGHT:
FULL WATERWAY:

DOWNSTREAM STRUCTURE

TOWN: Marlboro
HIGHWAY # :
CLEAR SPAN:
YEAR BUILT:
STRUCTURE TYPE: Confluence with unnamed stream
DISTANCE: 80'
STRUCTURE #:
CLEAR HEIGHT:
FULL WATERWAY:

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY	2.84	1.37					
POSTING							
OPERATING	3.68	1.77	2.85	1.85	2.58	2.3	2.45
COMMENTS:							

PILE DRIVING AND TESTING REQUIREMENTS

1. NOMINAL PILE DRIVING CAPACITY — Rndr: ---
2. PILE TEST RESISTANCE FACTOR — ϕ: ---
3. MAXIMUM PILE TIP ELEVATION — SEE GEN. NOTES
4. ALL PILES WILL BE SET IN PRE-EXCAVATED HOLES INTO BEDROCK. SEE GENERAL NOTES FOR ADDITIONAL INFORMATION.

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span steel beam bridge

CLEAR SPAN(NORMAL TO STREAM): 60'
VERTICAL CLEARANCE ABOVE STREAMBED: 6.1'
WATERWAY OF FULL OPENING: 230 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	1290.1'	VELOCITY=	5.8 fps
Q10 =	1291.0'	"	8.0 fps
Q25 =	1291.3'	"	9.4 fps
Q50 =	1291.6'	"	10.3 fps
Q100 =	1291.9'	"	10.8 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY:
RELIEF ELEVATION: 1294.0'
DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 1293.3'
VERTICAL CLEARANCE: @ Q50 = 1.7'

SCOUR: Contraction scour @Q100 = 1.0' and @Q500 = 1.5'

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW:	7 cfs	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	3 cfs	0.5'
ORDINARY HIGH WATER:	80 cfs	1.5'

TEMPORARY BRIDGE REQUIREMENTS

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

ADDITIONAL INFORMATION

Confluence with unnamed stream 80' downstream of bridge

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN ONE-WAY TRAFFIC ON THE EXISTING STRUCTURE.
2. INSTALL AND MAINTAIN TRAFFIC SIGNALS.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	1.5 INCH
3. DESIGN SPAN	L:	80.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5. PRESTRESSING STRAND	f_y:	---
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'_c:	---
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:	---
12. REINFORCING STEEL	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270 (WEATHERING)	f_y:	50 KSI
14. SOIL UNIT WEIGHT	γ:	0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	—
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
17. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	70.0 KSF
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
19. NOMINAL AXIAL PILE RESISTANCE	q_p:	---
20. PILE YIELD STRENGTH ASTM A572	f_y:	50 KSI
21. PILE SIZE		HP 10X57
22. EST. PILE LENGTH (AVERAGE)	L_p:	13 FT
23. PILE RESISTANCE FACTOR	ϕ:	---
24. LATERAL PILE DEFLECTION	Δ:	---
25. BASIC WIND SPEED	V_{3s}:	---
26. MINIMUM GROUND SNOW LOAD	p_g:	---
27. SEISMIC DATA PGA: ---	S_s:	---
	S_1:	---

PROJECT NAME: **MARLBORO**
PROJECT NUMBER: **BRF 010-1(43)**

FILE NAME: **s10b414pi.dgn**
PROJECT LEADER: **K. HIGGINS**
DESIGNED BY: **R. KLINEFELTER**
PRELIMINARY INFORMATION SHEET

PLOT DATE: 9/11/2013
DRAWN BY: **K. FRIEDLAND**
CHECKED BY: **G. LAROCHE**

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2011 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2012 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.

2. ALL PRECAST SUBSTRUCTURE AND APPROACH SLAB CONCRETE ELEMENTS SHALL BE FABRICATED TO THE SPECIFIED DIMENSIONS AND ERECTED IN THE SPECIFIED LOCATIONS, ALL WITHIN TOLERANCES DEFINED ON THE PLANS AND IN THE PRECAST/PRESTRESSED CONCRETE INSTITUTE TOLERANCE MANUAL FOR PRECAST AND PRESTRESSED CONCRETE CONSTRUCTION, MNL 135-00, AND ITS LATEST REVISIONS.

3. ALL PREFABRICATED BRIDGE UNITS SHALL BE FABRICATED TO THE SPECIFIED DIMENSIONS AND ERECTED IN THE SPECIFIED LOCATIONS, ALL WITH TOLERANCES DEFINED ON THE PLANS AND UNDER ITEM 900.675 SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE).

4. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.

5. NO ADJUSTMENTS TO THE BITUMINOUS WEARING SURFACE ON THE BRIDGE SHALL BE MADE TO ACCOUNT FOR THE DIFFERENCE BETWEEN PREFABRICATED BRIDGE UNIT CAMBER AND THE THEORETICAL ROADWAY PROFILE. THE WEARING SURFACE SHALL BE SHIMMED TRANSVERSELY AS NECESSARY TO ACCOUNT FOR POTENTIAL DIFFERENTIAL CAMBER OF THE ADJACENT UNITS.

6. THERE ARE EXISTING AERIAL ELECTRIC AND TELEPHONE LINES THAT RUN PARALLEL TO VT 9 ON BOTH SIDES OF THE PROJECT THAT WILL BE MOVED TO THE NORTHERN SIDE. THE CONTRACTOR SHALL WORK AROUND AND PROTECT THESE LINES. SEE UTILITY SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

7. NO SUBSTITUTION FOR PRECAST CONCRETE APPROACH SLABS OR ABUTMENTS, INCLUDING WINGWALLS, WILL BE PERMITTED.

TRAFFIC CONTROL

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING THE TRAFFIC CONTROL PACKAGE IDENTIFYING THE CONSTRUCTION PROJECT BEFORE, DURING, AND AFTER THE EXISTING TRAFFIC PATTERN IS ALTERED. THE CONTRACTOR SHALL SUBMIT A DETAILED TRAFFIC CONTROL PLAN TO THE RESIDENT ENGINEER FOR ALL STAGES OF CONSTRUCTION, FOR APPROVAL PER SUBSECTION 105.03. ALL COSTS SHALL BE INCLUDED IN ITEM 900.645, “SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)”. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

9. ALL SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD. WHERE CONFLICTS EXIST, THE MUTCD SHALL GOVERN. FOR ADDITIONAL SIGNING INSTRUCTIONS SEE THE E SERIES OF THE STANDARDS.

10. ALL ITEMS REQUIRED TO IMPLEMENT THE CONTRACTOR’S TRAFFIC CONTROL PLAN WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED INCLUDED IN THE BID PRICE FOR ITEM 900.645, “SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)”.

11. AT LEAST ONE PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) SHALL BE POSITIONED IN ADVANCE OF EACH APPROACH TO THE WORK ZONE ADVISING OF THE ACTIVITY AHEAD.

EARTHWORK

12. PHASED REMOVAL OF THE EXISTING STRUCTURE SHALL BE PAID FOR UNDER ITEM 529.15, "REMOVAL OF STRUCTURE". THIS WORK SHALL INCLUDE REMOVAL OF ANY PORTIONS OF THE EXISTING ABUTMENTS THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION.

13. THE “STONE FILL, TYPE III” UNDER THE BRIDGE AS SHOWN IN THE PLANS SHALL BE PLACED BEFORE THE PREFABRICATED BRIDGE UNITS ARE SET.

CONCRETE

14. ITEM 514.10, "WATER REPELLENT, SILANE", SHALL BE APPLIED TO ALL EXPOSED CONCRETE ON THE BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE, WITH THE EXCEPTION OF THE BOTTOM OF THE DECK BETWEEN THE DRIP NOTCHES.

15. ALL PRECAST SUBSTRUCTURE AND APPROACH SLAB CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 540 – PRECAST CONCRETE.

16. ALL PREFABRICATED BRIDGE UNIT CONCRETE SHALL MEET THE REQUIREMENTS UNDER ITEM 900.675, “SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)”.

17. THE UNIT PRICE FOR PREFABRICATED BRIDGE UNITS SHALL INCLUDE CURBS, AND ALL RELATED LABOR AND MATERIALS. THIS WORK SHALL BE PAID FOR UNDER ITEM 900.675, “SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)”.

18. ALL CONCRETE FOR PREFABRICATED BRIDGE UNIT CLOSURE POURS, PRECAST APPROACH SLAB CLOSURE POURS, AND ABUTMENT PILE CAVITIES SHALL MEET THE REQUIREMENTS OF ITEM 900.608, “SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)”.

19. GROUT FOR THE VOID BETWEEN PREFABRICATED BRIDGE UNITS AND BRIDGE SEAT SHALL BE MORTAR, TYPE IV IN ACCORDANCE WITH SECTION 540 – PRECAST CONCRETE. MORTAR SHALL BE MIXED ON SITE AS NEEDED. READY MIXED MORTAR WILL NOT BE PERMITTED. GROUT FOR MECHANICAL SPLICES FOR BAR REINFORCEMENT SHALL BE APPROVED BY THE SPLICE MANUFACTURER. THE CONTRACTOR SHALL SUBMIT A GROUTING PROCEDURE PROPOSAL TO THE ENGINEER, INCLUDING A PREMIX NAME BRAND FOR APPROVAL.

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

21. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE "CONCRETE REINFORCING STEEL INSTITUTE".

22. ALL REINFORCING STEEL IN THE PREFABRICATED BRIDGE UNITS AND ALL OTHER SUPERSTRUCTURE REINFORCING STEEL SHALL MEET THE REQUIREMENTS FOR LEVEL III CORROSION RESISTANCE, SOLID STAINLESS REINFORCING STEEL IN ACCORDANCE WITH SECTION 507. PAYMENT FOR CLOSURE POUR REINFORCING WILL BE PAID UNDER ITEM 507.13. ALL OTHER SUPERSTRUCTURE REINFORCING, INCLUDING CURB REINFORCING, WILL BE PAID UNDER ITEM 900.675, “SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)”.

23. ALL REINFORCING STEEL IN THE PRECAST APPROACH SLABS AND ABUTMENTS, INCLUDING WINGWALLS, SHALL MEET THE REQUIREMENTS FOR LEVEL II CORROSION RESISTANCE IN ACCORDANCE WITH SECTION 507. PAYMENT FOR APPROACH SLAB CLOSURE POUR REINFORCING WILL BE PAID UNDER ITEM 507.12. PAYMENT FOR ALL OTHER APPROACH SLAB AND ABUTMENT REINFORCING WILL BE MADE UNDER THE APPROPRIATE SECTION 540 CONTRACT ITEM.

24. ALL MECHANICAL SPLICES FOR BAR REINFORCEMENT SHALL MEET THE REQUIREMENTS OF SECTION 507 – REINFORCING STEEL. LEVEL I CORROSION RESISTANCE (EPOXY) WILL BE PERMITTED FOR MECHANICAL SPLICE CONNECTORS IN ABUTMENT-TO-WINGWALL AND ABUTMENT-TO-PREFABRICATED BRIDGE UNIT CONNECTIONS ONLY. CORROSION RESISTANCE FOR ALL OTHER MECHANICAL SPLICES SHALL MATCH THE BARS THAT THEY ARE INTENDED TO SPLICE.

25. A TEMPLATE SHALL BE USED FOR THE LAYOUT OF MECHANICAL SPLICES FOR BAR REINFORCEMENT. THE SAME TEMPLATE SHALL BE USED FOR MATCHING FACES OF EACH CONNECTION.

26. ALL CONNECTIONS BETWEEN PRECAST/PREFABRICATED UNITS SHALL BE DRY FIT PRIOR TO DELIVERY TO THE PROJECT SITE.

27. FORMWORK FOR SURFACES ON THE PREFABRICATED BRIDGE UNITS AND PRECAST APPROACH SLABS THAT WILL BE IN CONTACT WITH LONGITUDINAL CLOSURE POURS SHALL BE TREATED WITH CONCRETE SURFACE RETARDER, OR SIMILAR, TO PROVIDE A ROUGHENED SURFACE; AND POWER WASHED WITH WATER PRIOR TO ERECTION.

PRECAST ABUTMENTS AND POST-TENSIONING

28. THE UNIT PRICE FOR EACH PRECAST ABUTMENT SHALL INCLUDE THE ASSOCIATED WINGWALLS, AND ALL LABOR AND MATERIALS TO CONNECT WINGWALLS TO THE PILE CAPS. THIS WORK SHALL BE PAID FOR UNDER ITEM 540.10, “PRECAST CONCRETE STRUCTURE (ABUTMENT #1)” AND “PRECAST CONCRETE STRUCTURE (ABUTMENT #2)” AS APPROPRIATE.

29. A VERTICAL CONSTRUCTION JOINT IS REQUIRED FOR PHASED PLACEMENT OF THE PRECAST ABUTMENTS. THE PRECAST ABUTMENT SECTIONS SHALL BE KEYED AND MATCH CAST. A JOINT DETAIL SHALL BE SHOWN ON THE FABRICATION DRAWINGS. THE FABRICATOR MAY ALTER THE LOCATION OF THE JOINT TO ACCOMMODATE THE SPECIFIC CONSTRUCTION PHASING PLAN. THE FABRICATOR MAY PROPOSE ADDITIONAL CONSTRUCTION JOINTS IF REQUIRED FOR SHIPMENT OF THE ABUTMENTS. ALTERNATE OR ADDITIONAL JOINT LOCATIONS MUST BE APPROVED BY THE PROJECT MANAGER.

30. ALL POST-TENSIONING STRAND AND CONDUIT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 510 – PRESTRESSED CONCRETE. GALVANIZED ANCHOR ASSEMBLIES, CONDUIT, AND POST-TENSIONING STRANDS SHALL BE INCLUDED UNDER ITEM 540.10, “PRECAST CONCRETE STRUCTURE (ABUTMENT #1) AND “PRECAST CONCRETE STRUCTURE (ABUTMENT #2)” AS APPROPRIATE. POST-TENSIONING STRANDS SHALL BE COVERED WITH SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF THE STRAND, EXCEPT AT ANCHORAGE LOCATIONS.

31. GALVANIZE ANCHOR ASSEMBLIES AFTER FABRICATION ACCORDING TO AASHTO M232M/M 232.

32. DESIGN VALUES
    - i. CONCRETE COMPRESSIVE STRENGTH: f'c = 5000 PSI.
    - ii. POST-TENSIONING STRANDS: 0.5 INCH DIAMETER, 270 KSI, LOW RELAXATION 7-WIRE STRANDS.
    - iii. ASSUMED MODULUS OF ELASTICITY IS 28,500 KSI.
    - iv. THERE SHALL BE 2 STRANDS PER CONDUIT.
    - v. JACKING FORCE PER STRAND = 32 KIPS

33. THE CORRUGATED STEEL PIPE SHALL MEET THE REQUIREMENTS OF SUBSECTION 711.01. ALL COSTS ASSOCIATED WITH PLACING THE CORRUGATED STEEL PIPE SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 540.10, “PRECAST CONCRETE STRUCTURE (ABUTMENT #1)” AND ITEM 540.10, “PRECAST CONCRETE STRUCTURE (ABUTMENT #2)”.

34. PROPOSED SEQUENCE OF SUBSTRUCTURE CONSTRUCTION:
    - i. PHASE 1:
        - a. PREPARE AND GRADE FOUNDATION TO REQUIRED ELEVATION.
        - b. PRE-BORE PILE LOCATIONS.
        - c. SET PILES.
        - d. CHECK FOUNDATION GRADE AND PLACE PRECAST ABUTMENT SECTIONS.
        - e. FILL PILE CAVITIES WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)”.
        - f. PLACE PRECAST WINGWALLS AND GROUT MECHANICAL SPLICE CONNECTORS.
        - g. BACKFILL MAY BE COMPLETED AFTER SPLICE CONNECTOR GROUT HAS REACHED 85% OF 5,000 PSI.
        - h. POST-TENSIONING DUCTS IN PRECAST ABUTMENT SECTIONS SHALL REMAIN ACCESSIBLE UNTIL PHASE 2 POST-TENSIONING IS COMPLETE.
    - ii. PHASE 2:
        - a. PREPARE AND GRADE FOUNDATION TO REQUIRED ELEVATION.
        - b. PRE-BORE PILE LOCATIONS.
        - c. SET PILES.
        - d. CHECK FOUNDATION GRADE AND PLACE PRECAST ABUTMENT SECTIONS.
            - i. APPLY EPOXY TO MATCH CAST FACES OF VERTICAL CONSTRUCTION JOINT.
        - e. INSTALL TRANSVERSE POST-TENSIONING STRANDS.
        - f. USE A CALIBRATED JACK TO TENSION TO 3 KIPS TO REMOVE SAG IN STRANDS.
        - g. CHECK ALIGNMENT OF PRECAST ABUTMENT SECTIONS.
        - h. STRESS POST-TENSIONING STRANDS USING A CALIBRATED JACK OPERATED BY QUALIFIED PERSONNEL WHO HAVE PREVIOUS EXPERIENCE IN POST-TENSIONING.
        - i. FILL PILE CAVITIES WITH ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)”.
        - j. PLACE PRECAST WINGWALLS AND GROUT MECHANICAL SPLICE CONNECTORS.
        - k. BACKFILL MAY BE COMPLETED AFTER SPLICE CONNECTOR GROUT HAS REACHED 85% OF 5,000 PSI.

35. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED FOR APPROVAL BY THE PROJECT MANAGER.

PREFABRICATED BRIDGE UNITS

36. PREFABRICATED BRIDGE UNITS ARE A NON-PROPRIETARY PRODUCT.

37. STRUCTURAL STEEL MEMBERS DESIGNATED “CVN” IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01.

38. ANY HOLES IN THE WEBS OF FASCIA BEAMS NOT OTHERWISE FILLED SHALL BE FILLED WITH BUTTON HEAD BOLTS. THESE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.19.

39. ANY CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE PROJECT MANAGER FOR APPROVAL.

40. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF SUBSECTION 506.10.

41. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8” DIAMETER HIGH STRENGTH BOLTS IN 15/16” DIAMETER HOLES, PER SECTION 506 UNLESS OTHERWISE NOTED.

42. FLEMING BRACKETS OR SIMILAR FALSE WORK SHALL BE PLACED AT A MAXIMUM SPACING OF 4 FEET. THE BRACKETS SHALL BEAR NEAR THE BOTTOM FLANGE AND IN NO CASE SHALL THEY BEAR ABOVE THE BOTTOM QUARTER WEB.

43. AFTER THE BEAMS HAVE BEEN ERECTED AT THE PREFABRICATED BRIDGE UNIT FABRICATION LOCATION, ELEVATIONS SHALL BE TAKEN ALONG THE TOP OF THE BEAMS AS DIRECTED BY THE RESIDENT ENGINEER, FOR USE IN DETERMINING THE FINISHED GRADE.

44. BEAM WEBS AND CROSS FRAMES SHALL BE PLUMB IN FINAL POSITION.

45. METHOD OF FORMING THE PREFABRICATED BRIDGE UNIT LONGITUDINAL CLOSURE POURS SHALL BE DETERMINED BY THE CONTRACTOR. THE FORMS SHALL BE REMOVABLE AND ABLE TO ACCOMMODATE DIFFERENTIAL CAMBER. FORM SUPPORTS SHALL NOT BE ATTACHED TO ANY PREFABRICATED SUPERSTRUCTURE ELEMENT BY DRILLING OR SIMILAR MEANS.

46. THE REINFORCING STEEL EXTENDING INTO THE LONGITUDINAL CONNECTION ON THE RIGHT SIDE OF PBU 3 AT EACH END MAY NEED TO BE INSTALLED AFTER THE PHASE 2 ABUTMENT SECTION IS PLACED DEPENDING ON THE SPECIFIC CONSTRUCTION PHASING PLAN. THE CONTRACTOR SHALL VERIFY ALL CLEARANCES AND IF NECESSARY PROPOSE A METHOD FOR INSTALLING REINFORCING STEEL USING MECHANICAL SPLICES FOR BAR REINFORCEMENT IN AREAS WHERE CLEARANCES CANNOT BE MET. ALL COSTS ASSOCIATED WITH PLACING THE MECHANICAL SPLICES SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 900.675, “SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)”.

47. THE FABRICATOR MAY ALTER THE DESIGN AS DETAILED IN THESE PLANS TO ACCOMMODATE THEIR SPECIFIC OPERATION. THIS ALTERATION SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT AND MEET THE SPECIFIED CRITERIA AND MUST BE APPROVED BY THE PROJECT MANAGER.

48. PROPOSED SEQUENCE OF SUPERSTRUCTURE CONSTRUCTION:
    - i. LAY OUT WORKING LINES THE ENTIRE WIDTH OF THE BRIDGE ALONG CENTERLINE OF BEARING, MEASURED FROM A SINGLE WORKING POINT. THE WORKING LINES SHALL BE BASED ON THE NOMINAL PREFABRICATED BRIDGE UNIT WIDTHS.
    - ii. VERIFY THE BRIDGE SEAT ELEVATIONS AND TAKE CORRECTIVE ACTION IF NECESSARY.
    - iii. INSTALL BEARING PADS.
    - iv. ERECT THE PREFABRICATED BRIDGE UNITS TO FIT WITHIN THE WORKING LINES.
    - v. ADJUST THE EXTERIOR UNIT SO THAT THE FASCIA FITS SNUG AGAINST THE CORK ON INTERIOR OF CHEEK WALL.
    - vi. CONSTRUCT FORMS FOR THE FLANGE CONNECTION POURS.
    - vii. COMPLETE LONGITUDINAL CLOSURE POURS BETWEEN PREFABRICATED BRIDGE UNIT FLANGES AND CURE.
    - viii. GROUT SUBSTRUCTURE TO SUPERSTRUCTURE MECHANICAL SPLICE CONNECTORS AND VOID BETWEEN BRIDGE SEAT AND BOTTOM OF PREFABRICATED BRIDGE UNITS AND CURE.
    - ix. APPLY SHEET MEMBRANE WATERPROOFING TO BACKWALLS.
    - x. BACKFILL AND PREPARE GRADE FOR APPROACH SLABS.
    - xi. PLACE PRECAST APPROACH SLAB SECTIONS.
    - xii. GROUT APPROACH SLAB ANCHOR DOWELS.
    - xiii. COMPLETE LONGITUDINAL CLOSURE POURS BETWEEN PRECAST APPROACH SLAB SECTIONS.

49. ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED FOR APPROVAL BY THE PROJECT MANAGER.

H-PILES

50. THE PILE LOCATIONS SHALL BE PRE-EXCAVATED WITH A MINIMUM PENETRATION OF 3 FEET INTO COMPETENT BEDROCK. THE MINIMUM REQUIRED PILE LENGTH IS 10 FEET. IF COMPETENT BEDROCK IS ENCOUNTERED SHALLOWER THAN 7 FEET BELOW THE BOTTOM OF THE PILE CAP, PRE-EXCAVATION TO A MINIMUM DEPTH OF 10 FEET BELOW THE PILE CAP IS REQUIRED.

51. ALL PRE-EXCAVATED HOLES SHALL BE 20 INCHES IN DIAMETER. THE ENTIRE PRE-EXCAVATED HOLE SHALL BE BACKFILLED WITH SAND AFTER THE PILE IS SET. SAND SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 703.03. REFER TO THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

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

53. THE TOPS OF THE PILES AFTER BACKFILLING WITH SAND SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN 3 INCHES. THE PILE ORIENTATION SHALL NOT VARY BY MORE THAN 5 DEGREES. THE CONTRACTOR SHALL DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER HOW THE TOLERANCES WILL BE MET. THESE MEASURES SHALL BE DEMONSTRATED IN A SUBMITTAL TO BE ACCEPTED BEFORE PILE PLACEMENT COMMENCES.

54. PRE-EXCAVATION IS REQUIRED AT ALL PILE LOCATIONS. PAYMENT SHALL BE PAID FOR UNDER ITEM 900.640, “SPECIAL PROVISION (PRE-EXCAVATION OF INTEGRAL ABUTMENTS PILES, EARTH)” OR ITEM 900.640, “SPECIAL PROVISION (PRE-EXCAVATION OF INTEGRAL ABUTMENTS PILES, ROCK)”.

MISCELLANEOUS

55. ITEM 520.10, “MEMBRANE WATERPROOFING, SPRAY APPLIED” SHALL BE APPLIED TO THE BRIDGE DECK AS PER THE MANUFACTURER’S INSTRUCTIONS AND EXTEND ONTO THE APPROACH SLABS TWO FEET BEYOND THE BEGIN BRIDGE/END OF BRIDGE. IF TRAFFIC WILL BE DRIVING DIRECTLY ON THE MEMBRANE SURFACE, AN AGGREGATE WEARING SURFACE SHALL BE ADHERED TO THE TOP MEMBRANE COAT PER THE SPECIFICATIONS.

56. EXISTING CONDITIONS SHEET HAS BEEN INCLUDED FOR THE CONTRACTOR TO USE FOR SUBMITTALS.

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10414gen.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
GENERAL NOTES

PLOT DATE: 13-SEP-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE

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				**EARTHWORK SUMMARY**
						1300				1300		CY	COMMON EXCAVATION	203.15		1300	CY	COMMON EXCAVATION (1300*1.0)
								1700		1700		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27		1275	CY	UNCLASSIFIED CHANNEL EXCAVATION (1700*0.75)
						200				200		CY	SAND BORROW	203.31		412.5	CY	STRUCTURE EXCAVATION (550*0.75)
						1				1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22		2987.5	CY	SUB TOTAL
								550		550		CY	STRUCTURE EXCAVATION	204.25		12	CY	ROUNDING
								325		325		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30		3000	CY	TOTAL FILL AVAILABLE
						450				450		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10		25	CY	TOTAL FILL REQUIRED
						850				850		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35		2975	CY	TOTAL WASTE
						50				50		CY	AGGREGATE SHOULDERS, IN PLACE	402.10				**SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANITIY)**
						8				8		CWT	EMULSIFIED ASPHALT	404.65		195	TON	TYPE IIS
						1				1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50		275	TON	TYPE IVS
								1		1		LS	SHORING SUPERSTRUCTURE	502.10		470	TON	TOTAL SUPERPAVE
								156		156		LF	STEEL PILING, HP 10 X 57	505.12				
								500		500		LB	REINFORCING STEEL, LEVEL II	507.12				
								1500		1500		LB	REINFORCING STEEL, LEVEL III	507.13				
								15		15		GAL	WATER REPELLENT, SILANE	514.10				
								81		81		LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10				
								371		371		SY	MEMBRANE WATERPROOFING, SPRAY APPLIED	520.10				
								81		81		LF	JOINT SEALER, HOT POURED	524.11				
								168		168		LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33				
								1		1		EACH	REMOVAL OF STRUCTURE (1,500 SF - EST)	529.15				
								24		24		EACH	BEARING DEVICE ASSEMBLY, PLAIN ELASTOMERIC PAD	531.16				
								1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #1)	540.10				
								1		1		LS	PRECAST CONCRETE STRUCTURE (ABUTMENT #2)	540.10				
								1		1		LS	PRECAST CONCRETE STRUCTURE (APPROACH SLAB #1)	540.10				
								1		1		LS	PRECAST CONCRETE STRUCTURE (APPROACH SLAB #2)	540.10				
							1			1		MGAL	DUST CONTROL WITH WATER	609.10				
								1150		1150		CY	STONE FILL, TYPE III	613.12				
													BEGIN OPTION AA					
						160				160		LF	PRECAST REINFORCED CONCRETE CURB, TYPE B	616.26				
						160				160		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28				
													END OPTION AA					
						4				4		EACH	YIELDING MARKER POSTS	619.17				
						200				200		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED	621.21				
						4				4		EACH	MANUFACTURED TERMINAL SECTION, TANGENT	621.51				
						4				4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	621.72				
						487.5				487.5		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
						200				200		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
						1000				1000		HR	FLAGGERS	630.15				

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414quantity_sheets.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
QUANTITY SHEET 1

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: J. SALVATORI

STATE OF VERMONT
AGENCY OF TRANSPORTATION

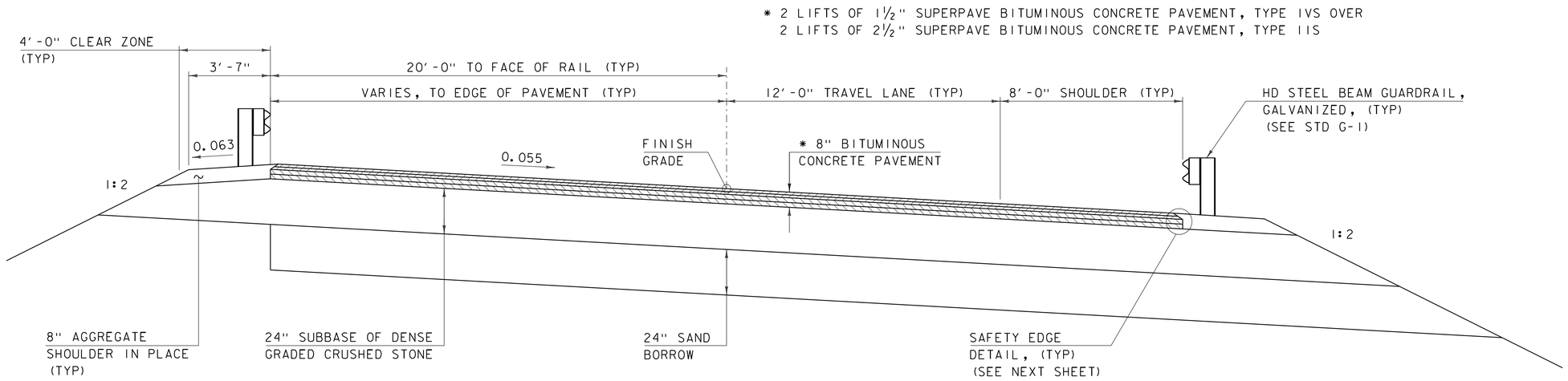
QUANTITY SHEET 2

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		LS	FIELD OFFICE, ENGINEERS	631.10				
									1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
									1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
									3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
						1				1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
						850				850		LF	4 INCH WHITE LINE	646.20				
						850				850		LF	4 INCH YELLOW LINE	646.21				
								1400		1400		SY	GEOTEXTILE UNDER STONE FILL	649.31				
							185			185		SY	GEOTEXTILE FOR SILT FENCE	649.51				
							225			225		SY	GEOTEXTILE FOR FILTER CURTAIN	649.61				
							5			5		LB	SEED	651.15				
							5			5		LB	SEED, WINTER RYE	651.17				
							40			40		LB	FERTILIZER	651.18				
							1			1		TON	AGRICULTURAL LIMESTONE	651.20				
							1			1		TON	HAY MULCH	651.25				
							70			70		CY	TOPSOIL	651.35				
								775		775		SY	GRUBBING MATERIAL	651.40				
							1			1		LS	EPSC PLAN	652.10				
							40			40		HR	MONITORING EPSC PLAN	652.20				
							1			1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30				
							400			400		SY	TEMPORARY EROSION MATTING	653.20				
							90			90		CY	VEHICLE TRACKING PAD	653.35				
							600			600		LF	PROJECT DEMARCATION FENCE	653.55				
						0.66				0.66		SF	TRAFFIC SIGNS, TYPE A	675.20				
						89				89		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
						6				6		EACH	REMOVING SIGNS	675.50				
						4				4		EACH	ERECTING SALVAGED SIGNS	675.60				
								27		27		CY	SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)(FPQ)	900.608				
								40		40		LF	SPECIAL PROVISION (PRE-EXCAVATION OF INTEGRAL ABUTMENT PILES, EARTH)	900.640				
								110		110		LF	SPECIAL PROVISION (PRE-EXCAVATION OF INTEGRAL ABUTMENT PILES, ROCK)	900.640				
						1				1		LS	SPECIAL PROVISION (CPM SCHEDULE)	900.645				
						1				1		LS	SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)	900.645				
						1				1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY)(N.A.B.I.)	900.650				
						1				1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650				
								382		382		SY	SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE)	900.675				
						470				470		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

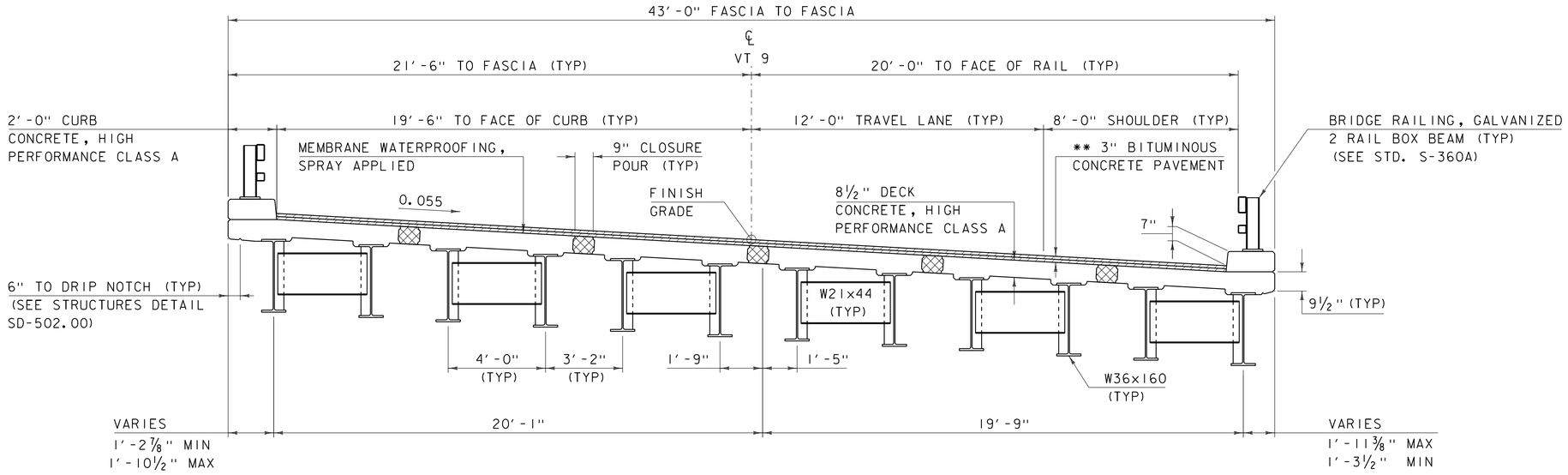
FILE NAME: s10b414quantity_sheets.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
QUANTITY SHEET 2

PLOT DATE: 19-SEP-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: J. SALVATORI



ROADWAY TYPICAL SECTION

SCALE: 3/8" = 1'-0"



** 2 LIFTS OF 1½" SUPERPAVE BITUMINOUS CONCRETE PAVEMENT, TYPE IVS

BRIDGE TYPICAL SECTION

SCALE: 3/8" = 1'-0"

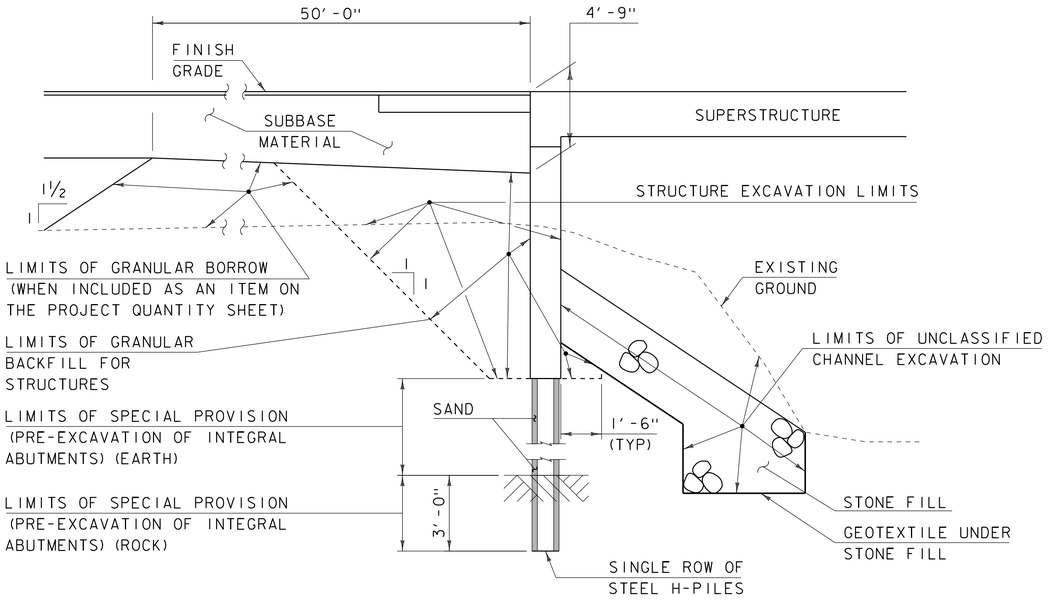
MATERIAL TOLERANCES
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- ¼"
- AGGREGATE SURFACE COURSE	+/- ½"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414typ.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
TYPICAL SECTIONS 1

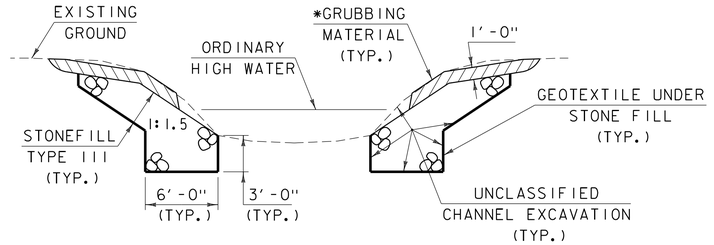
PLOT DATE: 19-SEP-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 6 OF 50



TYPICAL INTEGRAL ABUTMENT SECTION

NOT TO SCALE

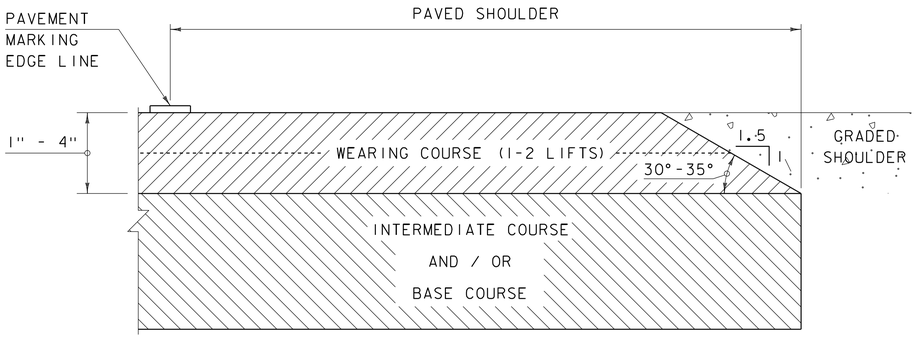
ACTUAL LIMITS OF STRUCTURE EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR. HOWEVER, ONLY THE EXCAVATION BETWEEN THE LIMITS SHOWN WILL BE PAID FOR UNDER THE ITEM 204.25 "STRUCTURE EXCAVATION". EXCAVATION BY THE CONTRACTOR OUTSIDE OF THESE LIMITS WILL BE AT THE EXPENSE OF THE CONTRACTOR.



CHANNEL TYPICAL SECTION

NOT TO SCALE

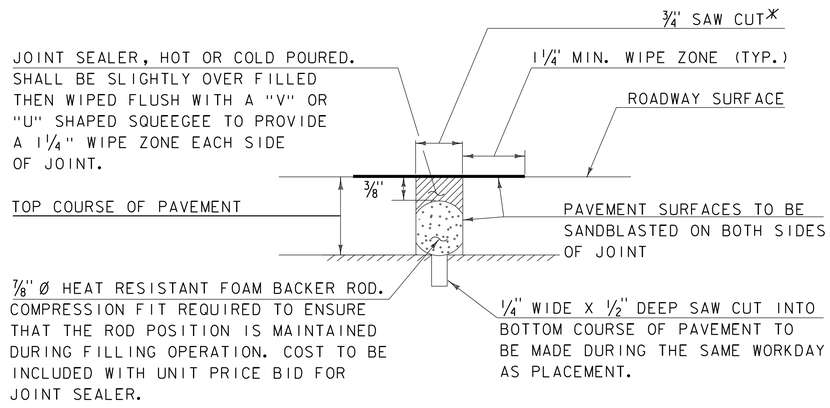
*GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.



SAFETY EDGE DETAIL

NOT TO SCALE

NOTE: LEVELING COURSE MAY INCLUDE THE "SAFETY EDGE" AT THE CONTRACTOR'S CHOICE.



SAWED PAVEMENT JOINT DETAIL

(NOT TO SCALE)

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

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10b414typ.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
TYPICAL SECTIONS 2	SHEET 7 OF 50

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

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

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

POINT	CODE	DESCRIPTION
	CH	CHANNEL EASEMENT
	CONST	CONSTRUCTION EASEMENT
	CUL	CULVERT EASEMENT
	D&C	DISCONNECT & CONNECT
	DIT	DITCH EASEMENT
	DR	DRAINAGE EASEMENT
	DRIVE	DRIVEWAY EASEMENT
	EC	EROSION CONTROL
	I&M	INSTALL & MAINTAIN EASEMENT
	LAND	LANDSCAPE EASEMENT
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
●	IPNS	IRON PIN SET
◎	IPNS	IRON PIN TO BE SET
⊠	CALC	CALCULATED ROW POINT
[DISTANCE]		DISTANCE CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

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

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

PROPOSED GEOMETRY CODES

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

UTILITY SYMBOLOGY

UNDERGROUND UTILITIES

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

ABOVE GROUND UTILITIES (AERIAL)

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

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

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

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

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

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

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

ENVIRONMENTAL RESOURCES

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

ARCHEOLOGICAL & HISTORIC

- ARCH — ARCHEOLOGICAL BOUNDARY
- HISTORIC DIST — HISTORIC DISTRICT BOUNDARY
- HISTORIC — HISTORIC AREA
- Ⓗ — HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

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

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: sl0b4l4Legend.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: J. SALVATORI
LEGEND SHEET	SHEET 8 OF 50

GPS CONTROL POINTS

HVCTRL #1

" D 14 RESET "

N = 138636.34
E = 1587856.07
ELEV. = 1360.39

TO REACH FROM THE EAST END OF THE VT ROUTE 9 BRIDGE OVER I-91 IN BRATTLEBORO GO WEST ALONG VT ROUTE 9 FOR 6.8 MI (10.9 KM) TO THE INTERSECTION OF ASPEN DRIVE OR WOLF ROAD RIGHT AND MCARTHUR ROAD LEFT. TURN RIGHT AND GO NORTH ALONG ASPEN DRIVE FOR 0.15 MI (0.24 KM) TO MR ESAUS 2 STORY WOOD FRAME HOUSE AND SITE OF MARK ON LEFT. THE MARK IS SET IN THE TOP OF A 4.8 M (15.7 FT) X 1.0 M (3.3 FT) ROCK OUTCROP WHICH PROJECTS 0.5 M (1.6 FT) ABOVE GROUND SURFACE INA FLOWER BED. IT IS 26.8 M (87.9 FT) WEST OF AND ABOUT 2 M (6.6 FT) HIGHER THAN THE CENTERLINE OF ASPEN DRIVE, 7.1 M (23.3 FT) WEST OF THE CENTERLINE OF GRAVEL DRIVE TO THE HOUSE, 26.3 M (86.3 FT) SOUTH OF THE SOUTHEAST CORNER OF THE HOUSE, AND 4.4 M (14.4 FT) NORTHEAST OF THE NORTHEAST CORNER OF A GARAGE.

HVCTRL #8

" TURNER "

N = 137154.88
E = 1590676.52
ELEV. = 1271.37

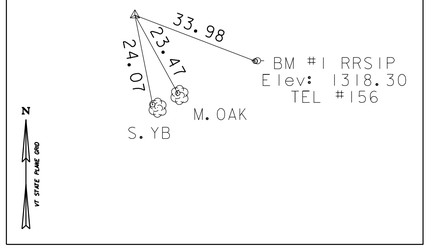
TO REACH FROM WEST END OF THE VT. ROUTE 9 BRIDEGS OVER I-91 GO WEST ALONG VT. ROUTE 9 FOR 6.4 MI (10.3 KM) TO THE INTERSECTION OF HAMILTON ROAD RIGHT. CONTINUE WEST TO FIND A SAFE TURN AROUND AND RETURN TO THE INTERSECTION OF HAMILTON ROAD LEFT. TURN LEFT AND GO NORTH ALONG HAMILTON ROAD FOR 0.05 MI (0.08 KM) TO THE MARK ON THE LEFT IN A LAWN. THE MARK IS SET IN THE TOP OF A 0.4 M (1.3 FT.) X 0.4 M (1.3 FT) ROCK OUTCROP WHICH IS FLUSH WITH THE GROUND SURFACE. IT IS 6.6 M (21.7 FT) WEST OF AND ABOUT 1.0 M (3.3 FT) HIGHER THAN THE CENTERLINE OF HAMILTON ROAD, 16.0 M (52.5 FT) SOUTHEAST OF A 35 CM MAPLE, 29.6 M (97.1 FT) NORTH OF THE END OF A STONEWALL, 39.0 M (128.0 FT) NORTHEAST OF THE NORTHEAST CORNER OF AN ATTACHED GARAGE, 11.0 M (36.1 FT) WEST OF A FIBERGLASS WITNESS POST.

• Description provided by Vermont Agency of Transportation Geodetic Unit

TRAVERSE TIES

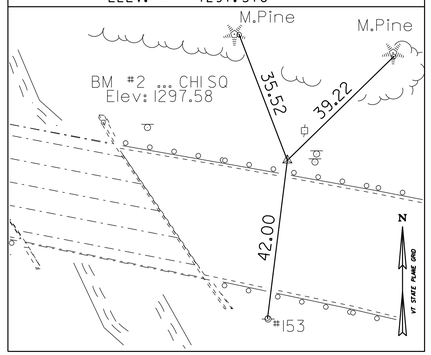
HVCTRL #3

NORTH =	137913.983
EAST =	1588033.422
ELEV. =	1316.717



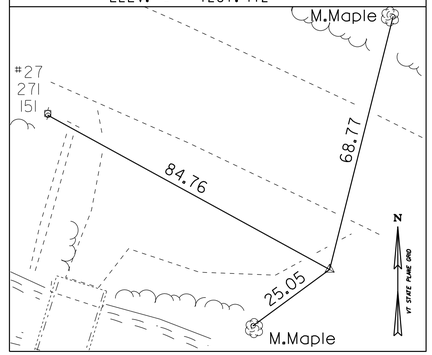
HVCTRL #4

NORTH =	137868.240
EAST =	1588998.310
ELEV. =	1297.570



HVCTRL #5

NORTH =	137595.674
EAST =	1589591.281
ELEV. =	1287.412



*Main Traverse Completed 10/27/98 by R.Gilman P.C. & T.Companion & G.Hitchcock [83b100]

ALIGNMENT TIES

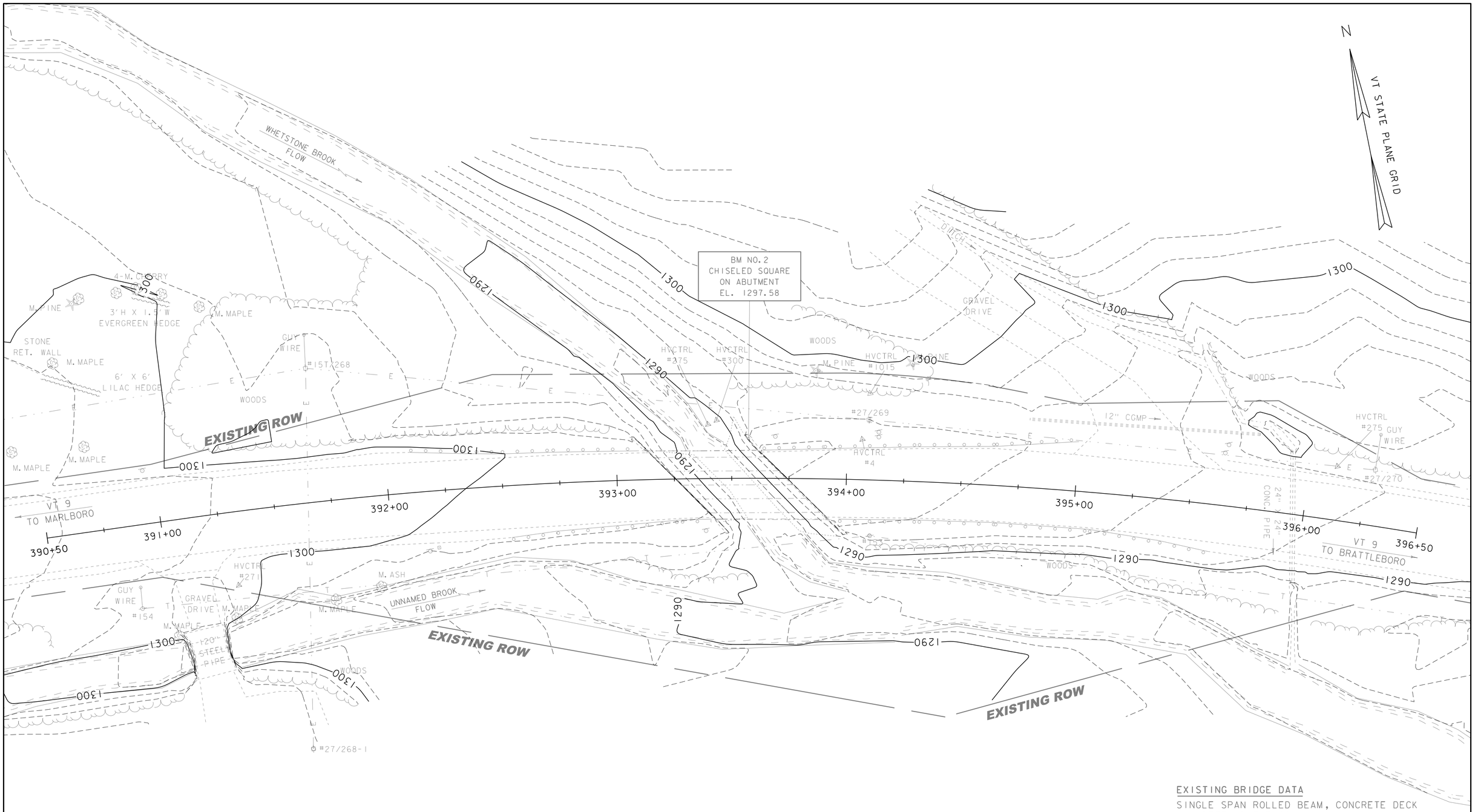
DATUM

VERTICAL NAVD 88
HORIZONTAL NAD 83 (96)
ADJUSTMENT Compass

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: survey\x10b414ti.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
TIE SHEET

PLOT DATE: 28-AUG-2013
DRAWN BY: R. BULLOCK
CHECKED BY: G. LAROCHE
SHEET 9 OF 50



EXISTING BRIDGE DATA

SINGLE SPAN ROLLED BEAM, CONCRETE DECK
CONCRETE ABUTMENTS
OVERALL LENGTH = 54'
OVERALL WIDTH = 31.3'

EXISTING CONDITIONS

20 0 20

SCALE: 1" = 20'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)

FILE NAME: s10b414existing_conditions.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: J. SALVATORI
EXISTING CONDITIONS	SHEET 10 OF 50

CONCRETE CURB, TYPE B (OPTION ITEM)
STA 392+66.60 - 393+06.52 LT
STA 392+75.90 - 393+15.99 RT
STA 393+89.16 - 394+29.08 LT
STA 394+00.61 - 394+40.70 RT

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 392+10.67 - 393+09.86 LT
STA 392+52.76 - 393+40.95 RT
STA 393+63.52 - 394+99.89 LT
STA 393+96.92 - 395+60.26 RT

N
VT STATE PLANE GRID

CHANNEL POE
STA 51+00.00

℄ BEARING
STA 393+13.00
F.G.= 1299.01

PI #1
STA 393+82.14 BK
STA 393+77.88 AHD

BM NO.2
CHISELED SQUARE
ON ABUTMENT
EL. 1297.58

℄ BEARING
STA 393+93.00
F.G.= 1297.57

END PROJECT
STA 394+50.00

BEGIN PROJECT
STA 392+50.00

END PAVEMENT
STA 395+75.00

END APPROACH
STA 396+00.00

PC #1
STA 391+10.02

VT 9 POB
STA 390+50.00

BEGIN APPROACH
STA 391+50.00

BEGIN BRIDGE
STA 393+12.23
F.G.= 1299.03

VT 9 STA 393+50.00 =
CHANNEL STA 50+00.00
Δ = 104°54'14" LT FROM
TANGENT TO CURVE

CHANNEL POB
STA 49+00.00

END BRIDGE
STA 393+93.78
F.G.= 1297.55

CONSTRUCTION
LIMITS

STONE FILL,
TYPE III
(TYP)

PT #1/VT 9 POE
STA 396+50.00

CURVE #1 DATA
Δ = 17°32'49"
D = 3°14'58"
R = 1763.18'
T = 272.12'
L = 539.98'
E = 20.88'

S 86°49'00" E

N 3°55'20" W

390+50 391+00 392+00 393+00 394+00 395+00 396+00 396+50

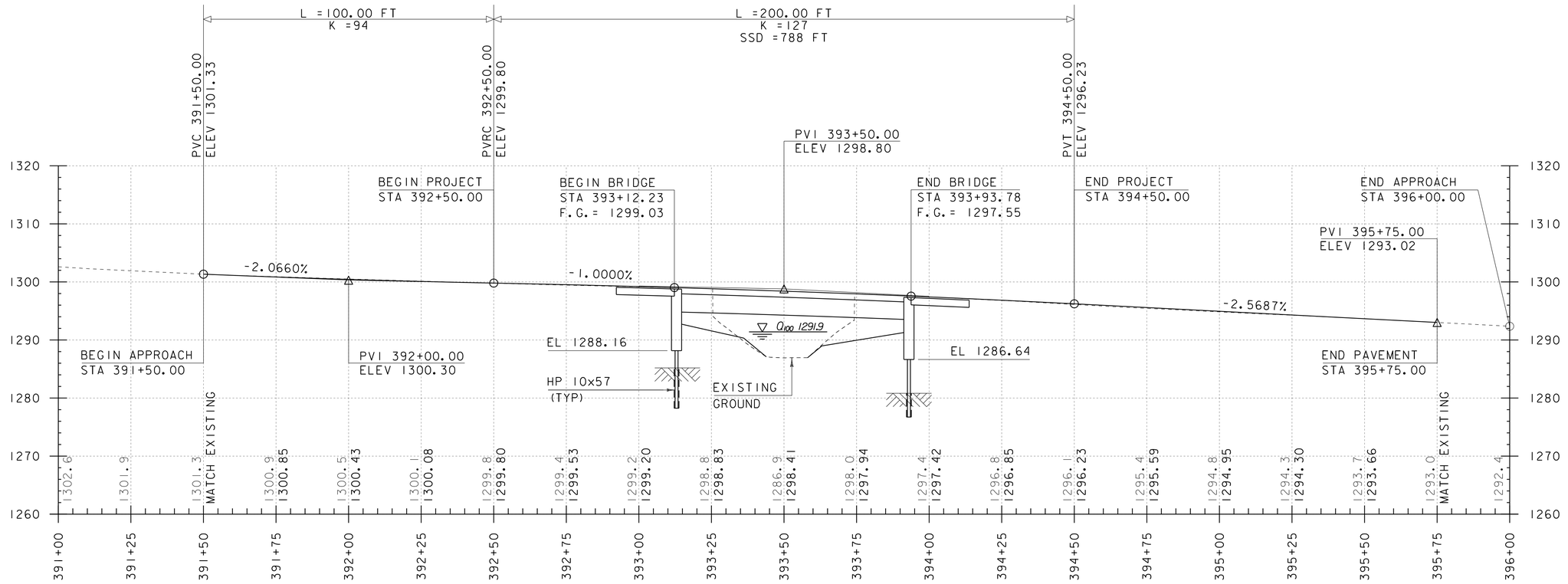
51+00 50+00 49+00

WHETSTONE BROOK FLOW
UNNAMED BROOK FLOW
EXISTING ROW
EXISTING ROW
VT 9 TO MARLBORO
VT 9 TO BRATTLEBORO
4-M.CHERRY
M.PINE
3'H X 1.5'W EVERGREEN HEDGE
M.MAPLE
STONE RET. WALL
6' X 6' LILAC HEDGE
GUY WIRE
#15T/268
WOODS
HVCTRL #275
HVCTRL #300
HVCTRL #1015
HVCTRL #4
#27/269
#27/270
12" CGMP
24" CONC PIPE
DITCH
GRAVEL DRIVE
HVCTRL #271
GUY WIRE #154
GRAVEL DRIVE
120' STEEL PIPE
#27/268-1
CZ

LAYOUT SHEET

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

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: sl0b4l4bdr.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
LAYOUT SHEET	SHEET 11 OF 50



NOTE:

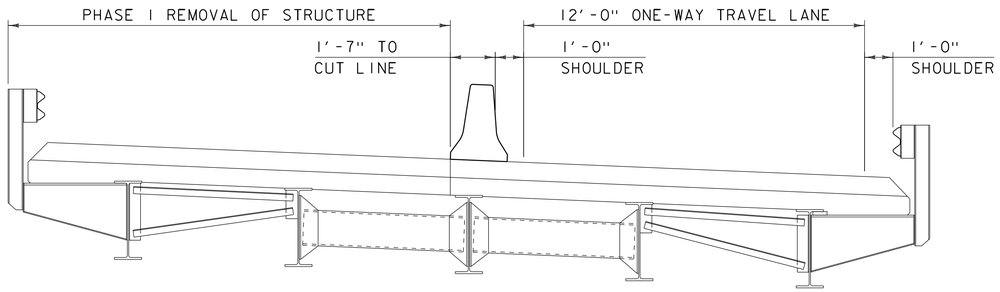
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG PROPOSED CENTERLINE.

ELEVATIONS SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADES ALONG PROPOSED CENTERLINE.

MAINLINE PROFILE

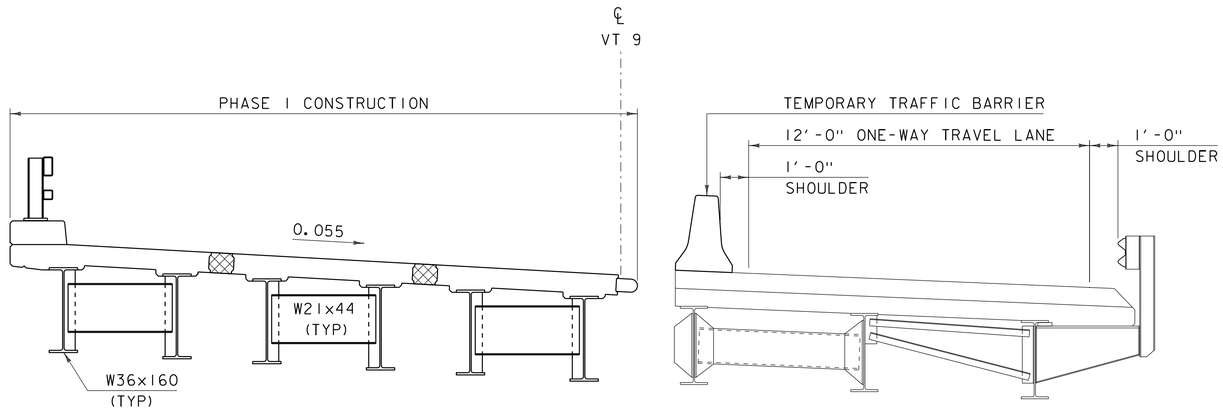
HORIZONTAL SCALE: 1" = 20'-0"
VERTICAL SCALE: 1" = 10'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10b414pro.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
MAINLINE PROFILE	SHEET 12 OF 50



EXISTING

SCALE: 3/8" = I'-0"



PHASE I

SCALE: 3/8" = I'-0"

NOTE:

CENTERLINE RUMBLE STRIPS ARE CURRENTLY IN PLACE ON THIS PORTION OF VERMONT ROUTE 9. IF FINAL PHASING PLAN REQUIRES MASKING OF ANY EXISTING CENTERLINE PAVEMENT MARKINGS, THE RUMBLE STRIPS WILL HAVE TO BE FILLED. IF THIS OCCURS, THE RUMBLE STRIP SHALL BE RESTORED AT THE END OF CONSTRUCTION. PAYMENT WILL BE INCIDENTAL TO CONTRACT ITEM 900.645 SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE).

TRAFFIC CONTROL

1. THE PHASING SHOWN IS OF A CONCEPTUAL NATURE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF A SITE SPECIFIC TRAFFIC CONTROL PLAN. A DETAILED TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR ALL PHASES OF CONSTRUCTION PER SECTION 105. ALL COSTS INCLUDING THE TEMPORARY TRAFFIC BARRIER AND THE TEMPORARY TRAFFIC SIGNALS SHALL BE INCLUDED IN ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

2. THE CONTRACTOR SHALL INDICATE THE INTENTION TO REDUCE THE POSTED SPEED LIMIT BASED ON THE SUBMITTED TRAFFIC CONTROL PLAN. ADDITIONAL SIGNS REQUIRED FOR A REDUCTION IN THE POSTED SPEED LIMIT SHALL BE INCLUDED IN ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

3. PHASE I TEMPORARY TRAFFIC BARRIER SHALL BE ADEQUATELY ANCHORED TO THE EXISTING BRIDGE DECK. PHASE 2 TEMPORARY TRAFFIC BARRIER ON THE NEW BRIDGE DECK SHALL BE POSITIONED SO THAT ADEQUATE SPACE FOR IMPACT DEFLECTION IS PROVIDED BEHIND THE BARRIER. ANCHORING TEMPORARY TRAFFIC BARRIER TO THE NEW BRIDGE DECK WILL NOT BE PERMITTED.

4. TEMPORARY TRAFFIC SIGNALS SHALL BE POSITIONED BETWEEN THE BRIDGE AND NEAREST DRIVEWAY ON EACH APPROACH. THE SIGNALS SHALL BE CLEARLY VISIBLE AT ALL TIMES FOR TRAFFIC EXITING DRIVEWAYS.

