

INDEX OF SHEETS						FINAL HYDRAULIC REPORT																	
<b>PLAN SHEETS</b>						<b>STANDARDS LIST</b>						<b>HYDROLOGIC DATA</b>						<b>PROPOSED STRUCTURE</b>					
1	TITLE SHEET	C-3A	SIDEWALK RAMPS	03-10-2008	DRAINAGE AREA: 4.0 SQ. MI. DATE: Apr. 3, 2013 CHARACTER OF TERRAIN: HILLY TO MOUNTAINOUS VALLEY TERRAIN STREAM CHARACTERISTICS: LAKE NATURE OF STREAMBED: SAND, SILT						STRUCTURE TYPE: SINGLE LANE FLOATING BRIDGE  CLEAR SPAN (NORMAL TO STREAM): 320 VERTICAL CLEARANCE ABOVE STREAMBED: +/- 27 FT WATERWAY OF FULL OPENING: 5255 SQ. FT.												
2	PRELIMINARY INFORMATION SHEET	C-10	CURBING	02-11-2008	Q 2.33 = 440 CFS Q50 = 1630 CFS Q 10 = 1130 CFS Q 100 = 2080 CFS Q 25 = 1380 CFS Q 500 = 3120 CFS						WATER SURFACE ELEVATIONS AT: UPSTREAM BRIDGE FASCIA  Q 2.33 = 1278.0 FT VELOCITY = 0 FPS Q 10 = 1278.6 FT " 0 FPS Q 25 = 1278.9 FT " 0 FPS Q50 = 1279.3 FT " 0 FPS Q 100 = 1279.8 FT " 0 FPS												
3	ROADWAY TYPICAL SECTIONS	E-119	UTILITY WORK ZONE	03-01-2004	DATE OF FLOOD OF RECORD: AUGUST, 2011 (TROPICAL STORM IRENE) ESTIMATED DISCHARGE: UNKNOWN WATER SURFACE ELEVATION: >1278.6 NATURAL STREAM VELOCITY: N/A ICE CONDITIONS: RECURRING SEASONAL ICE DEBRIS: N/A DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? NO IS ORDINARY RISE RAPID? NO IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? YES IF YES, DESCRIBE TWO UNNAMED STREAMS DISCHARGE INTO SUNSET LAKE						IS THE ROADWAY OVERTOPPED BELOW Q100? YES FREQUENCY: +/- 1.7 YR RELIEF ELEVATION: +/- 1277.5 FT DISCHARGE OVER ROAD @ Q100: UNKNOWN  AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: +/- 1273.2 FT VERTICAL CLEARANCE: N/A  SCOUR: N/A  REQUIRED CHANNEL PROTECTION: N/A												
4	BRIDGE TYPICAL SECTIONS	E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	08-08-1995	<b>EXISTING STRUCTURE INFORMATION</b>						<b>PERMIT INFORMATION</b>												
5	ISOMETRIC VIEWS	E-134	BRIDGE NUMBER PLAQUE	08-08-1995	STRUCTURE TYPE: SINGLE LANE FLOATING BRIDGE YEAR BUILT: 1978 CLEAR SPAN (NORMAL TO STREAM): 316 FT VERTICAL CLEARANCE ABOVE STREAMBED: +/- 27 FT WATERWAY OF FULL OPENING: 5255 SQ. FT. DISPOSITION OF STRUCTURE: COMPLETE REMOVAL TYPE OF MATERIAL UNDER SUBSTRUCTURE: GLACIAL TILL AND BEDROCK						AVERAGE DAILY FLOW: 10 CFS DEPTH OR ELEVATION: ORDINARY LOW WATER: 5 CFS 1274.9 FT ORDINARY HIGH WATER: 190 CFS 1275.3 FT												
6	EARTHWORK TYPICAL SECTIONS	E-138	MILE MARKER DETAILS - STATE & TOWN HIGHWAYS	05-30-2003	WATER SURFACE ELEVATIONS AT: UPSTREAM END OF CULVERT  Q 2.33 = 1278.0 FT VELOCITY = 0 FPS Q 10 = 1278.6 FT " 0 FPS Q 25 = 1278.9 FT " 0 FPS Q50 = 1279.3 FT " 0 FPS Q 100 = 1279.8 FT " 0 FPS						<b>TEMPORARY BRIDGE REQUIREMENTS</b>												
7 - 8	PROJECT NOTES	E-141	REGULATORY SIGN DETAILS	09-20-1995	LONG TERM STREAMBED CHANGES: N/A  IS THE ROADWAY OVERTOPPED BELOW Q100: YES, BOTH APPROACH ROADWAYS FREQUENCY: OVERTOPPED AT AN APPROXIMATE Q1.7 FLOOD EVENT RELIEF ELEVATION: +/- 1277.5 FT DISCHARGE OVER ROAD @ Q100: UNKNOWN						<b>ADDITIONAL INFORMATION</b>												
9 - 10	QUANTITY SHEETS	E-155	WARNING SIGN DETAILS	05-01-2004	<b>LRFR LOAD RATING FACTORS</b>						<b>DESIGN VALUES</b>												
11	BRIDGE QUANTITY SHEET	E-193	PAVEMENT MARKING DETAILS	08-18-1995	TOWN: BROOKFIELD DISTANCE: 180 FT HIGHWAY #: TH 1 STRUCTURE #: N/A CLEAR SPAN: UNKNOWN CLEAR HEIGHT: UNKNOWN YEAR BUILT: UNKNOWN FULL WATERWAY: UNKNOWN STRUCTURE TYPE: CULVERT AT NORTHERN INLET TO LAKE						1. DESIGN LIVE LOAD H12 2. FUTURE PAVEMENT dp: 0.0 INCH 3. ABUTMENT BEARING TO BEARING LENGTH (THREE SPANS) L: 317.00 FT ( 29.33 - 258.34 - 29.33 ) FT 4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS) Δ: --- 5. PRESTRESSING STRAND fy: --- 6. PRESTRESSED CONCRETE STRENGTH f'c: --- 7. PRESTRESSED CONCRETE RELEASE STRENGTH f'ci: --- 8. CONCRETE, HIGH PERFORMANCE CLASS A f'c: --- 9. CONCRETE, HIGH PERFORMANCE CLASS B f'c: 3.5 KSI 10. CONCRETE, CLASS A f'c: 4.0 KSI 11. CONCRETE, CLASS C f'c: 3.0 KSI 12. REINFORCING STEEL fy: 60 KSI 13. STRUCTURAL STEEL AASHTO M270 fy: --- 14. SOIL UNIT WEIGHT γ: 0.135 KCF 15. NOMINAL BEARING RESISTANCE OF SOIL qn: 15.0 KSF 16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD) φ: 0.45 17. NOMINAL BEARING RESISTANCE OF ROCK qn: 44.0 KSF 18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD) φ: 0.45 19. NOMINAL AXIAL PILE RESISTANCE qp: 135.0 KIPS 20. PILE YIELD STRENGTH ASTM A572 fy: 50 KSI 21. PILE SIZE HP 12X74 22. EST. PILE LENGTHS ( TWO SUBSTRUCTURES ) Lp: --- ( ABUTMENT 1 = 51 AND ABUTMENT 2 = N/A ) FT 23. PILE RESISTANCE FACTOR φ: 0.65 24. LATERAL PILE DEFLECTION Δ: --- 25. BASIC WIND SPEED V3s: 90 MPH 26. MINIMUM GROUND SNOW LOAD pg: 0.05 K/FT² 27. SEISMIC DATA PGA: --- Ss: --- S1: ---												
12	CONVENTIONAL SYMBOLOLOGY LEGEND	T-1	TRAFFIC CONTROL GENERAL NOTES	08-06-2012	<b>UPSTREAM STRUCTURE</b>						<b>DOWNSTREAM STRUCTURE</b>												
13	TIE SHEET	T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	08-06-2012	TOWN: BROOKFIELD DISTANCE: 180 FT HIGHWAY #: TH 1 STRUCTURE #: N/A CLEAR SPAN: UNKNOWN CLEAR HEIGHT: UNKNOWN YEAR BUILT: UNKNOWN FULL WATERWAY: UNKNOWN STRUCTURE TYPE: CULVERT AT NORTHERN INLET TO LAKE						TOWN: BROOKFIELD DISTANCE: 180 FT HIGHWAY #: TH 1 STRUCTURE #: N/A CLEAR SPAN: UNKNOWN CLEAR HEIGHT: UNKNOWN YEAR BUILT: UNKNOWN FULL WATERWAY: UNKNOWN STRUCTURE TYPE: SLUICE DAM TO LAKE OUTLET												
14	LAYOUT SHEET	T-17	TRAFFIC CONTROL MISCELLANEOUS DETAILS	08-06-2012	<b>LRFR LOAD RATING FACTORS</b>						<b>PILE DRIVING AND TESTING REQUIREMENTS</b>												
15	PROFILE SHEET	T-24	TRAFFIC CONTROL FOR MAINTENANCE PAVEMENT MARKING OPERATION	08-06-2012	LOADING LEVELS: H-20, HL-93, 3S2, 6 AXLE, 3A. STR., 4A. STR., 5A. SEMI TONNAGE: 20, 36, 36, 66, 30, 34.5, 38 INVENTORY: 1.14, 0.70 POSTING: 1.34, 0.56, 0.95, 0.56, 0.91, 0.81, 0.84 COMMENTS: OPERATING VALUES ARE DEFLECTION (SERVICE) CONTROLLED.						1. NOMINAL PILE DRIVING CAPACITY Rndr: 135.00 KIP 2. PILE TEST RESISTANCE FACTOR φ: 0.65 3. MAXIMUM PILE TIP ELEVATION 1244.00 FT 4. SEE PROJECT NOTES FOR ADDITIONAL PILE FOUNDATION REQUIREMENTS.												
16	UTILITY RELOCATION PLAN	T-28	CONSTRUCTION SIGN DETAILS	08-06-2012	<b>TRAFFIC DATA</b>						<b>TEMPORARY BRIDGE PROFILE ALONG TEMP CL</b>												
17	GUARDRAIL LAYOUT SHEET	T-29	CONSTRUCTION SIGN DETAILS	08-06-2012	YEAR ADT DHV % D % T ADTT 2014 110 10 59 0.6 1 2034 120 10 59 0.8 2 20 year ESAL for flexible pavement from 2014 to 2034 : 7700 40 year ESAL for flexible pavement from 2014 to 2054 : 18200 Design Speed : 15 mph						AS BUILT "REBAR" DETAIL LEVEL I LEVEL II LEVEL III TYPE: TYPE: TYPE: GRADE: GRADE: GRADE: BOTTOM OF BEAMS ELEV. = 0.00 FT												
18 - 19	TIMBER GUARDRAIL DETAILS	T-30	CONSTRUCTION SIGN DETAILS	08-06-2012	<b>STRUCTURES DETAIL SHEETS</b>						<b>PROJECT INFORMATION</b>												
20	TRAFFIC SIGNS AND LINES LAYOUT	T-31	CONSTRUCTION SIGN DETAILS	08-06-2012	SD-501.00 CONCRETE DETAILS AND NOTES 05-07-2010 SD-502.00 CONCRETE DETAILS AND NOTES 10-10-2012 SD-601.00 STRUCTURAL STEEL DETAILS & NOTES 06-04-2010						PROJECT NAME: BROOKFIELD PROJECT NUMBER: BRF FLBR(2) FILE NAME: z12e134bdr_pi.dgn PLOT DATE: 11/7/2013 PROJECT LEADER: JOSH OLUND DRAWN BY: JOSH OLUND DESIGNED BY: JOSH OLUND CHECKED BY: DAVE BURHANS PRELIMINARY INFORMATION SHEET SHEET 2 OF 70												
21	TRAFFIC SIGN SUMMARY SHEET	T-35	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS	08-06-2012	<b>TRAFFIC DATA</b>						<b>TEMPORARY BRIDGE PROFILE ALONG TEMP CL</b>												
22	BORING INFORMATION & LAYOUT SHEET	T-36	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS FOR PAVING	08-06-2012	YEAR ADT DHV % D % T ADTT 2014 110 10 59 0.6 1 2034 120 10 59 0.8 2 20 year ESAL for flexible pavement from 2014 to 2034 : 7700 40 year ESAL for flexible pavement from 2014 to 2054 : 18200 Design Speed : 15 mph						AS BUILT "REBAR" DETAIL LEVEL I LEVEL II LEVEL III TYPE: TYPE: TYPE: GRADE: GRADE: GRADE: BOTTOM OF BEAMS ELEV. = 0.00 FT												
23 - 31	BORING LOGS	T-40	DELINEATORS AND MILEPOSTS	01-02-2013	<b>STRUCTURES DETAIL SHEETS</b>						<b>PROJECT INFORMATION</b>												
32	BRIDGE PLAN AND ELEVATION	T-45	SQUARE TUBE SIGN POST AND ANCHOR	01-02-2013	SD-501.00 CONCRETE DETAILS AND NOTES 05-07-2010 SD-502.00 CONCRETE DETAILS AND NOTES 10-10-2012 SD-601.00 STRUCTURAL STEEL DETAILS & NOTES 06-04-2010						PROJECT NAME: BROOKFIELD PROJECT NUMBER: BRF FLBR(2) FILE NAME: z12e134bdr_pi.dgn PLOT DATE: 11/7/2013 PROJECT LEADER: JOSH OLUND DRAWN BY: JOSH OLUND DESIGNED BY: JOSH OLUND CHECKED BY: DAVE BURHANS PRELIMINARY INFORMATION SHEET SHEET 2 OF 70												

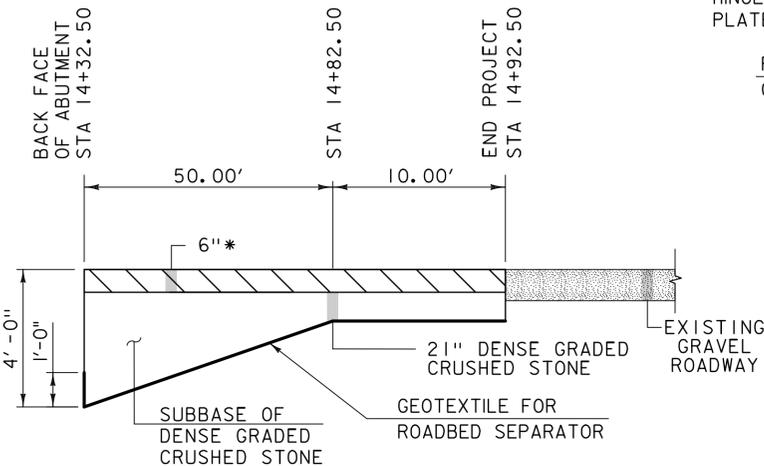
# MATERIAL TOLERANCES

(IF USED ON PROJECT)

MATERIAL ITEM	TOLERANCE
PAVEMENT	± 1/4" TOTAL THICKNESS
AGGREGATE SURFACE COURSE	± 1/2"
BASE COURSE	± 1/2"
SUBBASE	± 1"
SAND BORROW	± 1"
GRANULAR BORROW	± 1"

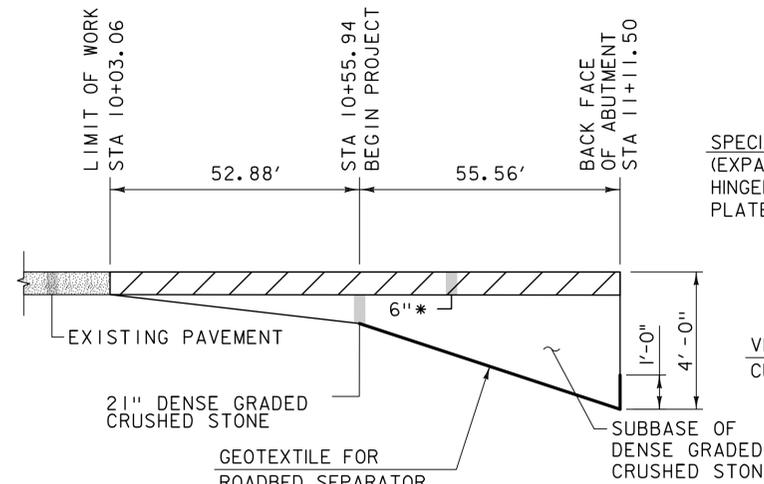
## GENERAL NOTES

1. TACK COAT: EMULSIFIED ASPHALT IS TO BE APPLIED AT A MINIMUM RATE OF 0.025 GAL/SY BETWEEN EACH LIFT OF BITUMINOUS CONCRETE PAVEMENT OR AS SPECIFIED BY THE ENGINEER.



### SUBBASE TAPER - EAST

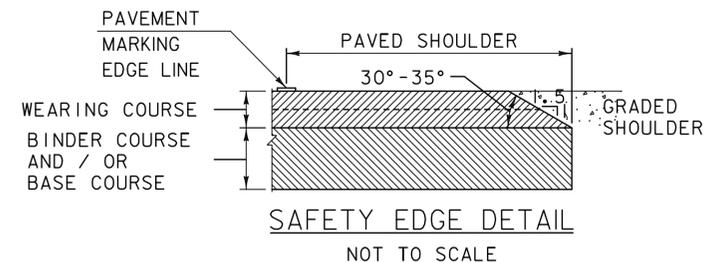
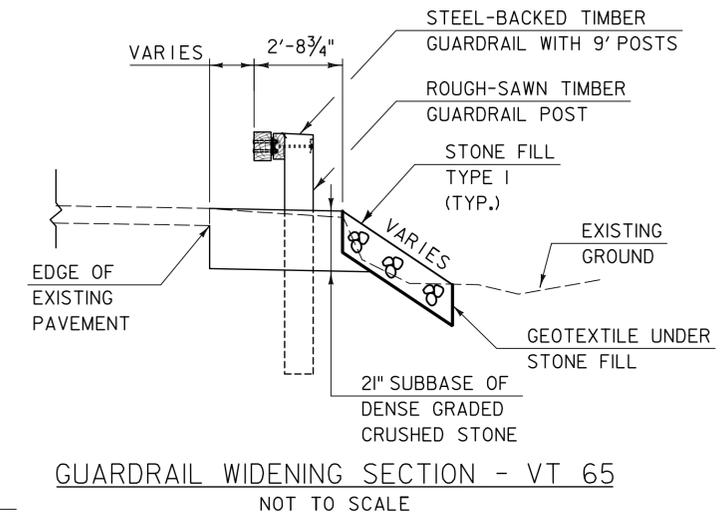
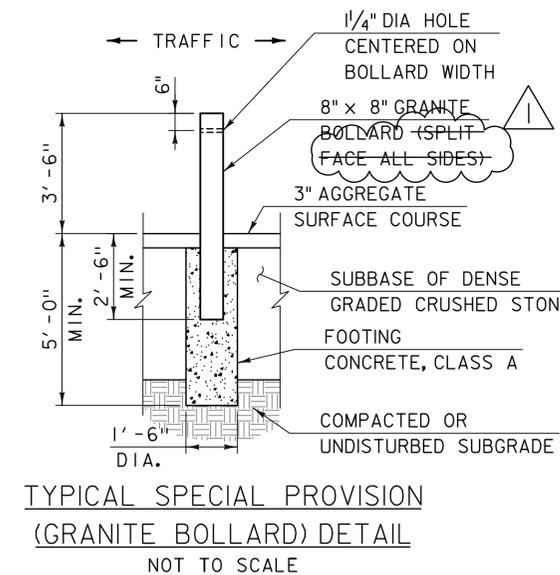
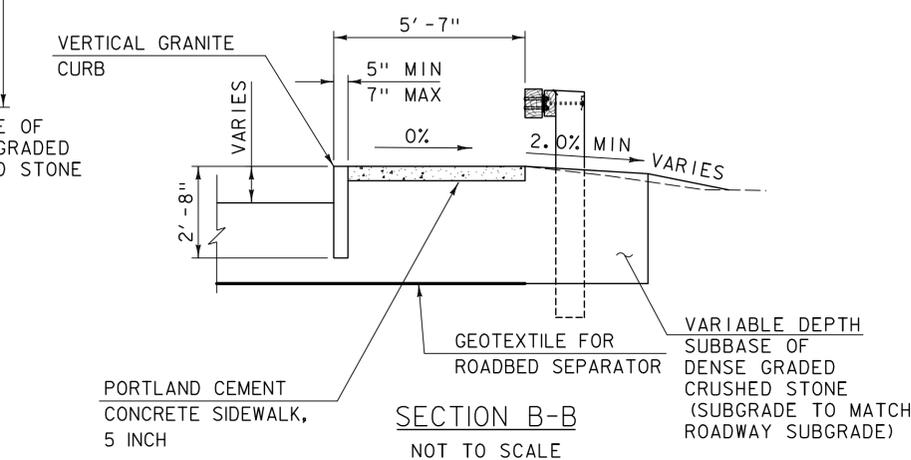
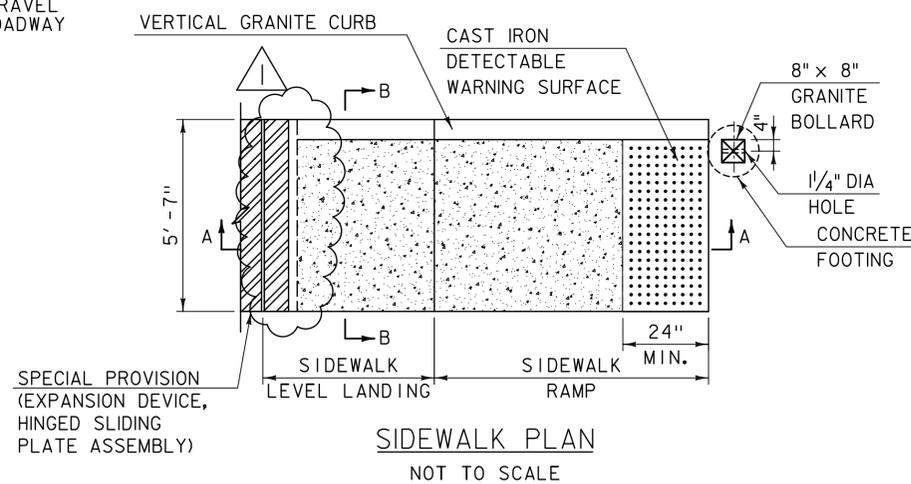
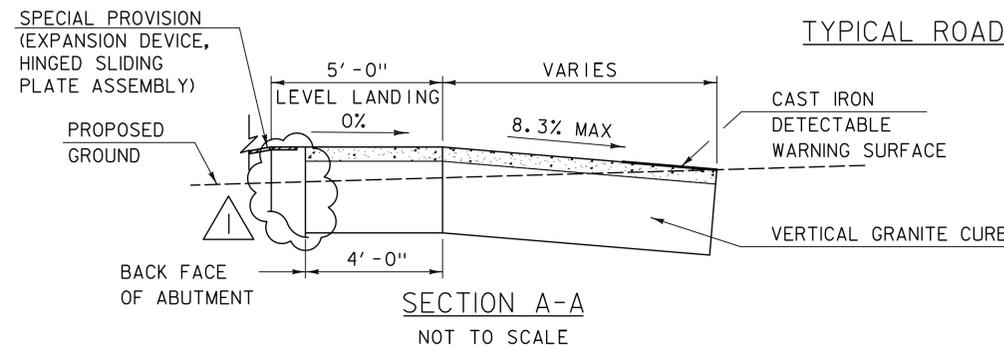
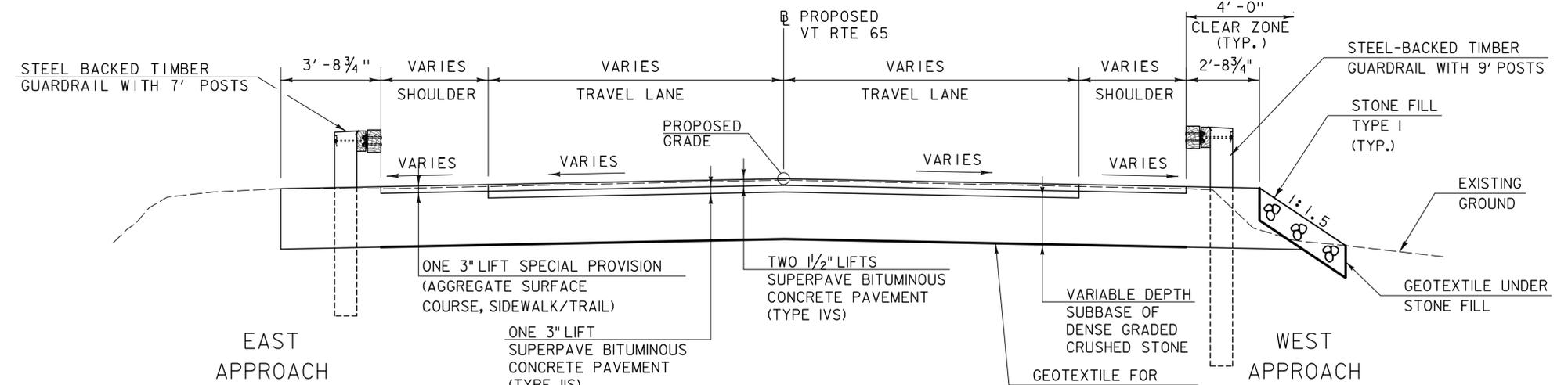
ALONG BASELINE NOT TO SCALE



### SUBBASE TAPER - WEST

ALONG BASELINE NOT TO SCALE

\* TWO 1 1/2" LIFTS BITUMINOUS CONCRETE PAVEMENT (TYPE IVS) OVER ONE 3" LIFT BITUMINOUS CONCRETE PAVEMENT (TYPE IIS)



- NOTES:
1. LEVELING COURSE SHALL INCLUDE THE "SAFETY EDGE" DEVICE OF THE CONTRACTOR'S CHOICE.
  2. THE EDGE OF PAVEMENT SHALL BE FORMED IN SUCH A WAY THAT BITUMINOUS CONCRETE PAVEMENT IS EXTRUDED OR COMPRESSED TO FORM THE 30 TO 35 DEGREE ANGLE. DEVICES THAT SIMPLY STRIKE-OFF THE MIX WITHOUT PROVIDING ANY COMPACTIVE EFFORT WILL NOT BE ALLOWED.

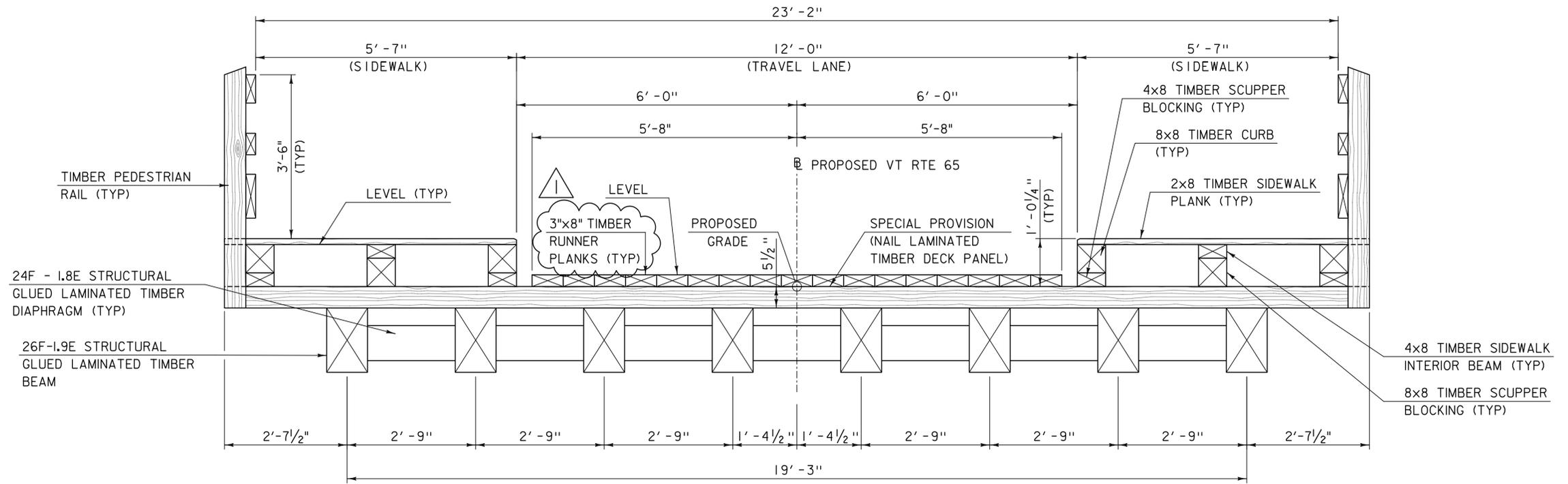
REVISION	DESCRIPTION	DATE
REVISION #1	HINGE PLATE & BOLLARD CHANGES	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

TYLIN INTERNATIONAL

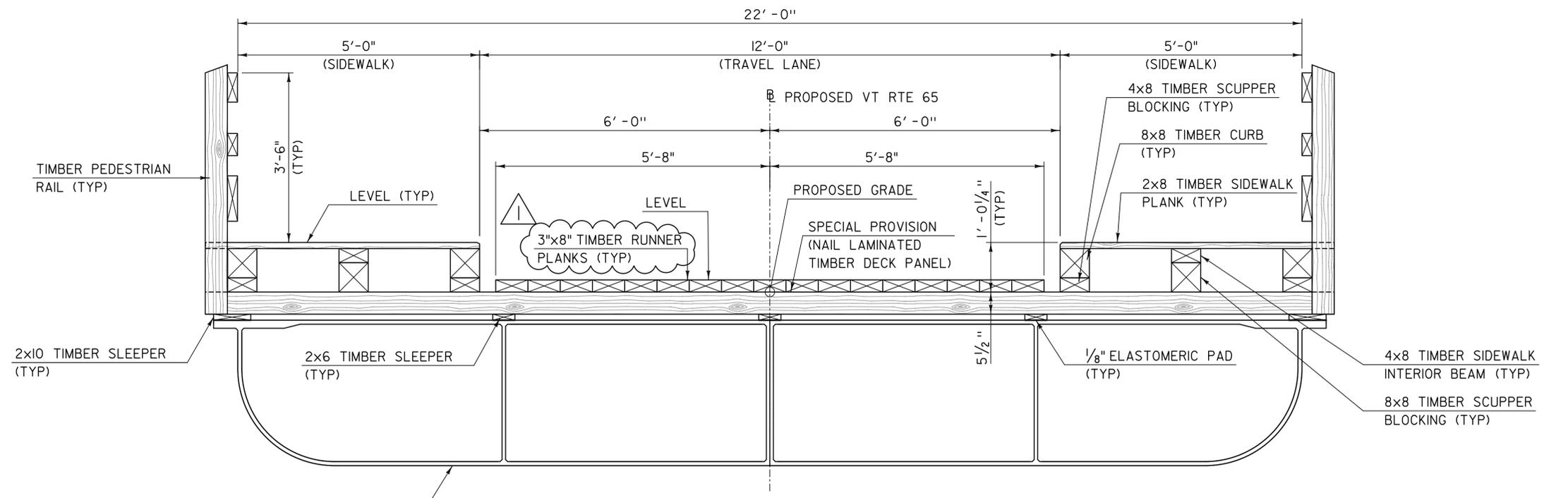
FILE NAME: z12e134bdr\_typ.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: D. BURHANS  
ROADWAY TYPICAL SECTIONS

PLOT DATE: 2/5/2014  
DRAWN BY: D. BURHANS  
CHECKED BY: D. BRYANT  
SHEET 3 OF 70



**ARTICULATING RAMP TYPICAL SECTION**

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



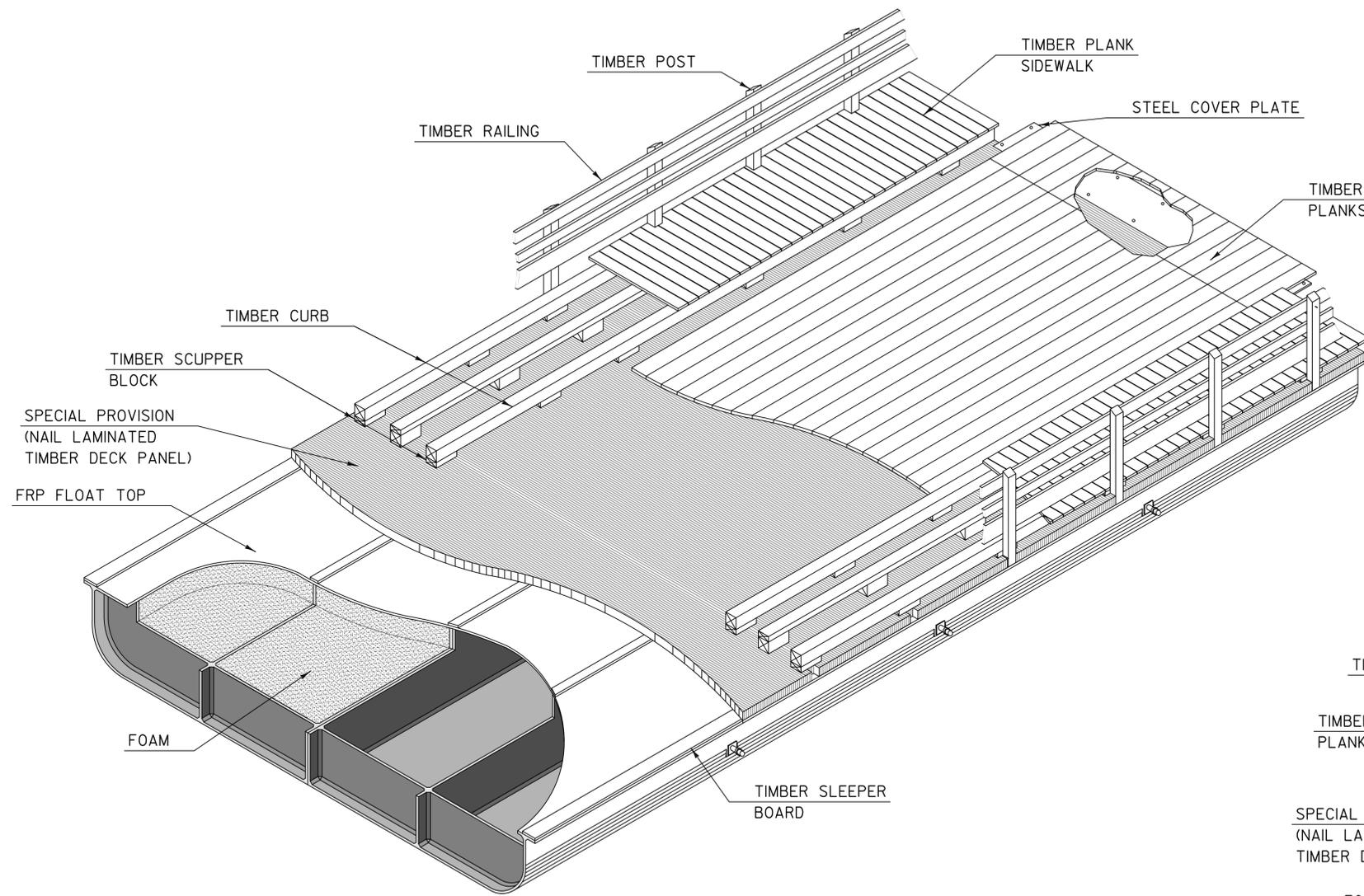
**FLOATING SPAN TYPICAL SECTION**

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

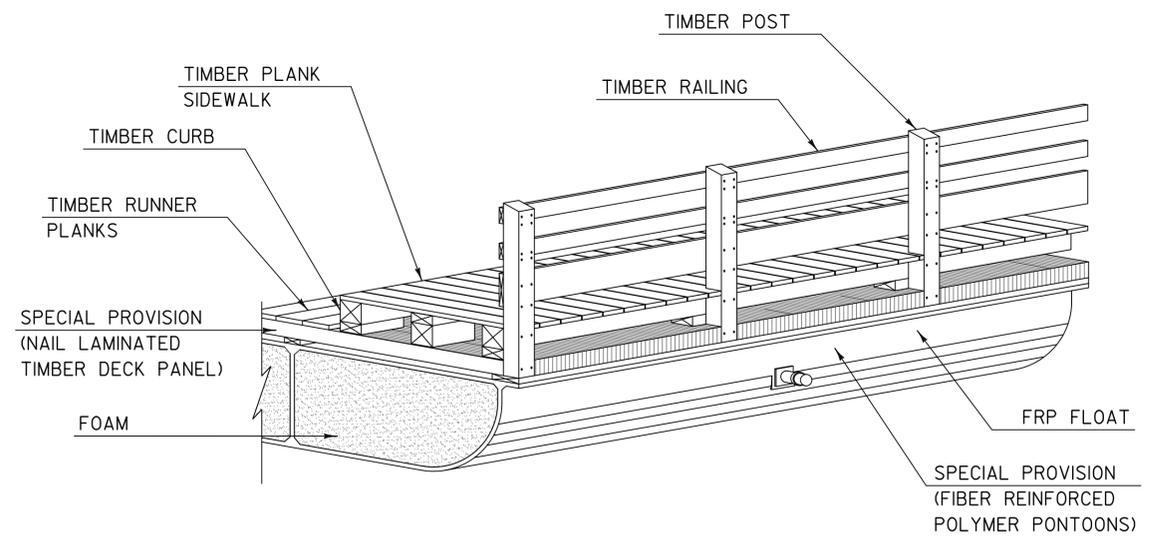
REVISION	DESCRIPTION	DATE
REVISION #1	RUNNER PLANK THICKNESS CHANGE	2/4/2014

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRF FLBR(2)

**TYLIN** INTERNATIONAL  
 FILE NAME: z12e134bdr\_brdge.typ.dgn  
 PROJECT LEADER: J. OLUND  
 DESIGNED BY: T. POULIN  
 BRIDGE TYPICAL SECTIONS  
 PLOT DATE: 2/5/2014  
 DRAWN BY: S. MORGAN  
 CHECKED BY: J. OLUND  
 SHEET 4 OF 70



FLOAT ISOMETRIC  
NOT TO SCALE



FLOAT ISOMETRIC - CURB SECTION  
NOT TO SCALE

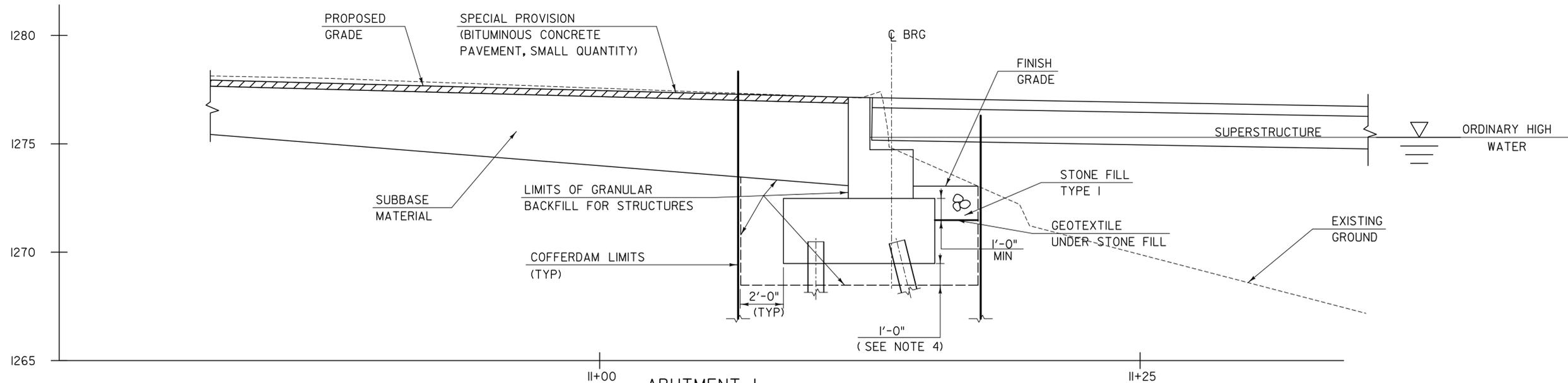
NOTE: ISOMETRIC DRAWINGS ARE GRAPHICAL REPRESENTATIONS ONLY.

TYLIN INTERNATIONAL

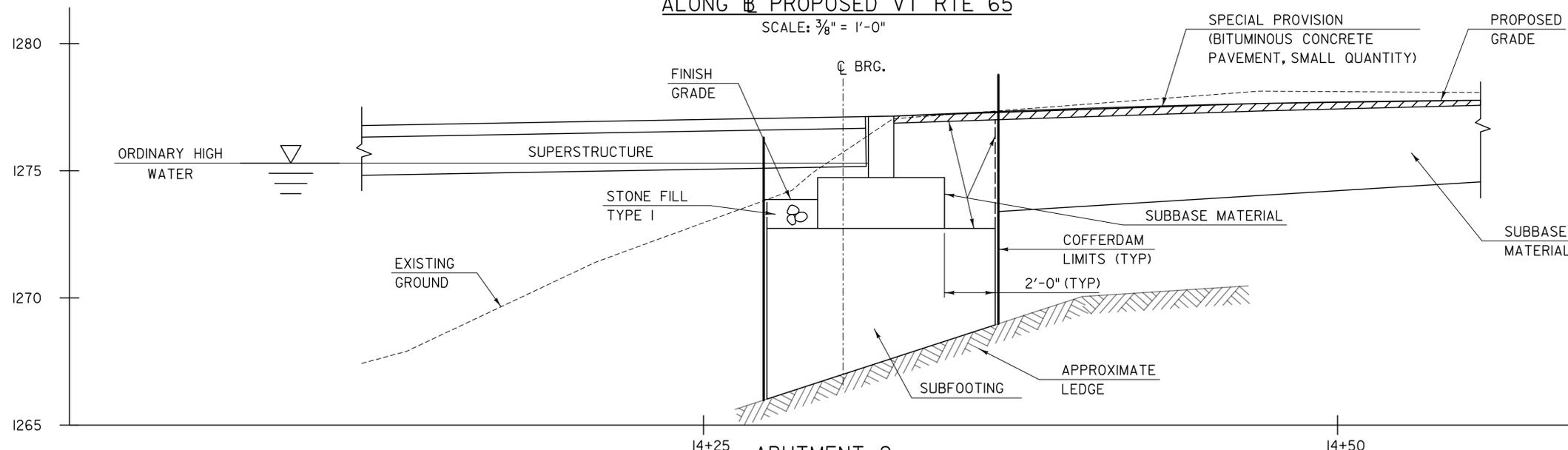
PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

FILE NAME: z12e134bdrfrp\_iso.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: T. POULIN  
ISOMETRIC VIEWS

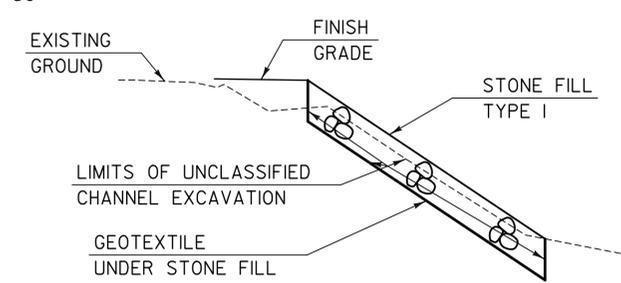
PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: J. OLUND  
SHEET 5 OF 70



**ABUTMENT 1**  
**COFFERDAM AND EARTHWORK SECTION**  
**ALONG PROPOSED VT RTE 65**  
 SCALE: 3/8" = 1'-0"



**ABUTMENT 2**  
**COFFERDAM AND EARTHWORK SECTION**  
**ALONG PROPOSED VT RTE 65**  
 SCALE: 3/8" = 1'-0"



**LAKE SHORE EARTHWORK DETAIL**  
 (NOT TO SCALE)

**NOTES:**

1. COFFERDAM DIMENSIONS TO BE DETERMINED BY THE CONTRACTOR.
2. THE PAY LIMITS OF EITHER "COFFERDAM EXCAVATION, EARTH" OR "COFFERDAM EXCAVATION, ROCK" SHALL BE 2'-0" OUTSIDE THE PERIMETER OF THE FOOTING AND FROM BOTTOM OF EXCAVATION UP TO THE EXISTING GROUND OR BOTTOM OF SUBBASE, WHICHEVER IS LOWER.
3. IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN THE INDICATED COFFERDAM EXCAVATION PAY LIMITS, PAYMENT FOR ALL UNCLASSIFIED CHANNEL EXCAVATION, INCLUDING THAT PORTION WHICH IS INSIDE THE COFFERDAM BUT OUTSIDE THE COFFERDAM PAY LIMITS, WILL BE MADE AT THE CONTRACT UNIT PRICE FOR UNCLASSIFIED CHANNEL EXCAVATION. NO MEASUREMENT AND PAYMENT WILL BE MADE FOR COFFERDAM EXCAVATION AND GRANULAR BACKFILL FOR STRUCTURES OUTSIDE THE PAY LIMITS DEFINED IN NOTE 2.
4. USE A 12" UNDERCUT, IF DETERMINED NECESSARY BY ENGINEER.