5. INSTALLATION OF TEMPORARY TRAFFIC CONTROL SIGNS SHALL BE COORDINATED WITH EXISTING TRAFFIC CONTROL SIGN ASSEMBLIES. ALL SIGNS REMOVED OR COVERED SHALL BE REPLACED OR UNCOVERED WHEN THE TRAFFIC CONTROL PLAN IS DISASSEMBLED.

PHASE CONSTRUCTION

6. PHASE I: (SEE PHASE I DETOUR LAYOUT SHEET)
TRAFFIC SHALL BE MAINTAINED ON THE SOUTHERN PORTION OF THE EXISTING BRIDGE IN A 12'-0" ONE-WAY TRAVEL LANE. TEMPORARY TRAFFIC SIGNALS SHALL BE USED TO ALTERNATE EASTBOUND AND WESTBOUND TRAFFIC ON THE TRAVEL LANE.

7. SHORING FOR EXISTING BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE SHALL BE INCLUDED IN SITE SPECIFIC CONSTRUCTION PHASING PLAN SUBMITTAL. ALL COSTS SHALL BE INCLUDED IN ITEM 502.10, SHORING SUPERSTRUCTURE.

8. REMOVE NORTHERN PORTION OF EXISTING BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE TO CUT LINE.

9. CONSTRUCT NORTHERN PORTIONS OF NEW ABUTMENTS, BRIDGE SUPERSTRUCTURE, APPROACH SLABS, ROADWAY AND RAILING.

10. PHASE 2A: (SEE PHASE 2 DETOUR LAYOUT SHEET)
TRAFFIC SHALL BE MAINTAINED ON THE NORTHERN PORTION OF THE NEW BRIDGE IN A 12'-0" ONE-WAY TRAVEL LANE. TEMPORARY TRAFFIC SIGNALS SHALL BE USED TO ALTERNATE EASTBOUND AND WESTBOUND TRAFFIC ON THE TRAVEL LANE.

11. REMOVE REMAINING SOUTHERN PORTION OF EXISTING BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE.

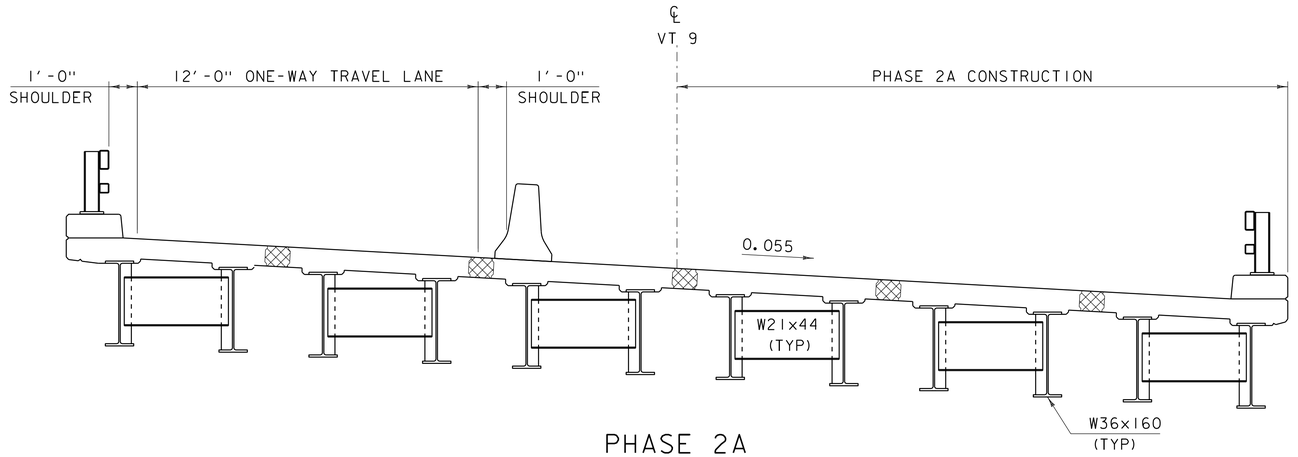
12. CONSTRUCT SOUTHERN PORTIONS OF NEW ABUTMENTS, BRIDGE SUPERSTRUCTURE, APPROACH SLABS, ROADWAY AND RAILING.

13. PHASE 2B: (SEE PHASE 2 DETOUR LAYOUT SHEET)
TRAFFIC SHALL BE MAINTAINED IN A 12'-0" ONE-WAY TRAVEL LANE WITH ALTERNATING TRAFFIC WHILE MEMBRANE WATERPROOFING, SPRAY APPLIED, AND BITUMINOUS CONCRETE PAVEMENT WORK IS COMPLETED.

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

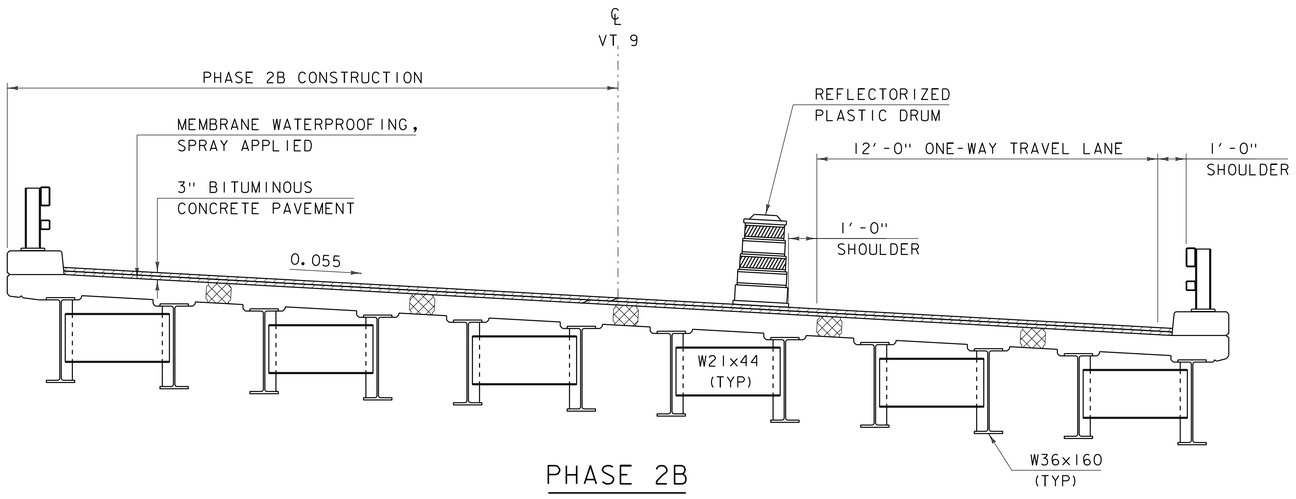
FILE NAME: s10b414phasewrk.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
PHASE CONSTRUCTION DETAILS I

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 13 OF 50



PHASE 2A

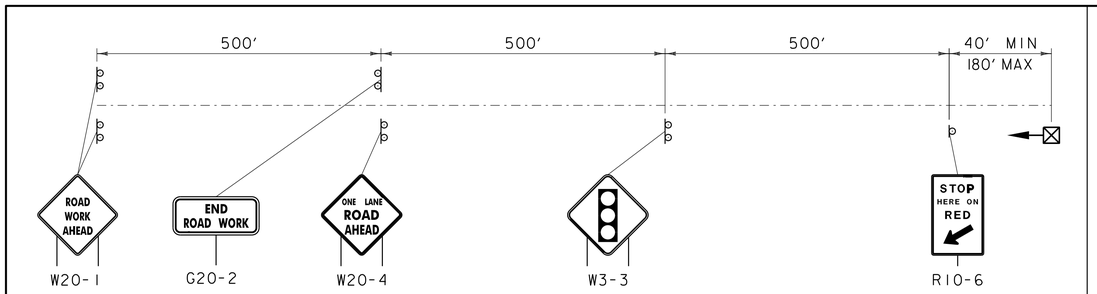
SCALE: 3/8" = 1'-0"



PHASE 2B

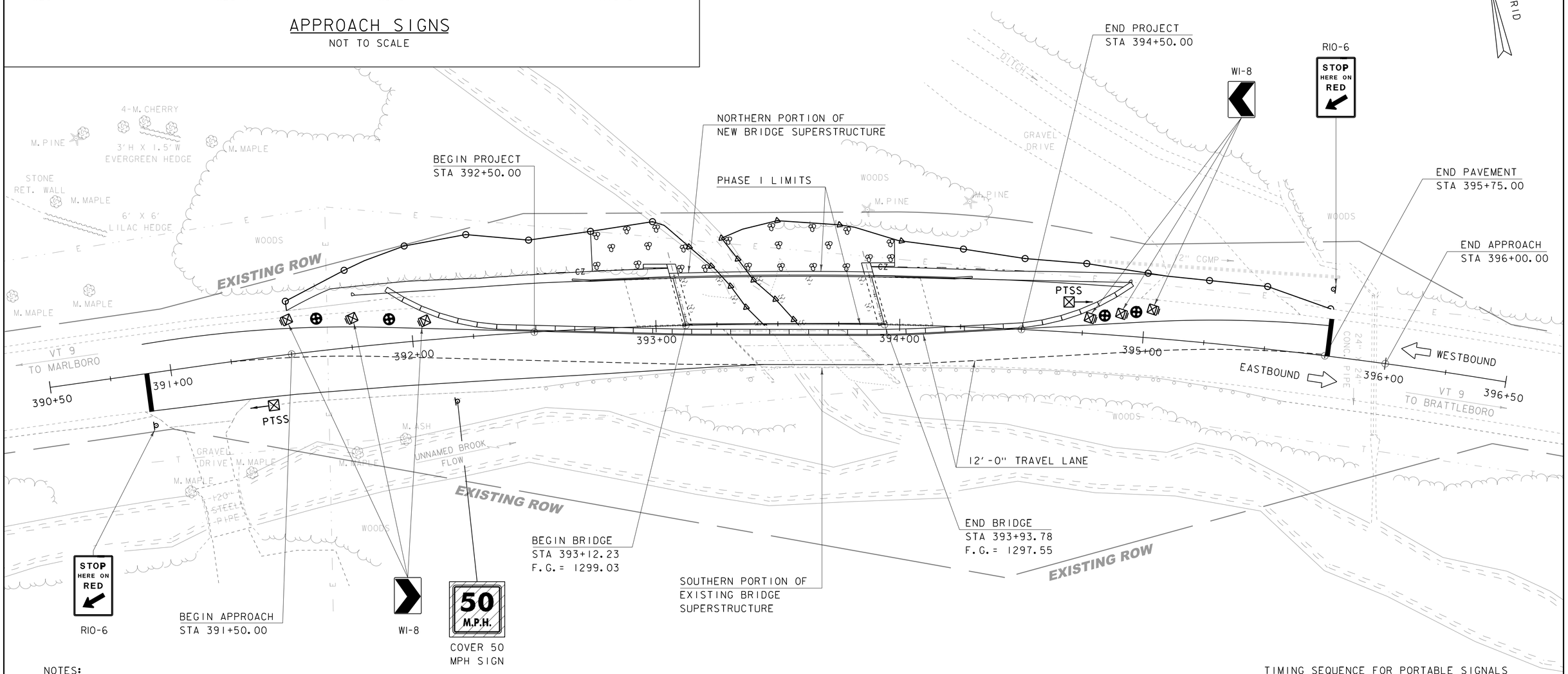
SCALE: 3/8" = 1'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10b414phasewrk.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
PHASE CONSTRUCTION DETAILS 2	SHEET 14 OF 50



APPROACH SIGNS

NOT TO SCALE



NOTES:

1. ACTUAL BARRIER LOCATION AND TERMINATION TO BE DETAILED BY CONTRACTOR AND SUBMITTED IN THE SITE SPECIFIC TRAFFIC CONTROL PLAN.
2. ACTUAL SIGNAL LOCATION AND ANY ASSOCIATED SIGNAGE TO BE DETAILED BY CONTRACTOR AND SUBMITTED IN THE SITE SPECIFIC TRAFFIC CONTROL PLAN.
3. CONTRACTOR SHALL MEET WITH EACH PROPERTY OWNER AFFECTED BY THE TEMPORARY SIGNAL. CONTRACTOR SHALL SUGGEST TO PROPERTY OWNER THAT PROPERTY OWNER SHOULD WAIT UNTIL TRAFFIC IS FLOWING IN THE DIRECTION THE PROPERTY OWNER WISHES TO TRAVEL AND ENTER AT THE END OF THAT LINE.

PHASE I DETOUR LAYOUT

20 0 20

SCALE: 1" = 20'-0"

LEGEND

- REMOVAL OF EXISTING MARKINGS
- SIGN POSTS
- TYPE III BARRICADES (MOD.)
- TEMP. TRAFFIC BARRIER
- REFLECTORIZED BARREL
- PTSS — PORTABLE TRAFFIC SIGNAL SYSTEM
- TEMPORARY STOP BAR

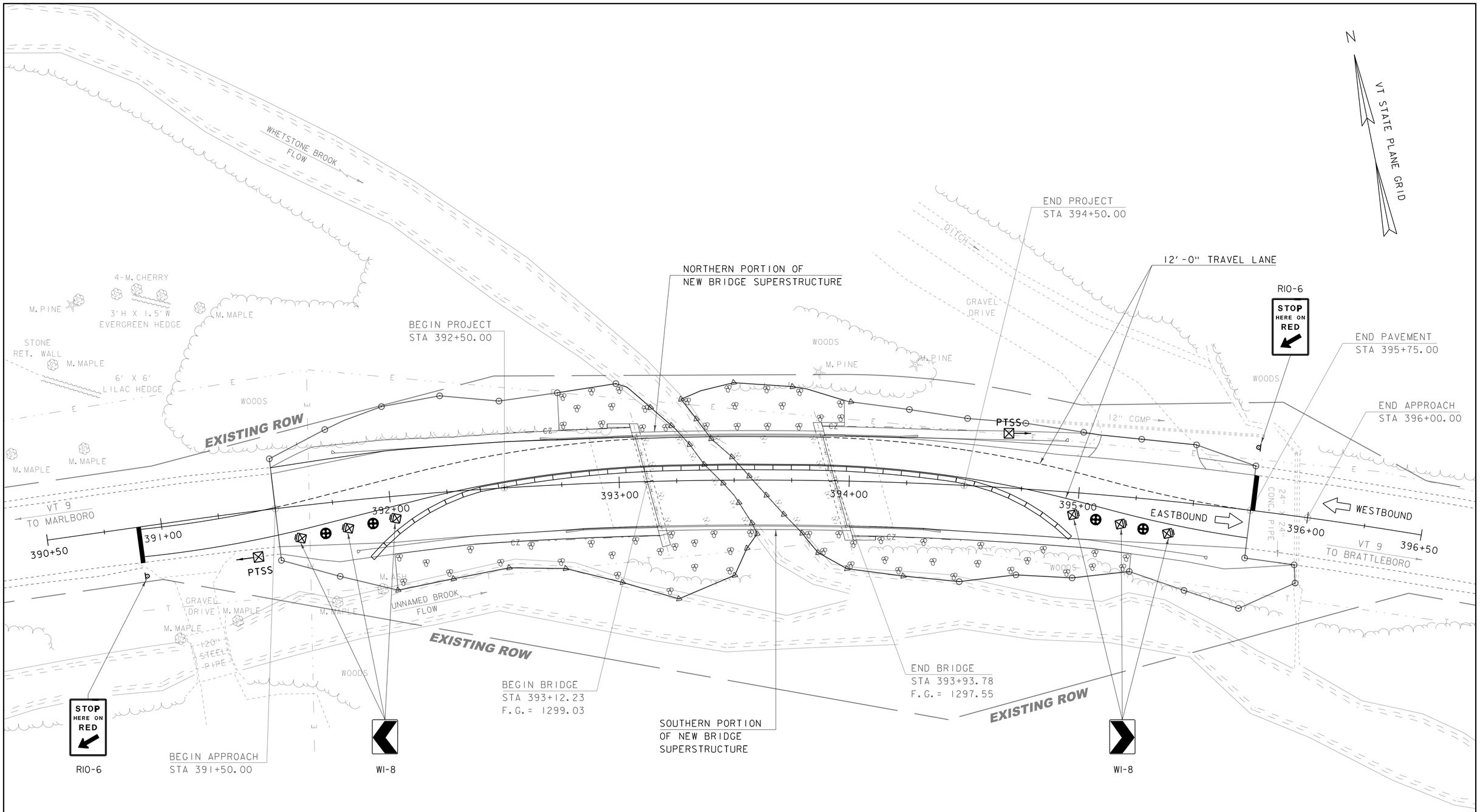
TIMING SEQUENCE FOR PORTABLE SIGNALS

MAXIMUM GREEN	30 SECONDS
MINIMUM GREEN	15 SECONDS
EXTENSION	3.5 SECONDS
ALL-RED CLEARANCE	20 SECONDS

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: sl0b414phase1.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
PHASE I DETOUR LAYOUT

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: J. SALVATORI
SHEET 15 OF 50



PHASE 2 DETOUR LAYOUT

20 0 20

SCALE: 1" = 20'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10b414phase2.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: J. SALVATORI
PHASE 2 DETOUR LAYOUT	SHEET 16 OF 50

N

VT STATE PLANE GRID

EXISTING POLE
TO REMAIN

NEW AERIAL TELEPHONE
AND ELECTRIC LINES

NEW UTILITY POLE
W/ 10' GUY WIRE
STA 394+10, 32' LT

END PROJECT
STA 394+50.00

WHETSTONE BROOK
FLOW

DITCH

GRAVEL
DRIVE

4-M. CHERRY

M. PINE

3'H X 1.5'W
EVERGREEN HEDGE

M. MAPLE

STONE
RET. WALL

M. MAPLE

6' X 6'
LILAC HEDGE

GUY
WIRE

#157/268

BEGIN PROJECT
STA 392+50.00

HVCTRL
#275

HVCTRL
#300

WOODS

M. PINE

HVCTRL
#1015

M. PINE

END PAVEMENT
STA 395+75.00

AER E&T

NEW AERIAL TELEPHONE
LINE ONLY (TYP)

EXISTING ROW

WOODS

12" CGMP

END APPROACH
STA 396+00.00

HVCTRL
#275

GUY
WIRE

#27/270

M. MAPLE

M. MAPLE

HVCTRL
#4

VT 9
TO MARLBORO

390+50

391+00

392+00

393+00

394+00

395+00

396+00

396+50

24" CONC PIPE

VT 9
TO BRATTLEBORO

HVCTRL
#271

GUY
WIRE

#54

GRAVEL
DRIVE

M. MAPLE

M. ASH

M. MAPLE

M. MAPLE

120' STEEL PIPE

UNNAMED BROOK
FLOW

WOODS

CONSTRUCTION
LIMITS

EXISTING ROW

EXISTING POLE
TO REMAIN

BEGIN BRIDGE
STA 393+12.23
F.G. = 1299.03

END BRIDGE
STA 393+93.78
F.G. = 1297.55

EXISTING ROW

EXISTING POLE
TO REMAIN

BEGIN APPROACH
STA 391+50.00

#27/268-1

STONE FILL,
TYPE III
(TYP)

EXISTING BRIDGE DATA

SINGLE SPAN ROLLED BEAM, CONCRETE DECK
CONCRETE ABUTMENTS
OVERALL LENGTH = 54'
OVERALL WIDTH = 31.3'

PROPOSED UTILITY LAYOUT

20 0 20

SCALE: 1" = 20'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10b414bdr.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
PROPOSED UTILITY LAYOUT	SHEET 17 OF 50

REMOVING SIGNS

STA 392+16.30 RT (1)
STA 329+20.35 RT (1)
STA 393+38.55 RT (1)
STA 393+68.95 LT (1)
STA 394+13.60 LT (1)
STA 395+63.73 LT (1)

TRAFFIC SIGNS, TYPE A

STA 393+10.00 RT
STA 393+95.00 LT

ERECTING SALVAGED SIGNS

STA 392+16.30 RT (2)
STA 394+25.00 LT (1)
STA 395+64.80 LT (1)

4 INCH WHITE LINE

STA 391+50.00 - 395+75.00 LT
STA 391+50.00 - 395+75.00 RT

4 INCH YELLOW LINE (DOUBLE)

STA 391+50.00 - 395+75.00 CL

MILLED RUMBLE STRIPS

STA 391+50.00 - 395+75.00 CL

N

VT STATE PLANE GRID

STA 390+95.20 LT

TRUCK LANE 500 FEET — RET

RET

STA 393+68.95 LT

BRIDGE 48 VT 9 — R

R

STA 393+95.00 LT

BRIDGE 48 VT 9 — N

N

STA 394+13.60 LT

511 TRAVEL INFO — R&S

R R

STA 394+25.00 LT

511 TRAVEL INFO — S

N N

STA 395+63.73 LT

Neringa next left 1 — R&S

R R

STA 395+64.80 LT

Neringa next left 1 — S

N N

WHETSTONE BROOK FLOW

4-M. CHERRY

M. PINE

3' H X 1.5' W EVERGREEN HEDGE

M. MAPLE

STONE RET. WALL

M. MAPLE

GUY WIRE #15T/268

6' X 6' LILAC HEDGE

WOODS

EXISTING ROW

M. MAPLE

M. MAPLE

VT 9 TO MARLBORO

BEGIN PROJECT
STA 392+50.00

HVCTRL #275

HVCTRL #300

WOODS

M. PINE

HVCTRL #1015

M. PINE

#27/269

CZ

END PROJECT
STA 394+50.00

DITCH

GRAVEL DRIVE

WOODS

12" CMP

END PAVEMENT
STA 395+75.00

END APPROACH
STA 396+00.00

HVCTRL #275

GUY WIRE

#27/270

24" CONC PIPE

WOODS

VT 9 TO BRATTLEBORO

390+50

391+00

392+00

393+00

394+00

395+00

396+00

396+50

HVCTRL #271

GUY WIRE #154

GRAVEL DRIVE

M. MAPLE

M. MAPLE

120" STEEL PIPE

UNNAMED BROOK FLOW

M. ASH

M. MAPLE

CZ

WOODS

EXISTING ROW

BEGIN BRIDGE
STA 393+12.23
F.G. = 1299.03

END BRIDGE
STA 393+93.78
F.G. = 1297.55

EXISTING ROW

BEGIN APPROACH
STA 391+50.00

#27/268-1

SPEED LIMIT 50 — R&S

R

STA 392+16.30 RT

SPEED LIMIT 50 — S

0090 1311 0740 — S

N

STA 392+16.30 RT

0090 1311 0740 — R&S

R

STA 392+20.35 RT

BRIDGE 48 VT 9 — N

N

STA 393+10.00 RT

BRIDGE 48 VT 9 — R

R

STA 393+38.55 RT

SIGNS AND PAVEMENT MARKINGS

20 0 20

SCALE: 1" = 20'-0"

LEGEND

EXISTING SIGNS

NEW OR SALVAGED SIGNS

RET	RETAIN
R	REMOVE
N	NEW
R&S	REMOVE & SALVAGE
S	SALVAGE

NOTE:
ADJUST NEW CENTERLINE AND EDGE LINES TO MATCH EXISTING LINES AT BEGIN/END APPROACH

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414sign.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
SIGNS AND PAVEMENT MARKINGS

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

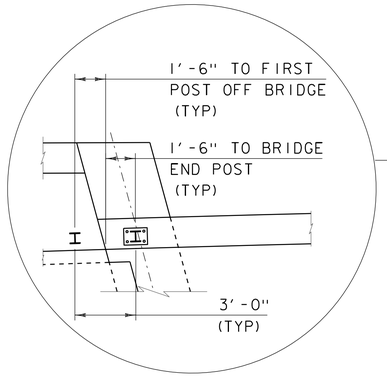
MILEMARKER, STATION, OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS EA	WIDTH (in)	HEIGHT (in)	NEW & SALVAGED SIGNS "A"	"B"	SALV SIGN	SALV TIS	EXIST POST RETAIN	EXIST POST SALVAGE	NEW SIGN POSTS NO. OF POSTS	FLANGED CHANNEL lb/ft 1.12	2.0	3.0	SQUARE STEEL (in) lb/ft 1.75 (1.88)	2.0 (2.42)	2.5 (3.35)	ANCHOR	SLEEVE	TUBULAR ALUMINUM Ø (in) 3.0 (1.3)	4.0 (1.7)	4.0 MOD (1.7)	TUBULAR STEEL Ø (in) FOUNDATION	3.0 (7.6)	3.5 (9.0)	4.0 (10.8)	5.0 (14.6)	W-SHAPE STEEL FTG. SIZE 24"	30"	WEIGHT	POST SIZE	SIGN FRAME REQUIRED	REMARKS	SIGN DETAIL DETAIL IN SHS	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER
											OPTION ITEMS																										
392+16.3 RT	SPEED LIMIT 50						X				1					15		X																		
392+16.3 RT	0090 1311 0740						X																													
393+10.0 RT	BRIDGE 48 VT 9	1	6	8	0.33						1				7			X																VD-701			E-134
393+95.0 LT	BRIDGE 48 VT 9	1	6	8	0.33						1				7			X																VD-701			E-134
394+25.0 LT	511 TRAVEL INFO						X				2					30		X																		
395+64.8 LT	Neringa next left ← 1						X				2					30		X																		
TOTALS		SF 0.66	SF	EA. 4	SF							FT	FT	FT	FT 14.0	FT 75.0	FT	EA	LB	LB	LB	EA.	LB	LB	LB	LB	EA.	EA.	LB						
															FT 89																					

FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND VTRANS "SIGN POST DESIGN GUIDELINE."
SHS = STANDARD HIGHWAY SIGNS

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1 (43)

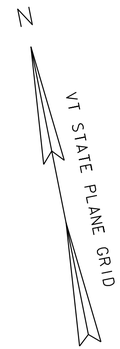
FILE NAME: s10b414tss.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
TRAFFIC SIGN SUMMARY SHEET

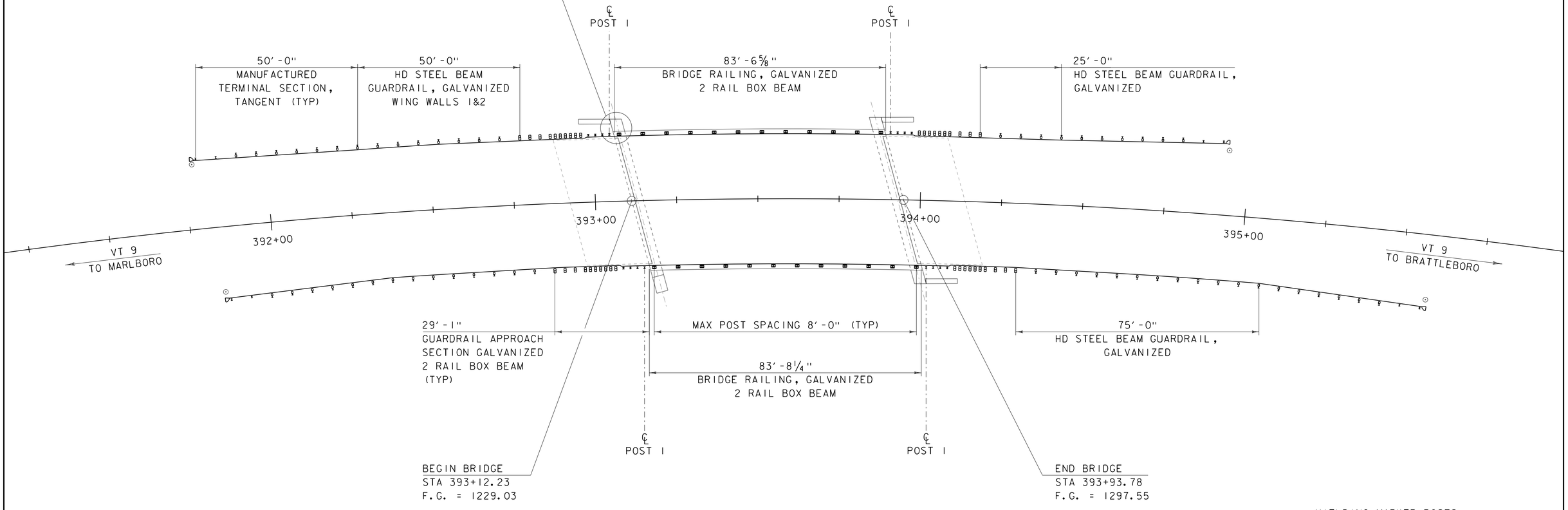
PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 19 OF 50



INSET "A"

NOT TO SCALE





YIELDING MARKER POSTS

STA 391+77.50 - 20.0' LT
STA 391+84.00 - 20.0' RT
STA 394+94.00 - 20.0' LT
STA 395+58.00 - 20.0' RT

NOTES:

1. SEE STANDARDS S-360A, S-360B, S-363, G-1 AND G-19.

RAIL LAYOUT SHEET

SCALE: 1" = 15'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10b414rail.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
RAIL LAYOUT SHEET	SHEET 20 OF 50

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

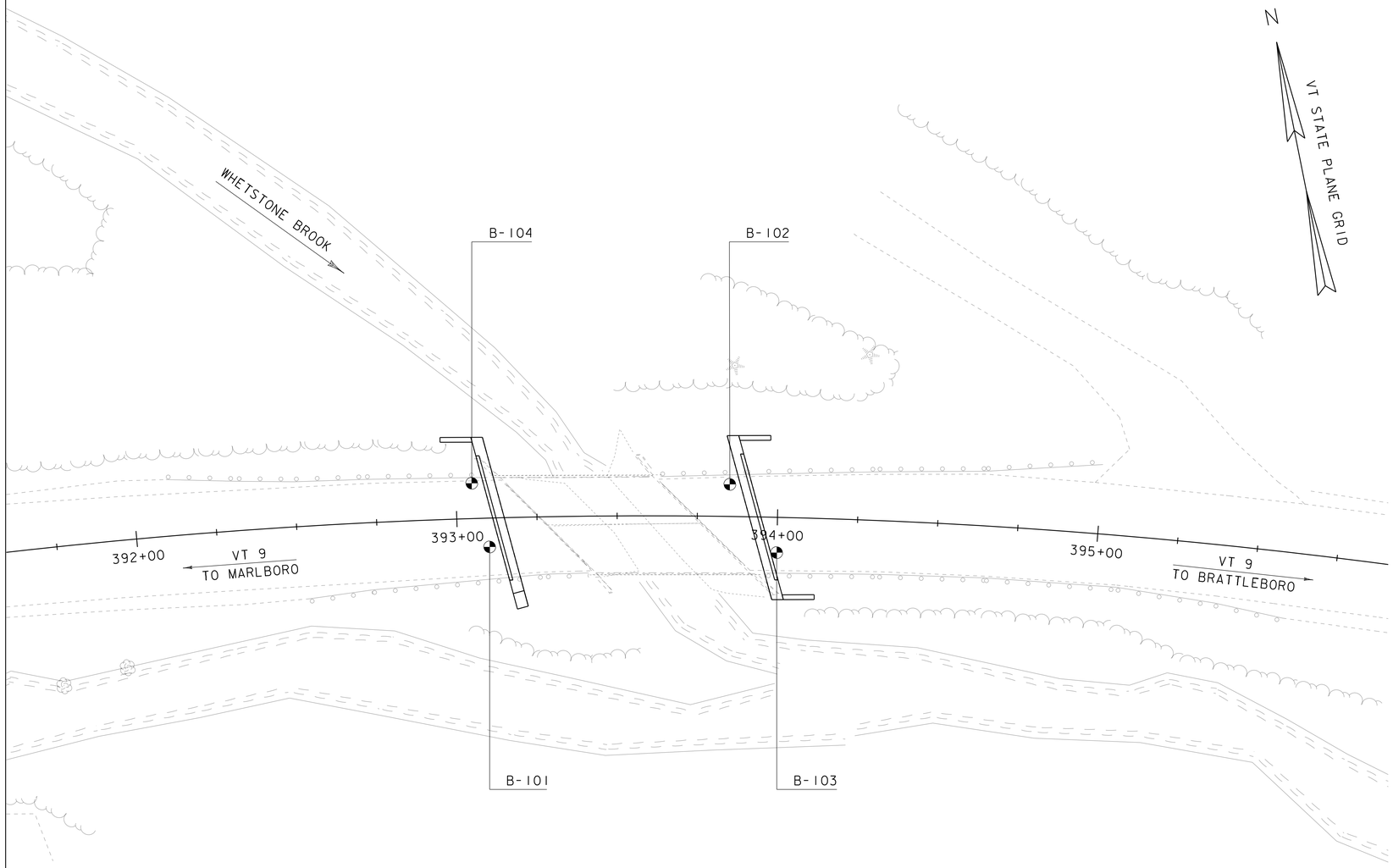
CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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 1 3/8" I.D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 5/8"
NX	Core Size 2 1/8"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	Top of Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)
VTSPG	NAD83 - See Note 7

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



BORING LAYOUT SHEET

SCALE 1" = 20'-0"

20 0 20

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.

GENERAL NOTES

1. The subsurface explorations shown herein were made between 7-30-12 and 8-1-12 by Terracon.

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

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

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

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

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

7. Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
B-101	393+10	9' RT	1299.00'	1285.00'
B-102	393+85	10' LT	1298.50'	1283.50'
B-103	394+00	11' RT	1297.00'	1278.00'
B-104	393+05	11' LT	1298.50'	1285.50'

PROJECT NAME: MARLBORO

PROJECT NUMBER: BRF 010-1(43)

FILE NAME: sllb414bor.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
BORING LAYOUT SHEET

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 21 OF 50

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

BORING LOG

MARLBORO
BRF 010-1 (43)

Boring No.: B-101
Page No.: 1 of 1
Pin No.:
Checked By: LJD

Boring Crew: Geosearch, Inc. Fitchburg, MA, JE
Date Started: 7/30/12 Date Finished: 7/31/12
VTSPG NAD83: N 137719.00 ft E 1588828.00 ft
Station: 393+10 Offset: 9 RT
Ground Elevation: 1,299.0 ft. (approx)

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 55	CE = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
07/30/12	9.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Bituminous concrete, 0.0 ft – 0.5 ft							
		A-1-a, GrSaSi, gray, Rec. = 1.2 ft, (Fill)			11-17-18 (35)	1.0	54.2	33.7	12.1
		A-1-b, GrSaSi, gry-brn, Rec. = 1.3 ft, (Fill)			11-14-12-12 (26)	5.0	44.7	42.9	12.4
5		A-1-b, SaGrSi, gry-brn, Rec. = 1.0 ft, (Fill)			23-14-11-8 (25)	9.2	40.9	43.2	15.9
		A-4, SaSiGr, brn Rec. = 1.7 ft				31.6	14.2	44.5	41.3
		A-1-a, GrSaSi, brn			5-11-13-11 (24)	9.1	55.8	34.6	9.6
		A-1-a, GrSaSi, brn, Rec. = 1.5 ft			8-16-19-23 (35)	8.3	63.0	27.5	9.5
10		A-1-b, GrSaSi, brn, Rec. = 1.3 ft			20-26-29-46 (55)	6.9	53.3	31.6	15.1
AB #1 BOTTOM OF PILE CAP EL 1288.16		12.0 ft – 14.0 ft, Highly weathered bedrock Rec = 0.3 ft			62/6" (62+)				
15		14.0 ft – 17.5 ft, NXDC, Hard, fresh, dark gray, medium grained QUARTZITE, primary joints low angle, closely spaced (possible boulder).	1 (10-30)	88 (15.5)					
		17.5 ft – 19.0 ft, Hard, fresh light gray, fine grained, QUARTZITE, primary joints low angle, moderately spaced.							
20		19.0 ft – 24.0 ft, NXDC, Hard, fresh light gray, fine grained, QUARTZITE, primary joints low angle, widely spaced.	2 (10-30)	97 (76)					
AB #1 PILE TIP EL 1278.16									
25		24.0 ft – 29.0 ft, NXDC, Hard, fresh light gray, fine grained, QUARTZITE, primary joints low angle, widely spaced. Qu = 9,390 psi (24.4 ft) Qu = 8,950 psi (24.7 ft)	3 (10-30)	95 (95)					
		Hole stopped @ 29.0 ft							

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

BORING LOG J112513O.GPJ VERMONT AOT.GDT 10/25/12

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

BORING LOG

MARLBORO
BRF 010-1 (43)

Boring No.: B-102
Page No.: 1 of 1
Pin No.:
Checked By: LJD

Boring Crew: Geosearch, Inc. Fitchburg, MA, JE
Date Started: 8/01/12 Date Finished: 8/01/12
VTSPG NAD83: N 137775.00 ft E 1588854.00 ft
Station: 393+85 Offset: 10 LT
Ground Elevation: 1,298.5 ft. (approx)

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 55	CE = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
08/01/12	8.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Bituminous concrete, 0.0 ft – 0.5 ft							
		Gravel base, 0.5 ft – 1.0 ft							
		A-1-a, GrSaSi, gry-brn, Rec. = 1.5 ft, (Fill)			6-11-13-21 (24)	2.3	57.4	31.6	11.0
5		A-1-b, GrSaSi, gry-brn, Rec. = 1.7 ft, (Fill)			5-2-2-7 (4)	3.7	47.8	43.1	9.1
10		A-4, SaSiGr, Rec. = 1.5 ft, with roots, wood pieces (Fill)			2-2-52-35 (54)	47.2	13.7	48.7	37.6
AB #2 BOTTOM OF PILE CAP EL 1286.64		A-4, C-F SAND, some silt, little gravel, brn, very dense							
		13.0 ft – 15.0 ft, Highly weathered bedrock							
15		15.0 ft – 20.0 ft, NXDC, Hard, fresh, gray, fine grained SCHIST, with high angle foliation. Qu = 5,760 psi (16.8 ft) Qu = 3,730 psi (18.6 ft)	1 (60-80)	100 (95)					
20		20.0 ft – 25.0 ft, NXDC, Hard, fresh, gray, fine grained SCHIST, with high angle foliation, primary joint parallel to foliation, widely spaced. Qu = 1,654 psi (21.0 ft) Qu = 1,816 psi (22.2 ft) Qu = 2,430 psi (23.3 ft)	2 (60-80)	100 (87)					
AB #2 PILE TIP EL 1276.64									
25		Qu = 3,881 PSI (24.6 ft)							
		Hole stopped @ 25.0 ft							

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

BORING LOG J112513O.GPJ VERMONT AOT.GDT 10/25/12

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: sllb414bor.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFLETER
BORING LOGS

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 22 OF 50

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

BORING LOG

MARLBORO
BRF 010-1 (43)

Boring No.: B-103
Page No.: 1 of 1
Pin No.:
Checked By: LJD

Boring Crew: Geosearch, Inc. Fitchburg, MA, JE
Date Started: 8/01/12 Date Finished: 8/01/12
VTSPG NAD83: N 137706.00 ft E 1588885.00 ft
Station: 394+00 Offset: 11 RT
Ground Elevation: 1,297.0 ft. (approx)

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 55	CE = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
08/01/12	10.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Bituminous concrete, 0.0 ft – 0.5 ft					
		Gravel base, 0.5 ft – 1.0 ft					
		A-1-b, SaGrSi, gray, Rec. = 1.5 ft, (Fill)	10-17-9-11 (26)	3.7	41.0	45.2	13.8
5		A-1-b, SaGrSi, gry-brn, Rec. = 1.0 ft, (Fill)	12-6-8-6 (14)	11.0	44.0	44.2	11.8
AB #2 BOTTOM OF PILE CAP EL 1286.64							
10		A-1-b, GrSaSi, gry-brn, Rec. = 1.2 ft	4-6-16-18 (22)	10.0	50.6	34.9	14.5
15		Rec. = 1.3 ft, 15.0 ft – 17.0 ft, Highly weathered bedrock	17-32-46-74 (78)				
		Hole stopped @ 19.0 ft Auger refusal @ 19.0 ft					
AB #2 PILE TIP EL 1275.00							
20							
25							

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

BORING LOG J:\125130.GPJ VERMONT AOT.GDT 10/25/12

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

BORING LOG

MARLBORO
BRF 010-1 (43)

Boring No.: B-104
Page No.: 1 of 1
Pin No.:
Checked By: LJD

Boring Crew: Geosearch, Inc. Fitchburg, MA, JE
Date Started: 8/01/12 Date Finished: 8/01/12
VTSPG NAD83: N 137769.00 ft E 1588797.00 ft
Station: 393+05 Offset: 11 LT
Ground Elevation: 1,298.5 ft. (approx)

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	300	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:		Auto/N
Rig:	CME 55	CE = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
08/01/12		NE

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Bituminous concrete, 0.0 ft – 0.5 ft					
		Gravel base, 0.5 ft – 1.0 ft					
		A-1-a, GrSaSi occasional cobbles/boulders, gry-brn, Rec. = 1.3 ft, (Fill)	5-9-10-13 (19)	1.9	74.7	15.2	10.1
5		Rec. = 0.0 ft, 5.0 ft – 6.0 ft	39-63				
		Note: Drill action suggests frequent cobbles and boulders from 4–11 feet (possible fill)					
AB #1 BOTTOM OF PILE CAP EL 1288.16							
10		A1-b, C-F SAND, some gravel, little silt, brn, ocassional cobbles,very dense	65/6"				
		Hole stopped @ 13.0 ft Auger refusal @ 13.0 ft					
15							
AB #1 PILE TIP EL 1278.16							
20							
25							

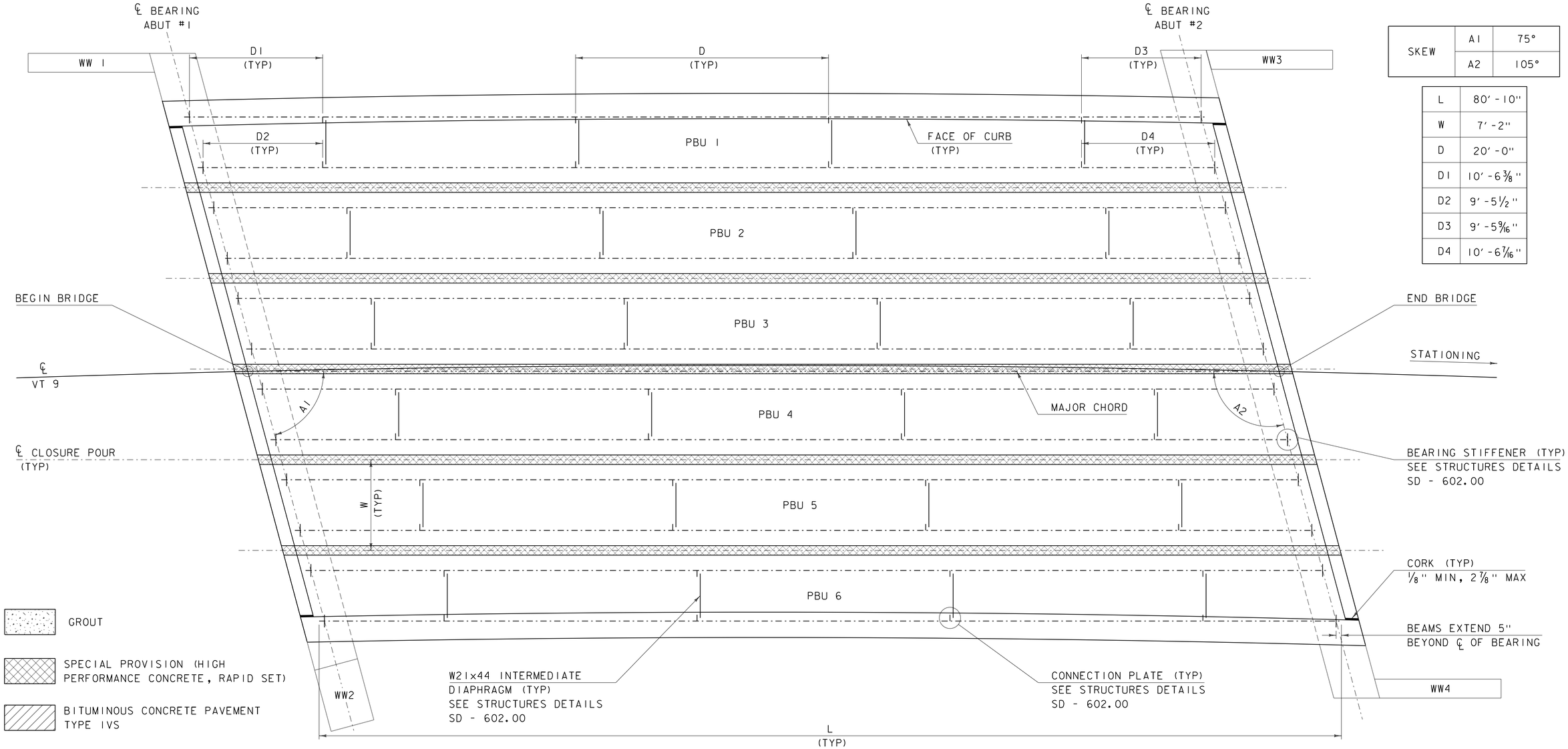
Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. CE is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations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

BORING LOG J:\125130.GPJ VERMONT AOT.GDT 10/25/12

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: sllb414bor.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
BORING LOGS

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 23 OF 50



SKEW	A1	75°
	A2	105°

L	80'-10"
W	7'-2"
D	20'-0"
D1	10'-6 3/8"
D2	9'-5 1/2"
D3	9'-5 9/16"
D4	10'-6 7/16"

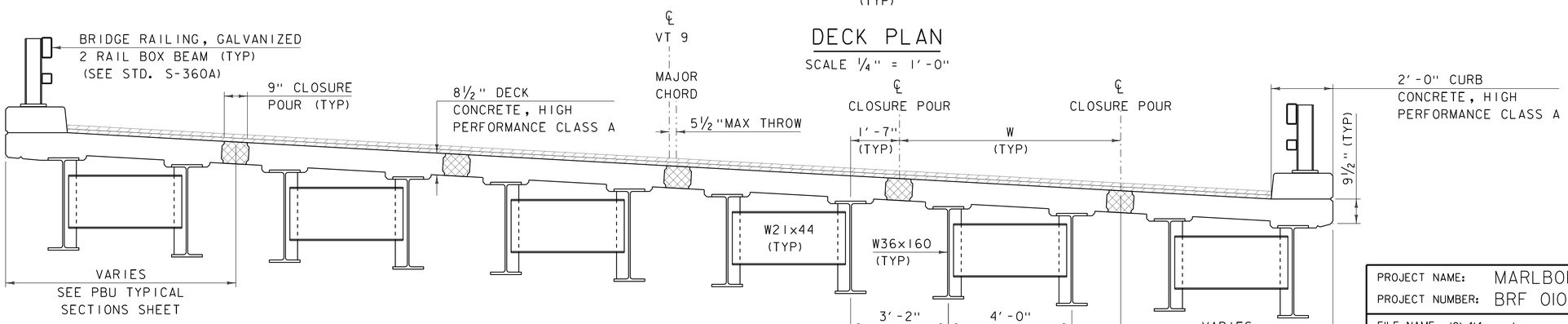
GROUT

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET)

BITUMINOUS CONCRETE PAVEMENT TYPE IVS

DECK PLAN

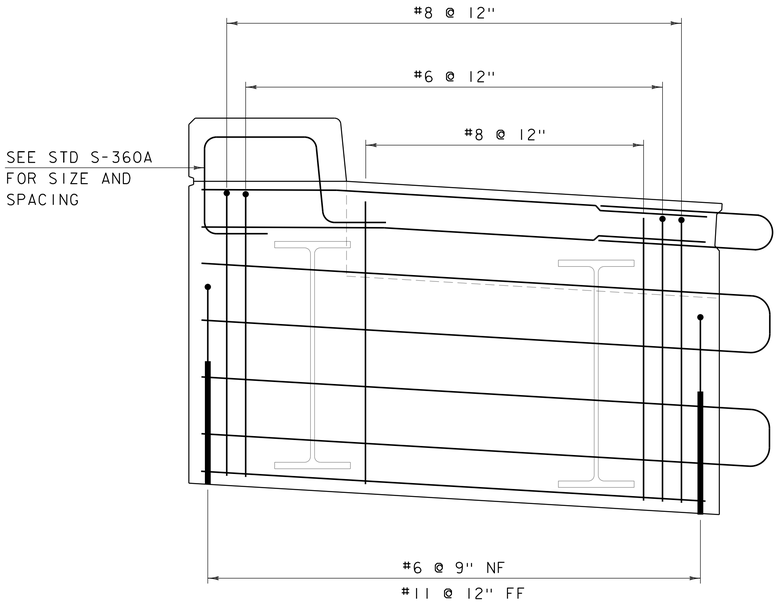
SCALE 1/4" = 1'-0"



BRIDGE TYPICAL SECTION

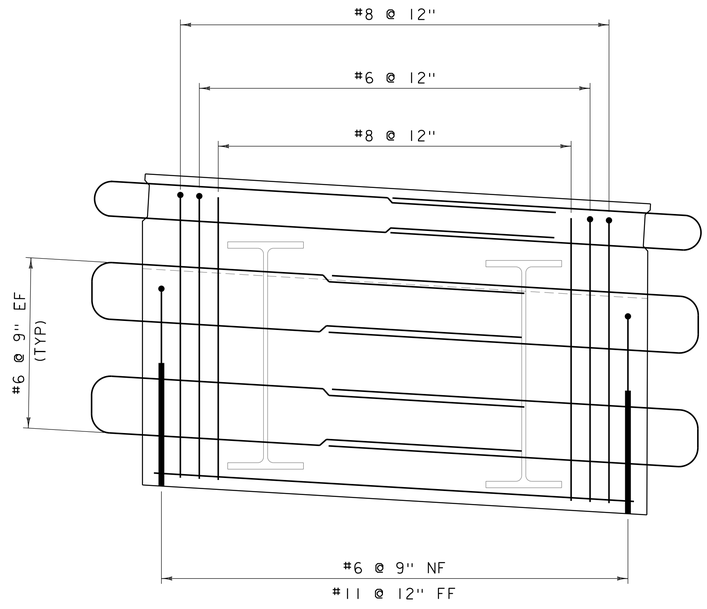
SCALE 1/2" = 1'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: sl0b414sup.dgn	PLOT DATE: 13-SEP-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: J. SALVATORI
DECK PLAN	SHEET 24 OF 50



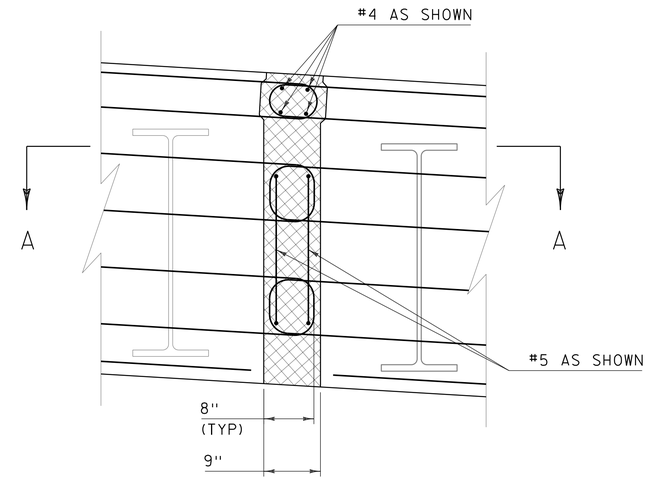
BRIDGE END PBU 1 & 6

SCALE 1" = 1'-0"



BRIDGE END PBU 2 - 5

SCALE 1" = 1'-0"

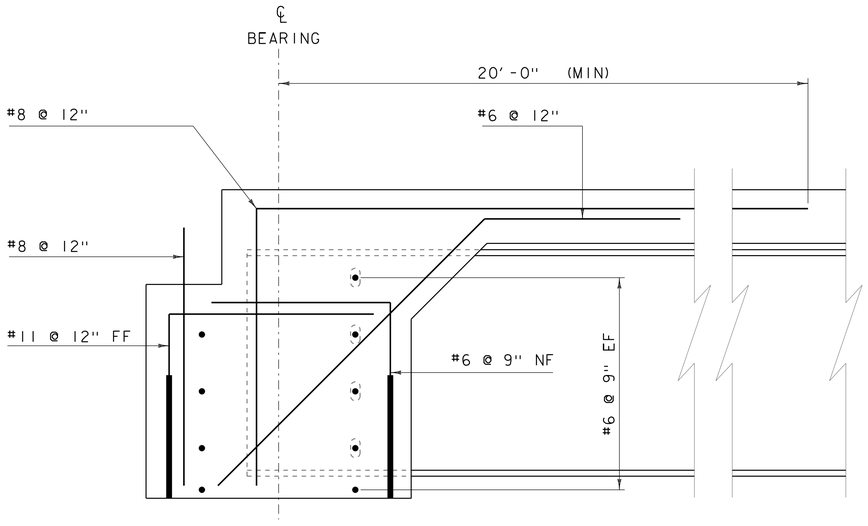


BRIDGE END CONNECTION DETAIL ELEVATION

SCALE 1" = 1'-0"

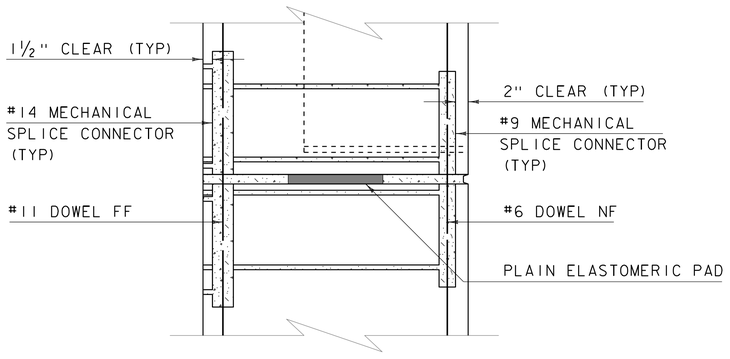
NOTE:

1. PBU 1 SHOWN, PBU 6 SIMILAR.



BRIDGE END TYPICAL

SCALE 1" = 1'-0"

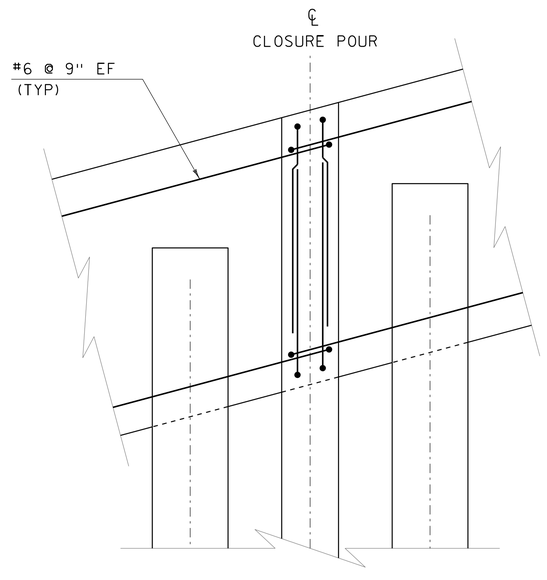


CONNECTION DETAIL

SCALE 1" = 1'-0"

NOTE:

1. ONE #9 MECHANICAL SPLICE CONNECTOR MAY BE OMITTED ON FRONT FACE OF ABUTMENT AND FRONT FACE OF PBU BACKWALL AT EACH BEAM LOCATION.



SECTION A-A

SCALE 1" = 1'-0"

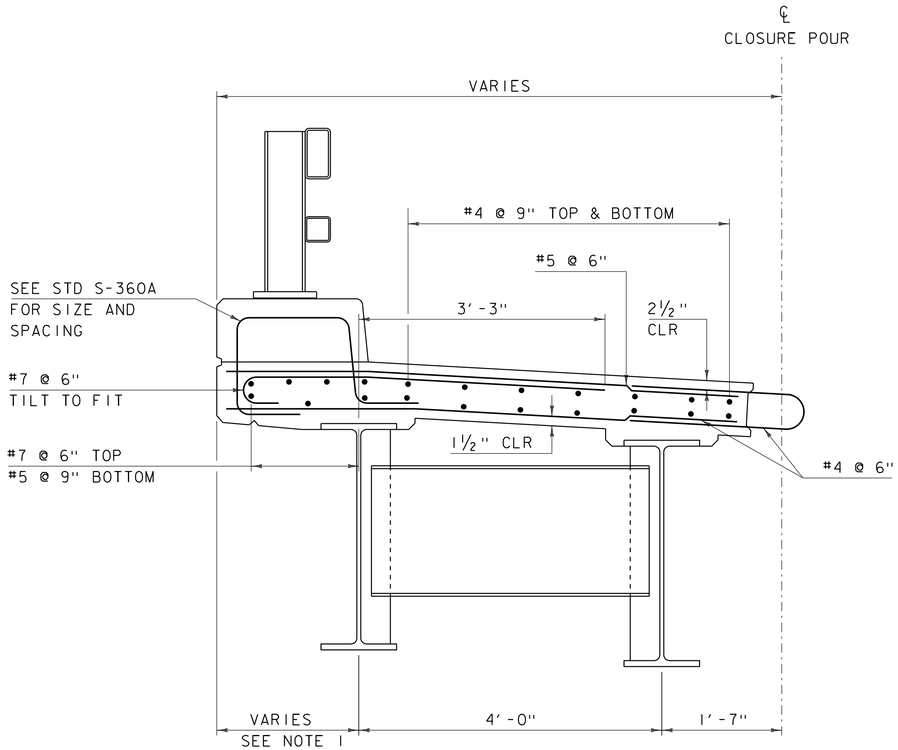
NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-7" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

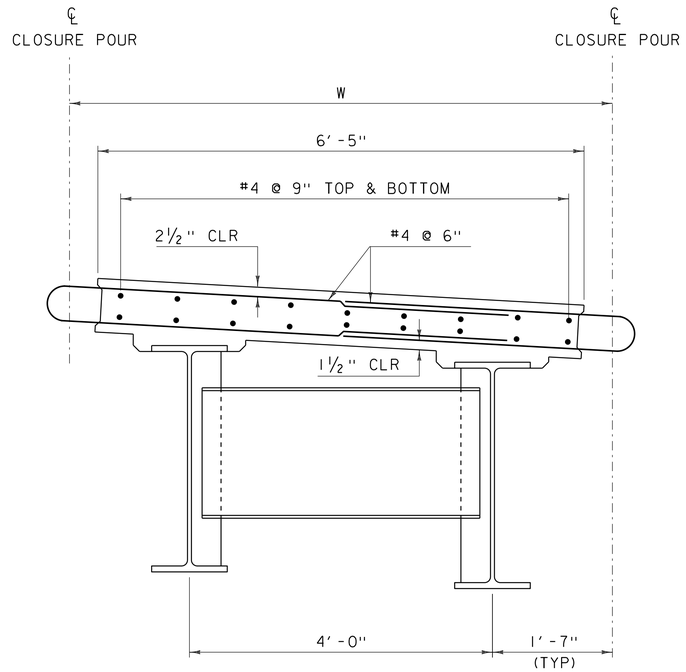
FILE NAME: s10b414sup.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
PBU END DETAILS

PLOT DATE: 13-SEP-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 25 OF 50



PBU 1 & 6

SCALE 1" = 1'-0"



PBU 2 - 5

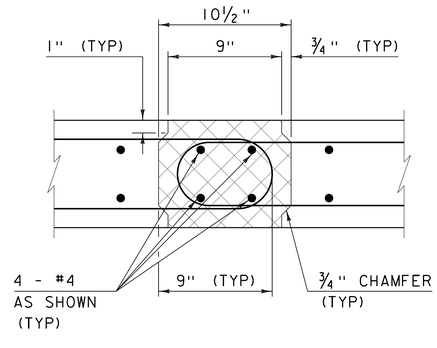
SCALE 1" = 1'-0"

NOTES:

1. PBU 1: 1'-2⅞" MIN, 1'-10½" MAX
   PBU 6: 1'-3½" MIN, 1'-11⅜" MAX
2. PBU 1 SHOWN, PBU 6 SIMILAR.

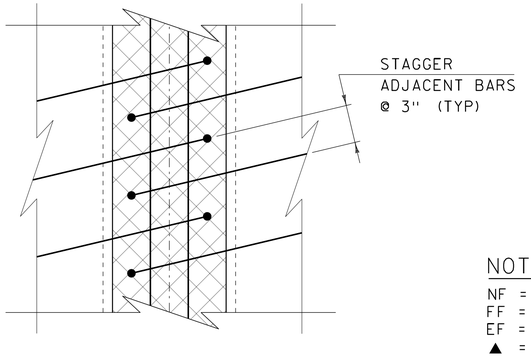
PBU FABRICATION TOLERANCES	
LENGTH (OVERALL)	± ¾", ¾" MAXIMUM BETWEEN ADJACENT UNITS
WIDTH (OVERALL)	± ¼"
DEPTH (OVERALL)	± ¼"
WEB SPACING	± ⅛" IN 10 FEET
DECK THICKNESS	+ ¼", - ⅛"
SHEAR KEY WIDTH AND DEPTH	± ¼"
VARIATION FROM SPECIFIED CAMBER	± ¾", ¾" MAXIMUM BETWEEN ADJACENT UNITS
VARIATION FROM SPECIFIED END SQUARNESS OR SKEW	± ¾"
LOCATION OF MECHANICAL SPLICE CONNECTORS MEASURED FROM COMMON REFERENCE POINT	± ¼"
LOCATION OF PROJECTING REINFORCING MEASURED FROM COMMON REFERENCE POINT	± ½"
LOCAL SMOOTHNESS OF ANY SURFACE	± ¼" IN 10 FEET

PBU ERECTION TOLERANCES	
TOP ELEVATION FROM SPECIFIED ELEVATION	± ¾", ¼" MAXIMUM BETWEEN ADJACENT UNITS*
PLAN LOCATION OF ANY POINT MEASURED FROM COMMON REFERENCE POINT	± ⅝"
JOINT WIDTH	± ½"
JOINT TAPER	± ¼"



CONNECTION DETAIL SECTION

SCALE 2" = 1'-0"



CONNECTION DETAIL PLAN

SCALE 2" = 1'-0"

NOTE:

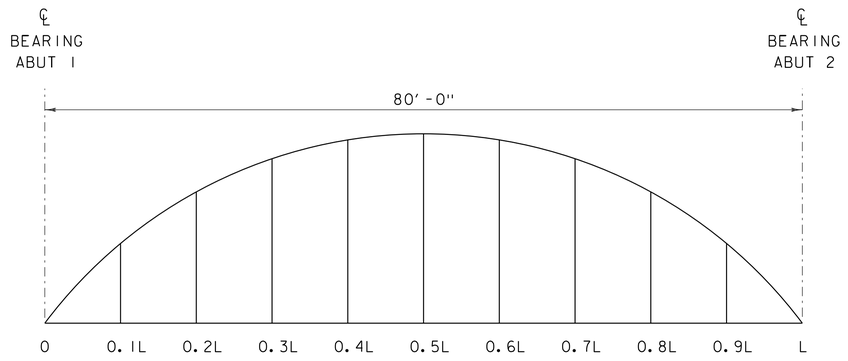
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
1'-9" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

*CAMBER LEVELING LOAD MAY BE REQUIRED TO MEET TOLERANCE. VERTICAL DEVIATION BETWEEN UNITS UP TO ¾" SHALL BE CORRECTED BY APPLIED CAMBER LEVELING LOAD TO BRING WITHIN TOLERANCE. ERECTION PLAN SHALL INCLUDE CALCULATIONS FOR CORRECTION PROCEDURE. LOAD SHALL NOT BE REMOVED UNTIL CLOSURE POUR CONCRETE ATTAINS THE MINIMUM 24-HR COMPRESSIVE STRENGTH.

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414sup.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
PBU TYPICAL SECTIONS

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 26 OF 50



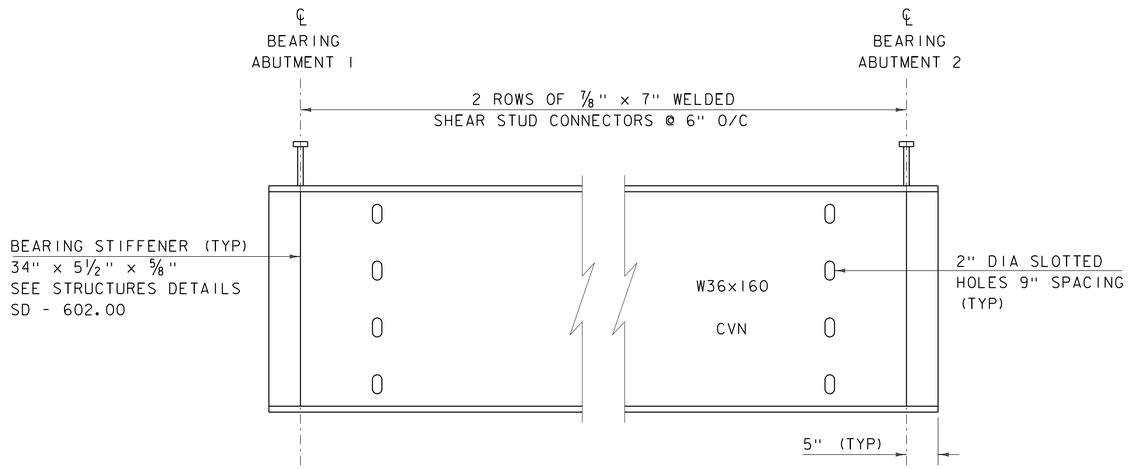
CAMBER DIAGRAM

NOT TO SCALE

	0	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	L
Steel Deflection	0	3/16	5/16	7/16	1/2	9/16	1/2	7/16	5/16	3/16	0
Slab & Super Deflection	0	5/8	1 3/16	1 9/16	1 7/8	1 15/16	1 7/8	1 9/16	1 3/16	5/8	0
Total Deflection	0	13/16	1 1/2	2	2 3/8	2 1/2	2 3/8	2	1 1/2	13/16	0
Residual Camber	0	3/8	5/8	13/16	15/16	1	15/16	13/16	5/8	3/8	0
Total Camber	0	1 3/16	2 1/8	2 13/16	3 5/16	3 1/2	3 5/16	2 13/16	2 1/8	1 3/16	0

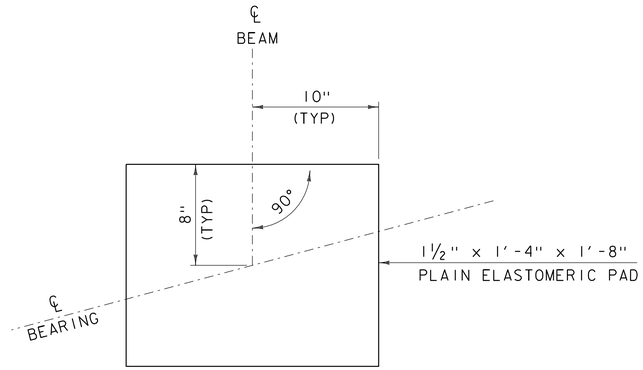
CAMBER AND DEFLECTION

(INCHES)



SHEAR STUD CONNECTION DIAGRAM

NOT TO SCALE



BEARING LAYOUT

SCALE 1" = 2'-0"

BEARING NOTES:

1. BEARINGS SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF SECTIONS 531 AND 731.

2. THE ELASTOMER WAS DESIGNED WITH A SHEAR MODULUS OF 110 PSI +/- 15%.

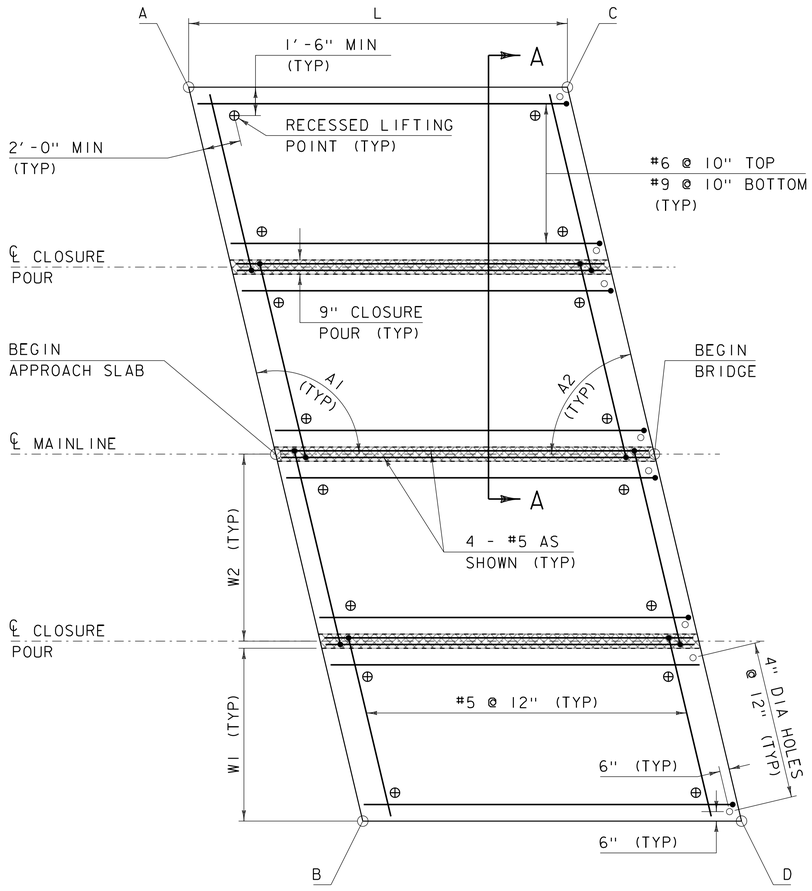
3. THE BEARING DEVICE SHALL BE PLACED ON THE SLOPED BRIDGE SEAT. THE CONTRACTOR MAY NEED TO BRACE THE SUPERSTRUCTURE UNITS TO PREVENT EXCESSIVE LATERAL DISPLACEMENT OF THE BEARING PRIOR TO THE BRIDGE BECOMING INTEGRAL.

4. THE CONTRACTOR IS ADVISED TO HAVE A MINIMUM OF 24 - 1/4"x1'-4"x1'-8" GALVANIZED STEEL SHIMS AVAILABLE FOR USE FOR ELEVATION ADJUSTMENTS UPON THE SETTING OF THE SUPERSTRUCTURE UNITS. THE SHIMS SHALL BE FABRICATED ACCORDING TO SECTION 531 AND SHALL BE INCLUDED UNDER ITEM 531.16,"BEARING DEVICE ASSEMBLY, PLAIN ELASTOMERIC PAD".

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414sup.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
CAMBER & DEFLECTION

PLOT DATE: 19-SEP-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 27 OF 50

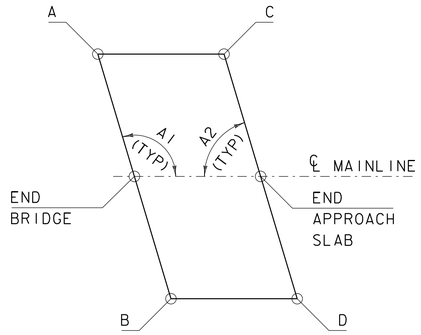


APPROACH SLAB #1 PLAN VIEW

SCALE 1/4" = 1'-0"

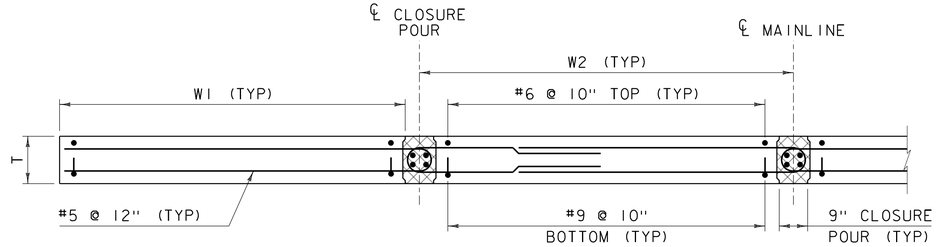
NOTE:

1. LIFTING POINTS SHALL BE DESIGNED BY FABRICATOR AND SUBMITTED WITH CALCULATIONS.
2. REINFORCING STEEL FOR APPROACH SLAB #1 SHALL BE SIMILAR TO APPROACH SLAB #2.



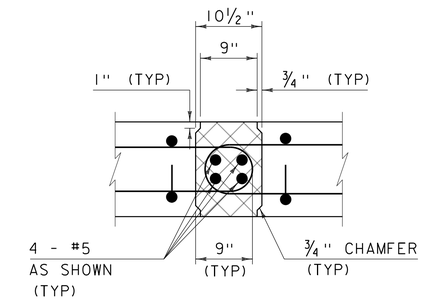
APPROACH SLAB #2 PLAN VIEW

NOT TO SCALE



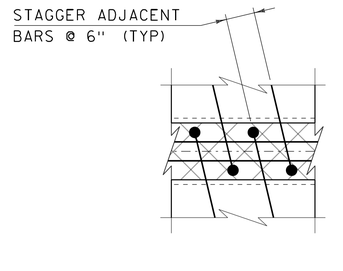
SECTION A-A

SCALE 1/2" = 1'-0"



CONNECTION DETAIL SECTION

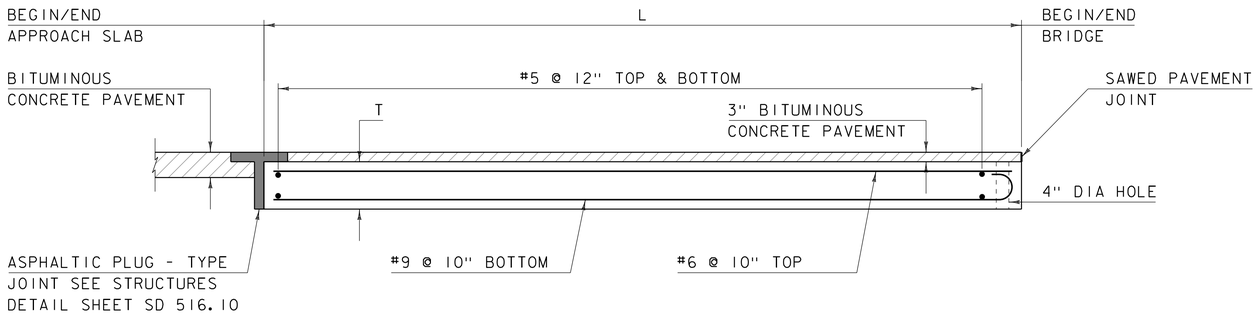
SCALE 1" = 1'-0"



CONNECTION DETAIL PLAN

SCALE 1" = 1'-0"

APPROACH SLAB #1			
	STATION	OFFSET	ELEVATION
1A	392+87.79	-19.41	1300.19
BEGIN AS #1	392+92.23	℄	1299.06
1B	392+96.77	19.39	1297.93
1C	393+07.57	-19.35	1299.90
END AS #1	393+12.23	℄	1298.78
1D	393+16.99	19.34	1297.64



APPROACH SLAB ELEVATION VIEW

SCALE 1/2" = 1'-0"

T	1'-3"
L	20'-0"
W1	9'-1 1/2"
W2	9'-10 1/2"

APPROACH SLAB #1	A1	103°
	A2	77°

APPROACH SLAB #2	A1	107°
	A2	73°

APPROACH SLAB DIMENSIONS

APPROACH SLAB #2			
	STATION	OFFSET	ELEVATION
2A	393+88.16	-19.42	1298.49
BEGIN AS #1	393+93.78	℄	1297.30
2B	393+99.53	19.40	1296.11
2C	394+07.94	-19.35	1298.05
END AS #2	394+13.78	℄	1296.86
2D	394+19.75	19.33	1295.66

APPROACH SLAB ELEVATIONS

ALL ELEVATIONS ARE TOP OF SLAB

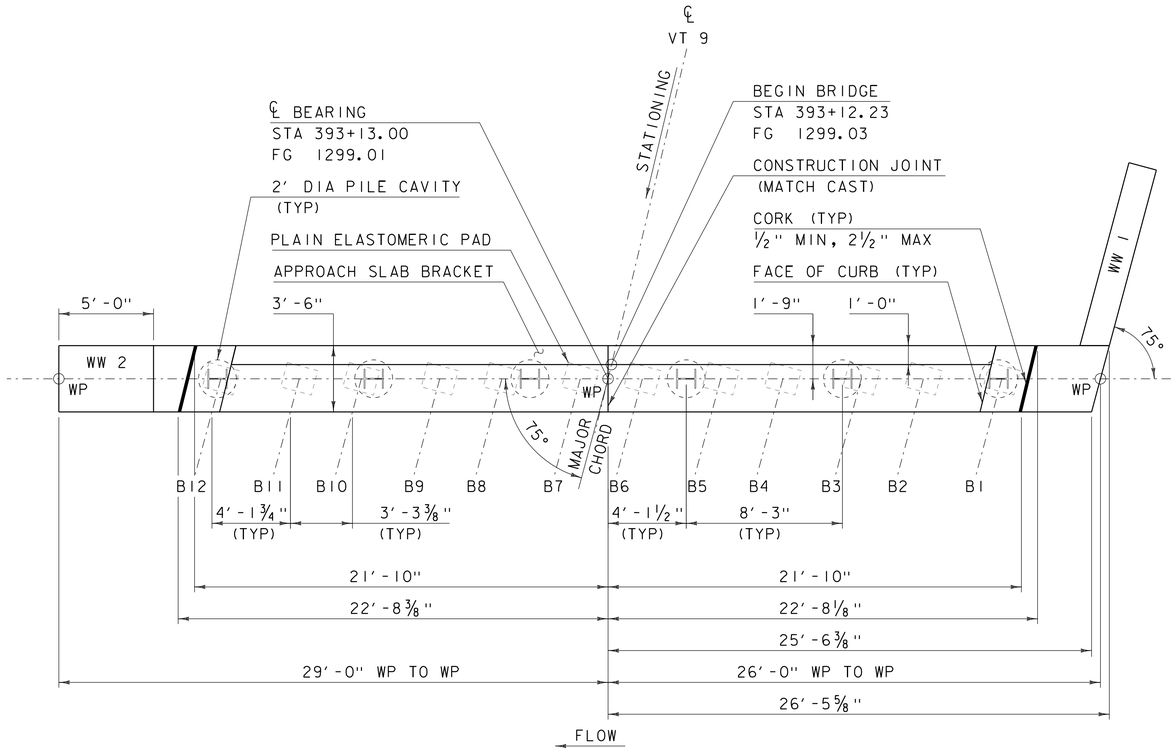
NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-7" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

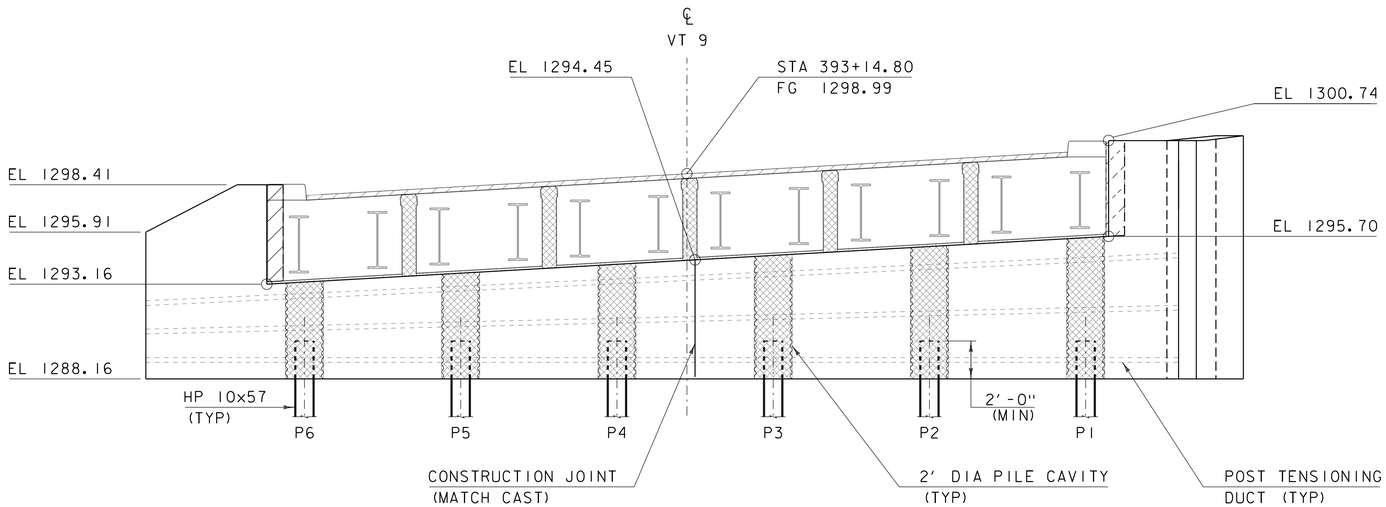
FILE NAME: s10b414apslab.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
APPROACH SLAB DETAILS

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 28 OF 50



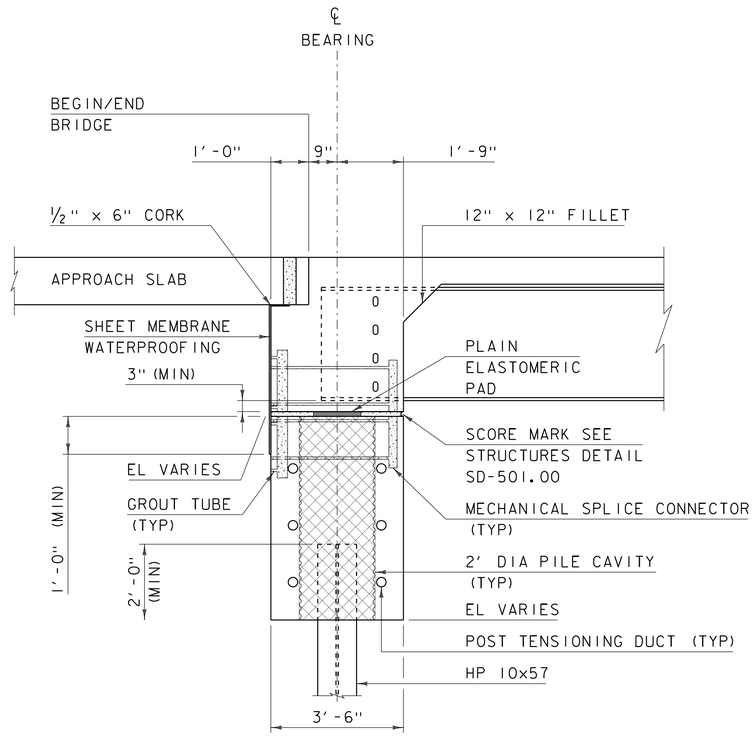
ABUTMENT 1 PLAN (PCU 1)

SCALE ¼" = 1'-0"



ABUTMENT 1 ELEVATION (PCU 1)

SCALE ¼" = 1'-0"



ABUTMENT TYPICAL SECTION

SCALE ½" = 1'-0"

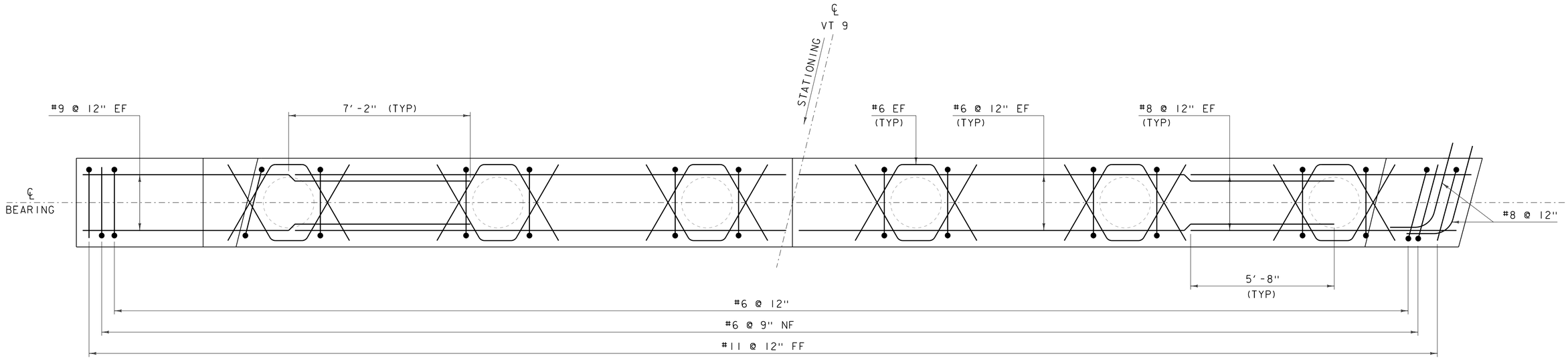
NOTES:

1. THE BRIDGE PLAQUE FURNISHED BY THE AGENCY SHALL BE CAST INTO THE PCU AND BE INCIDENTAL TO THE PRECAST CONCRETE STRUCTURE ITEM. SEE STRUCTURES DETAIL SD-502.00 FOR LOCATION AND POSITIONING OF THE BRIDGE PLAQUE.

2. GROUT FOR PRECAST CONNECTIONS IS INCIDENTAL TO ITEM 540.10.

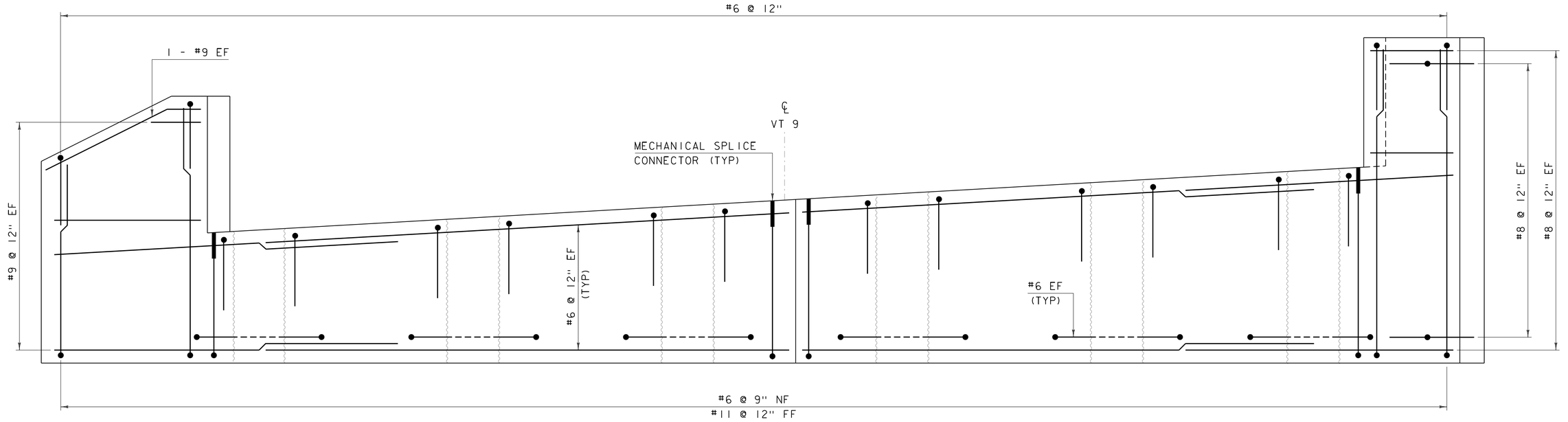
3. SHEET MEMBRANE WATERPROOFING ON BACKWALLS IS INCIDENTAL TO ITEM 900.675, SPECIAL PROVISION (PREFABRICATED BRIDGE UNIT SUPERSTRUCTURE).

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10414sub_1.dgn	PLOT DATE: 13-SEP-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
ABUTMENT 1	SHEET 29 OF 50



ABUTMENT 1 REINFORCING PLAN (PCU 1)

SCALE 1/2" = 1'-0"



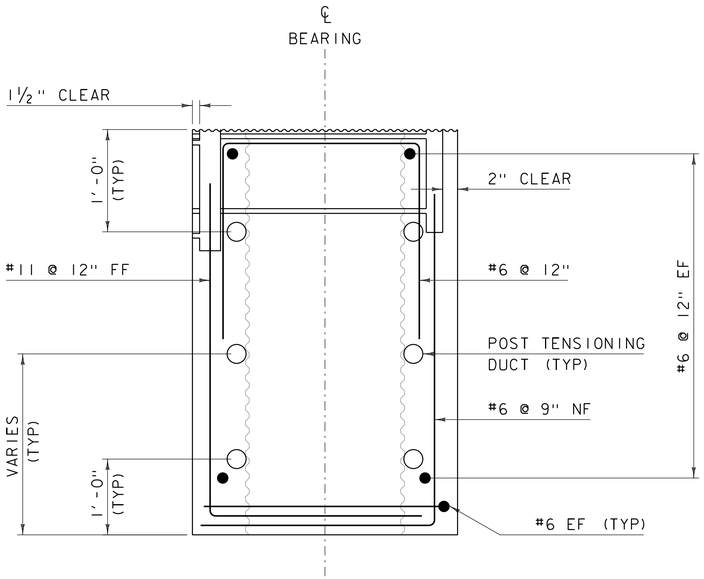
ABUTMENT 1 REINFORCING ELEVATION (PCU 1)

SCALE 1/2" = 1'-0"

NOTE:

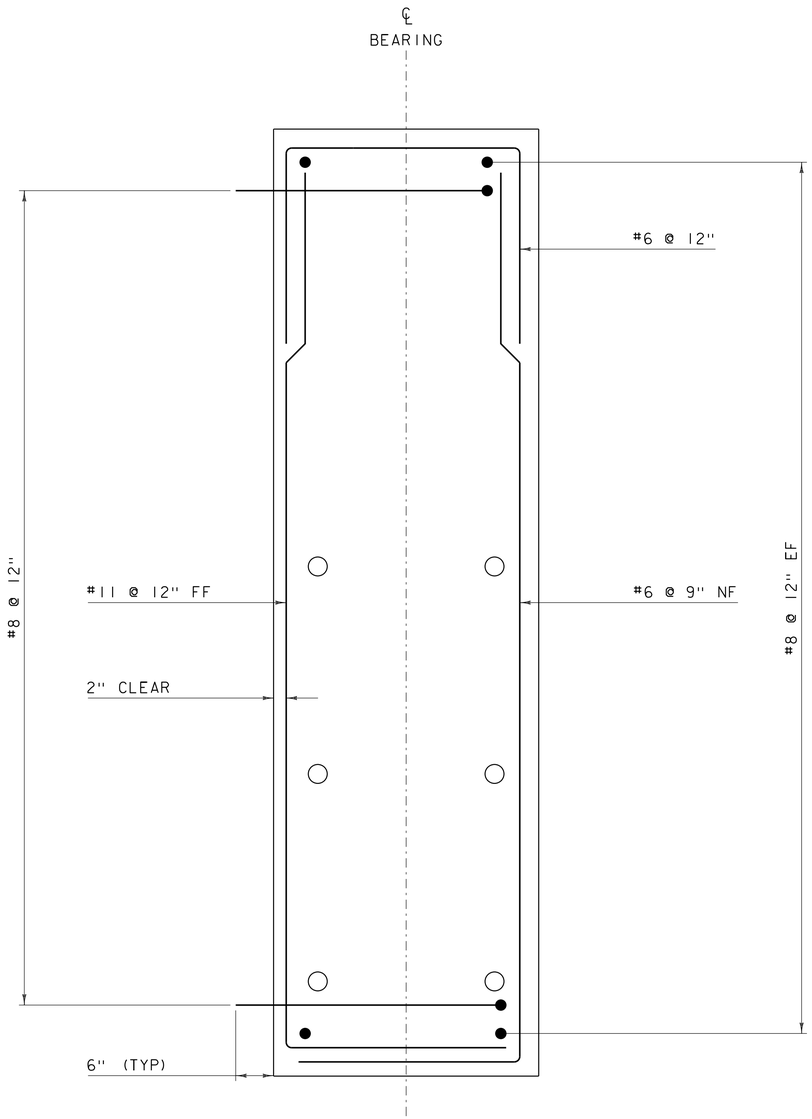
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3'-1" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10414sub_1.dgn	PLOT DATE: 13-SEP-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
ABUTMENT 1 REINFORCING	SHEET 30 OF 50



ABUTMENT REINFORCING
AT BRIDGE SEAT

SCALE 1" = 1'-0"



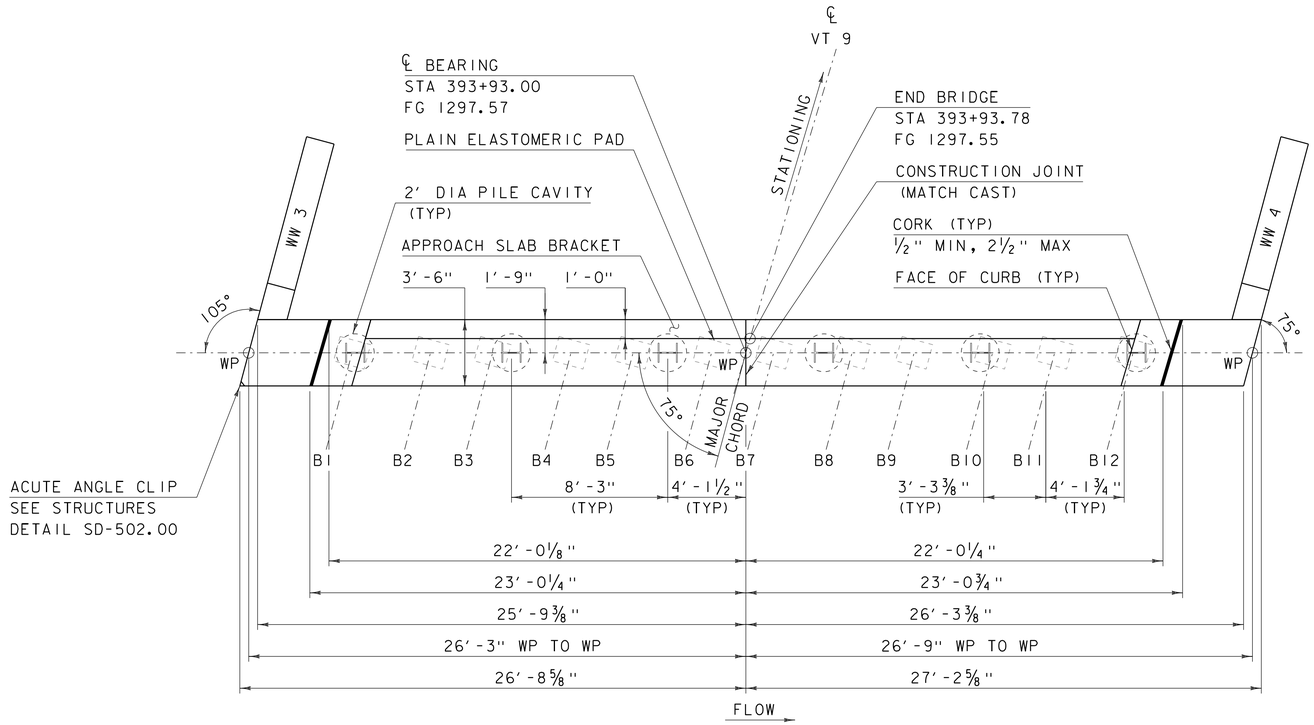
ABUTMENT REINFORCING
AT CHEEK WALL

SCALE 1" = 1'-0"

NOTE:

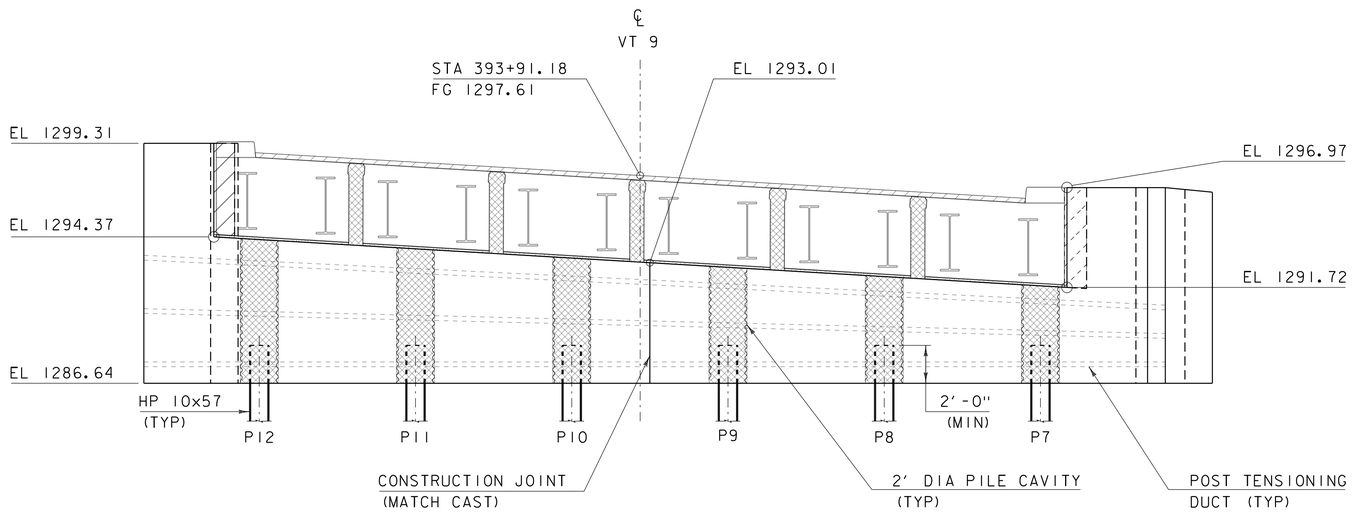
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3'-1" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10414sub_1.dgn	PLOT DATE: 13-SEP-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
ABUTMENT REINFORCING TYPICALS	SHEET 31 OF 50



ABUTMENT 2 PLAN (PCU 2)

SCALE ¼" = 1'-0"



ABUTMENT 2 ELEVATION (PCU 2)

SCALE ¼" = 1'-0"

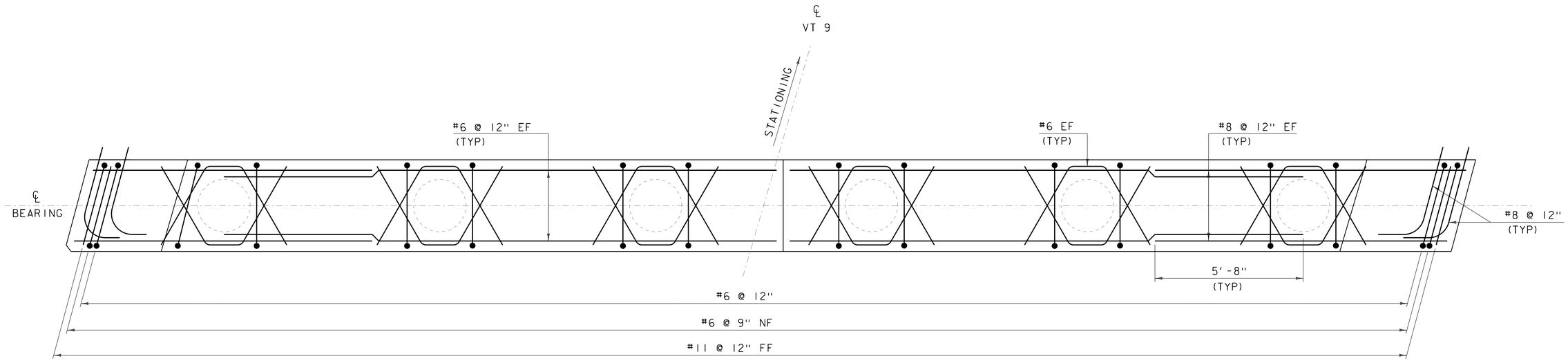
PRECAST ABUTMENT FABRICATION TOLERANCES	
LENGTH (OVERALL)	± ¼"
WIDTH (OVERALL)	± ¼"
DEPTH (OVERALL)	± ¼"
VARIATION FROM SPECIFIED END SQUARNESS OR SKEW	± ⅛" PER 12" WIDTH ± ½" MAXIMUM
LOCATION OF MECHANICAL SPLICE CONNECTORS MEASURED FROM COMMON REFERENCE POINT	± ¼"
LOCATION OF PROJECTING REINFORCING MEASURED FROM COMMON REFERENCE POINT	± ¼"
LOCAL SMOOTHNESS OF ANY SURFACE	± ¼" IN 10 FEET
LOCATION OF POST TENSIONING CONDUITS	± ¼"
LOCATION OF PILE CAVITIES	± 1"

PRECAST ABUTMENT ERECTION TOLERANCE	
VARIATION FROM SPECIFIED BRIDGE SEAT ELEVATION	± ⅛", ⅛" MAXIMUM BETWEEN ADJACENT UNITS
PLAN LOCATION OF ANY POINT MEASURED FROM COMMON REFERENCE POINT	± ½"
PLUMB	± ¼" IN 10 FEET ± ½" MAXIMUM

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

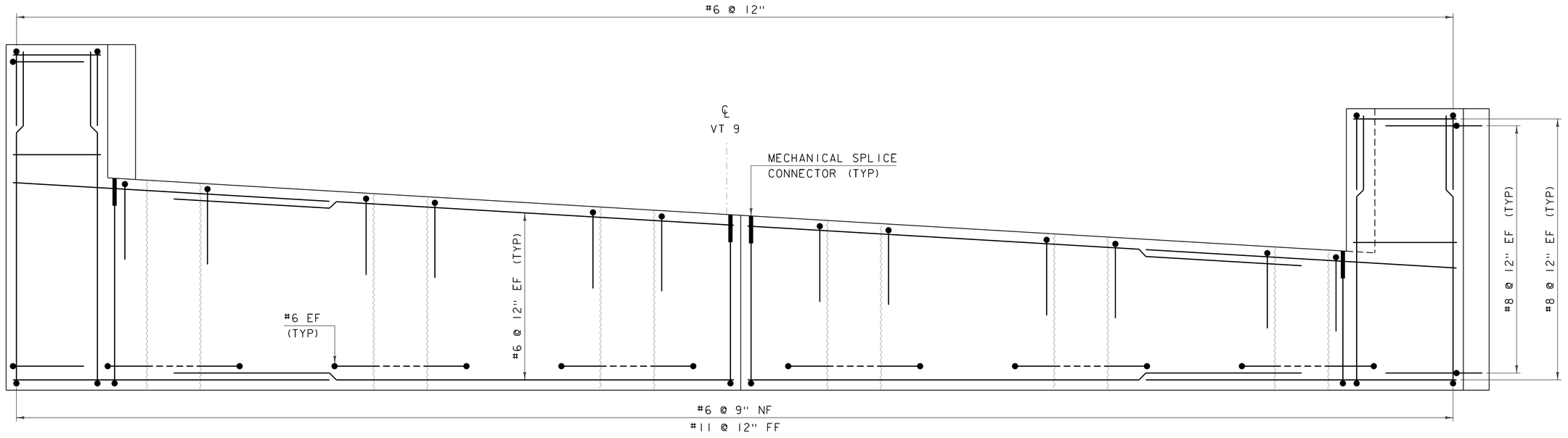
FILE NAME: s10414sub_2.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
ABUTMENT 2

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 32 OF 50



ABUTMENT 2 REINFORCING PLAN (PCU 2)

SCALE ½" = 1'-0"



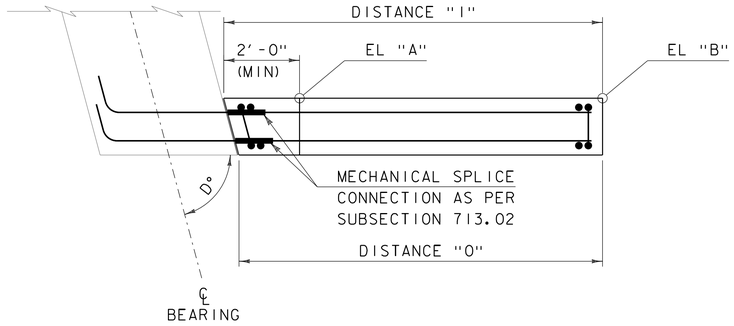
ABUTMENT 2 REINFORCING ELEVATION (PCU 2)

SCALE ½" = 1'-0"

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3'-1" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: MARLBORO	
PROJECT NUMBER: BRF 010-1(43)	
FILE NAME: s10414sub_2.dgn	PLOT DATE: 13-SEP-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
ABUTMENT 2 REINFORCING	SHEET 33 OF 50

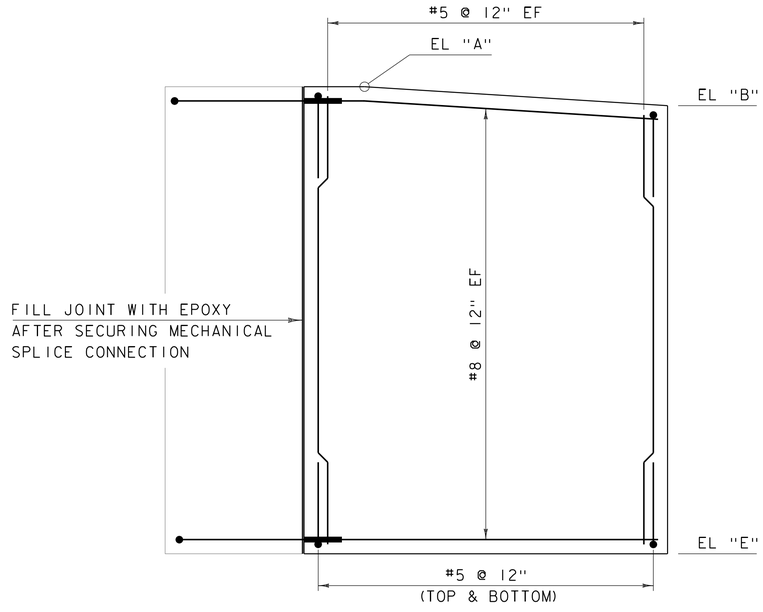


PLAN VIEW FOR PCU 3 & PCU 5
(PCU 4 SIMILAR)

SCALE ½" = 1'-0"

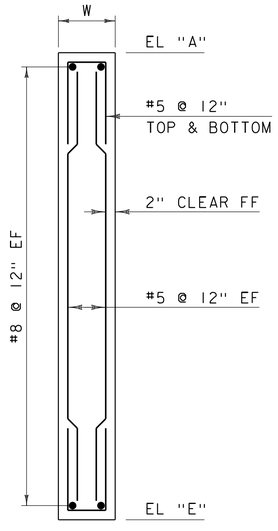
PCU 3 - PCU 5 ELEVATIONS

	PCU 3	PCU 4	PCU 5
	WW1	WW3	WW4
EL "A"	1300.74	1299.31	1296.97
EL "B"	1300.99	1299.06	1296.72
EL "E"	1288.16	1286.64	1286.64
DIST "I"	10'-0"	9'-7⅛"	10'-0"
DIST "O"	9'-7⅛"	10'-0"	9'-7⅛"
DIST "W"	1'-6"	1'-6"	1'-6"
ANGLE "D"	75°	105°	75°



PCU 3-5 ELEVATIONS

SCALE ½" = 1'-0"



PCU 3-5 TYPICAL SECTION

SCALE ½" = 1'-0"

NOTE:

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
3" CLEAR, UNLESS OTHERWISE
SPECIFIED ON THE PLANS.
2'-7" BAR LAP UNLESS OTHERWISE
SPECIFIED ON THE PLANS.

NOTE:

1. EPOXY GROUT SHALL BE INCIDENTAL TO THE PRECAST CONCRETE STRUCTURE.

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10414ww.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
WINGWALL DETAILS

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 34 OF 50

N

VT STATE PLANE GRID

N 137918.31
E 1588691.84
390+99.27
25.47 LT

N 137927.56
E 1588845.48
392+48.47
48.82 LT

N 137927.56
E 1588845.48
392+48.47
48.82 LT

N 137874.80
E 1589070.87
394+74.21
41.43 LT

N 137865.16
E 1589093.72
394+98.26
38.21 LT

N 137849.18
E 1589179.81
395+83.15
48.37 LT

N 137803.54
E 1589234.10
396+48.28
23.61 LT

PETERS

BALDWIN

WHETSTONE BROOK
FLOW

P L

4-M. CHERRY
M. PINE
3' H X 1.5' W
EVERGREEN HEDGE
M. MAPLE
STONE
RET. WALL
M. MAPLE
6' X 6'
LILAC HEDGE
GUY
WIRE
#15T/268
WOODS

BEGIN PROJECT
STA 392+50.00

S78°57'50"E
153.88

N86°33'12"E
153.92

EXISTING ROW

HVCTRL
#275
HVCTRL
#300
WOODS
M. PINE
HVCTRL
#1015
M. PINE

END PROJECT
STA 394+50.00

DITCH

GRAVEL
DRIVE

S67°6'58"E
24.80

S79°29'12"E
87.56

WOODS

S49°56'49"E
70.92

END PAVEMENT
STA 395+75.00

END APPROACH
STA 396+00.00

HVCTRL
#275
GUY
WIRE

#27/269

#27/270

12" CGMP

HVCTRL
#4

M. MAPLE
M. MAPLE

VT 9
TO MARLBORO

390+50
391+00
392+00
393+00
394+00
395+00
396+00
396+50

VT 9
TO BRATTLEBORO

24" CONC. PIPE

HVCTRL
#271

GUY
WIRE
#154

GRAVEL
DRIVE
M. MAPLE
M. MAPLE

120' STEEL PIPE

M. ASH

UNNAMED BROOK
FLOW

WOODS

#27/268-1

BEGIN APPROACH
STA 391+50.00

EXISTING ROW

S68°35'9"E
346.77

BEGIN BRIDGE
STA 393+12.23
F.G. = 1299.03

CONSTRUCTION
LIMITS

END BRIDGE
STA 393+93.78
F.G. = 1297.55

N85°56'11"E
207.48

EXISTING ROW

P L

FULLER

BOYD

CARPENTER

N 137868.98
E 1588687.24
390+97.42
24.04 RT

N 137742.38
E 1589010.07
394+48.31
102.04 RT

N 137757.08
E 1589217.03
396+48.73
25.89 RT

ROW LAYOUT SHEET

20 0 20

SCALE: 1" = 20'-0"

THIS SHEET IS FOR R.O.W. PURPOSES ONLY

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414row_layout.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
ROW LAYOUT SHEET

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: J. SALVATORI
SHEET 35 OF 50

EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REPLACEMENT OF BRIDGE 48 WITH RELATED ROADWAY APPROACH AND CHANNEL WORK. THE PROJECT LOCATION IS IN THE TOWN OF MARLBORO, VT ON VERMONT ROUTE 9, BEGINNING APPROXIMATELY 0.870 MILES FROM THE MARLBORO AND BRATTLEBORO TOWN LINE. ONE-WAY TRAFFIC WILL BE MAINTAINED ON THE EXISTING ROAD THROUGH THE USE OF PHASED CONSTRUCTION AND TEMPORARY TRAFFIC SIGNALS.

THE NEW PREFABRICATED CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE WILL BE APPROXIMATELY 82 FEET IN LENGTH WITH 118 FEET OF ROADWAY WORK.

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 LAYOUT PLAN.

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.68 ACRES.

IT IS ANTICIPATED THAT THIS PROJECT WILL BE COMPLETED IN ONE CONSTRUCTION SEASON.

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS MOUNTAINOUS, MOSTLY FORESTED WITH SOME OPEN AREAS. VT ROUTE 9 AND TWO GRAVEL DRIVEWAYS ARE WITHIN THE PROJECT SITE. THE IMMEDIATE AREA IS RURAL RESIDENTIAL WITH SEVERAL HOUSES IN THE GENERAL VICINITY OF THE PROJECT. THERE ARE OVERHEAD UTILITIES WHICH MAY HAVE TO BE RELOCATED PRIOR TO CONSTRUCTION.

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

WHETSTONE BROOK AND A DOWNSTREAM UNNAMED BROOK ARE THE ONLY WATER SOURCES ON THE PROJECT SITE. THE BROOK IS CLASSIFIED AS SINUOUS WITH A STREAM BED CONSISTING OF GRAVEL AND COBBLES. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 3.3 SQUARE MILES. AT THE END OF THE PROJECT, THERE IS A 24 INCH CULVERT UNDER THE ROAD WHICH CONVEYS WATER FROM A DITCH TOWARDS THE BROOK. DUE TO THE NATURE OF THE SURROUNDING TERRAIN, RUNOFF WATER ENTERING THE PROJECT SITE WILL BE PRIMARILY LIMITED TO THAT WHICH IS CONVEYED ALONG ROADWAY EMBANKMENT, AND THAT WHICH FOLLOWS VT ROUTE 9 ALONG THE -2.1% GRADE AT THE BEGINNING OF THE PROJECT LIMITS AND -2.6% GRADE AT THE END OF THE PROJECT LIMITS.

1.2.3 VEGETATION

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

1.2.4 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF WINDHAM, VERMONT. SOILS ON THE PROJECT SITE ARE 46D BERKSHIRE AND MONADNOCK FINE SANDY LOAM, 15% TO 25% SLOPES, “K FACTOR” = 0.24/0.28 AND 26C WESTBURY FINE SANDY LOAM, 8% TO 15% SLOPES, “K FACTOR” = 0.37. 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: NONE.
HISTORICAL AREAS: NONE.
ARCHEOLOGICAL AREAS: NONE.
PRIME AGRICULTURAL LAND: NONE.
THREATENED AND ENDANGERED SPECIES: NONE.
WATER RESOURCE: WHETSTONE BROOK.
WETLANDS: NONE.

1.3 RISK EVALUATION

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

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

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

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

1.4.1 MARK SITE BOUNDARIES

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

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

1.4.2 LIMIT DISTURBANCE AREA

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

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

1.4.3 SITE ENTRANCE/EXIT STABILIZATION

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

FOLLOWING GUIDANCE FROM THE LOW RISK SITE HANDBOOK, THE CONTRACTOR SHALL PROPOSE LOCATIONS FOR STABILIZED CONSTRUCTION ENTRANCES ON THE CONTRACTOR DEVELOPED EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

1.4.4 INSTALL SEDIMENT BARRIERS

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

FILTER CURTAIN SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLANS PRIOR TO ANY CHANNEL WORK.

FOLLOWING GUIDANCE FROM THE LOW RISK SITE HANDBOOK, THE CONTRACTOR SHALL PROPOSE LOCATIONS FOR SILT FENCE ON THE CONTRACTOR DEVELOPED EPSC PLAN.

1.4.5 DIVERT UPLAND RUNOFF

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

THE NEED TO DIVERT UPLAND RUNOFF IS NOT ANTICIPATED AT THIS 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.

THE USE OF STONE CHECK DAMS IS NOT ANTICIPATED FOR THIS PROJECT.

1.4.7 CONSTRUCT PERMANENT CONTROLS

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

THE USE OF PERMANENT STORMWATER TREATMENT DEVICES IS NOT ANTICIPATED FOR THIS PROJECT.

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY STABILIZATION IN PLACE WITHIN 48 HOURS OF DISTURBANCE.

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.

DEWATERING IS NOT ANTICIPATED AT THIS SITE. IF DEWATERING IS NECESSARY, THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR.

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: MARLBORO
PROJECT NUMBER: BRF 010-1 (43)

FILE NAME: s10b414erodet.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
EPSC NARRATIVE

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 36 OF 50

N

VT STATE PLANE GRID

26C WESTBURY
FINE SANDY LOAMS
WITH 8% TO 15% SLOPES
"K FACTOR" = .37
VERY STONEY

46D BERKSHIRE AND MONADNOCK
FINE SANDY LOAMS
WITH 15%-25% SLOPES
"K FACTOR" = .24 -.28
VERY STONEY

BALDWIN

PETERS

RIPARIAN BUFFER

WHETSTONE BROOK
FLOW

FLOOD PLAIN

END PROJECT
STA 394+50.00

BEGIN PROJECT
STA 392+50.00

END PAVEMENT
STA 395+75.00

END APPROACH
STA 396+00.00

EXISTING ROW

PHASE 1

PHASE 2

RIPARIAN BUFFER

CONSTRUCTION
LIMITS

END BRIDGE
STA 393+93.78
F.G. = 1297.55

BEGIN BRIDGE
STA 393+12.23
F.G. = 1299.03

BEGIN APPROACH
STA 391+50.00

UNNAMED BROOK
FLOW

BOYD

FULLER

CARPENTER

STONE FILL,
TYPE III
(TYP)

NOTES:

1. FOR CLARITY, AREAS TO BE SEEDED AND MULCHED HAVE NOT BEEN INDICATED. HOWEVER, ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS APPLICABLE.

2. EXISTING CONTOURS SHOWN. SEE CROSS SECTIONS FOR FINAL CONDITIONS.

EPSC PLAN

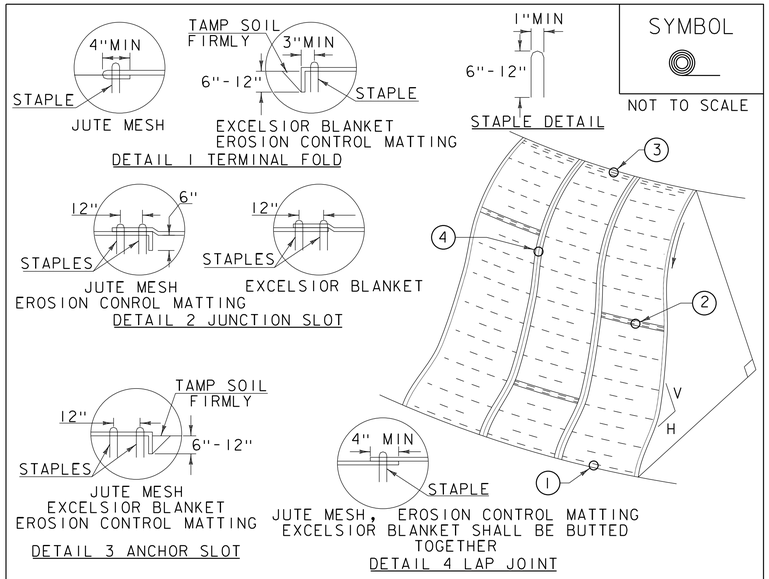
20 0 20

SCALE: 1" = 20'-0"

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414ero_bdr.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
EPSC PLAN

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 37 OF 50



SYMBOL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

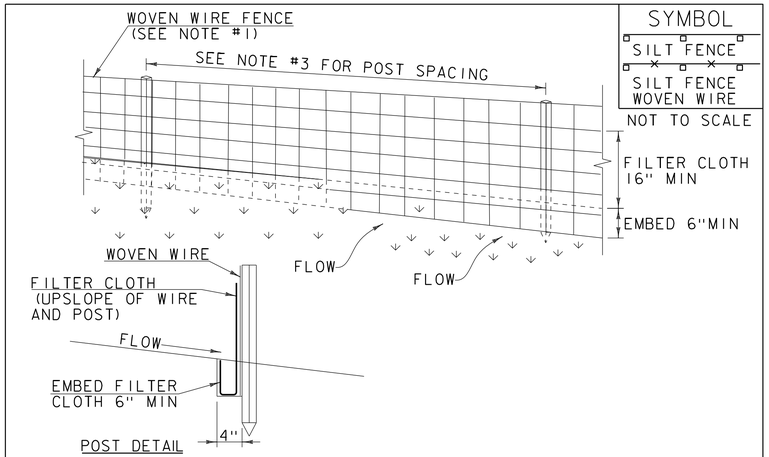
1. APPLY TO SLOPES GREATER THAN 3H: IV OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4'X225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4'X150' ROLL OF MATERIAL.
4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

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

ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE

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

REVISIONS	
APRIL 16, 2007	JMF
JANUARY 13, 2009	WHF



SYMBOL

SILT FENCE

SILT FENCE WOVEN WIRE

NOT TO SCALE

FILTER CLOTH 16" MIN

EMBED 6"MIN

CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE REINFORCED FENCE IS REQUIRED WITHIN 100' UPSLOPE OF RECEIVING WATERS WHEN THE PROJECT FALLS UNDER A CONSTRUCTION STORMWATER PERMIT. WOVEN WIRE SHALL BE A MIN. 14 GAUGE WITH A 6" MAX. MESH OPENING.
2. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI100X, STABILINKA T140N OR APPROVED EQUIVALENT.
3. POST SPACING FOR WIRE-BACKED FENCE SHALL BE 10' MAXIMUM. FOR FILTER-CLOTH FENCE, WHEN ELONGATION IS >50%, POST SPACING SHALL NOT EXCEED 4' AND WHEN ELONGATION IS <50%, POST SPACING SHALL NOT EXCEED 6'.
4. WOVEN WIRE FENCE IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY 6" AND FOLDED.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN SEDIMENT REACHES HALF OF FABRIC HEIGHT.

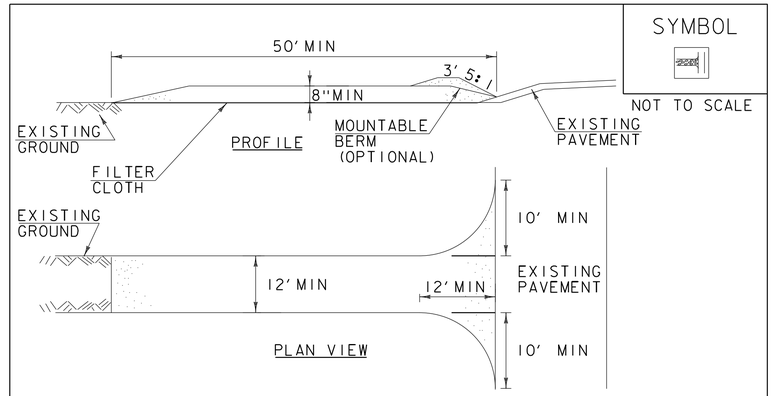
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SILT FENCE

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

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

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



SYMBOL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

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

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

STABILIZED CONSTRUCTION ENTRANCE

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

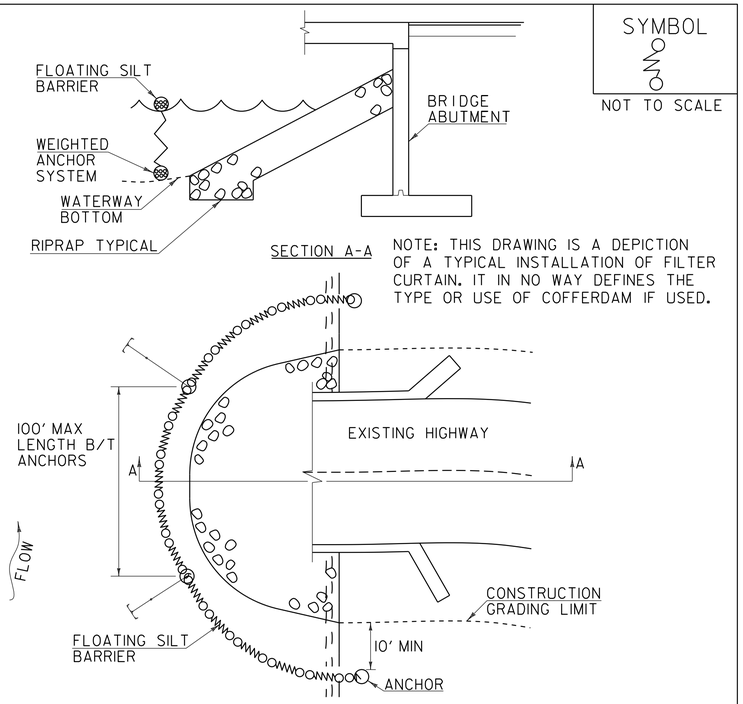
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR VEHICLE TRACKING PAD (PAY ITEM 653.35) OR AS SPECIFIED IN THE CONTRACT.