**TYLIN**INTERNATIONAL

PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
PROJECT NUMBER: BRFLBR(2)	DRAWN BY: B. CARTER
FILE NAME: z12e134bdearthtyp.dgn	CHECKED BY: R. HEBERT
PROJECT LEADER: J. OLUND	SHEET 6 OF 70
DESIGNED BY: J. OLUND	
EARTHWORK TYPICAL SECTIONS	

**GENERAL**

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2011, WITH ITS LATEST REVISIONS AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION WITH INTERIMS THROUGH 2012.
2. THE EXISTING BRIDGE IS CLOSED TO ALL TRAFFIC DUE TO INADEQUATE LOAD CAPACITY AND OTHER DEFICIENCIES. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE AND ITS OFFICERS AND EMPLOYEES HARMLESS REGARDING THE CONTRACTOR'S USE OF THE EXISTING BRIDGE FOR TRANSPORTING VEHICLES, MATERIALS, OR PEOPLE ACROSS THE LAKE.
3. THE EXISTING TIMBER BRIDGE RAILINGS (POSTS AND RAILS) SHALL BE CAREFULLY REMOVED WITHOUT DAMAGE AND DELIVERED TO THE BROOKFIELD TOWN GARAGE AT 866 VT ROUTE 65. THE REMAINING COMPONENTS OF THE EXISTING BRIDGE, INCLUDING BUT NOT LIMITED TO THE FLOATING SPAN, APPROACH RAMPS, ABUTMENTS, TIE-BACK ANCHORS, AND GRANITE BLOCKS EXTENDING FROM THE ABUTMENTS, SHALL BE REMOVED IN ITS ENTIRETY AND BECOME THE PROPERTY OF THE CONTRACTOR. PAYMENT SHALL BE MADE UNDER ITEM 529.15, "REMOVAL OF STRUCTURE".
4. NO BURNING OF REMOVED MATERIALS AT THE PROJECT SITE WILL BE ALLOWED. THE EXISTING BRIDGE LUMBER MAY CONTAIN HAZARDOUS WOOD PRESERVATIVES. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE AND ITS OFFICERS AND EMPLOYEES HARMLESS REGARDING THE CONTRACTOR'S HANDLING OF THESE MATERIALS AND SUBSEQUENT USE, RE-USE, OR DISPOSAL OF THESE MATERIALS.
5. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AT 50°F AND AT LAKE ELEVATION 1274.7 FT, UNLESS NOTED OTHERWISE.
6. THE CONTRACTOR IS NOTIFIED THAT AN EXISTING DRY HYDRANT IS LOCATED WITHIN THE PROJECT LIMITS. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
7. NO PROVISIONS HAVE BEEN MADE FOR THE CONTRACTOR TO PERFORM WORK OR SET UP STAGING OUTSIDE THE EXISTING RIGHT-OF-WAY. SHOULD THE CONTRACTOR REQUIRE ANY ADDITIONAL RIGHT-OF-WAY, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL EASEMENTS AND BEAR THE COSTS OF SUCH EASEMENTS WITHOUT FURTHER COMPENSATION.

**TRAFFIC MAINTENANCE DURING CONSTRUCTION**

8. BRIDGE NO. 2 SHALL REMAIN CLOSED TO ALL TRAFFIC FOR THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL DEVELOP, SUBMIT TO THE ENGINEER FOR APPROVAL, AND IMPLEMENT A ROAD CLOSURE AND TRAFFIC CONTROL PLAN IN ACCORDANCE WITH SECTION 641. EXISTING CLOSURE SIGNAGE AND BARRICADES MAY REMAIN IN PLACE AND BE USED BY THE CONTRACTOR FOR THE DURATION OF THE PROJECT. EXISTING SIGNS AND BARRICADES SHALL REMAIN THE PROPERTY OF THE STATE AND SHALL BE DELIVERED TO THE MAINTENANCE GARAGE IN WILLIAMSTOWN WHEN NO LONGER NEEDED. THE COST OF REMOVING AND DELIVERING EXISTING BARRIERS AND SIGNS SHALL BE INCLUDED IN ITEM 641.10, "TRAFFIC CONTROL."
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING THE JOB SITE FROM VEHICULAR, BOAT, AND PEDESTRIAN TRAFFIC WHILE SIMULTANEOUSLY MAINTAINING ACCESS TO ALL ADJACENT DRIVES AND THE TOWN OWNED/OPERATED DRY HYDRANT ON THE SOUTHEAST CORNER OF THE BRIDGE. ALL COSTS ASSOCIATED WITH CREATING A TRAFFIC CONTROL PLAN AND FURNISHING, MAINTAINING, AND REMOVING TRAFFIC CONTROL SIGNS AND DEVICES NEEDED FOR SUCCESSFUL IMPLEMENTATION OF THIS PLAN WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 641.10, "TRAFFIC CONTROL."
10. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND THE "STANDARD HIGHWAY SIGNS AND MARKINGS" BOOK.

**EARTHWORK AND RELATED ITEMS**

11. ITEM "STONE FILL, TYPE I" UNDER THE BRIDGE AS SHOWN IN THE PLANS SHALL BE PLACED BEFORE THE SUPERSTRUCTURE RAMPS ARE SET.
12. TEMPORARY CONSTRUCTION FILLS USED FOR ANY PURPOSE WITHIN THE LAKE SHALL CONSIST OF CLEAN STONE FILL ONLY. NO TEMPORARY FILLING IN THE LAKE SHALL OCCUR WITHOUT THE APPROVAL OF THE LAKES AND PONDS ENGINEER.

**CONCRETE**

13. ALL SUBSTRUCTURE CONCRETE ABOVE THE SUB-FOOTING SHALL BE HIGH PERFORMANCE, CLASS B.
14. SUBFOOTING CONCRETE SHALL BE CLASS C.
15. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES.

16. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE "CONCRETE REINFORCING STEEL INSTITUTE".
17. ALL REINFORCING STEEL SHALL BE LEVEL I, EPOXY COATED IN ACCORDANCE WITH SECTION 507 OF THE GENERAL SPECIAL PROVISIONS. MINIMUM CLEAR COVER SHALL BE 3.0 INCHES, UNLESS NOTED OTHERWISE.
18. ALL HORIZONTAL CONSTRUCTION JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STRUCTURES DETAIL SHEET SD-502.00.

**PILE FOUNDATIONS**

19. THE PILES SHALL BE HP 12 X 74.
20. PILE SHOES ARE REQUIRED AND SHALL CONFORM TO SUBSECTION 505.04(F) OF THE STANDARD SPECIFICATIONS.
21. THE PILES SHALL BE DRIVEN TO A NOMINAL RESISTANCE OF 135 KIPS AS DETERMINED BY THE RESULTS OF DYNAMIC TESTING, AS INTERPRETED BY THE ENGINEER.
22. FOR ESTIMATING PURPOSES, THE PILE TIP ELEVATIONS WERE ASSUMED TO EXTEND 50 FEET BELOW THE BOTTOM OF THE FOOTING. THE ACTUAL LENGTHS MAY VARY.
23. TO ENSURE THAT THE NOMINAL RESISTANCE HAS BEEN ATTAINED AND TO PREVENT THE OVERSTRESSING OF THE PILES DURING DRIVING OPERATIONS, DYNAMIC TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SUBSECTION 505.04(d)-2 OF THE STANDARD SPECIFICATIONS. A PILE TEST SHALL BE CONDUCTED ON THE FIRST PLUMB PILE AND FIRST BATTERED PILE DRIVEN AT ABUTMENT NO. 1 (TWO TOTAL TESTS). MORE TESTS MAY BE REQUIRED BY THE ENGINEER.

**FOOTINGS ON BEDROCK**

24. FOOTINGS AND/OR SUBFOOTINGS FOR SUBSTRUCTURES FOUNDED ON BEDROCK SHALL BE PLACED ON CLEAN COMPETENT ROCK. ALL LOOSE ROCK AND DEBRIS SHALL BE REMOVED.
25. ONCE THE ELEVATION OF COMPETENT BEDROCK HAS BEEN DETERMINED, THE CONTRACTOR SHALL PROVIDE A BEDROCK PROFILE TO THE ENGINEER FOR PREPARATION OF AS-BUILT DRAWINGS. FOOTING ELEVATIONS SHALL NOT BE ADJUSTED WITHOUT APPROVAL OF THE ENGINEER.
26. THE LIMITS OF THE SUBFOOTING SHALL BE 2 FT OUTSIDE OF THE HORIZONTAL LIMITS OF THE FOOTING. THE TOP SURFACE OF THE SUBFOOTING SHALL BE INTENTIONALLY ROUGHENED TO 0.25 IN AMPLITUDE.
27. ANY CONCRETE REQUIRED FOR SUBFOOTINGS SHALL BE PAID FOR WITH ITEM 541.30, "CONCRETE, CLASS C." AN ESTIMATED QUANTITY OF ITEM 541.30 HAS BEEN INCLUDED IN THE CONTRACT.
28. ANY BEDROCK THAT NEEDS TO BE REMOVED SHALL BE PAID FOR UNDER ITEM 208.35, "COFFERDAM EXCAVATION, ROCK." OVER-BREAKAGE BEYOND THE AVERAGE MAXIMUM ALLOWANCE SPECIFIED IN SUBSECTIONS 204.09 (B) (1) AND 208.11 (C) WILL BE AT THE CONTRACTOR'S EXPENSE.
29. DOWELS SHALL BE DRILLED AND GROUTED INTO BEDROCK WHEN THE SLOPE IS AT OR GREATER THAN 10 DEGREES FROM HORIZONTAL. THE DOWELS SHALL HAVE A 2 FT MINIMUM EMBEDMENT INTO THE BEDROCK AND SHALL EXTEND INTO THE SUBFOOTING A MINIMUM OF 1.5 FT.

**BEARING NOTES**

30. ALL STEEL PLATES, BARS, SHAPES, AND HARDWARE SHALL BE STAINLESS STEEL CONFORMING TO THE REQUIREMENTS OF "SPECIAL PROVISION (BEARING DEVICE ASSEMBLY, FLOATING BRIDGE)".
31. BOLTS USED TO CONNECT BEARINGS TO THE STAINLESS STEEL SHELF SHALL BE TIGHTENED TO A TORQUE OF 190 FT\*LB. THREADS OF BOLTS SHALL BE EXCLUDED FROM THE THICKNESS OF CONNECTED MATERIAL.

**FIBER REINFORCED POLYMER (FRP) NOTES**

32. FRP PONTOON DETAILS DEPICTED THROUGHOUT THIS PLAN SET ARE CONCEPTUAL. THE FABRICATOR SHALL PROVIDE DESIGNS FOR THE FRP COMPONENTS IN ACCORDANCE WITH THESE PLANS AND THE SPECIAL PROVISIONS. THE FABRICATOR MAY ALTER THE DETAILS NOTED IN THESE PLANS TO ACCOMMODATE THEIR SPECIFIC OPERATION. CHANGES TO FRP PONTOON DETAILS NOTED IN THIS PLAN SET MAY REQUIRE CHANGES TO TIMBER DECK CONNECTIONS, FIELD SPLICE CONNECTIONS, AND RAMP BEARING CONNECTIONS, AMONG OTHER ASPECTS. DESIGN AND DETAILING OF SUCH CHANGES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL, AND SHALL BE SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT, WHERE APPROPRIATE.
33. ALL INSIDE CORNERS/EDGES SHALL BE CHAMFERED OR FILLETED 1/2 INCH. ALL EXTERIOR EDGES SHALL BE CHAMFERED OR FILLETED 1/4 INCH.
34. HEAVY CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE SHALL BE PROHIBITED FROM DIRECT CONTACT WITH THE TOP SURFACE OF THE FRP RAFTS. ONLY FOOT TRAFFIC AND TOOLS NECESSARY FOR INSTALLATION OF THE FRP PONTOONS WILL BE ALLOWED TO BEAR DIRECTLY ON THE RAFTS. THE PROPOSED TIMBER DECK SHALL BE INSTALLED PRIOR TO ALLOWING CONSTRUCTION EQUIPMENT ON THE FRP RAFTS.

**FASTENERS FOR FIBER REINFORCED POLYMER**

35. THREADS OF BOLTS SHALL BE EXCLUDED FROM THE THICKNESS OF THE CONNECTED MATERIAL.
36. HOLES IN THE FRP MEMBERS FOR FIELD SPLICE AND STAINLESS STEEL SHELF INSTALLATION SHALL BE LOCATED IN ACCORDANCE WITH THESE PLANS AND THROUGH USE OF THE STEEL PLATES AS A TEMPLATE.
37. BOLTS USED IN THE INSTALLATION OF STEEL FIELD SPLICES SHALL BE TIGHTENED TO A TORQUE OF 300 FT\*LB AND FASTENED WITH TWO WASHERS AND A DOUBLE NUT. BOLTS USED IN THE INSTALLATION OF STAINLESS STEEL SHELVES SHALL BE TIGHTENED TO A TORQUE OF 190 FT\*LB AND FASTENED WITH TWO WASHERS AND A DOUBLE NUT.
38. HOLES IN THE FRP MEMBERS FOR NAIL LAMINATED TIMBER DECK PANEL ATTACHMENT SHALL BE FIELD DRILLED USING THE DECK PANELS AS A TEMPLATE. COSTS ASSOCIATED WITH DRILLING AND INSTALLING HARDWARE NEEDED FOR ATTACHING THE DECK PANELS TO THE FRP PONTOONS SHALL BE INCLUDED IN ITEM 900.670, "SPECIAL PROVISION (NAIL LAMINATED TIMBER DECK PANEL)." HOLE DRILLING FOR DECK PANEL INSTALLATION SHALL BEGIN AT THE MIDDLE OF EACH RAFT AND PROGRESS OUTWARD TOWARD THE RAFT ENDS.
39. BOLTS USED IN THE ATTACHMENT OF NAIL LAMINATED TIMBER DECK PANELS SHALL BE TIGHTENED TO A TORQUE OF 15 FT\*LB AND FASTENED WITH TWO WASHERS AND A DOUBLE NUT.

**FASTENERS FOR TIMBER**

40. ALL FASTENERS AND ASSOCIATED HARDWARE IN CONTACT WITH TYPE V PRESERVATIVE (ALKALINE COPPER QUATERNARY) SHALL BE STAINLESS STEEL. STAINLESS STEEL BOLTS AND SCREWS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593, ALLOY GROUP 1, 2, OR 3, CONDITION CW, WITH A MINIMUM YIELD STRENGTH OF 43 KSI.
41. ALL OTHER FASTENERS AND ASSOCIATED HARDWARE FOR TIMBER CONSTRUCTION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SUBSECTIONS 709.01(h) AND 709.03(d), UNLESS NOTED OTHERWISE.
42. WITH THE EXCEPTION OF CARRIAGE BOLT HEADS AND UNLESS NOTED OTHERWISE, WASHERS SHALL BE PROVIDED UNDER ALL BOLT HEADS AND NUTS.
43. ANY UNUSED HOLES IN THE FINAL, AS BUILT CONDITION SHALL BE FILLED WITH A TIGHT FITTING FULL WIDTH WOODEN PEG.
44. AFTER BOLT INSTALLATION, ALL RESULTING CAVITIES OF PRE-BORED, COUNTERSUNK, VERTICALLY INSTALLED BOLTS SHALL BE FILLED WITH HOT POURED JOINT SEALER. THE COST FOR THIS WORK SHALL BE PAID UNDER RELATED CONTRACT ITEMS.
45. THREADED RODS SHALL BE ASTM A615, GRADE 75. ASSOCIATED NUTS SHALL BE IN ACCORDANCE WITH ASTM A108 AND WASHERS SHALL BE IN ACCORDANCE WITH ASTM F436. BEARING PLATE ASSEMBLIES SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 36. ALL COMPONENTS OF THE THREADED ROD AND CROSS BRACE ASSEMBLY SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M 111 OR AASHTO M 232, AS APPLICABLE.

REVISION	DESCRIPTION	DATE
REVISION #1	REVISED NOTES	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

<b>TYLIN</b> INTERNATIONAL	FILE NAME: z12e134bdrnotes.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: J. OLUND	CHECKED BY: D. MYERS
	PROJECT NOTES 1	SHEET 7 OF 70

46. PROPOSED THREADED ROD TENSIONING SEQUENCE FOR RODS PASSING THROUGH GLUED LAMINATED GIRDERS AND DIAPHRAGMS:

- INITIALLY TENSION RODS TO 15 KIPS
- RE-TENSION TO 15 KIPS 1 WEEK AFTER THE INITIAL STRESSING
- RE-TENSION TO 15 KIPS 4-6 WEEKS AFTER THE SECOND STRESSING

47. CROSS BRACE THREADED RODS PASSING BENEATH THE GLUED LAMINATED GIRDERS SHALL BE WRENCH TIGHTENED UPON COMPLETION OF THE DIAPHRAGM THREADED ROD TENSIONING SEQUENCE.

48. ALL COMPONENTS OF THE THREADED ROD AND CROSS BRACE ASSEMBLY SHALL BE PAID UNDER ITEM 522.40, "STRUCTURAL GLUED LAMINATED TIMBER".

**TIMBER NOTES**

49. ALL TIMBER CONSTRUCTION SHALL COMPLY WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION WITH INTERIMS THROUGH 2012, THE NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION 2005 AND ITS LATEST REVISIONS, AND THE LATEST EDITION OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC) SPECIFICATION.

50. ALL TIMBER SHALL BE GRADED BY A RECOGNIZED GRADING AGENCY AND, WHERE APPLICABLE, THE REQUIREMENTS OF THE SOUTHERN PINE INSPECTION BUREAU (SPIB). INDIVIDUAL BOARDS SHALL NOT BE STAMPED WITH A GRADE STAMP AND MATERIAL CERTIFICATIONS SHALL BE SUBMITTED FOR ALL TIMBER IN ACCORDANCE WITH SECTION 709.

51. UNLESS NOTED OTHERWISE, ALL SAWN TIMBER INCORPORATED IN THE PROJECT SHALL MEET THE REQUIREMENTS OF SUBSECTION 709.01, "STRUCTURAL LUMBER AND TIMBER" OF THE STANDARD SPECIFICATIONS AND THE FOLLOWING:

- WEARING SURFACE: WHITE OAK, NO. 1 GRADE, FULL SAWN
- ALL OTHER: SOUTHERN YELLOW PINE, NO. 1 GRADE, DRESSED (SURFACED FOUR SIDES)

52. GLUED LAMINATED TIMBER BEAMS AND DIAPHRAGMS SHALL MEET THE REQUIREMENTS OF SUBSECTION 709.03, "STRUCTURAL GLUED LAMINATED TIMBER" OF THE STANDARD SPECIFICATIONS AND SHALL BE COMPRISED OF SOUTHERN PINE. GLUED LAMINATED TIMBER BEAMS SHALL MEET THE DESIGN VALUES FOR AASHTO COMBINATION SYMBOL 26F-1.9E. GLUED LAMINATED TIMBER DIAPHRAGMS SHALL MEET THE DESIGN VALUES FOR AASHTO COMBINATION SYMBOL 24F-1.8E.

53. PRESERVATIVE TREATMENT FOR TIMBER SHALL BE AS FOLLOWS:

- NAIL LAMINATED TIMBER DECK PANELS: PRESERVATIVE TYPE II OR TYPE III (SEE NEXT NOTE)
- GLUED LAMINATED TIMBER: PRESERVATIVE TYPE II
- WEARING SURFACE: NO TREATMENT
- ALL OTHER: PRESERVATIVE TYPE V

INCISING WILL NOT BE ALLOWED.

54. THE FABRICATOR MAY USE PRESERVATIVE TYPE II OR III (PENTACHLOROPHENOL TYPE A OR TYPE C) TO TREAT THE NAIL LAMINATED TIMBER DECK PANELS. IF PRESERVATIVE TYPE II IS SELECTED, EXPANSION BATH AND STEAM CLEANING POST TREATMENT OPERATIONS SHALL BE INCORPORATED. IF PRESERVATIVE TYPE III IS SELECTED, POST TREATMENT NEED ONLY INCLUDE EXPANSION BATH OPERATIONS.

55. ALL TREATED WOOD PRODUCTS IN THIS PROJECT SHALL BE PRODUCED IN COMPLIANCE WITH THE "BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC AND WETLAND ENVIRONMENTS" (BMPS) PUBLISHED BY THE WESTERN WOOD PRESERVERS INSTITUTE (WWW.WWPINSTITUTE.ORG), NOVEMBER 1, 2011 OR THE MOST CURRENT VERSION INCLUDING PUBLISHED AMENDMENTS.

56. ALL "STRUCTURAL LUMBER AND TIMBER, TREATED" SHALL BE CUT AND DRILLED TO THE APPROPRIATE GEOMETRIES PROVIDED IN THE PLANS AND SPECIFICATIONS PRIOR TO TREATMENT. FIELD CUTTING AND/OR DRILLING WILL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL BY THE ENGINEER ON A CASE-BY-CASE BASIS. DAMAGE TO TREATED TIMBERS CAUSED BY FABRICATION, HANDLING, OR CONSTRUCTION MAY BE CAUSE FOR REJECTION. WHERE FIELD CUTTING OR DRILLING IS ALLOWED BY THE ENGINEER, THE FRESHLY EXPOSED SURFACE SHALL BE TREATED WITH TWO COATS OF COPPER NAPHTHENATE SOLUTION, LIBERALLY APPLIED IN ACCORDANCE WITH SUBSECTION 522.13C OF THE STANDARD SPECIFICATIONS.

57. ONLY MATURE WOOD SHALL BE USED FOR STRUCTURAL APPLICATIONS; JUVENILE WOOD WILL NOT BE ALLOWED. "MATURE" AND "JUVENILE" WOOD DEFINITIONS SHALL BE IN ACCORDANCE WITH THE "WOOD HANDBOOK: WOOD AS AN ENGINEERING MATERIAL" PUBLISHED BY THE FOREST PRODUCTS LABORATORY AND AVAILABLE AT WWW.PFL.FS.FED.US.

58. THE FOLLOWING MATERIALS WILL BE RANDOMLY SELECTED, FROM THE PROJECT, BY THE VTRANS MATERIALS AND RESEARCH SECTION FOR PHYSICAL AND CHEMICAL TESTING. THESE QUANTITIES SHALL BE ADDED TO THE PROJECT QUANTITIES SHOWN IN THE PLANS. PAYMENT SHALL BE INCIDENTAL TO RELATED CONTRACT ITEMS.

- A. STEEL BACKED TIMBER GUARDRAIL
  - 2 - 6x10x10 FT RAIL SECTIONS
- B. CURB AND SIDEWALK TIMBER
  - 2 - 8x8x6 FT CURB SECTIONS
  - 2 - 2x8x5.67 FT SIDEWALK PLANKS
  - 2 - 4x8x1.5 FT SIDEWALK STIFFENER SECTIONS
- C. TIMBER PEDESTRIAN RAILING, BRIDGE
  - 2 - 3x8x6 FT RAIL SECTIONS
  - 2 - 3x6x6 FT RAIL SECTIONS
  - 2 - 3x12x6 FT RAIL SECTIONS
  - 2 - 6x6x5 FT RAIL POSTS
- D. TIMBER DECK
  - 2 - 3x8x8 FT RUNNER PLANKS
  - 2 - 2x6x8 FT DECK PLANK LAMINATES

59. NO TIMBER SPECIES SUBSTITUTIONS WILL BE ALLOWED.

**MATERIALS FOR STRUCTURAL LUMBER AND TIMBER**

MEMBER TYPE	MEMBER SIZE (SEE NOTE 51)	QUANTITY (MFBM)	PAY ITEM FOR MEMBER TYPE
RUNNER PLANKS	3"x8"	9.84	522.20 - STRUCTURAL LUMBER AND TIMBER, UNTREATED
RUNNER PLANKS AT STEEL COVER PLATES	2"x8"	0.31	522.20 - STRUCTURAL LUMBER AND TIMBER, UNTREATED
RUNNER PLANKS - TRANSVERSE SPACERS AT STEEL COVER PLATES	1"x6"	0.05	522.20 - STRUCTURAL LUMBER AND TIMBER, UNTREATED
SCUPPER BLOCKING (CURB)	4x8	0.93	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
CURB	8x8	6.85	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
SCUPPER BLOCKING (SIDEWALK INTERIOR BEAM)	8x8	0.62	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
SIDEWALK INTERIOR BEAM	4x8	1.71	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
SIDEWALK PLANKS	2x8	7.90	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
PEDESTRIAN RAIL - POST	6x6	1.70	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
PEDESTRIAN RAIL - POST (FLOATING SPAN ENDS)	5x6	0.05	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
PEDESTRIAN RAIL - BACKER BOARD	2x6	0.01	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
PEDESTRIAN RAIL - BOTTOM RAIL	3x12	1.95	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
PEDESTRIAN RAIL - MIDDLE RAIL	3x6	0.98	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED
PEDESTRIAN RAIL - TOP RAIL	3x8	1.30	522.25 - STRUCTURAL LUMBER AND TIMBER, TREATED

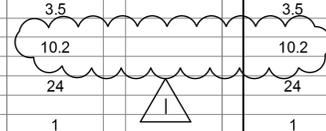
REVISION	DESCRIPTION	DATE
REVISION #1	RUNNER PLANK THICKNESS CHANGE	2/5/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

<b>TYLIN</b> INTERNATIONAL	FILE NAME: z12e134bdrnotes.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: J. OLUND	CHECKED BY: D. MYERS
	PROJECT NOTES 2	SHEET 8 OF 70

# QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	TRAINING	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
						525					525		CY	COMMON EXCAVATION	203.15				
									20		20		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27				
						1					1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22		525	CY	EARTH AND ROCK EXCAVATION
									45		45		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30		0	CY	SOLID ROCK EXCAVATION
									235		235		CY	COFFERDAM EXCAVATION, EARTH	208.30		525	CY	EARTH EXCAVATION
									10		10		CY	COFFERDAM EXCAVATION, ROCK	208.35		2.7	CY	PLANIMETERED FILL
									1		1		LS	COFFERDAM (ABUTMENT NO. 1)	208.40		0	CY	LESS FACTORED SOLID ROCK
									1		1		LS	COFFERDAM (ABUTMENT NO. 2)	208.40		0	CY	LESS DISPLACEMENT OF ANY LARGE STRUCTURES
						440					440		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35		2.7	CY	NET PLANIMETERED FILL
						1.5					1.5		CWT	EMULSIFIED ASPHALT	404.65		0.15		FACTOR
						1					1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50		3.1	CY	PLANIMETERED FILL INCLUDING FACTOR
									59		59		CY	CONCRETE, HIGH PERFORMANCE CLASS B	501.34				
									1		1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10				
									410		410		LF	STEEL PILING, HP 12 X 74	505.16				
									2		2		EACH	DYNAMIC PILE LOADING TEST	505.45				
									5500		5500		LB	REINFORCING STEEL, LEVEL I	507.11				
									44		44		LF	DRILLING AND GROUTING DOWELS	507.16				
									3.5		3.5		GAL	WATER REPELLENT, SILANE	514.10				
						10.2					10.2		MFBM	STRUCTURAL LUMBER AND TIMBER, UNTREATED	522.20				
						24					24		MFBM	STRUCTURAL LUMBER AND TIMBER, TREATED	522.25				
									1		1		LS	STRUCTURAL GLUED LAMINATED TIMBER (12.3 MFBM) (BEAMS AND DIAPHRAGMS)	522.40				
									1		1		EACH	REMOVAL OF STRUCTURE (6620 SF - EST.)	529.15				
									75		75		CY	CONCRETE, CLASS C	541.30				
						20					20		HR	POWER GRADER RENTAL	608.15				
						20					20		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25				
						20					20		HR	TRUCK RENTAL	608.37				
						20					20		HR	LOADER RENTAL, TYPE I	608.40				
						25					25		MGAL	DUST CONTROL WITH WATER	609.10				
						40			35		75		CY	STONE FILL, TYPE I	613.10				
						53					53		LF	VERTICAL GRANITE CURB	616.21				
						29					29		SY	PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH	618.10				
						40					40		SF	DETECTABLE WARNING SURFACE	618.30				
						214					214		LF	STEEL BACKED TIMBER GUARDRAIL	621.18				
						210					210		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
						40					40		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
						200					200		HR	FLAGGERS	630.15				
										1	1		LS	FIELD OFFICE, ENGINEERS	631.10				
										1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
										1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
										3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				



REVISION	DESCRIPTION	DATE
REVISION #1	RUNNER PLANK THICKNESS CHANGE	2/4/2014

**TYLIN**INTERNATIONAL

PROJECT NAME: **BROOKFIELD**  
 PROJECT NUMBER: **BRF FLBR(2)**  
 FILE NAME: z12e134.xls PLOT DATE: 01/30/2014  
 PROJECT LEADER: J. OLUND DRAWN BY: S. MORGAN  
 DESIGNED BY: T. POULIN CHECKED BY: S. KELLER  
 QUANTITY SHEET #1 SHEET 9 OF 70

# QUANTITY SHEET 2

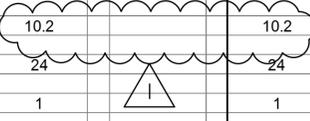
SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
						ROADWAY	TRAINING	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							520				520		HR	EMPLOYEE TRAINEESHIP	634.10				
						1					1		LS	MOBILIZATION/DEMOLITION	635.11				
						1					1		LS	TRAFFIC CONTROL	641.10				
						143					143		LF	4 INCH YELLOW LINE	646.21				
						12					12		EACH	LETTER OR SYMBOL	646.30				
						360					360		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
						110			80		190		SY	GEOTEXTILE UNDER STONE FILL	649.31				
								75			75		SY	GEOTEXTILE FOR SILT FENCE	649.51				
								290			290		SY	GEOTEXTILE FOR FILTER CURTAIN	649.61				
								3			3		LB	SEED	651.15				
								1			1		LB	SEED, WINTER RYE	651.17				
								20			20		LB	FERTILIZER	651.18				
								0.1			0.1		TON	AGRICULTURAL LIMESTONE	651.20				
								0.1			0.1		TON	HAY MULCH	651.25				
						20					20		CY	TOPSOIL	651.35				
								1			1		LS	EPSC PLAN	652.10				
								70			70		HR	MONITORING EPSC PLAN	652.20				
								1			1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30				
								2			2		EACH	FILTER BAG	653.45				
								260			260		LF	PROJECT DEMARCATION FENCE	653.55				
						55.6					55.6		SF	TRAFFIC SIGNS, TYPE A	675.20				
						112.2					112.2		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
						12					12		EACH	REMOVING SIGNS	675.50				
						10					10		CY	SPECIAL PROVISION (AGGREGATE SURFACE COURSE, SIDEWALK/TRAIL)	900.608				
									32		32		EACH	SPECIAL PROVISION (BEARING DEVICE ASSEMBLY, FLOATING BRIDGE)	900.620				
						4					4		EACH	SPECIAL PROVISION (GRANITE BOLLARD)	900.620				
									2		2		EACH	SPECIAL PROVISION (STAINLESS STEEL SHELF)	900.620				
						2					2		EACH	SPECIAL PROVISION (WINTER TRAFFIC BARRIER)	900.620				
									93		93		LF	SPECIAL PROVISION (EXPANSION DEVICE, HINGED SLIDING PLATE ASSEMBLY)	900.640				
									1		1		LS	SPECIAL PROVISION (FIBER REINFORCED POLYMER PONTOONS)	900.645				
						1					1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY)(N.A.B.I.)	900.650				
						1					1		LU	SPECIAL PROVISION (MXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650				
									7320		7320		SF	SPECIAL PROVISION (NAIL LAMINATED TIMBER DECK PANEL)	900.670				
						115					115		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

PROJECT NAME: **BROOKFIELD**  
PROJECT NUMBER: **BRF FLBR(2)**  
FILE NAME: z12e134.xls PLOT DATE: 11/07/2013  
PROJECT LEADER: J. OLUND DRAWN BY: S. MORGAN  
DESIGNED BY: T. POULIN CHECKED BY: S. KELLER  
QUANTITY SHEET #2 SHEET 10 OF 70



# BRIDGE QUANTITY SHEET

SUMMARY OF BRIDGE QUANTITIES										TOTALS		DESCRIPTIONS			DETAILED SUMMARY OF QUANTITIES		
						APPROACH SLABS	ABUTMENT #1	ABUTMENT #2	SUPERSTRUCTURE	BRIDGE TOTAL	UNIT	ITEMS	ITEM NUMBER	QUANTITIES	UNIT	ITEMS	
						11	9			20	CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27				
						42	3			45	CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				
						130	105			235	CY	COFFERDAM EXCAVATION, EARTH	208.30				
						.	10			10	CY	COFFERDAM EXCAVATION, ROCK	208.35				
						1				1	LS	COFFERDAM (ABUTMENT NO. 1)	208.40				
							1			1	LS	COFFERDAM (ABUTMENT NO. 2)	208.40				
						41	18			59	CY	CONCRETE, HIGH PERFORMANCE CLASS B	501.34				
						1				1	LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10				
						410				410	LF	STEEL PILING, HP 12 X 74	505.16				
						2				2	EACH	DYNAMIC PILE LOADING TEST	505.45				
						3500	2000			5500	LB	REINFORCING STEEL, LEVEL I	507.11				
							44			44	LF	DRILLING AND GROUTING DOWELS	507.16				
						2	1.5			3.5	GAL	WATER REPELLENT, SILANE	514.10				
								10.2		10.2	MFBM	STRUCTURAL LUMBER AND TIMBER, UNTREATED	522.20				
								24		24	MFBM	STRUCTURAL LUMBER AND TIMBER, TREATED	522.25				
								1		1	LS	STRUCTURAL GLUED LAMINATED TIMBER (12.3 MFBM) (BEAMS AND DIAPHRAGMS)	522.40				
								1		1	EACH	REMOVAL OF STRUCTURE (6620 SF - EST.)	529.15				
							75			75	CY	CONCRETE, CLASS C	541.30				
						19	16			35	CY	STONE FILL, TYPE I	613.10				
						45	35			80	SY	GEOTEXTILE UNDER STONE FILL	649.31				
								32		32	EACH	SPECIAL PROVISION (BEARING DEVICE ASSEMBLY, FLOATING BRIDGE)	900.620				
								2		2	EACH	SPECIAL PROVISION (STAINLESS STEEL SHELF)	900.620				
								93		93	LF	SPECIAL PROVISION (EXPANSION DEVICE, HINGED SLIDING PLATE ASSEMBLY)	900.640				
								1		1	LS	SPECIAL PROVISION (FIBER REINFORCED POLYMER PONTOONS)	900.645				
								7320		7320	SF	SPECIAL PROVISION (NAIL LAMINATED TIMBER DECK PANEL)	900.670				



REVISION	DESCRIPTION	DATE
REVISION #1	RUNNER PLANK THICKNESS CHANGE	2/4/2014

PROJECT NAME: **BROOKFIELD**  
 PROJECT NUMBER: **BRF FLBR(2)**  
 FILE NAME: z12e134.xls PLOT DATE: 01/30/2014  
 PROJECT LEADER: J. OLUND DRAWN BY: S. MORGAN  
 DESIGNED BY: T. POULIN CHECKED BY: S. KELLER  
 BRIDGE QUANTITY SHEET SHEET 11 OF 70





GPS CONTROL POINTS

HVCTRL #1  
 189 MILE 37  
 NORTH = 559671.109  
 EAST = 1610545.674  
 ELEV. = 1454.003

GENERAL LOCATION, BROOKFIELD, VT.

TO REACH FROM THE VT ROUTE 66 BRIDGE OVER I-89 AT EXIT 4 IN RANDOLPH, GO NORTH ALONG I-89 NORTHBOUND FOR 6.4 MI (10.3 KM) TO THE SITE OF THE MARK ON THE LEFT, DIRECTLY OPPOSITE MILE MARKER 37.25. IT IS 5.7 MI (9.2 KM) SOUTH ALONG I-89 SOUTHBOUND FROM THE I-89 BRIDGES OVER VT ROUTE 64 AT EXIT 5 IN WILLIAMSTOWN.

THE MARK IS SET FLUSH WITH THE GROUND SURFACE IN THE TOP OF A MASSIVE ROCK OUTCROP.

IT IS 12.4 M (40.7 FT) WEST-NORTHWEST OF AND ABOUT 0.5 M (1.6 FT) HIGHER THAN THE I-89 NORTHBOUND WEST-NORTHWEST EDGE OF PAVEMENT, 35.4 M (116.1 FT) SOUTH OF A 20 CM (8 INCH) FIR WITH TRIANGULAR BLAZE, 15.9 M (52.2 FT) EAST-SOUTHEAST OF A 25 CM (10 INCH) CHERRY WITH TRIANGULAR BLAZE, 15.6 M (51.2 FT) NORTHEAST OF A 20 CM (8 INCH) BIRCH WITH TRIANGULAR BLAZE AND 2.7 M (8.9 FT) NORTHWEST OF A FIBERGLASS WITNESS POST.

HVCTRL #2  
 189 MILE 37 AZ MK  
 NORTH = 565959.350  
 EAST = 1613008.773  
 ELEV. = 1495.242

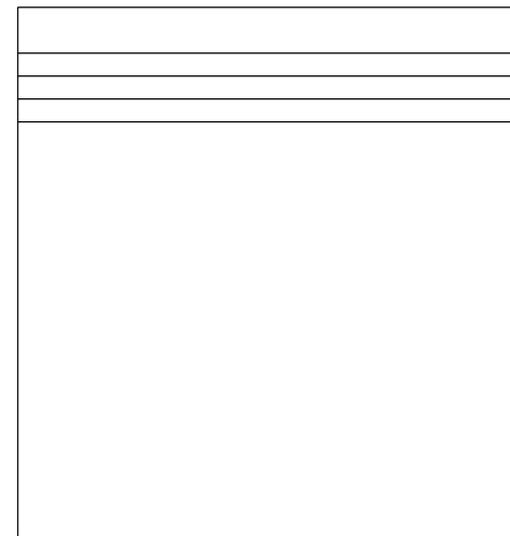
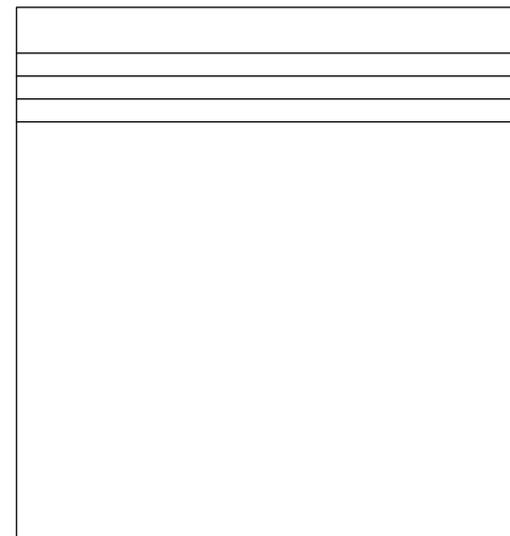
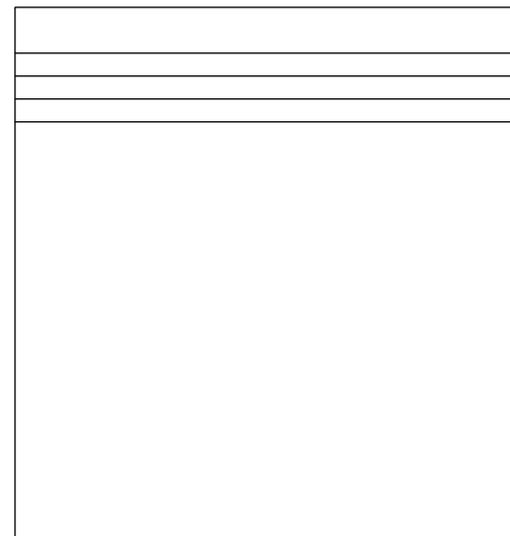
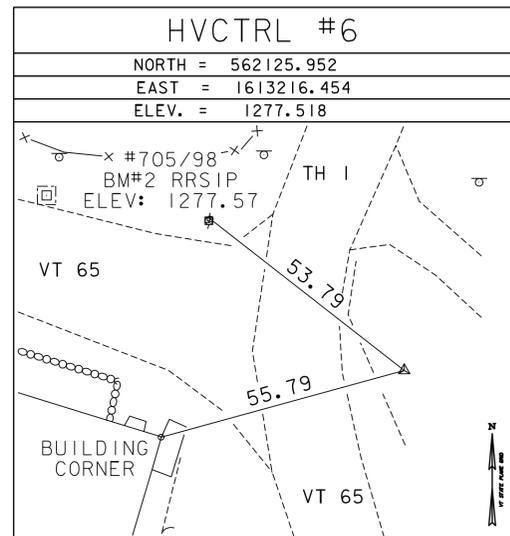
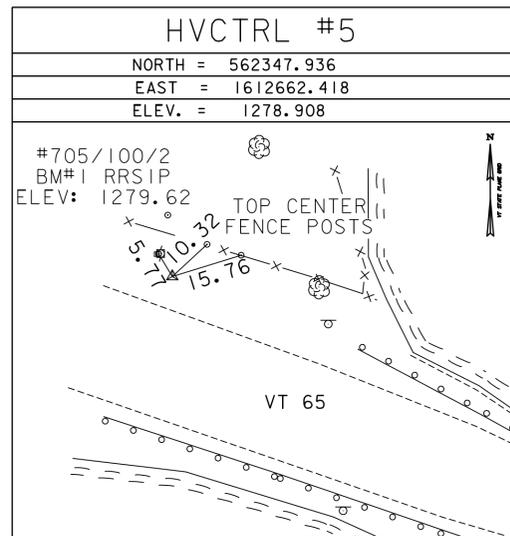
GENERAL LOCATION, BROOKFIELD, VT.

TO REACH FROM THE VT ROUTE 66 BRIDGE OVER I-89 AT EXIT 4 IN RANDOLPH, GO NORTH ALONG I-89 NORTHBOUND FOR 7.7 MI (12.4 KM) TO A PROMINENT QUARTZ ROCK OUTCROP ON THE RIGHT AND THE SITE OF THE MARK ON THE RIGHT, JUST SOUTH OF THE OUTCROP AND BETWEEN MILE MARKERS 38.50 AND 38.55. IT IS 4.5 MI (7.2 KM) SOUTH ALONG I-89 SOUTHBOUND FROM THE I-89 BRIDGES OVER VT ROUTE 64 AT EXIT 5 IN WILLIAMSTOWN.

THE MARK IS SET FLUSH WITH THE GROUND SURFACE IN THE TOP OF A 0.6 M (2.0 FT) X 0.5 M (1.6 FT) ROCK OUTCROP.

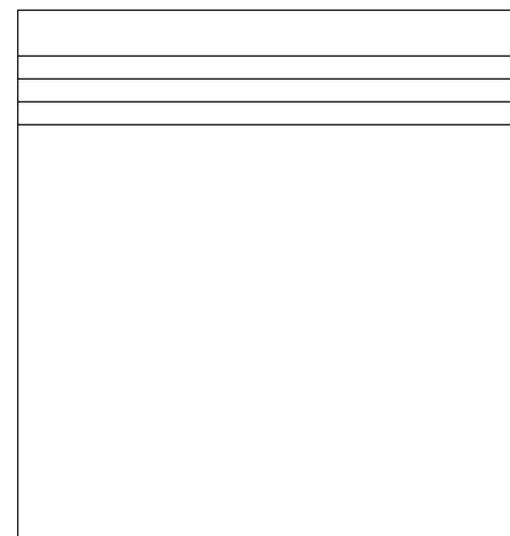
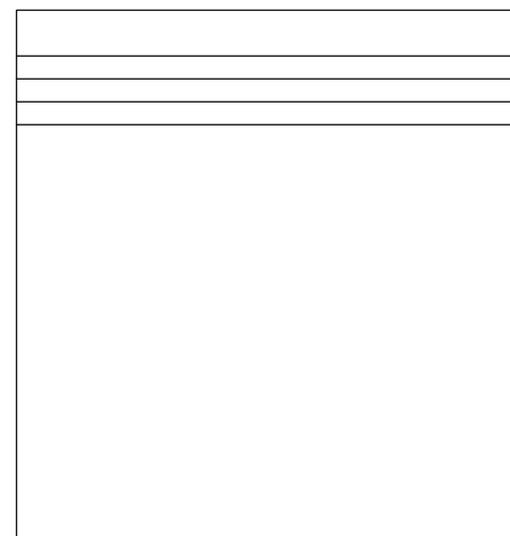
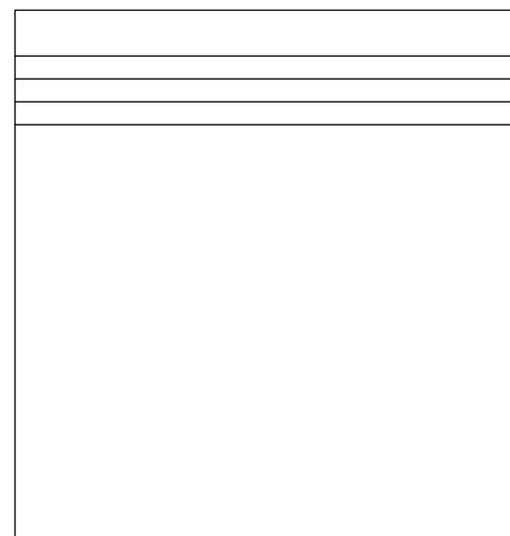
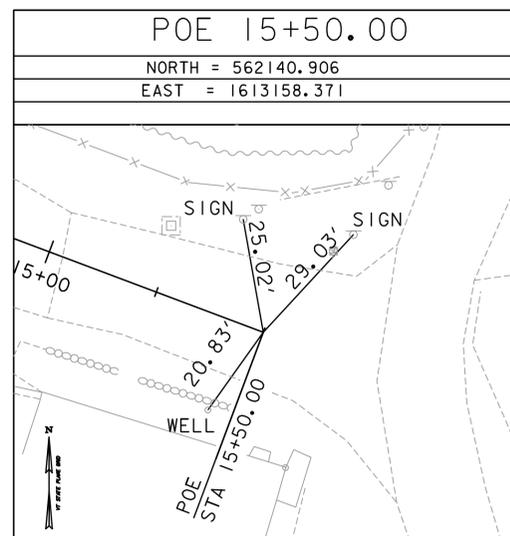
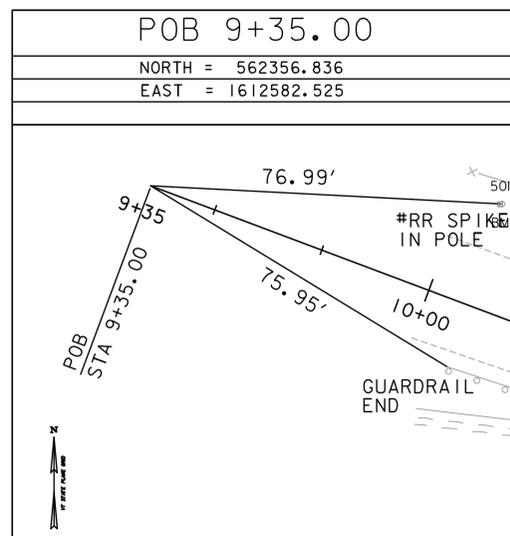
IT IS 12.1 M (39.7 FT) EAST OF AND ABOUT 0.3 M (1.0 FT) HIGHER THAN THE I-89 NORTHBOUND EAST EDGE OF PAVEMENT, 2.6 M (8.5 FT) SOUTH-SOUTHEAST OF THE SOUTH END OF THE QUARTZ OUTCROP, 33.4 M (109.6 FT) SOUTH OF MILE MARKER 38.55, 23.3 M (76.4 FT) SOUTH-SOUTHWEST OF A 40 CM (16 INCH) PINE WITH TRIANGULAR BLAZE, 11.7 M (38.4 FT) WEST-NORTHWEST OF THE INTERSTATE RIGHT-OF-WAY FENCE AND 0.9 M (3.0 FT) WEST-NORTHWEST OF A FIBERGLASS WITNESS POST.