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1 (43)

FILE NAME: s10b414ero_det.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
EPSC DETAILS 1

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 38 OF 50



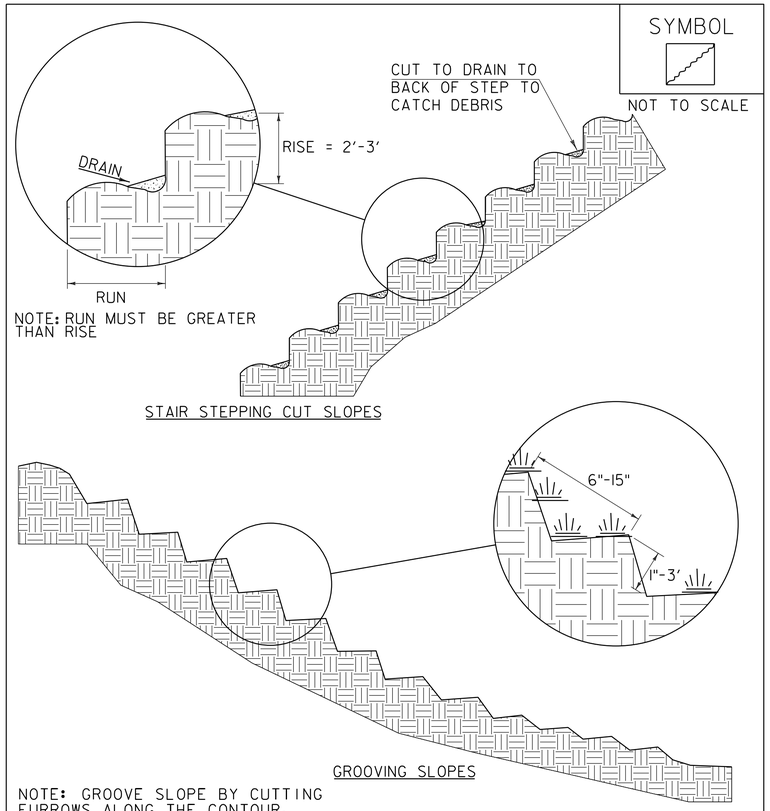
CONSTRUCTION SPECIFICATIONS

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

	FILTER CURTAIN

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

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



NOTE: GROOVE SLOPE BY CUTTING FURROWS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND RETAIN LIME, FERTILIZER AND SEED.

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

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

THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT

REVISIONS	
APRIL 1, 2008	WHF
JANUARY 13, 2009	WHF

VAOT RURAL AREA MIX

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

VAOT URBAN AREA MIX

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

SOIL AMENDMENT GUIDANCE

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

CONSTRUCTION GUIDANCE

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

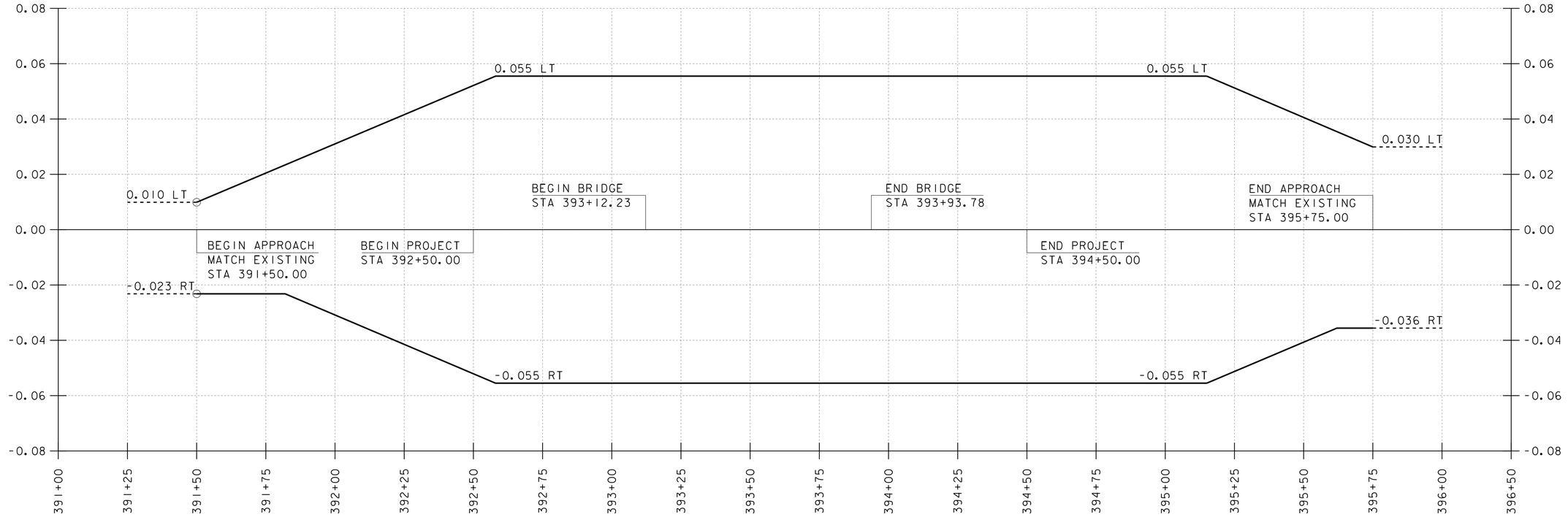
ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES	TURF ESTABLISHMENT

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

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1 (43)

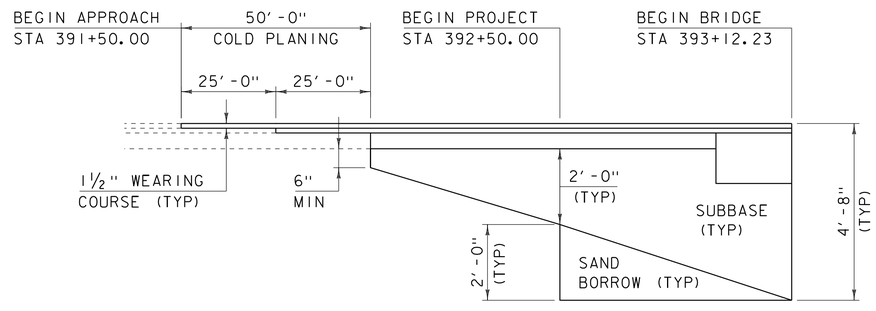
FILE NAME: s10b414ero_det.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
EPSC DETAILS 2

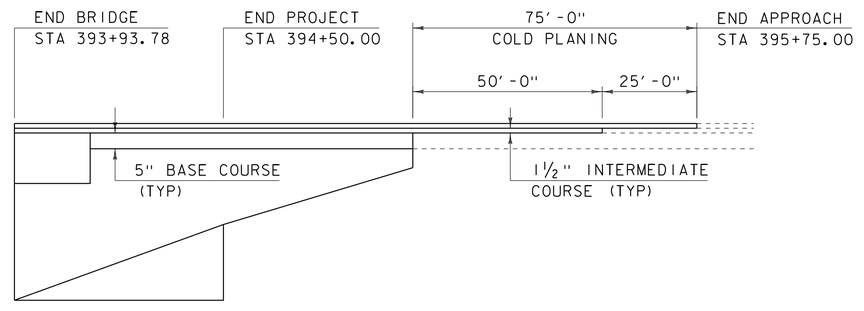
PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 39 OF 50



VT 9 BANKING DIAGRAM

HORIZONTAL SCALE: 1" = 20'-0"
VERTICAL SCALE: NOT TO SCALE

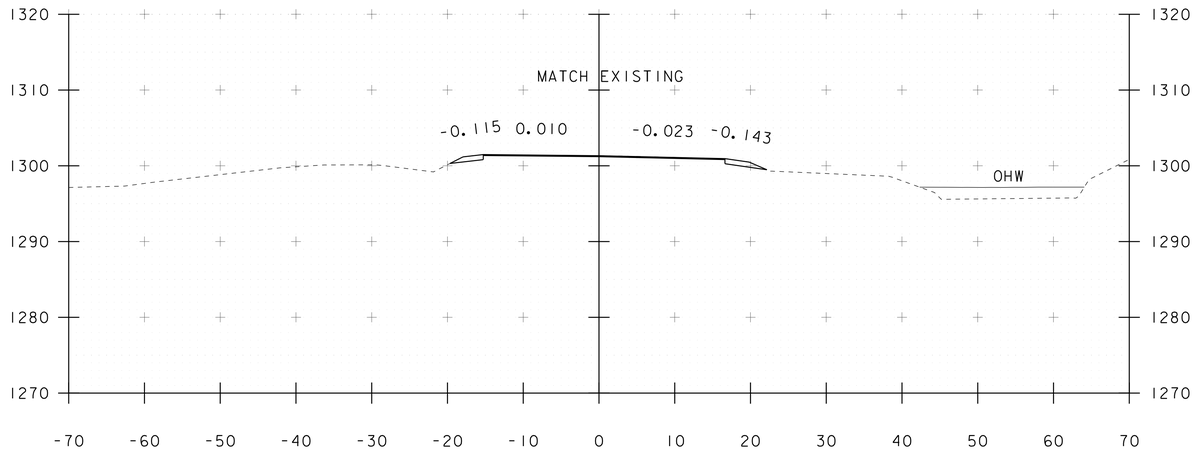




VT 9 MATERIAL TRANSITION DETAIL

HORIZONTAL SCALE: 1" = 20'-0"
VERTICAL SCALE: 1" = 2'-0"

PROJECT NAME:	MARLBORO
PROJECT NUMBER:	BRF 010-1(43)
FILE NAME: s10b414pro.dgn	PLOT DATE: 28-AUG-2013
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. FRIEDLAND
DESIGNED BY: R. KLINEFELTER	CHECKED BY: G. LAROCHE
BANKING DIAGRAM AND MATERIAL TRANSITION	SHEET 40 OF 50



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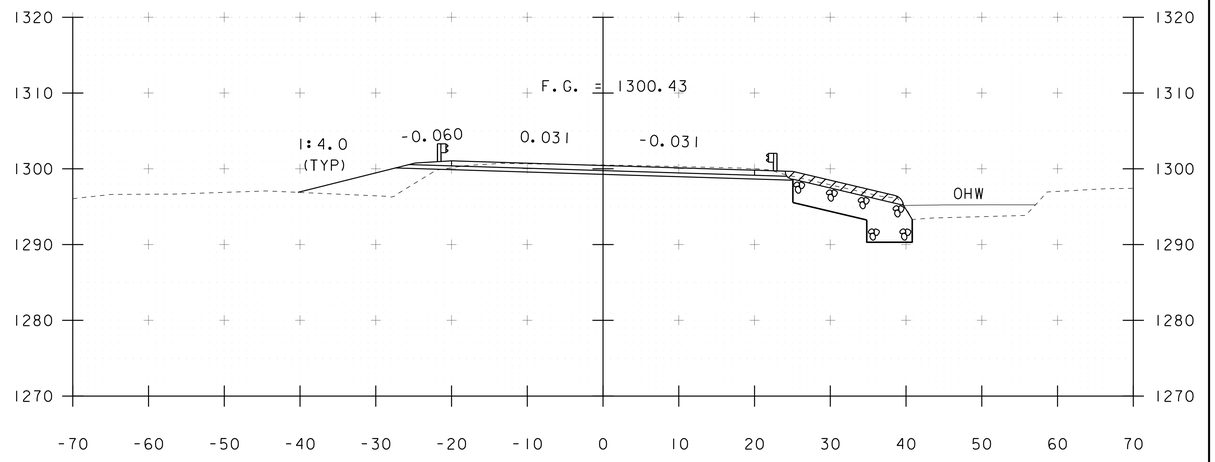
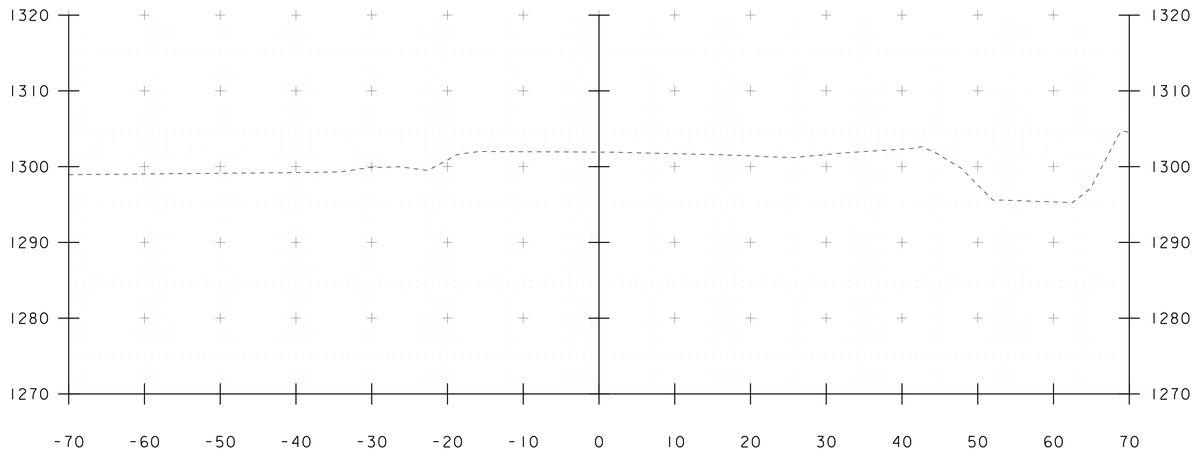
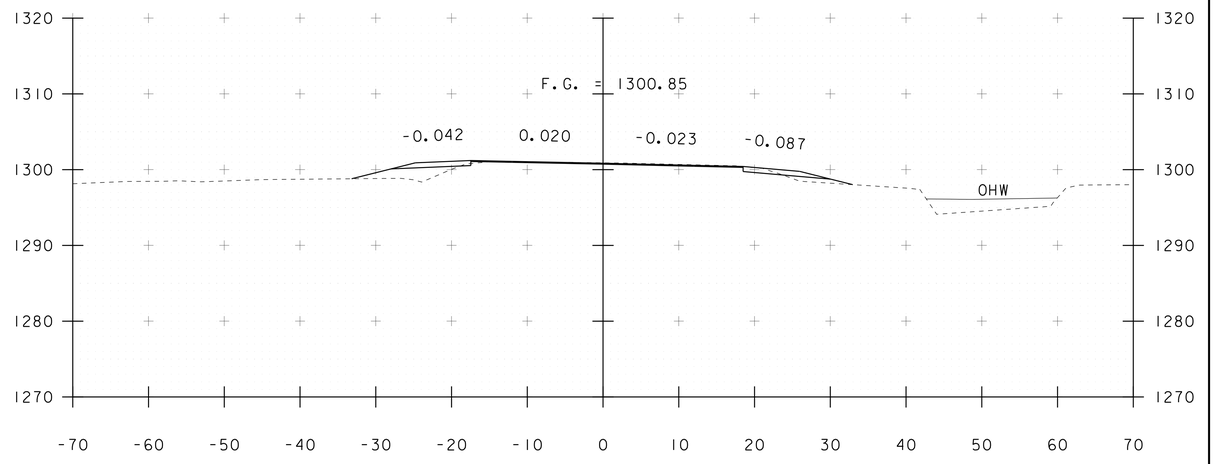
BEGIN APPROACH



392+00



391+25



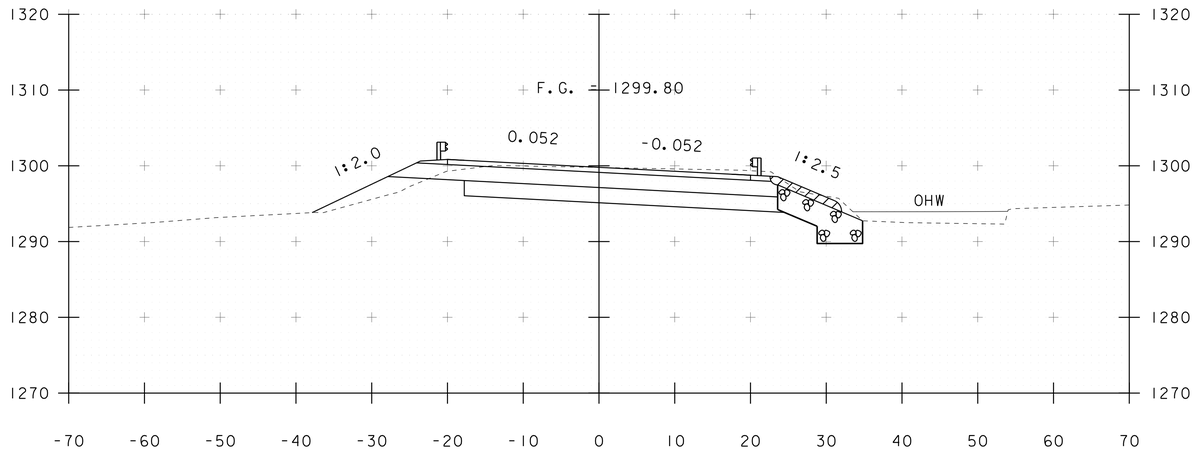
391+75

STA. 391+25 TO STA. 392+00

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
MAINLINE SECTIONS 1

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 41 OF 50



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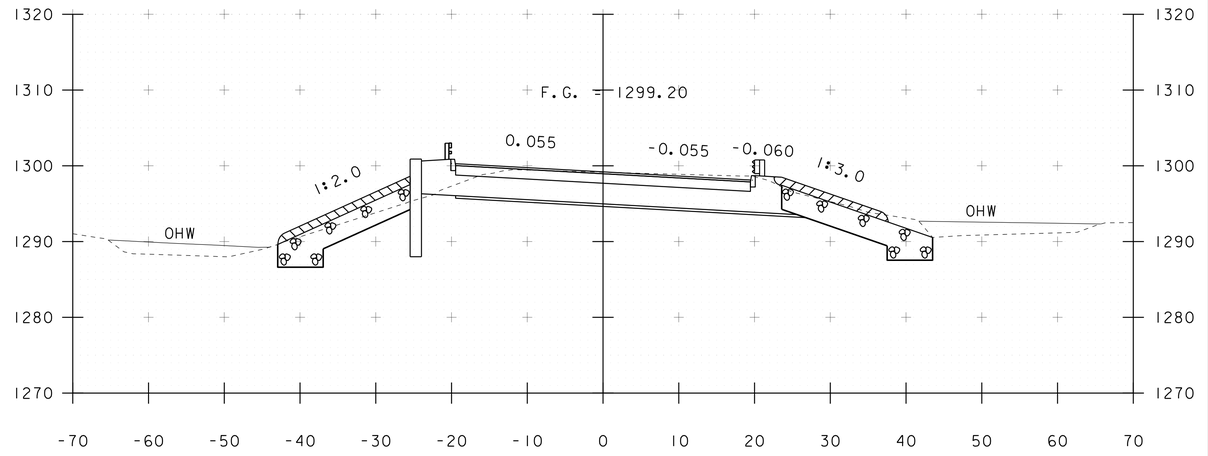
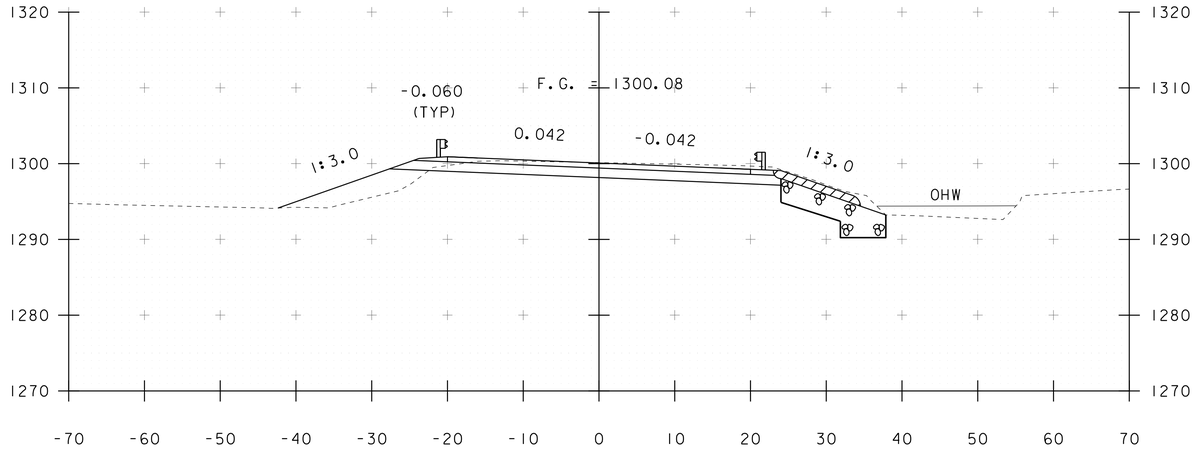
BEGIN PROJECT



393+00



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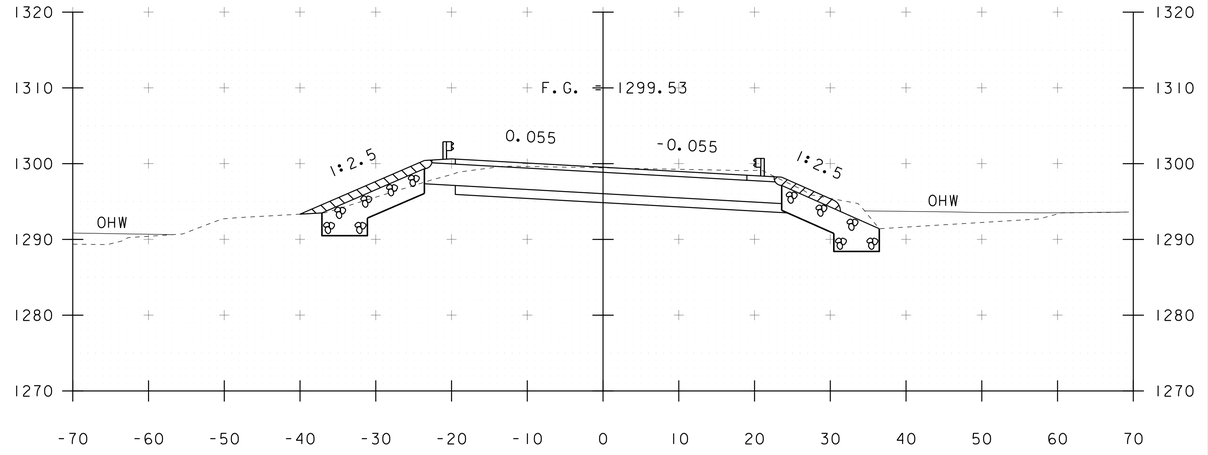


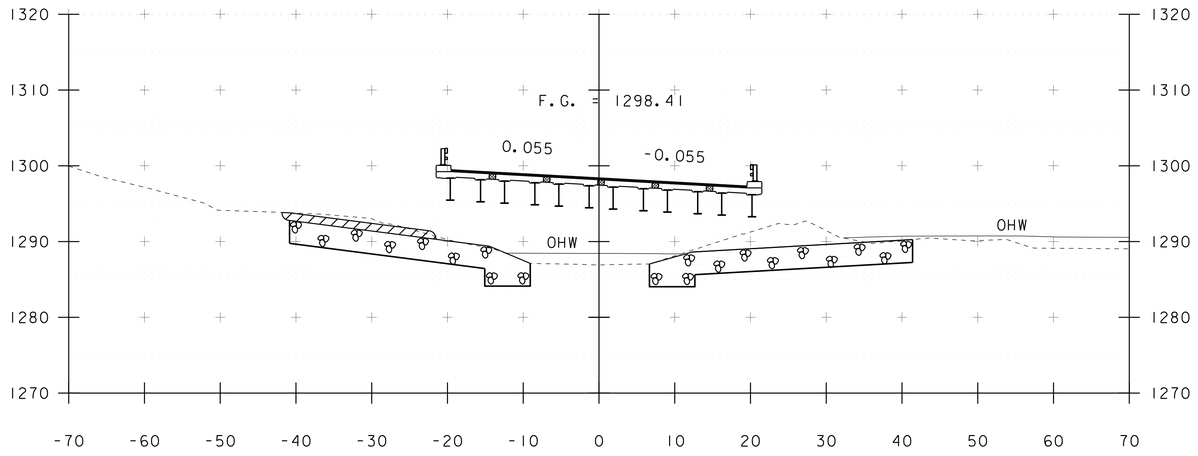
392+75

STA. 392+25 TO STA. 393+00

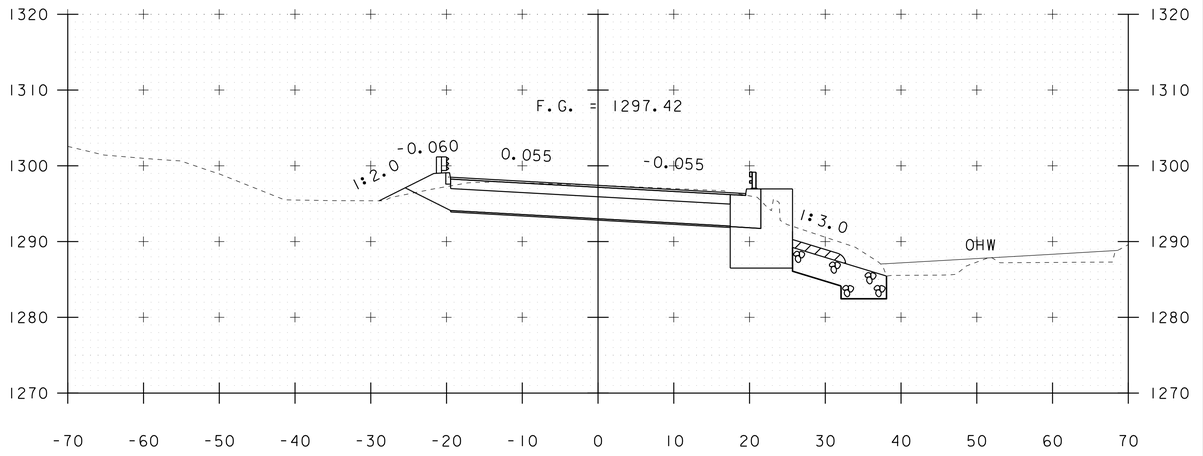
PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
MAINLINE SECTIONS 2

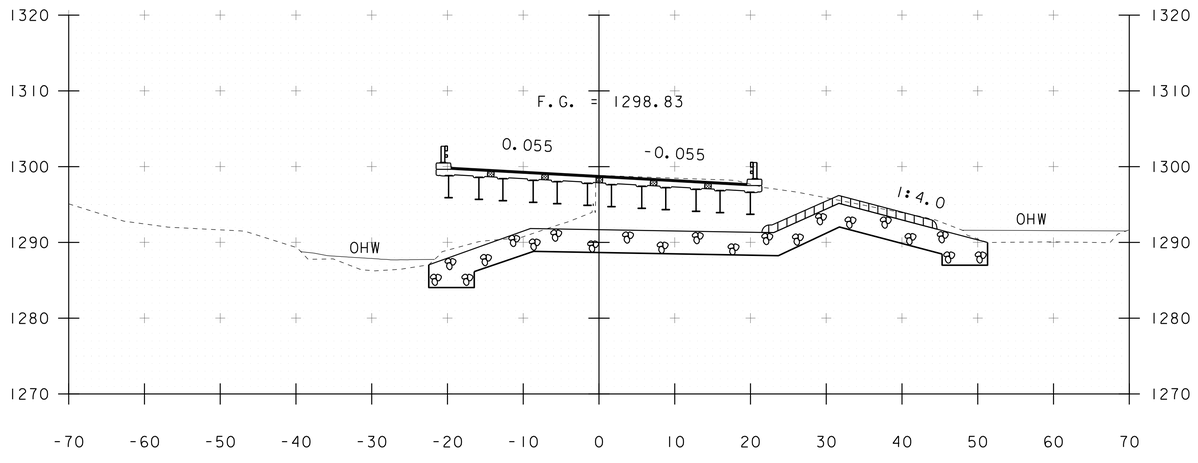
PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 42 OF 50



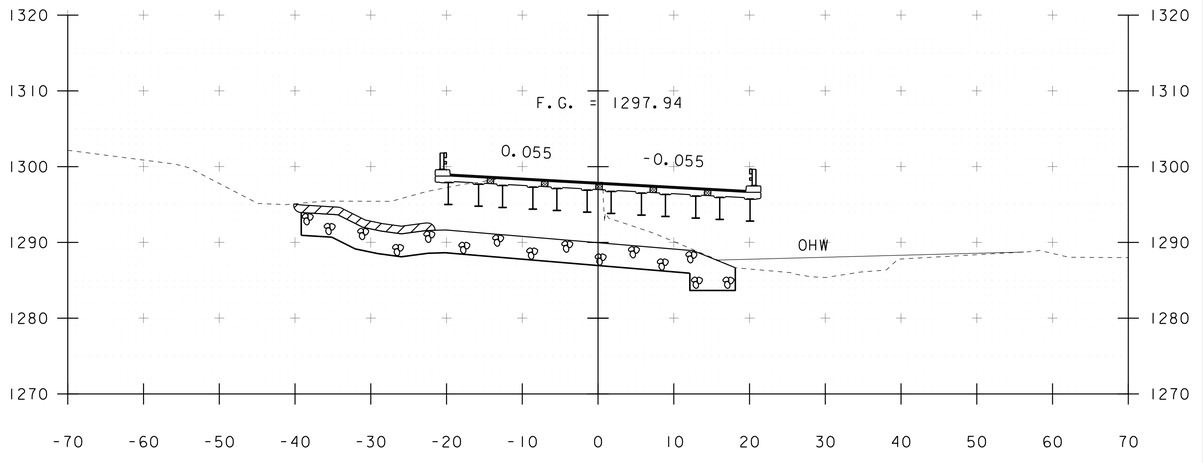
393+50



394+00
END BRIDGE STA 393+93.78



393+25
BEGIN BRIDGE STA 393+12.23



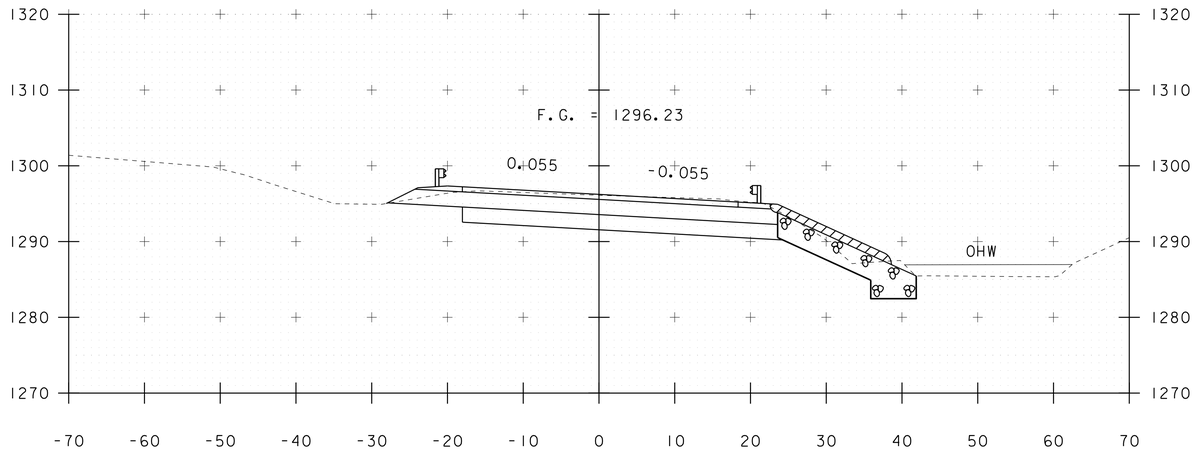
393+75

STA. 393+25 TO STA. 394+00

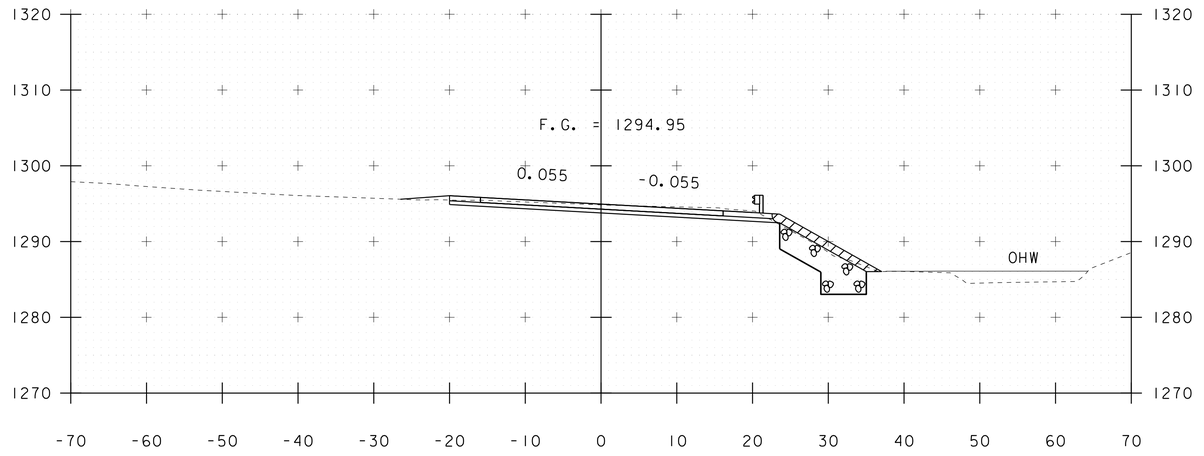
PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
MAINLINE SECTIONS 3

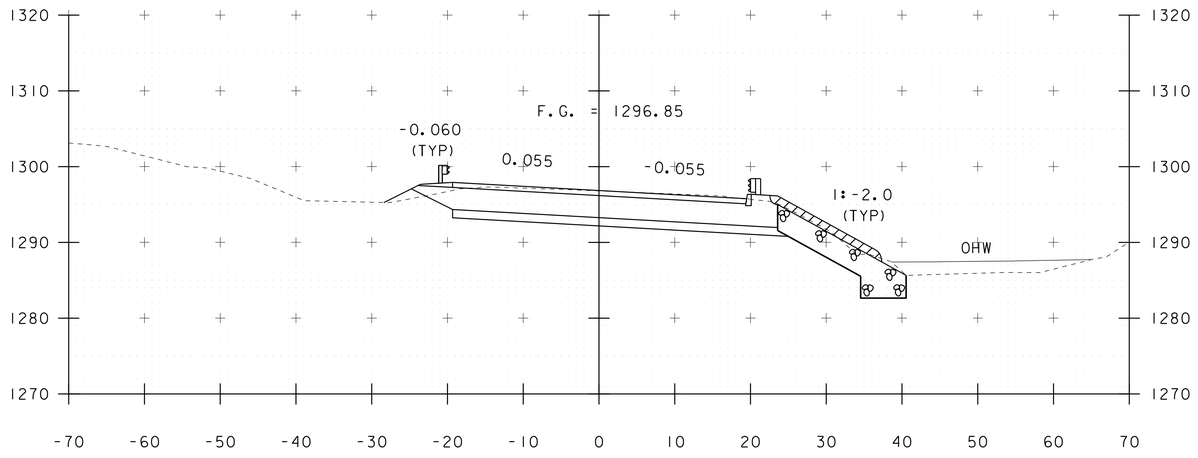
PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 43 OF 50



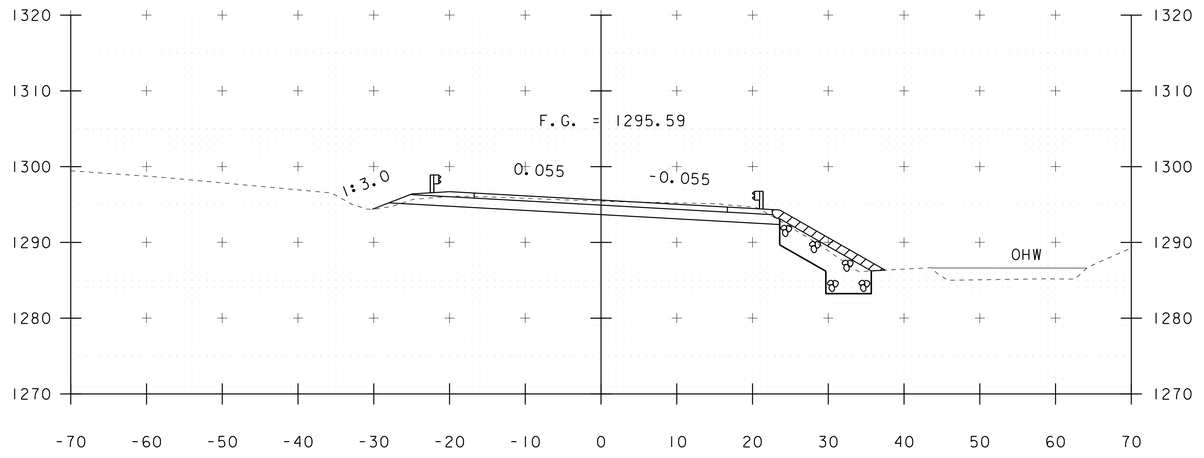
394+50
END PROJECT



395+00



394+25



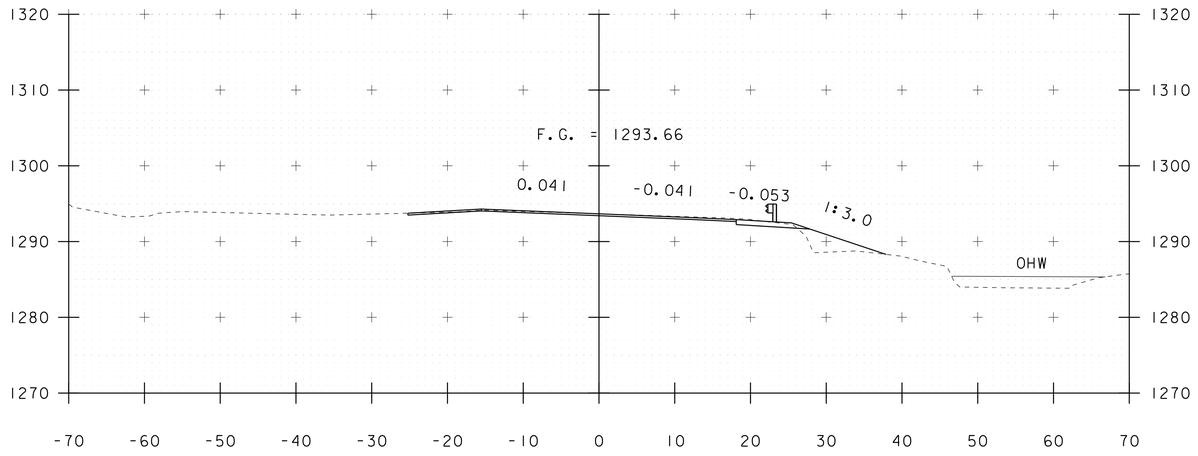
394+75

STA. 394+25 TO STA. 395+00

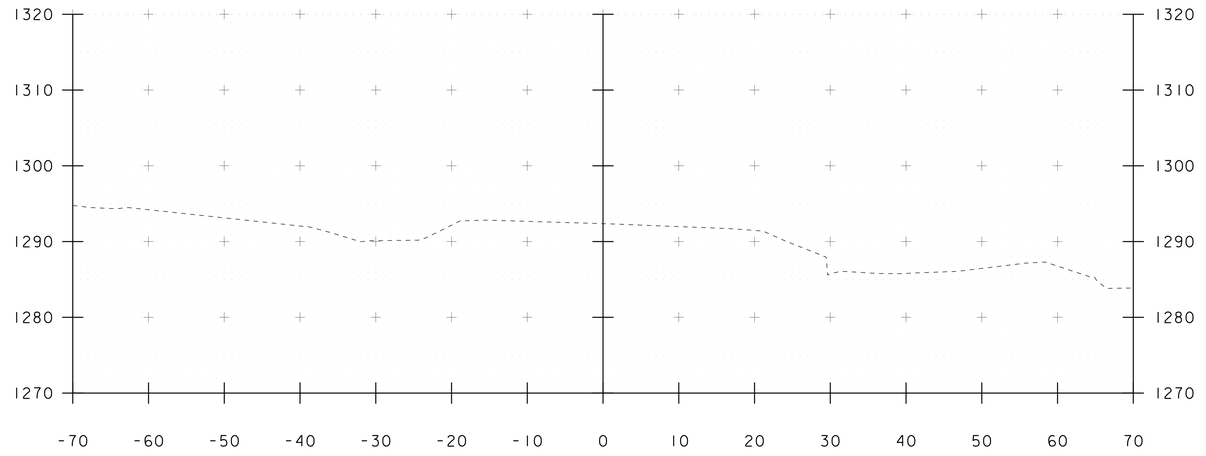
PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
MAINLINE SECTIONS 4

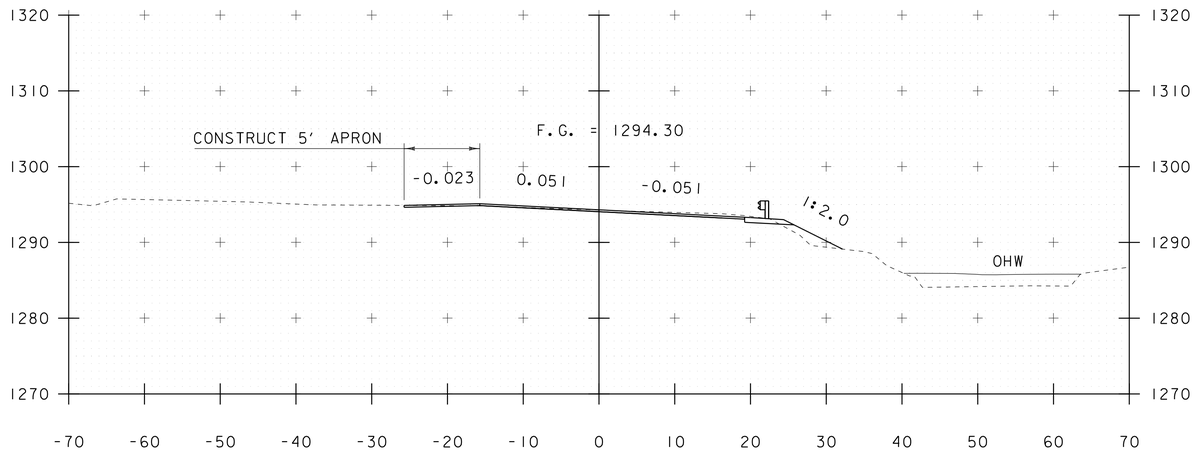
PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 44 OF 50



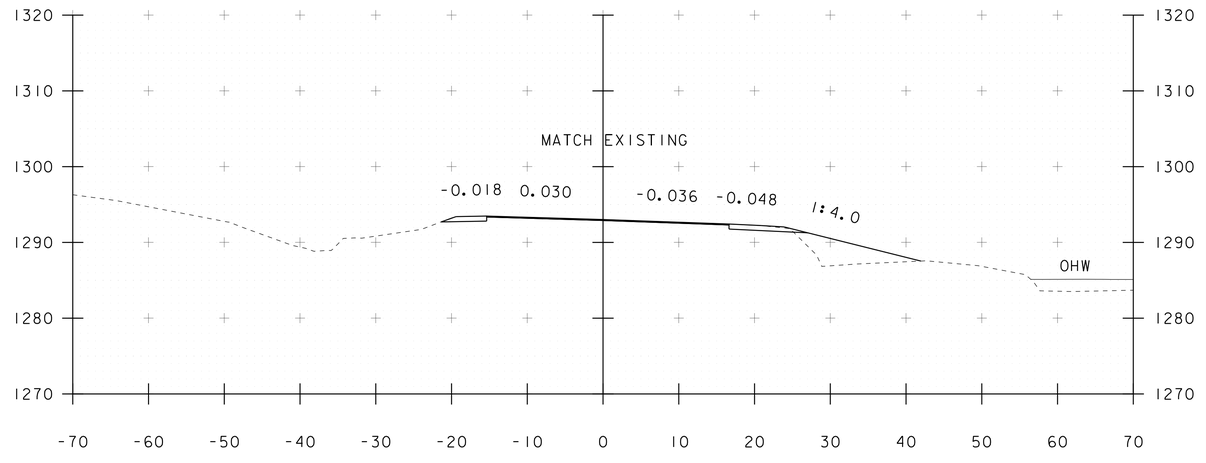
395+50



396+00



395+25



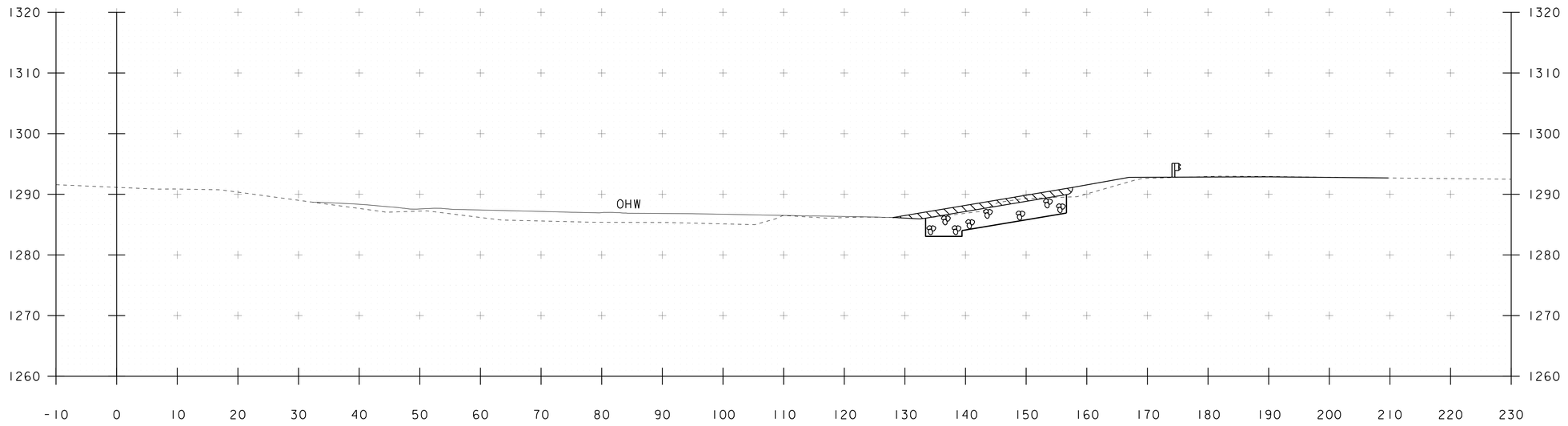
395+75
END APPROACH

STA. 395+25 TO STA. 396+00

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

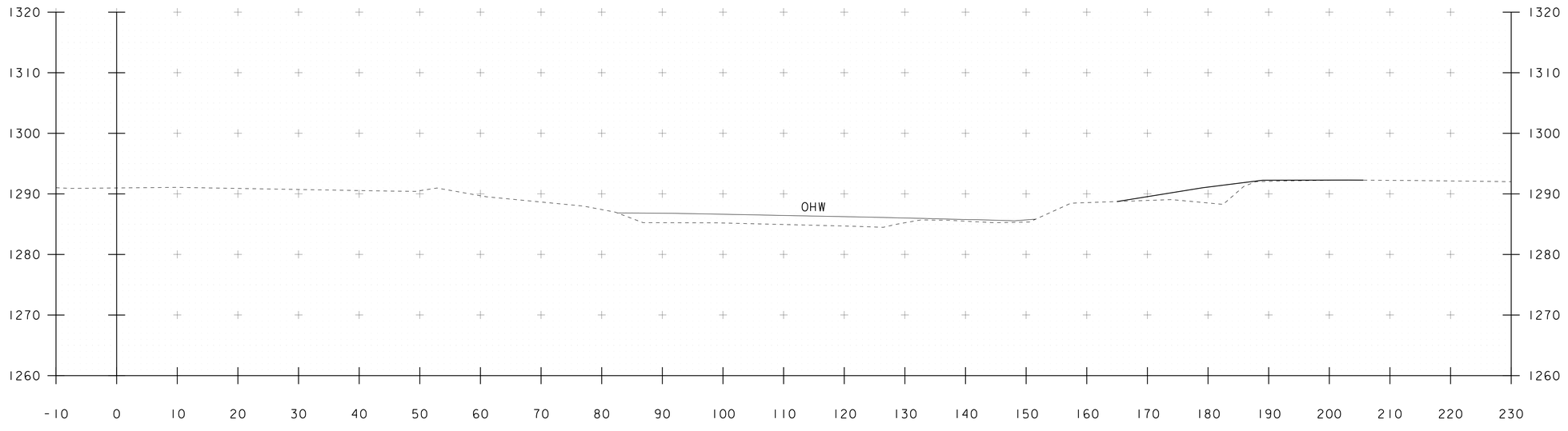
FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
MAINLINE SECTIONS 5

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 45 OF 50



49+20

STA 49+17 RT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL



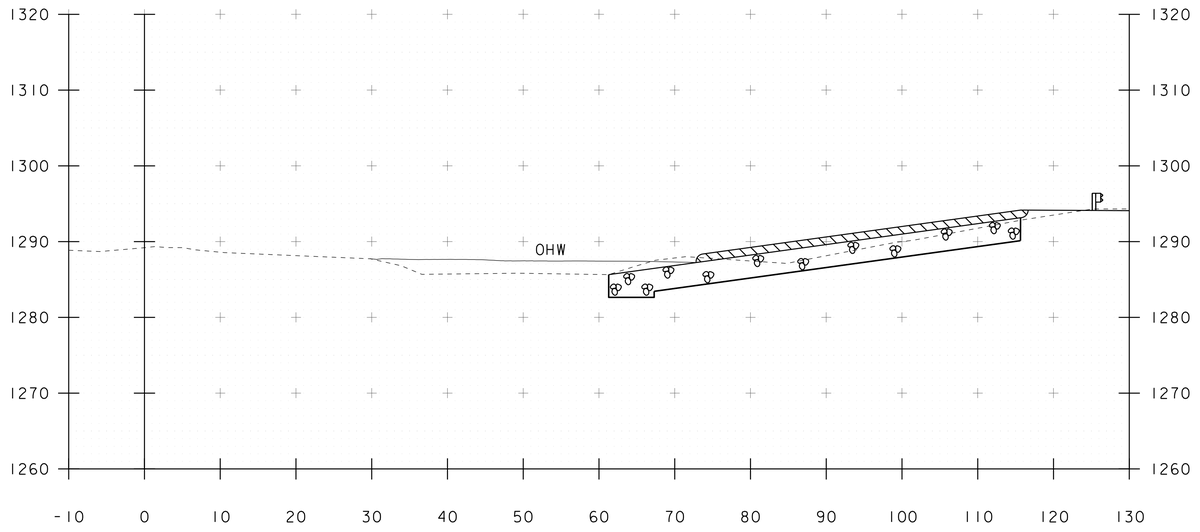
49+10

STA. 49+10 TO STA. 49+20

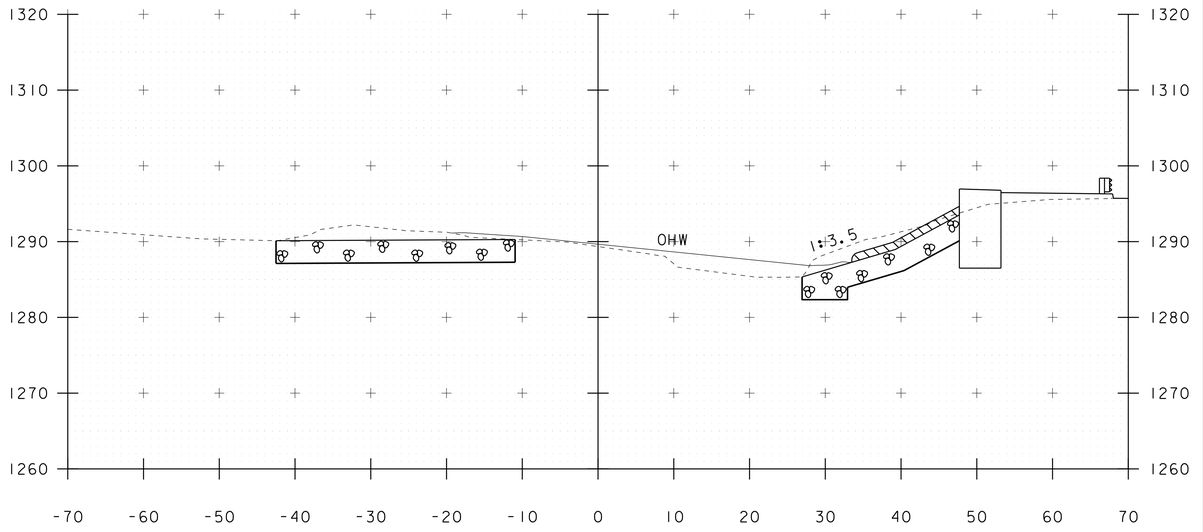
PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
CHANNEL SECTIONS I

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 46 OF 50

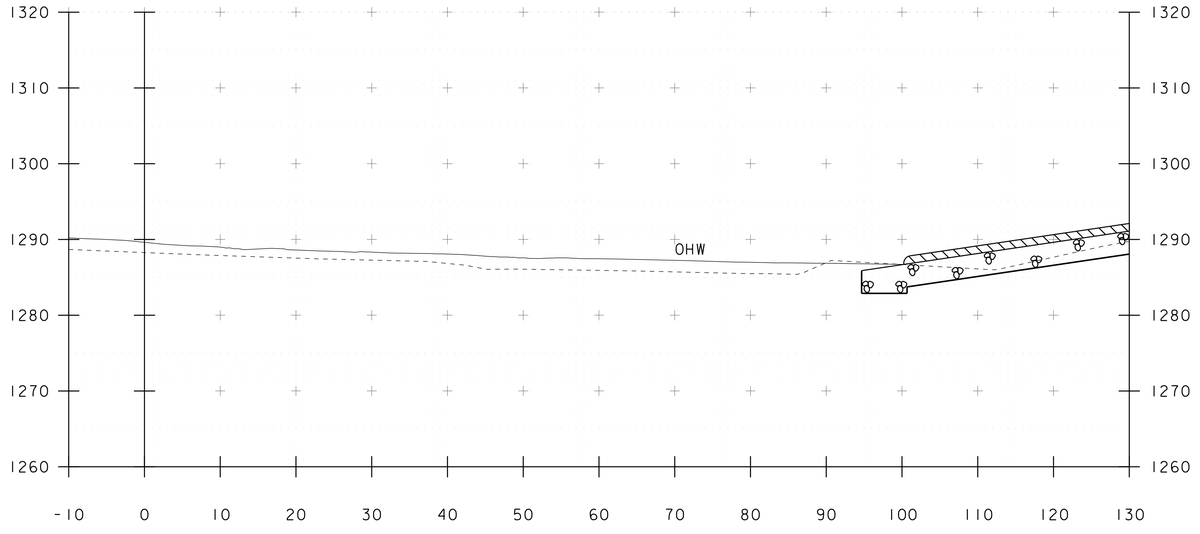


49+40

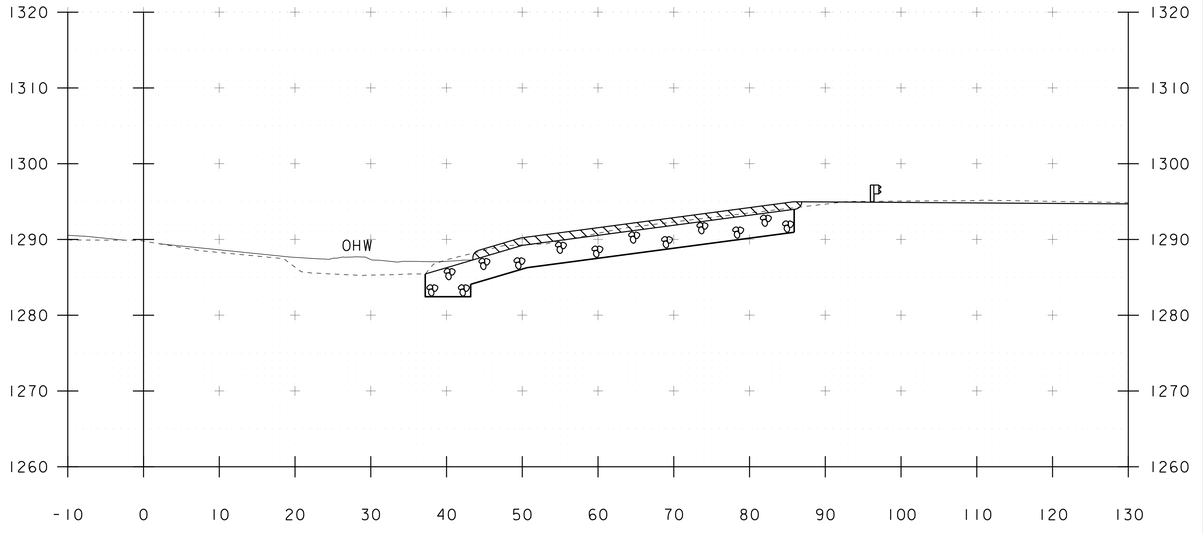


49+60

STA 49+56 LT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL



49+30



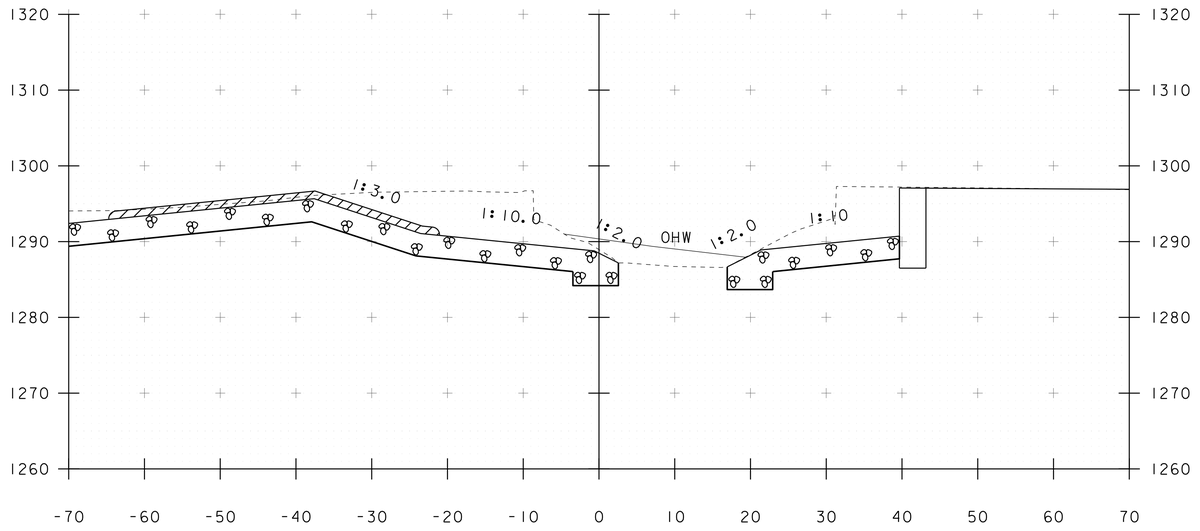
49+50

STA. 49+30 TO STA. 49+60

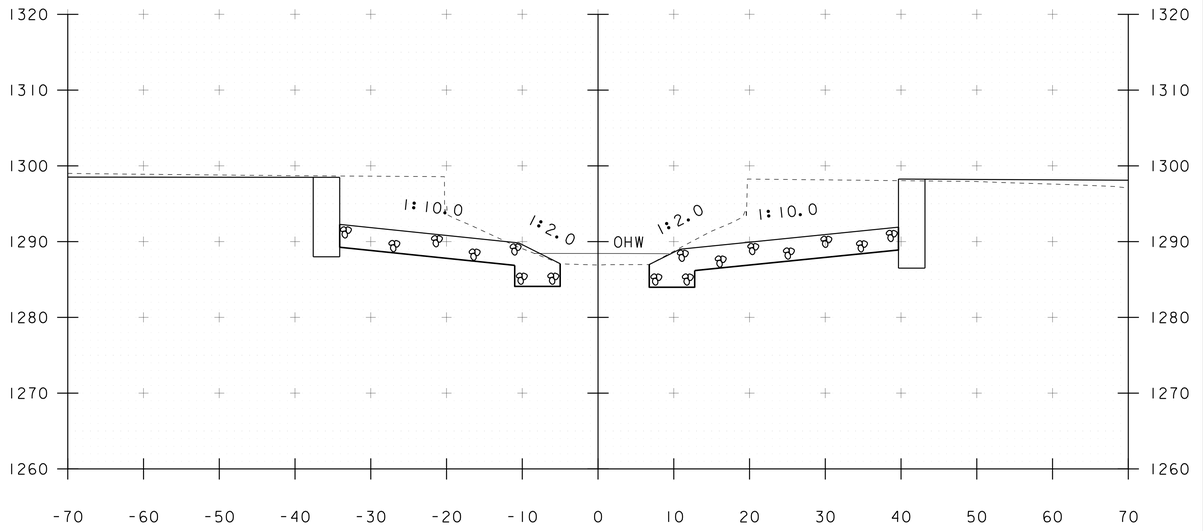
PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
CHANNEL SECTIONS 2

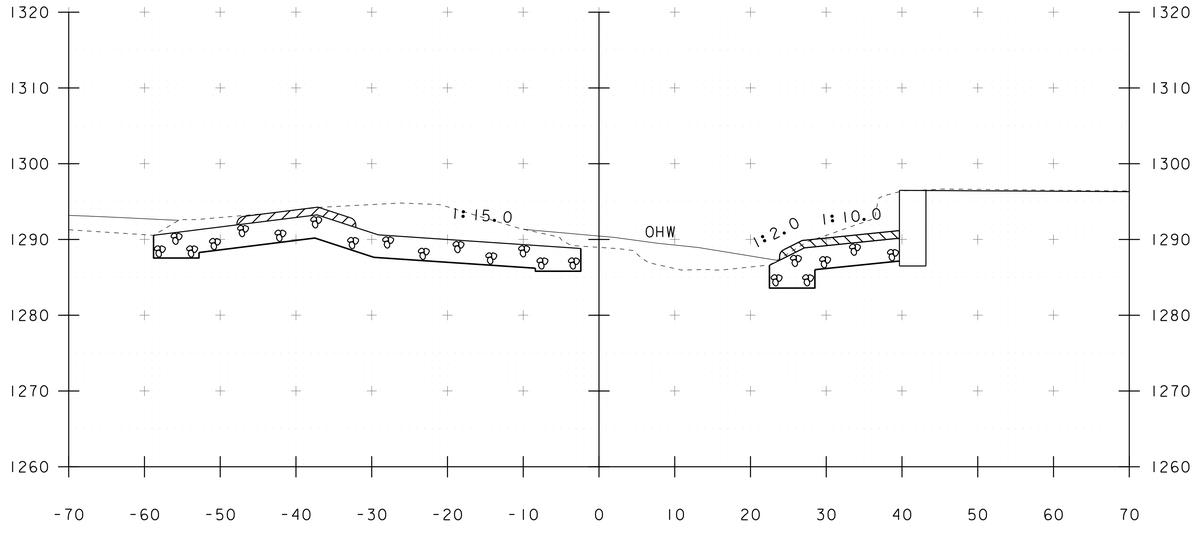
PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 47 OF 50