TRAVERSE TIES



\* MAIN TRAVERSE COMPLETED 1/5/2011 BY R. GILMAN P.C. & P. WINTERS & D. BREER

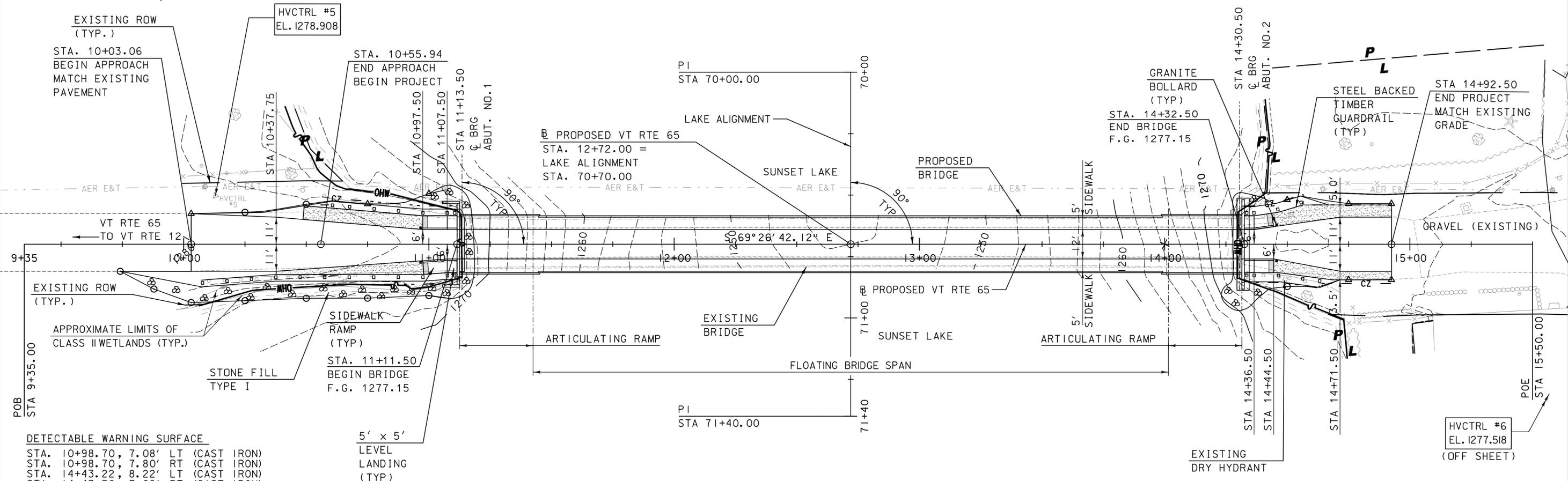
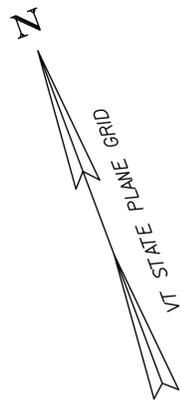
ALIGNMENT TIES



DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83 (07)
ADJUSTMENT	COMPASS

PROJECT NAME:	BROOKFIELD
PROJECT NUMBER:	BRF FLBR(2)
FILE NAME:	z12e134bdr_t1.dgn
PROJECT LEADER:	J. OLUND
DESIGNED BY:	D. BURHANS
TIE SHEET	
PLOT DATE:	12/3/2013
DRAWN BY:	B. CARTER
CHECKED BY:	K. DUCHARME
SHEET	13 OF 70





**DETECTABLE WARNING SURFACE**  
 STA. 10+98.70, 7.08' LT (CAST IRON)  
 STA. 10+98.70, 7.80' RT (CAST IRON)  
 STA. 14+43.22, 8.22' LT (CAST IRON)  
 STA. 14+43.30, 7.08' RT (CAST IRON)

**SPECIAL PROVISION (GRANITE BOLLARD)**  
 STA. 10+96.61, 6.69' LT  
 STA. 10+96.61, 7.39' RT  
 STA. 14+45.66, 7.95' LT  
 STA. 14+45.66, 6.86' RT

**LEGEND:**  
 [Hatched Box] SPECIAL PROVISION (AGGREGATE SURFACE COURSE, SIDEWALK/TRAIL)

**PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH**  
 STA. 10+97.50, LT TO STA. 11+11.50, LT  
 STA. 10+97.50, RT TO STA. 11+11.50, RT  
 STA. 14+32.50, LT TO STA. 14+44.40, LT  
 STA. 14+32.50, RT TO STA. 14+44.50, RT

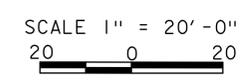
**SPECIAL PROVISION (AGGREGATE SURFACE COURSE, SIDEWALK/TRAIL)**  
 STA. 10+37.75, RT TO STA. 10+97.88, RT  
 STA. 10+48.69, LT TO STA. 10+97.50, LT  
 STA. 14+43.64, LT TO STA. 14+92.50, LT  
 STA. 14+44.50, RT TO STA. 14+92.50, RT

**VERTICAL GRANITE CURB\***  
 STA. 10+95, LT TO STA. 11+10, LT  
 STA. 10+95, RT TO STA. 11+10, RT  
 STA. 14+30, LT TO STA. 14+55, LT  
 STA. 14+30, RT TO STA. 14+55, RT

\* VERTICAL GRANITE CURB IS TALLER THAN STANDARD. SEE DETAILS ON ROADWAY TYPICAL SECTIONS.

**EXISTING BRIDGE DATA**  
 YEAR BUILT 1978  
 TIMBER DECK ON PLASTIC FOAM FILLED FLOATS  
 OVERALL LENGTH = 320 FT  
 DECK WIDTH = 18 FT

**LAYOUT**

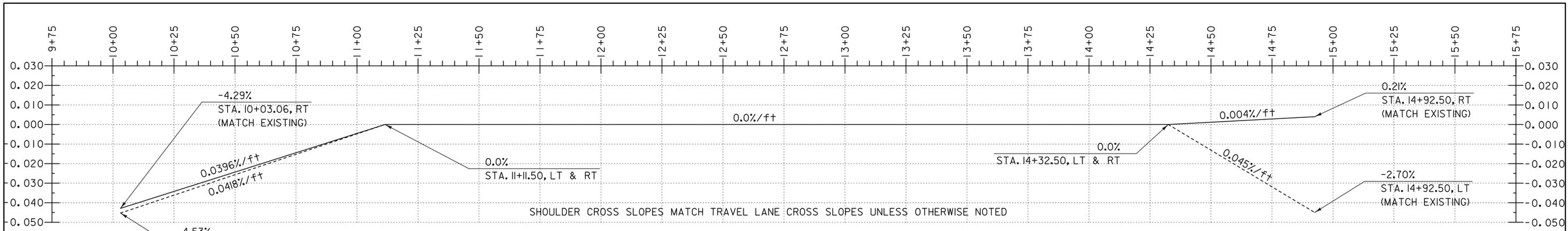


**STEEL BACKED TIMBER GUARDRAIL**  
 STA. 10+07.68, RT TO STA. 11+12.00, RT  
 STA. 10+60.13, LT TO STA. 11+12.00, LT  
 STA. 14+32.00, RT TO STA. 14+63.85, RT  
 STA. 14+32.00, LT TO STA. 14+56.45, LT

**REMOVAL AND DISPOSAL OF GUARDRAIL**  
 STA. 10+10, RT TO STA. 11+10, RT  
 STA. 10+55, LT TO STA. 11+10, LT  
 STA. 14+30, LT TO STA. 14+50, LT  
 STA. 14+30, RT TO STA. 14+70, RT

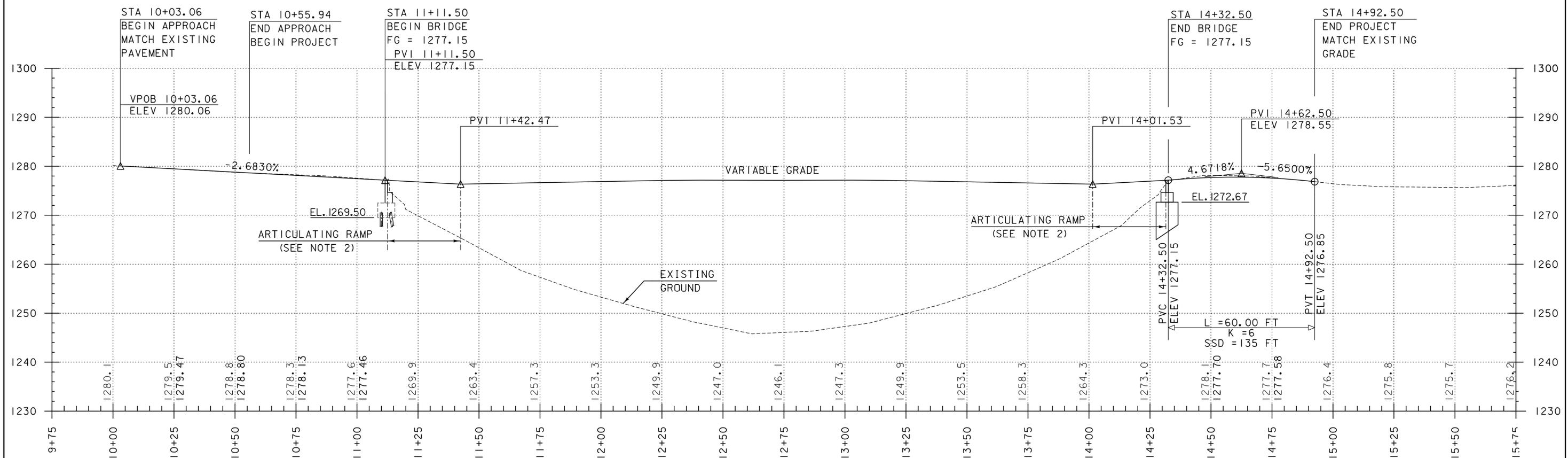
**TYLIN INTERNATIONAL**

PROJECT NAME: BROOKFIELD	
PROJECT NUMBER: BRFLBR(2)	
FILE NAME: z12e134bdr_nul.dgn	PLOT DATE: 12/3/2013
PROJECT LEADER: J. OLUND	DRAWN BY: D. BURHANS
DESIGNED BY: D. BURHANS	CHECKED BY: D. BRYANT
LAYOUT SHEET	SHEET 14 OF 70



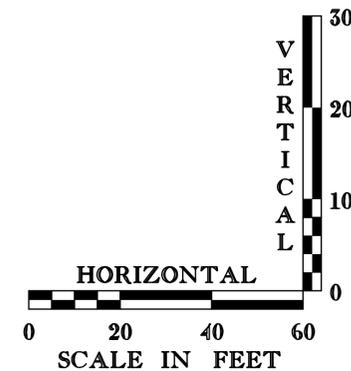
### BANKING DIAGRAM - VT RTE 65

HORIZ: 1"=20'  
NO VERTICAL SCALE



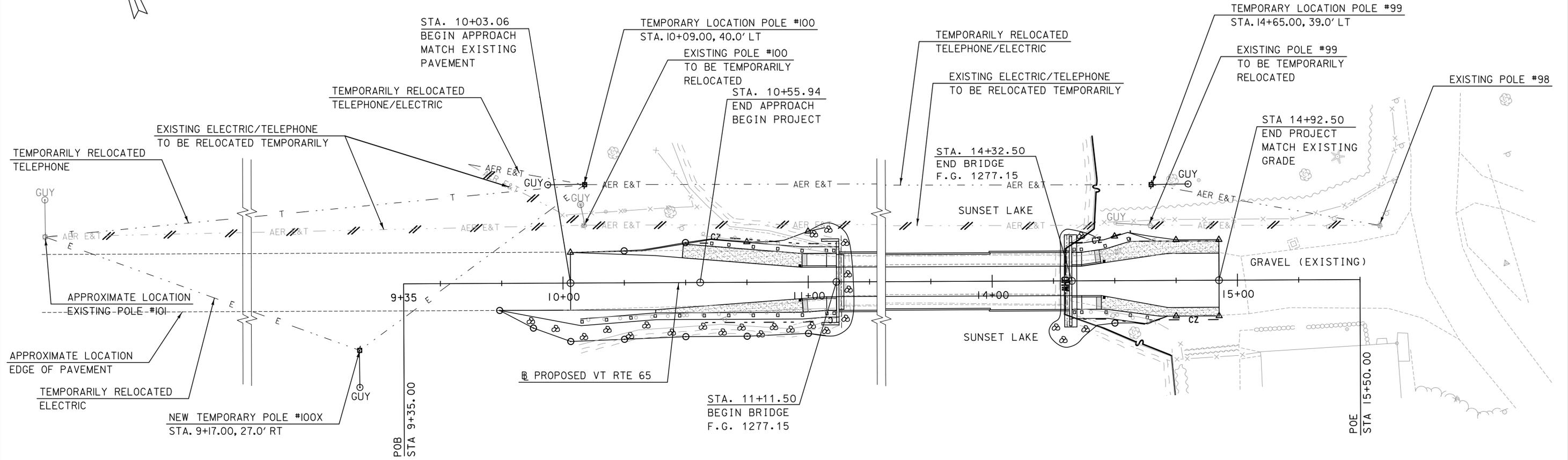
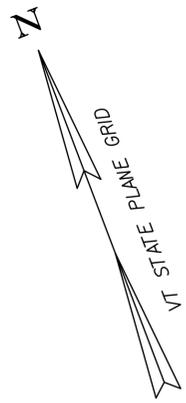
### PROFILE - VT RTE 65

- NOTES:
1. PGL ELEVATIONS ALONG SUPERSTRUCTURE ARE DEPENDENT ON WATER ELEVATION AND SUPERSTRUCTURE MATERIAL PROPERTIES, THEREFORE THESE VALUES ARE NOT LABELED ON THE PROFILE.
  2. DUE TO THE VARIABILITY OF WATER SURFACE ELEVATION AND SUPERSTRUCTURE MATERIAL PROPERTIES THE SLOPES OF THE ARTICULATING RAMPS WILL VARY.
  3. THE GRADES SHOWN TO THE NEAREST TENTH ARE THE EXISTING GROUND ELEVATIONS ALONG THE PROPOSED ALIGNMENT.
  4. THE GRADES SHOWN TO THE NEAREST HUNDRETH ARE THE PROPOSED GRADES FOR THE NEW ALIGNMENT AT NORMAL WATER ELEVATION.



TYLIN INTERNATIONAL

PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
PROJECT NUMBER: BRFLBR(2)	DRAWN BY: D. BURHANS
FILE NAME: z12e134bdr_pro.dgn	CHECKED BY: D. BRYANT
PROJECT LEADER: J. OLUND	SHEET 15 OF 70
DESIGNED BY: D. BURHANS	
PROFILE SHEET	

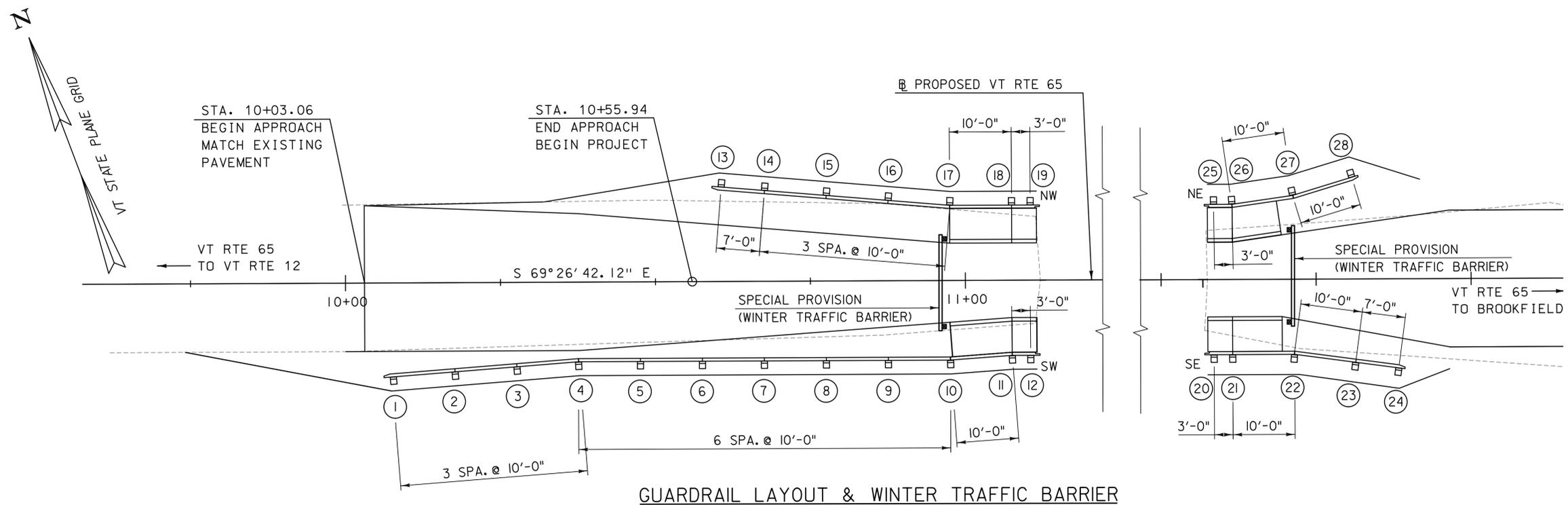


UTILITY RELOCATION PLAN

- LEGEND:**
- T — TELEPHONE
  - E — ELECTRIC
  - AER E&T — ELECTRIC/TELEPHONE
  - /// AER E&T /// ELECTRIC/TELEPHONE TO BE RELOCATED

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

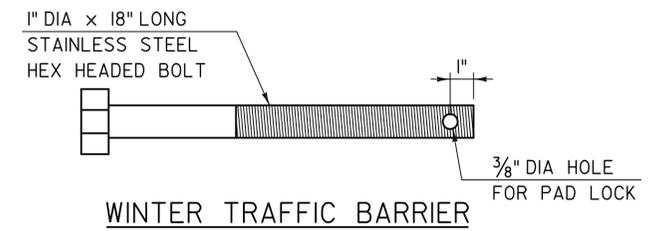
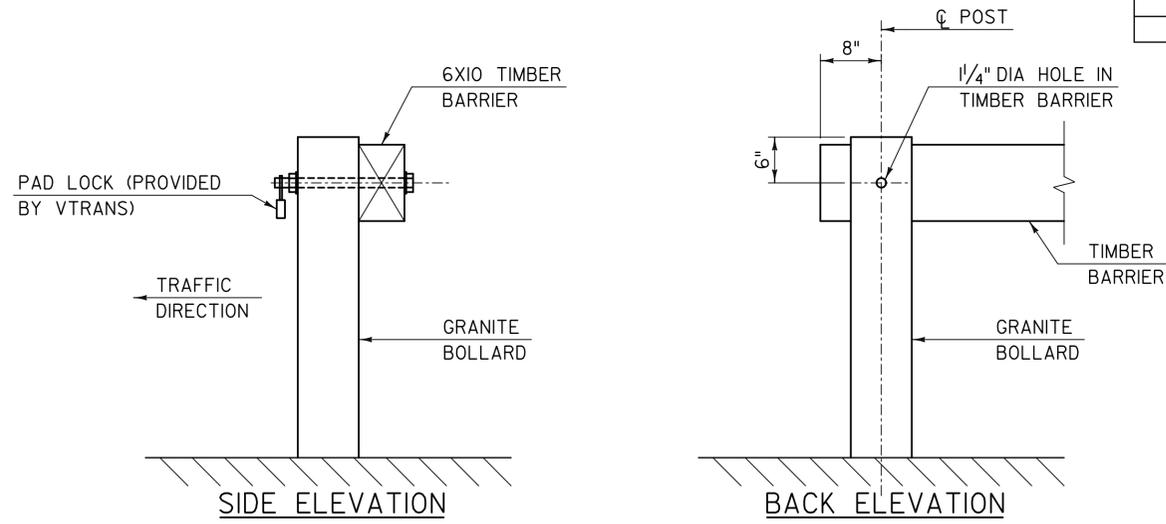
<b>TYLIN</b> INTERNATIONAL	PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
	PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: P. MCCLURE
	FILE NAME: z12e134bdr_nul.utl.dgn	CHECKED BY: D. BRYANT
	DESIGNED BY: D. BURHANS	SHEET 16 OF 70
	UTILITY RELOCATION PLAN	



POST LOCATION		
POST NO.	STATION	OFFSET
1	STA. 10+07.68	15.50 RT
2	STA. 10+17.65	14.73 RT
3	STA. 10+27.62	13.96 RT
4	STA. 10+37.56	13.21 RT
5	STA. 10+47.53	13.20 RT
6	STA. 10+57.53	13.20 RT
7	STA. 10+67.53	13.20 RT
8	STA. 10+77.53	13.20 RT
9	STA. 10+87.53	13.20 RT
10	STA. 10+97.56	13.20 RT
11	STA. 11+07.53	12.50 RT
12	STA. 11+10.50	12.50 RT
13	STA. 10+60.71	15.58 LT
14	STA. 10+67.68	15.00 LT
15	STA. 10+77.65	14.15 LT
16	STA. 10+87.61	13.31 LT
17	STA. 10+97.54	12.50 LT
18	STA. 11+07.53	12.48 LT
19	STA. 11+10.50	12.48 LT
20	STA. 14+33.50	12.48 RT
21	STA. 14+36.50	12.48 RT
22	STA. 14+46.44	12.51 RT
23	STA. 14+56.29	13.80 RT
24	STA. 14+63.23	14.73 RT
25	STA. 14+33.46	12.48 LT
26	STA. 14+36.44	12.51 LT
27	STA. 14+46.20	13.91 LT
28	STA. 14+55.71	16.75 LT

**TIMBER GUARDRAIL NOTES**

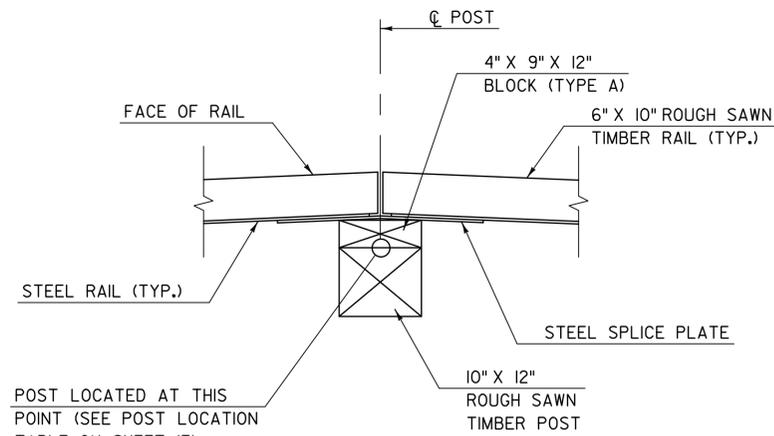
- I. WOOD POSTS, OFFSET BLOCKS AND TIMBER RAIL SHALL CONFORM TO SUBSECTION 728.01.
2. STEEL SPLICE PLATES SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M111M / M111 AND CONFORM TO THE REQUIREMENTS OF AASHTO M270M / M270, GRADE 36.
3. MISCELLANEOUS HARDWARE AND FITTINGS SUCH AS BOLTS, NUTS, AND WASHERS SHALL CONFORM TO THE DIMENSIONS SHOWN.
4. BOLTS, NUTS, AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 728.03(c) (1)-(2).
5. LAG SCREWS SHALL BE OF LOW TO MEDIUM CARBON STEEL AND SHALL BE OF GOOD COMMERCIAL QUALITY.
6. DELINEATORS SHALL BE A 3 INCH BY 1.5 INCH RETROREFLECTIVE ALUMINUM STRIP ATTACHED WITH TWO 4D GALVANIZED NAILS. DELINEATORS SHALL BE PLACED APPROXIMATELY 10 FEET APART, CENTERED VERTICALLY ALONG THE FACE OF THE TIMBER RAIL, AND CLEARLY VISIBLE TO APPROACHING TRAFFIC. RETROREFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 751.03 AND SHALL BE OF ENCAPSULATED LENS SILVER. PAYMENT SHALL BE INCIDENTAL TO ITEM 621.18.
7. STEEL-BACKED TIMBER GUARDRAIL LAYOUT DIMENSIONS ARE PROVIDED AT THE FRONT SURFACE OF THE ROUGH SAWN TIMBER RAIL AT THE CENTERLINE OF THE POST.
8. POST LAYOUT LOCATIONS ARE PROVIDED AT THE FACE OF POST AT THE CENTERLINE OF THE POST.
9. REFER TO TIMBER GUARDRAIL DETAILS SHEETS FOR STEEL-BACKED TIMBER GUARDRAIL DETAILS.
10. THE FINAL GUARDRAIL LOCATION SHALL BE FIELD VERIFIED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER PRIOR TO CONSTRUCTION. ALL COST ASSOCIATED WITH VERIFYING THE GUARDRAIL LAYOUT SHALL BE INCLUDED IN ITEM 621.18.
- II. ALL COSTS ASSOCIATED WITH THE CONCRETE ANCHORS FOR SHORT GUARDRAIL POSTS ON THE TIMBER GUARDRAIL DETAILS-2 SHEET (IF NEEDED), SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 621.18, STEEL BACKED TIMBER GUARDRAIL.



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

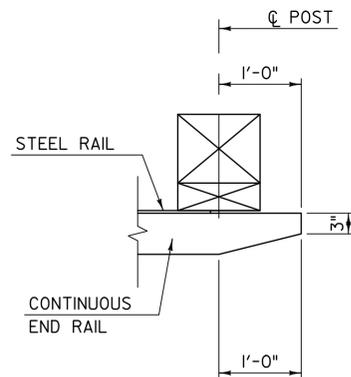
**TYLIN** INTERNATIONAL

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRFLBR(2)  
 FILE NAME: z12e134bdr\_gr1.dgn  
 PROJECT LEADER: J. OLUND  
 DESIGNED BY: D. BURHANS  
 GUARDRAIL LAYOUT SHEET  
 PLOT DATE: 12/3/2013  
 DRAWN BY: P. MCCLURE  
 CHECKED BY: D. BRYANT  
 SHEET 17 OF 70



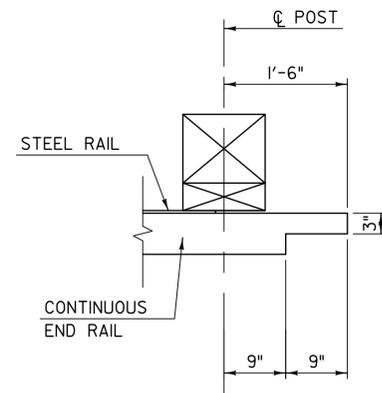
**POST DETAIL**

POST LOCATED AT THIS POINT (SEE POST LOCATION TABLE ON SHEET 17)



**RAILING DETAIL - APPROACH ENDS**

PLAN DETAIL FOR RAIL AT POSTS 1, 13, 24 & 28

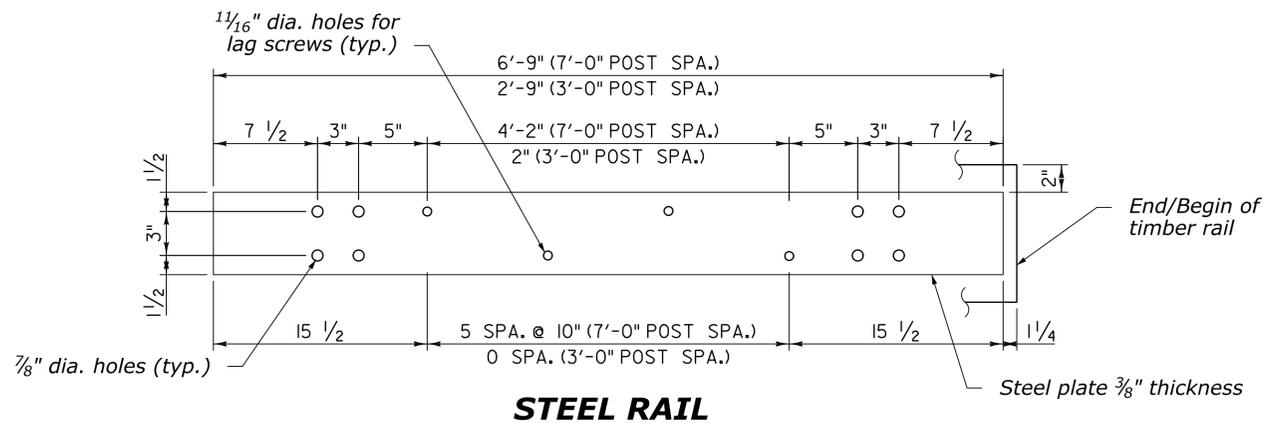


**RAILING DETAIL AT BRIDGE RAIL INTERFACE**

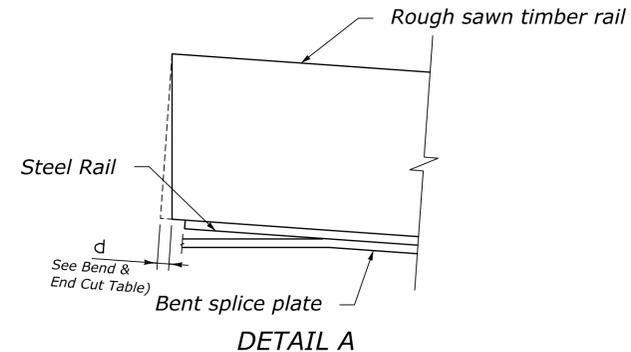
PLAN DETAIL FOR RAIL AT POSTS 12, 19, 20 & 25

**NOTE:**

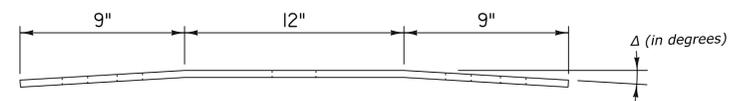
1. Furnish shop bent splice plates. Use the minimum bend angle shown in the table below.
2. See Guardrail Layout Sheet for Plan View.



**STEEL RAIL**

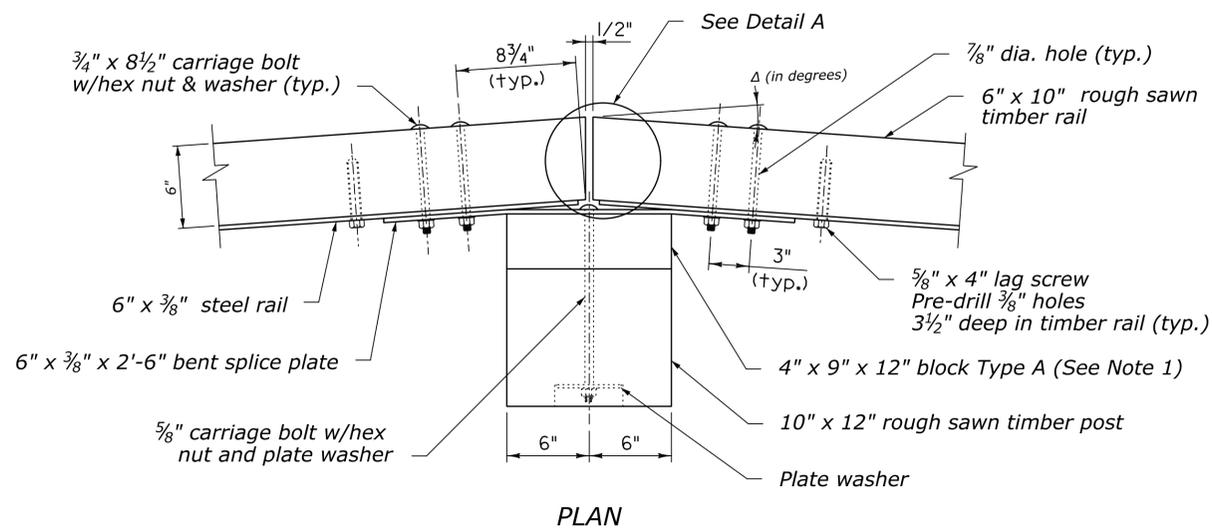


**DETAIL A**

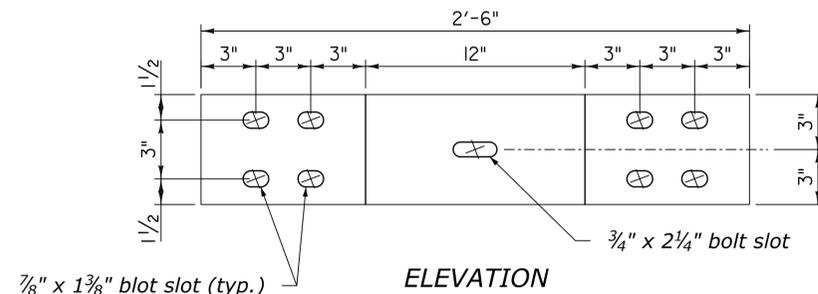


**PLAN**

BEND AND END CUT TABLE			
POST #	BEND TYPE	$\Delta$ degrees	d in
4	CONVEX	2.21	1/4
10	CONCAVE	2.05	3/16
11	CONVEX	2.05	3/16
17	CONVEX	2.41	1/4
22	CONVEX	3.81	3/8
26	CONVEX	4.07	7/16
27	CONVEX	4.34	7/16

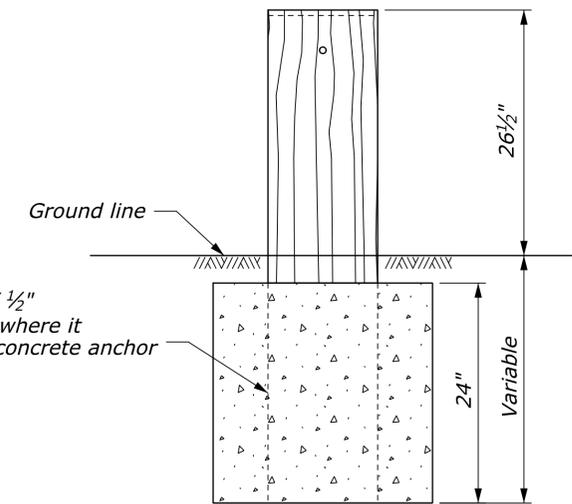
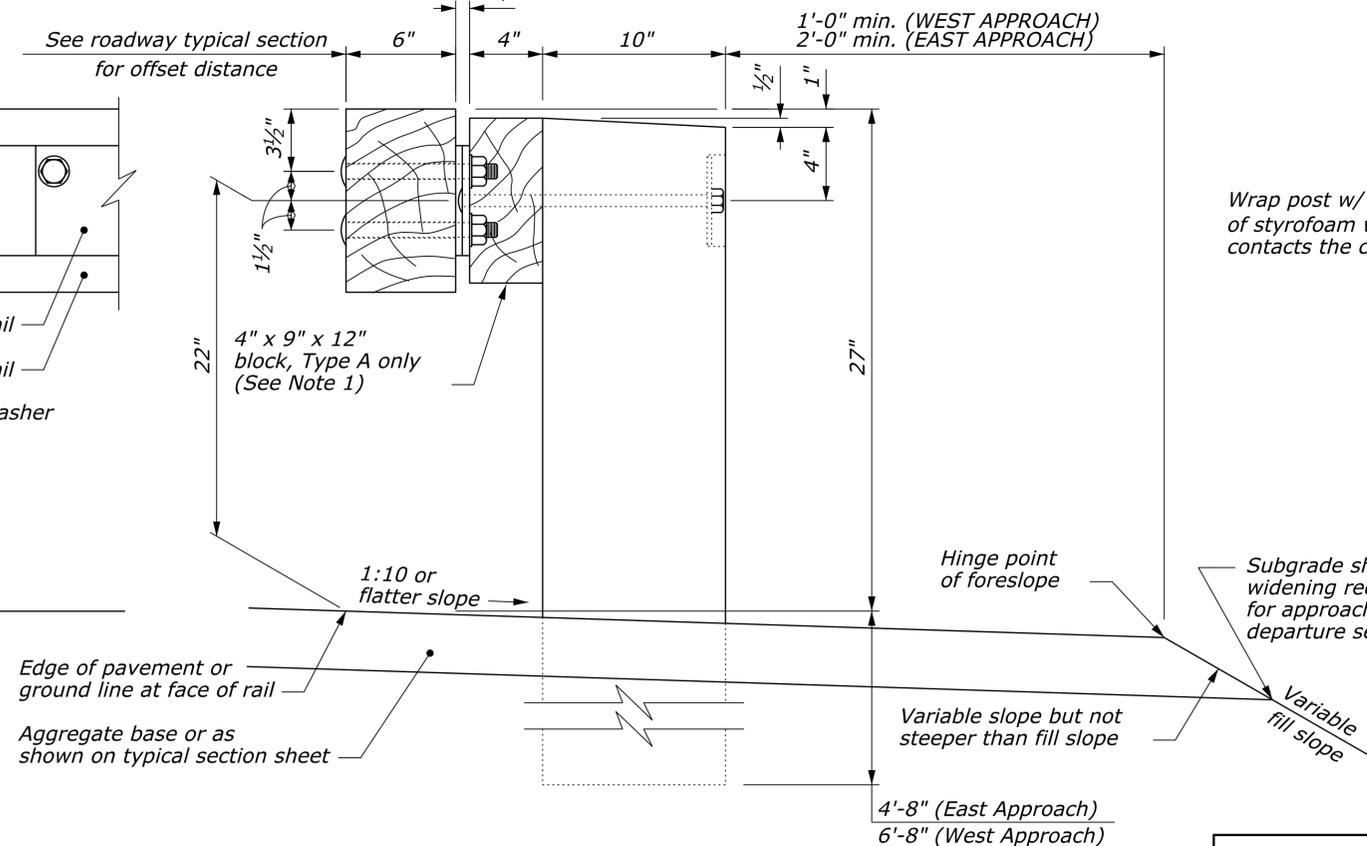
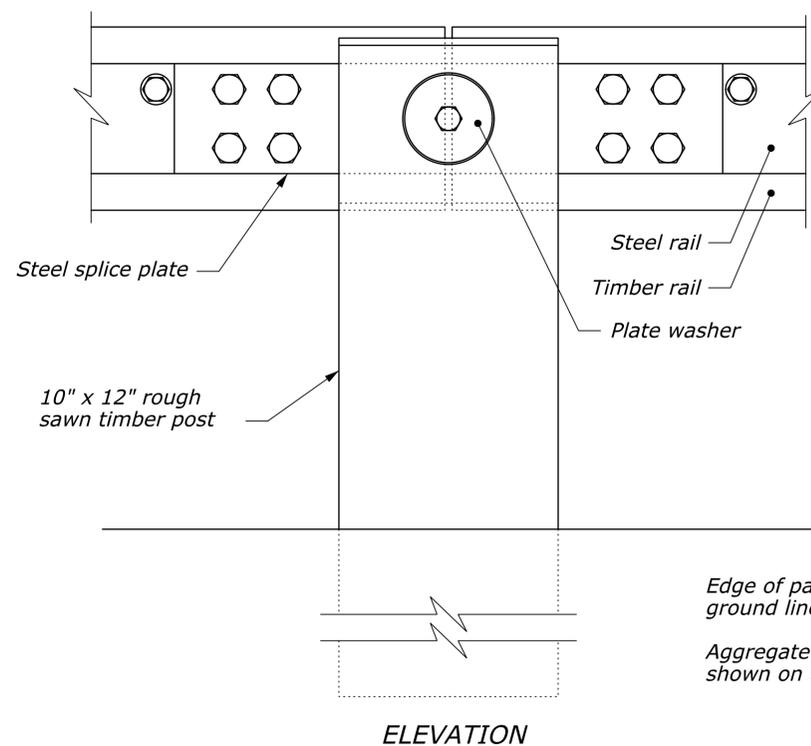
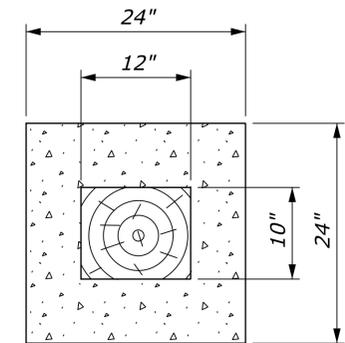
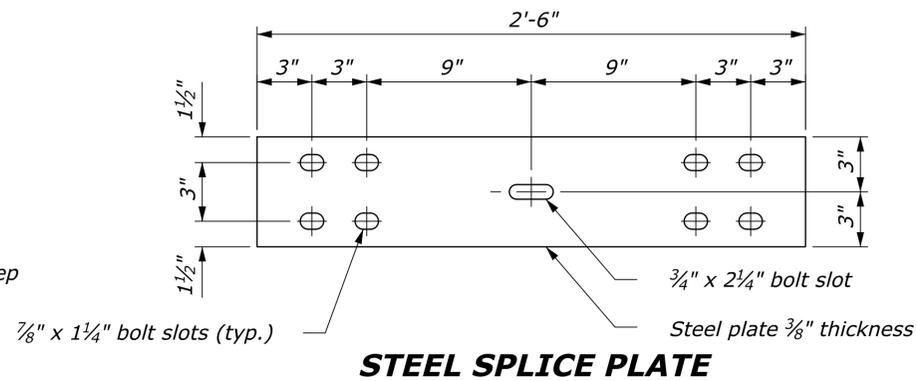
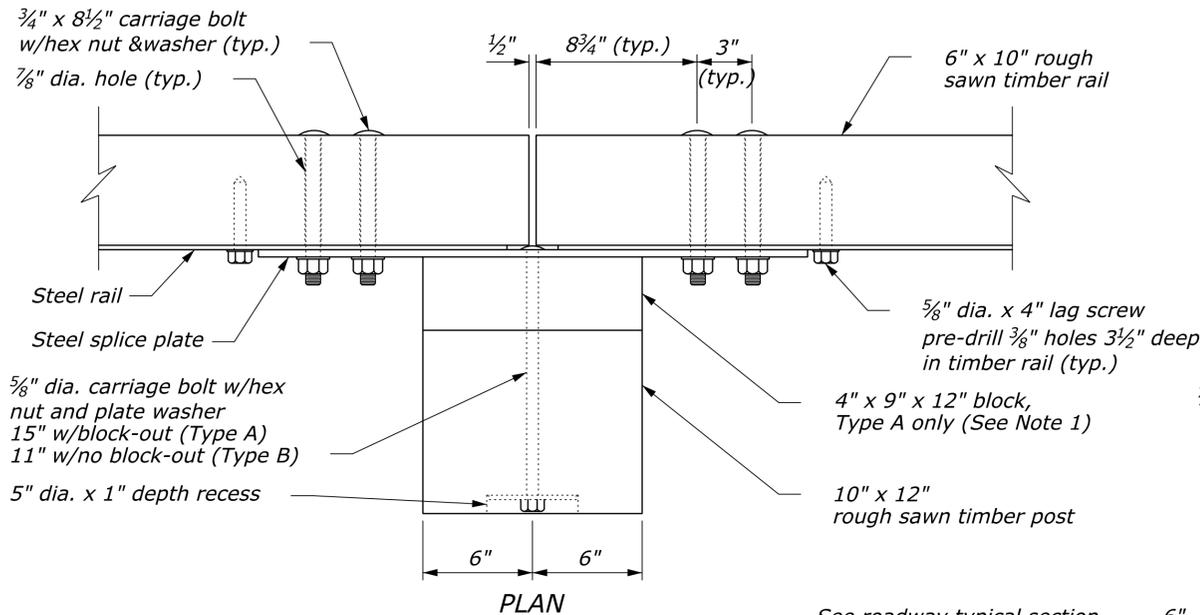
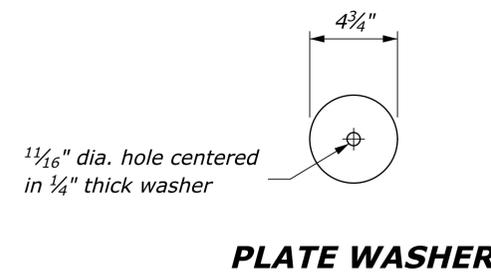
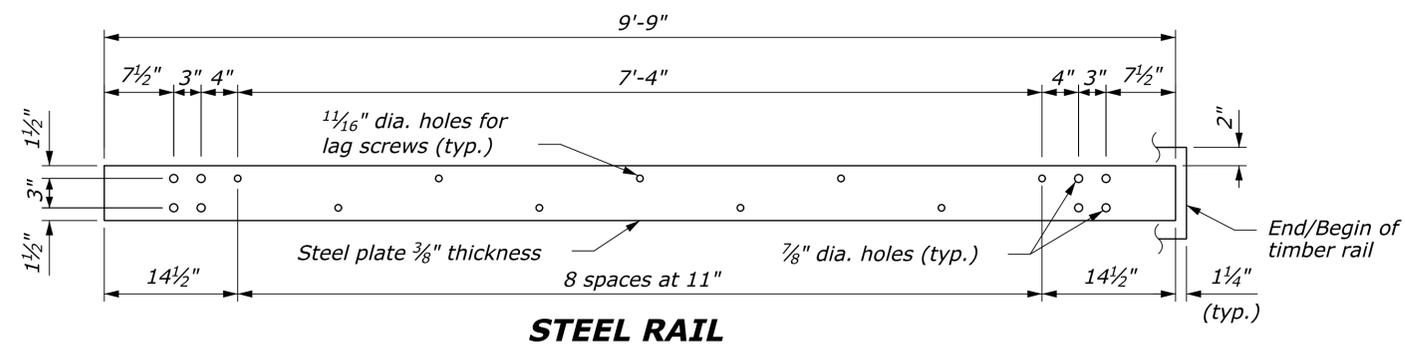


**PLAN**



**BENT SPLICE PLATE**

6" x 3/8" x 2'-6"



24" dia. round anchor is an acceptable alternative. Reduced size acceptable in solid rock.