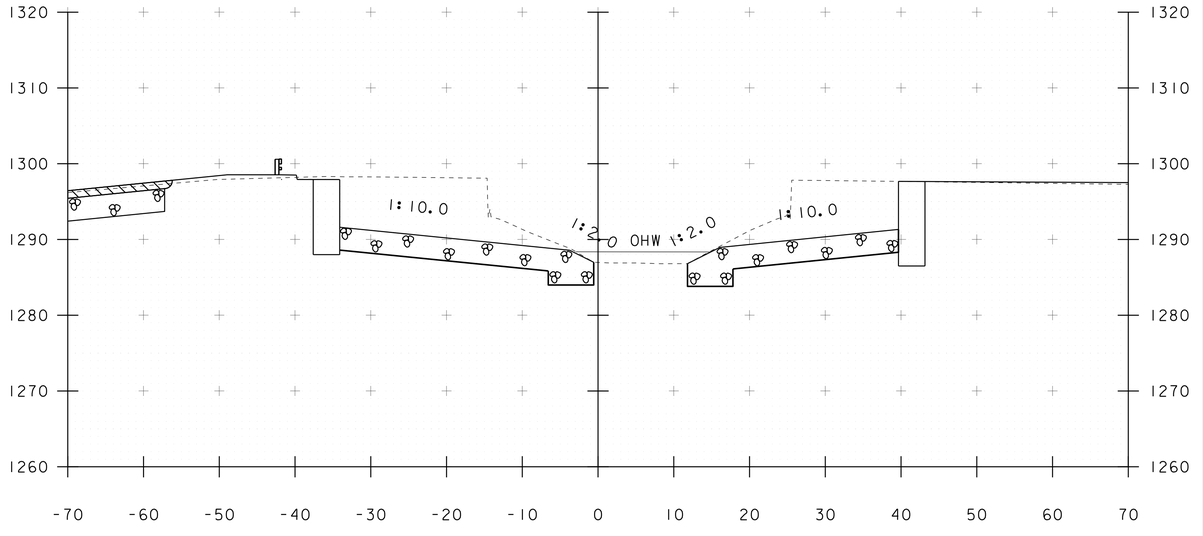
49+80



50+00



49+70



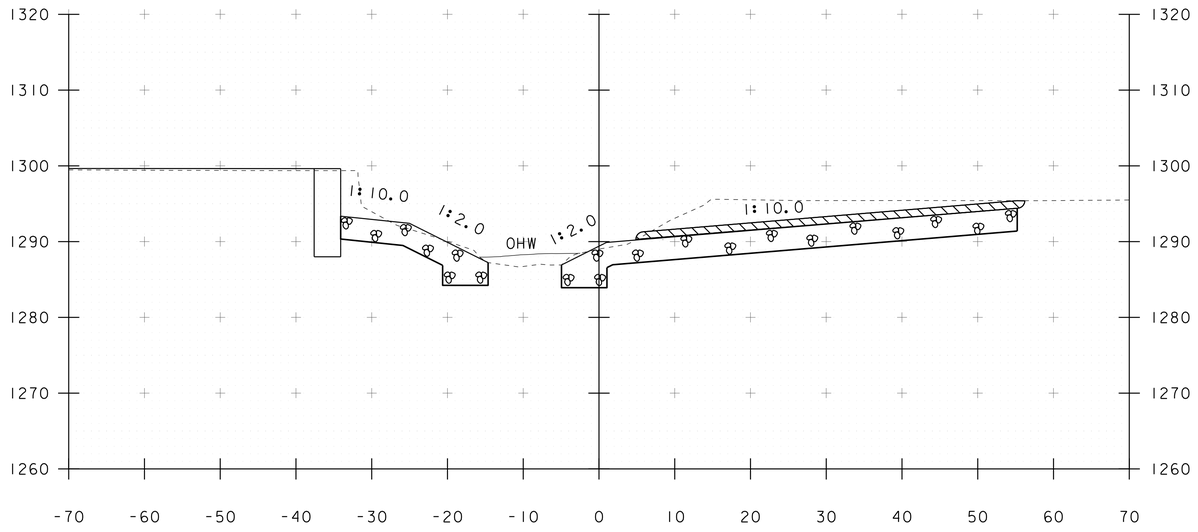
49+90

STA. 49+70 TO STA. 50+00

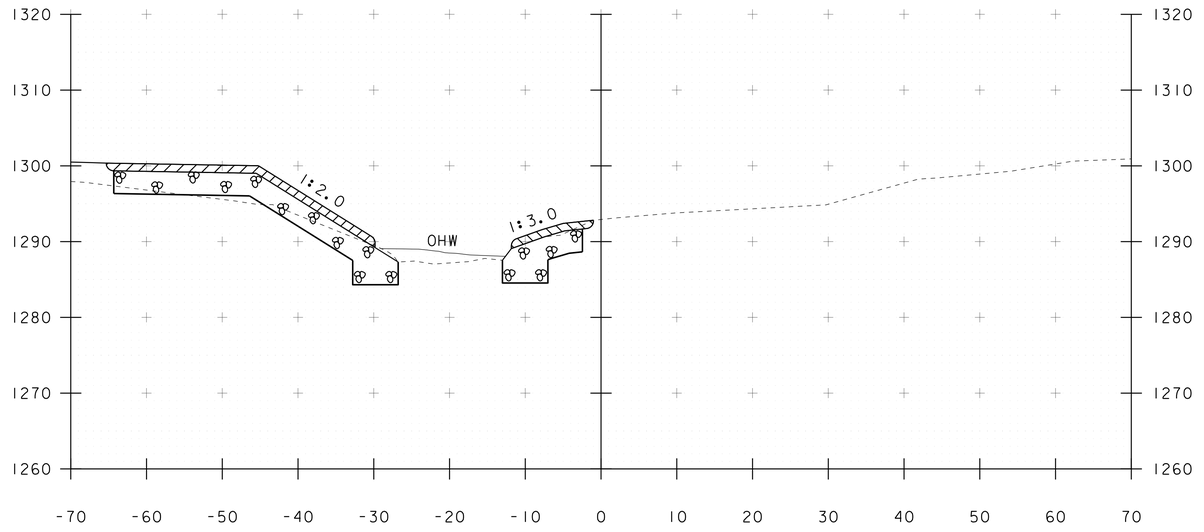
PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
CHANNEL SECTIONS 3

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 48 OF 50

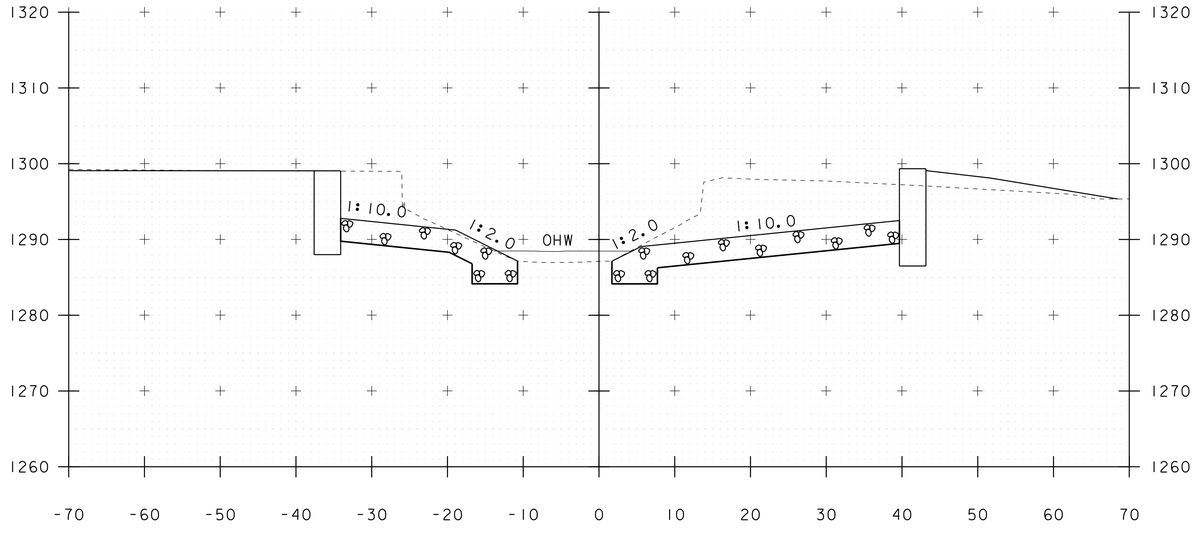


50+20

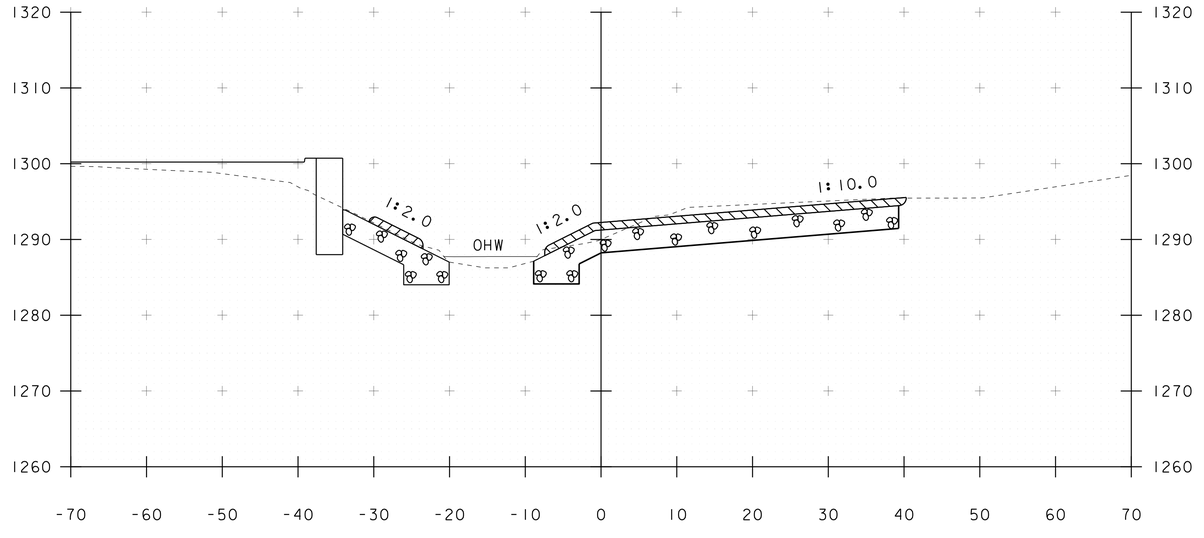


50+40

STA 50+41 LT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL



50+10



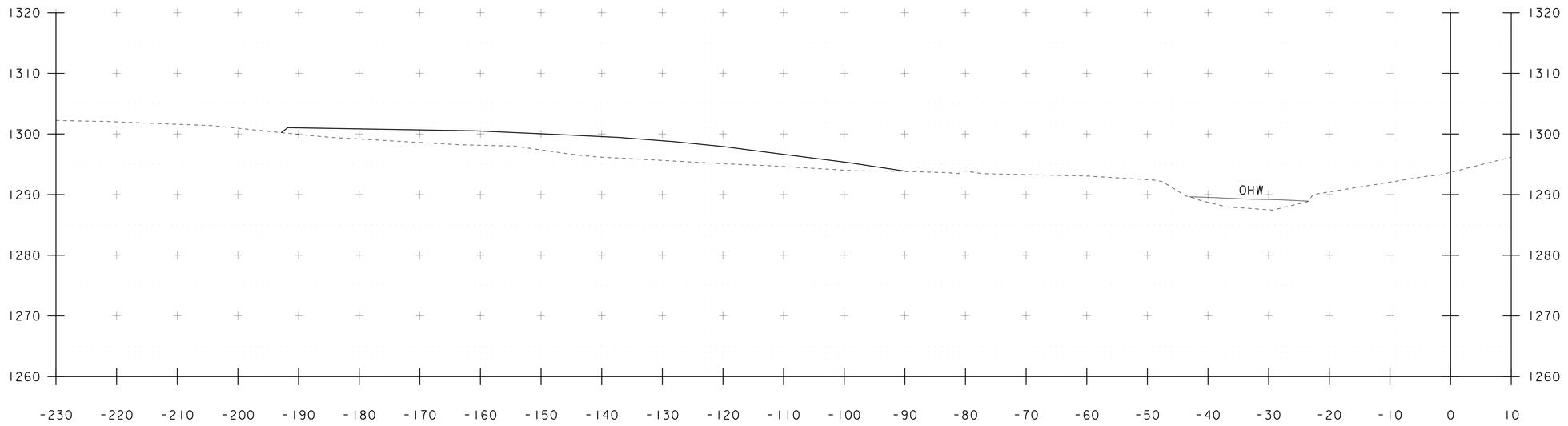
50+30

STA. 50+10 TO STA. 50+40

PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

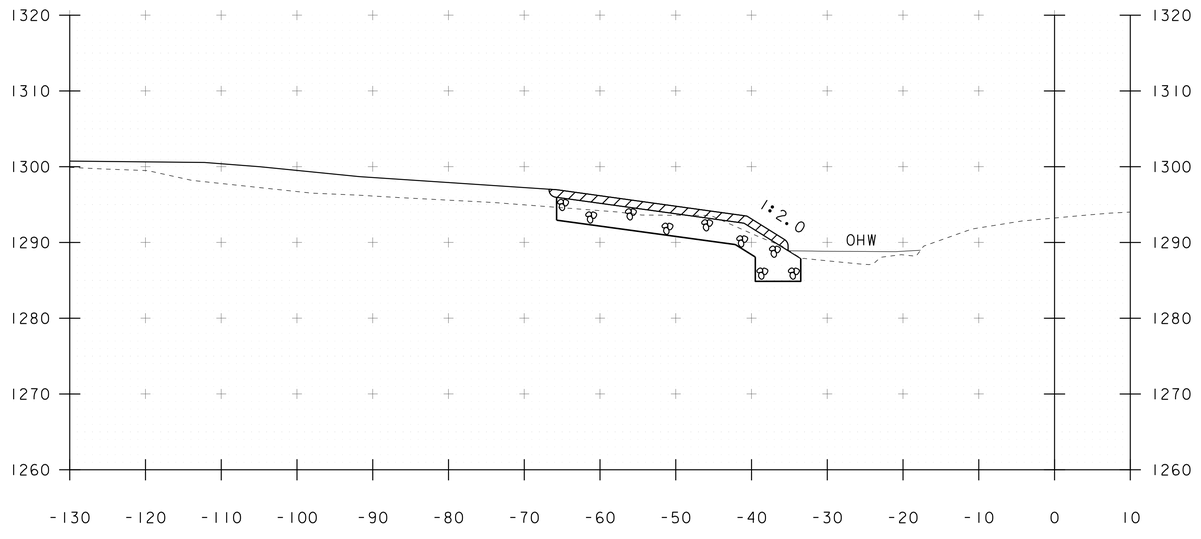
FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
CHANNEL SECTIONS 4

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 49 OF 50



STA 50+57 FAR LT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

50+60



50+50

STA. 50+50 TO STA. 50+60

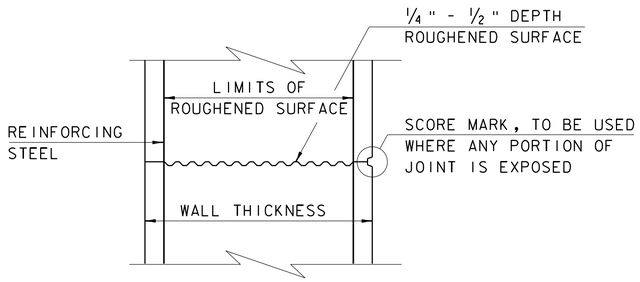
PROJECT NAME: MARLBORO
PROJECT NUMBER: BRF 010-1(43)

FILE NAME: s10b414xsl.dgn
PROJECT LEADER: K. HIGGINS
DESIGNED BY: R. KLINEFELTER
CHANNEL SECTIONS 5

PLOT DATE: 28-AUG-2013
DRAWN BY: K. FRIEDLAND
CHECKED BY: G. LAROCHE
SHEET 50 OF 50

CONCRETE GENERAL NOTES

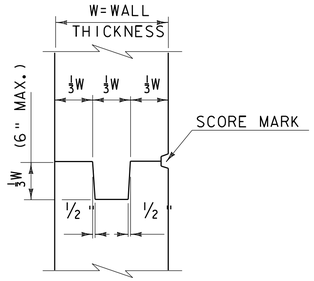
1. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1"



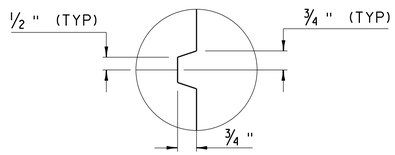
TYPICAL HORIZONTAL CONSTRUCTION JOINT
(NOT TO SCALE)

1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.

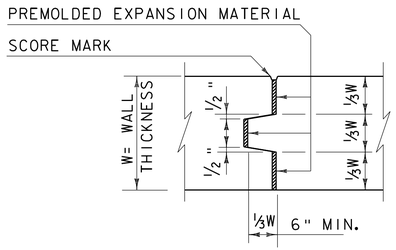
2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



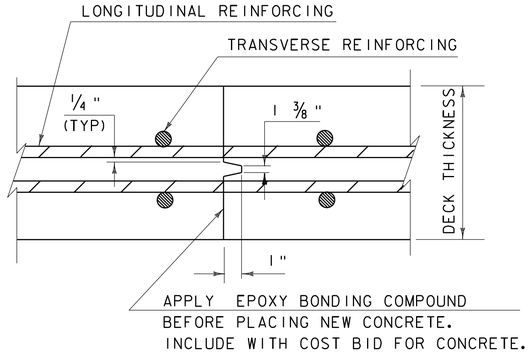
TYPICAL CONCRETE CONSTRUCTION JOINT
(NOT TO SCALE)



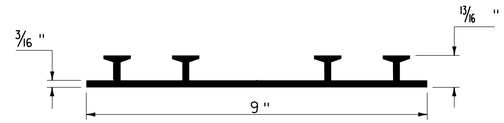
SCORE MARK DETAIL
(NOT TO SCALE)



TYPICAL CONCRETE EXPANSION JOINT
(NOT TO SCALE)



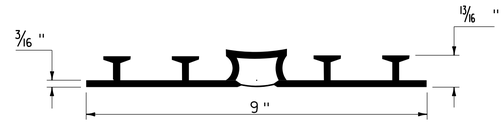
TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS
(NOT TO SCALE)



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

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

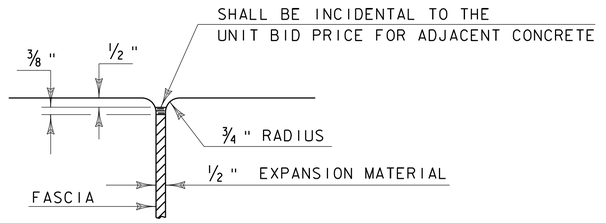
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



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

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

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



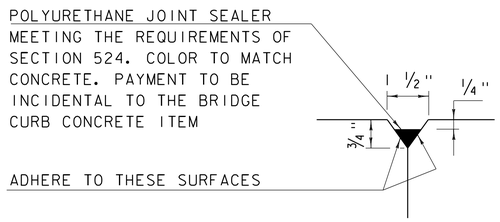
JOINT BETWEEN FASCIA AND WINGWALL
(NOT TO SCALE)

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION

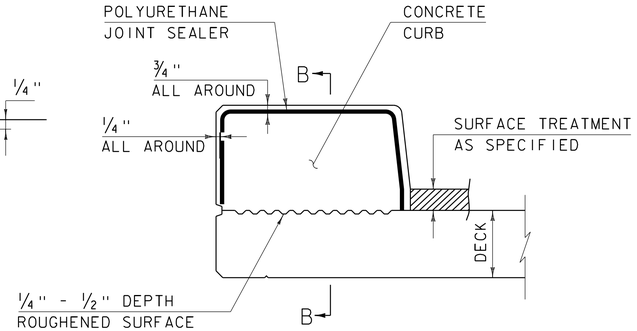
CONCRETE DETAILS AND NOTES

VERMONT AGENCY OF TRANSPORTATION
STRUCTURES - SECTION

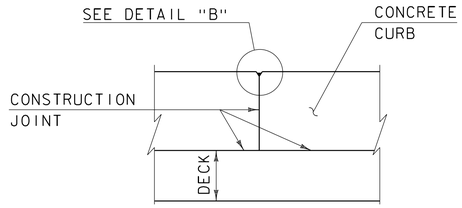
STRUCTURES DETAIL SD-501.00



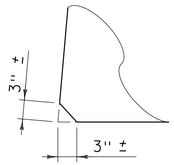
DETAIL "B"
(NOT TO SCALE)



CONCRETE CURB JOINT SECTION
(NOT TO SCALE)



SECTION B - B
(NOT TO SCALE)



ACUTE ANGLE CLIP DETAIL
(NOT TO SCALE)

1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION

CONCRETE CURB JOINT NOTES

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

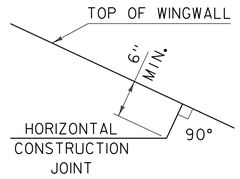
2. IF THE CONTRACTOR CHOOSES NOT TO USE AN APPROVED SHRINKAGE REDUCING ADMIXTURE, THE CURBS SHALL BE CONSTRUCTED WITH CONSTRUCTION JOINTS SPACED AT A MAXIMUM OF 15'-0" CENTER TO CENTER AND 2'-0" MINIMUM FROM THE CENTER OF NEAREST BRIDGE RAILING POST.

3. ON MULTI-SPAN CONTINUOUS SUPERSTRUCTURES, REGARDLESS OF WHETHER APPROVED SHRINKAGE REDUCING ADMIXTURE IS USED, CURB JOINTS SHALL BE LOCATED OVER THE CENTERLINE OF PIERS AND 7'-0" EACH SIDE OF THE CENTERLINE OF EACH PIER.

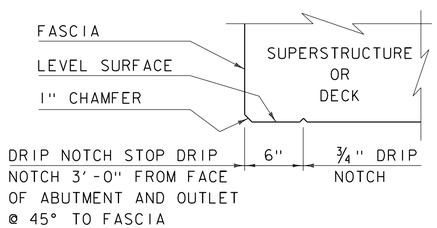
4. WHEN CURB JOINTS ARE USED THE CURBS SHALL BE PLACED IN ALTERNATE SECTIONS WITH A MINIMUM OF 48 HOUR DELAY BETWEEN ADJACENT PLACEMENTS.

5. LONGITUDINAL REINFORCING SHALL BE CONTINUOUS THROUGH CURB CONSTRUCTION JOINTS. CURB STIRRUP BARS SHALL BE TURNED AS NECESSARY TO MAINTAIN COVER IN THE FLARED CURB ENDS.

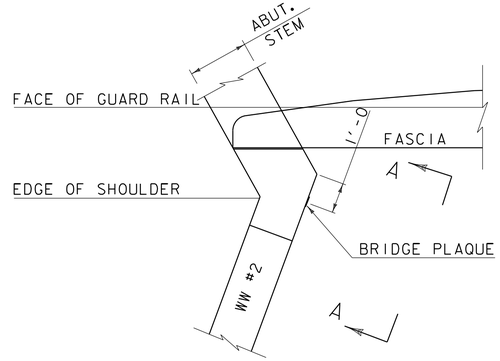
6. THE JOINT SPACING AND DETAILS SHOWN SHALL APPLY TO SIDEWALKS WHEN SHOWN IN THE PLANS.



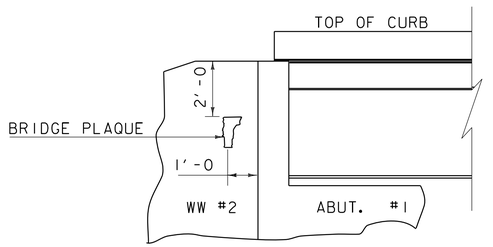
HORIZONTAL WINGWALL CONSTRUCTION JOINT
(NOT TO SCALE)



DRIP NOTCH DETAIL
(NOT TO SCALE)



PLAN



VIEW "A - A"

BRIDGE PLAQUE
(NOT TO SCALE)

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

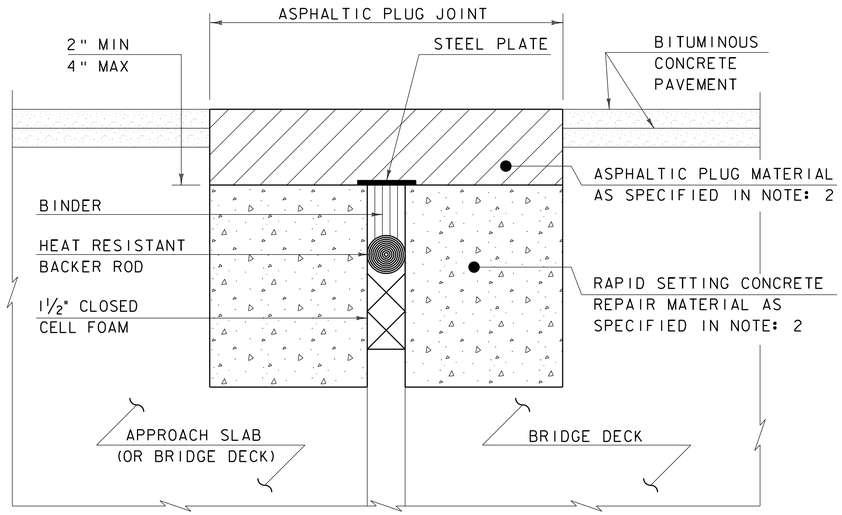
PAYMENT FOR INSTALLATION OF THE BRIDGE PLAQUE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

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

CONCRETE DETAILS AND NOTES

VERMONT AGENCY OF TRANSPORTATION
STRUCTURES - SECTION

STRUCTURES DETAIL
SD-502.00



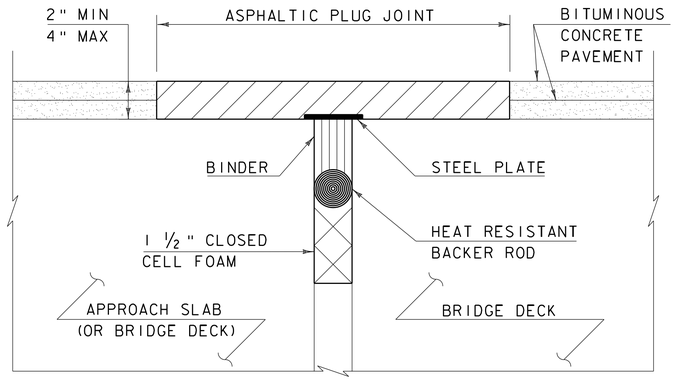
ASPHALTIC PLUG-TYPE JOINT DETAIL - REHAB

NOTES: (NOT TO SCALE)

1. THE CONTRACTOR SHALL REMOVE ALL ASPHALTIC PLUG JOINT MATERIAL AND DETERIORATED CONCRETE AS DIRECTED BY THE ENGINEER. REMOVAL OF THE FIRST 4 INCHES OF MATERIAL SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 516.10 BRIDGE EXPANSION JOINT, ASPHALTIC PLUG. ANY REMOVAL OF MATERIAL GREATER THAN 4 INCHES SHALL BE INCLUDED IN THE BID PRICE OF ITEM 580.20 RAPID SETTING CONCRETE REPAIR MATERIAL WITH COURSE AGGREGATE.

2. THE CONTRACTOR SHALL REPLACE REMOVED MATERIAL THAT IS LESS THAN 4" FROM FINISHED GRADE WITH ASPHALTIC PLUG JOINT MATERIAL MEETING THE REQUIREMENTS OF SUBSECTION 707.15. ALL REMOVED MATERIAL THAT IS GREATER THAN 4 INCHES FROM FINISHED GRADE SHALL BE REPLACED WITH RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE MEETING THE REQUIREMENTS OF SUBSECTION 780.04.

3. REINFORCING STEEL NOT SHOWN FOR CLARITY.



ASPHALTIC PLUG-TYPE JOINT DETAIL - NEW

(NOT TO SCALE)

ASPHALTIC PLUG JOINT NOTES

INSTALLATION:

1. LOCATE THE JOINT CENTRALLY OVER THE DECK OVERLAY EXPANSION GAP OR FIXED JOINT, MARKED OUT TO THE MANUFACTURER'S RECOMMENDED WIDTH.
2. REMOVE THE BITUMINOUS CONCRETE PAVEMENT FULL DEPTH AS SHOWN ON THE PLANS. THE PAVEMENT SHALL BE DRY AND SAW CUT TO THE LIMITS REQUIRED TO PLACE THE JOINT. A PNEUMATIC HAMMER AND CHISEL MAY BE USED ADJACENT TO THE CURB ONLY WHEN SAW CUTTING IS NOT POSSIBLE.
3. BLAST CLEAN THE JOINT AREA OF DEBRIS, ASPHALT AND SHEET MEMBRANE. THOROUGHLY DRY THE JOINT AREA WITH COMPRESSED AIR PRIOR TO APPLYING BINDER MATERIAL.
4. REPAIR MATERIAL GREATER THAN 4 INCHES FROM FINISHED GRADE WITH RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE MEETING THE REQUIREMENTS OF SUBSECTION 780.04.
5. PLACE PROPERLY SIZED HEAT RESISTANT BACKER ROD IN THE MOVEMENT GAP ALLOWING FOR 1" +/- OF BINDER ABOVE THE ROD.
6. HEAT AND PLACE THE BINDER MATERIAL AS RECOMMENDED BY THE MANUFACTURER.
7. PLACE 1/4" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRE-STAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER. THE STEEL PLATES MAY BE OMITTED WHERE THE ENGINEER DETERMINES THAT THE APPROACH SLAB OR BRIDGE DECK WILL PROVIDE INADEQUATE SUPPORT AND WHERE VERTICAL MOVEMENT OF THE PLATES MIGHT OCCUR.
8. HEAT AND MIX THE BINDER MATERIAL AND AGGREGATE AS RECOMMENDED BY THE MANUFACTURER.
9. INSTALLATION OF MATERIAL, COMPACTION, AND TOP COATING SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
10. IMMEDIATELY AFTER TOP COATING, CAST AN ANTI-SKID MATERIAL OVER THE JOINT TO REDUCE THE RISK OF TRACKING.
11. ONCE THE JOINT REACHES 82 DEG C (180 DEG F) +/-, WATER MAY BE USED TO EXPEDITE THE COOLING PROCESS.
12. PROTECT JOINT FROM TRAFFIC UNTIL THE MATERIAL HAS COOLED TO 51 DEG C (125 DEG F) +/-.

WEATHER LIMITATIONS

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

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

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION

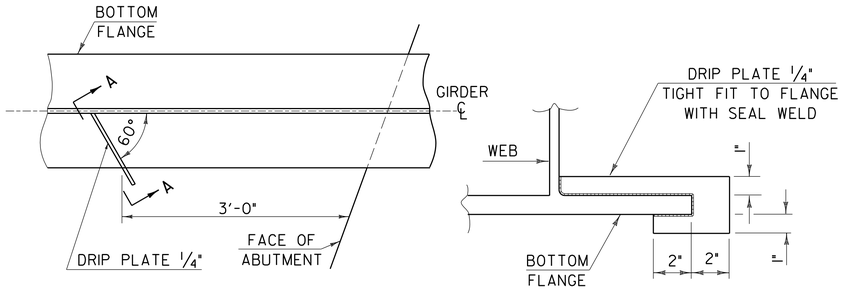
BRIDGE JOINT
ASPHALTIC PLUG

VERMONT AGENCY OF TRANSPORTATION
STRUCTURES · DIVISION

STRUCTURES DETAIL
SD-516.10

STRUCTURAL STEEL GENERAL NOTES:

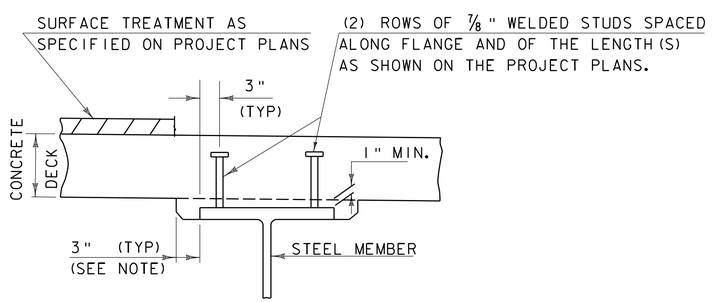
1. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER HIGH-STRENGTH BOLTS IN 15/16" DIAMETER HOLES, PER SUBSECTION 506.19, UNLESS OTHERWISE SPECIFIED.
2. ALL HOLES IN THE WEBS OF THE FASCIA GIRDERS THAT ARE NOT OTHERWISE FILLED, SHALL BE FILLED WITH EITHER BUTTON HEAD OR HEX HEAD BOLTS. THESE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.19.
3. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF SUBSECTION 506.10.
4. ANY CONNECTIONS THAT ARE NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE STRUCTURES ENGINEER FOR APPROVAL.
5. STRUCTURAL STEEL MEMBERS DESIGNATED "CVN" IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01 OF THE STANDARD SPECIFICATIONS.
6. ENDS OF GIRDERS ARE TO BE VERTICAL IN THEIR FINAL POSITION.
7. AFTER SUPERSTRUCTURE STEEL HAS BEEN ERECTED, ELEVATIONS ALONG THE TOP OF THE GIRDERS SHALL BE TAKEN AS DIRECTED BY THE RESIDENT ENGINEER FOR USE IN DETERMINING FINISHED GRADES.



PLAN DRIP PLATE

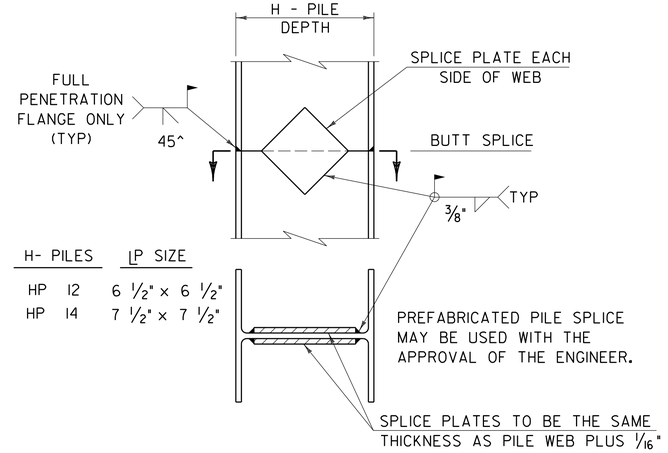
SECTION A - A

NOTE: DRIP PLATES SHALL BE PLACED ON OUTSIDE EDGE OF FASCIA GIRDERS ON THE HIGH SIDE OF ALL PIERS AND ABUTMENTS OR AS INDICATED ON PROJECT PLANS.



NOTE:
THE 3" HORIZONTAL SECTION MAY BE ELIMINATED FOR FORMING SYSTEMS DESIGNED FOR THE CONSTRUCTION OF VERTICAL HAUNCHES. ANY VOIDS RESULTING FROM FORMING SYSTEM ELEMENTS SHALL BE FILLED WITH JOINT SEALER, POLYURETHANE MEETING THE REQUIREMENTS OF SECTION 524. THE COST OF THE JOINT SEALER, POLYURETHANE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

HAUNCH AND SHEAR CONNECTOR DETAIL



H- PILES	LP SIZE
HP 12	6 1/2" x 6 1/2"
HP 14	7 1/2" x 7 1/2"

DETAIL OF PILE SPLICE

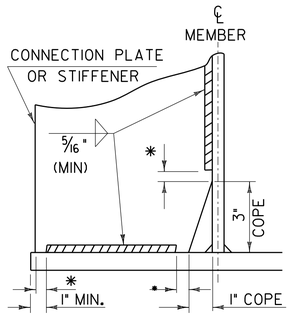
DETAILS ON THIS SHEET ARE "NOT TO SCALE" UNLESS NOTED OTHERWISE.

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
JUNE 4, 2010	MODIFIED NOTES

STRUCTURAL STEEL DETAILS & NOTES

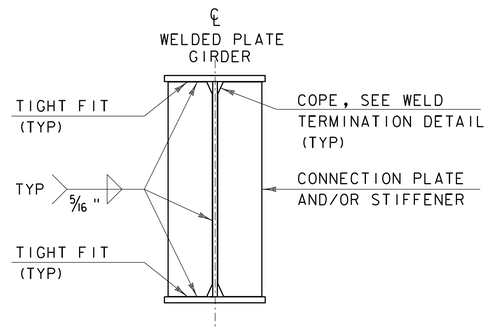
VERMONT AGENCY OF TRANSPORTATION
STRUCTURES - SECTION

STRUCTURES DETAIL
SD-601.00



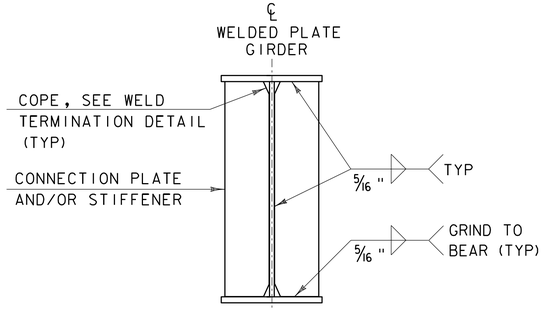
WELD TERMINATION AND COPING DETAILS FOR STEEL MEMBERS

*NO WELD FOR 3/8" MIN. 7/8" MAX. (EXCEPT MUST MAINTAIN 1" MINIMUM FROM EDGE OF FLANGE)

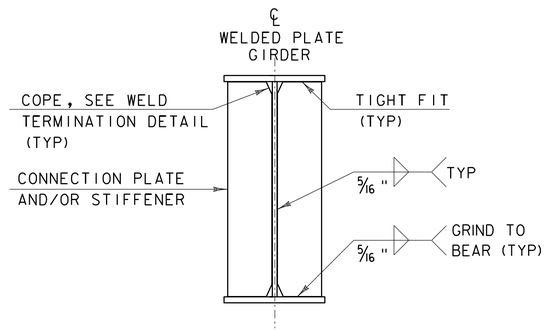


INTERMEDIATE CONNECTION PLATES AND/OR STIFFENERS FOR WELDED PLATE GIRDERS

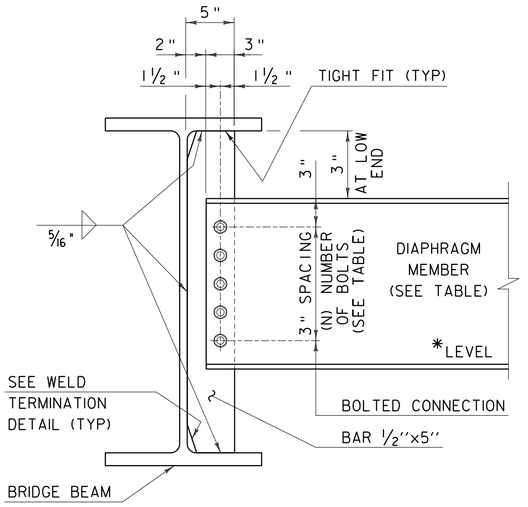
INTERMEDIATE DETAIL IS ONLY USED WHEN PLATE DOES NOT OCCUR AT AN ABUTMENT OR PIER.



ABUTMENT BEARING STIFFENERS AND/OR CONNECTION PLATES FOR WELDED PLATE GIRDERS



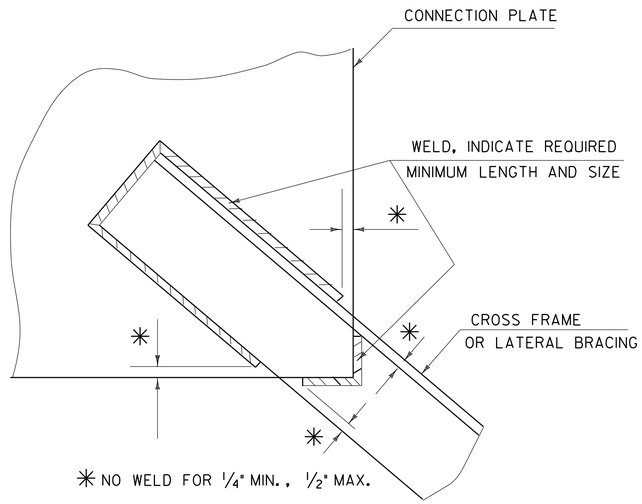
PIER BEARING STIFFENERS AND/OR CONNECTION PLATES FOR WELDED PLATE GIRDERS



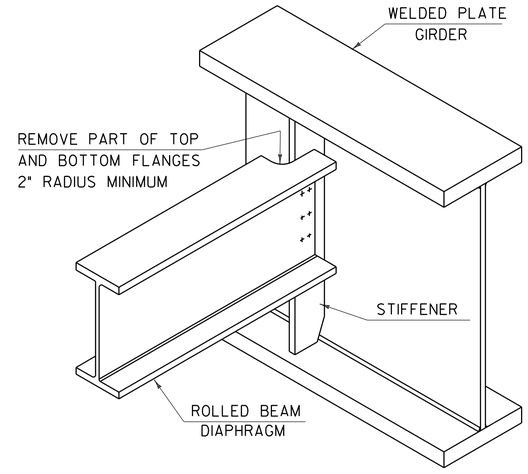
DEPTH		DIAPHRAGM MEMBER	(N) BOLTS
ROLLED BEAM	24" 30"	C15x33.9	4
	31" 36"	MC18x42.7	5
	37" 42"	W21x44	6
PLATE GIRDER WEB	31" 36"	W27x84	7
	37" 42"	W33x118	9
	43" 48"	W36x135	10

INTERMEDIATE DIAPHRAGMS FOR 24" TO 48" BRIDGE BEAMS

* IF CLEARANCE CANNOT BE MET, DIAPHRAGM MAY BE SLOPED.



WELD LOCATION DETAIL AT CROSS FRAMES AND LATERAL BRACING



SEE CONTRACT DRAWINGS FOR SIZES OF MEMBERS AND CONNECTION DETAILS

ROLLED BEAM USED AS DIAPHRAGM

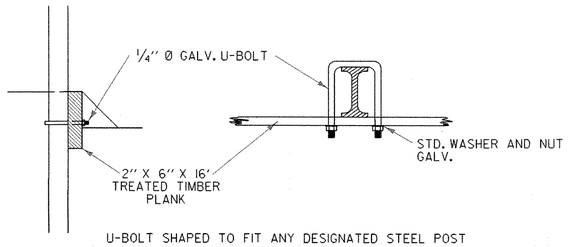
DETAILS ON THIS SHEET ARE "NOT TO SCALE" UNLESS NOTED OTHERWISE.

REVISIONS	
MAY 7, 2010	APPROVED FOR USE BY VAOT STRUCTURES SECTION
MAY 2, 2011	ADD INTERMEDIATE DIAPHRAGMS DETAIL & ADD NOT TO SCALE NOTE

STRUCTURAL STEEL PLATE GIRDER DETAILS AND NOTES

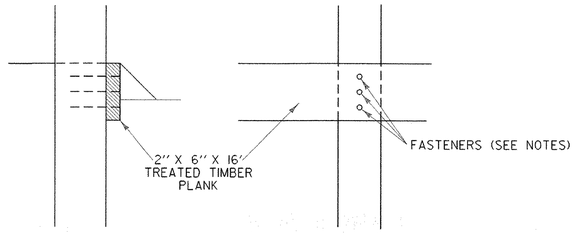
VERMONT AGENCY OF TRANSPORTATION
STRUCTURES - SECTION

STRUCTURES DETAIL
SD-602.00

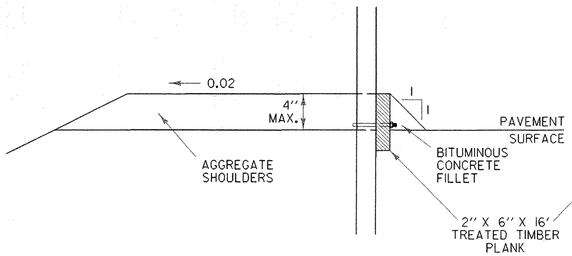


U-BOLT SHAPED TO FIT ANY DESIGNATED STEEL POST

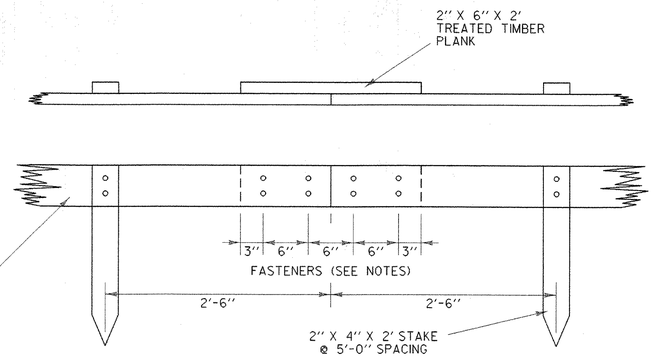
WITH STEEL POSTS



WITH WOOD POSTS (EXISTING CONDITION)

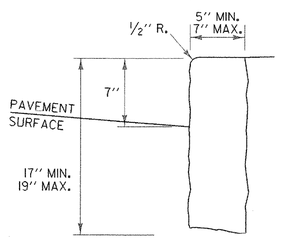


BITUMINOUS CONCRETE FILLET DETAIL

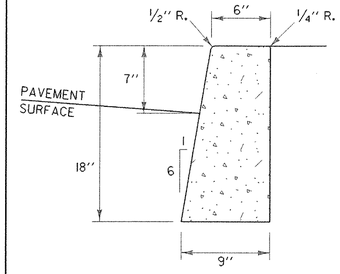


SPLICE DETAIL

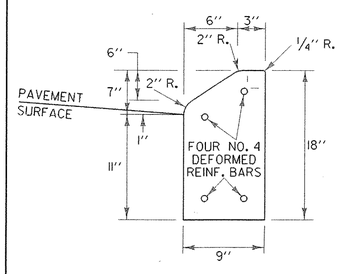
TREATED TIMBER CURB



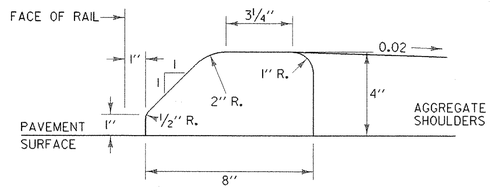
VERTICAL GRANITE CURB



CAST IN PLACE CONCRETE CURB, TYPE B

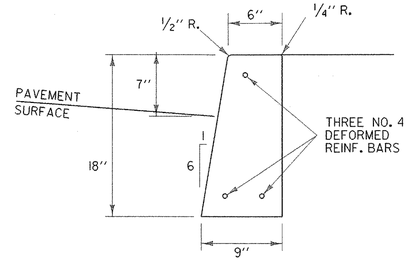


PRECAST REINFORCED CONCRETE CURB, TYPE A

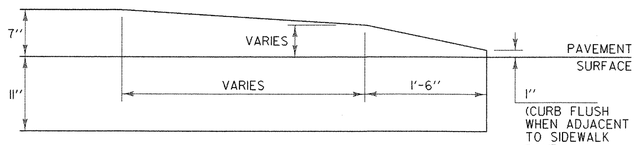


USE ONLY WITH STEEL BEAM GUARDRAIL

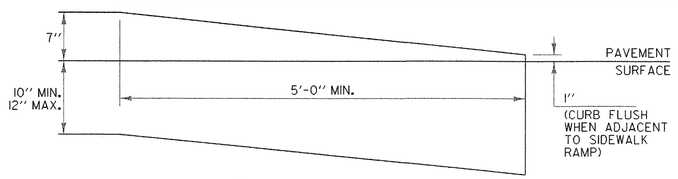
BITUMINOUS CONCRETE CURB, TYPE A



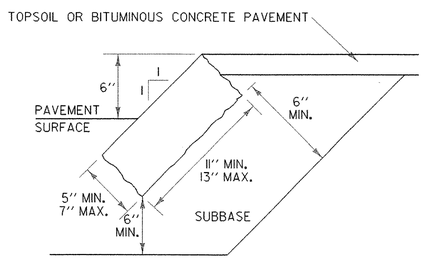
PRECAST REINFORCED CONCRETE CURB, TYPE B



CONCRETE CURB END



VERTICAL GRANITE CURB END



EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.

GRANITE SLOPE EDGING

GENERAL NOTES:

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

OTHER STDS. REQUIRED: **NONE**

REVISIONS AND CORRECTIONS

FEB. 11, 2008 - ORIGINAL APPROVAL DATE

APPROVED

Kevin A. Marshia
ROADWAY, TRAFFIC & SAFETY ENGINEER

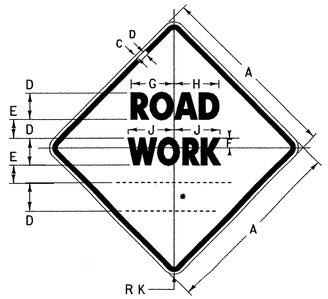
DIRECTOR OF PROGRAM DEVELOPMENT

Mark D. Richter
FEDERAL HIGHWAY ADMINISTRATION

CURBING

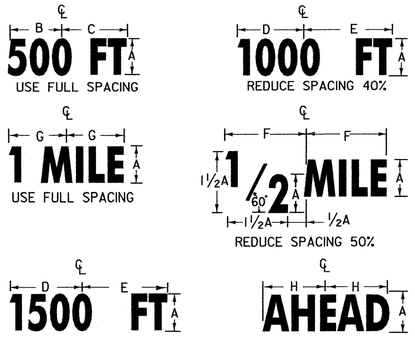
VERMONT AGENCY OF TRANSPORTATION

STANDARD C-10



W20-1

• SEE DISTANCE DETAILS

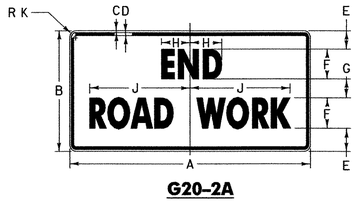


DISTANCE DETAILS

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	5/8	7/8	5D	3 1/2	3 1/4	8 3/8	8 7/8	9	2 1/4
STD.	48	3/4	1 1/4	7D	4 3/4	4 1/2	11 11/16	12 7/16	12 5/8	3

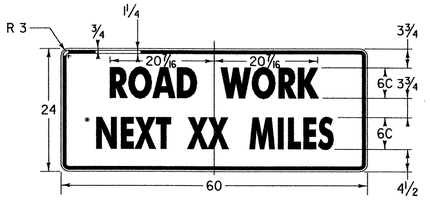
DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
5D	10 3/16	10 3/16	11 5/8	11 1/4	11 1/4	9 1/2	10 7/8
7D	14 1/4	15 1/8	14 7/8	15 3/4	15 3/4	13 1/16	15 1/2

(ALL DIMENSIONS SHOWN IN INCHES)



G20-2A

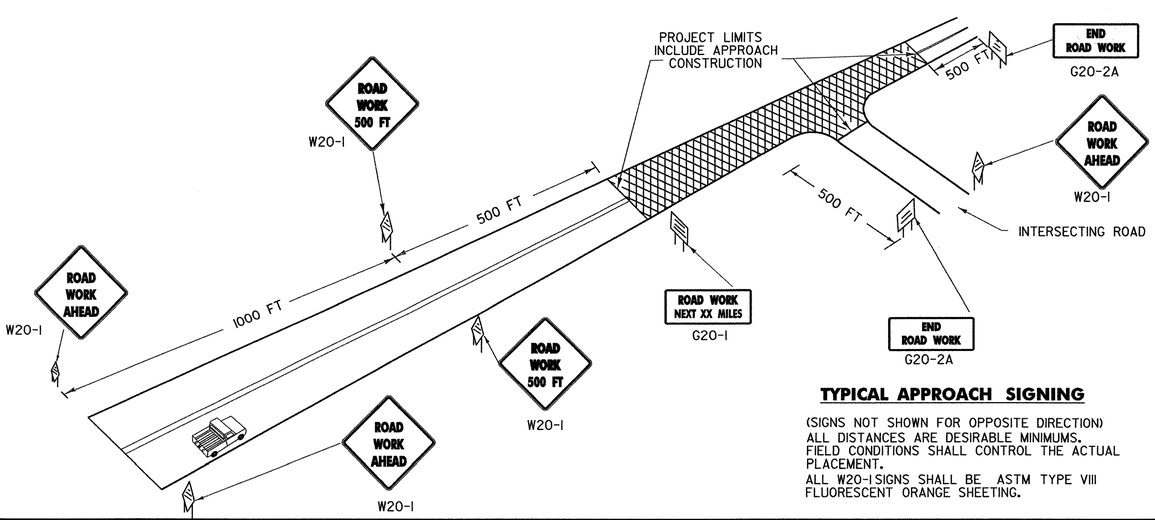
SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	18	5/8	7/8	3 3/4	4C	2 1/2	4	12 5/8	2 1/4
STD.	48	24	3/4	1 1/4	4 1/8	6C	3 3/4	5 7/8	22	3



G20-1

• OPTICALLY CENTER

THIS SIGN TO BE USED WHEN PROJECT LENGTH EXCEEDS 2 MILES OR AS REQUESTED BY THE RESIDENT ENGINEER. SHOW MILEAGE TO NEAREST 1/4 MILE USING FRACTIONS, NOT DECIMALS. HAND LETTERING OF MILEAGE WILL NOT BE ALLOWED.



TYPICAL APPROACH SIGNING

(SIGNS NOT SHOWN FOR OPPOSITE DIRECTION)
ALL DISTANCES ARE DESIRABLE MINIMUMS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
ALL W20-1 SIGNS SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING.

NOTES

THE SIGNS SHOWN ON THIS SHEET ARE INTENDED FOR USE IN PROVIDING ADVANCE WARNING AND INFORMATION ON CONSTRUCTION PROJECTS OVER WHICH TRAFFIC WILL BE MAINTAINED. WHEN ADDITIONAL APPROACH SIGNS OR OTHER TYPES OF ADVANCE SIGNING OR CONTROL ARE NECESSARY, THE PLANS AND\OR THE SPECIFICATIONS FOR THAT PROJECT WILL GIVE THE DETAILS OF THE SIGNS AND DEVICES REQUIRED. FOR ON-PROJECT CONSTRUCTION SIGNS, REFER TO APPROPRIATE STANDARD SHEETS.

APPLICATION OF STANDARDS

SINCE IT IS NOT POSSIBLE TO PRESCRIBE DETAILED STANDARDS OF APPLICATION FOR ALL OF THE SITUATIONS THAT MAY CONCEIVABLY ARISE ON A CONSTRUCTION PROJECT, REFERENCE SHALL BE MADE TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" FOR THE PRINCIPLES, PROCEDURES, AND STANDARDS THAT WILL BE REQUIRED IN CONNECTION WITH ADVANCED WARNING AND ON-PROJECT CONSTRUCTION SIGNS AND BARRICADES. THE SIGNS SHOWN IN E-101 AND E-102 REPRESENT A SAMPLE OF THOSE MORE COMMONLY USED.

LOCATION

THE SIGNS SHALL BE LOCATED AS DETAILED ON THIS SHEET OR AS OTHERWISE SHOWN ON THE PLANS. THEY SHALL APPEAR AT EACH END OF THE HIGHWAY UNDER CONSTRUCTION AND ON ALL INTERSECTING PUBLIC HIGHWAYS. THE ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

DESIGN

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

MATERIALS

THE SIGN BASE MATERIAL USED FOR THE SIGNS ON THIS SHEET MAY BE ANY OF THE FOLLOWING, WITH MINIMUM THICKNESS AS NOTED.

FLAT SHEET ALUMINUM	0.125 INCHES
HIGH DENSITY OVERLAYED PLYWOOD	5/8 INCHES

REFLECTORIZATION

ALL LEAD SIGNS (W20-1) ON THIS SHEET SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING. ALL OTHER SIGNS ON THIS SHEET SHALL BE ASTM TYPE III RETROREFLECTORIZED SHEETING.

COLORS

THE COLORS SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA. COLORS SHOWN ON THIS SHEET CONSIST OF BLACK TEXT AND BORDER ON A RETROREFLECTORIZED ASTM TYPE III OR TYPE VIII ORANGE BACKGROUND.

INSTALLATION

THE SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY, OR UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER ON POSTS SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST 7 FEET ABOVE THE EDGE OF PAVEMENT, AND THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST 6 FEET OUTSIDE THE SHOULDER POINT, 4 FEET OUTSIDE GUARD RAIL, OR 2 FEET OUTSIDE CURBING, OR SIDEWALK. THE INSTALLATION OF SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER, IN URBAN AREAS, THE BOTTOM OF THE SIGN SHALL BE AT LEAST 7 FEET ABOVE THE SIDEWALK. SIGNS MAY BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.

NOTES CONT.

MAINTENANCE

SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACED, OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.

GENERAL

THE COST OF FURNISHING, INSTALLING, MAINTAINING AND REMOVING ALL CONSTRUCTION APPROACH SIGNS WILL BE CONSIDERED INCIDENTAL WORK PERTAINING TO THE PROJECT AS A WHOLE AND SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR VARIOUS ITEMS INVOLVED IN THE CONTRACT. DURING ALL PHASES OF CONSTRUCTION THE REQUIREMENTS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE MET.

SIGN COVERS

SIGN COVERS SHALL CONSIST OF A PANEL PAINTED FLAT BLACK, THE SAME SIZE AS THE SIGN IT COVERS. THE PANEL SHALL BE OF WOOD, PLYWOOD, HARDBOARD OR ANY MATERIAL SATISFACTORY TO THE ENGINEER. NO MATERIAL WILL BE APPROVED THAT WILL DETERIORATE BY EXPOSURE TO THE WEATHER DURING THE PROJECT. MOUNTING OF THE PANEL SHALL BE DONE IN SUCH A WAY AS NOT TO DAMAGE THE SIGN FACE MATERIAL.

CONTRACTORS SHALL COORDINATE THEIR SIGNING ACTIVITIES WITH OTHER CONTRACTORS WITHIN THE PROJECT LIMITS, AS DIRECTED BY THE REGIONAL CONSTRUCTION ENGINEER.

SIGN POSTS

WHERE CONSTRUCTION SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARD RAIL OR OTHER APPROVED TRAFFIC BARRIERS, THE POSTS ON WHICH THE SIGNS ARE MOUNTED SHALL BE YIELDING METAL POSTS AS DESIGNATED IN THE E SERIES OF STANDARD DRAWINGS OR YIELDING WOODEN POSTS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

WOODEN POSTS ARE ACCEPTABLE FOR USE WITH CONSTRUCTION SIGNS. THESE POSTS SHALL HAVE A UNIFORM CROSS-SECTION AND SHALL BE MADE FROM GRADE 2, AIR-DRIED SOUTHERN YELLOW PINE OR ANOTHER EQUIVALENT SOFTWOOD. AN ACCEPTABLE EQUIVALENT SOFTWOOD SHALL HAVE AN EXTREME FIBER IN BENDING "Fb" DESIGN VALUE NOT TO EXCEED 1400 psi AND HORIZONTAL SHEAR "Fv" DESIGN VALUE NOT TO EXCEED 90 psi SPECIFICATION; "DESIGN VALUES FOR WOOD CONSTRUCTION" AND RELATED SUPPLEMENT, LATEST EDITION.

AS ESTABLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION IN THEIR NATIONAL DESIGN. THE FOLLOWING ARE CONSIDERED TO BE ACCEPTABLE WOODEN POSTS:

1. 4" X 4" (ACTUAL DIMENSIONS ARE S4S 3.5" X 3.5")
   A) ACCEPTABLE FOR SINGLE OR DUAL POSTS INSTALLATION WITH NO MODIFICATIONS.

ALL WOODEN POSTS SHALL HAVE AN EMBEDMENT DEPTH OF 4 FEET.
NO CROSS-BRACING OR BACK-BRACING TO KEEP THE POSTS PLUMB WILL BE ALLOWED.
CONCRETE FOUNDATIONS, COLLARS, OR SOIL BEARING PLATES ARE NOT PERMITTED.
CONSTRUCTION SIGNS SHALL BE PLACED ON TWO OR MORE POSTS WHEN ANY OF THE FOLLOWING CONDITIONS GOVERN:

A) THE SIGN WIDTH (HORIZONTAL DIMENSIONS FOR DIAMOND SHAPED SIGNS) EXCEEDS 3 1/2 FEET.
B) THE EXPOSED SIGN AREA OF ANY SINGLE SIGN OR ASSEMBLY EXCEEDS 7 SQ. FEET.
C) THE Sv OF A SINGLE POST IS 64.