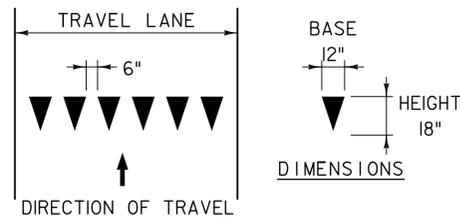
**CONCRETE ANCHOR FOR SHORT GUARDRAIL POST**

**STEEL-BACKED TIMBER GUARDRAIL TYPE A & TYPE B**

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

FILE NAME: z12el34bdr\_grL.dets2.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: D. BURHANS  
TIMBER GUARDRAIL DETAILS - 2

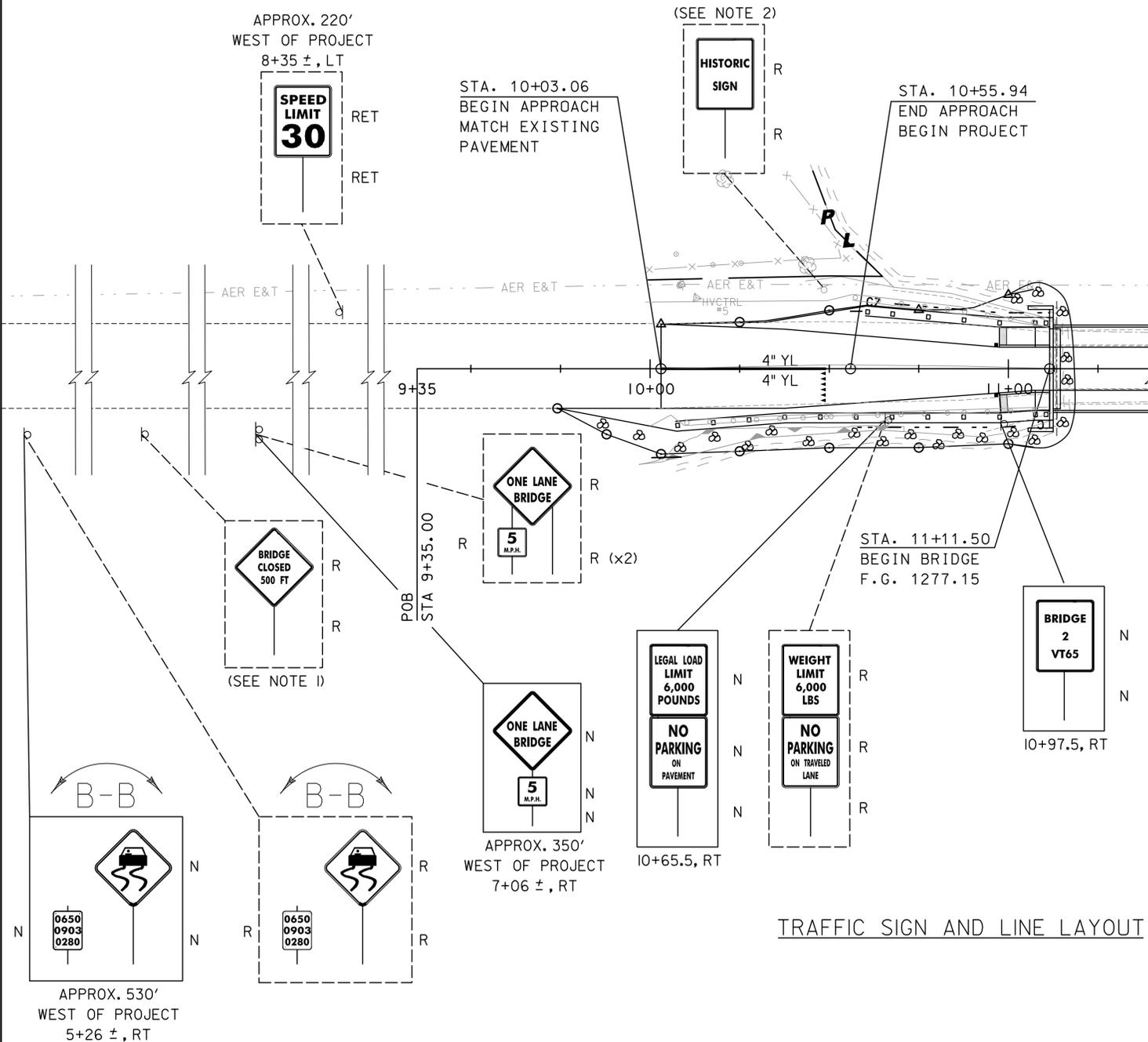
PLOT DATE: 12/3/2013  
DRAWN BY: P. MCCLURE  
CHECKED BY: D. BRYANT  
SHEET 19 OF 70



**REMOVING SIGNS**  
 STA 5+26±, RT (x2)  
 STA 6+26±, RT  
 STA 7+06±, RT (x2)  
 STA 10+48, LT  
 STA 10+65.5, RT (x2)  
 STA 14+51.5, LT  
 STA 14+65.5, LT  
 STA 15+39.5, LT  
 68.00± SOUTH EAST OF INTERSECTION, RT

**YIELD LINE LAYOUT**

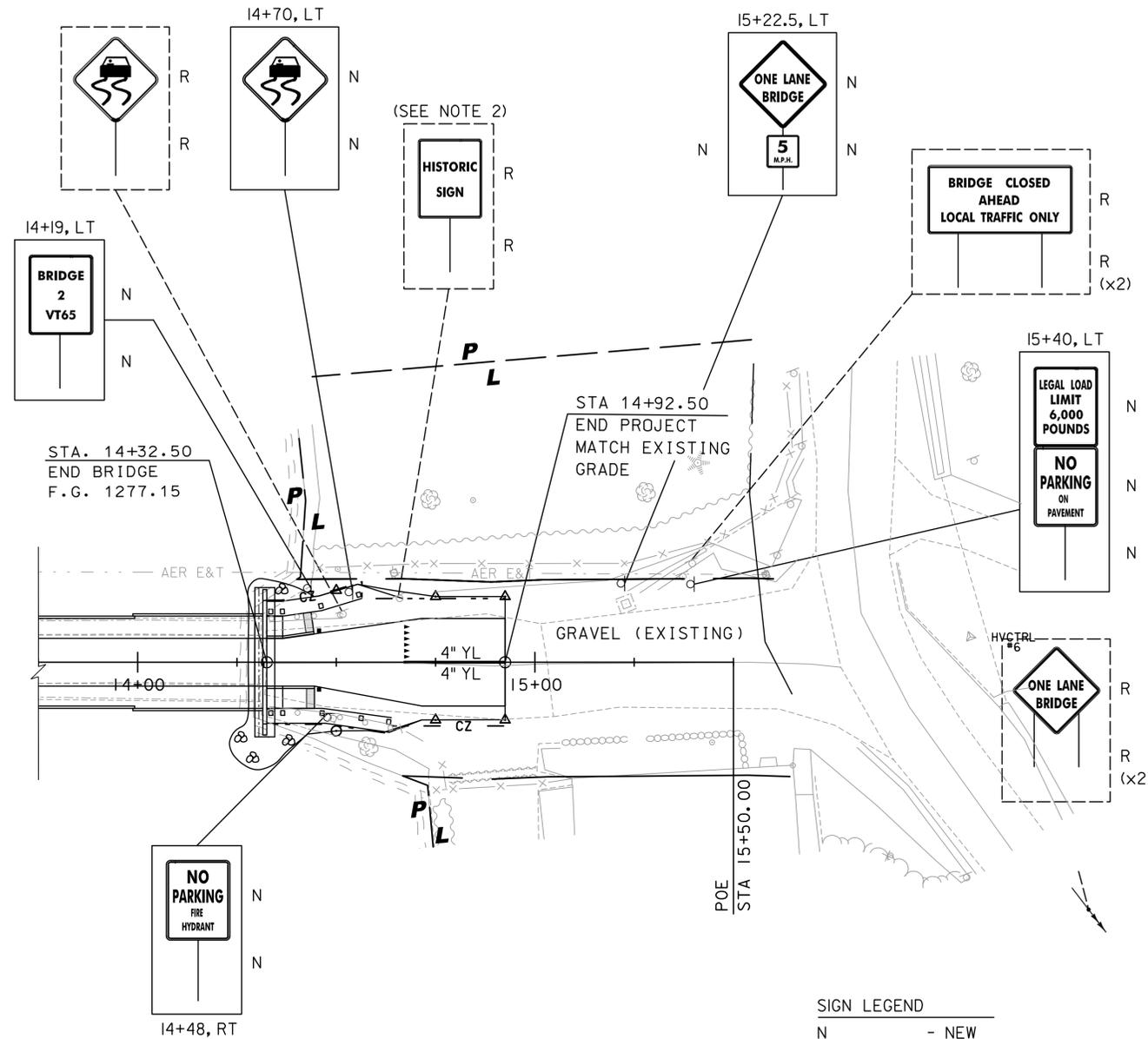
NOTE: TRIANGLES WILL BE PAID AS 6 EACH UNDER CONTRACT ITEM 646.30



**TRAFFIC SIGN AND LINE LAYOUT**

**4 INCH YELLOW LINE**  
 STA. 10+03.06 - 10+49 (DOUBLE CENTERLINE)  
 STA. 14+67 - 14+92.50 (DOUBLE CENTERLINE)

**LETTER OR SYMBOL**  
 STA. 10+49, RT (X 6)  
 STA. 14+67, LT (X 6)



**NOTES:**

- EXISTING CONSTRUCTION SIGNS SHALL BE REMOVED AFTER PROJECT IS COMPLETED. TO BE PAID FOR UNDER TRAFFIC CONTROL ITEM 641.10. SEE "PROJECT NOTES 1" SHEET FOR MORE INFORMATION.
- EXISTING HISTORIC SIGN SHALL BE REMOVED BY CONTRACTOR AND OWNERSHIP TRANSFERRED TO VTRANS HISTORIC PRESERVATION OFFICER SCOTT NEWMAN BY CALLING (802) 595-5119. COST FOR DELIVERY AND COORDINATION WITH THE HISTORIC PRESERVATION OFFICER SHALL BE PAID UNDER ITEM 675.50.

**SIGN LEGEND**

N	- NEW
R	- REMOVE
RET	- RETAIN
R & S	- REMOVE AND SALVAGE
	- EXISTING ASSEMBLY
	- PROPOSED ASSEMBLY

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

**TYLIN INTERNATIONAL**

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRFLBR(2)

FILE NAME: z12e134bdr\_nul.sign.dgn  
 PROJECT LEADER: J. OLUND  
 DESIGNED BY: D. BURHANS  
 TRAFFIC SIGNS AND LINES LAYOUT

PLOT DATE: 12/3/2013  
 DRAWN BY: D. BURHANS  
 CHECKED BY: D. BRYANT  
 SHEET 20 OF 70



**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**

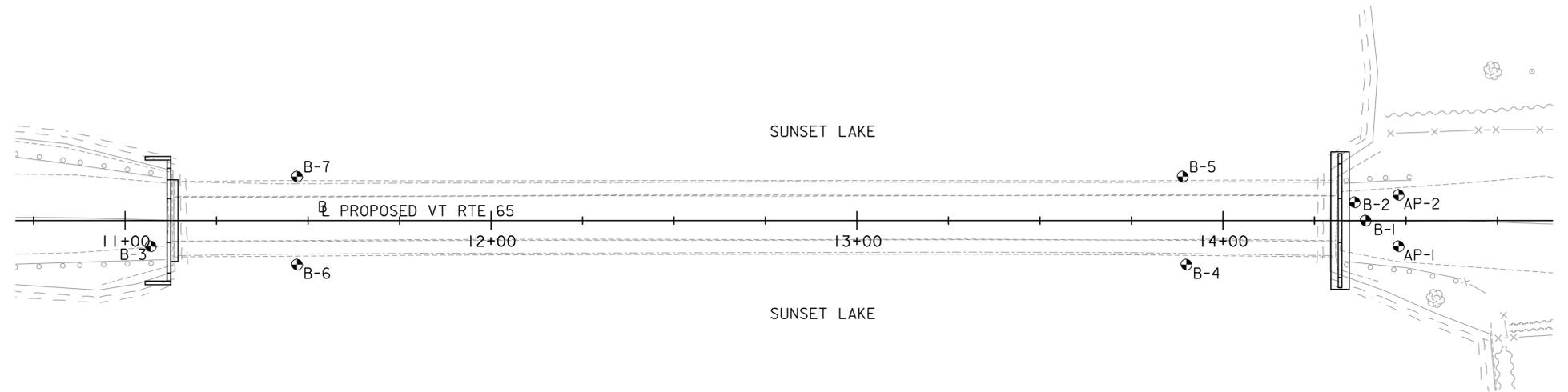
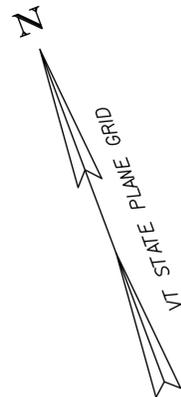
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

**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
- 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 To Ledge Or Boulder
- NR No Recovery
- Rec. Recovery
- %Rec. Percent Recovery
- RQD Rock Quality Designation
- CBR California Bearing Ratio
- < Less Than
- > Greater Than
- R Refusal (N > 100)

COLOR

bk	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**

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

**GENERAL NOTES**

- The subsurface explorations shown herein were made between July 30, 2012 and February 25, 2013 by GeoDesign Inc.
- Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by GeoDesign Inc. and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
- Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
- Engineering judgement 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 judgement by the Contractor.
- Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
- Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

**BORING CHART**

HOLE NO.	STATION	OFFSET	NORTHING	EASTING	GROUND ELEVATION	ELEVATION TLOB
AP-1	14+48.00	7' RT	562170.00	1613060.00	1278.0	1272.5
AP-2	14+48.00	7' LT	562183.00	1613066.00	1278.0	1270.0
B-1	14+39.00	0.00	562179.00	1613055.00	1278.0	1268.5
B-2	14+36.00	5' LT	562184.00	1613057.00	1278.0	1270.2
B-3	11+07.00	7' RT	562290.00	1612740.00	1277.0	-
B-4	13+90.00	12' RT	562185.00	1613005.00	1261.5	1252.0
B-5	13+89.00	12' LT	562208.00	1613012.00	1262.0	1250.0
B-6	11+47.00	12' RT	562271.00	1612777.00	1261.0	-
B-7	11+47.00	12' LT	562294.00	1612786.00	1262.0	-

**DEFINITIONS (AASHTO)**

- BEDROCK (LEDGE)** - Rock in its native location of indefinite thickness.
- BOULDER** - A rock fragment with an average dimension > 12 inches.
- COBBLE** - Rock fragments with an average dimension between 3 and 12 inches.
- GRAVEL** - Rounded particles of rock < 3" and > 0.075" (#10 sieve).
- SAND** - Particles of rock < 0.075" (#10 sieve) and > 0.0029" (#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.

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

**TYLIN** INTERNATIONAL

FILE NAME: z12e134bdr\_bor\_inf.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: J. OLUND  
BORING INFORMATION & LAYOUT SHEET

PLOT DATE: 12/3/2013  
DRAWN BY: J. OLUND  
CHECKED BY: R. HEBERT  
SHEET 22 OF 70

 STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: AP-1					
		Brookfield Floating Bridge BRF FLBR(2)		Page No.: 1 of 1 Pin No.: 12e134 Checked By: JFW					
Boring Crew: J. Leonhardt (TransTech)		Casing Type: AUGER	Sampler: N.A.	Groundwater Observations					
Date Started: 3/01/13	Date Finished: 3/01/13	I.D.: 3.25 in		Date	Depth (ft)	Notes			
VTSPG NAD83: N 562170.00 ft E 1613060.00 ft		Hammer Wt: N.A.	N.A.						
Station: 14+48	Offset: 7' R	Hammer Fall: N.A.	N.A.						
Ground Elevation: 1278 ft		Hammer/Rod Type: NA							
		Rig: CME 45C SKID	CE = NA						
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)			Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Auger probe only. No soil data obtained.							
		Hole stopped @ 5.5 ft HSA refusal on inferred bedrock or possible boulder.							
		Remarks: 1) Ground surface elevation, northing, easting, and stationing are estimated from concept plans provided by TY Lin dated December 17, 2012. 2) Hollow stem auger refusal at 5.5' deep on inferred bedrock or possible boulder.							
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.									

BOTTOM OF  
ABUT NO 2  
EL 1272.67

GEODESIGN BORING LOG: 888-04.5 FLOATING BRIDGE VTRANS FORMAT.GPJ VERMONT A07.GBT 5/7/13



PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: S. MORGAN
FILE NAME: z12e134bdr_bor_log.dgn	CHECKED BY: J. OLUND
PROJECT LEADER: J. OLUND	SHEET 23 OF 70
DESIGNED BY: J. OLUND	
BORING LOGS 1	



VTTrans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-1				
				Brookfield Floating Bridge BRF FLBR(2)		Page No.: 1 of 1				
						Pin No.: 12e134				
						Checked By: JAG				
Boring Crew: H. Garrow, J. Wimet (GeoDesign)		Casing		Sampler		Groundwater Observations				
Date Started: 7/30/12 Date Finished: 7/30/12		Type: FJ		SS		Date				
VTSPG NAD83: N 562179.00 ft E 1613055.00 ft		I.D.: 4 in		1.38 in		Depth (ft)				
Station: 14+39 Offset: 0.00		Hammer Wt: N.A.		140 lb.		Notes				
Ground Elevation: 1278 ft		Hammer Fall: N.A.		30 in.		07/30/12 2.0 Wet sample.				
		Hammer/Rod Type: Auto/AWJ								
		Rig: CME 45C SKID		CE = 1.33						
Depth (ft)	Strata (C)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Cores Rec. (ft)	Drill Rate (min/ft)	Blow/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0-2	S1	(0'-2'): Loose, dark brown-black fine to coarse SAND, some fine Gravel, little Silt, trace Root Fibers, trace Cinders, moist. (FILL) Rec. = 1.5 ft (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).)				2-3-5-7 (6)	7.4	47.9	42.7	9.4
2-4	S2	(2'-4'): Loose, brown WOOD and fine to coarse SAND, some fine Gravel, trace (+) Silt, strong Creosote Odor and Sheen, wet. (FILL) Rec. = 0.5 ft Inferred Timber Cribbing from 2' to 2.6' (AASHTO M145 Classification: A-1-a) (AASHTO M145 Classification: Visual Description (Burmister).)				7-6-3-2 (9)	11.1	50.9	37.5	11.6
4-6	S3	(4'-6'): Very loose, brown WOOD, some coarse Gravel, trace fine to coarse Sand, trace Silt, strong Creosote Odor, wet. (FILL) Rec. = 0.5 ft Inferred Timber Cribbing from 4' to 4.9' (AASHTO M145 Classification: Visual Description (Burmister).)				3-2-1-5 (3)	15.7	12.9	50.9	36.2
6-8	S4	(6'-8'): Medium dense, gray fine to medium SAND and SILT, wet. (SAND & SILT) Rec. = 1.2 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)				3-9-13-25 (22)				
8-9.5	C1	Inferred Weathered Rock based on casing resistance and rig chatter. (AASHTO M145 Classification: Field Note.) C1) Good quality, moderately hard, fresh with occasional slight weathering in joints, close to wide jointing, gray LIMESTONE, with a white quartzite intrusion in the bottom 6" of the sample. Strong reaction to dilute HCl. C2) Excellent quality, moderately hard, fresh, gray LIMESTONE. Strong reaction to dilute HCl.	98 (78)	8	4					
9.5		Hole stopped @ 19.5 ft								
10										
15										
20										
25										
30										
35										
40										
45										
Remarks: 1) Drilled through wood (inferred timber cribbing) from 2' to 2.6' deep and 4' to 4.9' deep. 2) Spoon bouncing on inferred weathered bedrock at 8' deep. 3) Driller inferred weathered bedrock from 8' to 9.5' deep based on rotary casing and roller bit resistance and chatter. Roller bit refusal at 9.5' deep on top of inferred competent bedrock. 4) Consistent gray-white return water throughout coring C1. Driller increased the rotary head rate after the first foot of coring in C1. 5) Lab testing gradations reported are per AASHTO M145. 6) Northing, Easting, Ground Surface Elevation, and Stationing shown are approximations based on taped measurements made from existing features in the field by GeoDesign personnel on July 30, 2012 and MicroStation files downloaded from TY Lin's FTP site by GeoDesign personnel on August 22, 2012. Location and elevation approximations for the borehole should be considered accurate only to the degree implied by the method of borehole location used.										
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.										

BOTTOM OF  
ABUT NO 2  
EL 1272.67

SECTION BORING LOG: BRB-04-5 FLOATING BRIDGE VTRANS FORMAT.GPJ VERMONT AGT.GDT 8/7/13



PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: S. MORGAN
FILE NAME: z12e134bdr_bor_log.dgn	CHECKED BY: J. OLUND
PROJECT LEADER: J. OLUND	SHEET 25 OF 70
DESIGNED BY: J. OLUND	
BORING LOGS 3	

 STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-2			
		Brookfield Floating Bridge BRF FLBR(2)		Page No.: 1 of 1			
Boring Crew: H. Garrow, J. Wimet (GeoDesign)		Casing Sampler		Date			
Date Started: 7/30/12 Date Finished: 7/30/12		Type: FJ SS		Depth (ft)			
VTSPG NAD83: N 562184.00 ft E 1613057.00 ft		I.D.: 4 in 1.38 in		Notes			
Station: 14+36 Offset: 5' L		Hammer Wt: N.A. 140 lb.		07/30/12 2.0 Wet sample.			
Ground Elevation: 1278 ft		Hammer Fall: N.A. 30 in.					
		Hammer/Rod Type: Auto/AWJ					
		Rig: CME 45C SKID CE = 1.33					
Depth (ft)	Strata (C)	CLASSIFICATION OF MATERIALS (Description)	Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0-2	XXXX	S1 (0'-2'): Very loose, dark brown fine to coarse SAND, some fine Gravel, little Silt, trace Cinders, moist. (FILL) Rec. = 1.5 ft (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).)	3-2-2-4 (4)	8.2	44.9	42.2	12.9
2-4	XXXX	S2 (2'-4'): Loose, dark brown SILT and fine to coarse SAND, little coarse Gravel (stuck in spoon tip), wet. (FILL) Rec. = 0.9 ft (AASHTO M145 Classification: A-2-4) (AASHTO M145 Classification: Visual Description (Burmister).)	2-3-5-25 (See Note 3)	22.1	23.6	46.1	30.3
4-6	XXXX	S3 (4'-6'): Very loose, piece of coarse GRAVEL stuck in spoon tip. (FILL) Rec. = 0.1 ft (AASHTO M145 Classification: Visual Description (Burmister).)	5-1-1-1 (See Note 3)				
6-7.6	XXXX	S4 (6'-7.6'): Refusal, gray fine to coarse GRAVEL (fractured weathered rock), little Silt, trace fine Sand, wet. (SANDY SILT) (AASHTO M145 Classification: Visual Description (Burmister).) Rec. = 0.3 ft Inferred Weathered Rock based on casing resistance and rig chatter. (AASHTO M145 Classification: Field Note.)	2-8-25/0.2 (100+)				
Hole stopped @ 7.8 ft Roller bit refusal on inferred competent bedrock.							
Remarks: 1) Borehole located 5' north of B-1. 2) No sample from S3 at 4' deep was retained. One piece of coarse gravel in the spoon tip was the entire recovery. 3) SPT N-values for samples S2 and S3 are invalid due to driller taking samples without clearing borehole between spoons. Instruct driller to clean borehole between samples going forward. 4) Advanced casing through wood from 5' to 6' deep (inferred timber cribbing). Wood was observed in roller bit spoils but was not picked up in split spoon sample S3. 5) Advance roller bit to 6.5' to clear hole of woody debris prior to sampling S4. 6) Split spoon refusal at 7.7' deep after 15 blows with no movement. 7) Roller bit refusal at 7.8' deep on inferred bedrock. 8) Lab testing gradations reported are per AASHTO M145. 9) Northing, Easting, Ground Surface Elevation, and Stationing shown are approximations based on taped measurements made from existing features in the field by GeoDesign personnel on July 30, 2012 and MicroStation files downloaded from TY Lin's FTP site by GeoDesign personnel on August 22, 2012. Location and elevation approximations for the borehole should be considered accurate only to the degree implied by the method of borehole location used.							
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.							

BOTTOM OF  
ABUT NO 2  
EL 1272.67

GEODESIGN BORING LOG: 888-045 FLOATING BRIDGE VTRANS FORMAT.PLT VERMONT.ADT.GBT 5/7/13

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

TYLIN INTERNATIONAL

FILE NAME: z12e134bdr\_bor\_log.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: J. OLUND  
BORING LOGS 4

PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: J. OLUND  
SHEET 26 OF 70

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-3				
		Brookfield Floating Bridge BRF FLBR(2)		Page No.: 1 of 3		Pin No.: 12e134				
		Checked By: JAG								
Boring Crew: H. Garrow, J. Wimeth/J. Gilman (GeoDesign)		Casing Type: FJ		Sampler: SS		Groundwater Observations				
Date Started: 7/31/12 Date Finished: 8/01/12		I.D.: 4 in 1.38 in		Date		Depth (ft)				
VTSPG NAD83: N 562290.00 ft E 1612740.00 ft		Hammer Wt: N.A. 140 lb.		07/31/12		2.0				
Station: 11+07 Offset: 7' R		Hammer Fall: N.A. 30 in.		08/01/12		1.5				
Ground Elevation: 1277 ft		Hammer/Rod Type: Auto/AWJ		In casing (overnight)						
		Rig: CME 45C SKID CE = 1.33								
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. (ROD %)	Drill Rate (minutes/ft)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
5	XXXX	Asphalt (AASHTO M145 Classification: Visual Description (Burmister).)				3-4-4-4 (8)	19.6	37.8	40.9	21.3
	XXXX	S1 (1'-3'): Loose, dark brown fine to coarse SAND, some (+) Silt, little (+) fine to coarse Gravel, moist to wet. (FILL) (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).) Rec. = 1.1 ft				7-4-3-2 (7)	22.6	31.7	39.9	28.4
	XXXX	S2 (3'-5'): Loose, no recovery, (FILL) Rec. = 0.0 ft (AASHTO M145 Classification: Visual Description (Burmister).)				2-1-5-3 (6)	26.7	45.6	36.0	18.4
	XXXX	S3 (5'-7'): Loose, dark brown silt and fine to coarse SAND, some fine to coarse Gravel, trace Organic Fibers, wet. (LAKE SEDIMENT - POSSIBLE FILL) Rec. = 0.4 ft (AASHTO M145 Classification: A-2-4) (AASHTO M145 Classification: Visual Description (Burmister).)				1-1-8-10 (9)	17.3	48.2	34.1	17.7
	XXXX	S4 (7'-9'): Loose, dark brown fine to coarse SAND, some fine Gravel, little Silt, trace (+) Organic Fibers, wet. (LAKE SEDIMENT - POSSIBLE FILL) Rec. = 0.7 ft (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).) Rec. = 0.7 ft				2-2-8-5 (10)	14.6	42.3	44.2	13.5
	XXXX	S5 (9'-11'): Medium dense, dark brown fine to coarse SAND, little fine to coarse Gravel, little Silt, wet. (SILTY SAND & GRAVEL) (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).)				6-6-6-7 (12)	15.4	51.8	33.7	14.5
	XXXX	S6 (11'-13'): Medium dense, dark brown fine to coarse SAND, little Silt, little fine Gravel, wet. (SILTY SAND & GRAVEL) Rec. = 1.1 ft (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).)				3-6-6-9 (12)	10.8	57.6	32.0	10.4
	XXXX	S7 (13'-15'): Medium dense, dark brown fine to coarse SAND, some fine Gravel, little Silt, wet. (SILTY SAND & GRAVEL) Rec. = 0.9 ft (AASHTO M145 Classification: A-1-a) (AASHTO M145 Classification: Visual Description (Burmister).)				16-10-10-14 (20)	10.8	41.9	32.0	26.1
	XXXX	S8 (15'-17'): Medium dense, dark brown fine to coarse SAND, some fine Gravel, trace Silt, wet. (SILTY SAND & GRAVEL) Rec. = 0.6 ft (AASHTO M145 Classification: A-1-a) (AASHTO M145 Classification: Visual Description (Burmister).)				15/0.4 (100+)	5.4	70.8	16.0	13.2
	XXXX	S9 (20'-22'): Medium dense, gray fine to medium SAND, some Silt, some fine to coarse Gravel, wet. (GLACIAL TILL WITH FREQUENT BOULDERS/COBBLES) Rec. = 1.0 ft (AASHTO M145 Classification: A-2-4) (AASHTO M145 Classification: Visual Description (Burmister).)				50/0.4 (100+)	7.7	65.9	15.3	18.8
	XXXX	S10 (25'-25.4'): Refusal, gray fine to coarse GRAVEL (fractured cobble pieces), little fine to medium Sand, little Silt, wet. (GLACIAL TILL WITH FREQUENT BOULDERS/COBBLES) Rec. = 0.3 ft (AASHTO M145 Classification: A-1-a) (AASHTO M145 Classification: Visual Description (Burmister).)	C1	36 (10)	2	23-50/0.2 (100+)	7.0	56.4	23.1	20.5
	XXXX	S11 (30'-30.4'): Refusal, gray fine to coarse GRAVEL, little fine to coarse Sand, little (-) Silt, wet. (Pen = 0.4, Rec. = 0.4) C1 Very poor quality, fresh, moderately hard, gray LIMESTONE (Boulder). (GLACIAL TILL WITH FREQUENT BOULDERS/COBBLES) Rec. = 0.4 ft (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).)				67 (100+)	8.6	44.7	22.9	32.4
	XXXX	S12 (35'-35.7'): Refusal, gray fine to coarse SAND and fine to coarse GRAVEL, some Silt, wet. (GLACIAL TILL WITH FREQUENT BOULDERS/COBBLES) Rec. = 0.7 ft (AASHTO M145 Classification: A-1-b) (AASHTO M145 Classification: Visual Description (Burmister).)				48-50 (100+)	10.7	24.3	22.6	53.1

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-3				
		Brookfield Floating Bridge BRF FLBR(2)		Page No.: 2 of 3		Pin No.: 12e134				
		Checked By: JAG								
Boring Crew: H. Garrow, J. Wimeth/J. Gilman (GeoDesign)		Casing Type: FJ		Sampler: SS		Groundwater Observations				
Date Started: 7/31/12 Date Finished: 8/01/12		I.D.: 4 in 1.38 in		Date		Depth (ft)				
VTSPG NAD83: N 562290.00 ft E 1612740.00 ft		Hammer Wt: N.A. 140 lb.		07/31/12		2.0				
Station: 11+07 Offset: 7' R		Hammer Fall: N.A. 30 in.		08/01/12		1.5				
Ground Elevation: 1277 ft		Hammer/Rod Type: Auto/AWJ		In casing (overnight)						
		Rig: CME 45C SKID CE = 1.33								
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. (ROD %)	Drill Rate (minutes/ft)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
55		Description (Burmister). S13 (40'-40.5'): Refusal, gray SILT, some (-) fine to medium Sand, trace fine to coarse Gravel, wet. (GLACIAL TILL WITH FREQUENT BOULDERS/COBBLES) Rec. = 0.5 ft (AASHTO M145 Classification: A-2-4) (AASHTO M145 Classification: Visual Description (Burmister).)				50 (100+)	11.6	18.4	19.5	62.1
		S14 (45'-46'): Refusal, gray SILT, some fine to medium Sand, trace (+) fine Gravel, wet. (GLACIAL TILL) Rec. = 1.0 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)				18-25-32-38 (57)	23.2		7.2	92.8
		S15 (50'-50.5'): Refusal, gray SILT, little fine Sand, trace fine Gravel, wet. (GLACIAL TILL) Rec. = 0.5 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)				17-23-26-35 (49)	23.5		27.4	72.6
		S16 (55'-57'): Very dense, gray SILT, little fine Sand, wet. (GLACIAL TILL) Rec. = 1.6 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)								
		S17 (60'-62'): Very dense, SILT and fine to medium SAND, wet. (GLACIAL TILL) Rec. = 1.6 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)								
		S18 (70'-72'): Dense, SILT and fine to medium SAND, wet. (GLACIAL TILL) Rec. = 1.6 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)				3-14-24 (38)	24.0		39.2	60.8
		S19 (80'-82'): Very dense, SILT and fine to medium SAND, wet. (GLACIAL TILL) Rec. = 1.7 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)				20-31-40-44 (71)	22.8		41.2	58.8
		S20 (90'-91.4'): Refusal, gray SILT, little fine to coarse Sand, trace fine to coarse Gravel, wet (top 3" washed angular gravel). (GLACIAL TILL) Rec. = 1.4 ft (AASHTO M145 Classification: A-4) (AASHTO M145 Classification: Visual Description (Burmister).)				22-50-50/0.4 (100+)	20.4	12.3	7.8	79.9

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-3				
		Brookfield Floating Bridge BRF FLBR(2)		Page No.: 3 of 3		Pin No.: 12e134				
		Checked By: JAG								
Boring Crew: H. Garrow, J. Wimeth/J. Gilman (GeoDesign)		Casing Type: FJ		Sampler: SS		Groundwater Observations				
Date Started: 7/31/12 Date Finished: 8/01/12		I.D.: 4 in 1.38 in		Date		Depth (ft)				
VTSPG NAD83: N 562290.00 ft E 1612740.00 ft		Hammer Wt: N.A. 140 lb.		07/31/12		2.0				
Station: 11+07 Offset: 7' R		Hammer Fall: N.A. 30 in.		08/01/12		1.5				
Ground Elevation: 1277 ft		Hammer/Rod Type: Auto/AWJ		In casing (overnight)						
		Rig: CME 45C SKID CE = 1.33								
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. (ROD %)	Drill Rate (minutes/ft)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
105		Hole stopped @ 100.0 ft No refusal to 100' deep.								
110		Remarks: 1) Start sampling at 1' deep. Advanced casing through 5" of asphalt. 2) Driller notes occasional roller bit chatter through inferred coarse gravel and or small cobbles at 13' deep. 3) Infer boulder at 24.5' deep based on roller bit resistance. 4) Split spoon refusal at 25.4' deep after 10 blows with no movement. 5) Infer glacial till with frequent nested boulders and cobbles (estimated under 12" thick) from 24.5' to 35' deep based grinding and chatter during casing advance. Recoveries from the clean out barrel used to clear the casing and split spoon samples from this interval were almost entirely composed of broken pieces of Limestone with silt and sand. Attempted core run from 30' to 35' and recovered 1.8' worth of Limestone and Quartz boulder/cobble pieces. 6) Driller used hammer to pound sampler through approximately 8" of slough to reach sample interval for S12 at 35' (8 blows), 12" of slough for sample S13 at 40' deep (10 blows) and through 4" of slough at 45' deep (11 blows). Asked driller to clean hole with the roller bit instead of cleaned barrel going forward in attempt to break up more of the coarse gravel slough in the borehole. Driller stated he couldn't because it would over torque the drill rods. 7) Infer glacial till between 35' and 45' deep to contain frequent boulders and cobbles (estimated under 12" diameter) but not as frequent as noted between 24.5' and 35'. 8) Boulders and cobbles not encountered while advancing borehole below 45' deep. 9) Driller noted decrease in resistance to casing advance at approximately 54' deep. 10) Exploration terminated after roller bit advance to 100' deep with no refusal (casing was at 90' deep). 11) Lab testing gradations reported are per AASHTO M145. 12) Northing, Easting, Ground Surface Elevation, and Stationing shown are approximations based on visual estimates of the borehole location made in the field by GeoDesign personnel on July 31, 2012 and MicroStation files downloaded from TY Lin's FTP site by GeoDesign personnel on August 22, 2012. Location and elevation approximations for the borehole should be considered accurate only to the degree implied by the method of borehole location used.								

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

FILE NAME: z12e134bdr\_bor\_log.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: J. OLUND  
BORING LOGS 5

PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: J. OLUND  
SHEET 27 OF 70



VT		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-4							
				Brookfield Floating Bridge BRF FLBR(2)		Page No.: 1 of 1							
						Pin No.: 12e134							
						Checked By: DTH							
Boring Crew: J. Leonhardt (TransTech), J. Wimeff (GeoDesign)		Casing Sampler		Groundwater Observations									
Date Started: 2/22/13 Date Finished: 2/22/13		Type: FJ	SS	Date	Depth (ft)	Notes							
VTSPG NAD83: N 562185.00 ft E 1613005.00 ft		I.D.: 4 in	1.38 in										
Station: 13+90 Offset: 12'R		Hammer Wt: N.A.	140 lb.										
Ground Elevation: 1275 ft		Hammer Fall: N.A.	30 in.										
		Hammer/Rod Type: Safety/AWJ											
		Rig: CME 45C SKID	CE = 1										
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)		Run (tip dep.)	Core Rec. (ROD %)	Drill Rate (min/ft)	Blows/F (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
5		Water Column											
15		S1 (13.5' - 15.5'): Very loose, black/brown PEAT and ORGANIC SILT and fine to medium SAND, some Wood Pieces, wet. (Lake Bottom Sediment) Rec. = 0.6 ft (AASHTO M145 Classification: A-4.)					2/24" (1)	115.8	4.5	36.4	59.1	NP	NP
20		S2 (20' - 20.2'): Refusal, black ORGANIC SILT and WOOD PIECES and fine to coarse SAND, trace Debris (Beer Cap), little fine Gravel, wet. (Lake Bottom Sediment). Rec. = 0.2 ft (AASHTO M145 Classification: A-4.)					50/2" (8)	98.2	22.6	32.4	45.0	NP	NP
25		Inferred Lake Bottom Sediment.		C1	100 (100)	5							
		C1) Excellent quality, moderately hard, fresh, moderately jointed, gray with white banding LIMESTONE. Moderate to strong reaction to diluted HCl. Jointing at 38 degrees from horizontal.		C2	96 (65)	7							
		C2) Fair quality, moderately hard, fresh, closely to moderately jointed gray with white banding LIMESTONE. Moderate to strong reaction to diluted HCl. Jointing between 0 and 35 degrees from horizontal with one joint at 65 degrees.		C3	100 (100)	8							
		C3) Excellent quality, moderately hard, fresh, widely jointed, gray with white banding LIMESTONE. Moderate to strong reaction to diluted HCl. Jointing nearly horizontal.											
		Hole stopped @ 33.0 ft											
		Remarks:											
		1) Ground surface elevation, northing, easting, and stationing are estimated from concept plans provided by TY Lin dated December 17, 2012. Borehole performed ~10' west of proposed hinge point due to accessibility.											
		2) Hammer correction factor is assumed to be 1.0 (rope and cathead safety hammer).											
		3) Performed borehole through lake ice. Lake bottom sediments noted to begin at 13.5' below ice level.											
		4) After hitting sample S1 with 2 blows, both the rod and casing began sinking through the lake bottom sediments.											
		5) Spill spoon refusal at 20.2' deep on inferred cobble.											
		6) Driller notes increase in rollerbit resistance on inferred bedrock at 23' deep.											
		7) Stopped core C1 at 24.5' deep to add a drill rod and immediately had core blockage upon attempting to restart core run. End core run C1 at 24.5'.											
		8) Stopped core C2 at 29' (4.5' long run) due to drill stroke. Begin C3 at 29'.											
		9) Stopped core C3 after 4' of penetration for a total of 10' of rock core.											
		10) Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145.											
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.											

GEODESIGN BORING LOG: BBR-44.5 FLOATING BRIDGE VERMONT FORMAT (SP) VERMONT AD-601 9/7/13

<b>TYLIN</b> INTERNATIONAL	PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
	PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: S. MORGAN
	FILE NAME: z12e134bdr_bor_log.dgn	CHECKED BY: J. OLUND
	PROJECT LEADER: J. OLUND	SHEET 28 OF 70
	DESIGNED BY: J. OLUND	
	BORING LOGS 6	

VTTrans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-5						
				Brookfield Floating Bridge BRF FLBR(2)		Page No.: 1 of 1						
						Pin No.: 12e134						
						Checked By: DTH						
Boring Crew: J. Leonhardt (TransTech), J. Wimet (GeoDesign)		Casing Sampler		Groundwater Observations								
Date Started: 2/25/13 Date Finished: 2/25/13		Type: FJ SS		Date	Depth (ft)	Notes						
VTSPG NAD83: N 562208.00 ft E 1613012.00 ft		I.D.: 4 in 1.38 in										
Station: 13+89 Offset: 12'L		Hammer Wt: N.A. 140 lb.										
Ground Elevation: 1275 ft		Hammer Fall: N.A. 30 in.										
		Hammer/Rod Type: Safety/AWJ										
		Rig: CME 45C SKID CE = 1										
Depth (ft)	Strata (t)	CLASSIFICATION OF MATERIALS (Description)	Run (tip dep.)	Corr. Blows (RCP %)	Drill Rate (minutes/ft)	Blows/ft (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
0		Water Column.										
15	x x x	Inferred Lake Bottom Sediments (Organic Silts and Organic Matter).										
24.5		S1 (24.5' - 25'): Refusal, gray fine to medium SAND, some (+) Silt, some fine Gravel (fractured), wet. Rec. = 0.5 ft (AASHTO M145 Classification: A-2-4.)				6-12/0" (R)						
25		C1) Excellent quality, moderately hard, fresh, moderate to widely jointed, gray with white banding LIMESTONE. Moderate to strong reaction to diluted HCl. Jointing between 0 and 35 degrees from horizontal.	C1	100 (98)	9		14.3	26.2	44.8	29.0	NP	NP
25												
30		Hole stopped @ 30.0 ft										
35		Remarks: 1) Ground surface elevation, northing, easting, and stationing are estimated from concept plans provided by TY Lin dated December 17, 2012. Borehole performed ~10' west of proposed hinge point due to accessibility. 2) Hammer correction factor is assumed to be 1.0 (rope and cathead safety hammer). 3) Performed borehole through lake ice. Lake bottom sediments noted to begin at 13' below ice level. 4) White placing casing through ice to lake bottom, casing stopped on sediments at 13' deep. Driller added additional section of casing and casing sunk through sediments prior to obtaining a sample at 13' deep. Casing continued to advance under its own self weight until 22' deep. Driller drove casing to 24.5' deep prior to sampling S1 (due to excessive casing stickup at 22'). 5) Stop sample S1 after 12 blows with no movement and spoon bouncing. Note casing to have sunk 6 inches while sampling S1. 6) Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145.										
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.												