OTHER STDS. REQUIRED: E-100A, E-101, E-102

REVISIONS AND CORRECTIONS

MAY 26, 1989 - DATE OF ORIGINAL ISSUE
OCT 21, 1992 - REVISED WOOD POST REQUIREMENTS, ADDED SIGN DETAILS, & REVISED TITLE BLOCK
AUG. 08, 1995 - MINOR NOTE REVISIONS
JAN. 06, 1997 - MINOR NOTE AND DIMENSION REVISIONS
JAN. 2, 2004 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VIII

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

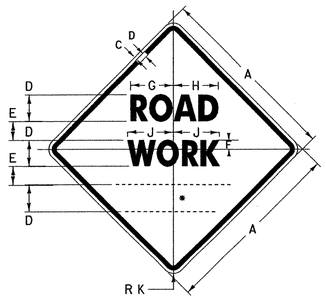
TRAFFIC OPERATIONS ENGINEER

FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION APPROACH SIGNS

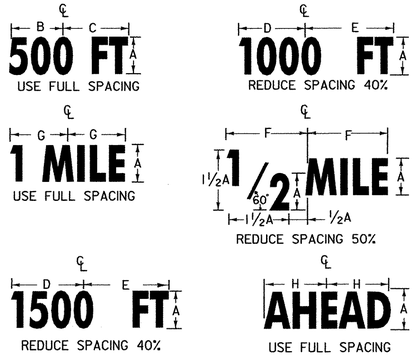
VERMONT AGENCY OF TRANSPORTATION

STANDARD E-100



W20-1

• SEE DISTANCE DETAILS

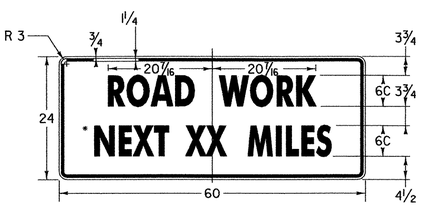


DISTANCE DETAILS

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	5/8	7/8	5D	3 1/2	3 1/4	8 3/8	8 7/8	9	2 1/4
STD.	48	3/4	1 1/4	7D	4 3/4	4 1/2	11 11/16	12 7/16	12 5/8	3

DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
5D	10 3/16	10 3/16	11 5/8	11 1/4	11 1/4	9 1/2	10 7/8
7D	14 1/4	15 1/8	14 7/8	15 3/4	15 3/4	13 1/16	15 1/2

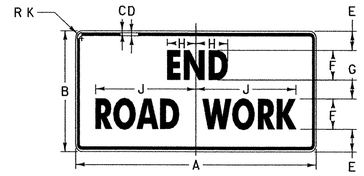
(ALL DIMENSIONS SHOWN IN INCHES)



G20-1

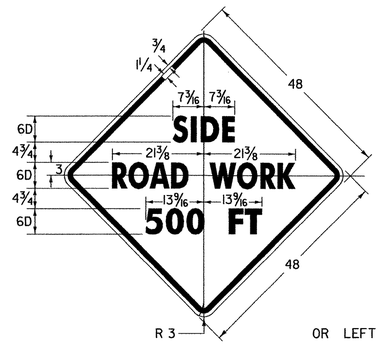
• OPTICALLY CENTER

THIS SIGN TO BE USED WHEN PROJECT LENGTH EXCEEDS 2 MILES OR AS REQUESTED BY THE RESIDENT ENGINEER. SHOW MILEAGE TO NEAREST 1/4 MILE USING FRACTIONS, NOT DECIMALS. HAND LETTERING OF MILEAGE WILL NOT BE ALLOWED.



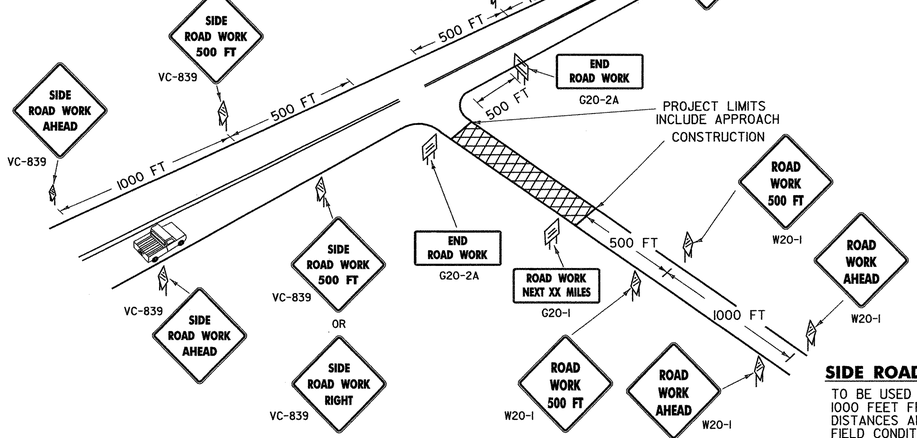
G20-2A

SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
MIN.	36	18	5/8	7/8	3 3/4	4C	2 1/2	4	12 5/8	2 1/4
STD.	48	24	3/4	1 1/4	4 1/8	6C	3 3/4	5 7/8	22	3



VC-839

OR LEFT - 17 3/4
RIGHT - 22
500 - 14 3/4
FT - 8 1/16



SIDE ROAD APPROACH SIGNING

TO BE USED WHEN CONSTRUCTION IS UP TO 1000 FEET FROM THE INTERSECTION. ALL DISTANCES ARE DESIREABLE MINIMUMS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.

ALL W20-1 AND VC-839 SIGNS SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING.

NOTES

THE SIGNS SHOWN ON THIS SHEET ARE INTENDED FOR USE IN PROVIDING ADVANCE WARNING AND INFORMATION ON CONSTRUCTION PROJECTS OVER WHICH TRAFFIC WILL BE MAINTAINED. WHEN ADDITIONAL APPROACH SIGNS OR OTHER TYPES OF ADVANCE SIGNING OR CONTROL ARE NECESSARY, THE PLANS AND\OR THE SPECIFICATIONS FOR THAT PROJECT WILL GIVE THE DETAILS OF THE SIGNS AND DEVICES REQUIRED. FOR ON-PROJECT CONSTRUCTION SIGNS, REFER TO APPROPRIATE STANDARD SHEETS.

APPLICATION OF STANDARDS

SINCE IT IS NOT POSSIBLE TO PRESCRIBE DETAILED STANDARDS OF APPLICATION FOR ALL OF THE SITUATIONS THAT MAY CONCEIVABLY ARISE ON A CONSTRUCTION PROJECT, REFERENCE SHALL BE MADE TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" FOR THE PRINCIPLES, PROCEDURES, AND STANDARDS THAT WILL BE REQUIRED IN CONNECTION WITH ADVANCED WARNING AND ON-PROJECT CONSTRUCTION SIGNS AND BARRICADES. THE SIGNS SHOWN IN E-101 AND E-102 REPRESENT A SAMPLE OF THOSE MORE COMMONLY USED.

LOCATION

THE SIGNS SHALL BE LOCATED AS DETAILED ON THIS SHEET OR AS OTHERWISE SHOWN ON THE PLANS. THEY SHALL APPEAR AT EACH END OF THE HIGHWAY UNDER CONSTRUCTION AND ON ALL INTERSECTING PUBLIC HIGHWAYS. THE ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

DESIGN

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

NOTES CONT.

MATERIALS

THE SIGN BASE MATERIAL USED FOR THE SIGNS ON THIS SHEET MAY BE ANY OF THE FOLLOWING, WITH MINIMUM THICKNESS AS NOTED.

FLAT SHEET ALUMINUM	0.125 INCHES
HIGH DENSITY OVERLAYED PLYWOOD	5/8 INCHES

REFLECTORIZATION

ALL LEAD SIGNS (W20-1, VC-839) ON THIS SHEET SHALL BE ASTM TYPE VIII FLUORESCENT ORANGE SHEETING. ALL OTHER SIGNS ON THIS SHEET SHALL BE ASTM TYPE III RETROREFLECTORIZED SHEETING.

COLORS

THE COLORS SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA. COLORS SHOWN ON THIS SHEET CONSIST OF BLACK TEXT AND BORDER ON A RETROREFLECTORIZED ASTM TYPE III OR TYPE VIII ORANGE BACKGROUND.

INSTALLATION

THE SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY, OR UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER ON POSTS SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST 7 FEET ABOVE THE EDGE OF PAVEMENT, AND THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST 6 FEET OUTSIDE THE SHOULDER POINT, 4 FEET OUTSIDE GUARD RAIL, OR 2 FEET OUTSIDE CURBING, OR SIDEWALK. THE INSTALLATION OF SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER, IN URBAN AREAS, THE BOTTOM OF THE SIGN SHALL BE AT LEAST 7 FEET ABOVE THE SIDEWALK. SIGNS MAY BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.

MAINTENANCE

SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACED, OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.

GENERAL

THE COST OF FURNISHING, INSTALLING, MAINTAINING AND REMOVING ALL CONSTRUCTION APPROACH SIGNS WILL BE CONSIDERED INCIDENTAL WORK PERTAINING TO THE PROJECT AS A WHOLE AND SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR VARIOUS ITEMS INVOLVED IN THE CONTRACT. DURING ALL PHASES OF CONSTRUCTION THE REQUIREMENTS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE MET.

SIGN COVERS

SIGN COVERS SHALL CONSIST OF A PANEL PAINTED FLAT BLACK, THE SAME SIZE AS THE SIGN IT COVERS. THE PANEL SHALL BE OF WOOD, PLYWOOD, HARDBOARD OR ANY MATERIAL SATISFACTORY TO THE ENGINEER. NO MATERIAL WILL BE APPROVED THAT WILL DETERIORATE BY EXPOSURE TO THE WEATHER DURING THE PROJECT. MOUNTING OF THE PANEL SHALL BE DONE IN SUCH A WAY AS NOT TO DAMAGE THE SIGN FACE MATERIAL.

CONTRACTORS SHALL COORDINATE THEIR SIGNING ACTIVITIES WITH OTHER CONTRACTORS WITHIN THE PROJECT LIMITS, AS DIRECTED BY THE REGIONAL CONSTRUCTION ENGINEER.

SIGN POSTS

WHERE CONSTRUCTION SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARD RAIL OR OTHER APPROVED TRAFFIC BARRIERS, THE POSTS ON WHICH THE SIGNS ARE MOUNTED SHALL BE YIELDING METAL POSTS AS DESIGNATED IN THE E SERIES OF STANDARD DRAWINGS OR YIELDING WOODEN POSTS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

WOODEN POSTS ARE ACCEPTABLE FOR USE WITH CONSTRUCTION SIGNS. THESE POSTS SHALL HAVE A UNIFORM CROSS-SECTION AND SHALL BE MADE FROM GRADE 2, AIR-DRIED SOUTHERN YELLOW PINE OR ANOTHER EQUIVELENT SOFTWOOD. AN ACCEPTABLE EQUIVELENT SOFTWOOD SHALL HAVE AN EXTREME FIBER IN BENDING "Fb" DESIGN VALUE NOT TO EXCEED 1400 psi AND HORIZONTAL SHEAR "Fv" DESIGN VALUE NOT TO EXCEED 90 psi SPECIFICATION; "DESIGN VALUES FOR WOOD CONSTRUCTION" AND RELATED SUPPLEMENT, LATEST EDITION.

AS ESTABLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION IN THEIR NATIONAL DESIGN THE FOLLOWING ARE CONSIDERED TO BE ACCEPTABLE WOODEN POSTS:

1. 4" X 4" (ACTUAL DIMENSIONS ARE S4S 3.5" X 3.5")

A) ACCEPTABLE FOR SINGLE OR DUAL POSTS INSTALLATION WITH NO MODIFICATIONS.

ALL WOODEN POSTS SHALL HAVE AN EMBEDMENT DEPTH OF 4 FEET.
NO CROSS-BRACING OR BACK-BRACING TO KEEP THE POSTS PLUMB WILL BE ALLOWED.
CONCRETE FOUNDATIONS COLLARS OR SOIL BEARING PLATES ARE NOT PERMITTED.
CONSTRUCTION SIGNS SHALL BE PLACED ON TWO OR MORE POSTS WHEN ANY OF THE FOLLOWING CONDITIONS GOVERN:

A) THE SIGN WIDTH (HORIZONTAL DIMENSIONS FOR DIAMOND SHAPED SIGNS) EXCEEDS 3 1/2 FEET.
B) THE EXPOSED SIGN AREA OF ANY SINGLE SIGN OR ASSEMBLY EXCEEDS 7 SQ. FEET.
C) THE Sv OF A SINGLE POST IS 64

OTHER STDS. REQUIRED: E-100, E-101, E-102

REVISIONS AND CORRECTIONS

JAN. 06, 1997 - DATE OF ORIGINAL ISSUE
JAN. 2, 2004 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VIII

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

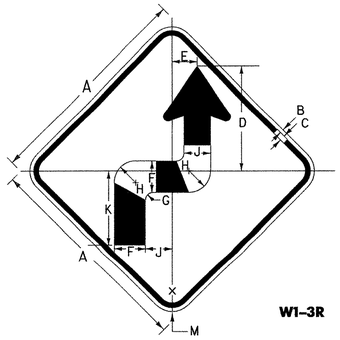
TRAFFIC OPERATIONS ENGINEER

FEDERAL HIGHWAY ADMINISTRATION

SIDE ROAD CONSTRUCTION APPROACH SIGNS

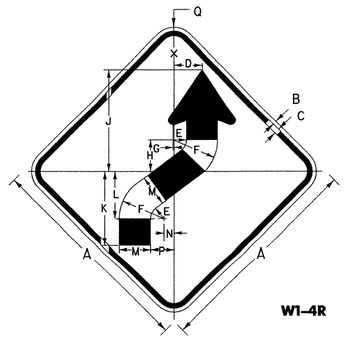
VERMONT AGENCY OF TRANSPORTATION

STANDARD
E-100A



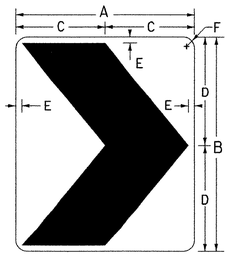
W1-3R

SIGN	DIMENSIONS (INCHES)											
	A	B	C	D	E	F	G	H	J	K	L	M
STD. & MIN.	36	5/8	7/8	17 7/16	4 17/32	5 1/4	1 1/4	3 5/8	4 1/2	12 15/32	1 3/32	2 1/4
SPECIAL	48	3/4	1 1/4	23 3/16	5 5/8	7	1 5/8	4 7/8	6	16 5/8	2 3/16	3



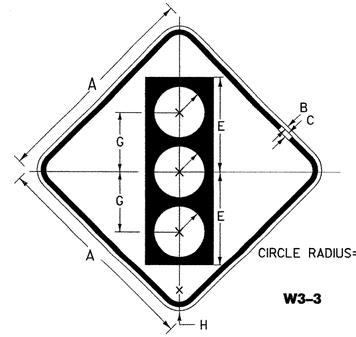
W1-4R

SIGN	DIMENSIONS (INCHES)														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
STD. & MIN.	36	5/8	7/8	4 23/32	2 1/4	7 1/2	5/32	5 1/4	16 7/8	12 3/8	7 7/8	5 1/4	1 11/16	3 15/16	2 1/4
SPECIAL	48	3/4	1 1/4	6 5/16	3	10	3/16	7	22 1/2	16 1/2	10 1/2	7	2 1/4	5 1/4	3



W1-8

SIGN	DIMENSIONS(INCHES)					
	A	B	C	D	E	F
STD.	18	24	9	12	3/4	1 1/2
SPECIAL	24	30	12	15	7/8	1 1/2
EXPWY.	30	36	15	18	1	1 7/8
FRWY.	36	48	18	24	1 1/8	2 1/4



CIRCLE RADIUS=F

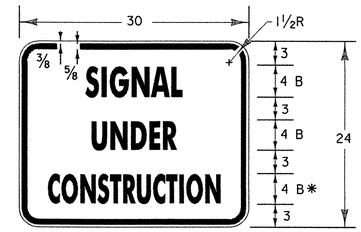
W3-3

SIGN	DIMENSIONS (INCHES)							
	A	B	C	D	E	F	G	H
STD. & MIN.	36	5/8	7/8	5 3/4	15 3/4	4 1/4	10	2 1/4
SPECIAL	48	3/4	1 1/4	7 1/2	20	5	12 1/2	3

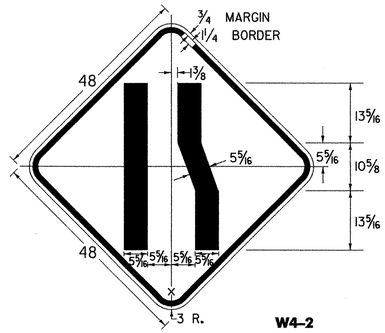
COLORS

SYMBOL & LEGEND - BLACK (NON-REFL)
BACKGROUND - ORANGE (REFL)

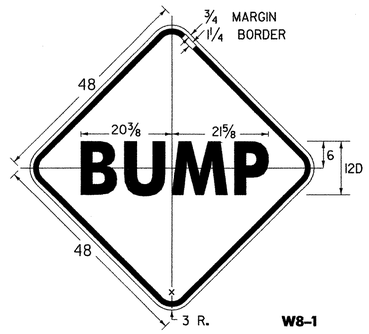
TOP CIRCLE RED (REFL)
MIDDLE CIRCLE YELLOW (REFL)
BOTTOM CIRCLE GREEN (REFL)



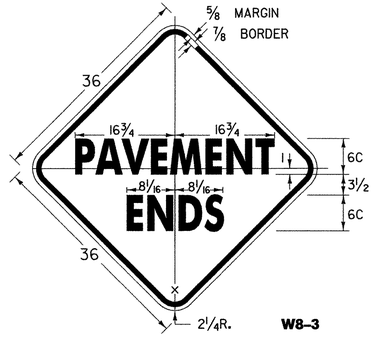
* REDUCE SPACING 50%



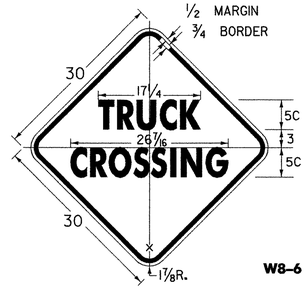
W4-2



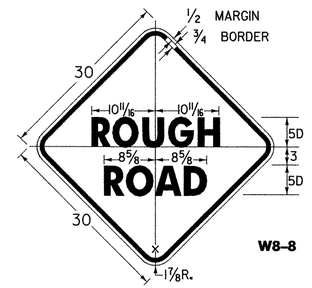
W8-1



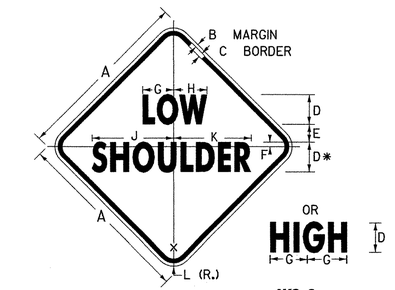
W8-3



W8-6



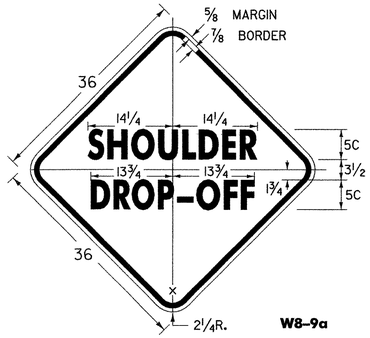
W8-8



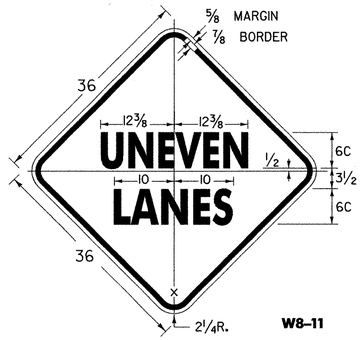
* REDUCE SPACING 25%

W8-9

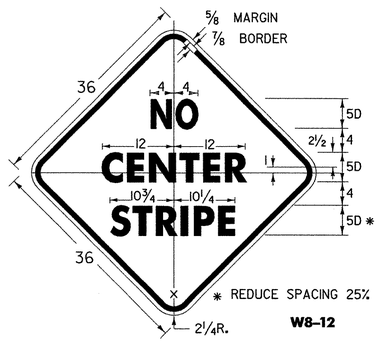
SIGN	DIMENSIONS(INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
STD.	30	1/2	3/4	5C	3	3/4	5 5/16	5 5/8	13 11/16	13 1/16	1 1/8
FWY.	48	3/4	1 1/4	8C	5	1 1/4	8 1/4	9	21 1/8	20 1/8	3



W8-9a

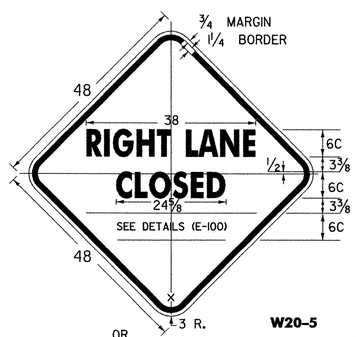


W8-11



* REDUCE SPACING 25%

W8-12



W20-5

(ALL DIMENSIONS SHOWN IN INCHES)

NOTES

SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS

COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS ON ASTM TYPE III OR TYPE VI RETROREFLECTORIZED ORANGE BACKGROUND, UNLESS OTHERWISE NOTED.

OTHER STDS. REQUIRED: E-100

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
OCT. 21, 1992 - ADDED ADDITIONAL SIGN DIMENSIONS, REVISED CHEVRON BACKROUND TO ORANGE, & REVISED TITLE BLOCK
AUG. 08, 1995 - ADDED AND DELETED VARIOUS SIGN DETAILS
MAR., 10 1997 - REVISED SIGN DETAILS
MAY 30, 2003 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VI

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

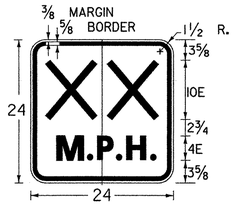
TRAFFIC OPERATIONS ENGINEER

FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION SIGN DETAILS

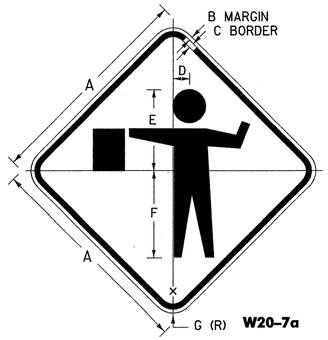
VERMONT AGENCY OF TRANSPORTATION

STANDARD
E-101



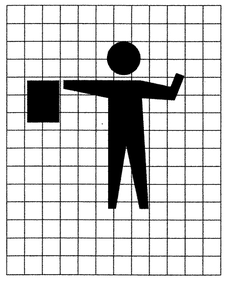
"XX" DENOTES ADVISORY SPEED AS SHOWN ON THE PLANS

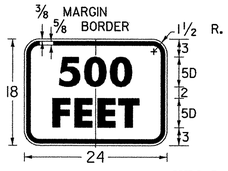
W13-1



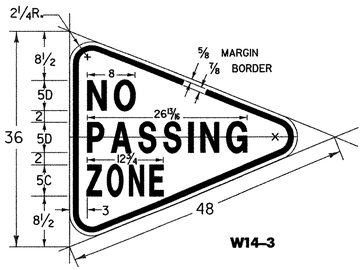
W20-7a

SIGN	DIMENSIONS(INCHES)						
	A	B	C	D	E	F	G
STD.	36	5/8	7/8	2 3/4	13 1/2	14 5/8	2 1/4
FWY.	48	3/4	1 1/4	3 3/4	18	19 1/2	3

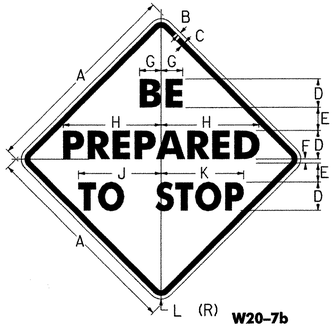




W16-2a



W14-3



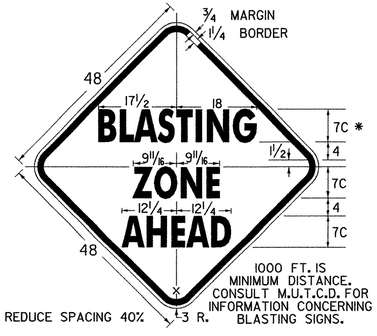
W20-7b

COLORS:
BLACK BORDER AND TEXT (NON RETRORFL.)
ORANGE BACKROUND (RETRORFL.)

W3-4

COLORS:
BLACK BORDER AND TEXT (NON RETRORFL.)
YELLOW BACKROUND (RETRORFL.)

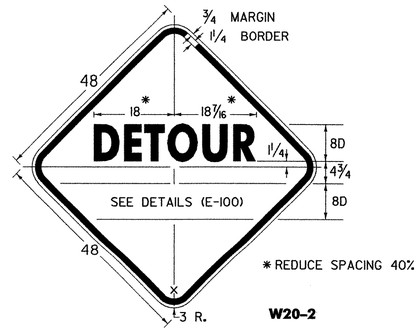
SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K	L
MIN.	36	5/8	7/8	6C	3 5/8	7/8	3 3/4	16 5/8	13	13 7/8	2 1/4
STD.	48	3/4	1 1/4	8C	4 7/8	1 1/4	5	21 7/8	17 3/8	18 1/2	3
EXPWY.	60	3/4	1 1/4	9C	5 5/8	1 5/8	5 5/8	24 3/4	19 3/8	20 1/4	3



* REDUCE SPACING 40%

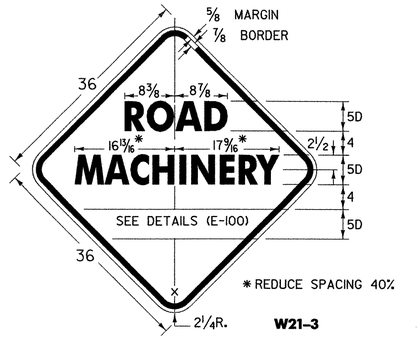
1000 FT. IS MINIMUM DISTANCE. CONSULT M.U.T.C.D. FOR INFORMATION CONCERNING BLASTING SIGNS.

W22-1



* REDUCE SPACING 40%

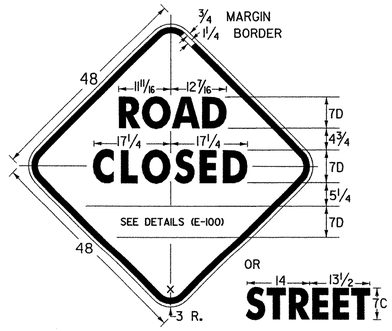
W20-2



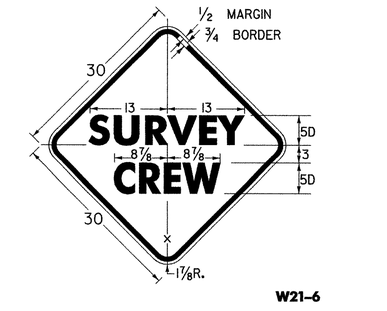
* REDUCE SPACING 40%

W21-3

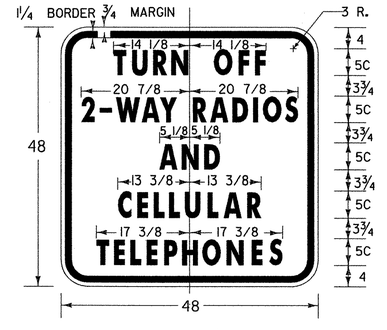
W22-3



W20-3



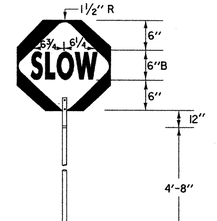
W21-6



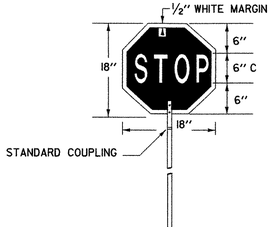
VW22-1

SIGN PADDLE FOR FLAGPERSON

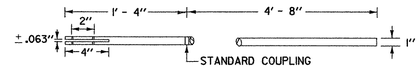
ORANGE ASTM TYPE III OR TYPE VI RETROREFLECTORIZED DIAMOND WITH BLACK TEXT AND BORDER



RED ASTM TYPE III OR TYPE VI RETROREFLECTORIZED OCTAGON WITH WHITE ASTM TYPE III OR TYPE VI RETROREFLECTORIZED TEXT



SIGN DETAIL



STAFF DETAIL

MATERIALS
THE SIGN MATERIALS SHALL BE 0.063" ALUMINUM WITH COLORS AS INDICATED ON DETAILS.
THE STAFF SHALL BE 3/4" TO 1 1/4" DIAMETER RIGID ALUMINUM CONDUIT/TUBING WITH A WALL THICKNESS OF 0.125", OR 1" TO 1 1/2" DIAMETER RIGID PVC CONDUIT/TUBING WITH 0.125" WALL THICKNESS

MOUNTING
THE STAFF SHALL BE MOUNTED WITH EITHER TWO 1/4" DIAMETER ALUMINUM BOLTS OR TWO 1/4" DIAMETER ALUMINUM RIVETS.

NOTES

SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS
COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS ON ASTM TYPE III OR TYPE VI RETROREFLECTORIZED ORANGE BACKGROUND, UNLESS OTHERWISE NOTED
SIGN DETAILS INDICATE THE APPROPRIATE COLOR.

OTHER STDS. REQUIRED: E-100

NOTE: ALL DIMENSIONS SHOWN IN INCHES EXCEPT WHERE NOTED

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
JAN. 23, 1989 - DELETE MOTORCYCLE SYMBOL SIGN AND SPEED SIGN, ADDED TWO SIGNS
OCT. 21, 1992 - ADDED A SIGN, REVISED A SIGN DIMENSION & TYPE ERROR & REVISED TITLE BLOCK
AUG. 08, 1995 - ADDED FLAGGER GRID
JUNE 30, 2003 - CHANGED REFLECTIVE SHEETING TO ASTM TYPE III OR TYPE VI CHANGED TEXT ON W20-7b SIGN

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

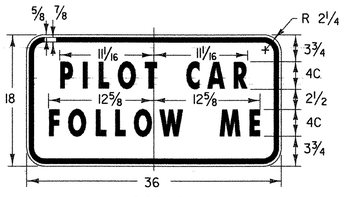
TRAFFIC OPERATIONS ENGINEER

FEDERAL HIGHWAY ADMINISTRATION

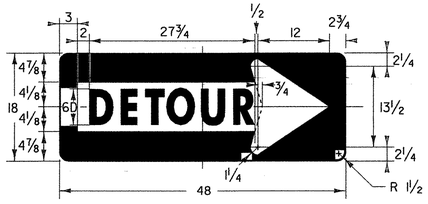
CONSTRUCTION SIGN DETAILS

VERMONT AGENCY OF TRANSPORTATION

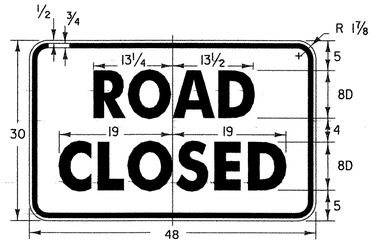
STANDARD
E-102



G20-4

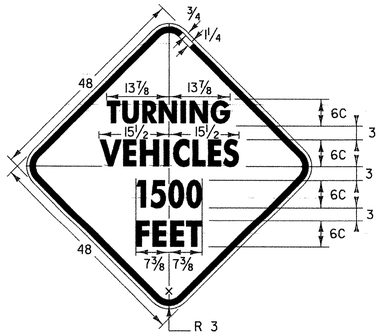


M4-10(R)

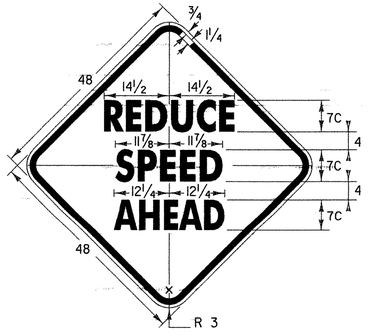


R11-2

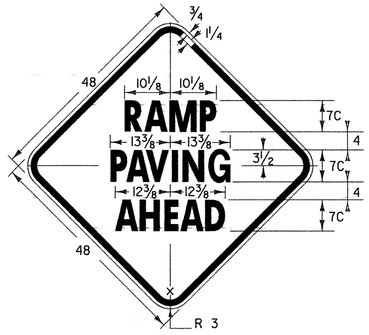
COLORS:
BLACK TEXT AND BORDER
WHITE RETROREFLECTORIZED BACKGROUND



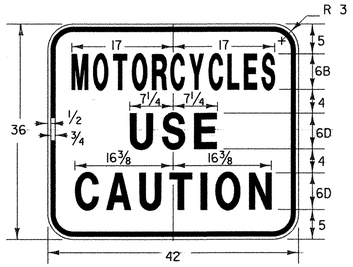
VC-001



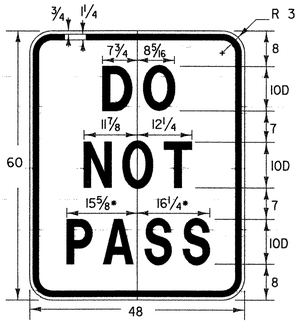
VC-002



VC-003

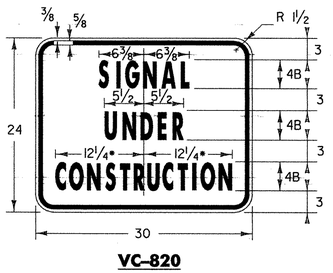


VC-004



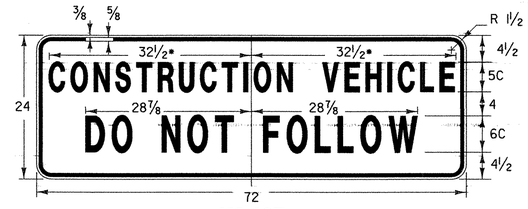
VC-005

• REDUCE SPACING BY 40%



VC-820

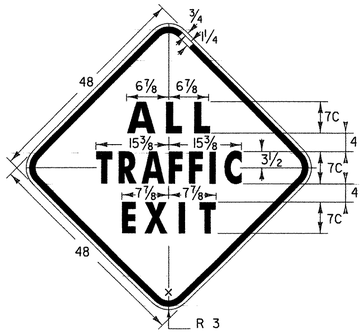
• REDUCE SPACING 25%



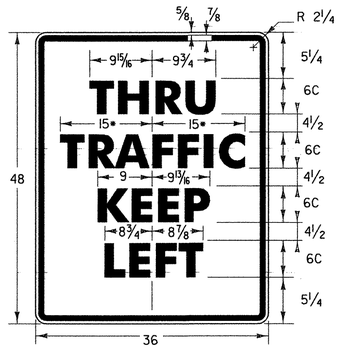
VC-007

• REDUCE SPACING 20%

IT IS SUGGESTED THAT THIS SIGN BE DESIGNED TO FOLD, (DOWN OR ACROSS), BE COVERED, OR BE REMOVED WHEN NOT IN USE. THE SIGN SHOULD ALSO BE MOUNTED AS TO NOT INTERFERE WITH THE VISIBILITY OF DIRECTIONAL OR TAIL LIGHTS AS REQUIRED BY LAW.



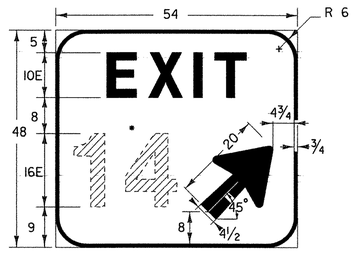
VC-008



VR-118L

• REDUCE SPACING 25 %

COLORS:
BLACK TEXT AND BORDER
WHITE (RETROREFLECTORIZED) BACKGROUND



E5-1a

• EXIT NUMBER AS PER PLANS OPTICALLY SPACED

COLORS:
WHITE RETROREFLECTORIZED BORDER, ARROW AND LEGEND
GREEN RETROREFLECTORIZED BACKGROUND

(ALL DIMENSIONS SHOWN IN INCHES EXCEPT WHERE NOTED)

NOTES

SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS

COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS ON ASTM TYPE III OR TYPE VIII RETROREFLECTIVE ORANGE BACKGROUND, UNLESS OTHERWISE NOTED.

SIGN DETAILS INDICATE THE PROPER COLOR.

OTHER STDS. REQUIRED: E-100, E-151

REVISIONS AND CORRECTIONS

AUG 08, 1995 - DATE OF ORIGINAL ISSUE
MAY 01, 2004 - CHANGED REFLECTIVE SHEETING TO TYPE III

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

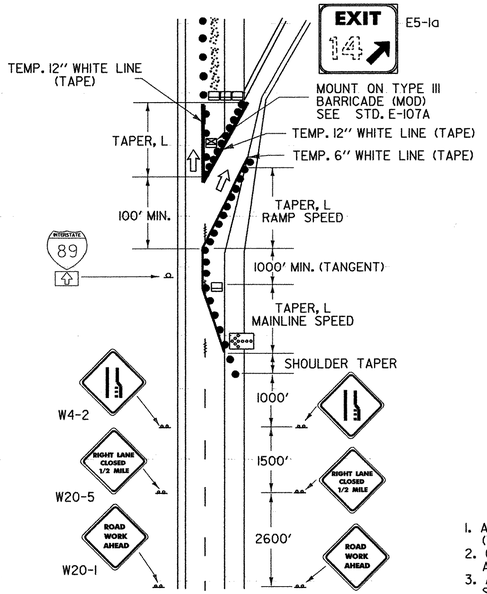
TRAFFIC OPERATIONS ENGINEER

FEDERAL HIGHWAY ADMINISTRATION

CONSTRUCTION SIGN DETAILS

VERMONT AGENCY OF TRANSPORTATION

STANDARD E-102A



MAINLINE LANE CLOSURE AT AN EXIT RAMP

NOT TO SCALE

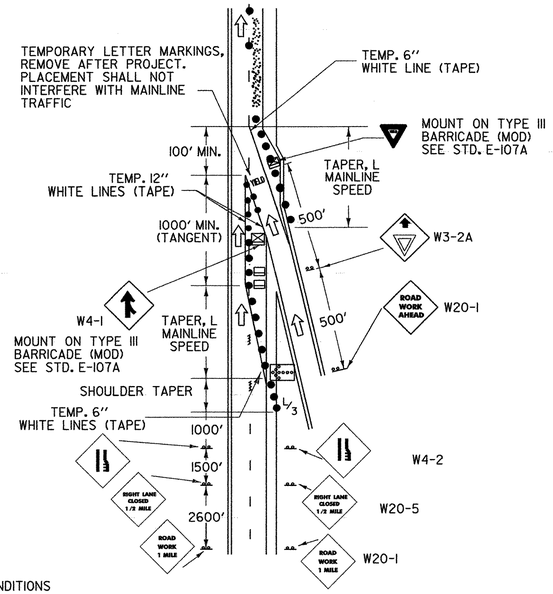
THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT THE GORE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE EXIT RAMP.

LEGEND

- REFL. PLASTIC DRUMS
- PAVEMENT MARKING REMOVAL
- INDICATES TRAFFIC FLOW
- WORK AREA
- FLASHING ARROW PANEL
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)

NOTES

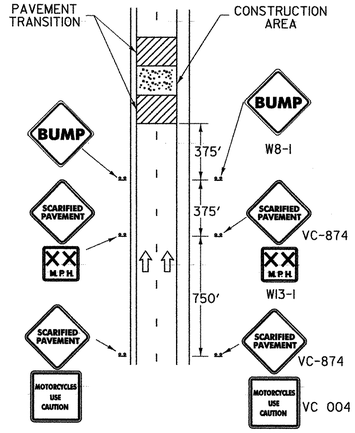
1. ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE) UNLESS OTHERWISE NOTED.
2. CHANNELIZING DEVICES SHALL BE PLACED IN ACCORDANCE WITH THE TABLE ON THIS SHEET
3. ALL DISTANCES ARE DESIRABLE MINIMUMS, FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
4. TAPER RATES ARE BASED ON THE POSTED MAINLINE AND EXIT SPEEDS.
5. TEMPORARY PAVEMENT MARKINGS ARE REQUIRED WHEN THE LAYOUT IS TO BE IN EFFECT FOR THREE DAYS OR MORE.
6. LANE CLOSURES AND TAPER LENGTHS, L, AS DETAILED ON THIS SHEET.
7. EXIT SIGN SHALL BE MOUNTED A MINIMUM OF 7 FEET ABOVE THE GROUND AND HIGH ENOUGH TO BE SEEN ABOVE CHANNELIZING DEVICES.



MAINLINE LANE CLOSURE AT AN ENTRANCE RAMP

NOT TO SCALE

THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT THE END OF THE ACCELERATION LANE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE ON-RAMP TRAFFIC. IF THE LENGTH OF THE ACCELERATION LANE IS NOT ADEQUATE, THE YIELD SIGN SHALL BE REPLACED WITH A STOP SIGN. IF A STOP SIGN IS USED, IT SHOULD BE ACCOMPANIED BY A STOP BAR.

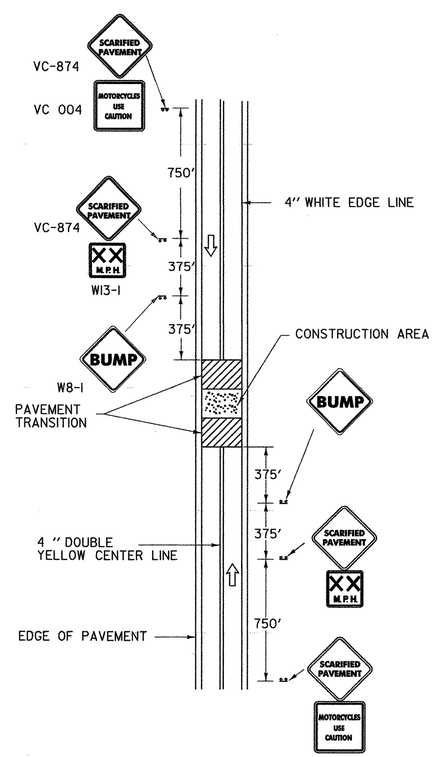


ADVANCED WARNING SIGN PACKAGE FOR COLD PLANED (SCARIFIED) SURFACES DIVIDED HIGHWAY

NOT TO SCALE

NOTES

1. ADVISORY SPEED AS DETERMINED BY THE RESIDENT ENGINEER (40 MPH MINIMUM RECOMMENDED).
2. ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE).
3. ALL DISTANCES ARE DESIRABLE MINIMUMS, FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
4. THE BUMP SIGN MAY BE ELIMINATED WHEN THERE IS NO BUMP. WHEN THE CONTRACTOR IS WORKING IN THE CONSTRUCTION AREA THE APPROPRIATE ADVANCED WARNING SIGN PACKAGE SHALL BE USED, SEE STD.E-103.
5. GATE POSTING OF SIGNS IS AN OPTION AS DETERMINED BY THE RESIDENT ENGINEER (WHEN PASSING, TURNING OR CLIMBING LANES LIMIT VISIBILITY).

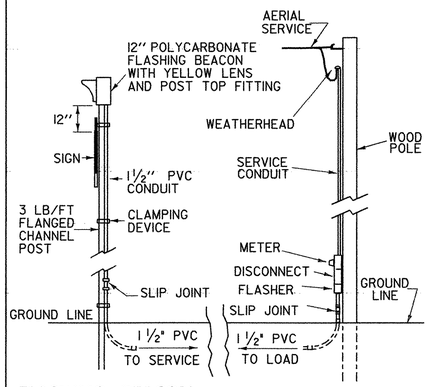


ADVANCED WARNING SIGN PACKAGE FOR COLD PLANED (SCARIFIED) SURFACES 2 LANE ROADWAY

NOT TO SCALE

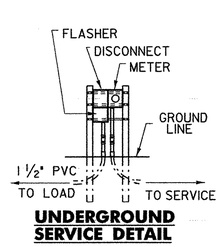
NOTES

1. ADVISORY SPEED AS DETERMINED BY THE RESIDENT ENGINEER (40 MPH MINIMUM RECOMMENDED).
2. ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE).
3. ALL DISTANCES ARE DESIRABLE MINIMUMS, FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
4. THE BUMP SIGN MAY BE ELIMINATED WHEN THERE IS NO BUMP. WHEN THE CONTRACTOR IS WORKING IN THE CONSTRUCTION AREA THE APPROPRIATE ADVANCED WARNING SIGN PACKAGE SHALL BE USED, SEE STD.E-110.
5. GATE POSTING OF SIGNS IS AN OPTION AS DETERMINED BY THE RESIDENT ENGINEER (WHEN PASSING, TURNING OR CLIMBING LANES LIMIT VISIBILITY).

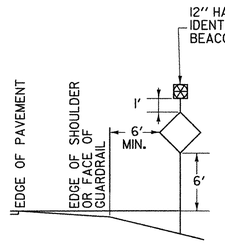


FLASHING BEACON DETAIL

AERIAL SERVICE WITHOUT LUMINAIRE



UNDERGROUND SERVICE DETAIL



SIGN PLACEMENT DETAIL

NOTES

1. AT THE CONTRACTOR'S OPTION:
   A. THE POWER SUPPLY MAY BE AERIAL OR UNDERGROUND (SEE DETAIL).
   B. POWER FOR A FLASHING BEACON MAY BE COMBINED WITH POWER FOR A TRAFFIC SIGNAL OR THEY MAY HAVE SEPARATE POWER SOURCES.
   C. THE FLASHER MAY BE INSTALLED ON A STANCHION NEAR THE SIGN, ON A UTILITY POLE (WITH UTILITY COMPANY APPROVAL) OR AT THE SAME LOCATION AS A TRAFFIC SIGNAL CONTROLLER.
2. THE FLASHER UNIT SHALL BE ONE CIRCUIT AND INCLUDE A RADIO INTERFERENCE FILTER.
3. BATTERY OPERATED FLASHERS WILL NOT BE ALLOWED.
4. BOTTOM OF THE BEACON SHALL BE A MIN. OF 8' AND A MAX. OF 12' ABOVE THE EDGE OF THE PAVEMENT.
5. FOR URBAN AREA PLACEMENT SEE STD. E-121.
6. FOR POWER DROP STANCHIONS SEE STD. E-175

CHANNELIZING DEVICES

TAPER RATES ARE DETERMINED USING THE FOLLOWING EQUATION:

L = WS FOR DESIGN SPEEDS OF 45 MPH OR GREATER

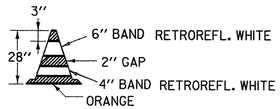
L = $WS^2/60$ FOR DESIGN SPEEDS OF 40 MPH OR LESS

WHERE: L = MINIMUM LENGTH OF TAPER IN FEET

W = WIDTH OF OFFSET (USUALLY LANE WIDTH) IN FEET

S = DESIGN SPEED IN MPH

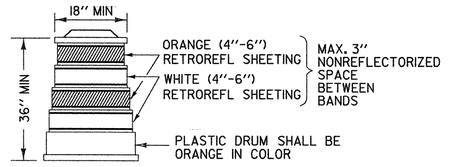
POSTED SPEED OR 85th PERCENTILE (mph)	DESIGN SPEED (mph)	TAPER LENGTHS (ft)			TANGENT SECTION LENGTHS (L/2) (ft)	MINIMUM BUFFER SPACE LENGTH (ft)	MAXIMUM CHANNELIZING DEVICE SPACING (ft)		BARRIER FLARE RATE (MIN)
		MERGING 12ft LANE (L)	SHIFTING W=16ft (L/2)	SHOULDER W=10ft (L/3)			TAPER	ALONG LANE LINE& WORK ZONE	
≤40	40	320	215	90	160	160	35	70	1:9
45	45	540	360	150	270	270	40	80	1:9
50	50	600	400	170	300	300	50	100	1:11
55	55	660	440	185	330	330	55	110	1:13
60 & 65	60	720	480	200	360	360	60	120	1:13
70	70	840	560	235	420	440	65	130	1:13



28" REFLECTORIZED CONE

NOTES

1. 28" CONES SHALL BE USED ON ROADWAYS WITH SPEED LIMITS OF 35 MPH OR MORE AND ON ALL ROADWAYS DURING HOURS OF DARKNESS.
2. CONES MAY BE WEIGHTED TO PREVENT OVERTURNING, HOWEVER THE WEIGHTS SHALL NOT PRESENT A HAZARD IF THE CONE IS STRUCK.
3. RETROREFLECTIVE SHEETING SHALL BE ASTM TYPE III OR TYPE VI.



REFLECTORIZED PLASTIC DRUM

SAND BAGS OR AN APPROPRIATE BALLASTING DEVICE, WHICH DOES NOT PRESENT A HAZARD TO THE IMPACTING VEHICLE OR BECOME A PROJECTILE UPON IMPACT, SHALL BE USED TO WEIGHT DRUMS. RETROREFLECTIVE SHEETING SHALL BE ASTM TYPE III OR TYPE VI.

OTHER STDS. E-101, E-102, E-102A, E-103, E-107A, E-110, E-121, E-136,
REQUIRED: E-150, E-175

REVISIONS AND CORRECTIONS

APR 12, 1988 - DATE OF ORIGINAL ISSUE

JAN 23, 1989 - REVISED EXIT SIGN - CLARIFIED EXIT TAPER

SEPT 20, 1993 - REVISED RAMP CLOSURES, FLASHING BEACON DETAILS AND MOVED TYPE III BARRICADE (MOD) TO STDE-107A

AUG 08, 1995 - REVISED BEACON SIZE

MAR. 01, 2004 - ADDED ADVANCED WARNING SIGN PACKAGE FOR COLD PLANED TWO WAY HIGHWAYS, CHANNELIZING DEVICES CHART

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

TRAFFIC OPERATIONS ENGINEER

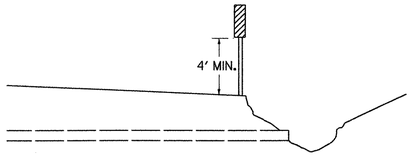
FEDERAL HIGHWAY ADMINSTRATION

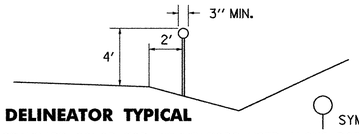
TRAFFIC CONTROL MISCELLANEOUS DETAILS

VERMONT AGENCY OF TRANSPORTATION

STANDARD

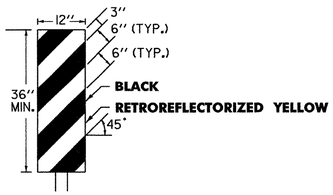
E-106





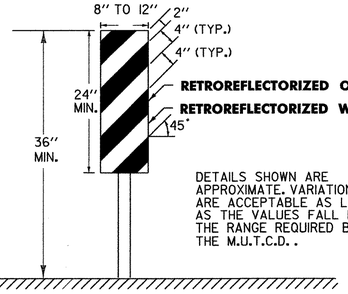
DELINEATOR TYPICAL

THE STANDARD COLOR FOR DELINEATORS USED ALONG BOTH SIDES OF TWO-WAY STREETS AND HIGHWAYS AND THE RIGHT SIDE OF ONE-WAY STREETS SHALL BE WHITE. DELINEATORS USED ALONG THE LEFT SIDE OF ONE-WAY ROADWAYS SHALL BE YELLOW THEY SHALL HAVE A MINIMUM AREA OF 7 SQUARE INCHES. THEY MAY BE ROUND, SQUARE OR OBLONG, FOR ALTERNATES SEE STD. E-198



OBJECT MARKER TYPICAL

OBJECTS MARKERS ARE USED TO MARK OBSTRUCTIONS WITHIN OR ADJACENT TO THE ROADWAY. IN SOME CASES THERE MAY NOT BE A PHYSICAL OBJECT INVOLVED, BUT OTHER ROADSIDE CONDITIONS SUCH AS NARROW SHOULDER DROP-OFFS, GORES, D.I. EXCAVATIONS, AND ABRUPT CHANGES IN THE ROADWAY ALIGNMENT MAY MAKE IT UNDESIRABLE FOR A DRIVER TO LEAVE THE ROADWAY. THE INSIDE EDGE OF THE OBJECT MARKER SHALL BE IN LINE WITH THE INNER EDGE OF THE OBSTRUCTION, WHENEVER POSSIBLE.
OBJECT MARKERS SHALL HAVE ALTERNATING BLACK AND RETROREFLECTORIZED YELLOW STRIPES. (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS).

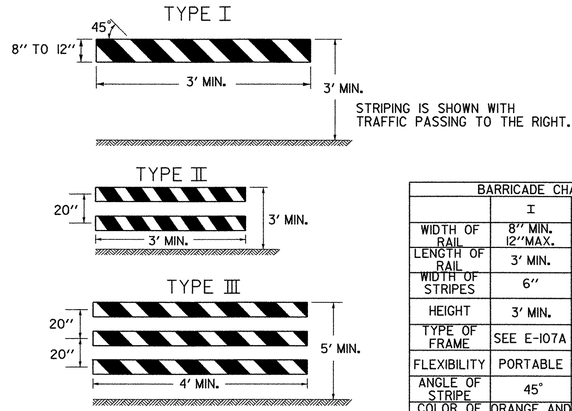


DETAILS SHOWN ARE APPROXIMATE. VARIATIONS ARE ACCEPTABLE AS LONG AS THE VALUES FALL IN THE RANGE REQUIRED BY THE M.U.T.C.D..

VERTICAL PANEL

VERTICAL PANELS SHALL HAVE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED STRIPES (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS). THESE DEVICES MAY BE USED FOR TRAFFIC SEPARATION, CHANNELIZING OR BARRICADING WHERE SPACE IS AT A MINIMUM.

DELINEATOR, VERTICAL PANEL AND OBJECT MARKER DETAILS FOR CONSTRUCTION AREAS WHERE TRAFFIC IS MAINTAINED



A TYPE III(MODIFIED) BARRICADE SHALL CONSIST OF TYPE II RAILS MOUNTED ON A BREAKAWAY BARRICADE AS SHOWN ON STANDARD SHEET E-107A.

BARRICADE CHARACTERISTICS			
	I	II	III
WIDTH OF RAIL	8" MIN. 12" MAX.	8" MIN. 12" MAX.	8" MIN. 12" MAX.
LENGTH OF RAIL	3' MIN.	3' MIN.	4' MIN.
WIDTH OF STRIPES	6"	6"	6"
HEIGHT	3' MIN.	3' MIN.	5' MIN.
TYPE OF FRAME	SEE E-107A	SEE E-107A	SEE E-107A
FLEXIBILITY	PORTABLE	PORTABLE	PORTABLE
ANGLE OF STRIPE	45°	45°	45°
COLOR OF STRIPES	ORANGE AND WHITE	ORANGE AND WHITE	ORANGE AND WHITE

BARRICADE CHARACTERISTICS

DETOUR DESIGN SPEED (M.P.H.)	MINIMUM RADIUS (FT.)[a] SUPERELEVATION (FT./FT.) 0.00[b]	0.02	0.04	0.06	0.08
20	160	140	130	120	110
25	245	220	200	185	170
30	375	335	305	275	255
35	510	455	410	375	340
40	715	630	575	510	470
50	1190	1045	955	850	765

a. PER AASHTO REQUIREMENTS
b. 0.00 SUPERELEVATION SHOULD BE AVOIDED IF POSSIBLE

BARRICADES

APPLICATION NOTES

TYPE I BARRICADES SHALL BE USED ON CONVENTIONAL ROADS OR URBAN STREETS AND ARTERIALS TO MARK A SPECIFIC HAZARD.

TYPE II BARRICADES SHALL BE USED ON EXPRESSWAYS AND FREEWAYS, SERVING THE SAME FUNCTIONS AS TYPE I BARRICADES.

TYPE III BARRICADES (SEE STD. E-107A) SHALL ONLY BE USED WHEN A ROAD SECTION OR LANE IS CLOSED TO TRAFFIC AND ARE TO BE ERECTED AT THE POINT OF CLOSURE.

MATERIALS

THE BARRICADES SHOWN ON THIS SHEET SHOULD BE OF LIGHTWEIGHT MATERIAL. IF WOOD IS USED THE FOLLOWING CONDITIONS SHALL APPLY:

1. WOODEN BARRICADES (TYPE I AND II)
   A) SHALL NOT BE USED TO CHANNELIZE OR DELINEATE WORK AREAS WITHIN THE CLEAR ZONE OF ANY HIGHWAY WHERE OPERATING SPEEDS IN EXCESS OF 20 M.P.H. ARE EXPECTED UNLESS INSTALLED FOR PEDESTRIAN CONTROL BEHIND APPROVED POSITIVE BARRIERS.
   B) MAY BE USED WHERE OPERATING SPEEDS OF 20 M.P.H. OR LESS ARE EXPECTED.
2. TYPE III WOODEN BARRICADES SHALL NOT BE USED.

COLORS

THE BARRICADE PANELS SHOWN ON THIS SHEET SHALL HAVE ALTERNATING RETRO-REFLECTORIZED WHITE AND ORANGE STRIPES. THE ORANGE SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICALS AND APPROVED BY THE US DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION. THE BARRICADE COMPONENTS SHALL BE WHITE UNLESS UNPAINTED METAL OR ALUMINUM IS USED.

REFLECTORIZATION

THE RETROREFLECTIVE SHEETING ON BARRICADE PANELS SHALL BE ASTM TYPE III.

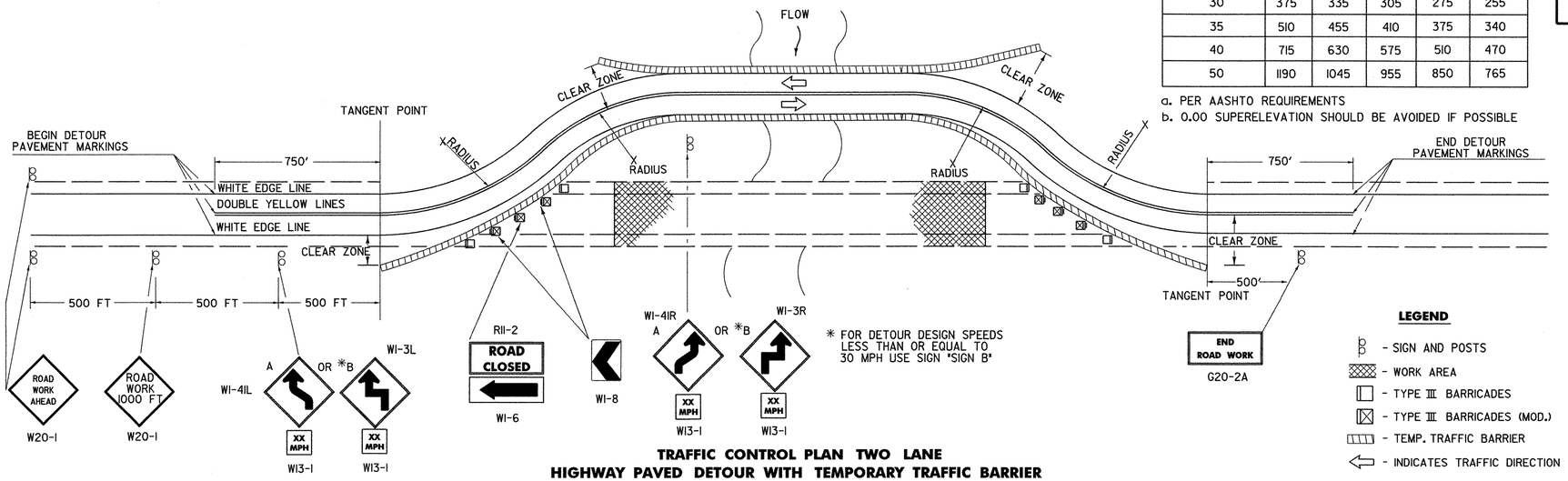
LOCATION

THE BARRICADES SHOWN ON THIS SHEET WILL BE LOCATED BY THE RESIDENT ENGINEER IN THE FIELD OR AS SHOWN ON THE PLANS. THE LOCATION OF THE BARRICADES SHALL FOLLOW THE PROCEDURES SET FORTH IN THE ''MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES'', OR AS OTHERWISE NOTED.

MAINTENANCE

BARRICADES SHALL BE MAINTAINED IN CLEAN CONDITION, SATISFACTORY TO THE RESIDENT ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO THE APPROACHING TRAFFIC AT ALL TIMES. DAMAGED, DEFACED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED, OR REPLACED AS ORDERED BY THE RESIDENT ENGINEER.

ALL SIGN PLACEMENT DISTANCES ARE DESIRABLE SPECIFICATIONS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT. PROJECT CONSTRUCTION APPROACH SIGNING PLACEMENT SHALL TAKE INTO CONSIDERATION SPACING REQUIREMENTS FOR THE DETOUR SIGN LAYOUT REQUIREMENTS.



* FOR DETOUR DESIGN SPEEDS LESS THAN OR EQUAL TO 30 MPH USE SIGN "SIGN B"

LEGEND

- SIGN AND POSTS
- WORK AREA
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)
- TEMP. TRAFFIC BARRIER
- INDICATES TRAFFIC DIRECTION

TRAFFIC CONTROL PLAN TWO LANE HIGHWAY PAVED DETOUR WITH TEMPORARY TRAFFIC BARRIER

DETOUR NOTES

1.) SIGNS AND DELINEATION SHOWN FOR ONE DIRECTION OF TRAFFIC ONLY.

2.) THE CONTRACTOR IS RESPONSIBLE FOR PAVEMENT MARKING AND SHALL REMOVE ANY CONFLICTING OR CONFUSING EXISTING MARKINGS.

3.) ADDITIONAL SIGNING MAY BE REQUIRED AT THE DISCRETION OF THE RESIDENT ENGINEER.

4.) UNPAVED DETOURS REQUIRE PAVEMENT MARKINGS FOR TRANSITIONS FROM EXISTING PAVEMENT.

5.) THE NUMBER OF CHANNELIZING DEVICES, BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THIS SHEET ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED SHALL BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR CURVE, ETC.).

6.) AASHTO CLEAR ZONE REQUIREMENTS SHOULD BE MET. IF NOT THEN AN APPROVED ENERGY ABSORPTION ATTENUATOR (SUITABLE FOR THE TEMPORARY TRAFFIC BARRIER USED AND FOR THE DESIGN SPEED) SHALL BE INSTALLED PER THE CURRENT AASHTO ROADSIDE DESIGN GUIDE.

7.) THE DETOUR DESIGN SPEED SHOULD BE NO LESS THAN 10 M.P.H. BELOW THE POSTED SPEED LIMIT, UNLESS PHYSICAL RESTRICTIONS PREVENT THIS.

8.) SEE STANDARD SHEETS E-100, E-101 AND E-102 FOR SIGN DETAIL AND MATERIAL REQUIREMENTS.

9.) IF THE USE OF TEMPORARY TRAFFIC BARRIER IS NOT REQUIRED, THEN REFLECTORIZED PLASTIC DRUMS SHALL BE USED.

OTHER STDS. REQUIRED: E-100, E-101, E-102, E-102a, E-107a, E-198

REVISIONS AND CORRECTIONS
SEPT. 10, 1987 - DATE OF ORIGINAL ISSUE
APRIL 29, 1988 - FHWA REVIEW COMMENTS
SEPT. 20, 1993 - NEW RADIUS CHART, BARRICADE ALIGNMENT AND USE OF TEMPORARY TRAFFIC BARRIER
AUG. 08, 1995 - REVISED SIGNING PER MUTCD
JUNE 30, 2003 - CHANGED REFLECTIVE SHEETING TO TYPE III

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

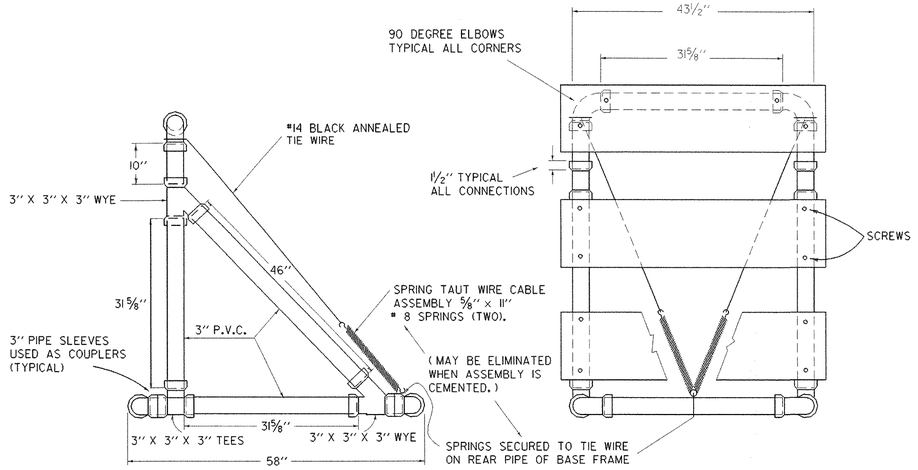
TRAFFIC OPERATIONS ENGINEER

FEDERAL HIGHWAY ADMINISTRATION

DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS

VERMONT AGENCY OF TRANSPORTATION

STANDARD E-107



SIDE VIEW
TYPE III BARRICADE

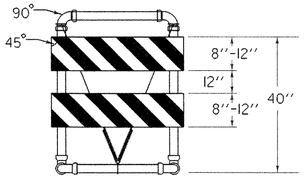
FRONT VIEW
TYPE III BARRICADE

MATERIALS FOR TYPE I AND II BARRICADES

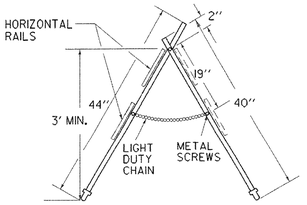
20' - 1" PVC
4 - 1" PVC 90° ELBOWS
30" - ½" ID THINWALL PVC CONDUIT
36" - ¼" STEEL ROD
4 - 1" WASHERS
24" - LIGHT DUTY CHAIN
½" - #14 PAN HEAD METAL SCREWS (AS REQUIRED)
2 - ¾" COTTER PINS
2 OR 4 - 8" OR 12" X 36" X 0.025" BARRICADE RAILS (AS REQUIRED)

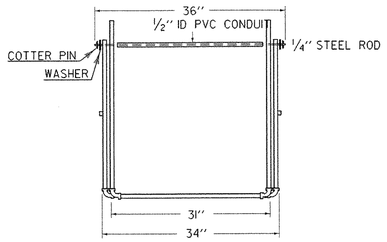
MATERIALS FOR TYPE III BARRICADES

30 LF - 3" I.D. PVC PIPE
6 - 3" 90° ELBOWS
2 - 3" TEES
4 - 3" WYES
3 - 8" OR 12" X 48" X 0.025" BARRICADE RAILS
2 - 5/8" X 11" #8 SPRING (IF ASSEMBLY IS NOT CEMENTED)
12 - 1" #14 PAN HEAD METAL SCREWS
15 LF - #14 BALCK ANNEALED TIE WIRE (IF ASSEMBLY IS NOT CEMENTED)



TYPE III (MODIFIED) BARRICADE
(STRIPING IS SHOWN WITH TRAFFIC PASSING TO THE RIGHT).





TYPE I AND TYPE II BARRICADE

MATERIALS

THE PIPE, WYES, TEES AND ELBOWS USED TO CONSTRUCT BARRICADES SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 2241 FOR P.V.C. 1120 OR 1220 SDR-21, PRESSURE RATING 200 PSI. THE WYES, TEES AND ELBOWS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 2466, TYPE II, GRADE 1. ALL JOINTS SHALL BE SLIP-FIT AND MAY BE LIGHTLY CEMENTED. THE BARRICADE RAILS SHALL BE FABRICATED FROM 0.025" ANODIZED, ALUMINUM AND SHALL HAVE REFLECTORIZED ALTERNATING ORANGE AND WHITE STRIPES (SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS).

MAINTENANCE

BARRICADES SHALL BE MAINTAINED IN CLEAN AND LEGIBLE CONDITIONS SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. DAMAGED, DEFACED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER. THE P.V.C. PIPE AND FITTINGS SHALL BE WHITE IN COLOR. AT LEAST TWO (2) HOLES SHALL BE DRILLED (3/16" DIAM.) IN EACH SECTION OF PIPE AND FITTINGS IF THE ASSEMBLY IS NOT CEMENTED.

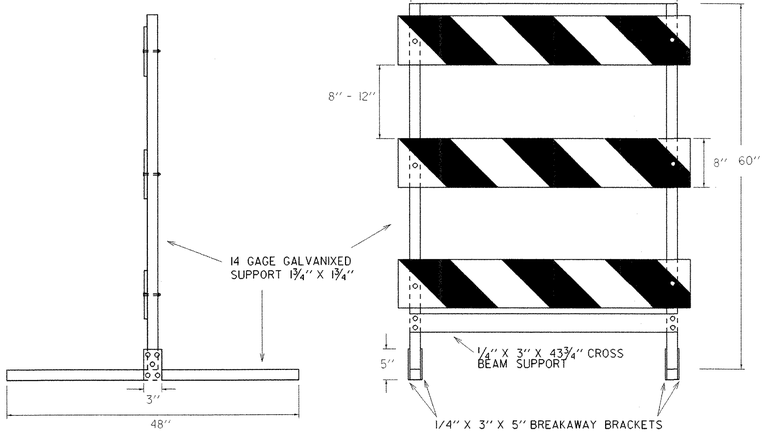
BARRICADES SHALL BE STABILIZED WITH SAND BAGS OF MINIMUM WEIGHT WHICH WILL NOT CONSTITUTE A HAZARD IF THE BARRICADE IS HIT. THESE SHALL BE PLACED ONLY ON THE FRONT AND REAR PIPES OF THE BASE FRAME OF THE BARRICADE. SAND BAG STABILIZERS SHALL BE SO PLACED AS NOT TO BE A HAZARD TO VEHICLES PASSING ON EITHER SIDE. IF BARRICADE REPLACEMENT COSTS CAN BE CONSIDERED NEGLIGIBLE, GLUED JOINTS MAY PROVIDE ADDITIONAL STABILITY TO THE INSTALLATION.

TYPE I BARRICADES SHALL UTILIZE ONE HORIZONTAL RAIL IN EACH DIRECTION.

TYPE II BARRICADES SHALL BE A TYPE I BARRICADE WITH AN ADDITIONAL HORIZONTAL RAIL MOUNTED BELOW THE OTHER IN EACH DIRECTION.

TYPE III BARRICADES (MODIFIED) SHALL CONSIST OF THE BREAKAWAY 3" PVC DESIGN SHOWN ON THIS SHEET WITH THE TWO RAIL LAYOUT DETAILED ABOVE LEFT.

SEE STD E-107 FOR ADDITIONAL INFORMATION.



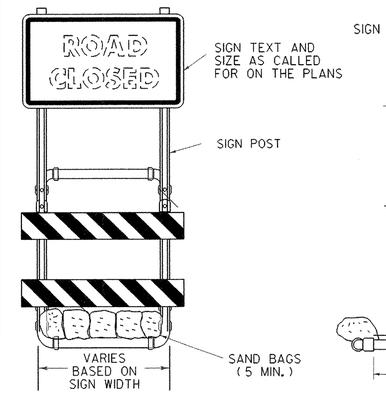
SIDE AND FRONT VIEW OF TYPE III METAL BARRICADE

MATERIALS FOR METAL TYPE III BARRICADES

PANELS (3):
8" X 48" GALVANIZED STEEL...COVERED 1 OR 2 SIDES WITH WHITE/ORANGE, DIAGONALLY STRIPED REFLECTIVE SHEETING

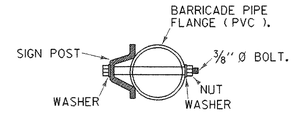
VERTICAL SUPPORTS (2): 14 GAGE GALVANIZED TUBING 1 3/4" X 1 3/4" X 60"
HORIZONTAL SUPPORTS (2): 14 GAGE GALVANIZED TUBING 1 3/4" X 1 3/4" X 48"
CROSS BEAM SUPPORT (1): COLD GALVANIZED STEEL 1/4" X 3" X 43 3/4"
BREAKAWAY BRACKETS (4): COLD GALVANIZED STEEL 1/4" X 3" X 5"

FASTENERS:
6 - SHEAR BOLTS WITH LOCK NUTS 1/4" D X 2 3/4"
4 - FULCRUM BOLTS WITH LOCK NUTS 3/8" D X 2 3/4"
4 - FASTENER BOLTS WITH LOCK NUTS 3/8" D X 2 3/4"
6 - PANEL BOLTS WITH LOCK NUTS AND WASHERS 1/4" D X 2"
ALL FASTENERS GALVANIZED STEEL.
ALL BOLTS HEX HEAD.



NOTES:

1) REFER TO STANDARD TYPE III BARRICADE (ABOVE LEFT)
2) ALL BARRICADE JOINTS SHALL BE GLUED.
3) FIVE SAND BAGS ARE REQUIRED BOTH FRONT AND BACK, 50 LB. MINIMUM EACH.



CONNECTION DETAIL

SIGN MOUNTING ON TYPE III BARRICADE (MODIFIED)

OTHER STDS. REQUIRED: E-107

REVISIONS AND CORRECTIONS

SEPT. 10, 1987 - ORIGINAL APPROVAL DATE
SEPT. 20, 1993 - REVISED NOTES AND TYPE III (MOD.) BARRICADE DETAIL
AUG. 08, 1995 - ADDED METAL TYPE III BARRICADE
JUN. 08, 2009 - MINOR CORRECTIONS

APPROVED

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BREAKAWAY BARRICADE DETAILS

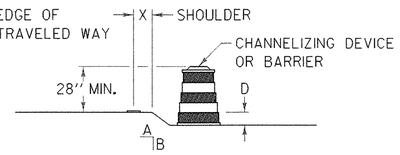
/traf/std/stdel07a.dgn : stdel07a.i

VERMONT AGENCY OF TRANSPORTATION

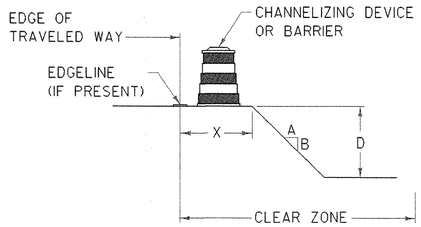
STANDARD E-107 A

DROP-OFF ADJACENT TO TRAVELED WAY

TYPE 1



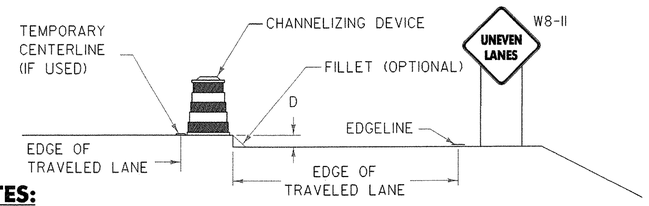
TYPE 2



NOTES:

1. CHANNELIZING DEVICES OR BARRIER SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELED WAY.
2. FOR SPECIFIC REQUIREMENTS USE CHART "A".
3. IF THE DROP-OFF REQUIRES CHANNELIZING DEVICES TO REMAIN IN PLACE OVERNIGHT THEN "LOW SHOULDER" (W8-9) OR "SHOULDER DROP OFF" (W8-9A) SIGNS SHOULD BE INSTALLED.

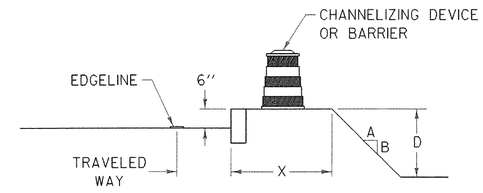
DROP-OFF BETWEEN ADJACENT TRAVELED LANE



NOTES:

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

DROP-OFF BEYOND SHOULDER OR CURB



NOTES:

1. CHANNELIZING DEVICES OR BARRIER SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELED WAY.
2. FOR SPECIFIC REQUIREMENTS USE CHART "A" OR "B" AS APPLICABLE.

CHART "A"
ALL SPEEDS WITH NO CURB

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

NOTES:

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

CHART "B"
40 MPH OR LESS WITH CURB

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

NOTES:

1. USE THIS CHART FOR DROP-OFF BEYOND SHOULDER OR CURB.
2. USE THIS CHART FOR VERTICAL CURBS OF SIX INCHES OR GREATER. FOR LOWER OR MOUNTABLE CURBS USE CHART "A".
3. FOR CURBED SECTIONS WITH POSTED SPEED ABOVE 40 MPH, USE CHART "A".

GENERAL NOTES:

1. THESE CONDITIONS AND TREATMENTS ARE ONLY PART OF THE TRAFFIC CONTROL SYSTEM AND SHOULD BE USED IN ADDITION TO THE PROPER WORK ZONE SIGNING.
2. THE FOLLOWING ARE ACCEPTABLE CHANNELIZING DEVICES:

   A. VERTICAL PANEL
   B. TYPE I OR TYPE II BARRICADE
   C. PLASTIC DRUM
   * D. CONE - WHERE APPLICABLE
   E. TUBULAR MARKERS (MUTCD)

   * IF CHANNELIZING DEVICES ARE REQUIRED TO REMAIN IN PLACE DURING NIGHTTIME HOURS, CONES SHALL BE A MINIMUM OF 36 INCHES HIGH.

3. WHERE BARRIER IS CALLED FOR, EITHER CONCRETE BARRIER (JERSEY SHAPE), STEEL BEAM GUARDRAIL OR OTHER FEDERAL HIGHWAY ADMINISTRATION (FHWA) APPROVED BARRIER MAY BE USED.

   BARRIER ENDS FACING ONCOMING TRAFFIC SHALL BE TAPERED BEYOND THE CLEAR ZONE OR PROTECTED WITH AN APPROVED END TREATMENT DESIGNED FOR THE POSTED SPEED LIMIT OF THE ROADWAY.

4. CHANNELIZING DEVICE SPACING ALONG A LONGITUDINAL DROP-OFF (TANGENT) SHALL BE AS FOLLOWS:

   TANGENT - CHANNELIZING DEVICES SHALL BE SPACED "2S" ("S" IS THE POSTED SPEED LIMIT IN FEET) APART.

5. "LOW SHOULDER" (W8-9), "SHOULDER DROP OFF" (W8-9A) OR "UNEVEN LANES" (W8-11) SIGNS, WHEN USED, SHOULD BEGIN PRIOR TO THE DROP-OFF CONDITION AND SHOULD BE REPEATED EVERY 1500 FEET.
6. USE CHART "A" FOR DROP OFFS CREATED BY PROJECT ACTIVITIES.

OTHER STDS. REQUIRED: **E-101, E-106, E-107, E-107A**

REVISIONS AND CORRECTIONS

SEPT. 20, 1993 - ORIGINAL APPROVAL DATE
AUG. 18, 1995 - ADDED SHOULDER WARNING NOTE
DEC. 8, 2008 - GENERAL UPDATE
JUN. 8, 2009 - MINOR REVISIONS

APPROVED

Kevin A. Marshia
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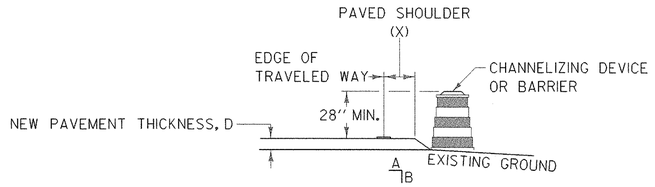
CONSTRUCTION ZONE LONGITUDINAL DROP OFFS

VERMONT AGENCY OF TRANSPORTATION

STANDARD E-108

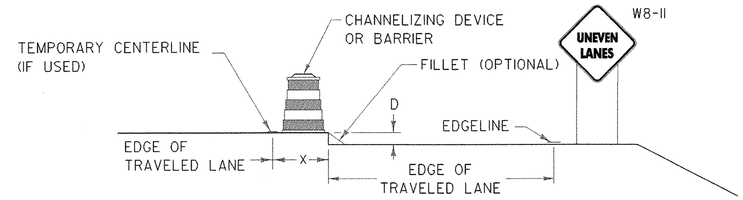
DROP-OFF ADJACENT TO TRAVELED WAY



NOTES:

1. CHANNELIZING DEVICES SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELED WAY.
2. FOR SPECIFIC REQUIREMENTS USE CHART "A".
3. IF THE DROP-OFF REQUIRES CHANNELIZING DEVICES TO REMAIN IN PLACE OVERNIGHT THEN "LOW SHOULDER" (W8-9) OR "SHOULDER DROP OFF" (W8-9A) SIGNS SHOULD BE INSTALLED.

DROP-OFF BETWEEN ADJACENT TRAVELED LANE



NOTES:

1. WHENEVER A LONGITUDINAL DROP-OFF BETWEEN ADJACENT TRAVELED LANES IS TO BE LEFT OVERNIGHT THEN "UNEVEN LANES" (W8-11) SIGNS SHOULD BE INSTALLED. CHANNELIZING DEVICES SHOULD BE INSTALLED IF THE REQUIREMENTS OF CHART "A" ARE MET.
2. IF REQUIRED, THE CHANNELIZING DEVICES USED SHALL BE THOSE WHICH MAXIMIZE THE WIDTH OF THE TRAVELED LANE (I.E. CONES, VERTICAL PANELS OR TUBULAR MARKERS).
3. FOR SPECIFIC REQUIREMENTS USE CHART "A".

CHART "A"

ALL SPEEDS WITH NO CURB

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

NOTE:

1. ON BORDERLINE CONDITIONS, THE ENGINEER SHOULD DETERMINE WHICH TREATMENT IS ADEQUATE FOR THE EXISTING CONDITIONS.

GENERAL NOTES:

1. THESE CONDITIONS AND TREATMENTS ARE ONLY PART OF THE TRAFFIC CONTROL SYSTEM AND SHOULD BE USED IN ADDITION TO THE PROPER WORK ZONE SIGNING.
2. THE FOLLOWING ARE ACCEPTABLE CHANNELIZING DEVICES:

   A. VERTICAL PANEL
   B. TYPE I OR TYPE II BARRICADE
   C. PLASTIC DRUM
   * D. CONE - WHERE APPLICABLE
   E. TUBULAR MARKERS (MUTCD)

   * IF CHANNELIZING DEVICES ARE REQUIRED TO REMAIN IN PLACE DURING NIGHTTIME HOURS, CONES SHALL BE A MINIMUM OF 36 INCHES HIGH.
3. WHERE BARRIER IS CALLED FOR, EITHER CONCRETE BARRIER (JERSEY SHAPE), STEEL BEAM GUARDRAIL OR OTHER FEDERAL HIGHWAY ADMINISTRATION (FHWA) APPROVED BARRIER MAY BE USED.

   BARRIER ENDS FACING ONCOMING TRAFFIC SHALL BE TAPERED BEYOND THE CLEAR ZONE OR PROTECTED WITH AN APPROVED END TREATMENT DESIGNED FOR THE POSTED SPEED LIMIT OF THE ROADWAY.
4. CHANNELIZING DEVICE SPACING ALONG A LONGITUDINAL DROP-OFF (TANGENT) SHALL BE AS FOLLOWS:

   TANGENT - CHANNELIZING DEVICES SHALL BE SPACED "2S" ("S" IS THE POSTED SPEED LIMIT IN FEET) APART.
5. "LOW SHOULDER" (W8-9), "SHOULDER DROP OFF" (W8-9A) OR "UNEVEN LANES" (W8-11) SIGNS, WHEN USED, SHOULD BEGIN PRIOR TO THE DROP-OFF CONDITION AND SHOULD BE REPEATED EVERY 1500 FEET.
6. USE CHART "A" FOR DROP OFFS CREATED BY PROJECT ACTIVITIES.

OTHER STDS. REQUIRED: **E-101, E-106, E-107, E-107A**

REVISIONS AND CORRECTIONS

DEC. 8, 2008 - ORIGINAL APPROVAL DATE

JUN. 8, 2009 - MINOR REVISIONS

APPROVED

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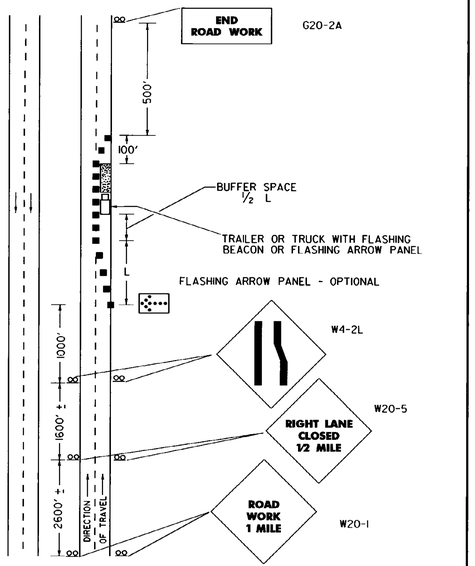
CONSTRUCTION ZONE LONGITUDINAL DROP OFFS FOR PAVING

VERMONT AGENCY OF TRANSPORTATION

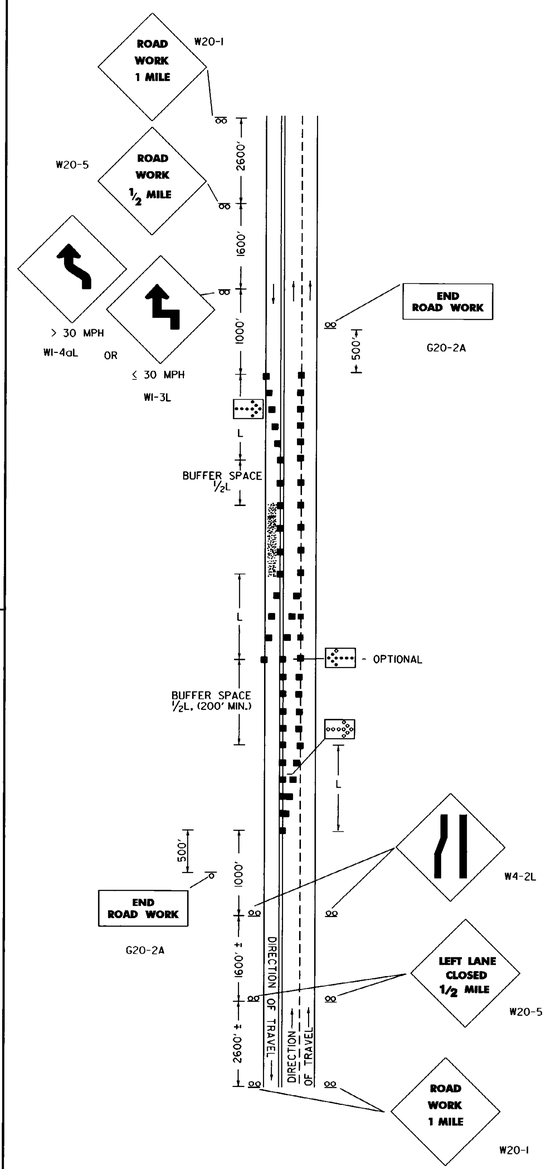
STANDARD

E-108 A



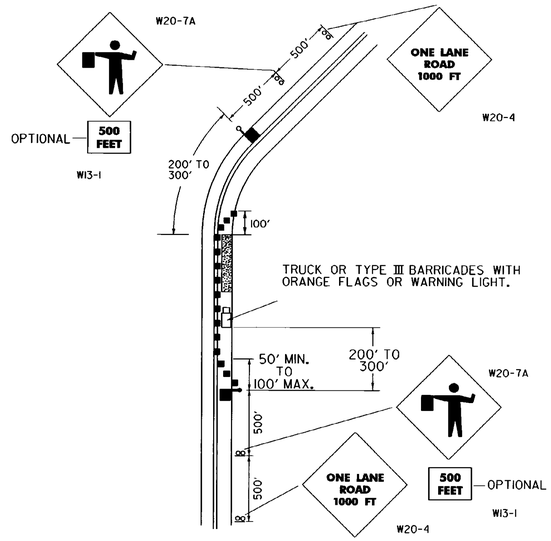
TYPICAL APPLICATION – DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF ROADWAY IS CLOSED.

NTS



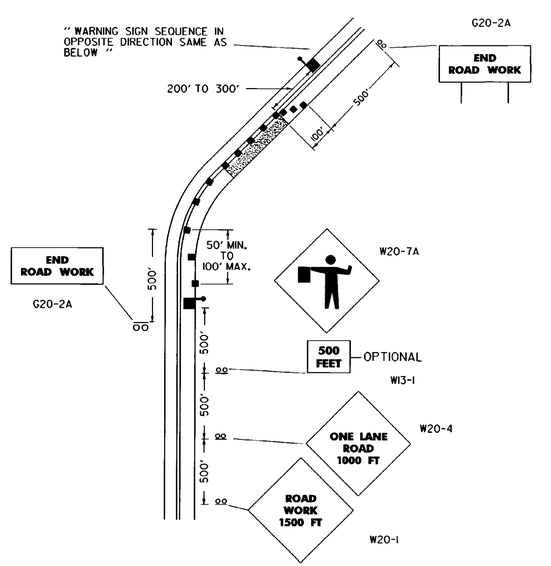
TYPICAL APPLICATION – DAYTIME MAINTENANCE OPERATION OF SHORT DURATION ON A 3 LANE ROADWAY WHERE CENTER LANE IS USED FOR OPPPOSING TRAFFIC

NTS



TYPICAL APPLICATIONS – DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 2-LANE ROADWAY WHERE FLAGGING IS PROVIDED

NTS



TYPICAL APPLICATIONS – TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.

NTS

NOTES

REFLECTORIZATION

ALL SIGNS USED DURING THE HOURS OF DARKNESS SHALL BE REFLECTORIZED (TYPE II OR III). CONES USED FOR TRAFFIC CONTROL AT NIGHT SHALL COMPLY WITH STANDARD E-106.

COLORS

THE WARNING SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT, BORDER, AND SYMBOLS ON AN ORANGE BACKGROUND. THE TEXT AND BORDERS MAY BE SCREENED, LETTERING FILM, OR HAND PAINTED. THE ORANGE SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

TEXT DESIGN

LETTERS, DIGITS, SPACING, AND TEXT DIMENSIONS SHALL CONFORM WITH THE ''STANDARD ALPHABETS FOR HIGHWAY SIGNS'' AS REFERENCED IN THE ''MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES''.

SPECIFICATIONS

WARNING SIGNS SHALL MEET THE STANDARD STATE SPECIFICATIONS FOR TRAFFIC SIGNS.

SIGN BASE MATERIAL

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

FLAT STEEL OR ALUMINUM	0.125 INCHES
HIGH DENSITY OVERLAYED PLYWOOD	1/2, 5/8, OR 3/4 INCHES
GALVANIZED SHEET STEEL	12 GAGE

1. SIGNS WITH ''ROAD WORK 1500 FT. AND ''END ROAD WORK'' TEXT SHALL BE USED WHEN THE WORK IS NOT COMPLETE AND A HAZARD REMAINS OVERNIGHT.
2. THE FLAGPERSON SHALL USE THE SIGN PADDLE DETAILED ON STANDARD SHEET E-102.
3. ALL SIGNS SHALL BE COVERED OR REMOVED AT THE END OF THE WORKING DAY UNLESS REQUIRED FOR THE PROTECTION AND SAFETY OF THE TRAVELING PUBLIC.
4. INSTALLATION: SIGNS AND BARRICADES SHALL BE IN PLACE PRIOR TO THE START OF THE MAINTENANCE OPERATION TO WHICH THEY APPLY AND SHALL BE REMOVED PROMPTLY WHEN THE NEED NO LONGER EXISTS. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER ON YIELDING WOOD OR METAL POSTS SET SECURELY IN THE GROUND (IN ACCORDANCE WITH STD. E-121), OR ON PORTABLE SUPPORTS WHEN APPROPRIATE. THE INSTALLATION OF SIGNS AND BARRICADES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
5. ALTHOUGH LISTED AS A MAINTENANCE OPERATION STANDARD SIGN SHEET, THE APPROACH SIGNS SHOWN SHALL BE USED BY CONTRACTORS WHEN WORKING WITHIN OR OUTSIDE PROJECT LIMITS.
6. ALL DISTANCES ARE DESIRABLE SPECIFICATIONS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
7. SIGN DETAILS NOT SHOWN ON THIS SHEET CAN BE FOUND ON STANDARD SHEETS E-100, E-101, AND E-102.
8. TAPER FORMULA
   L = SXW FOR SPEEDS OF 45 OR MORE
   $L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 OR LESS
   WHERE
   L = MINIMUM LENGTH OF TAPER
   S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85 PERCENTILE SPEED.
   W = WIDTH OF OFFSET.
9. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT IN M.P.H.. ON TANGENT SECTIONS THE MAXIMUM SPACING SHOULD BE APPROXIMATELY EQUAL TO TWICE THE POSTED SPEED LIMIT.
10. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK THE FLAGPERSON STATIONS AT NIGHT AS NEEDED.
11. AT SHORT WORK ZONES WHERE ADEQUATE SIGHT DISTANCE IS AVAILABLE FOR THE SAFE HANDLING OF TRAFFIC ONE FLAGGER MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
12. CHANNELIZING DEVICES SHALL BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
13. THE NUMBER OF CHANNELIZING AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THIS SHEET ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED SHALL BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR CURVE, ETC.).

LEGEND:

- FLAGPERSON
- CHANNELIZING DEVICES (CONES OR DRUMS)
- FLASHING ARROW PANEL
- WORK AREA
- SIGN & POSTS
- TYPE III BARRICADES

OTHER STDS. REQUIRED: E-100, E-101, E-102, E-106

REVISIONS AND CORRECTIONS

SEPT 10, 1987 - DATE OF ORIGINAL ISSUE
MAR 01, 1988 - FHWA REVIEW COMMENTS

SEP 20, 1993 - REVISED NOTES & MISC. DETAILS

AUG 08, 1995 - DELETED SIGN DETAILS

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

APPROVED

Gordon D. MacArthur
DIRECTOR OF ENGINEERING

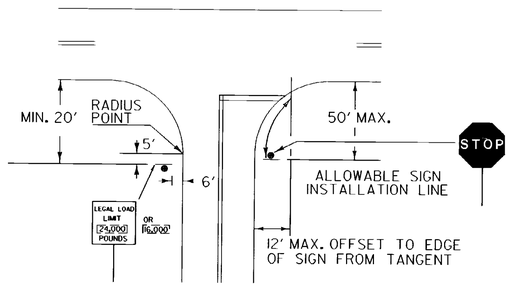
David A. Ross
TRAFFIC AND SAFETY ENGINEER

MAJOR MAINTENANCE OPERATION LANE CLOSURE

/traf/std/stdell0.dgn : stdell0.1

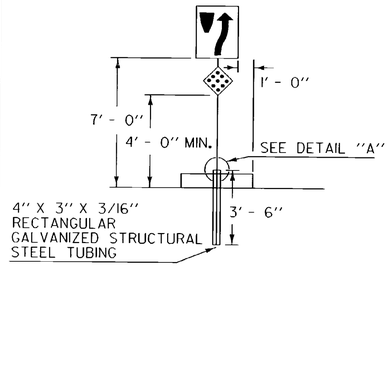
VERMONT AGENCY OF TRANSPORTATION

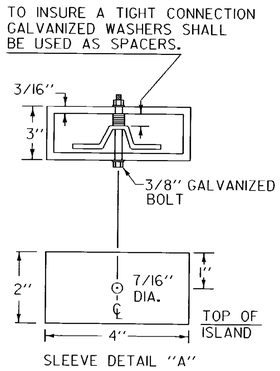
STANDARD
E-110



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

LEGAL LOAD LIMIT AND STOP SIGNS AT INTERSECTIONS WITH TOWN HIGHWAYS

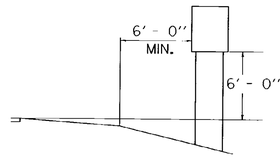


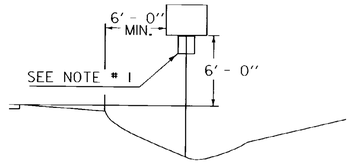


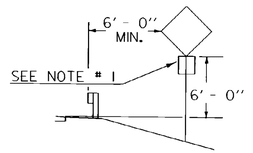
SLEEVE DETAIL "A"

SIGNS ON MEDIAN ISLANDS IN THE LINE OF TRAFFIC

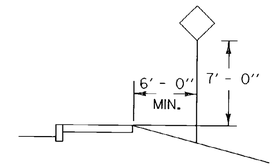
INCREASE VERTICAL CLEARANCE TO 7' IN AREAS OF FREQUENT ROADSIDE PARKING OR PEDESTRIAN ACTIVITY

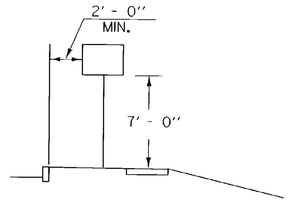




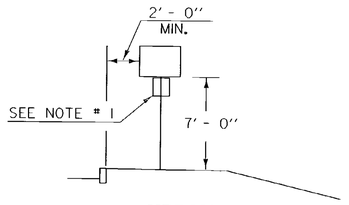


RURAL





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



URBAN

NOTES:

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

POST REFERENCE:

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

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

REVISIONS AND CORRECTIONS

JAN. 23, 1995 - DATE OF ORIGINAL ISSUE

AUG. 08, 1995 - VARIOUS MINOR NOTE REVISIONS

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

APPROVED

DIRECTOR OF ENGINFERING

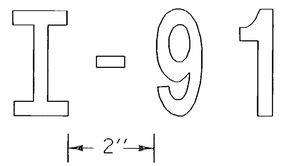
TRAFFIC AND SAFETY ENGINEER

STANDARD SIGN PLACEMENT CONVENTIONAL ROAD

/traf/std/stdel21.dgn : stdel21.i

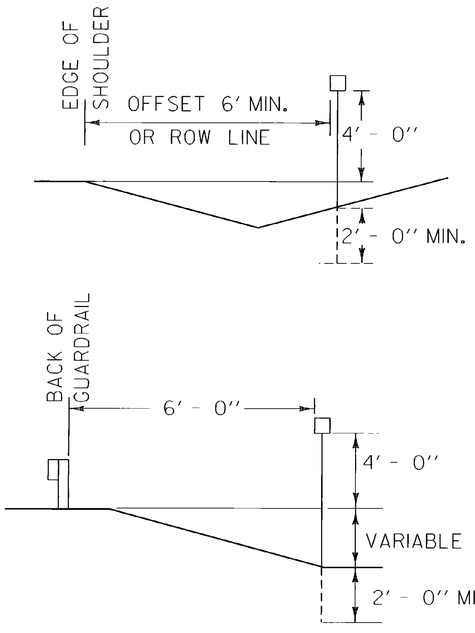
VERMONT AGENCY OF TRANSPORTATION

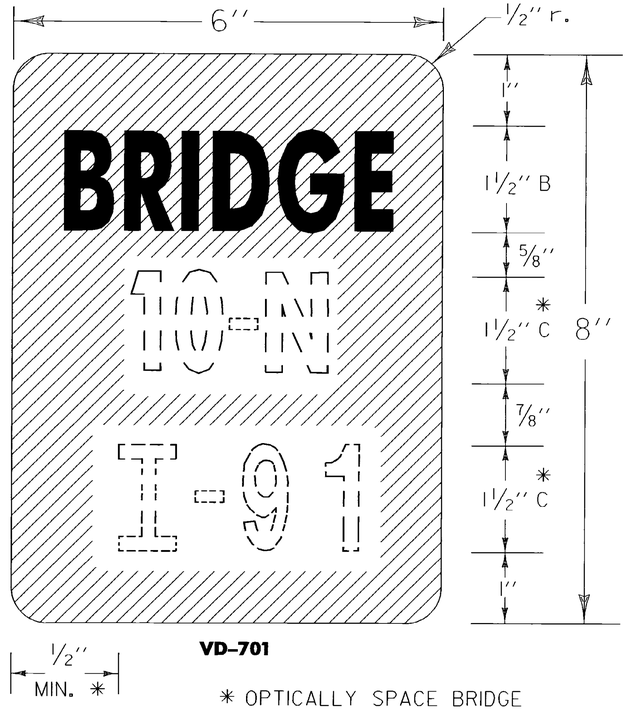
STANDARD E-121



HYPHENATED WORD DETAIL

FOR EXAMPLE, ROUTE NUMBERS SHALL APPEAR AS: I-91, US5, VT22





VD-701

* OPTICALLY SPACE BRIDGE AND ROUTE NUMBERS. SERIES B LETTERS MAY BE USED TO MAINTAIN VISUAL INTEGRITY.

NOTES:

GENERAL:
DOTTED LINES AND NUMERALS INDICATE TEXT THAT VARIES.

PAYMENT:
BRIDGE PLAQUES SHALL BE PAID AS TRAFFIC SIGNS, TYPE 'A', AND POSTS PAID AS FLANGED CHANNEL STEEL SIGN POSTS.

MATERIAL:
THE SIGN BASE MATERIAL SHALL BE 0.04" FLAT SHEET ALUMINUM.

COLORS:
THE SIGN SHALL HAVE A REFLECTORIZED WHITE TEXT ON REFLECTORIZED GREEN BACKROUND. THE COLORS SHALL CONFORM WITH THOSE FOUND IN STANDARD COLOR TOLERANCE CHARTS AS APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAYADMINISTRATION.

LETTERING:
LETTERS AND DIGITS SHALL CONFORM WITH THE STANDARD ALPHABETS FOR HIGHWAY SIGNS AS PRINTED BY THE FEDERAL HIGHWAY ADMINISTRATION.

POSTS:
FLANGED CHANNEL STEEL 2#/FT POSTS SHALL BE USED WHEN THE POST LENGTH EXCEEDS 7 FEET. FOR LENGTH OF 7 FEET OR LESS, A 1.12#/FT STEEL SIGN POST SHALL BE USED.

OTHER STDS. REQUIRED:

REVISIONS AND CORRECTIONS

DEC. 17, 1989 - DATE OF ORIGINAL ISSUE
AUG. 08, 1995 - MISC NOTE REVISIONS

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

APPROVED

Gordon S. MacArthur
DIRECTOR OF ENGINEERING

David A Ross
TRAFFIC AND SAFETY ENGINEER

BRIDGE NUMBER PLAQUE

/traf/std/stdel34.dgn : stdel34.i

VERMONT AGENCY OF TRANSPORTATION

STANDARD
E-134

MILEMARKER INFORMATION

IN ORDER TO PROVIDE FOR AN ACCURATE SYSTEM OF LOCATION, MILEMARKERS ARE INSTALLED ALONG U.S. AND STATE HIGHWAYS, CLASS I TOWN HIGHWAYS, FEDERAL AID PRIMARY AND FEDERAL AID SECONDARY HIGHWAYS.

THE FOLLOWING INFORMATION IS PROVIDED FOR INSTALLATION GUIDANCE.

MILEMARKERS WILL NORMALLY BE INSTALLED AT EACH 0.20 MILE INTERVAL, ALTERNATING FROM ONE SIDE OF THE ROAD TO THE OTHER, THUS HAVING A SIGN FACING TRAFFIC EACH 0.40 MILE. A MILEMARKER WILL ALSO BE INSTALLED AT EACH INTERSECTION, ON THE POST WITH THE STOP SIGN, (MILEMARKER TO BE PLACED PARALLEL TO MAINLINE VISIBLE TO TRAFFIC.) ANY MILEMARKER LOCATION FALLING WITHIN 0.05 MILE OF AN INTERSECTION WILL BE OMITTED. IF A NORMAL MILEMARKER LOCATION FALLS WITHIN 50' OF AN EXISTING HIGHWAY SIGN, THE MILEMARKER WILL BE INSTALLED ON THE EXISTING POST. WHEN NORMAL LOCATION OF A MILEMARKER IS UNDESIRABLE, I.E. ON A LAWN, DRIVEWAY, LEDGE, ETC., AN ATTEMPT WILL BE MADE TO LOCATE IT ACROSS THE ROAD. IF NO SUITABLE LOCATION CAN BE FOUND WITHIN 50' OF THE NORMAL LOCATION ON EITHER SIDE OF THE ROAD, IT MAY BE OMITTED. IF A NORMAL MILEMARKER LOCATION FALLS WITHIN 50 FT. OF A POWER POLE, MAIL BOX OR OTHER OBJECT WHICH WILL GIVE IT PARTIAL PROTECTION, LOCATE IT NEAR OR AT SUCH PROTECTIVE FEATURE.

ON CLASS I TOWN HIGHWAYS (CITIES, VILLAGES) OR OTHER CONGESTED AREAS, MILEMARKERS WILL ONLY BE INSTALLED ON EXISTING SIGN POSTS AND WILL CARRY THE ACTUAL MILEAGE TO THAT LOCATION. A MILEMARKER EACH 0.10 +/- MILE IS DESIRABLE THROUGH SUCH AREAS.

THE TOP ROW OF NUMERALS INDICATE THE ROUTE NUMBER. THESE INCLUDE:

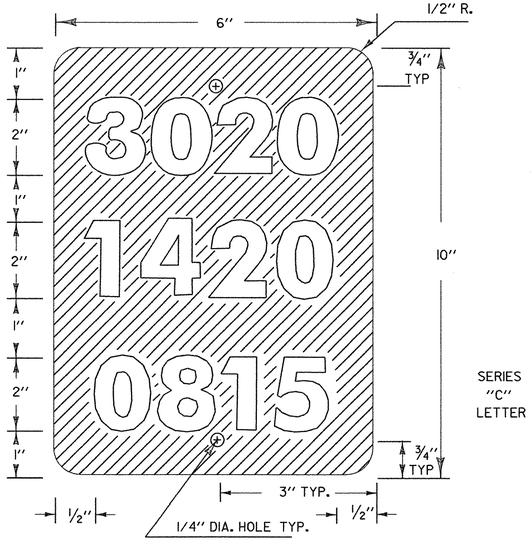
1) THE STATE ROUTE NUMBER, THE FOURTH NUMERAL OF WHICH BEING THE LETTER DESIGNATION. THUS, U.S. 2 WOULD BE 0020, ROUTE 100B WOULD BE 1002, ETC.

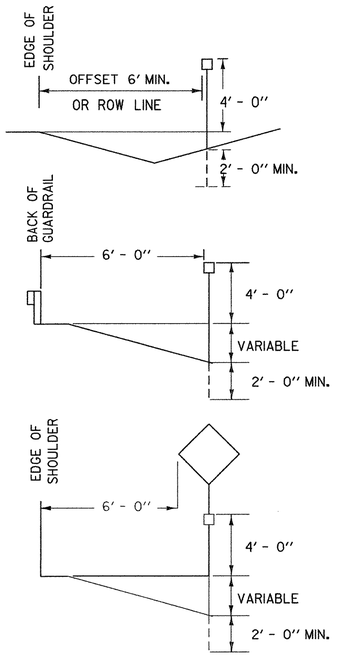
2) A 9000 SERIES NUMBER FOR NAMED STATE HIGHWAYS, CLASS I AND II TOWN HIGHWAYS AS LISTED ON THIS SHEET.

3) FEDERAL AID SECONDARY ROUTES ON TOWN HIGHWAYS USE F.A.S., ROUTE DESIGNATION NUMBERS, AS SHOWN ON THE PLANNING DIVISIONS MAP TITLED "FEDERAL AID SYSTEMS ON VERMONT HIGHWAYS".

THE SECOND ROW OF NUMERALS INDICATE THE COUNTY AND TOWN. THE COUNTY IS INDICATED IN THE FIRST TWO NUMBERS, CODED ALPHABETICALLY. THE TOWN IS INDICATED IN THE LAST TWO NUMBERS, CODED ALPHABETICALLY WITHIN THE COUNTY. THUS WATERBURY, THE EIGHTEENTH TOWN ALPHABETICALLY, IN WASHINGTON COUNTY, THE TWELFTH COUNTY ALPHABETICALLY, WOULD BE INDICATED AS 1218 ON THE MARKER.

THE BOTTOM ROW OF NUMERALS INDICATES THE MILEAGE IN HUNDREDTHS FROM THE TOWN LINE OR BEGINNING OF A ROUTE (TRAVELING SOUTH TO NORTH, OR WEST TO EAST). THE ROUTE DIRECTION IS ESTABLISHED USING THE AGENCY'S ROUTE LOG ANG PROGRESS CHARTS" AS A GUIDE.





CLASS I AND II TOWN HIGHWAYS

ROUTE CODE NUMBER	AND NAMED STATE HIGHWAY
9020	BARNET STATE HIGHWAY
9025	BENNINGTON NORTH STATE HIGHWAY
9030	BERLIN STATE HIGHWAY
9090	BRATTLEBORO STATE HIGHWAY
9150	CASTLETON STATE HIGHWAY
9180	COVENTRY STATE HIGHWAY
9210	FAIR HAVEN STATE HIGHWAY
9240	FAIRLEE STATE HIGHWAY
9270	FERRISBURG STATE HIGHWAY
9330	MAIDSTONE STATE HIGHWAY
9360	MIDDLESEX STATE HIGHWAY
9390	MONTPELIER STATE HIGHWAY
9420	MONTPELIER JUNCTION STATE HIGHWAY
9430	NEWBURY STATE HIGHWAY
9480	NORTON STATE HIGHWAY
9540	NORWICH STATE HIGHWAY
9600	PUTNEY STATE HIGHWAY
9630	QHECHEE STATE HIGHWAY
9720	ST. ALBANS ST. HWY. SOUTH
9730	ST. JOHNSBURY ST. HWY.
9750	SOUTH ALBURG STATE HIGHWAY
9840	WESTMINSTER STATE HIGHWAY
9870	WILDER STATE HIGHWAY
9900	WINHALL STATE HIGHWAY
9990	WEST RUTLAND-RUTLAND (BUS. US-4)
9991	BELLOWS FALLS S0117(ROCK-WEST ST.)
9992	BELLOWS FALLS S1117(BRIDGE ST.)
9993	BURLINGTON (ALTERNATE US-7)
9995	MONTPELIER (BUS. US-2)
9996	NEWPORT (ALTERNATE US-5)
9997	ST. JOHNSBURY (ALTERNATE US-5)
9998	SO. BURLINGTON-KENNEDY DRIVE

COUNTY/TOWN DESIGNATIONS

1 - ADDISON
0101 ADDISON
0102 BRIDPORT
0103 BRISTOL
0104 CORNWALL
0105 FERRISBURGH
0106 GOSHEN
0107 GRANVILLE
0108 HANCOCK
0109 LEICESTER
0110 LINCOLN
0111 MIDDLEBURY
0112 MONKTON
0113 NEW HAVEN
0114 ORWELL
0115 PANTON
0116 RIPTON
0117 SALISBURY
0118 SHOREHAM
0119 STARKSBORO
0120 VERGENNES
0121 WALTHAM
0122 WEYBRIDGE
0123 WHITING

2 - BENNINGTON
0201 ARLINGTON
0202 BENNINGTON
0203 DORSET
0204 GLASTENBURY
0205 LANDGROVE
0206 MANCHESTER
0207 PERU
0208 POWNAL
0209 READSBORO
0210 RUPERT
0211 SANDGATE
0212 SEARSBURG
0213 SHAFTSBURY
0214 STAMFORD
0215 SUNDERLAND
0216 WINHALL
0217 WOODFORD

3 - CALEDONIA
0301 BARNET
0302 BURKE
0303 DANVILLE
0304 GROTON
0305 HARDWICK
0306 KIRBY
0307 LYNDON
0308 NEWARK
0309 PEACHAM
0310 RYEGATE
0311 ST. JOHNSBURY
0312 SHEFFIELD
0313 STANNARD
0314 SUTTON
0315 WALDEN
0316 WATERFORD
0317 WHEELOCK

4 - CHITTENDEN
0401 BOLTON
0402 BUEL'S GORE
0403 BURLINGTON
0404 CHARLOTTE
0405 COLCHESTER
0406 ESSEX
0407 HINESBURG
0408 HUNTINGTON
0409 JERICHO
0410 MILTON
0411 RICHMOND
0412 ST. GEORGE
0413 SHELBURNE
0414 SO. BURLINGTON
0415 UNDERHILL
0416 WESTFORD
0417 WILLISTON
0418 WINOOSKI

5 - ESSEX
0501 AVERILL
0502 AVERY'S GORE
0503 BLOOMFIELD
0504 BRIGHTON (ISLAND POND)
0505 BRUNSWICK
0506 CANAAN
0507 CONCORD
0508 EAST HAVEN
0509 FERDINAND
0510 GRANBY
0511 GUILDHALL
0512 LEMINGTON
0513 LEWIS
0514 LUNENBURG
0515 MAIDSTONE
0516 NORTON
0517 VICTORY
0518 WARNER'S GRANT
0519 WARREN'S GORE

6 - FRANKLIN
0601 BAKERSFIELD
0602 BERKSHIRE
0603 ENOSBURG
0604 FAIRFAX
0605 FAIRFIELD
0606 FLETCHER
0607 FRANKLIN
0608 GEORGIA
0609 HIGHGATE
0610 MONTGOMERY
0611 RICHFORD
0612 ST. ALBANS CITY
0613 ST. ALBANS TOWN
0614 SHELDON
0615 SWANTON

7 - GRAND ISLE
0701 ALBURG
0702 GRAND ISLE
0703 ISLE LA MOTTE
0704 NORTH HERO
0705 SOUTH HERO

8 - LAMOILLE
0801 BELVIDERE
0802 CAMBRIDGE
0803 EDEN
0804 ELMORE
0805 HYDE PARK
0806 JOHNSON
0807 MORRISTOWN (MORRISVILLE)
0808 STOWE
0809 WATERVILLE
0810 WOLCOTT

9 - ORANGE
0901 BRADFORD
0902 BRAINTREE
0903 BROOKFIELD
0904 CHELSEA
0905 CORINTH
0906 FAIRLEE
0907 NEWBURY
0908 ORANGE
0909 RANDOLPH
0910 STRAFFORD
0911 THETFORD
0912 TOPSHAM
0913 TUNBRIDGE
0914 VERSHIRE
0915 WASHINGTON
0916 WEST FAIRLEE
0917 WILLIAMSTOWN

10 - ORLEANS
1001 ALBANY
1002 BARTON (ORLEANS VILLAGE)
1003 BROWNINGTON
1004 CHARLESTON
1005 COVENTRY
1006 CRAFTSBURY
1007 DERBY
1008 GLOVER
1009 GREENSBORO
1010 HOLLAND
1011 IRASBURG
1012 JAY
1013 LOWELL
1014 MORGAN
1015 NEWPORT CITY
1016 NEWPORT TOWN
1017 TROY
1018 WESTFIELD
1019 WESTMORE

11 - RUTLAND
1101 BENSON
1102 BRANDON
1103 CASTLETON
1104 CHITTENDEN
1105 CLARENDON
1106 DANBY
1107 FAIR HAVEN
1108 HUBBARDTON
1109 IRA
1110 MENDON
1111 MIDDLETOWN SPRINGS
1112 MT. HOLLY
1113 MT. TABOR
1114 PAWLET
1115 PITTSFIELD
1116 PITTSFORD
1117 POULTNEY
1118 PROCTOR
1119 RUTLAND CITY
1120 RUTLAND TOWN
1121 KILLINGTON
1122 SHREWSBURY
1123 SUDBURY
1124 TINMOUTH
1125 WALLINGFORD
1126 WELLS
1127 WEST HAVEN
1128 WEST RUTLAND

12 - WASHINGTON
1201 BARRE CITY
1202 BARRE TOWN
1203 BERLIN
1204 CABOT
1205 CALAIS
1206 DUXBURY
1207 E. MONTPELIER
1208 FAYSTON
1209 MARSHFIELD
1210 MIDDLESEX
1211 MONTPELIER
1212 MORETOWN
1213 NORTHFIELD
1214 PLAINFIELD
1215 ROXBURY
1216 WAITSFIELD
1217 WARREN
1218 WATERBURY
1219 WOODBURY
1220 WORCESTER

13 - WINDHAM
1301 ATHENS
1302 BRATTLEBORO
1303 BROOKLINE
1304 DOVER
1305 DUMMERSTON
1306 GRAFTON
1307 GUILFORD
1308 HALIFAX
1309 JAMAICA
1310 LONDONDERRY
1311 MARLBORO
1312 NEWFANE
1313 PUTNEY
1314 ROCKINGHAM (SAXTONS RIVER) (BELLOWS FALLS)
1315 SOMERSET
1316 STRATTON
1317 TOWNSHEND
1318 VERNON
1319 WARDSBORO
1320 WESTMINSTER
1321 WHITINGHAM
1322 WILMINGTON
1323 WINDHAM

14 - WINDSOR
1401 ANDOVER
1402 BALTIMORE
1403 BARNARD
1404 BETHEL
1405 BRIDGEWATER
1406 CAVENDISH
1407 CHESTER
1408 HARTFORD (WHITE RIVER JUNCTION)
1409 HARTLAND
1410 LUDLOW
1411 NORWICH
1412 PLYMOUTH
1413 POMFRET
1414 READING
1415 ROCHESTER
1416 ROYALTON
1417 SHARON
1418 SPRINGFIELD
1419 STOCKBRIDGE
1420 WEATHERSFIELD
1421 WESTON
1422 WEST WINDSOR
1423 WINDSOR
1424 WOODSTOCK

PAYMENT:
MILEMARKERS SHALL BE PAID AS TRAFFIC SIGNS, TYPE "A", AND POSTS PAID AS FLANGED CHANNEL STEEL SIGN POSTS.

MATERIAL:
THE SIGN BASE MATERIAL SHALL BE 0.04 " FLAT SHEET ALUMINUM .

COLORS:
THE SIGN SHALL HAVE AN ASTM TYPE III RETROREFLECTORIZED WHITE TEXT ON AN ASTM TYPE III RETROREFLECTORIZED GREEN BACKGROUND. THE COLORS SHALL CONFORM WITH THOSE FOUND IN STANDARD COLOR TOLERANCE CHARTS AS APPROVED BY US DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION

LETTERING:
LETTERS AND DIGITS SHALL CONFORM WITH THE STANDARD ALPHABETS FOR HIGHWAY SIGNS AS PRINTED BY THE FEDERAL HIGHWAY ADMINISTRATION.

POSTS:
POSTS SHALL BE EITHER 1¾" SQUARE STEEL POST IN A 2" SQUARE ANCHOR OR 1.12 LB/FT FLANGED CHANNEL STEEL POST FOR LENGTHS OF 7' OR LESS. IF POST LENGTH EXCEEDS 7' USE EITHER A 2" SQUARE STEEL POST IN A 2¼" SQUARE STEEL ANCHOR OR 2 LB/FT FLANGED CHANNEL STEEL POST.

OTHER STDS. REQUIRED: E-160, E-164

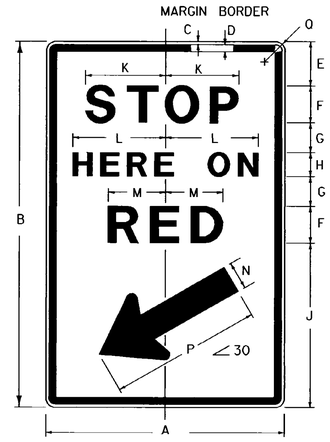
REVISIONS AND CORRECTIONS
OCT 20, 1988 - DATE OF ORIGINAL ISSUE
AUG. 08, 1995 - MINOR NOTE REVISIONS
MAY 30, 2003 - CHANGED SIZE OF MILEMARKER

APPROVED
DIRECTOR OF PROGRAM DEVELOPMENT
TRAFFIC OPERATIONS ENGINEER
FEDERAL HIGHWAY ADMINISTRATION

MILEMARKER DETAILS STATE AND TOWN HIGHWAYS

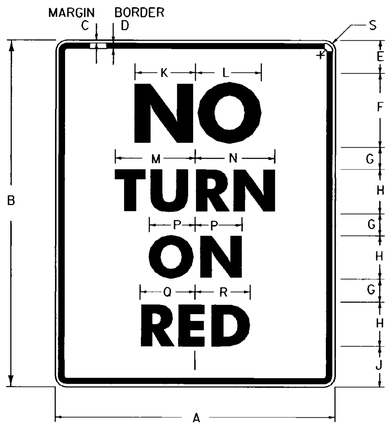
VERMONT AGENCY OF TRANSPORTATION

STANDARD
E-138



R10-6

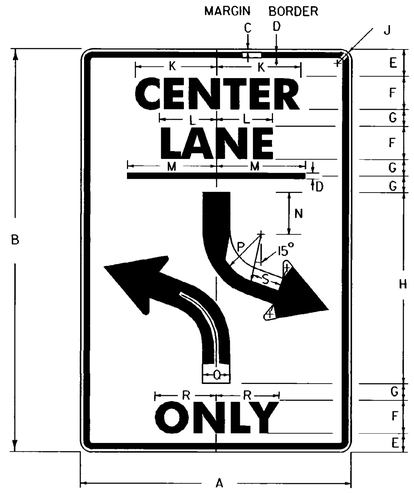
SIGN	A	B	C	D	E	F	G	H
STD.	24	36	3/8	5/8	4	5D	2 1/2	3D
SPECIAL	36	48	5/8	7/8	6	6D	4	4D
	J	K	L	M	N	P	Q	
STD.	14	8 31/32	9 1/32	5 15/16	2 5/8	14 5/8	1 1/2	
SPECIAL	18	9 31/32	12 1/32	7 1/8	2 3/4	16	2 1/4	



POST MOUNTING

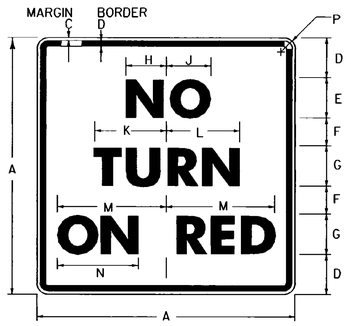
R10-11A

SIGN	A	B	C	D	E	F	G	H	J	K
STD.	24	30	3/8	5/8	3 1/4	5E	2 1/4	4D	3	4 13/16
SPECIAL	36	48	5/8	7/8	6	8E	3 1/2	6D	5 1/2	7 3/4
	L		M	N	P	Q	R	S		
STD.	5 3/16		6 5/8	6 1/2	3 1/2	4 5/8	4 7/8	1 1/2		
SPECIAL	8 1/4		10	9 3/4	5 1/4	6 7/8	7 3/8	2 1/4		



R3-9B

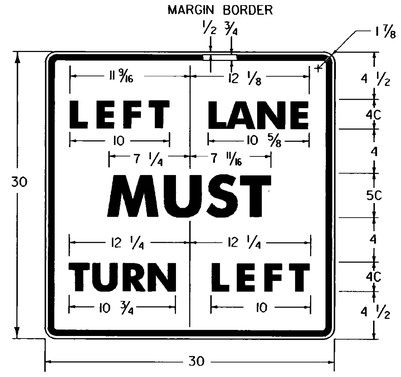
SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
STD.	24	36	3/8	5/8	2 1/2	3E	1 1/2	16	1 1/2	8 7/16
SPECIAL	36	48	5/8	7/8	3 1/2	5E	1 1/2	20	2 1/4	14 1/16
	L		M	N	P	Q	R	S		
STD.	5 3/4		8	2 1/2	6	2	5 5/16	1 1/2		
SPECIAL	9 1/2		12	3	8	3	9 7/8	2		



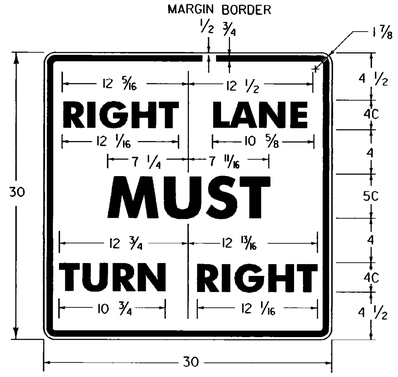
OVERHEAD MOUNTING

R10-11B

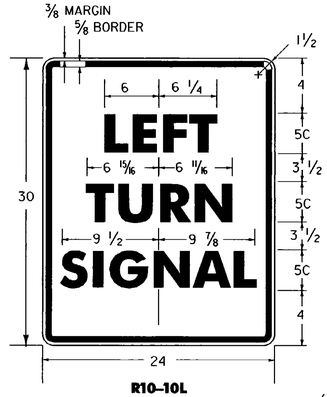
SIGN	DIMENSIONS (INCHES)														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	
MIN.	18	3/8	5/8	2 3/4	3E	1 3/4	3D	2 15/16	3 1/16	5	4 7/8	7 1/8	5 1/4	1 1/2	
STD.	24	3/8	5/8	3 1/2	4E	2 1/2	4D	3 7/8	4 1/8	6 5/8	6 1/2	9 1/2	6 1/2	1 1/2	
SPECIAL	30	1/2	3/4	4 1/2	5E	3	5D	4 15/16	5 3/16	8 1/4	8 1/8	11 7/8	7 3/4	1 7/8	



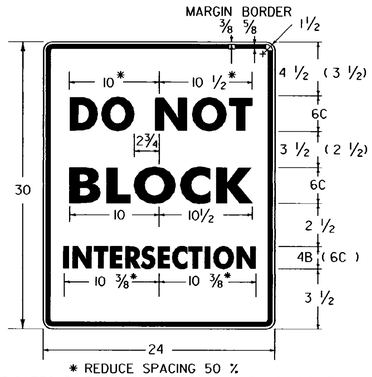
R3-7L



R3-7R

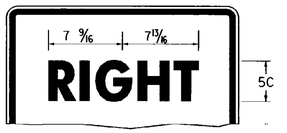


R10-10L

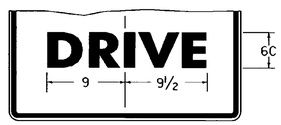


* REDUCE SPACING 50 %
( ) INDICATES DIMENSIONS FOR "DO NOT BLOCK DRIVE" SIGN

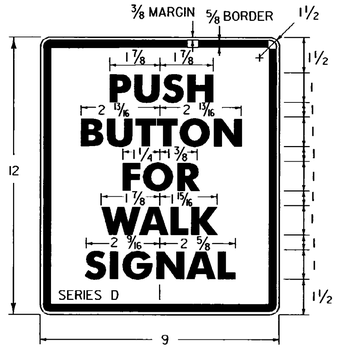
R10-7



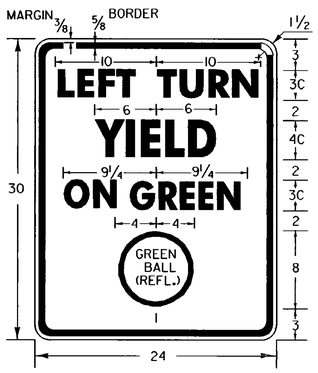
R10-10R



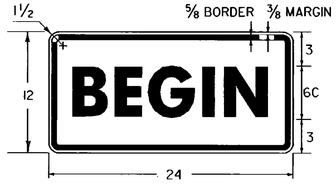
VR-656



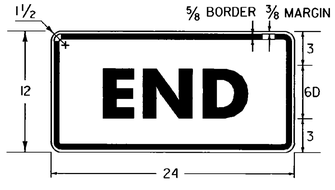
R10-4



R10-12



M4-11



M4-6

GENERAL:

1. ALL DIMENSIONS IN INCHES.
2. SEE STANDARD E-144 FOR ARROWHEAD DETAILS.

COLORS:

THE REGULATORY SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT ON REFLECTORIZED WHITE BACKGROUND, UNLESS OTHERWISE NOTED. THE COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

MATERIALS:

THE SIGN BASE MATERIALS USED FOR REGULATORY SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING OF THE MINIMUM THICKNESS NOTED.