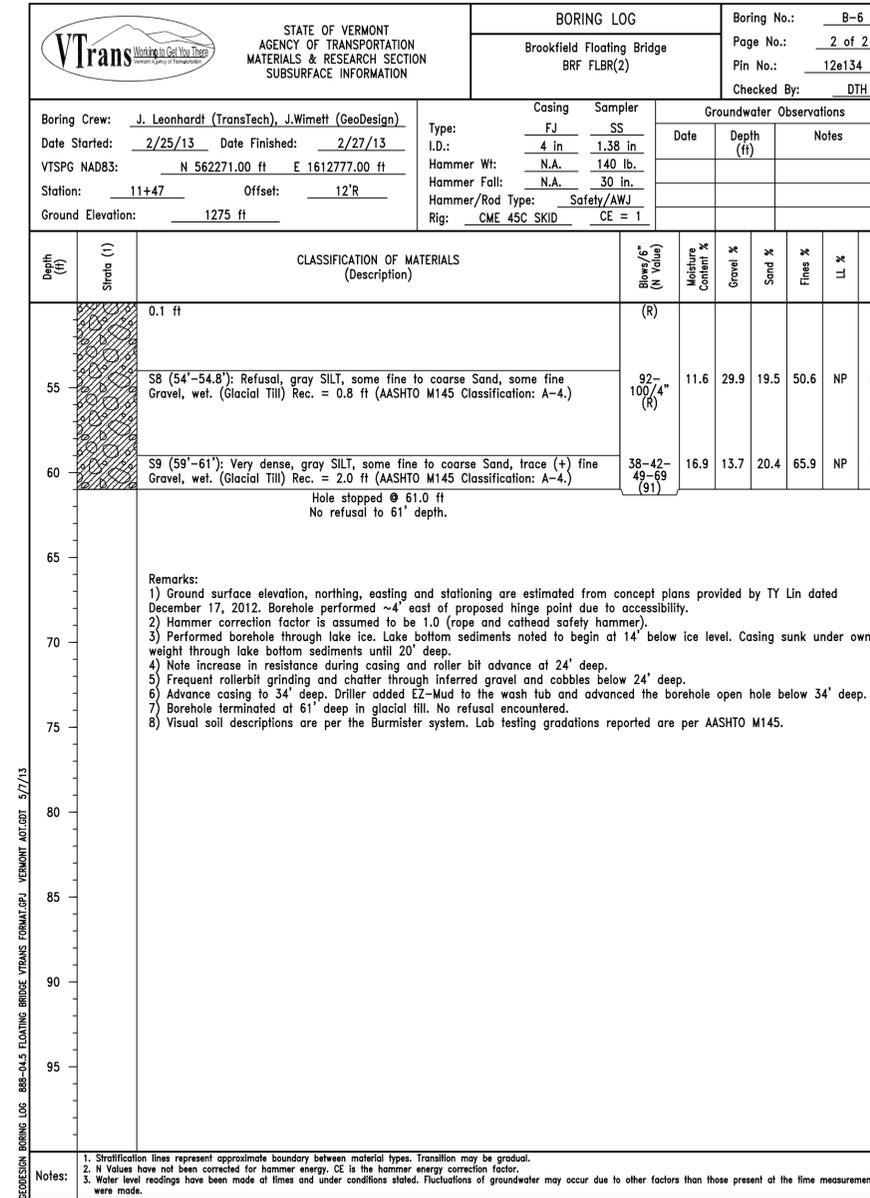
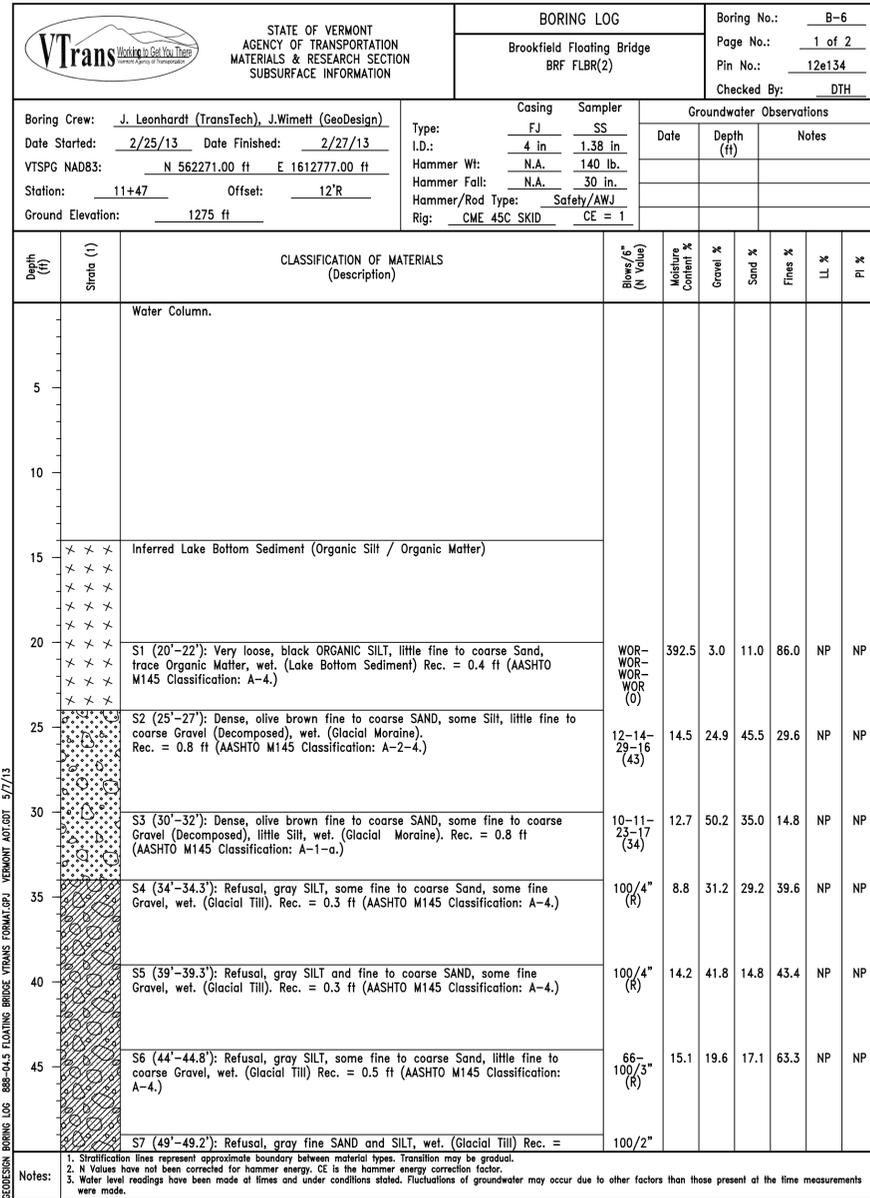
GEODESIGN BORING LOG 888-6445 FLOATING BRIDGE VIBRANS FORMAT.GPJ VERMONT AOT.GDT 5/7/13

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRF FLBR(2)

TYLIN INTERNATIONAL

FILE NAME: z12e134bdr\_bor\_log.dgn  
 PROJECT LEADER: J. OLUND  
 DESIGNED BY: J. OLUND  
 BORING LOGS 7

PLOT DATE: 12/3/2013  
 DRAWN BY: S. MORGAN  
 CHECKED BY: J. OLUND  
 SHEET 29 OF 70



VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-7				
				Brookfield Floating Bridge BRF FLBR(2)		Page No.: 1 of 2				
						Pin No.: 12e134				
						Checked By: DTH				
Boring Crew: J. Leonhardt (TransTech), J. Wimet (GeoDesign)		Casing Sampler		Groundwater Observations						
Date Started: 2/27/13 Date Finished: 2/28/13		Type: FJ SS		Date	Depth (ft)	Notes				
VTSPG NAD83: N 562294.00 ft E 1612786.00 ft		I.D.: 4 in 1.38 in								
Station: 11+47 Offset: 12'L		Hammer Wt: N.A. 140 lb.								
Ground Elevation: 1275 ft		Hammer Fall: N.A. 30 in.								
		Hammer/Rod Type: Safety/AWJ								
		Rig: CME 45C SKID CE = 1								
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)		Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		Water Column.								
5										
15		S1 (13'-15'): Very loose, no recovery. Inferred Lake Bottom Sediment (Organic Silt / Organic Matter) Rec. = 0.0 ft		WOR-WOR-1 (0)						
20		S2 (20'-22'): Very loose, brown ORGANIC SILT and ORGANIC MATTER, trace fine Gravel, trace Glass, trace fine Sand, wet. (Lake Bottom Sediment). Rec. = 0.1 ft (AASHTO M145 Classification: A-4.)		WOR-WOR-WOR (0)	166.1	6.7	8.7	84.6	NP	NP
25		S3 (25'-27'): Medium dense, gray fine to coarse SAND and fine to coarse GRAVEL, some Silt, wet. (Glacial Moraine) Rec. = 0.3 ft (AASHTO M145 Classification: A-2-4.)		7-14-10-8 (24)	8.9	48.4	22.8	28.8	NP	NP
30		S4 (30'-32'): Dense, gray fine to coarse SAND and SILT, little fine Gravel, wet. (Glacial Moraine) Rec. = 0.3 ft (AASHTO M145 Classification: A-4.)		9-11-25-35 (36)	10.1	22.9	35.7	41.4	NP	NP
35		Inferred nested boulders.								
35		C1 (35.5' - 37.5'): Gray LIMESTONE BOULDER/COBBLE PIECES.								
40		S5 (40'-40.75') Refusal, gray fine to coarse SAND and SILT, some fine to coarse Gravel, wet. (Glacial Till)								
40		Rec. = 0.75 ft (AASHTO M145 Classification: A-4.)		22-50/3" (R)	9.6	42.8	18.6	38.6	NP	NP
40		S6 (45'-45.5') Refusal, gray fine to coarse SAND, some fine to coarse Gravel, some Silt, wet. (INFERRED ROLLERBIT CUTTINGS)								
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.										

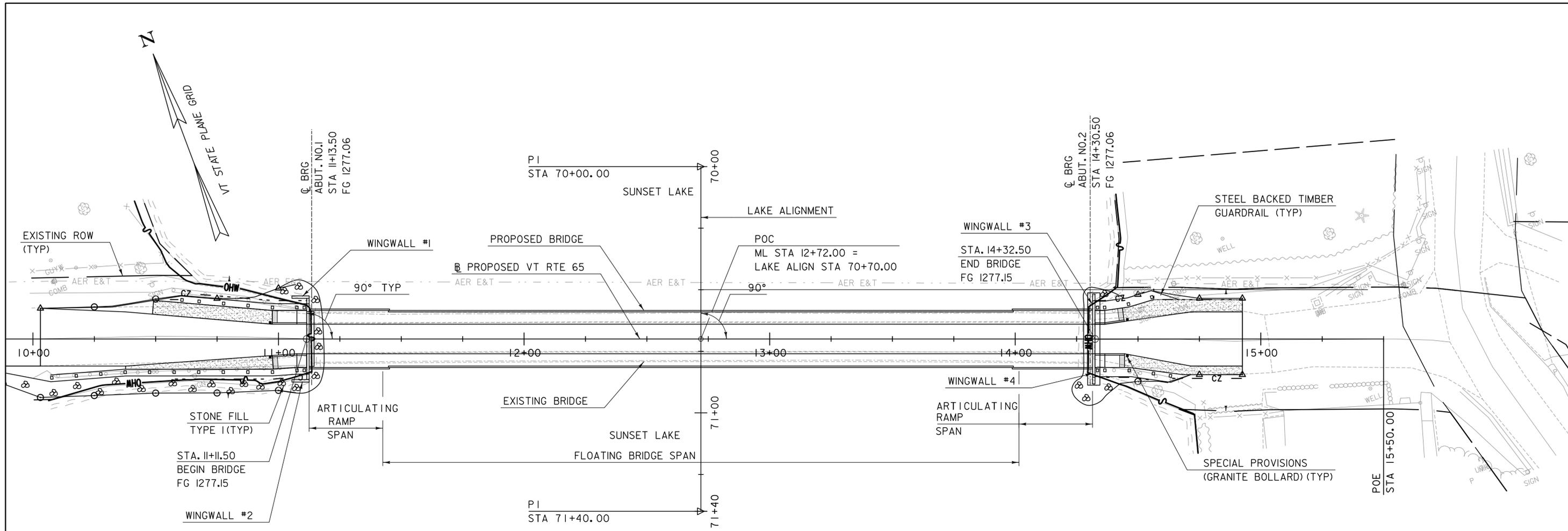
VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING LOG		Boring No.: B-7				
				Brookfield Floating Bridge BRF FLBR(2)		Page No.: 2 of 2				
						Pin No.: 12e134				
						Checked By: DTH				
Boring Crew: J. Leonhardt (TransTech), J. Wimet (GeoDesign)		Casing Sampler		Groundwater Observations						
Date Started: 2/27/13 Date Finished: 2/28/13		Type: FJ SS		Date	Depth (ft)	Notes				
VTSPG NAD83: N 562294.00 ft E 1612786.00 ft		I.D.: 4 in 1.38 in								
Station: 11+47 Offset: 12'L		Hammer Wt: N.A. 140 lb.								
Ground Elevation: 1275 ft		Hammer Fall: N.A. 30 in.								
		Hammer/Rod Type: Safety/AWJ								
		Rig: CME 45C SKID CE = 1								
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)		Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		Rec. = 0.5 ft (AASHTO M145 Classification: A-1-b.)		80-50/0" (R)	9.2	56.9	20.1	23.0	NP	NP
50		S7 (50'-50.9') Refusal, gray fine to coarse SAND and SILT, some fine to coarse Gravel, wet. (Glacial Till)								
50		Rec. = 0.9 ft (AASHTO M145 Classification: A-4.)		31-100/5" (R)	9.1	40.0	23.7	36.3	NP	NP
50		Hole stopped @ 50.9 ft No refusal to 50.9' depth.								
55										
60										
65										
70										
75										
80										
85										
Remarks: 1) Ground surface elevation, northing, easting, and stationing are estimated from concept plans provided by TY Lin dated December 17, 2012. Borehole performed ~4' east of proposed hinge point due to accessibility. 2) Hammer correction factor is assumed to be 1.0 (rope and overhead safety hammer). 3) Performed borehole through lake ice. Lake bottom sediments noted to begin at 13' below ice level. Casing sunk under own weight through lake bottom sediments until 23.5' deep. 4) Note increase in resistance during casing and roller bit advance at 23.5' deep. 5) Advance casing to 30' deep. Driller added EZ-Mud to the wash tub and advanced the borehole open hole below 30' deep. 6) Advance roller bit through inferred boulder from 32.5' to 35.5'. Attempt core run to break through boulders from 35.5' to 37.5'. Break through inferred nested boulders at 37' deep. 7) Telescope through 4" casing and inferred nested boulder layer with 3" flush joint casing to 40' deep. 8) Exploration terminated at 50.9 feet due to crooked borehole causing difficulty advancing the roller bit and clearing cuttings. 9) Visual soil descriptions are per the Burmister system. Lab testing gradations reported are per AASHTO M145.										
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.										

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

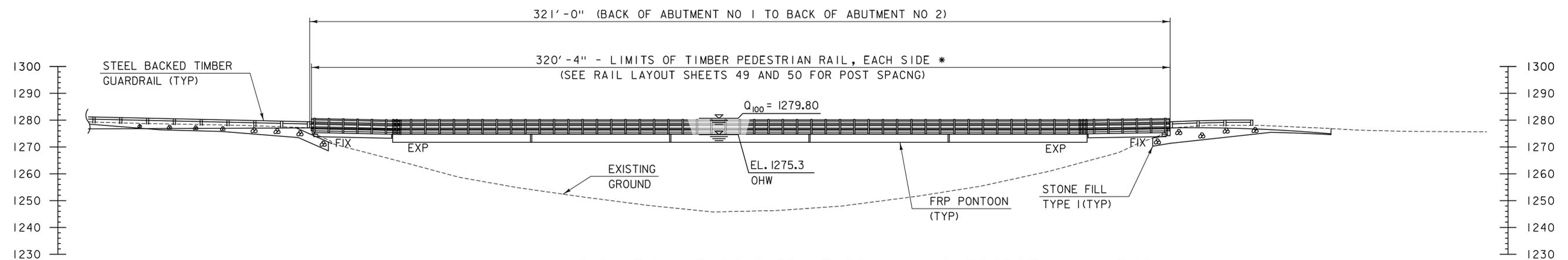
TYLIN INTERNATIONAL

FILE NAME: z12e134bdr\_bor\_log.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: J. OLUND  
BORING LOGS 9

PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: J. OLUND  
SHEET 31 OF 70

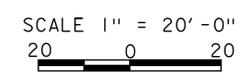


**PLAN**  
SCALE: 1" = 20'-0"



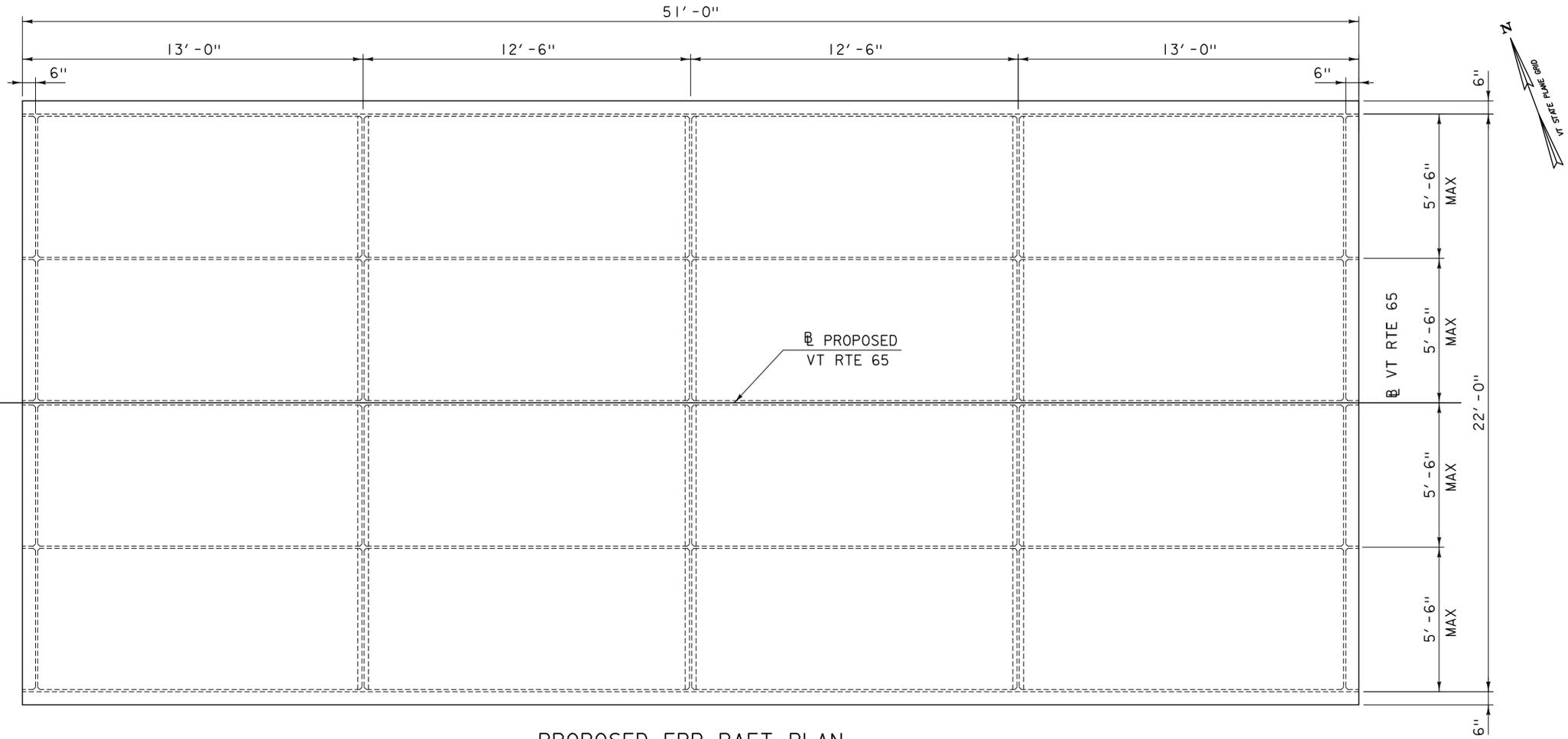
**ELEVATION AT SOUTHERN FASCIA**  
SCALE: 1" = 20'-0"

\* TIMBER PEDESTRIAN RAIL TO BE PAID UNDER ITEM 522.25, "STRUCTURAL LUMBER AND TIMBER, TREATED."

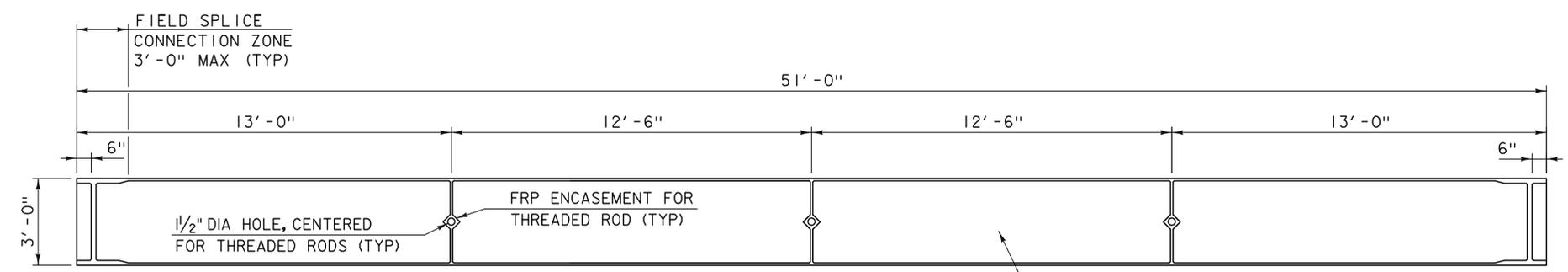
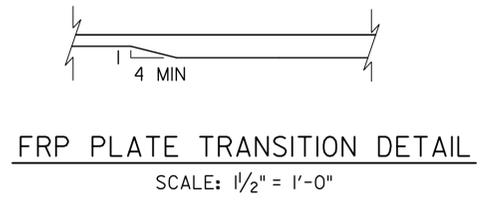


**TYLIN** INTERNATIONAL

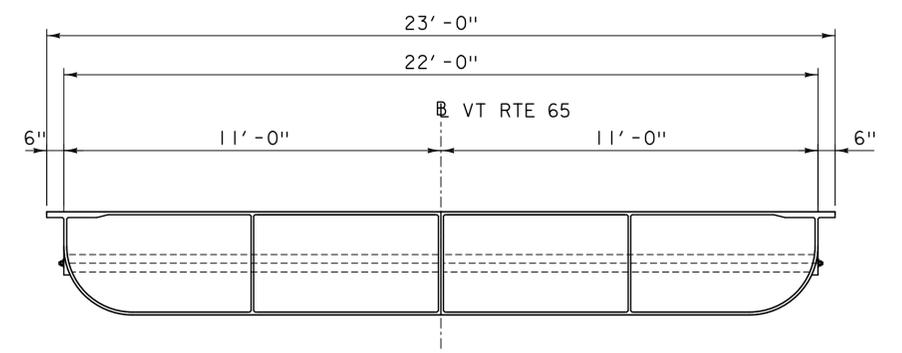
PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: S. MORGAN
FILE NAME: z12e134bdr.gpe.dgn	CHECKED BY: J. OLUND.
PROJECT LEADER: J. OLUND	SHEET 32 OF 70
DESIGNED BY: J. OLUND	
BRIDGE PLAN AND ELEVATION	



**PROPOSED FRP RAFT PLAN**  
 SCALE: 3/8" = 1'-0"  
 (INTERIOR RAFT SHOWN)

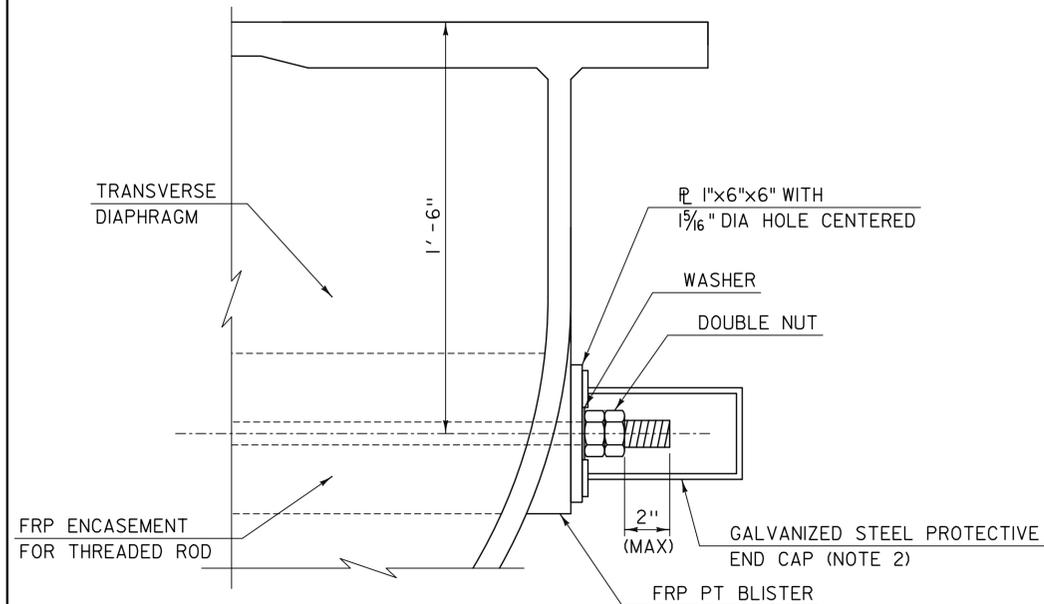


**PROPOSED FRP RAFT LONGITUDINAL SECTION**  
 SCALE: 3/8" = 1'-0"  
 (INTERIOR RAFT SHOWN)

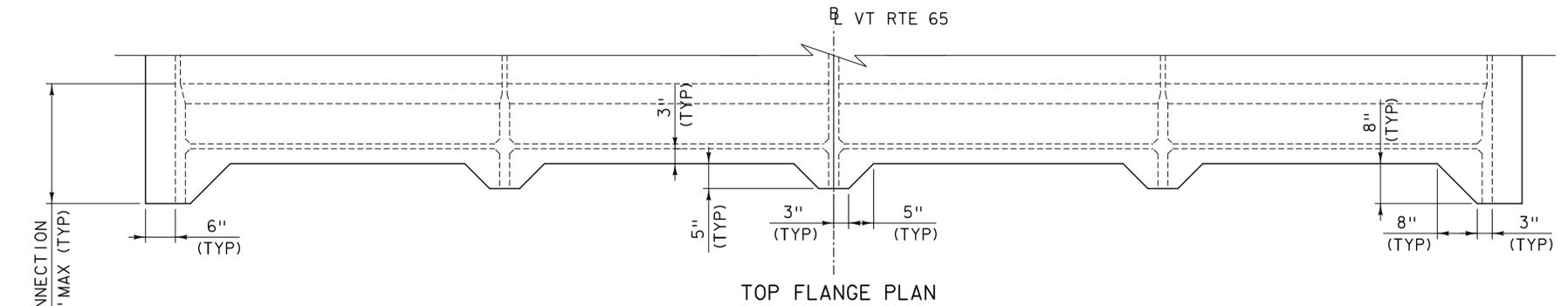


**PROPOSED FRP RAFT TRANSVERSE SECTION**  
 SCALE: 3/8" = 1'-0"

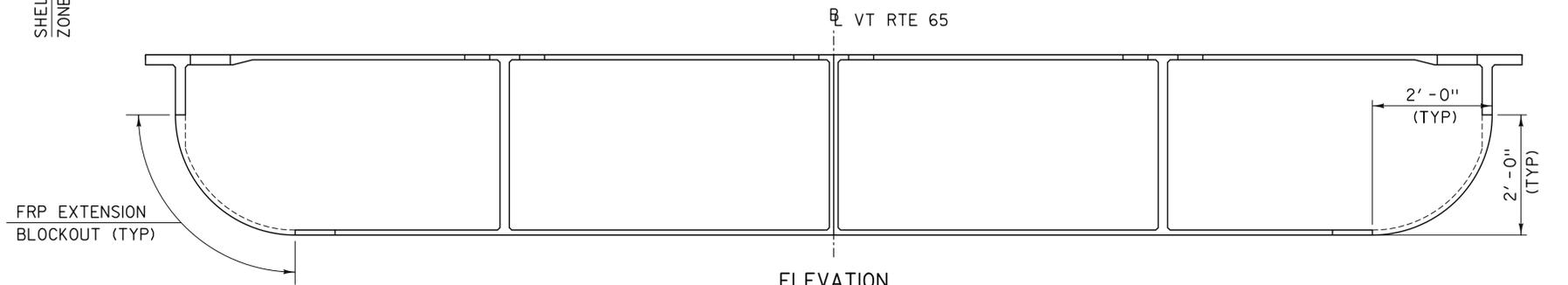
<b>TYLIN</b> INTERNATIONAL	PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
	PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: S. MORGAN
	FILE NAME: z12e134bdrfrp_details.dgn	CHECKED BY: D. MYERS
	PROJECT LEADER: J. OLUND	SHEET 33 OF 70
	DESIGNED BY: J. OLUND	
	FRP RAFT DETAILS I	



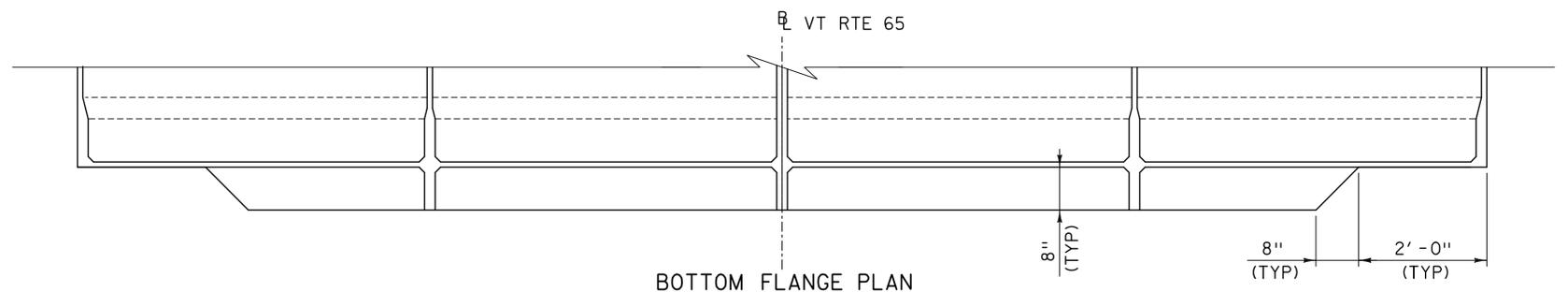
**PONTON CONNECTION DETAIL**  
NOT TO SCALE



**TOP FLANGE PLAN**



**ELEVATION**



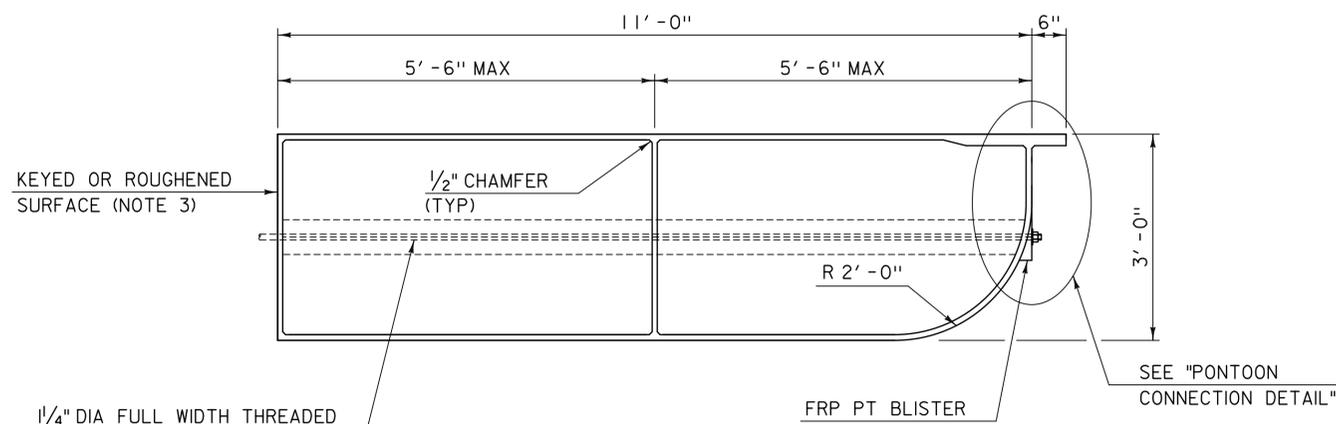
**BOTTOM FLANGE PLAN**

**FRP RAFT END DETAIL  
AT END OF FLOATING SPAN**

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

**NOTES:**

1. THREADED RODS SHALL BE TENSIONED TO AN INITIAL JACKING FORCE OF 55 KIPS AND SHALL BE RETENSIONED 2 WEEKS AFTER INITIAL TENSIONING, TO THE SAME MAGNITUDE. THE FRP ENCASUREMENT FOR THREADED RODS SHALL BE DESIGNED TO RESIST COMPRESSIVE FORCES CAUSED BY TENSIONING OPERATIONS. THREADS ALONG THREADED RODS NEED ONLY BE PRESENT NEAR THE ANCHOR LOCATIONS FOR PROPER INSTALLATION.
2. THE GALVANIZED STEEL PROTECTIVE END CAPS SHALL PROVIDE A WATER-TIGHT ENCLOSURE AROUND THE THREADED ROD ENDS. THE CONTRACTOR SHALL SUBMIT INTENDED METHOD OF SECURING THE END CAP FOR APPROVAL. ALTERNATIVE PROTECTIVE END CAPS MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDED SUCH CAPS CAN RESIST ICE PRESSURES NOTED HEREIN AND HAVE CORROSION RESISTANCE EQUIVALENT OR BETTER THAN THE PROPOSED GALVANIZED STEEL CAPS.
3. SURFACE BETWEEN PONTOONS SHALL BE KEYED OR ROUGHENED BY METHODS OF SANDBLASTING, ACID ETCHING, OR ADHESIVELY APPLIED SILICA GRIT. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.



**PROPOSED FRP PONTOON  
TRANSVERSE SECTION**

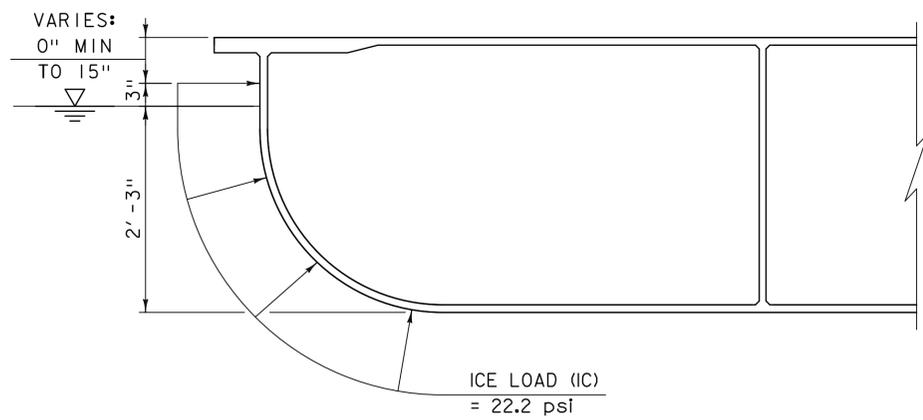
SCALE: 3/4" = 1'-0"

1/4" DIA FULL WIDTH THREADED ROD TO CONNECT PONTOONS (NOTE 1)

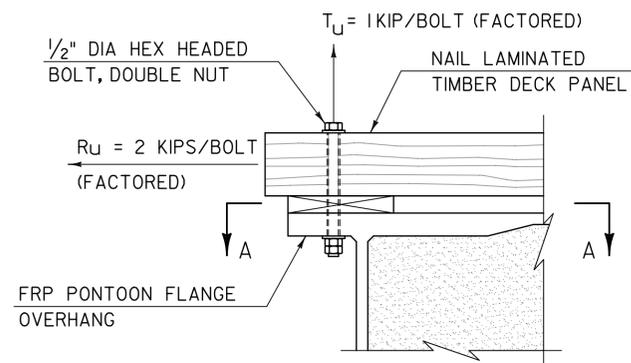
REVISION	DESCRIPTION	DATE
REVISION #1	REVISED NOTES	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

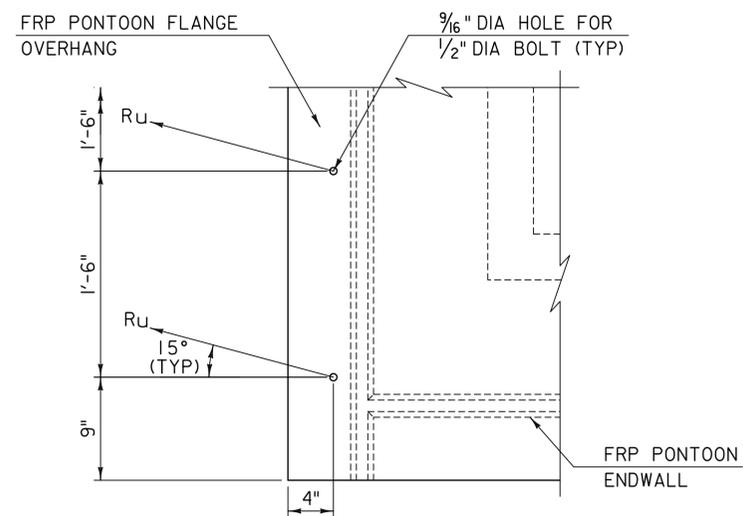
<b>TYLIN</b> INTERNATIONAL	FILE NAME: z12e134bdrfrp_details2.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: J. OLUND	CHECKED BY: D. MYERS
	FRP RAFT DETAILS 2	SHEET 34 OF 70



**ICE PRESSURE LOADING DIAGRAM**  
NOT TO SCALE



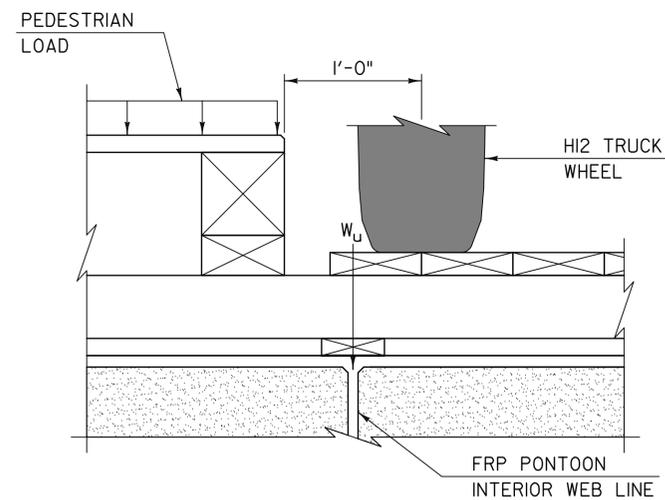
**DECK OVERHANG CONNECTION LOADING DIAGRAM - SECTION**  
NOT TO SCALE  
(NOT ALL BRIDGE COMPONENTS SHOWN FOR CLARITY)



**VIEW A-A - DECK OVERHANG CONNECTION LOADING DIAGRAM**  
NOT TO SCALE

**ICE LOAD NOTES:**

1. ICE LOADS SHALL BE TAKEN TO ACT EQUALLY TO BOTH SIDES OF THE FRP RAFTS SIMULTANEOUSLY. ICE FLOWS AND HANGING ICE DAMS NEED NOT BE CONSIDERED IN THE DESIGN OF THE FRP PONTOONS.
2. DESIGN FOR ICE PRESSURES NOTED ON THIS SHEET SHALL BE CONSIDERED SIMULTANEOUSLY WITH GLOBAL 'EXTREME EVENT II' GLOBAL DESIGN FORCES NOTED ON SHEET 37.



$W_U = 15.5 \text{ KIP}$  DISTRIBUTED OVER A 24" LONGITUDINAL LENGTH, WHICH ACCOUNTS FOR THE FACTORED REACTION DUE TO PEDESTRIAN LOAD, H12 TRUCK WHEEL LOAD, AND TIMBER DEAD LOAD

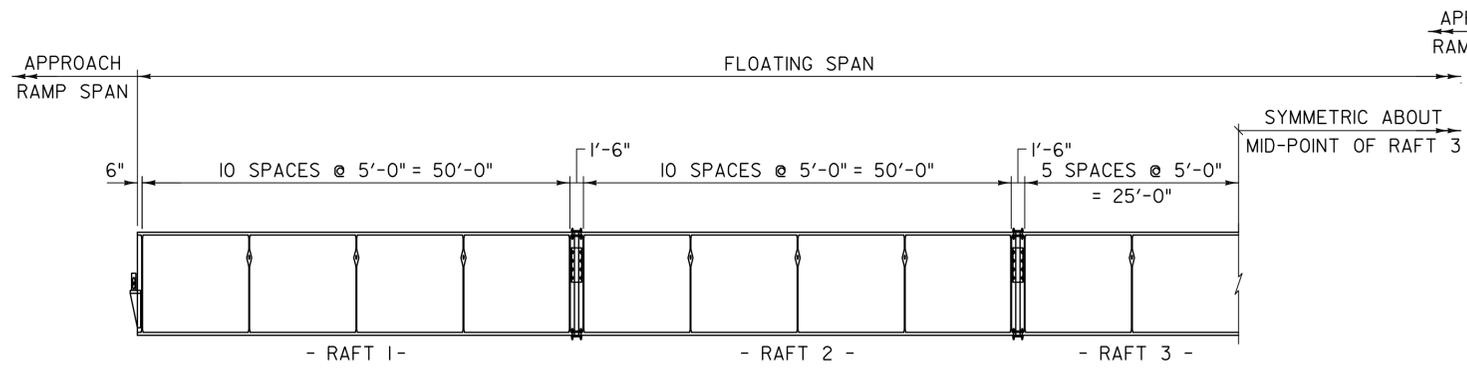
**REACTION AT WEB LINE DIAGRAM**  
NOT TO SCALE

**TYLIN**INTERNATIONAL

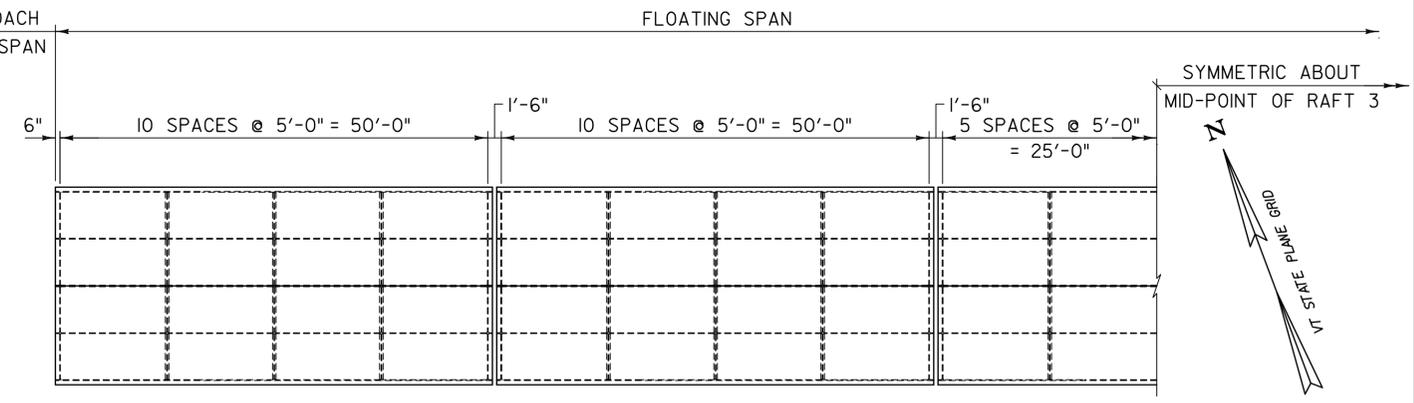
PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

FILE NAME: z12e134bdr-frpd1agr.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: J. OLUND  
FRP RAFT LOADING DIAGRAMS I

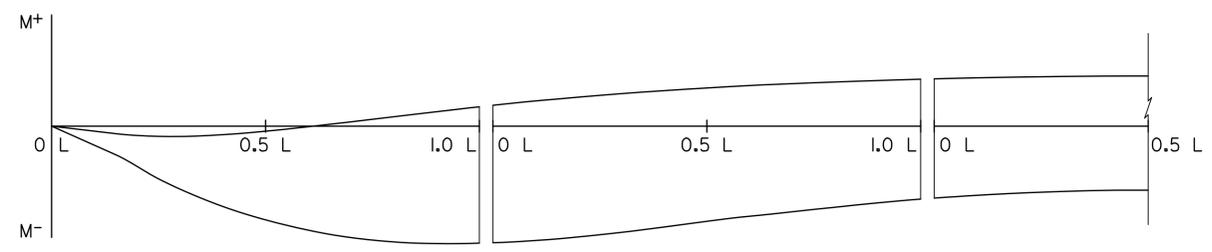
PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: C. TAYLOR  
SHEET 35 OF 70



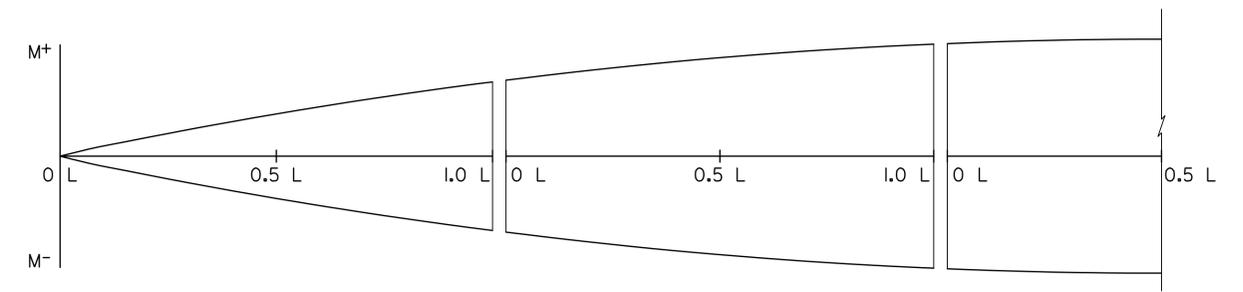
DESIGN VALUE LOCATION DIAGRAM  
 FLOATING SPAN ELEVATION VIEW  
 NOT TO SCALE



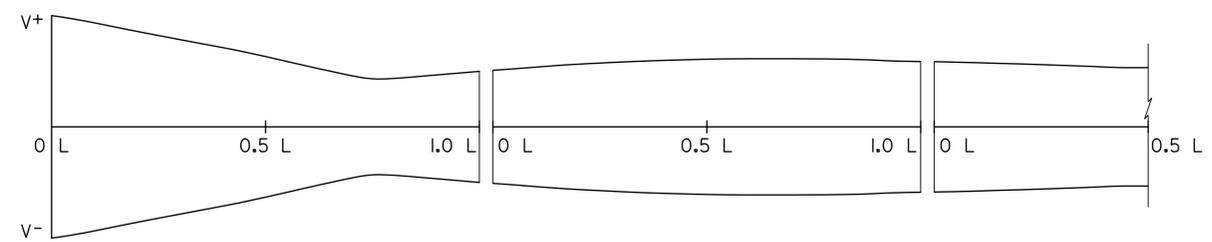
DESIGN VALUE LOCATION DIAGRAM  
 FLOATING SPAN PLAN VIEW  
 NOT TO SCALE



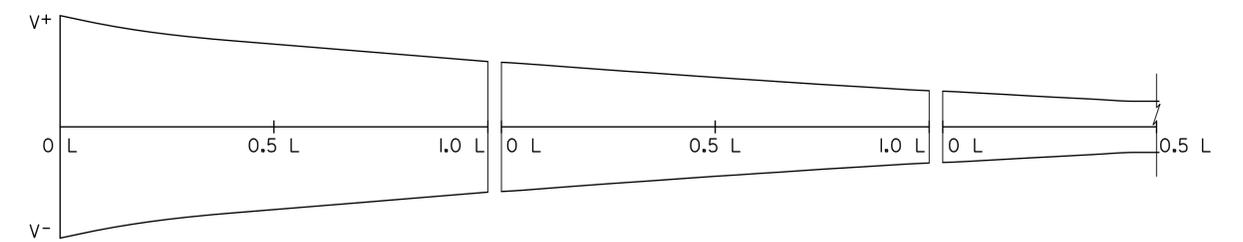
VERTICAL BENDING MOMENT ENVELOPE DIAGRAM  
 NOT TO SCALE



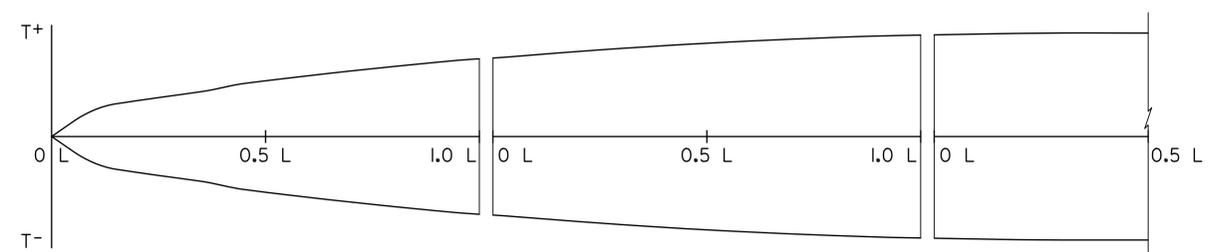
TRANSVERSE BENDING MOMENT ENVELOPE DIAGRAM  
 NOT TO SCALE



VERTICAL SHEAR ENVELOPE DIAGRAM  
 NOT TO SCALE



TRANSVERSE SHEAR ENVELOPE DIAGRAM  
 NOT TO SCALE



TORSION ENVELOPE DIAGRAM  
 NOT TO SCALE

**NOTE:**  
 1. DESIGN FORCE DIAGRAMS ARE GRAPHICAL ONLY; DESIGN VALUES CAN BE FOUND ON SHEET 37.

**TYLIN**INTERNATIONAL

PROJECT NAME:	BROOKFIELD	PLOT DATE:	12/3/2013
PROJECT NUMBER:	BRF FLBR(2)	DRAWN BY:	S. MORGAN
FILE NAME:	z12e134bdrfrpd1agr.dgn	CHECKED BY:	C. TAYLOR
PROJECT LEADER:	J. OLUND	SHEET	36 OF 70
DESIGNED BY:	J. OLUND		
FRP RAFT LOADING DIAGRAMS 2			