	9'' X 12'' 18'' X 18''	24'' X 12'' 24'' X 24'' 24'' X 30'' 24'' X 36'' 30'' X 30''	36'' X 48''
FLAT SHEET ALUMINUM	0.060''	0.080''	0.100''
HIGH DENSITY OVERLAID PLYWOOD	1/2''	1/2''	5/8''
GALVANIZED FLAT SHEET STEEL	18 GAGE	16 GAGE	14 GAGE

THE REFLECTIVE MATERIAL FOR GROUND MOUNTED SIGNS SHALL BE AASHTO TYPE II OR III WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. WHEN MOUNTED OVERHEAD, ALL SIGNS SHALL HAVE ENCAPSULATED LENS REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. THE TEXT OF THE SIGNS MAY BE LETTERING FILM, SILK SCREENED OR HAND PAINTED. HAND PAINTING MUST BE COMPARABLE IN QUALITY TO THE RESULTS OBTAINED BY SILK SCREENING.

SPECIFICATIONS

REGULATORY SIGNS SHALL MEET THE VERMONT STANDARD SPECIFICATIONS FOR TRAFFIC SIGNS.

TEXT DESIGN:

LETTERS, DIGITS, ARROWS, SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE ''STANDARD ALPHABET FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS'' AND DESIGNS PRESCRIBED IN THE STANDARD HIGHWAY SIGNS AS SPECIFIED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

OTHER STDS. : E-144 REQUIRED

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
SEPT. 20, 1995 - ADDED SIGN ID NUMBERS, MINOR NOTE REVISIONS, SHEET REALIGNMENT
AUG. 30, 1996 - MADE ERROR CORRECTIONS TO SIGN DETAILS R10-6 & R10-11B

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

APPROVED

DIRECTOR OF ENGINEERING

TRAFFIC AND SAFETY ENGINEER

REGULATORY SIGN DETAILS

/traf/std/stdel40.dgn : stdel40.i

VERMONT AGENCY OF TRANSPORTATION

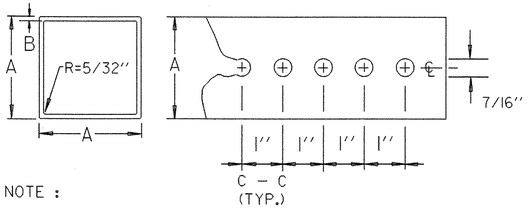
STANDARD E-140

GUARDRAIL DEFLECTION CHART

(PER AASHTO - ROADSIDE DESIGN GUIDE - LATEST EDITION)

TYPE		GR POST SPACING	DEFLECTION
THREE CABLE	W/STEEL POSTS	16' - 0"	11' - 6"
	W/WOODEN POSTS	12' - 6"	11' - 6"
W-BEAM	W/STRONG POST	6' - 3"	3'
BOX BEAM		6' - 0"	5'
THRIE BEAM	W/STRONG POST	6' - 3"	2'

THIS CHART LISTS THE THEORETICAL MAXIMUM DEFLECTION DISTANCE, UPON IMPACT, OF DIFFERENT TYPES OF GUARDRAIL AND VARIOUS POST SPACINGS.



NOTE :

THE POSTS SHALL BE CAREFULLY FORMED OF STEEL WITH A MINIMUM YIELD OF 55,000 PSI, INTO A SIZE AND SHAPE WITH CORNERS INDUCTION WELDED IN SUCH A MANNER THAT NEITHER FLASH NOR WELD SHALL INTERFERE WITH THE TELESCOPING PROPERTIES, NOR DAMAGE THE GALVANIZING.

* THE WALL THICKNESS TOLERANCES SHALL BE +.005" AND -.010" FOR THE 12 GAUGE.

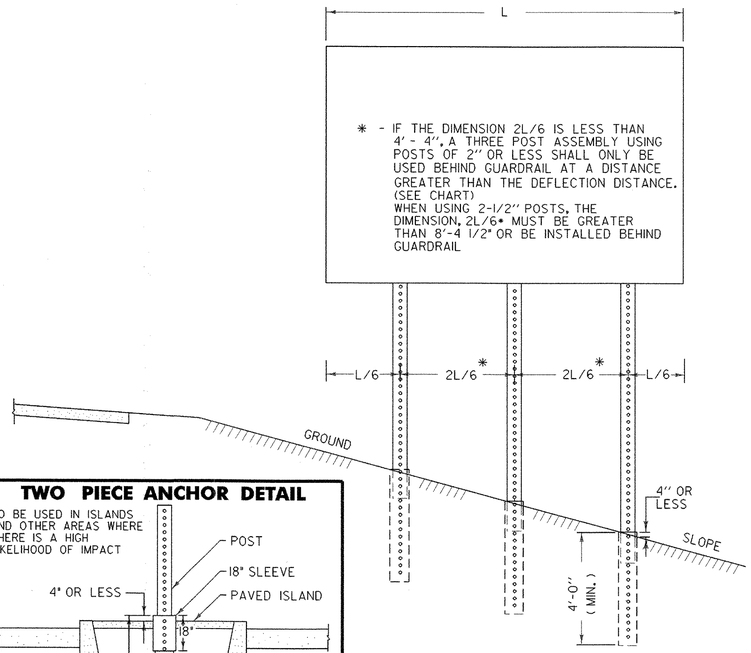
* THE WALL THICKNESS TOLERANCES SHALL BE +.002" AND -.008" FOR THE 14 GAUGE.

DIMENSION DETAILS AND POST SELECTION CHART

POST SELECTION CHART								
SIGN AREA (FT^2) X H (FT) ≤ SV (SELECTION VALUE)								
POST SIZE	DIMENSIONS			SECTION MODULUS IN^3	ONE POST Sv	TWO POST Sv	THREE POST Sv	NUMBER PERMITTED IN 8' PATH
LBS/FT.	A	*B	GAUGE					
1.88	1-3/4"	.083	14	0.230	46	92	138	TWO
2.42	2"	.083	12	0.380	77	154	231	TWO
3.35	2-1/2"	.105	12	0.642	130	260	390	ONE

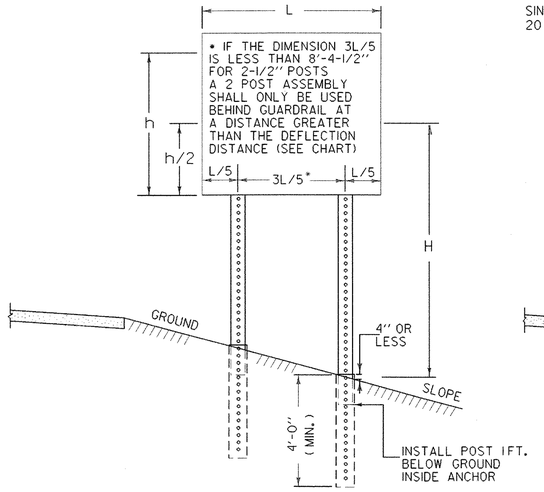
DESIGN CRITERIA:

WIND SPEED = 70 MPH (10 -YEAR MEAN RECURRENCE INTERVAL)
WIND PRESSURE = 19 PSF
STEEL MINIMUM YIELD = 55,000 PSI
ALLOWABLE STRESS = (1.4) 0.60 FY



TWO PIECE ANCHOR DETAIL

MULTI-POST INSTALLATIONS



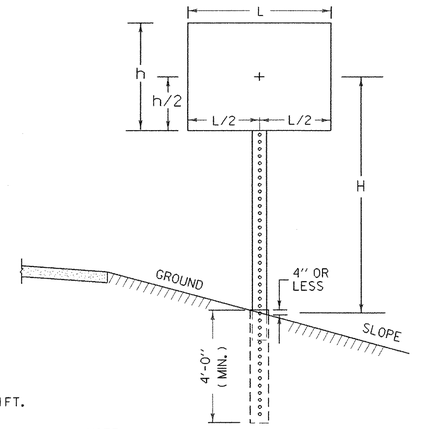
POST SPACING DETAILS

GENERAL NOTES

CONSTRUCTION METHODS - POSTS MAY BE DRIVEN OR SET IN A DUG HOLE AND BACKFILLED. IF DRIVEN, A DRIVING CAP SHALL BE USED. THE DUG HOLE INSTALLATION SHALL BE USED IN AREAS OF POOR SOIL CONDITIONS OR AS DIRECTED BY THE RESIDENT ENGINEER. BACKFILL SHALL BE COMPACTED AS DIRECTED BY THE RESIDENT ENGINEER.

SIGN CLEARANCES - HORIZONTAL AND VERTICAL SIGN CLEARANCES SHALL BE SHOWN ON THE PLANS OR THE APPROPRIATE STD. SHEETS.

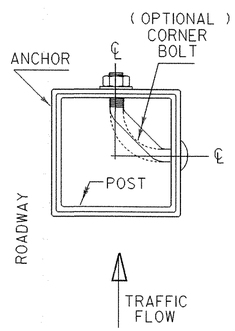
SINGLE POST INSTALLATIONS SHALL BE LIMITED TO A SIGN AREA OF 20 SQ. FT. OR LESS



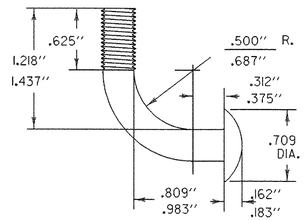
NOTE

WHEN USING SQUARE STEEL POSTS ON STEEP SLOPES (1ON 2 OR STEEPER) ADD ONE FOOT EMBEDMENT FOR GREATER STABILITY.

TOP VIEW OF ANCHOR, POST AND BOLT

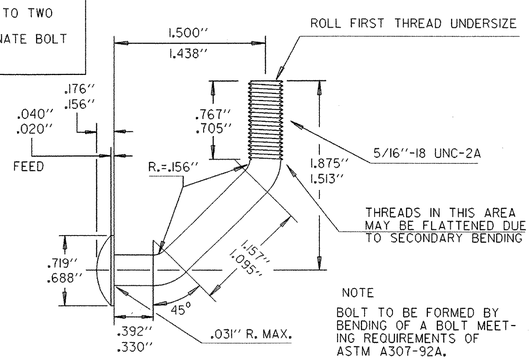


OPTIONAL CORNER BOLT DETAILS



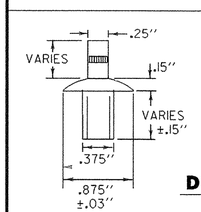
FOR 1-3/4" TO 2-1/2" SQ. TUBE BOLT SIZE VARIES WITH POST SIZE

DOUBLE DIMENSIONS REFER TO TWO ALTERNATE BOLT SIZES.



NOTE

BOLT TO BE FORMED BY BENDING OF A BOLT MEETING REQUIREMENTS OF ASTM A307-92A.

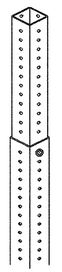


THIS DRIVE RIVET MAY BE SUBSTITUTED FOR EITHER OF THE CORNER BOLTS SHOWN ABOVE OR TO THE RIGHT.

DRIVE RIVET

* DIMENSIONS VARY AS NEEDED FOR POST SIZE USED

CONNECTION DETAIL



POST IS TO BE INSERTED INTO ANCHOR ONE FOOT BELOW GROUND LEVEL. ANCHOR IS TO BE 4'-0" MINIMUM LENGTH WITH NO MORE THAN 4" ABOVE GROUND. ANCHOR IS ONE SIZE (1/4") GREATER THAN THE POST AND ALL ANCHORS ARE TO BE 12 GAGE, EXCEPT ANCHORS FOR 2-1/2" POSTS ARE TO BE 3" AND 7 GAGE. CONNECTION IS TO BE MADE USING THE BOLT PROVIDED WITH THE SIGN SYSTEM (SEE DETAILS LEFT). AT THE TOP HOLE IN THE ANCHOR (APPROXIMATELY 3-1/2" ABOVE GROUND). THREE INCH ANCHORS WHICH DO NOT HAVE HOLES ON 1" CENTERS WILL REQUIRE DRILLING OF 7/16" HOLES FOR CONNECTIONS.

(SEE DETAIL LEFT FOR BOLT PLACEMENT)

OTHER STDS. REQUIRED E-120, E-160

REVISIONS AND CORRECTIONS

APR. 27, 1994 - ORIGINAL APPROVAL DATE
JUL. 21, 1994 - REVISED POST GAUGES
AUG. 18, 1995 - ADDED TWO PIECE ANCHOR DETAIL
MAR. 26, 1996 - REVISED POST SELECTION CHART
MAY 20, 1999 - REPLACE LOST ORIGINAL
JUN. 08, 2009 - POST SELECTION REVISIONS

APPROVED

Kevin S. Marshia
HIGHWAY, SAFETY & DESIGN ENGINEER

Richard Peterson
DIRECTOR OF PROGRAM DEVELOPMENT

Mark D. Richter
FEDERAL HIGHWAY ADMINISTRATION

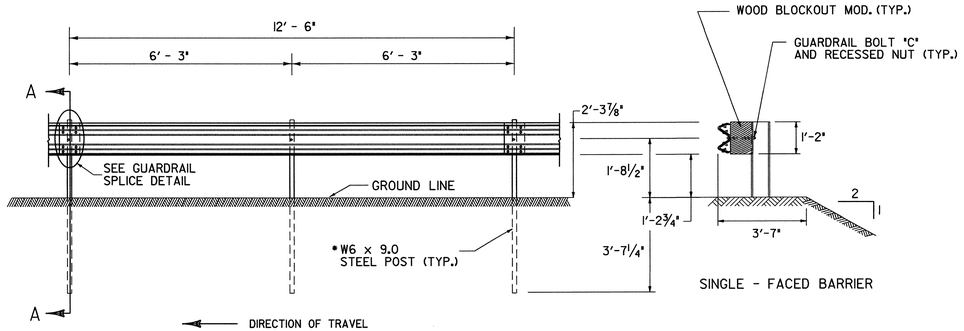
SQUARE STEEL SIGN POST

/traf/english/std/el64.dgn

VERMONT AGENCY OF TRANSPORTATION

STANDARD E-164

"W" BEAM GUARDRAIL WITH STEEL POSTS



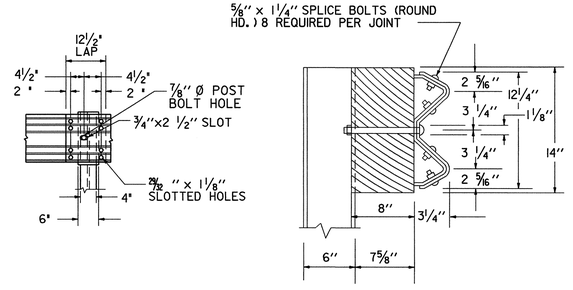
ELEVATION FROM ℄ OF ROAD

SINGLE - FACED BARRIER

DOUBLE - FACED BARRIER

PLAN

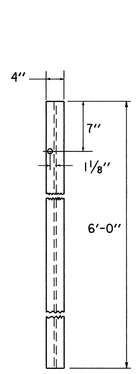
SECTION A -A



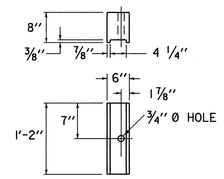
ELEVATION

SECTION

GUARDRAIL SPLICE DETAIL



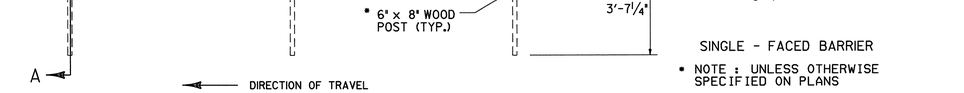
FRONT FACE STEEL POST



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

NOTES:
1. BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSI OR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPRPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE SIZE TOLERANCE OF ROUGH SAWN BLOCKS IN THE DIRECTION OF THE BOLT HOLES SHALL BE NOT MORE THAN +/- ¼".
2. SUPPLY WOOD BLOCKS PER AASHTO M 168.
3. TREAT WITH PRESERVATIVE PER AASHTO M 133.
4. BLOCKOUTS MAY ALSO BE MADE OF APPROVED ALTERNATIVE MATERIAL.

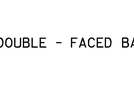
"W" BEAM GUARDRAIL WITH WOOD POSTS



ELEVATION FROM ℄ OF ROAD

SINGLE - FACED BARRIER

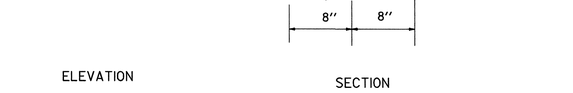
* NOTE : UNLESS OTHERWISE SPECIFIED ON PLANS



DOUBLE - FACED BARRIER

PLAN

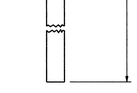
SECTION A -A



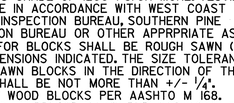
ELEVATION

SECTION

GUARDRAIL SPLICE DETAIL



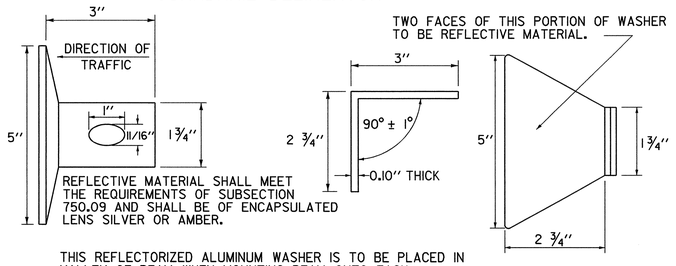
FRONT FACE WOOD POST



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

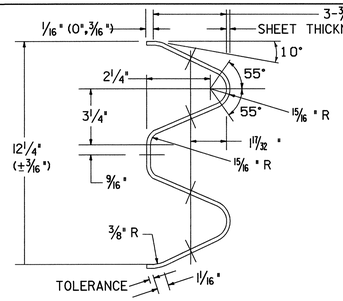
NOTES:
1. BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSI OR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPRPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE SIZE TOLERANCE OF ROUGH SAWN BLOCKS IN THE DIRECTION OF THE BOLT HOLES SHALL BE NOT MORE THAN +/- ¼".
2. SUPPLY WOOD BLOCKS PER AASHTO M 168.
3. TREAT WITH PRESERVATIVE PER AASHTO M 133.
4. BLOCKOUTS MAY ALSO BE MADE OF APPROVED ALTERNATIVE MATERIAL.

GUARDRAIL DELINEATOR



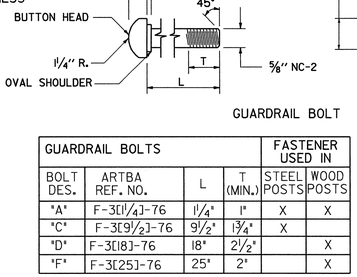
REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.

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



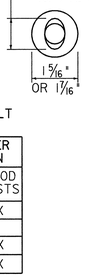
ARTBA RE-3[2@6'-3"=12'-6" CLASS A, TYPE 1]-73

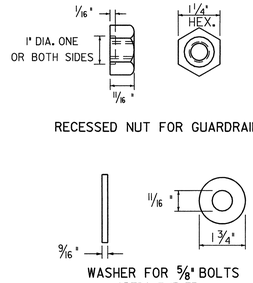
TYPICAL GUARDRAIL SECTION



GUARDRAIL BOLT

GUARDRAIL BOLTS				FASTENER USED IN	
BOLT DES.	ARTBA REF. NO.	L	T (MIN.)	STEEL POSTS	WOOD POSTS
"A"	F-3[11/4]-76	1¼"	1"	X	X
"C"	F-3[9½]-76	9½"	1¾"	X	
"D"	F-3[18]-76	18"	2½"		X
"F"	F-3[25]-76	25"	2"		X





RECESSED NUT FOR GUARDRAIL BOLT

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

GENERAL NOTES:

1. GUARDRAIL SHALL MEET THE REQUIREMENTS OF AASHTO M 180, CLASS A, TYPE I, UNLESS OTHERWISE DESIGNATED
2. GUARDRAIL SHALL BE SINGLE FACED UNLESS OTHERWISE DESIGNATED
3. GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW FOR THE LANE NEAREST THE GUARDRAIL.
4. FOR DESCRIPTION AND SPECIFICATION OF PARTS IDENTIFIED BY (ARTBA ...) AND OTHER DETAILS OF POSTS, POST ACCESSORIES, FASTENERS & RAIL ELEMENTS, SEE AASHTO-AGC-ARTBA JOINT TASK FORCE NO. 13, TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE", LATEST EDITION.
5. STANDARD STEEL BEAM TO BE ⅛" AND THE HEAVY DUTY TO BE 5/64" THICK.

OTHER STANDARD REQUIRED G-1d

REVISIONS AND CORRECTIONS

JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.
JAN.3,2000 - UPDATED TO REFLECT METRIC STD. CHANGES

APPROVED

DIRECTOR OF PROJECT DEVELOPMENT

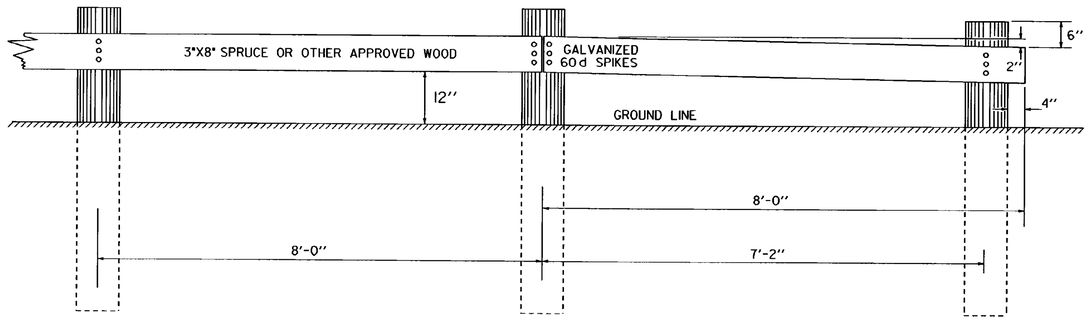
ROADWAY AND TRAFFIC DESIGN ENGINEER

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

VERMONT AGENCY OF TRANSPORTATION

STANDARD

G-1

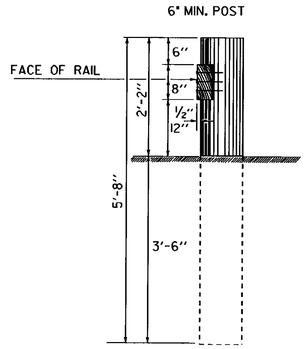


PLANK SIXTEEN FEET IN LENGTH TO BE USED WHEREVER POSSIBLE.
POSTS SIX (6) INCHES SQUARE MAY BE USED IN PLACE OF ROUND POSTS.
FIRST AND LAST POSTS OF EACH SECTION TO BE SET BACK TWELVE INCHES FROM THE GENERAL LINE OF POSTS, WHEN FOUR OR MORE POSTS ARE REQUIRED.
REFLECTIVE MATERIAL TO BE PLACED AS DIRECTED BY THE ENGINEER.
ALL WOOD MEMBERS SHALL BE GIVEN A PRESERATIVE TREATMENT.

PLANK RAIL

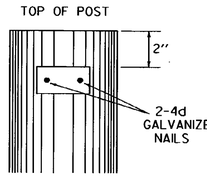
TO BE USED AS A BARRICADE OFF THE HIGHWAY

NOTCH TO BE TREATED WITH PRESERVATIVE BEFORE ERECTING PLANK.

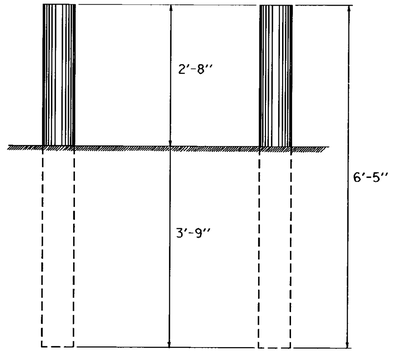


3" X 1½" REFLECTIVE ALUMINUM STRIP TO BE PLACED ON EVERY OTHER WOOD POST IN A LINE OF POSTS AND CLEARLY VISIBLE TO APPROACHING TRAFFIC.
STRIPS TO BE ATTACHED TO THE DESIGNATED RAIL POSTS ON BOTH SIDES OF THE ROAD AND VISIBLE TO TRAFFIC IN BOTH DIRECTIONS.

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

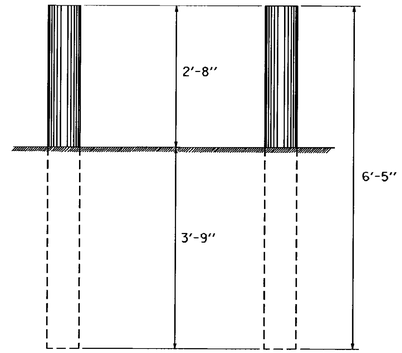


DELINEATION OF WOOD RAIL AND GUIDE POSTS



MARKER POSTS ARE TO BE 4" TO 5½" IN DIAMETER AND ARE TO BE PLACED AS DIRECTED BY THE ENGINEER. POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT.

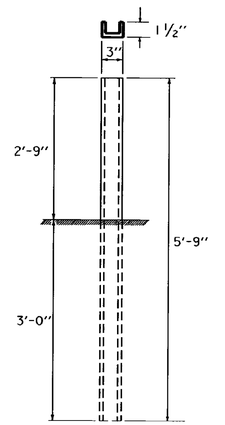
WOOD MARKER POSTS



REFLECTIVE MATERIAL TO BE PLACED AS DIRECTED BY THE ENGINEER.

POSTS ARE TO BE 4" TO 5½" IN DIAMETER AND ARE TO BE PLACED AS DIRECTED BY THE ENGINEER. POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT

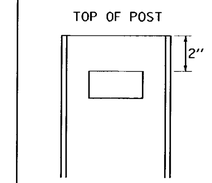
WOOD GUIDE POSTS



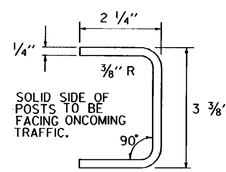
ALL STEEL MARKER POSTS TO BE GALVANIZED.
STEEL MARKER POSTS TO BE PLACED AS DIRECTED BY THE ENGINEER.

POSTS ARE TO BE AMERICAN STANDARD CHANNEL 5'-9" X 3". (4.1 LBS. PER FT.)

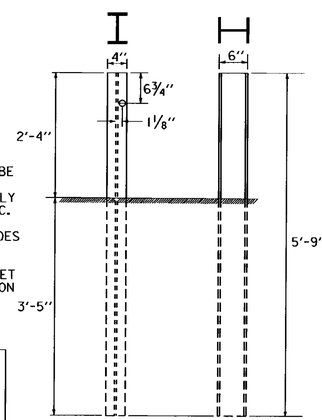
STEEL MARKER POSTS



3" X 1½" REFLECTIVE STRIP TO BE APPLIED TO EVERY OTHER POST IN A LINE OF POSTS AND CLEARLY VISIBLE TO APPROACHING TRAFFIC. STRIPS TO BE APPLIED TO THE DESIGNATED POSTS ON BOTH SIDES OF THE ROAD AND VISIBLE TO TRAFFIC IN BOTH DIRECTIONS. REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.



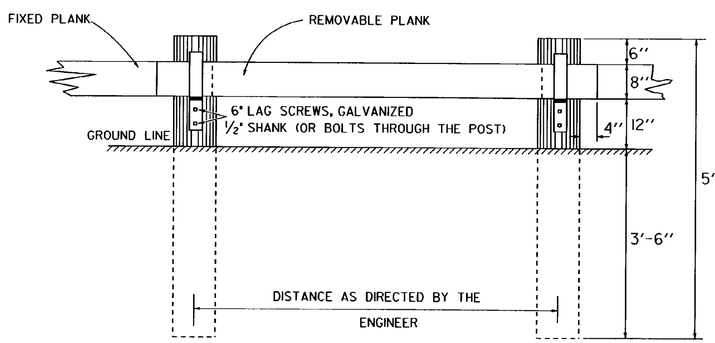
ALTERNATE POST



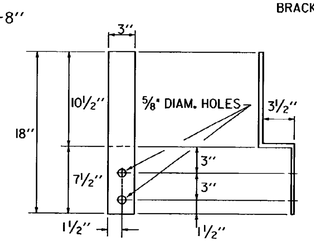
ALL STEEL GUIDE POSTS TO BE GALVANIZED.
REFLECTIVE MATERIAL TO BE PLACED AS DIRECTED BY THE ENGINEER.
POSTS ARE TO BE 5'-9" X 6" X 4" (8.5 LBS. PER FT.).

ALL POSTS IN A GIVEN RUN OF BARRIER TO BE UNIFORM.

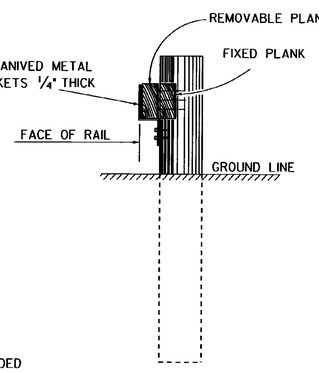
STEEL GUIDE POSTS



ENTRANCE THROUGH PLANK RAIL



BRACKET DETAIL



GALVANIZED METAL BRACKETS ARE TO BE INCLUDED IN THE UNIT BID PRICE FOR PLANK RAIL.

REVISIONS AND CORRECTIONS
DEC. 8, 1971 - ORIGINAL APPROVAL DATE
MAY 23, 1974 - ALTERNATE POST ADDED
MAY 29, 1979 - NOTE ON REFLECTIVE MATERIAL CHANGED
JULY 23, 1980 - CHANGED DIAMETER OF WOOD MARKER POST & WOOD GUIDE POST
MAY 25, 1982 - REMOVED ALTERNATE POST DETAIL
OCT. 31, 1985 - REVISED TO CONFORM TO 1986 SPECIFICATIONS
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

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

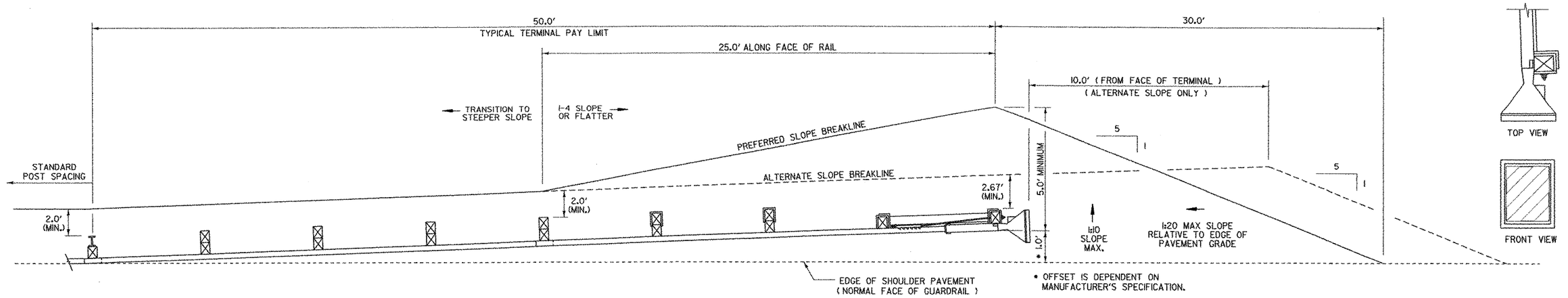
Gordon R. MacArthur, P.E.
DIRECTOR OF ENGINEERING

Walter M. Murphy, PE
DESIGN ENGINEER

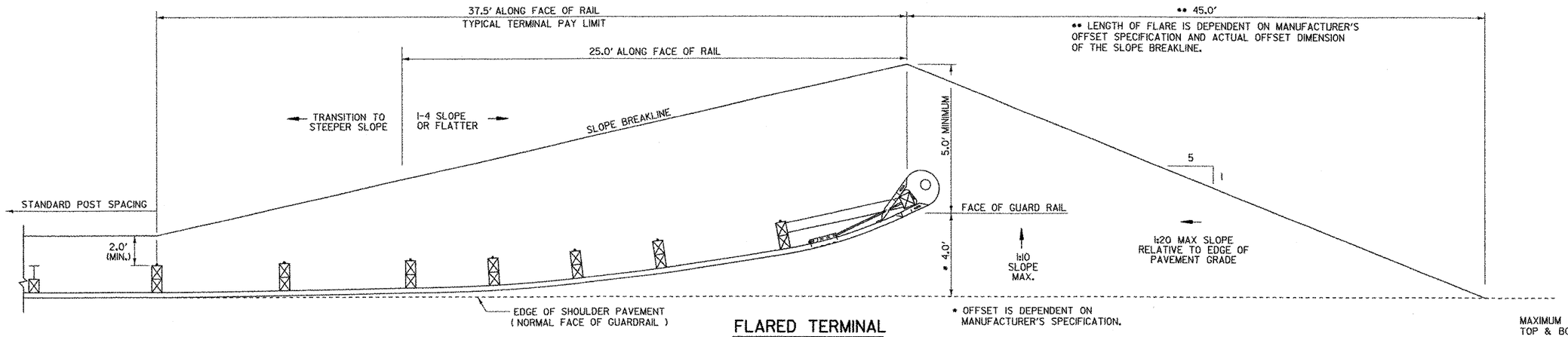
PLANK RAIL
GUIDE POSTS
WOOD MARKER POSTS
STEEL MARKER POSTS

VERMONT AGENCY OF TRANSPORTATION

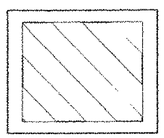
STANDARD
G-4



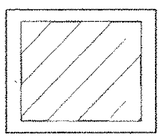
TANGENTIAL TERMINAL



FLARED TERMINAL



ORIENTATION OF REFLECTIVE SHEETING FOR LEFT SIDE OF ROAD HAZARD.



ORIENTATION OF REFLECTIVE SHEETING FOR RIGHT SIDE OF ROAD HAZARD.

GENERAL NOTES

1. THE AREA IMMEDIATELY BEHIND AND BEYOND THE TERMINAL SHOULD BE REASONABLY TRAVERSABLE AND FREE FROM FIXED-OBJECT HAZARDS TO THE EXTENT PRACTICABLE. IF A CLEAR RUNOUT PATH IS NOT ATTAINABLE, THIS AREA SHOULD AT LEAST BE SIMILAR IN CHARACTER TO UPSTREAM/UNSHIELDED ROADSIDE AREAS.

2. REFLECTIVE SHEETING SHALL BE PLACED ON THE TERMINAL END OF ALL TANGENT END TERMINALS. THIS SHALL BE OBJECT MARKER MATERIAL (TYPE 3 - STRIPED MARKER OM-3L AND OM-3R) CONSISTING OF A SQUARE OR RECTANGULAR SHAPE WITH ALTERNATING BLACK AND RETROREFLECTIVE YELLOW STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES TOWARDS TRAFFIC. THE MINIMUM WIDTH OF THE YELLOW STRIPE SHALL BE 3 INCHES. THE DIMENSIONS OF THE MARKER SHALL EXTEND FOR THE FULL WIDTH OF THE FACE PLATE ON THE TERMINAL HEAD AND BE SUFFICIENT IN HEIGHT (DEPENDENT ON THE TYPE OF END TERMINAL AND HEAD SIZE). REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.08 (B)(3) TYPE III OR HIGHER (AASHTO M 268 (ASTM 4956)). THE COST SHALL BE INCLUDED IN THE COST OF THE END TERMINAL.

3. REFLECTIVE SHEETING SHALL BE PLACED ON THE END OF FLARED TERMINALS WHICH ARE LOCATED 6 FEET OR LESS FROM THE EDGE OF SHOULDER (NORMAL FACE OF GUARDRAIL. THIS SHALL BE THE SAME OBJECT MARKER MATERIAL SPECIFIED IN NOTE 2. THE COST OF THE REFLECTIVE SHEETING SHALL BE INCLUDED IN THE COST OF THE END TERMINAL.

4. FOR THE FLARED TERMINAL, WITH AN OFFSET BETWEEN 4 FEET AND 6 FEET FROM THE NORMAL FACE OF GUARDRAIL, THE FOLLOWING SHALL PERTAIN; A REFLECTIVE BUTTON, MOUNTED ON A STANDARD DELINEATOR POST, SHALL BE INSTALLED AT THE NORMAL FACE OF GUARDRAIL, DIRECTLY OPPOSITE THE LEAD END OF THE TERMINAL. THE BUTTON SHALL BE WHITE FOR THE RIGHT SIDE OF THE ROAD AND YELLOW FOR THE LEFT SIDE. ANY DELINEATORS INSTALLED SHALL BE PAID FOR BY THE APPROPRIATE PAY ITEMS.

NOT TO SCALE

REVISIONS AND CORRECTIONS

OCT. 21, 1998 ORIGINAL APPROVAL

NOV. 15, 2002 MODIFIED SLOPE BREAKLINE, REFLECTIVE SHEETING ADDED

APPROVED

DIRECTOR OF PROJECT DEVELOPMENT

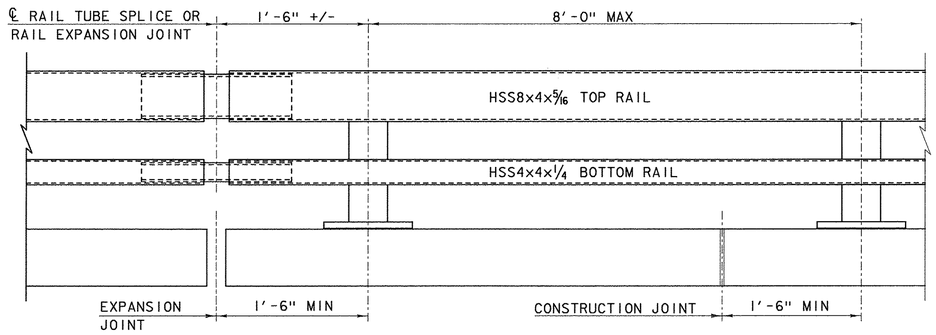
ROADWAY DESIGN ENGINEER

FEDERAL HIGHWAY ADMINISTRATION

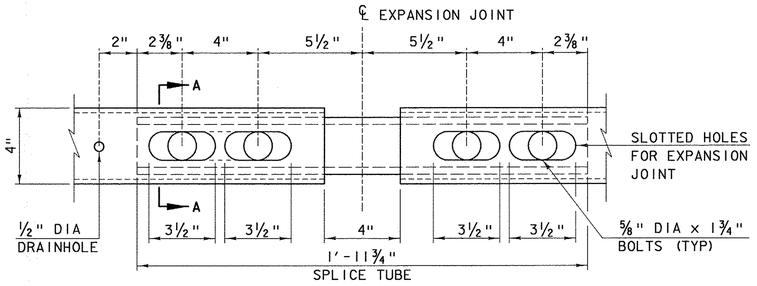
GENERIC PLANS FOR GUARDRAIL END TERMINALS

VERMONT AGENCY OF TRANSPORTATION

STANDARD G-19

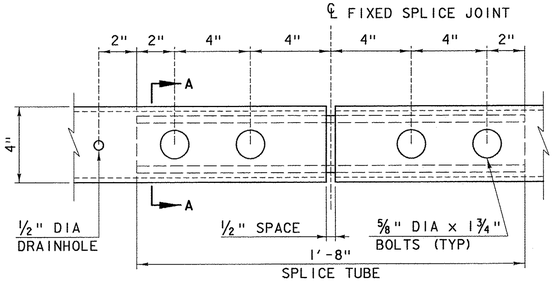


BRIDGE RAILING ELEVATION



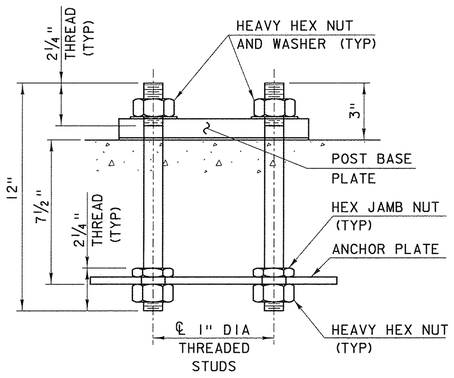
EXPANSION JOINT DETAIL

(BOTTOM VIEW)

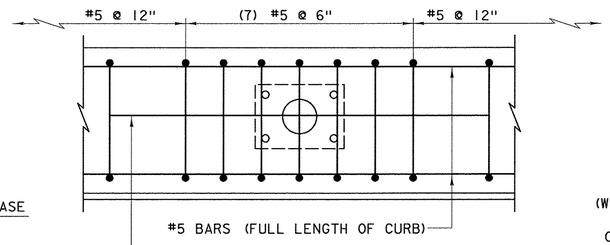


FIXED SPLICE JOINT DETAIL

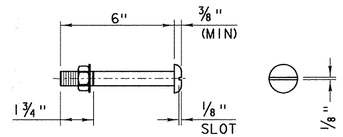
(BOTTOM VIEW)



RAIL POST ANCHORAGE

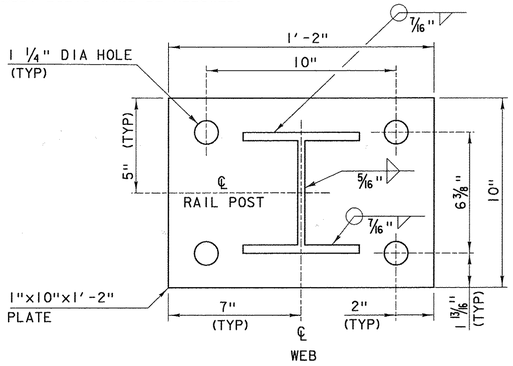


CURB REINFORCING PLAN

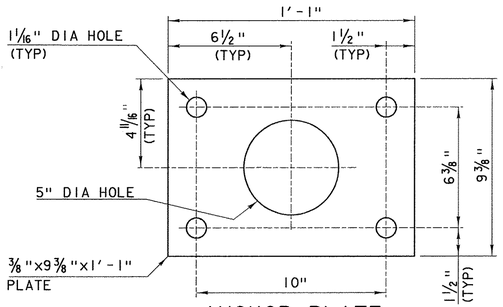


3/4" DIA A449 (TYPE 1) ROUND HEAD BOLT

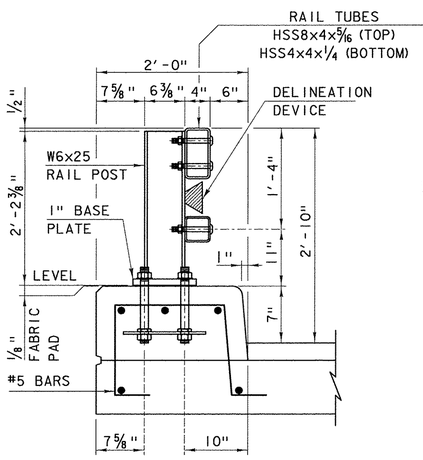
(WITH WASHER AND PREVAILING TORQUE TYPE LOCK NUT)
(SEE NOTE #8)
ONLY FULL DIAMETER BODY BOLTS WILL BE ALLOWED.



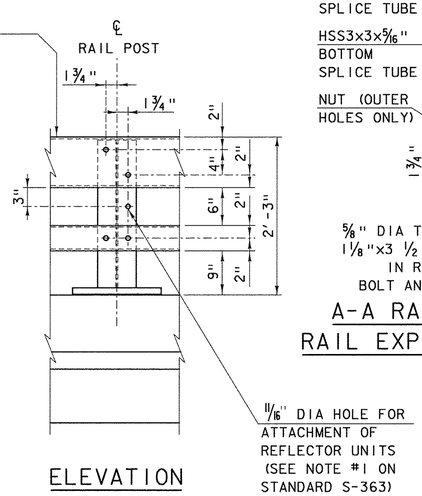
POST BASE PLATE



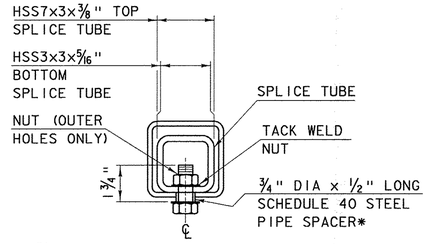
ANCHOR PLATE



TYPICAL SECTION



ELEVATION



5/8" DIA TAPPED HOLE IN SPLICE TUBE
1 1/8"x3 1/2" SLOT* OR 3/4" DIA HOLE**
IN RAIL TUBE FOR 5/8" DIA
BOLT AND PLAIN HARDENED WASHER

A-A RAIL TUBE SPLICE AND RAIL EXPANSION JOINT SECTION

*EXPANSION JOINT
** SPLICE

NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 525.
2. PRIOR TO GALVANIZING THE ASSEMBLED POST, GRIND ALL EDGES TO A MINIMUM RADIUS OF 1/16".
3. ALL POSTS SHALL BE SET NORMAL TO GRADE.
4. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO BRIDGE RAIL POSTS AND PREFERABLY TO AT LEAST FOUR POSTS.
5. RAIL TUBE EXPANSION JOINTS SHALL BE PROVIDED IN ANY RAIL BAY SPANNING THE END OF AN INTEGRAL ABUTMENT BRIDGE AND AT ALL SUPERSTRUCTURE EXPANSION JOINTS. EXPANSION JOINT WIDTH SHALL BE 4" AT 45°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.
6. HOLES IN RAILS FOR RAIL TUBE ATTACHMENT MAY BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO INSTALLATION.
7. RAIL POST ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
8. RAIL TUBES SHALL BE ATTACHED USING 3/4" FULL DIAMETER BODY ASTM A 449 (TYPE 1) ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 1/16" LARGER THAN THE BOLT SIZE.
9. ANY BENDING OF RAIL SHALL BE DONE AT A FABRICATION PLANT ACCORDING TO A PROCEDURE PROVIDED BY THE FABRICATOR.
10. THE MINIMUM DISTANCE FROM THE POST TO AN EXPANSION JOINT SHALL BE DETERMINED BY THE MINIMUM EDGE DISTANCE OF 5" FROM ANY ANCHOR STUD TO THE END OF THE SLAB, OR TO THE EXPANSION JOINT RECESS POUR, IF ONE IS USED.
11. SEE STANDARD DRAWING G-1 FOR DETAILS OF DELINEATORS. A DELINEATOR SHALL BE INSTALLED AT 30 FOOT SPACING OR THE NEAREST POST. WHITE IS TO BE INSTALLED ON THE DRIVER'S RIGHT. FOR ONE WAY BRIDGES, YELLOW IS TO BE INSTALLED ON THE DRIVER'S LEFT. PAYMENT SHALL BE INCIDENTAL TO OTHER ITEMS.
12. THIS RAILING MEETS THE REQUIREMENTS FOR A TL-4 SERVICE LEVEL.

OTHER STDS. REQUIRED: G-1

REVISIONS AND CORRECTIONS

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

APPROVED

Jon. Michael Hedges
STRUCTURES PROGRAM MANAGER

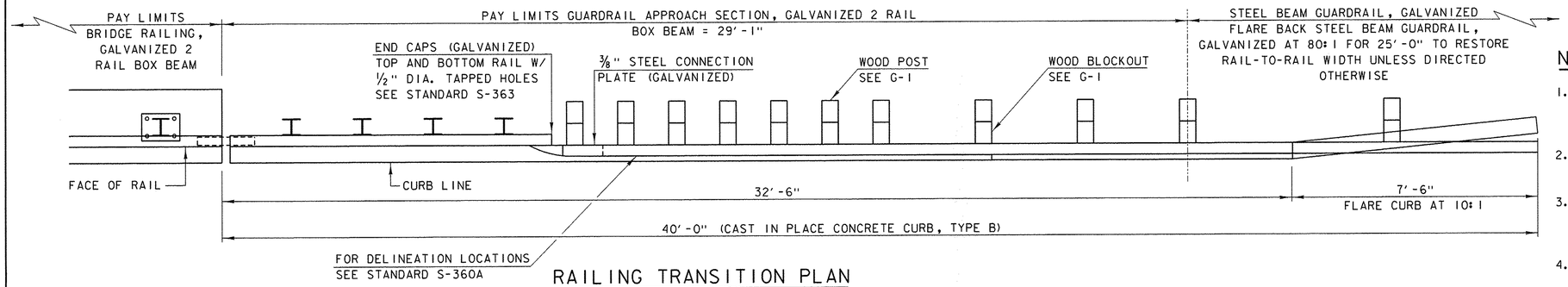
Richard Fetherston
DIRECTOR OF PROGRAM DEVELOPMENT

Mark D. Richter
FEDERAL HIGHWAY ADMINISTRATION

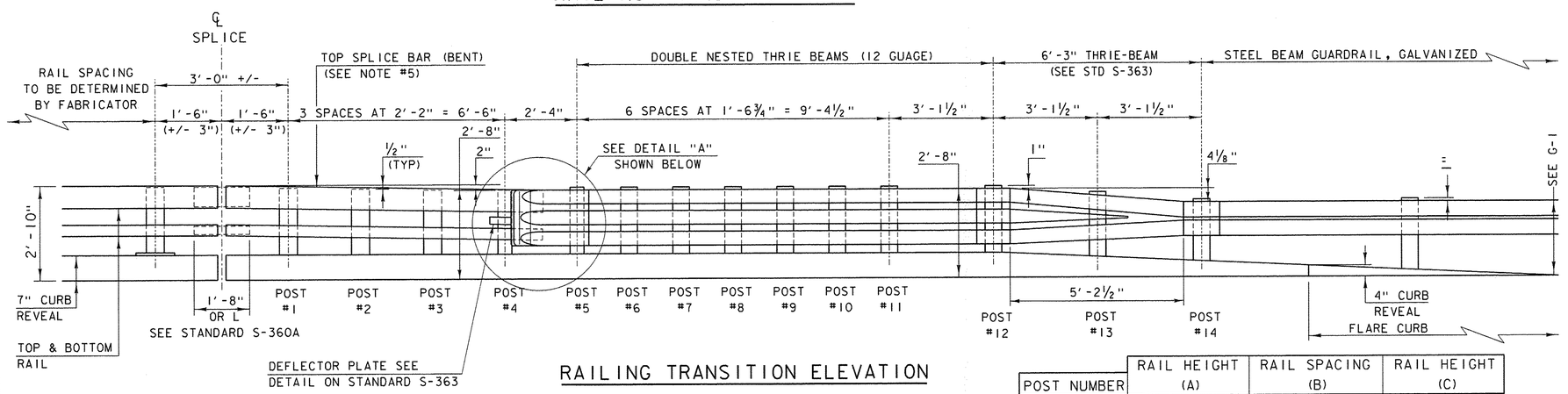
BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM

VERMONT AGENCY OF TRANSPORTATION

STANDARD S-360A



RAILING TRANSITION PLAN

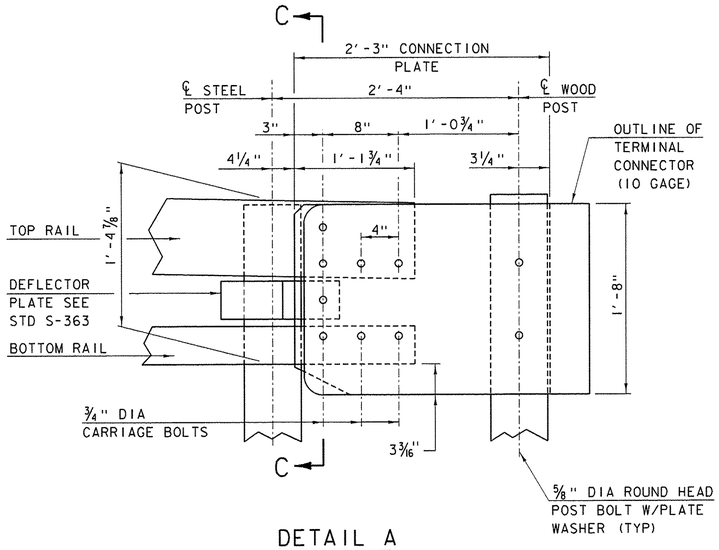


RAILING TRANSITION ELEVATION

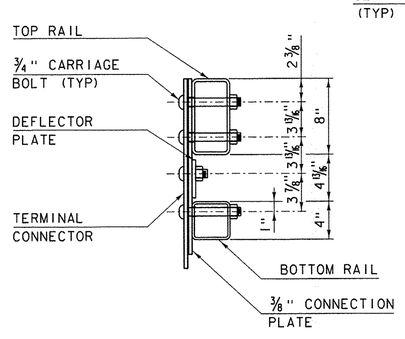
POST NUMBER	RAIL HEIGHT (A)	RAIL SPACING (B)	RAIL HEIGHT (C)
1	2'-9½"	1'-3¾"	1'-5¾"
2	2'-9"	1'-3½"	1'-5½"
3	2'-8½"	1'-3⅜"	1'-5⅜"
4	2'-8"	1'-2⅞"	1'-5⅛"

NOTES

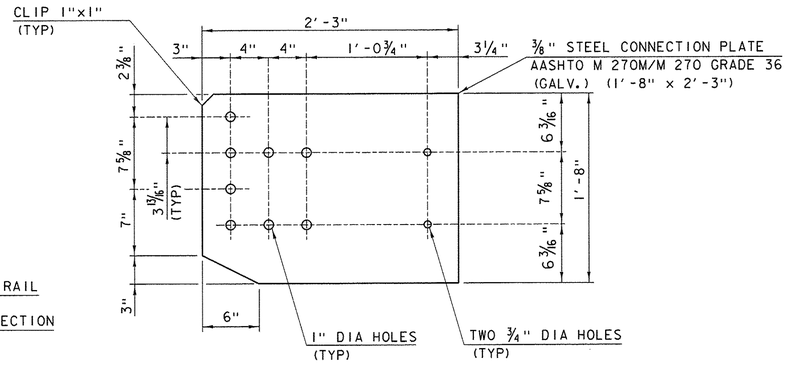
1. PAYMENT FOR GUARDRAIL APPROACH SECTION - GALVANIZED 2 RAIL BOX BEAM SHALL INCLUDE THE TERMINAL CONNECTOR, THE CONNECTION PLATE, THE DEFLECTOR PLATE, RAIL, POSTS, BLOCKS AND ATTACHMENT HARDWARE.
2. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.
3. TUBE AND STEEL POST MATERIALS,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



DETAIL A



SECTION C-C (CONNECTION PLATE)



CONNECTION PLATE

RAIL POST SECTION (POSTS 1-4)

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

REVISIONS AND CORRECTIONS

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

APPROVED

Wm. Michael Hedges
STRUCTURES ENGINEER

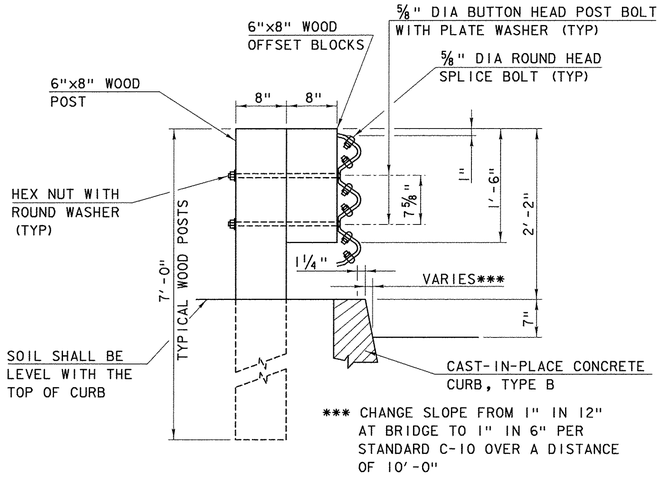
DIRECTOR OF PROGRAM DEVELOPMENT

Mark D. Richter
FEDERAL HIGHWAY ADMINISTRATION

GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM

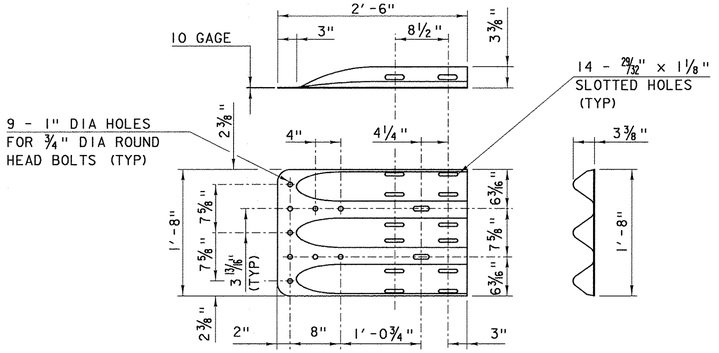
VERMONT AGENCY OF TRANSPORTATION

STANDARD
S-360B



*** CHANGE SLOPE FROM 1" IN 12" AT BRIDGE TO 1" IN 6" PER STANDARD C-10 OVER A DISTANCE OF 10'-0"

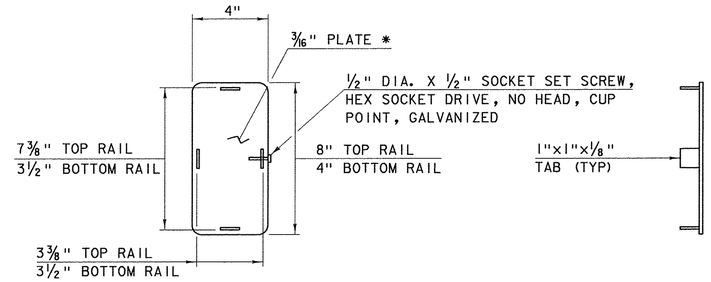
WOOD POST AND THRIE-BEAM RAIL ASSEMBLY



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

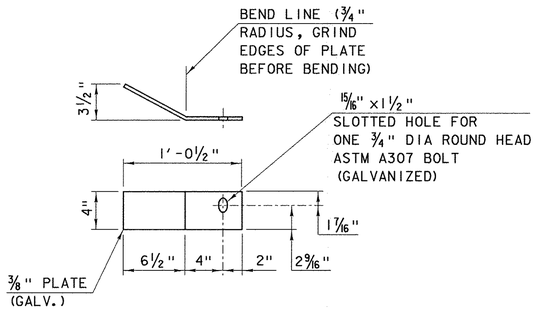
NOTES

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

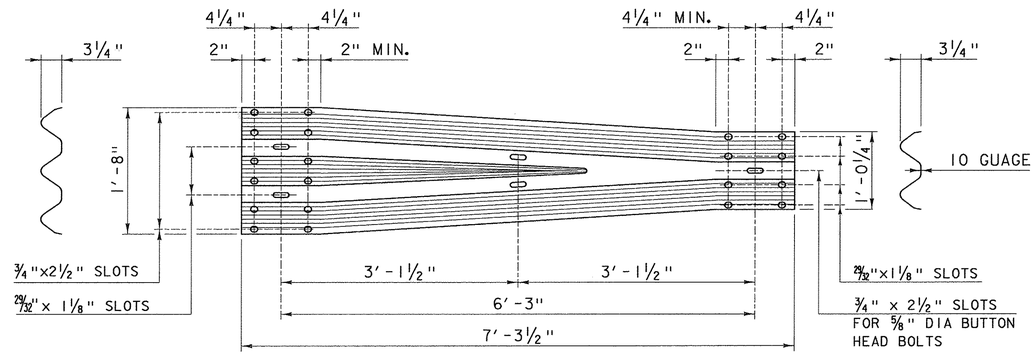


END CAP DETAIL

* ROUND CORNERS 1/2" RADIUS (TYP)



DEFLECTOR PLATE DETAIL



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

OTHER STDS. REQUIRED: C-10

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APPROVED

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THRIE BEAM TO STANDARD STEEL BEAM TRANSITION SECTION

VERMONT AGENCY OF TRANSPORTATION

STANDARD S-363