FIBER REINFORCED POLYMER RAFT DESIGN FORCE TABLE

LRFD LOAD COMBINATION AND DESIGN FORCE ENVELOPES	RAFT 1											RAFT 2										RAFT 3							
	0.0 L	0.1L	0.2 L	0.3 L	0.4 L	0.5 L	0.6 L	0.7 L	0.8 L	0.9 L	1.0 L	0.0 L	0.1L	0.2 L	0.3 L	0.4 L	0.5 L	0.6 L	0.7 L	0.8 L	0.9 L	1.0 L	0.0 L	0.1L	0.2 L	0.3 L	0.4 L	0.5 L	
SERVICE I	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-92	-132	-137	-119	-83	-41	10	63	115	163	170	208	242	276	307	335	360	382	410	428	444	448	455	461	458	460	461
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-280	-521	-721	-882	-1010	-1103	-1169	-1207	-1225	-1221	-1219	-1204	-1175	-1138	-1093	-1042	-988	-946	-911	-877	-845	-837	-812	-791	-775	-766	-763
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	5	39	71	102	132	160	187	212	237	260	281	287	307	326	343	359	373	386	398	409	418	425	428	434	438	442	444	444
	VERTICAL SHEAR, REVERSIBLE (KIP)	61.7	57.3	51.8	46.5	40.7	36.0	31.8	28.2	25.2	23.0	25.1	24.8	25.4	26.5	27.5	28.1	28.7	29.2	29.7	30.0	30.2	30.3	29.5	29.2	29.1	28.8	28.4	27.9
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	6.9	6.7	6.5	6.2	6.0	5.7	5.5	5.2	5.0	4.8	4.6	4.4	4.3	4.1	3.9	3.7	3.5	3.3	3.1	2.9	2.8	2.6	2.5	2.4	2.2	2.1	1.9	1.8
	TORSION, REVERSIBLE (KIP*FT)	63	170	216	275	316	355	391	426	458	488	516	532	545	569	590	610	628	644	658	670	681	691	696	699	704	708	710	710
STRENGTH II	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-74	-87	-64	-18	45	110	181	253	324	389	399	448	490	528	559	586	610	630	659	675	689	692	696	699	691	692	692
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-367	-683	-946	-1157	-1327	-1449	-1537	-1588	-1612	-1609	-1606	-1587	-1550	-1503	-1443	-1377	-1307	-1251	-1207	-1162	-1121	-1111	-1078	-1050	-1030	-1018	-1014
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	VERTICAL SHEAR, REVERSIBLE (KIP)	80.8	74.3	66.0	58.3	49.9	43.3	37.7	33.0	29.1	30.9	33.6	33.2	33.8	35.4	36.6	37.4	38.3	38.9	39.5	39.7	39.7	39.5	38.8	37.8	37.3	36.8	36.1	35.4
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TORSION, REVERSIBLE (KIP*FT)	227	283	336	406	452	496	537	575	611	645	663	680	708	734	757	779	798	815	830	842	853	859	863	869	873	876	876	874
STRENGTH III	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-101	-181	-241	-285	-314	-330	-337	-334	-325	-311	-306	-288	-267	-245	-222	-199	-177	-155	-136	-118	-103	-99	-86	-76	-69	-64	-63
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-142	-257	-347	-415	-463	-495	-513	-519	-515	-502	-498	-479	-456	-430	-402	-374	-346	-318	-293	-269	-249	-243	-226	-212	-202	-196	-194
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	12	92	169	242	313	380	444	505	563	617	668	683	730	774	815	852	887	918	946	971	992	1011	1016	1030	1041	1049	1054	1056
	VERTICAL SHEAR, REVERSIBLE (KIP)	31.5	28.4	22.9	18.0	13.6	9.7	6.4	3.5	1.1	2.5	4.0	4.6	5.1	5.8	6.2	6.4	6.4	6.2	5.9	5.4	4.9	4.3	3.9	3.6	2.8	2.0	1.2	0.4
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	16.4	16.0	15.4	14.8	14.2	13.6	13.0	12.4	11.9	11.4	10.8	10.5	10.2	9.7	9.2	8.7	8.3	7.8	7.4	7.0	6.5	6.2	5.9	5.7	5.3	4.9	4.6	4.3
	TORSION, REVERSIBLE (KIP*FT)	4	11	18	24	30	36	41	46	51	55	58	60	64	67	70	73	75	78	80	82	83	84	85	86	86	87	87	87
STRENGTH V	VERTICAL BENDING MOMENT, MAXIMUM (KIP*FT)	0	-74	-87	-64	-18	45	110	181	253	324	389	399	448	490	528	559	586	610	630	659	675	689	692	696	699	691	692	692
	VERTICAL BENDING MOMENT, MINIMUM (KIP*FT)	0	-367	-683	-946	-1157	-1327	-1449	-1537	-1588	-1612	-1609	-1606	-1587	-1550	-1503	-1443	-1377	-1307	-1251	-1207	-1162	-1121	-1111	-1078	-1050	-1030	-1018	-1014
	HORIZONTAL BENDING MOMENT, REVERSIBLE (KIP*FT)	6	45	83	120	154	187	219	249	277	304	329	337	360	382	402	420	437	453	466	479	489	498	501	508	513	517	520	521
	VERTICAL SHEAR, REVERSIBLE (KIP)	80.8	74.3	66.0	58.3	49.9	43.3	37.7	33.0	29.1	30.9	33.6	33.2	33.8	35.4	36.6	37.4	38.3	38.9	39.5	39.7	39.7	39.5	38.8	37.8	37.3	36.8	36.1	35.4
	HORIZONTAL SHEAR, REVERSIBLE (KIP)	8.1	7.9	7.6	7.3	7.0	6.7	6.4	6.1	5.9	5.6	5.3	5.2	5.0	4.8	4.5	4.3	4.1	3.9	3.6	3.4	3.2	3.0	2.9	2.8	2.6	2.4	2.3	2.1
	TORSION, REVERSIBLE (KIP*FT)	230	292	350	424	476	524	569	612	651	688	708	727	758	786	812	836	857	875	892	906	918	924	929	936	941	943	944	942
EXTREME EVENT II	VERTICAL BENDING MOMENT (KIP*FT)	0	-261	-471	-636	-761	-850	-909	-941	-952	-944	-921	-913	-879	-837	-789	-739	-686	-634	-584	-537	-494	-457	-446	-414	-389	-370	-359	-355
	VERTICAL SHEAR (KIP)	57.8	52.2	42.0	33.0	24.9	17.9	11.7	6.5	2.1	4.6	7.3	8.4	9.3	10.6	11.4	11.7	11.7	11.4	10.8	9.9	8.9	7.8	7.2	6.5	5.2	3.7	2.3	0.8

**NOTES:**

- DESIGN LOADS IN THE TABLE ABOVE ARE GLOBAL FORCES ACTING ON THE RAFTS. THESE DESIGN FORCES SHALL BE INVESTIGATED SIMULTANEOUSLY WITH LOCALIZED FORCE EFFECTS NOTED IN THESE PLANS, AS APPROPRIATE.
- EXTREME EVENT II LOAD COMBINATION SHALL BE INVESTIGATED WITH TRANSVERSE ICE PRESSURES NOTED ON SHEET 35.
- SERVICE AND STRENGTH FORCE EFFECTS NOTED IN THE TABLE ACCOUNT FOR VEHICULAR LIVE LOAD, PEDESTRIAN LOAD, WIND LOAD, AND DEAD AND LIVE LOAD APPROACH RAMP REACTIONS. EXTREME EVENT FORCE EFFECTS NOTED IN THE TABLE ACCOUNT FOR SNOW AND DEAD LOAD APPROACH RAMP REACTIONS.
- POSITIVE VERTICAL BENDING MOMENT VALUES CAUSE LONGITUDINAL TENSION STRESSES IN THE BOTTOM OF THE FRP RAFTS. NEGATIVE VERTICAL BENDING MOMENT VALUES CAUSE LONGITUDINAL TENSION STRESSES IN THE TOP OF THE FRP RAFTS.

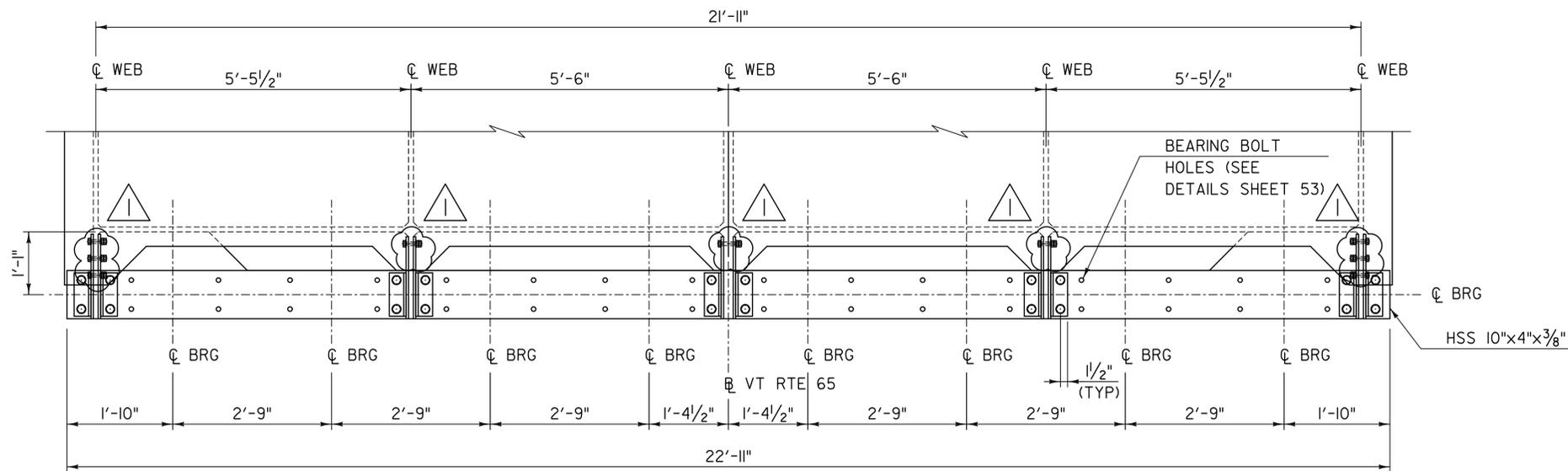
PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

**TYLIN**INTERNATIONAL

FILE NAME: z12e134bdrfrpd1agr.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: J. OLUND  
FRP RAFT LOADING DIAGRAMS 3

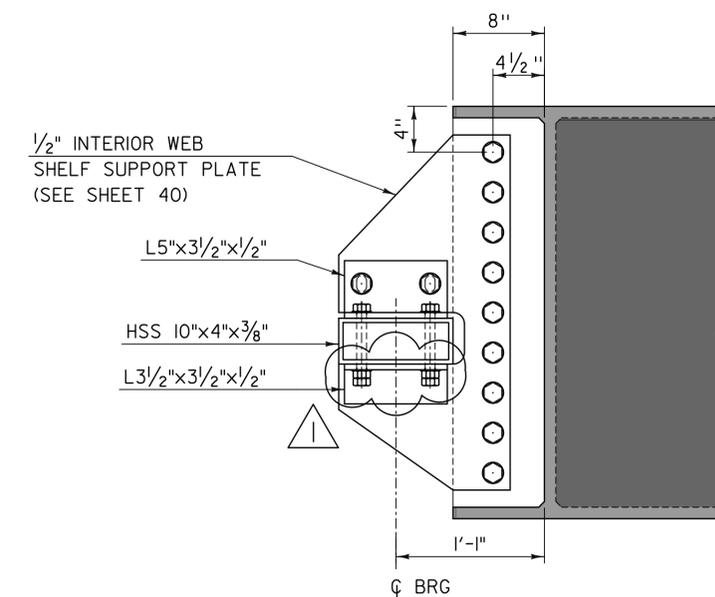
PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: C. TAYLOR  
SHEET 37 OF 70





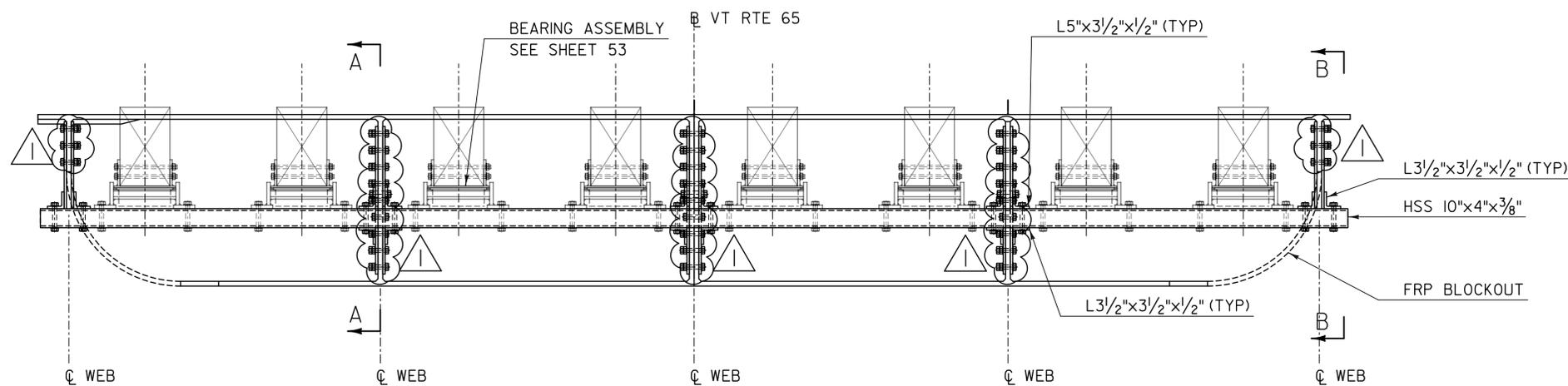
SHELF ASSEMBLY - PLAN

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



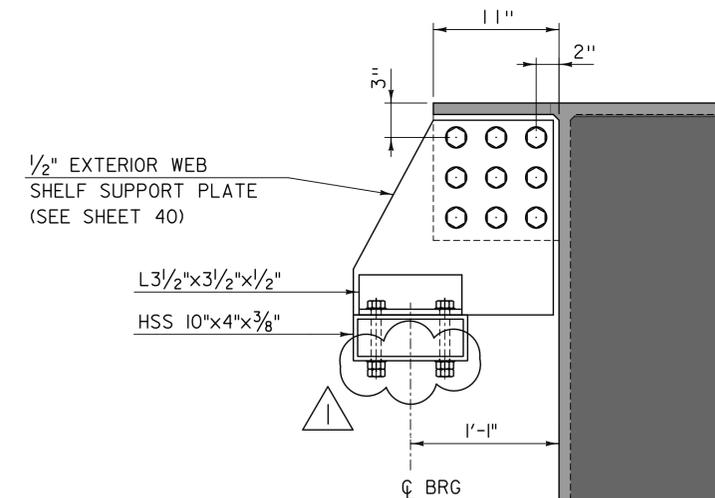
SECTION A-A

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



SHELF ASSEMBLY - ELEVATION

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



SECTION B-B

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

**SHELF NOTES:**

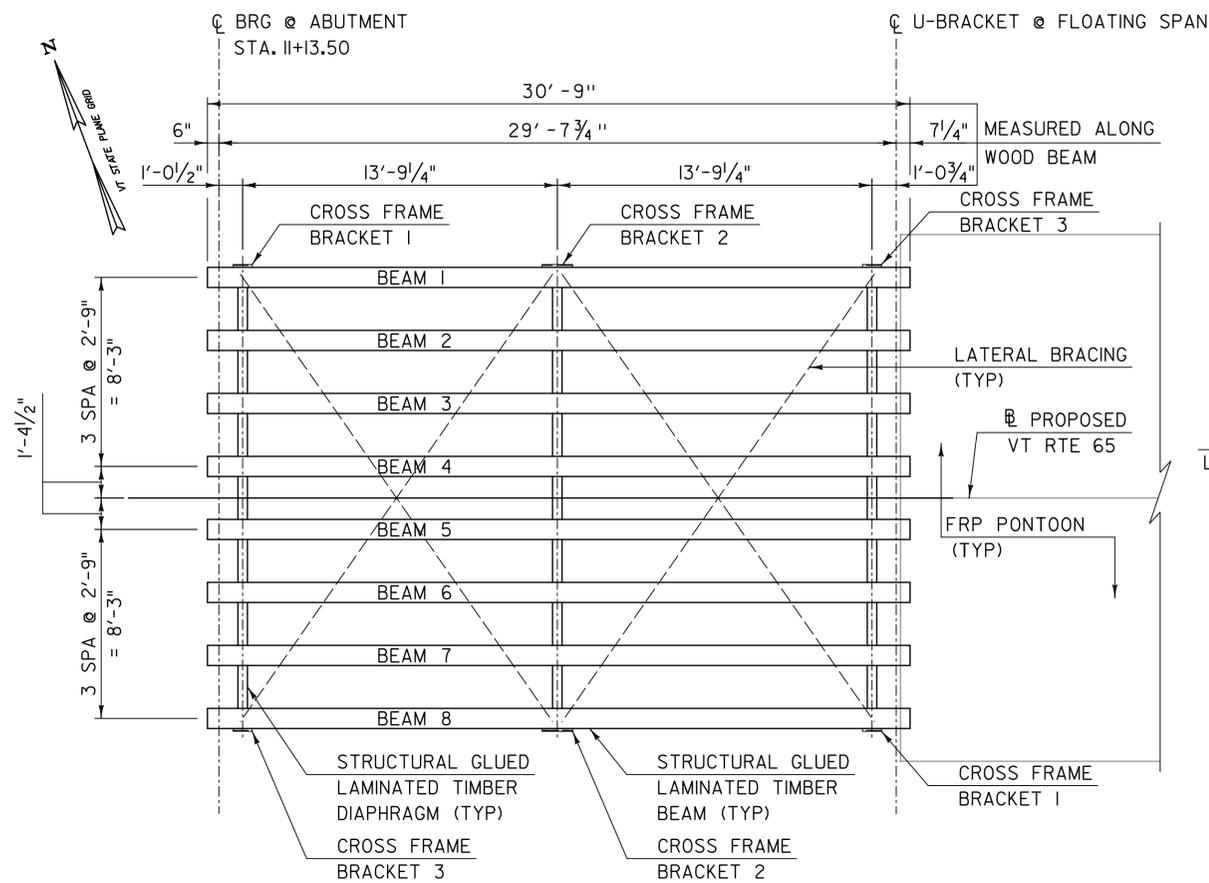
1. PLATE CONNECTIONS TO FRP SHALL BE DESIGNED AS BEARING CONNECTIONS; SLIP CRITICAL (FRICTION BASED) CONNECTION DESIGN IS NOT ALLOWED.
2. ALL BOLTS SHALL BE 7/8" DIA, IN 15/16" DIA HOLES, UNLESS NOTED OTHERWISE.
3. THE FACTORED PIN BEARING FORCE ACTING ON THE FRP PLATES IS 14.8 KIPS PER BOLT. THIS FORCE SHALL BE TAKEN TO ACT IN ANY DIRECTION RADIAL TO THE BOLT LONGITUDINAL AXIS.
4. FRP WEB EXTENSIONS SHALL BE DESIGNED TO RESIST A FACTORED FORCE OF 20.2 KIPS, TOTAL, ACTING TRANSVERSELY TO THE BRIDGE ALONG THE CENTERLINE OF SHELF.
5. BOLT HOLE LOCATIONS IN HSS SHELF AND SHIM PLATE THICKNESS BETWEEN INTERIOR WEB SHELF SUPPORT PLATES IS DEPENDENT ON FABRICATOR - SELECTED FRP PLATE THICKNESSES.

REVISION	DESCRIPTION	DATE
REVISION #1	ADDED DOUBLE NUT	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

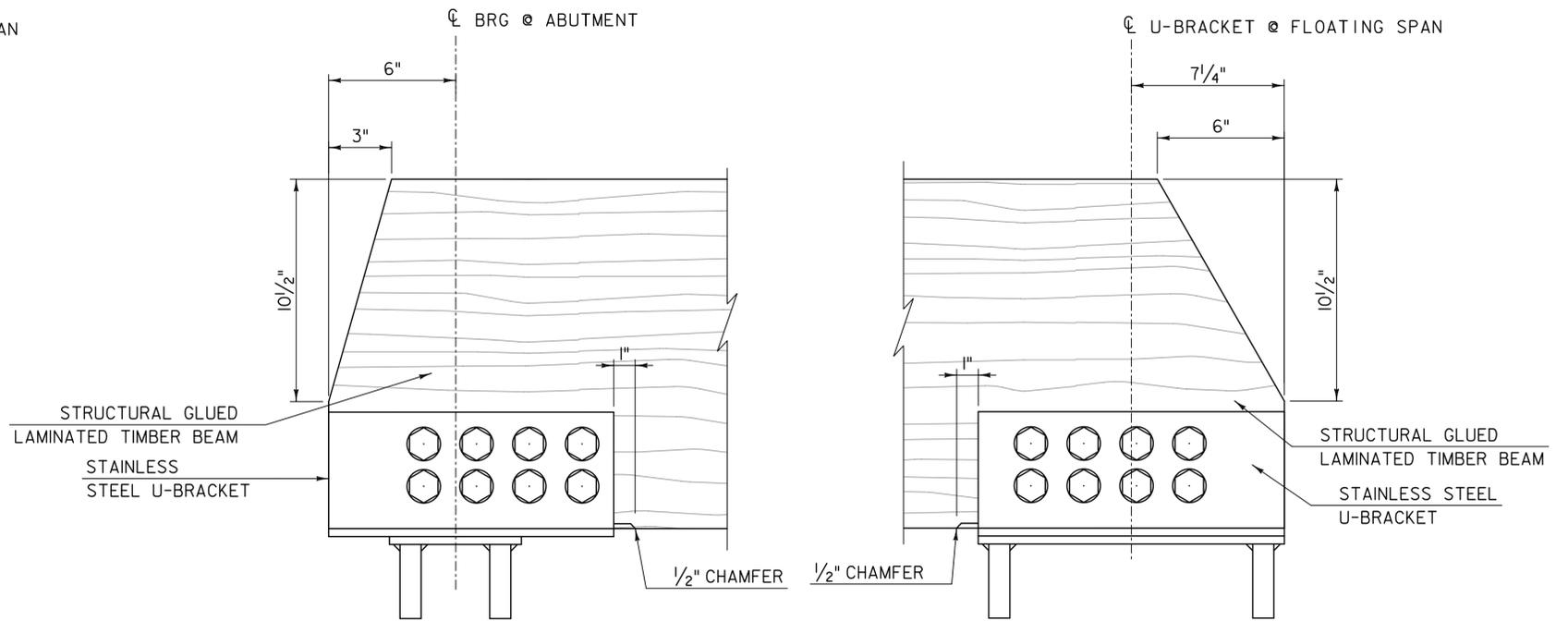
TYLIN INTERNATIONAL	FILE NAME: z12e134bdrfrpshel1.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: D. MYERS	CHECKED BY: J. OLUND
	RAMP-RAFT STAINLESS STEEL SHELF 1	SHEET 39 OF 70





**RAMP FRAMING PLAN**

SCALE: 1/4" = 1'-0"  
(WESTERN RAMP SHOWN, EASTERN RAMP OPPOSITE HAND)

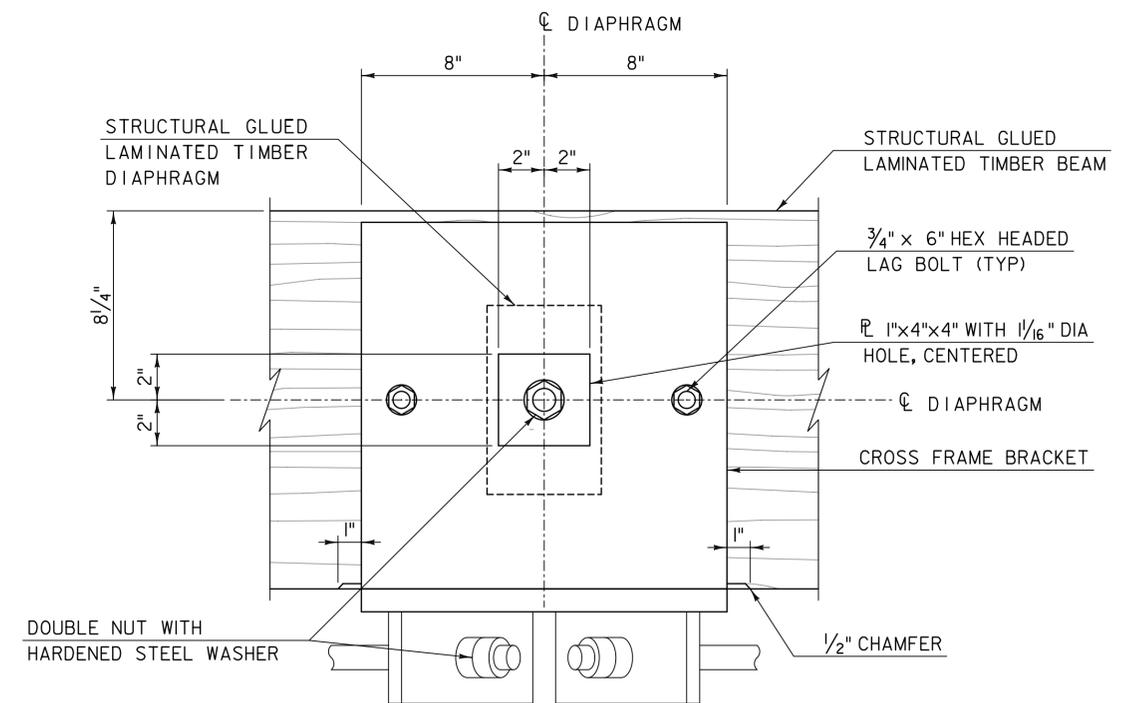


**BEAM END DETAIL AT ABUTMENT**

SCALE: 3" = 1'-0"

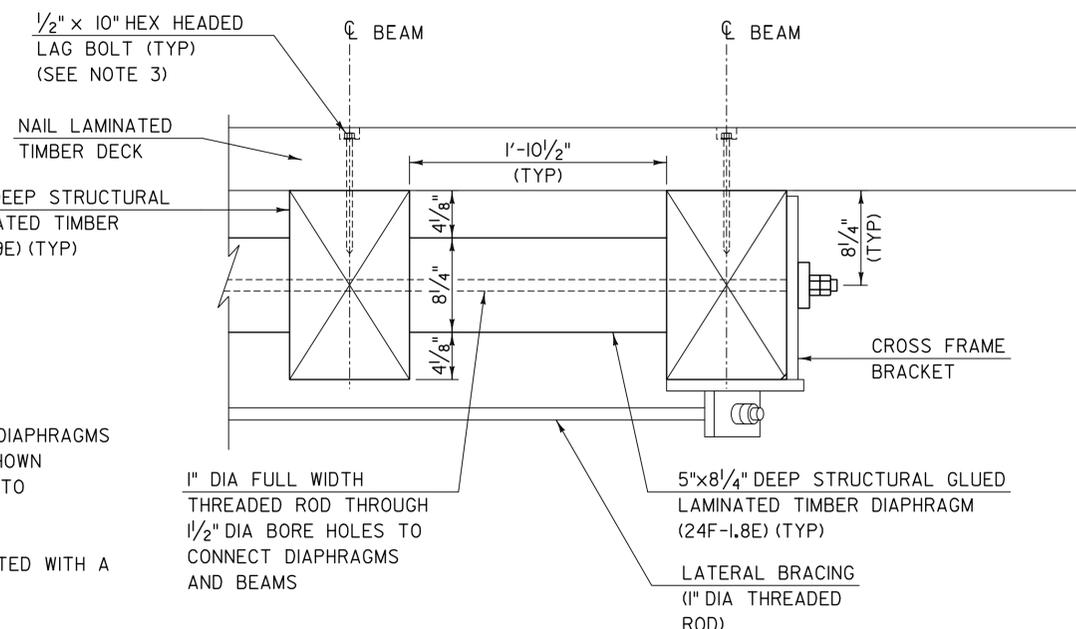
**BEAM END DETAIL AT FLOATING SPAN**

SCALE: 3" = 1'-0"



**THREADED ROD ANCHOR DETAIL**

SCALE: 3" = 1'-0"  
(MIDDLE DIAPHRAGM SHOWN, END DIAPHRAGMS SIMILAR)



**DIAPHRAGM DETAIL**

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

**NOTES:**

1. STRUCTURAL GLUED LAMINATED TIMBER BEAMS AND DIAPHRAGMS SHALL BE FULLY FABRICATED TO THE DIMENSIONS SHOWN INCLUDING ALL DRILLING, CUTTING, AND BORING PRIOR TO PRESSURE TREATING.
2. GLUED LAMINATED TIMBER BEAMS SHALL BE FABRICATED WITH A INCH VERTICAL CAMBER AT MIDSPAN.
3. SEE SHEET 44 FOR DECK PANEL AND DECK ATTACHMENT LAYOUT AND DETAILS.
4. SEE SHEET 53 FOR BEARING ASSEMBLY AND U-BRACKET CONNECTION DETAILS.

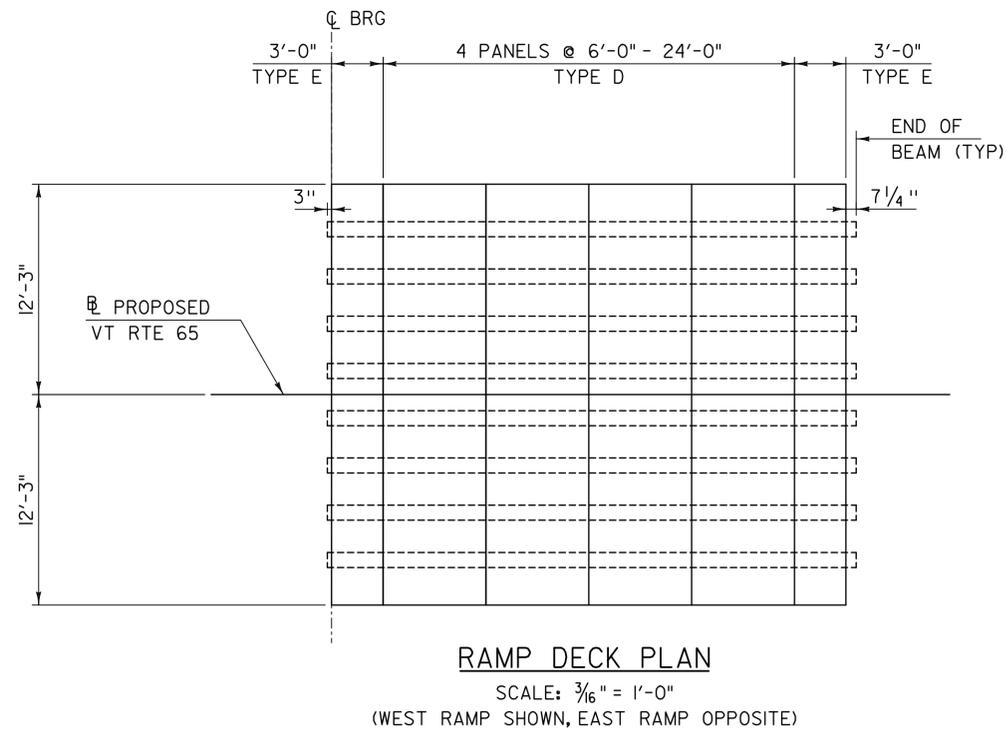
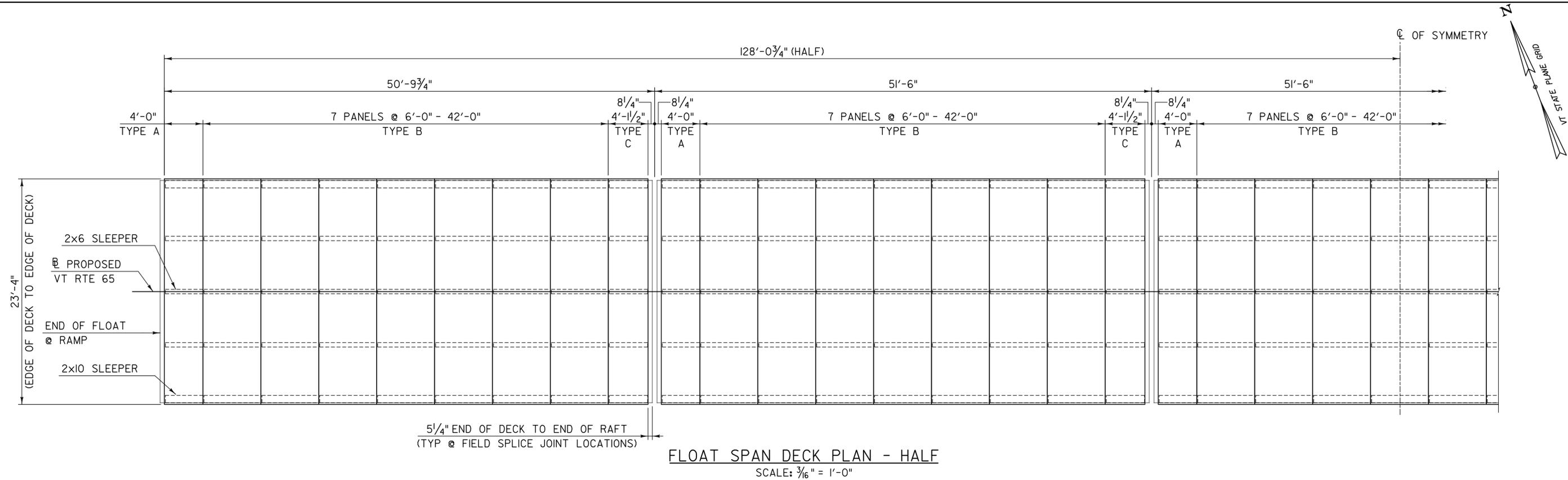
**TYLIN**INTERNATIONAL

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

FILE NAME: z12el34bdrramp\_frm.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: T. POULIN  
RAMP FRAMING PLAN

PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: J. OLUND  
SHEET 41 OF 70





**NOTE:**

ALL DIMENSIONS ARE MEASURED ALONG THE TOP SURFACE OF EACH DECK PANEL.

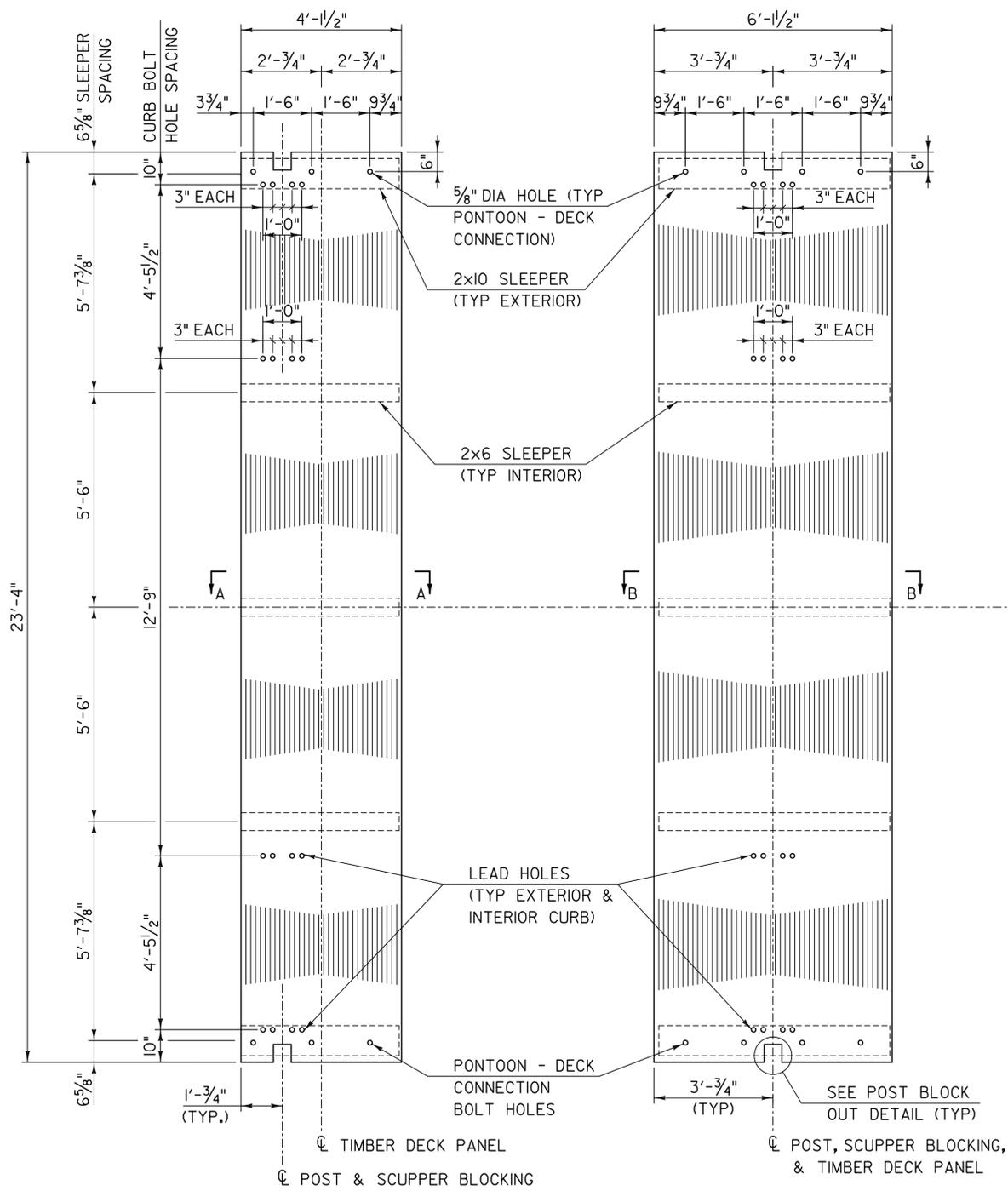
**TYLIN**INTERNATIONAL

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

FILE NAME: z12e134bdrdeckplan.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: T. POULIN  
DECK PANEL LAYOUT

PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: J. OLUND  
SHEET 43 OF 70





FLOATING SPAN DECK  
PANEL TYPE A - PLAN

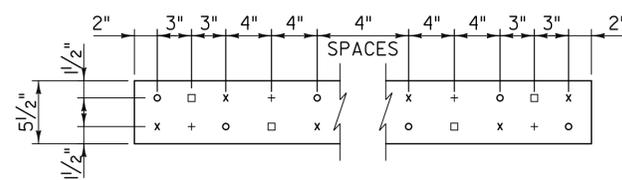
SCALE: 1/2" = 1'-0"

FLOATING SPAN DECK  
PANEL TYPE B - PLAN

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

FLOATING SPAN DECK  
PANEL TYPE C - PLAN

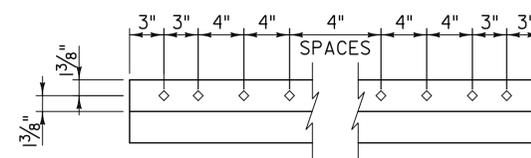
SCALE: 1/2" = 1'-0"



FLOATING SPAN DECK PANEL - NAIL PATTERN

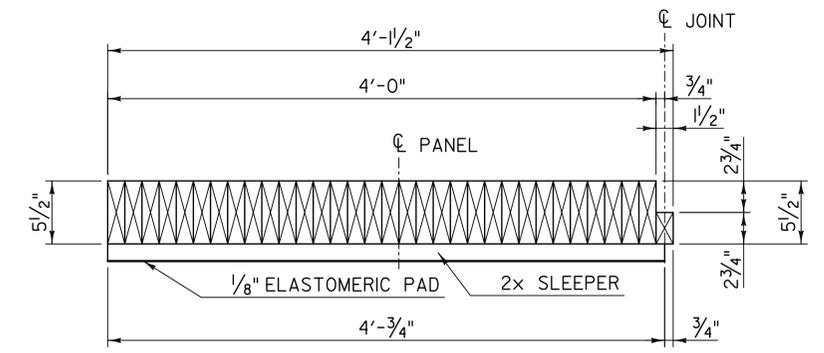
SCALE: 1/2" = 1'-0"

- o INDICATES NAILS IN FIRST LAMINATION
- x INDICATES NAILS IN SECOND LAMINATION
- + INDICATES NAILS IN THIRD LAMINATION
- INDICATES NAILS IN THE FIRST BOARD ONLY, REVERSED NAILING DIRECTION



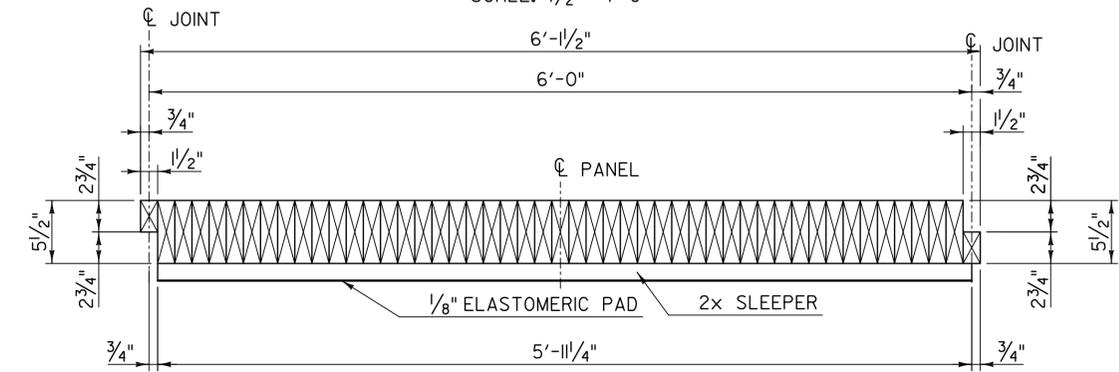
SHIP LAP BOARD - NAIL PATTERN

SCALE: 1/2" = 1'-0"  
(TOP SHIP LAP BOARD SHOWN, BOTTOM SIMILAR)



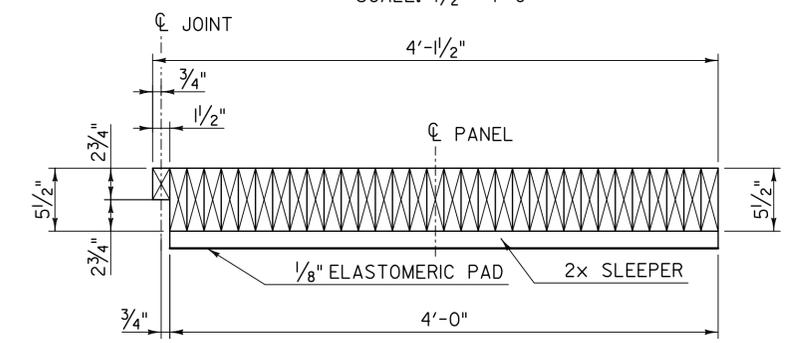
DECK PANEL SECTION A-A - TYPE A

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



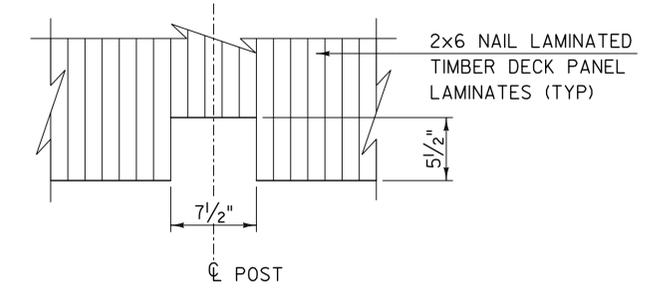
DECK PANEL SECTION B-B - TYPE B

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



DECK PANEL SECTION C-C - TYPE C

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



POST BLOCK OUT DETAIL

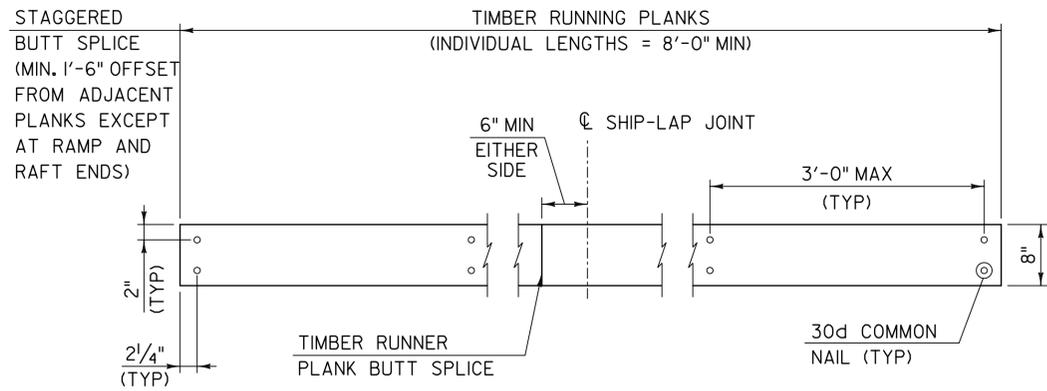
SCALE: 1/2" = 1'-0"

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

FILE NAME: z12e134bdrdeckpanel.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: T. POULIN  
FLOATING SPAN DECK PANELS

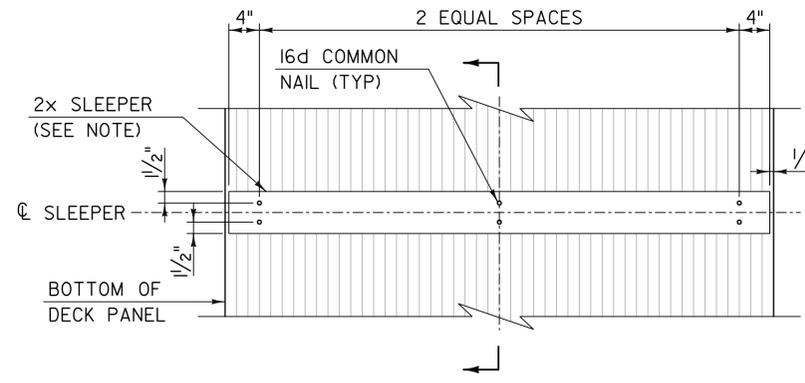
PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: S. KELLER  
SHEET 45 OF 70

TYLIN INTERNATIONAL



NOTE: TIMBER RUNNER PLANK NAILS SHALL BE CENTERED ON NAIL LAMINATED DECK PANEL LAMINATES.

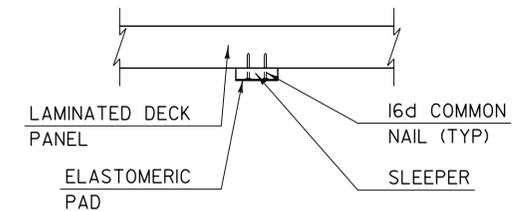
**RUNNER PLANK ATTACHMENT DETAIL - PLAN**  
SCALE: 1" = 1'-0"



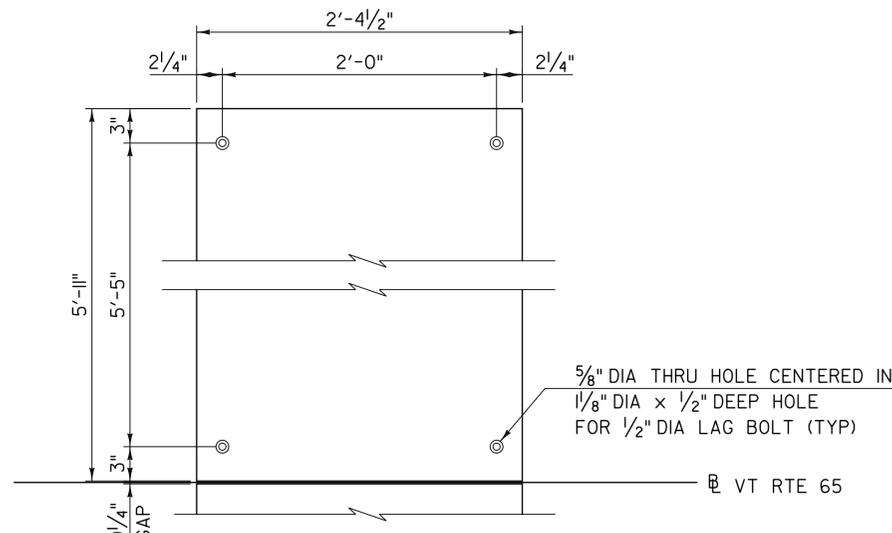
**SLEEPER DETAIL - PLAN**  
SCALE: 1" = 1'-0"

**NOTE:**

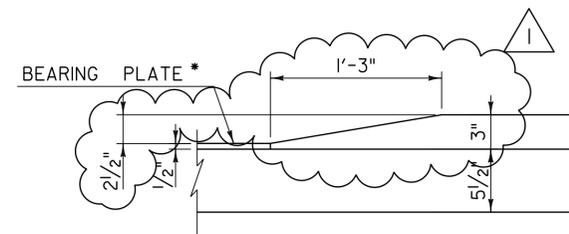
1. 1/8" THICK ELASTOMERIC PADS CONFORMING TO THE LENGTH AND WIDTH OF THE SLEEPER SHALL BE PLACED BENEATH THE SLEEPERS AND ATTACHED TO THE SLEEPERS WITH THE SAME NAILS USED TO ATTACH THE SLEEPER TO THE DECK.



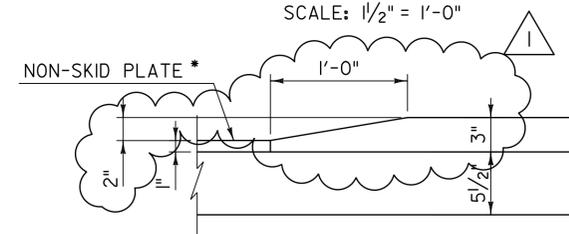
**SECTION**  
SCALE: 1" = 1'-0"



**STEEL COVER PLATE PLAN OVER RAFT FIELD SPLICE LOCATIONS**  
SCALE: 1/2" = 1'-0"

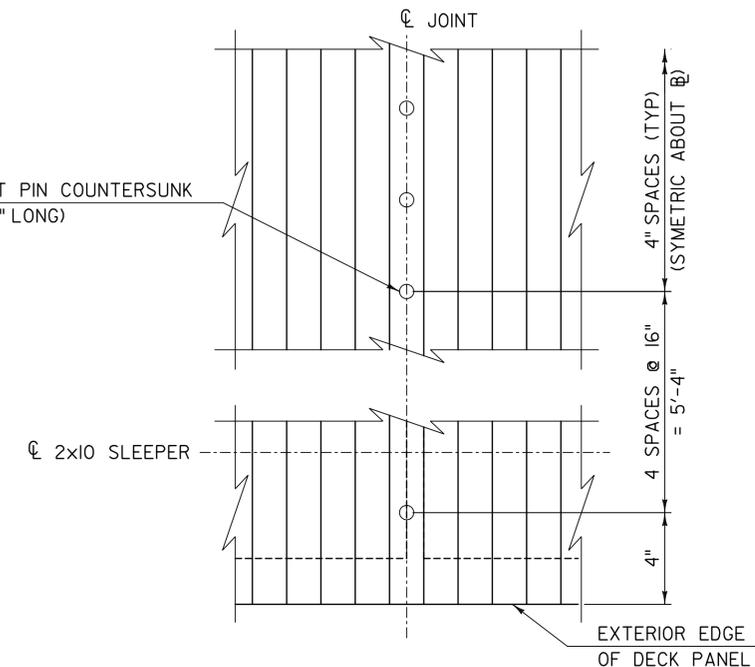


**TIMBER RUNNER PLANK BEVEL DETAIL 1**  
SCALE: 1/2" = 1'-0"

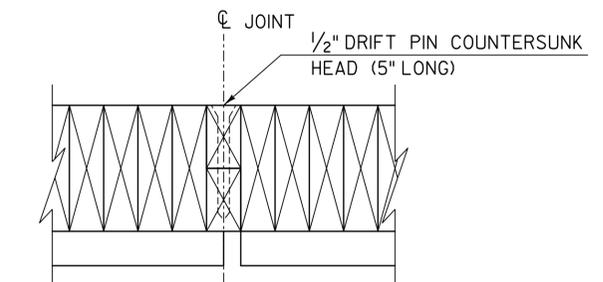


**TIMBER RUNNER PLANK BEVEL DETAIL 2**  
SCALE: 1/2" = 1'-0"

1/2" DRIFT PIN COUNTERSUNK HEAD (5" LONG)

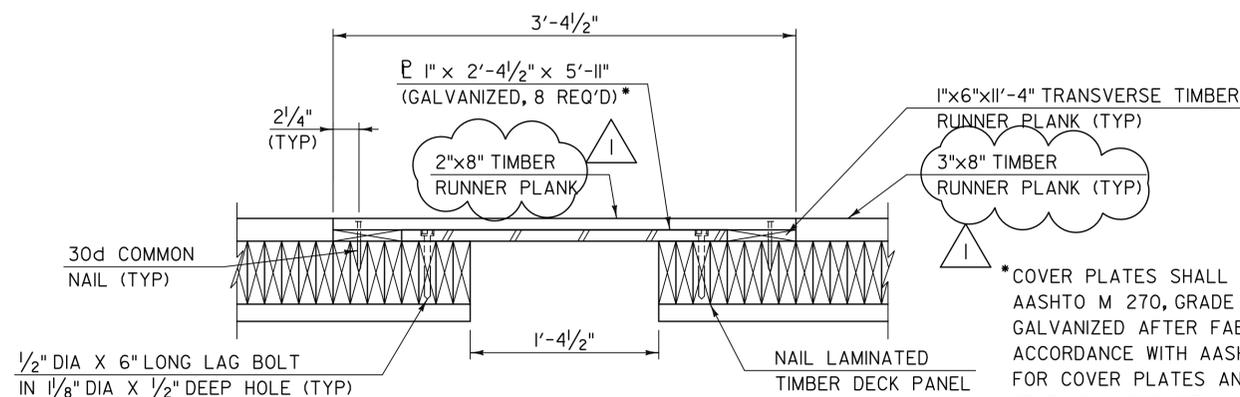


**SHIP-LAP DETAIL - PLAN**  
SCALE: 3" = 1'-0"



**SHIP-LAP DETAIL - SECTION**  
SCALE: 3" = 1'-0"

\* NON-SKID AND BEARING PLATES ARE COMPONENTS OF THE SPECIAL PROVISION (EXPANSION DEVICE, HINGED SLIDING PLATE ASSEMBLY). SEE SHEET 5I FOR LOCATION AND DETAILS.



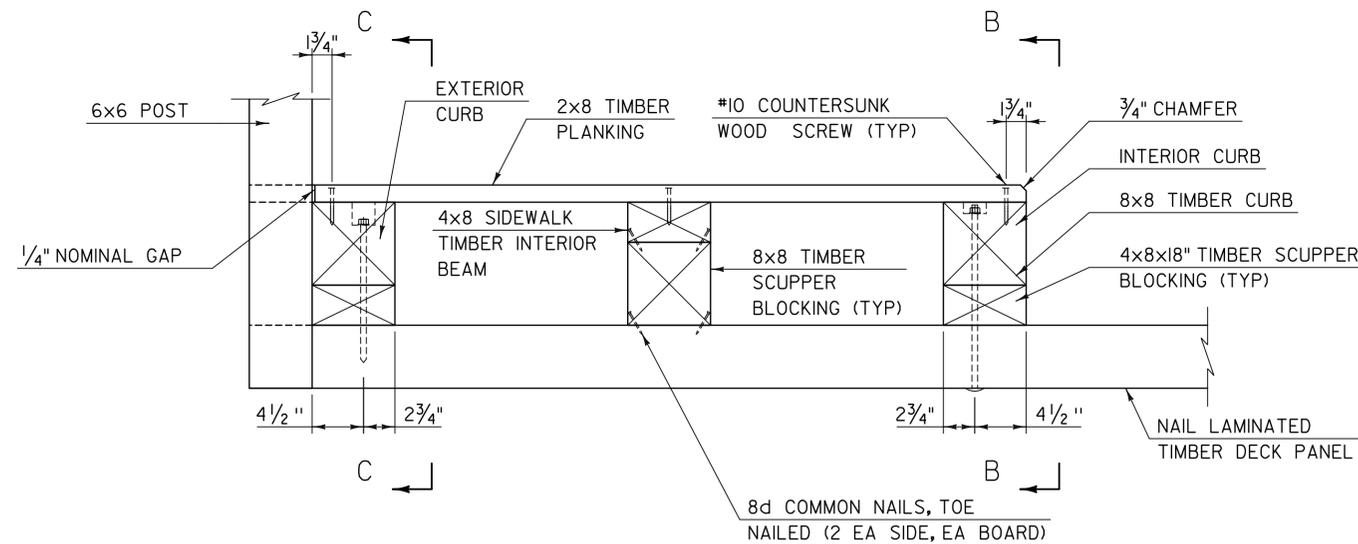
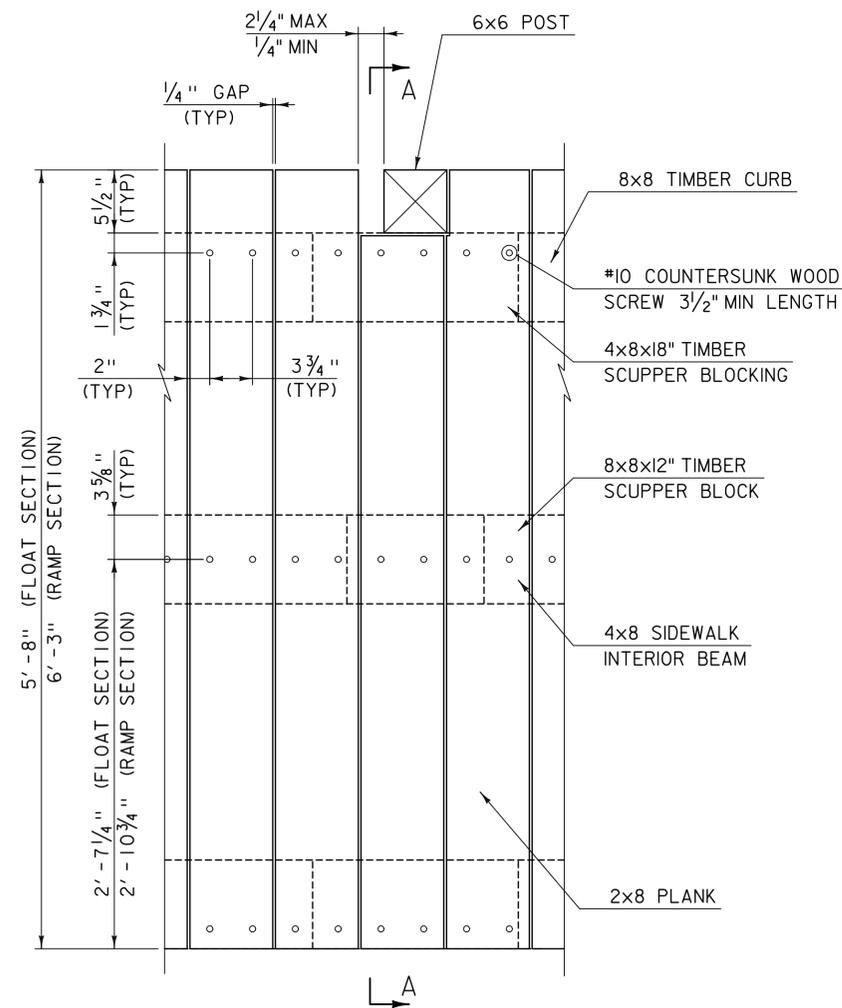
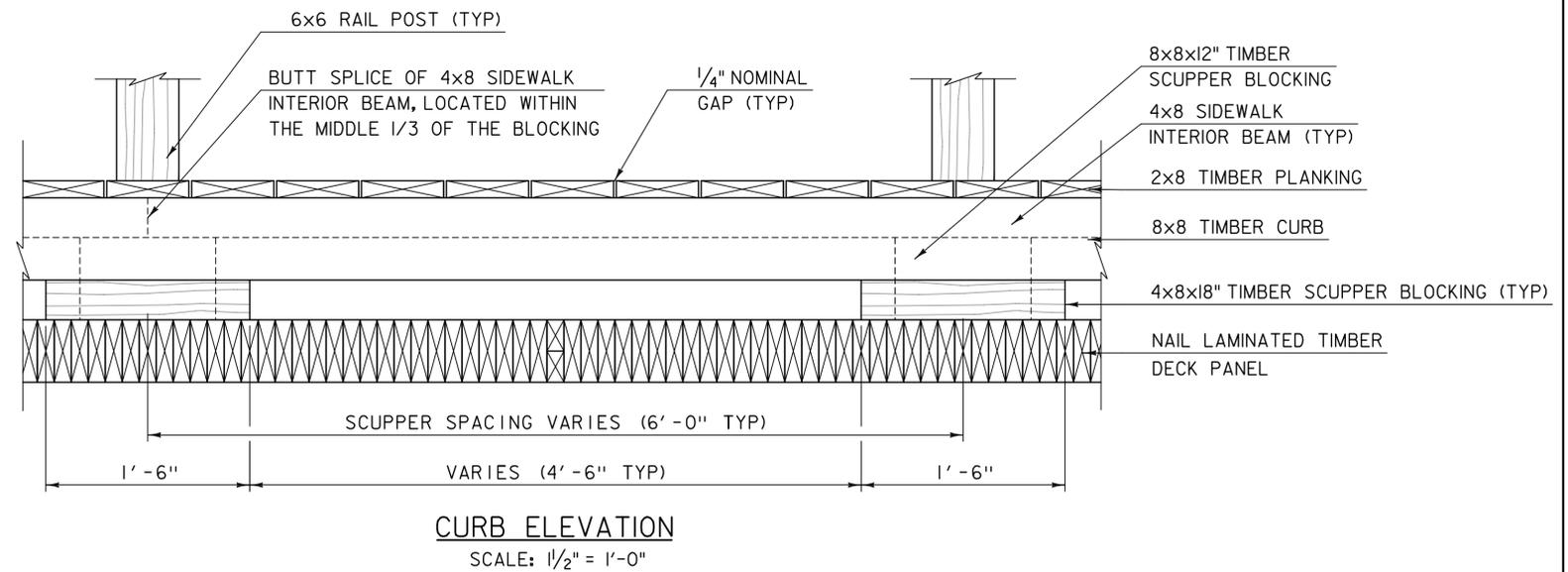
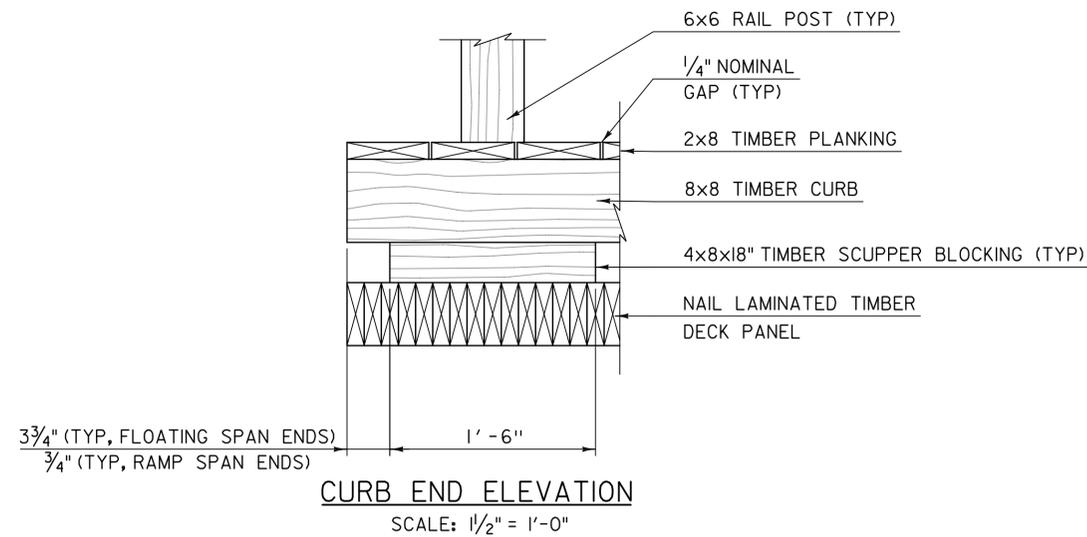
**TIMBER RUNNER PLANK AND STEEL COVER PLATE DETAIL OVER RAFT FIELD SPLICES**  
SCALE: 1/2" = 1'-0"

\* COVER PLATES SHALL CONFORM TO AASHTO M 270, GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M III. COSTS FOR COVER PLATES AND HARDWARE SHALL BE PAID UNDER ITEM 900.670, "SPECIAL PROVISION (NAIL LAMINATED TIMBER DECK PANEL)".

REVISION	DESCRIPTION	DATE
REVISION #1	RUNNER PLANK THICKNESS CHANGE	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

TYLIN INTERNATIONAL	FILE NAME: z12el34bdrdeckdet.s.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: T. POULIN	CHECKED BY: J. OLUND
	DECK PANEL DETAILS	SHEET 46 OF 70

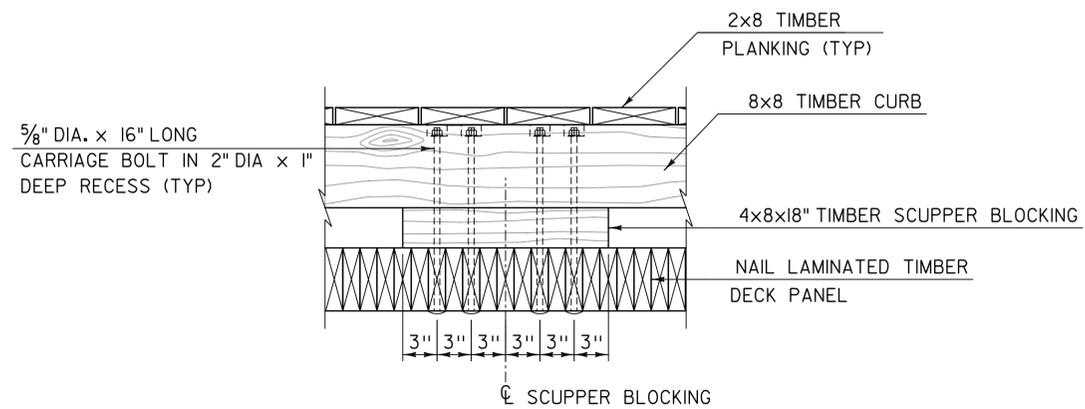


**TYLIN**INTERNATIONAL

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRFLBR(2)

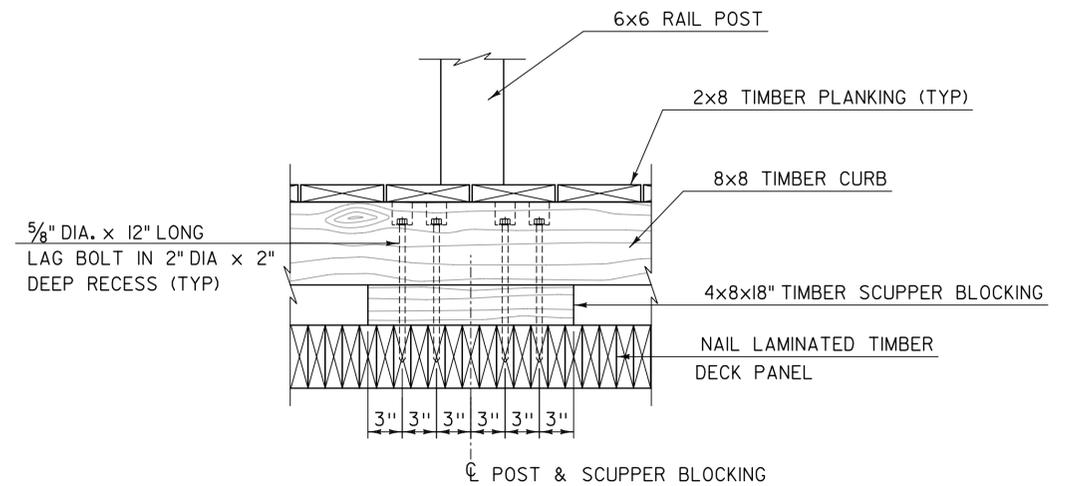
FILE NAME: z12e134bdrcurbdets1.dgn  
 PROJECT LEADER: J. OLUND  
 DESIGNED BY: T. POULIN  
 CURB DETAILS I

PLOT DATE: 12/3/2013  
 DRAWN BY: S. MORGAN  
 CHECKED BY: S. KELLER  
 SHEET 47 OF 70



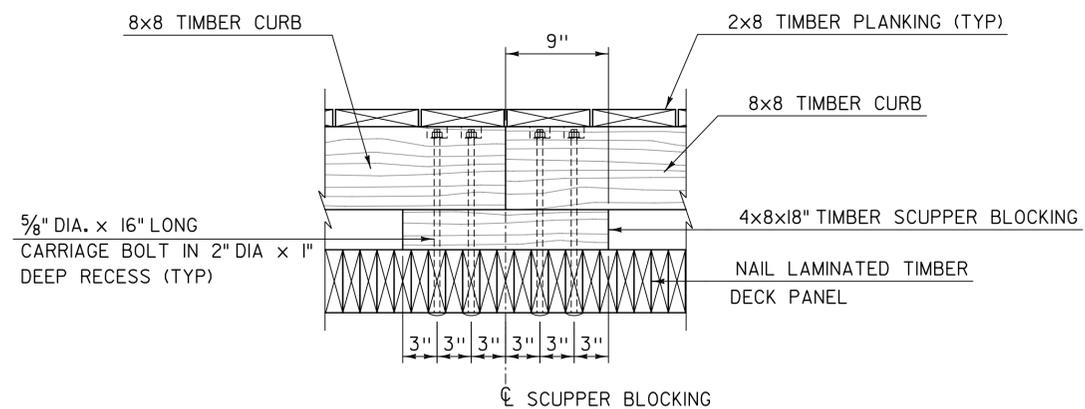
**SECTION B-B: INTERIOR CURB ELEVATION**

SCALE: 1/2" = 1'-0"  
(SIDEWALK CONNECTIONS NOT SHOWN FOR CLARITY)



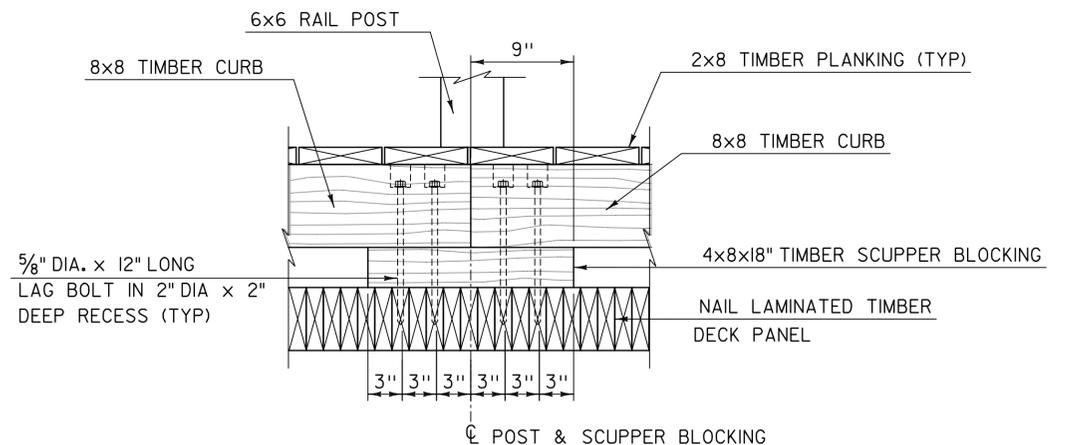
**SECTION C-C: EXTERIOR CURB ELEVATION**

SCALE: 1/2" = 1'-0"  
(SIDEWALK CONNECTIONS NOT SHOWN FOR CLARITY)



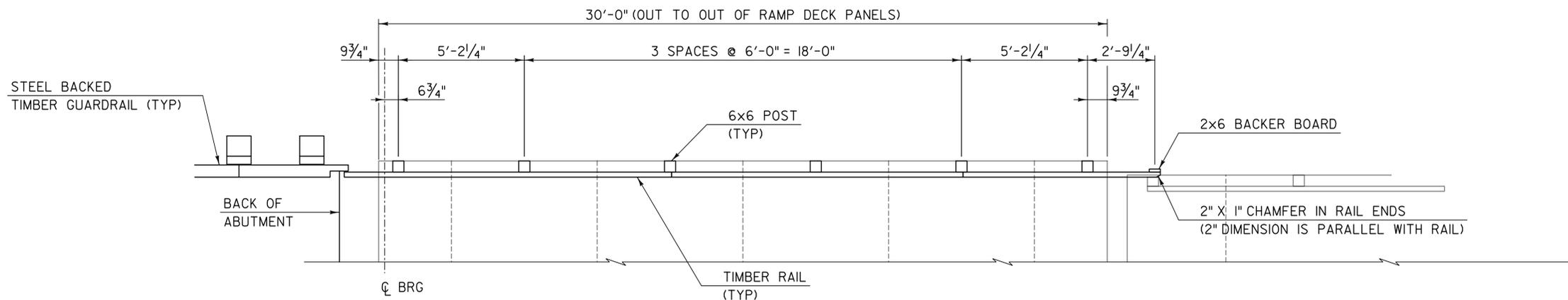
**SECTION B-B: INTERIOR CURB AT SPLICE**

SCALE: 1/2" = 1'-0"  
(SIDEWALK CONNECTIONS NOT SHOWN FOR CLARITY)



**SECTION C-C: EXTERIOR CURB AT SPLICE**

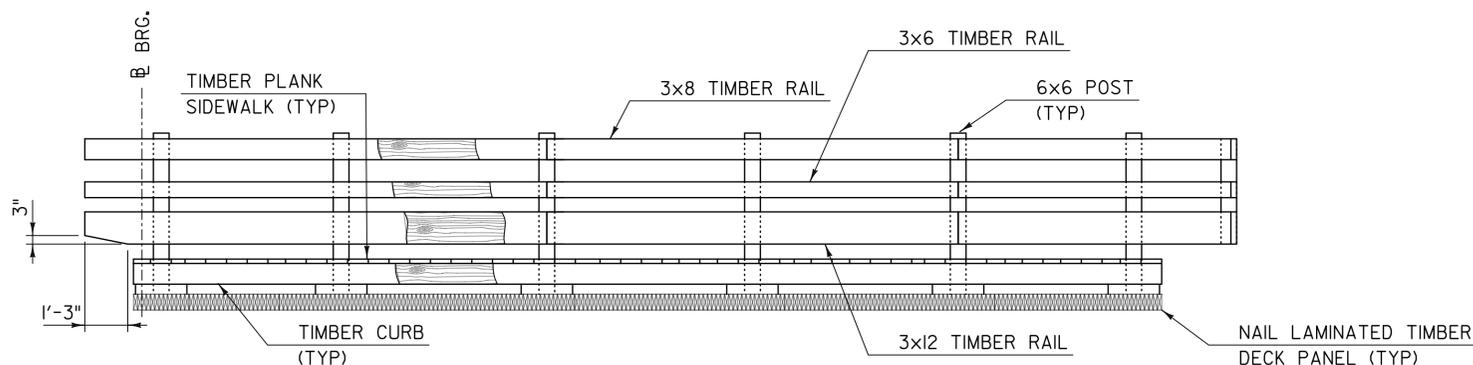
SCALE: 1/2" = 1'-0"  
(SIDEWALK CONNECTIONS NOT SHOWN FOR CLARITY)



**RAIL POST LAYOUT - RAMP PLAN**

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

(BOTH SIDES SIMILAR, SIDEWALK PLANKS AND CURB BOARDS NOT SHOWN FOR CLARITY)

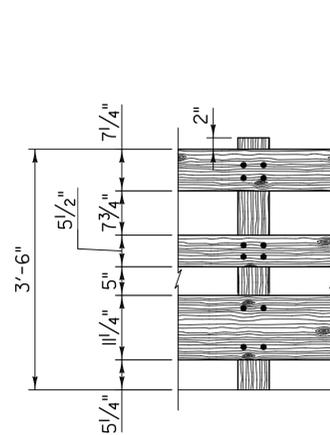


**RAMP RAIL LAYOUT - ELEVATION**

SCALE: 3/8" = 1'-0"  
(BOTH SIDES SIMILAR)

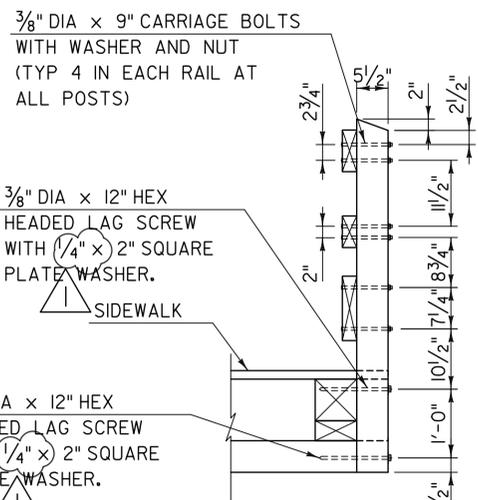
**NOTES:**

1. TIMBER RAILS SHALL BE ATTACHED TO A MINIMUM OF 3 POSTS, OR 2 POSTS AND THE BACKER BOARD.
2. NO POSITIVE CONNECTION SHALL BE MADE BETWEEN THE RAMP TIMBER RAILING AND EITHER THE STEEL BACKED TIMBER GUARDRAIL OR THE FLOATING SPAN TIMBER RAILING.



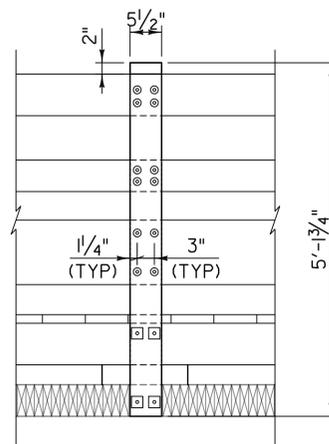
**TIMBER PEDESTRIAN RAIL - FRONT ELEVATION**

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



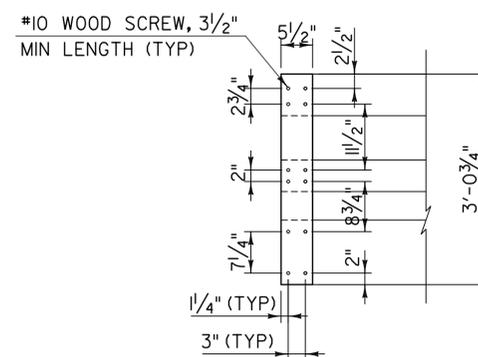
**RAIL POST - RAMP SECTION**

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



**RAIL POST - BACK ELEVATION**

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



**2x6 BACKER BOARD - BACK ELEVATION**

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

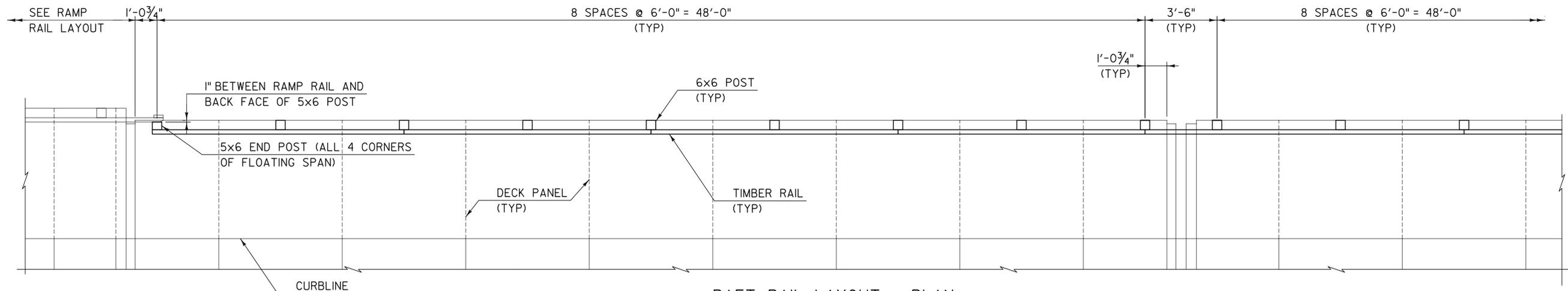
REVISION	DESCRIPTION	DATE
REVISION #1	WASHER THICKNESS ADDED	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

FILE NAME: z12e134bdratllayr.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: S. KELLER  
RAMP RAILING LAYOUT & DETAILS

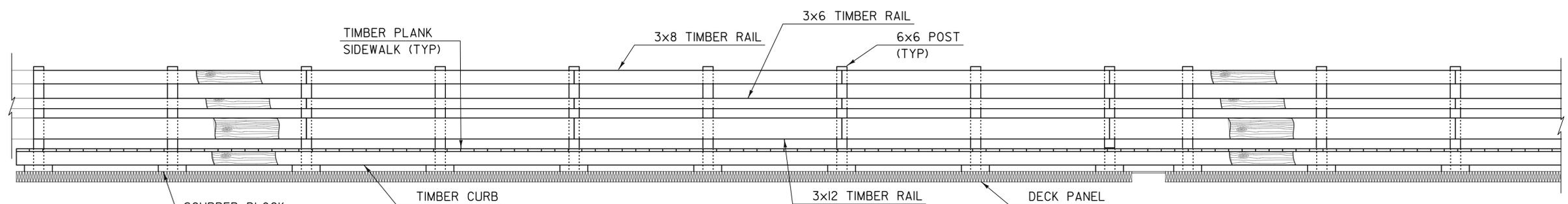
PLOT DATE: 2/5/2014  
DRAWN BY: S. MORGAN  
CHECKED BY: J. OLUND  
SHEET 49 OF 70

**TYLIN** INTERNATIONAL



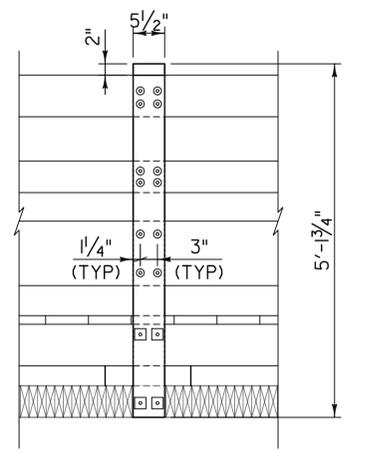
**RAFT RAIL LAYOUT - PLAN**

SCALE:  $\frac{3}{8}$ " = 1'-0"  
 (BOTH SIDES SIMILAR, SIDEWALK PLANKS AND CURB  
 BOARDS NOT SHOWN FOR CLARITY)



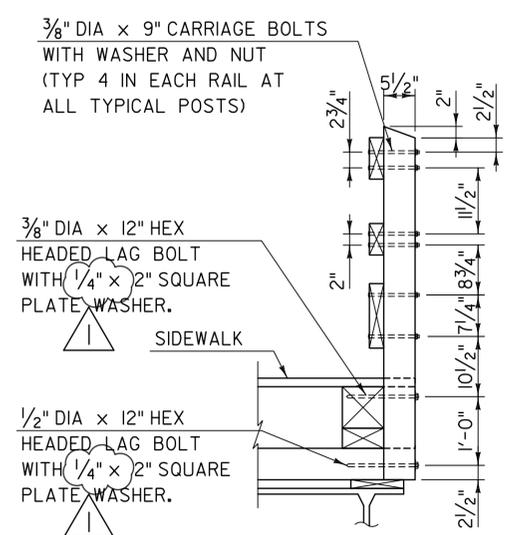
**RAFT RAIL LAYOUT - ELEVATION**

SCALE:  $\frac{3}{8}$ " = 1'-0"  
 (BOTH SIDES SIMILAR)



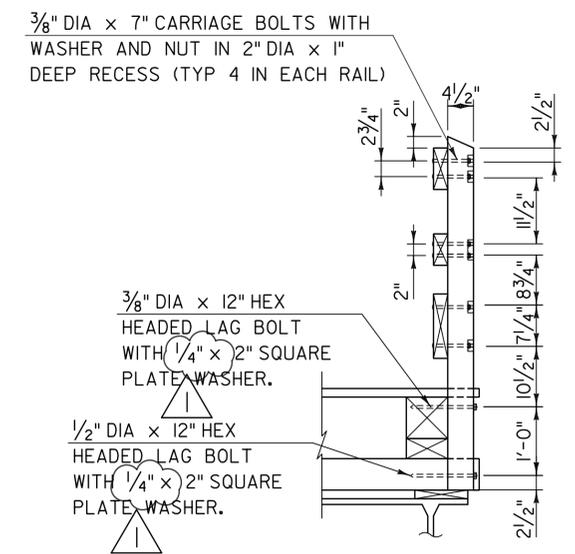
**RAIL POST - BACK ELEVATION**

SCALE:  $\frac{3}{4}$ " = 1'-0"



**TYPICAL RAIL POST - RAFT SECTION**

SCALE:  $\frac{3}{4}$ " = 1'-0"



**5x6 END POST - RAFT SECTION**

SCALE:  $\frac{3}{4}$ " = 1'-0"

**NOTES:**

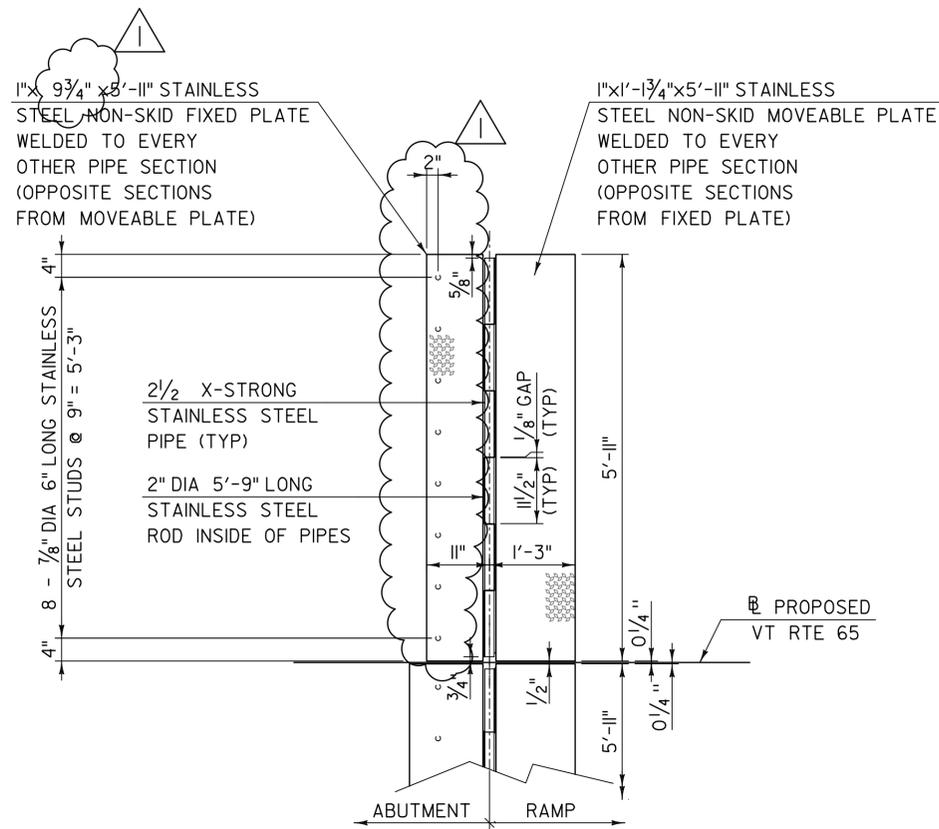
- 1. TIMBER RAILS SHALL BE ATTACHED TO A MINIMUM OF 3 POSTS.

REVISION	DESCRIPTION	DATE
REVISION #1	WASHER THICKNESS ADDED	2/4/2014

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRFLBR(2)

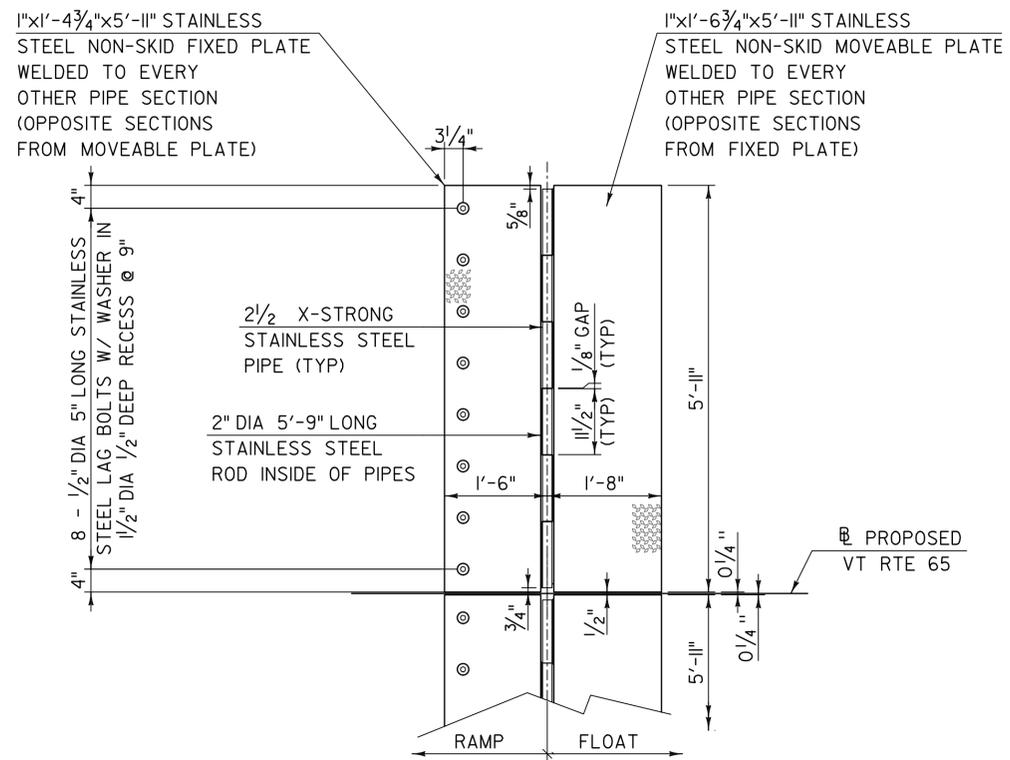
FILE NAME: z12e134bdr rail layf.dgn PLOT DATE: 2/5/2014  
 PROJECT LEADER: J. OLUND DRAWN BY: S. MORGAN  
 DESIGNED BY: S. KELLER CHECKED BY: J. OLUND  
 FLOATING SPAN RAILING LAYOUT & DETAILS SHEET 50 OF 70





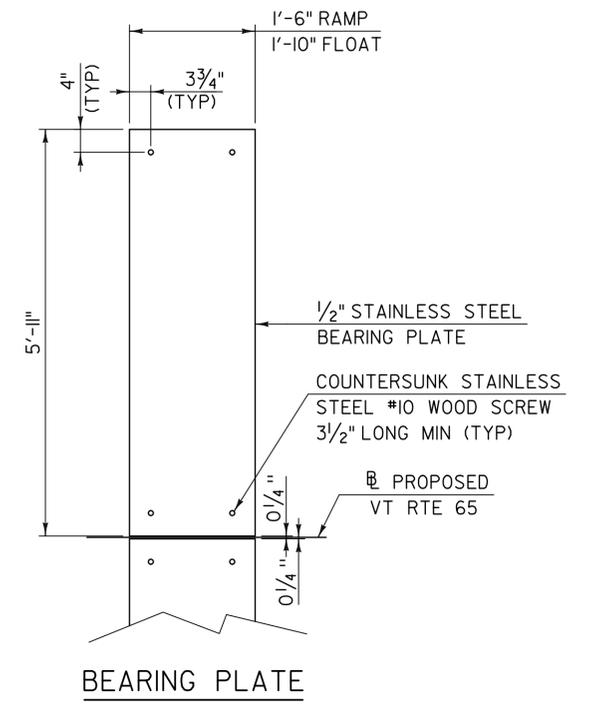
ABUTMENT / RAMP - ROADWAY ASSEMBLY

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



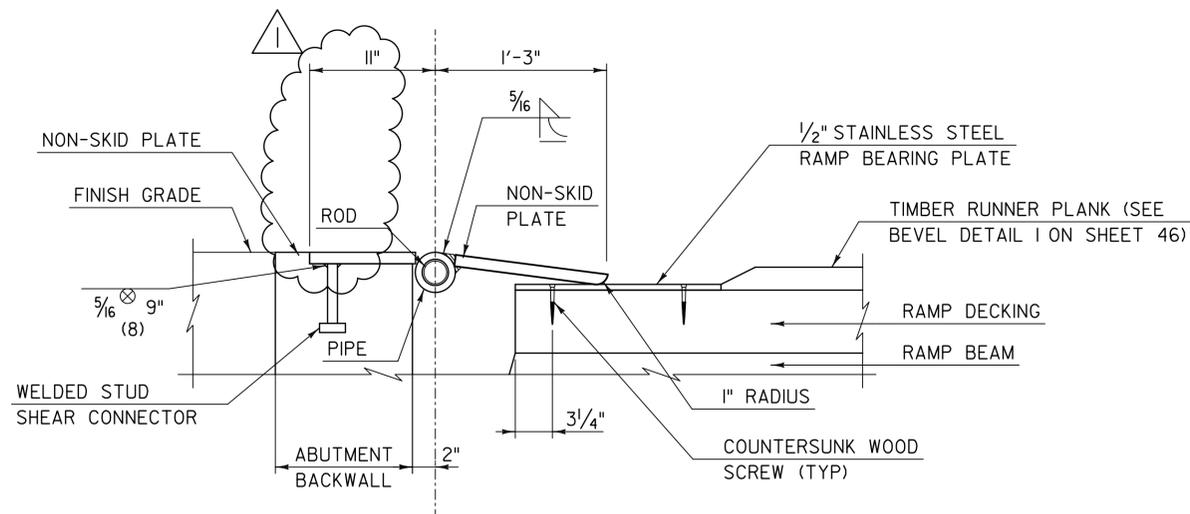
RAMP / FLOAT - ROADWAY ASSEMBLY

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



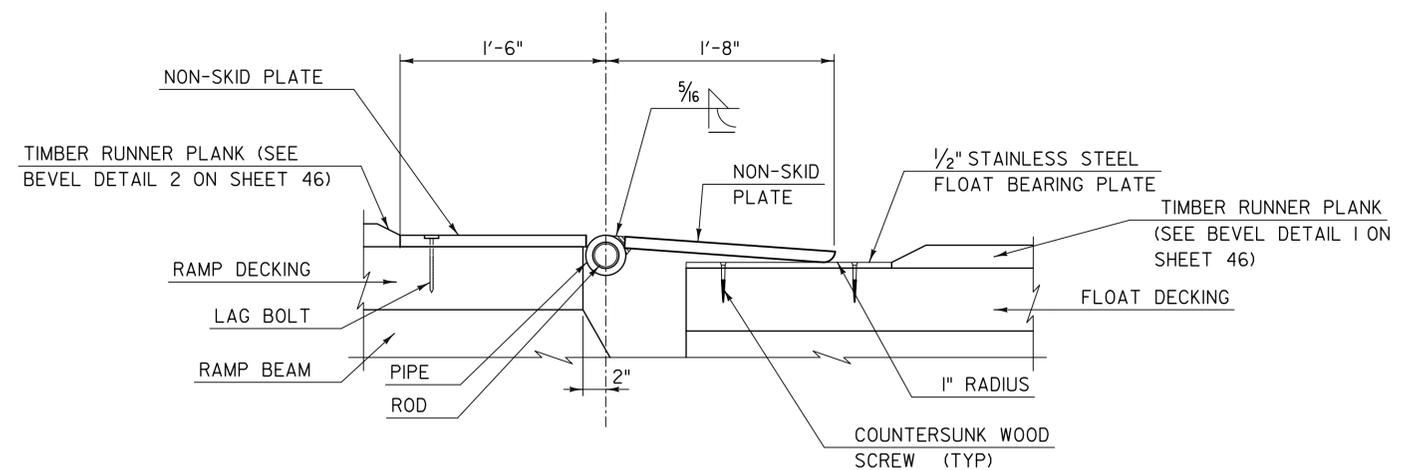
BEARING PLATE

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



ABUTMENT / RAMP - ROADWAY SECTION

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



RAMP / FLOAT - ROADWAY SECTION

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

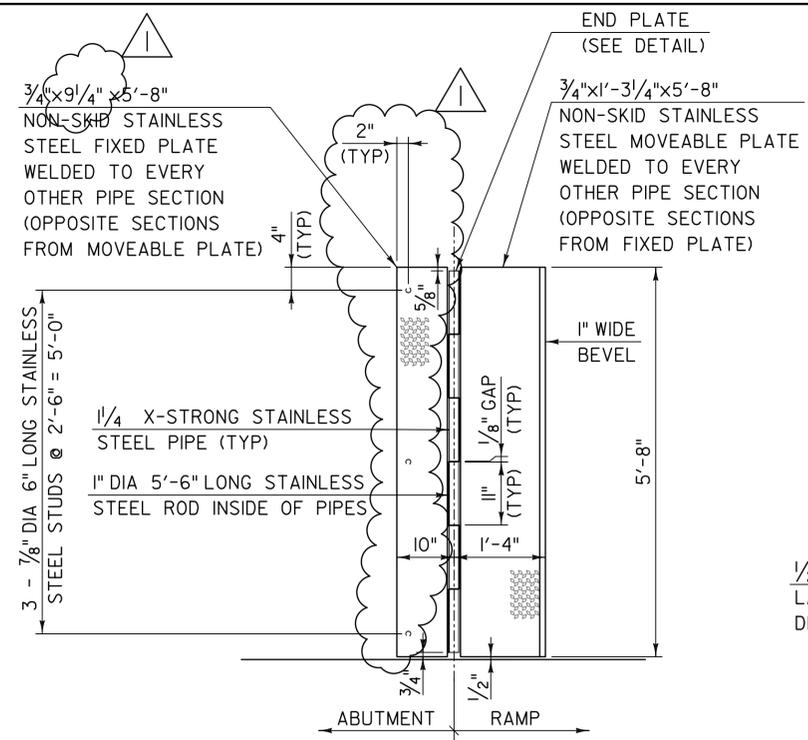
**NOTE:**

1. STEEL PIPES SHALL HAVE A MINIMUM 2 1/8" INNER DIAMETER.
2. ALL COSTS ASSOCIATED WITH SLIDING PLATE ASSEMBLY WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 900.640 SPECIAL PROVISION (EXPANSION DEVICE, HINGED SLIDING PLATE ASSEMBLY).
3. NON-SKID PLATES SHALL HAVE A DIAMOND (TREAD/CHECKERED) PATTERN ON THE TRAVEL SURFACE. NON-SKID PATTERN SHALL BE IN GENERAL CONFORMANCE WITH THE GEOMETRIC REQUIREMENTS OF ASTM A 793.

REVISION	DESCRIPTION	DATE
REVISION #1	HINGE PLATE CHANGE	2/4/2014

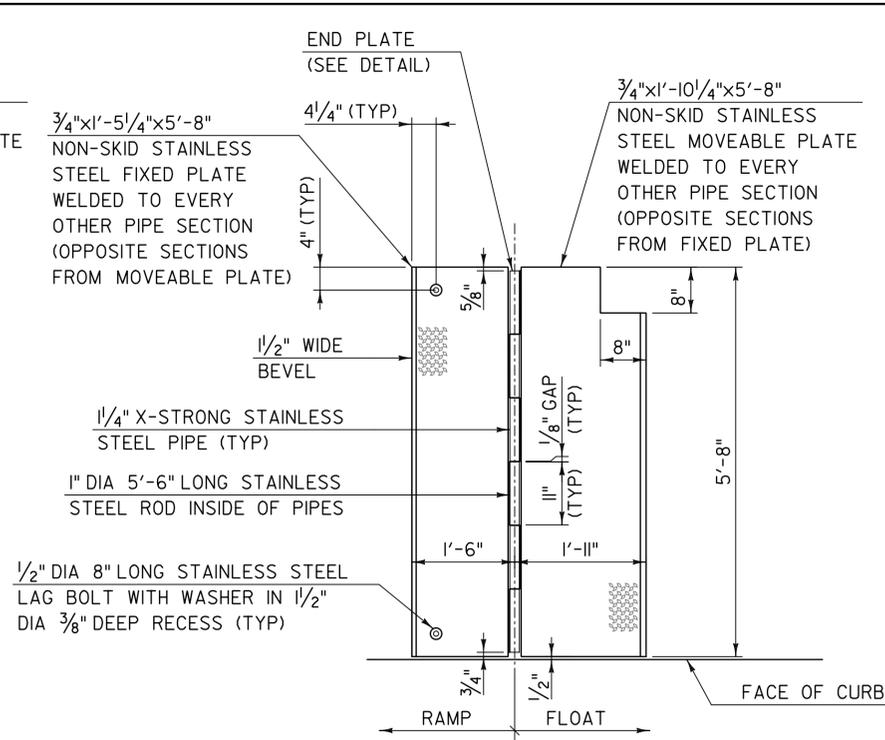
PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

TYLIN INTERNATIONAL	FILE NAME: z12e134bdrstelconn2.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: S. KELLER	CHECKED BY: D. MYERS
	HINGED SLIDING PLATE ASSEMBLY - ROADWAY SHEET 51 OF 70	



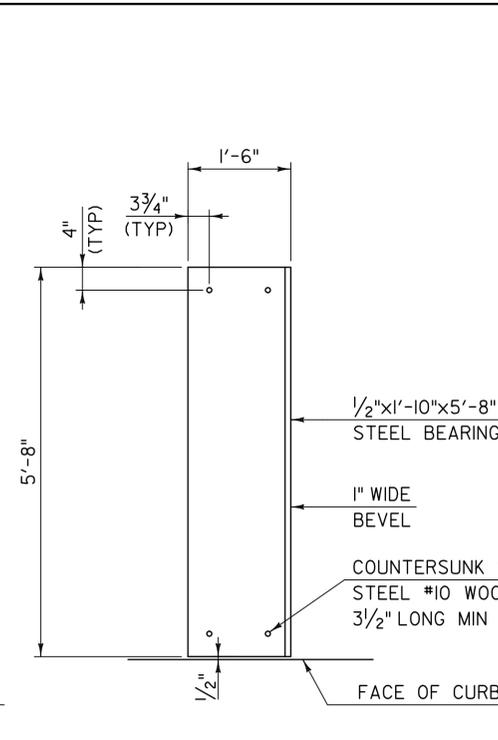
**ABUTMENT / RAMP - SIDEWALK ASSEMBLY**

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



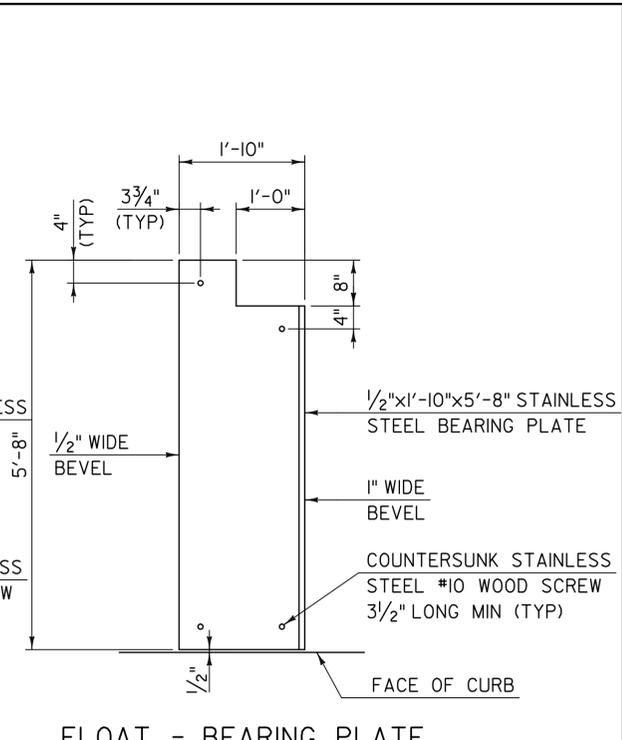
**RAMP / FLOAT - SIDEWALK ASSEMBLY**

SCALE: 3/4" = 1'-0"  
(NW AND SE CORNERS OF FLOAT SHOWN)  
(ASSEMBLIES AT SW AND NE CORNERS OF  
FLOAT MIRRORED ABOUT CL ROADWAY)



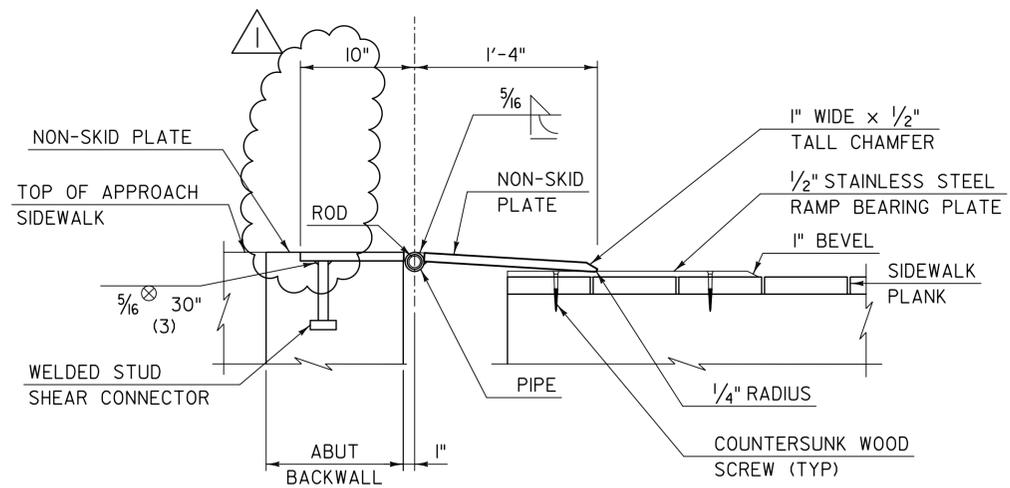
**RAMP - BEARING PLATE**

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



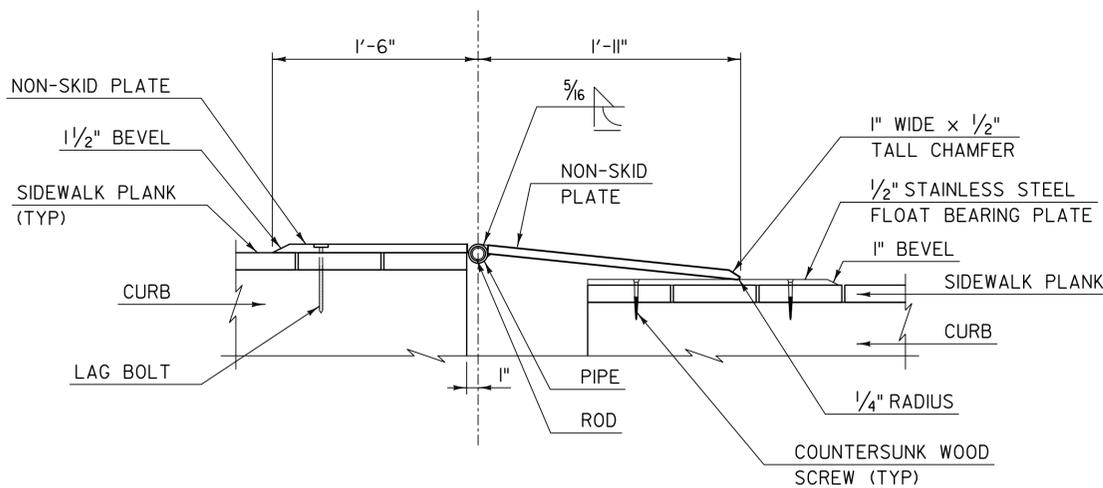
**FLOAT - BEARING PLATE**

SCALE: 3/4" = 1'-0"  
(NW AND SE CORNERS OF FLOAT SHOWN)  
(ASSEMBLIES AT SW AND NE CORNERS OF  
FLOAT MIRRORED ABOUT CL ROADWAY)



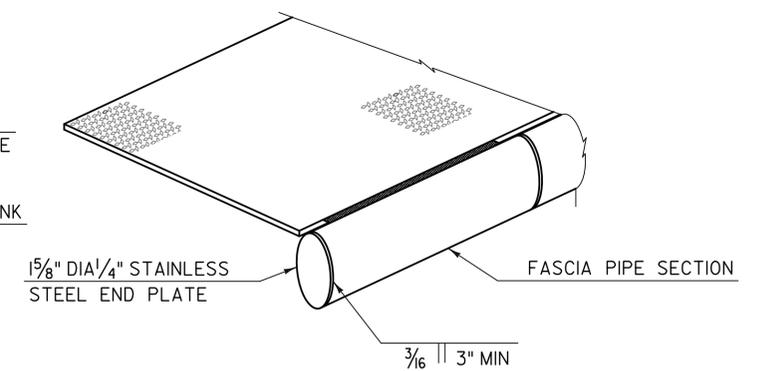
**ABUTMENT / RAMP - SIDEWALK SECTION**

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



**RAMP / FLOAT - SIDEWALK SECTION**

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



**END PLATE**

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

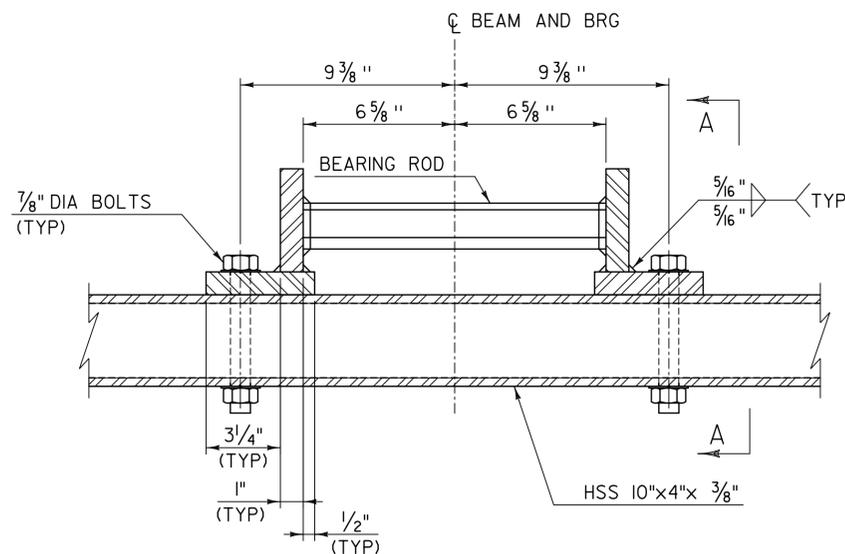
**NOTES:**

1. WELDS ON TOP OF HINGE ASSEMBLIES SHALL BE GROUND FLUSH.
2. STEEL PIPES SHALL HAVE A MINIMUM 1/8" INNER DIAMETER.
3. ALL COSTS ASSOCIATED WITH SLIDING PLATE ASSEMBLY WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 900.640 SPECIAL PROVISION (EXPANSION DEVICE, HINGED SLIDING PLATE ASSEMBLY).
4. NON-SKID PLATES SHALL HAVE A DIAMOND (TREAD/CHECKERED) PATTERN ON THE TRAVEL SURFACE. NON-SKID PATTERN SHALL BE IN GENERAL CONFORMANCE WITH THE GEOMETRIC REQUIREMENTS OF ASTM A 793.

REVISION	DESCRIPTION	DATE
REVISION #1	HINGE PLATE CHANGE	2/4/2014

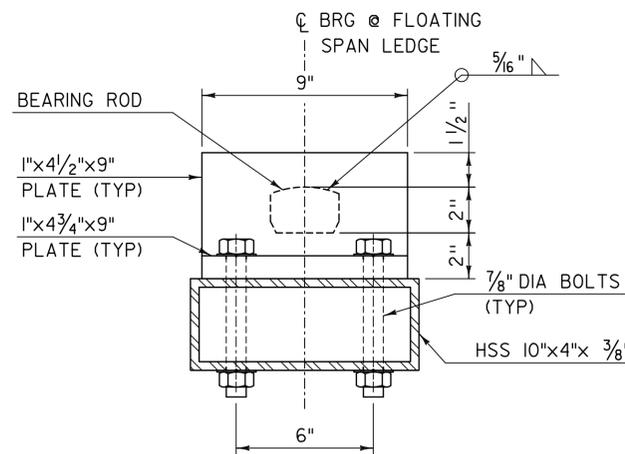
PROJECT NAME: **BROOKFIELD**  
PROJECT NUMBER: **BRF FLBR(2)**

<b>TYLIN</b> INTERNATIONAL	FILE NAME: z12e134bdrstelconn.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: S. KELLER	CHECKED BY: D. MYERS
	HINGED SLIDING PLATE ASSEMBLY - SIDEWALK SHEET 52 OF 70	



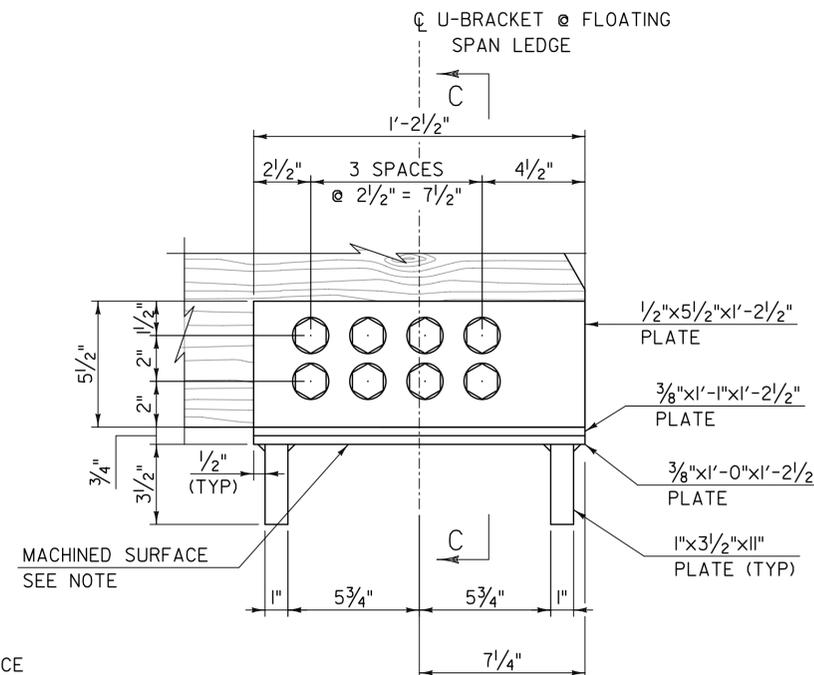
**FLOATING SPAN LEDGE  
BEARING ELEVATION**

SCALE: 3" = 1'-0"



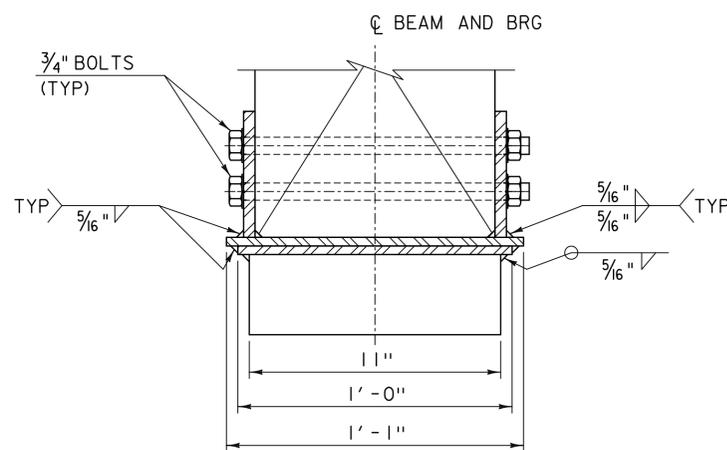
**FLOATING SPAN LEDGE  
SECTION A-A**

SCALE: 3" = 1'-0"



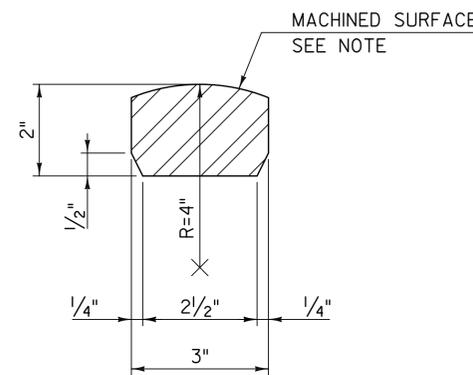
**U-BRACKET BEARING DETAIL  
- FLOATING SPAN LEDGE**

SCALE: 3" = 1'-0"



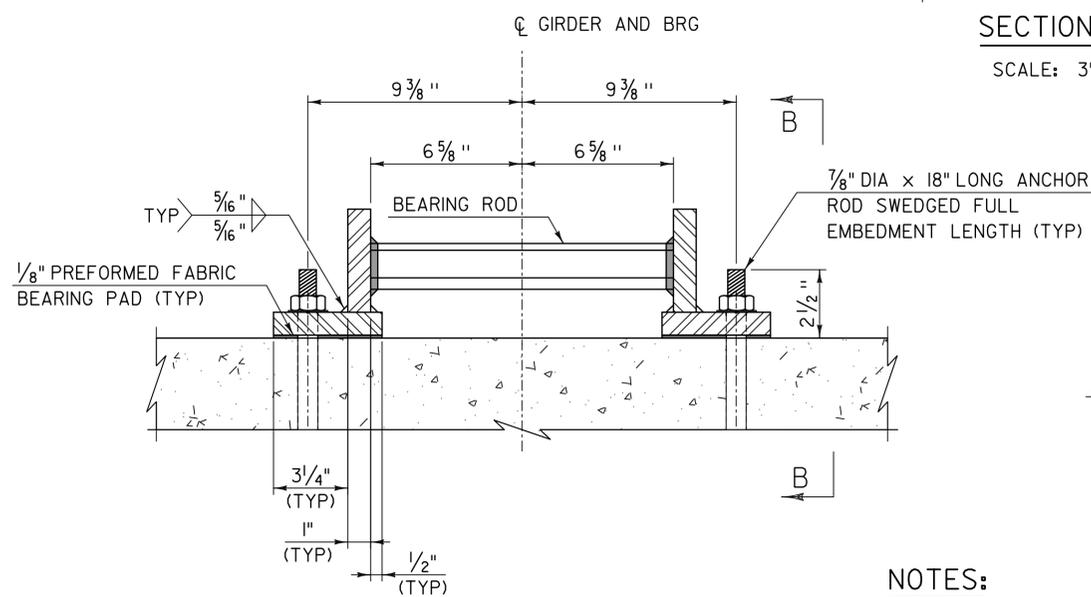
**SECTION C-C**

SCALE: 3" = 1'-0"



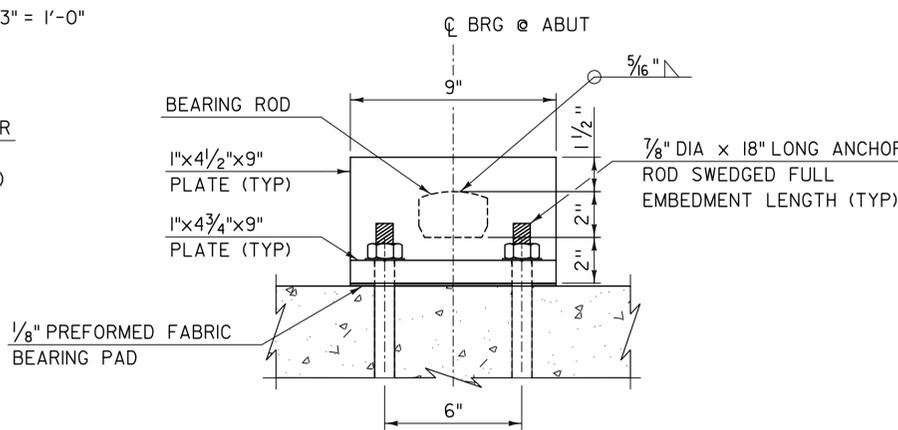
**BEARING ROD SECTION**

SCALE: 6" = 1'-0"



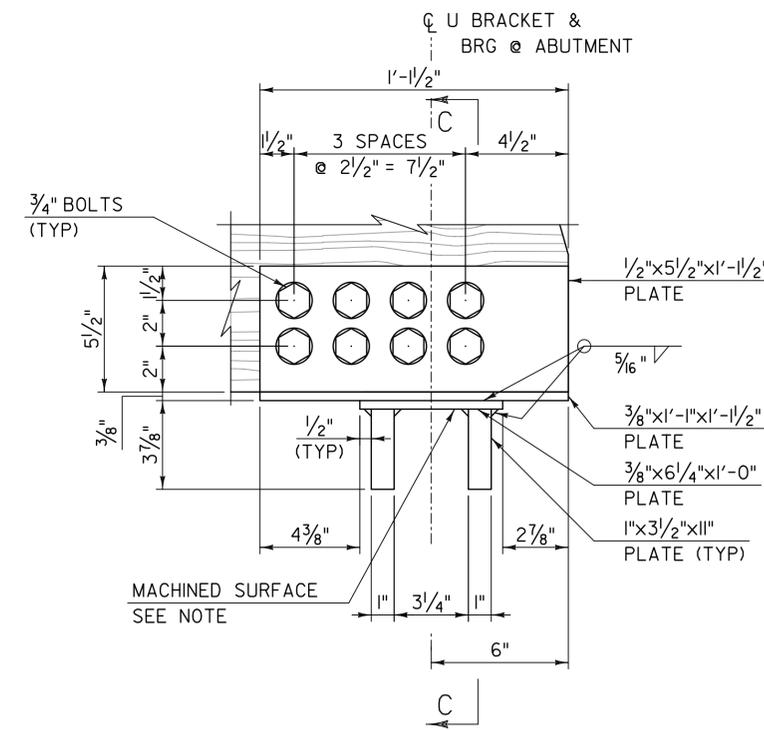
**ABUTMENT BEARING ELEVATION**

SCALE: 3" = 1'-0"



**ABUTMENT SECTION B-B**

SCALE: 3" = 1'-0"



**U-BRACKET BEARING DETAIL - ABUTMENT**

SCALE: 3" = 1'-0"

**NOTES:**

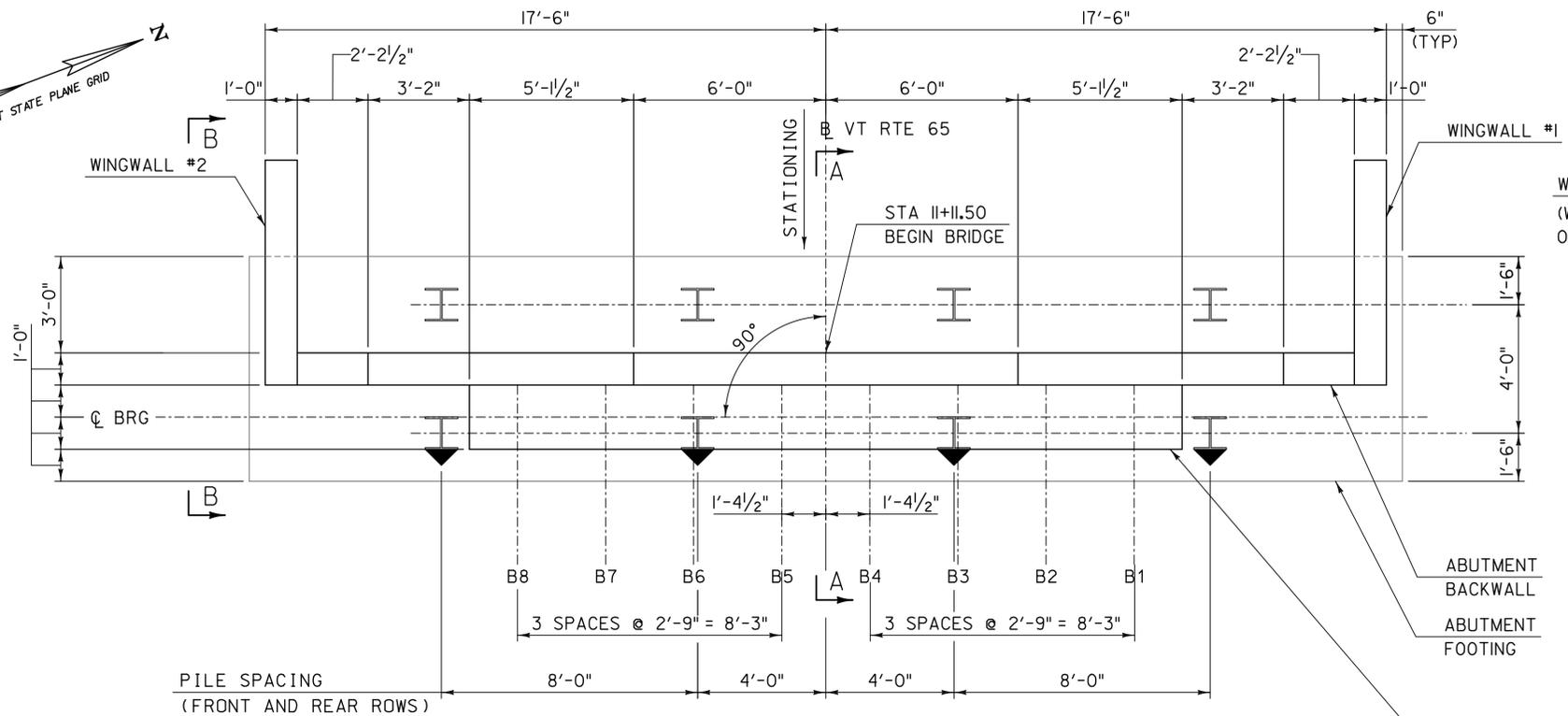
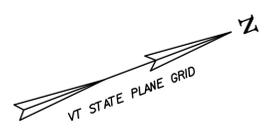
1. SURFACES NOTED AS MACHINED SURFACES SHALL BE FINISHED TO A ROUGHNESS TOLERANCE OF ANSI250 MICRO-INCHES.
2. PREFORMED FABRIC BEARING PADS SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 731.01, AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 900.620 "SPECIAL PROVISION (BEARING DEVICE ASSEMBLY, FLOATING BRIDGE)".

**TYLIN**INTERNATIONAL

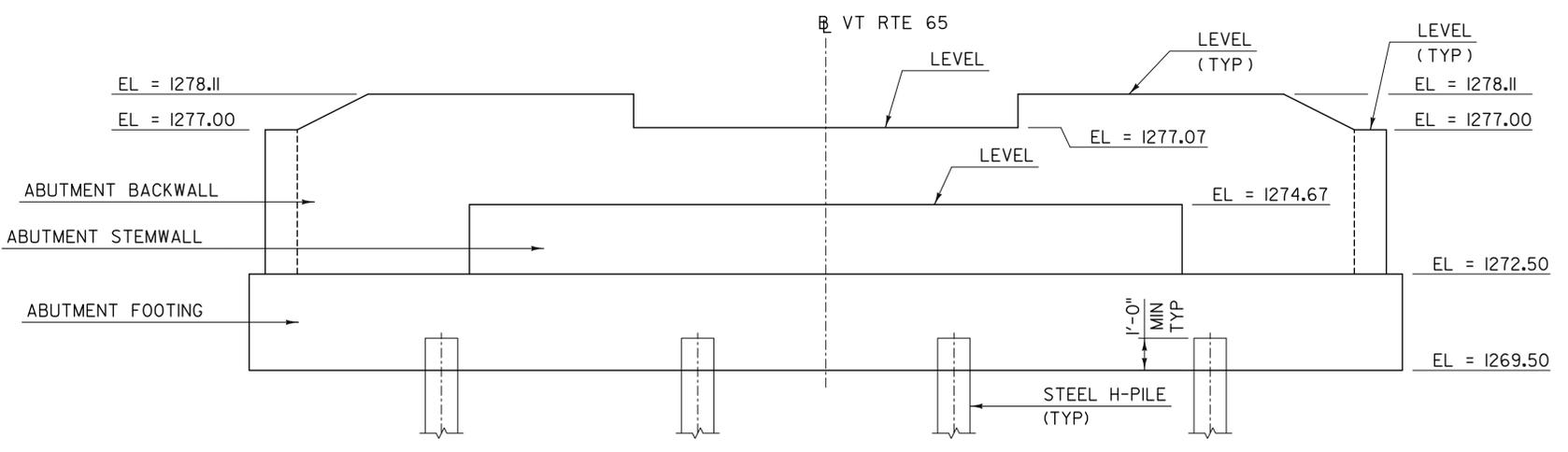
PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

FILE NAME: z12e134bdrbearIngs.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: D. MYERS  
BEARING DETAILS

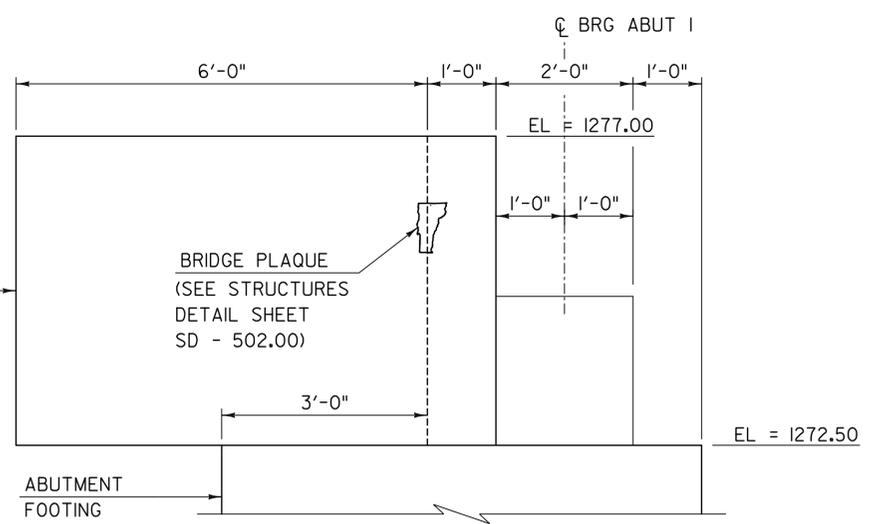
PLOT DATE: 12/3/2013  
DRAWN BY: S. MORGAN  
CHECKED BY: S. KELLER  
SHEET 53 OF 70



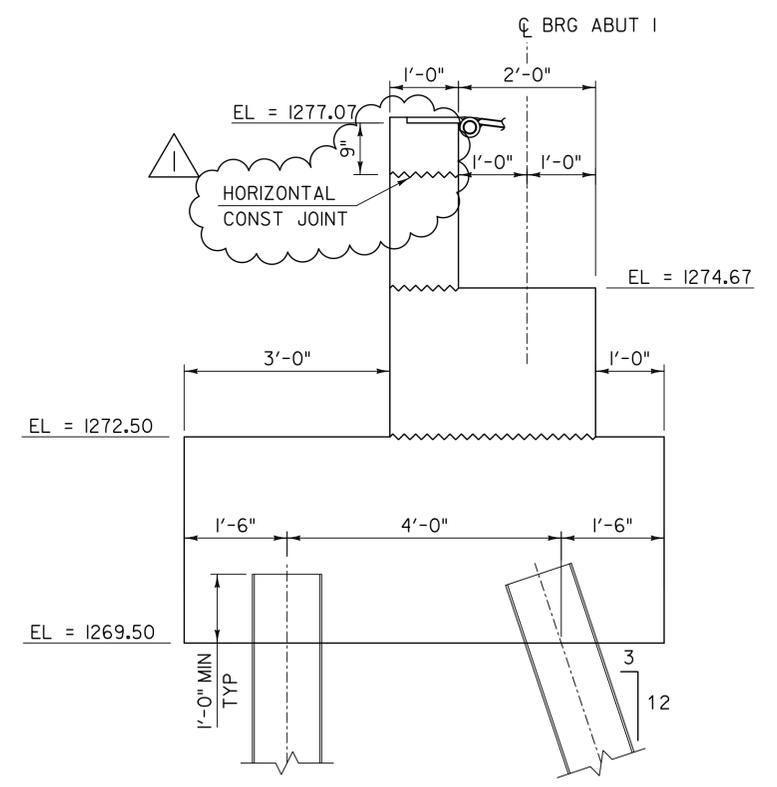
**ABUTMENT I - PLAN**  
SCALE: 3/8" = 1'-0"



**ABUTMENT I - ELEVATION**  
SCALE: 3/8" = 1'-0"



**VIEW B-B**  
SCALE: 3/4" = 1'-0"



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

**NOTE:**

- 1. ALL ELEVATIONS NOTED ARE AT TOP OF CONCRETE, BENEATH HINGED SLIDING PLATE ASSEMBLY.

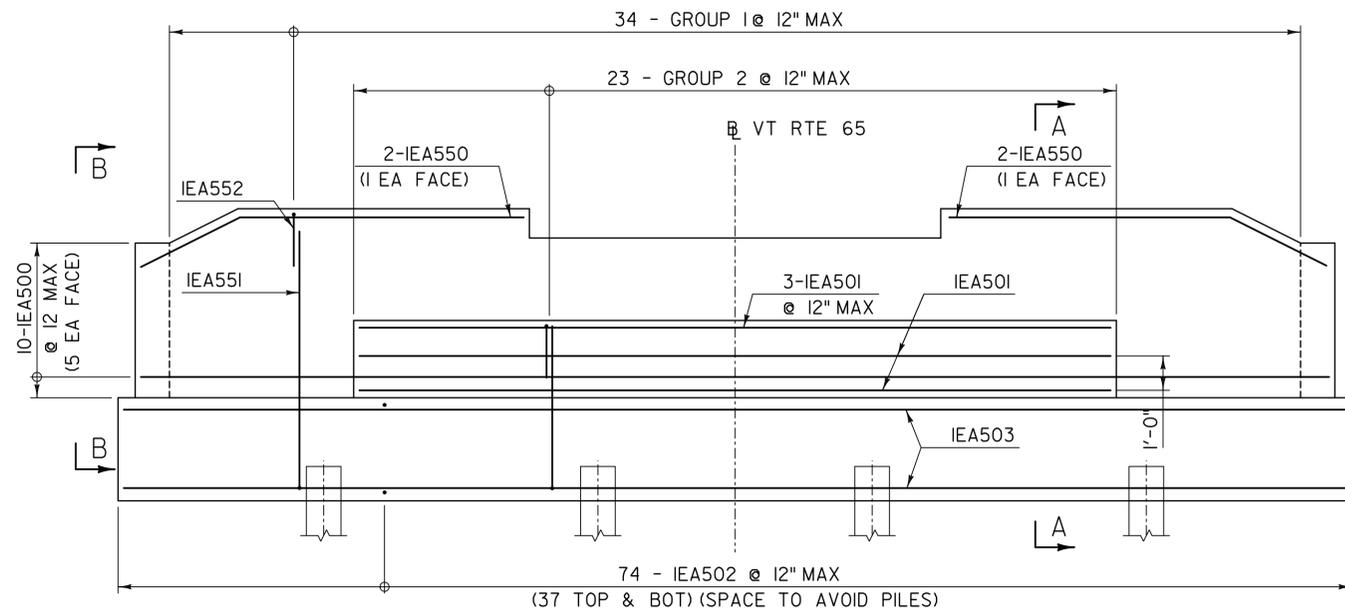
REVISION	DESCRIPTION	DATE
REVISION #1	ADDED CONSTRUCTION JOINT	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

**TYLIN** INTERNATIONAL

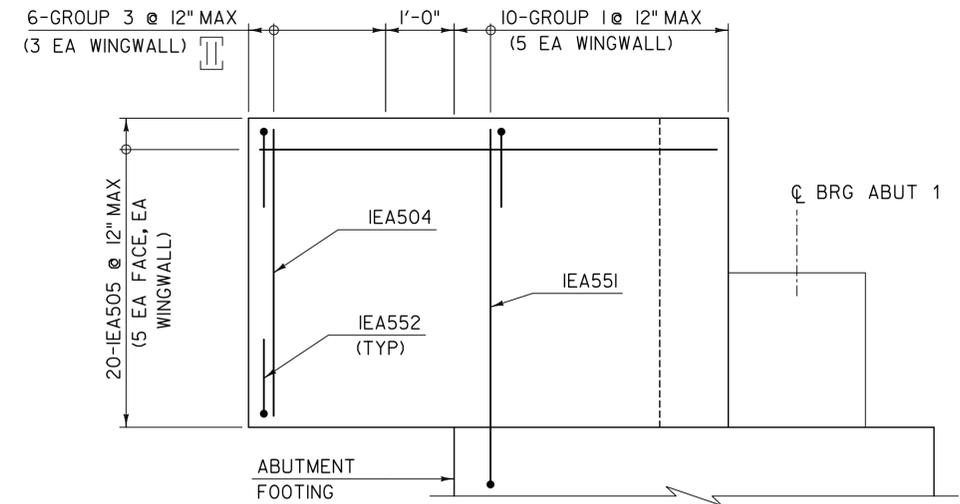
FILE NAME: z12e134bdrabut1.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: T. POULIN  
ABUTMENT I PLAN, ELEVATION & SECTIONS

PLOT DATE: 2/5/2014  
DRAWN BY: S. MORGAN  
CHECKED BY: S. KELLER  
SHEET 54 OF 70

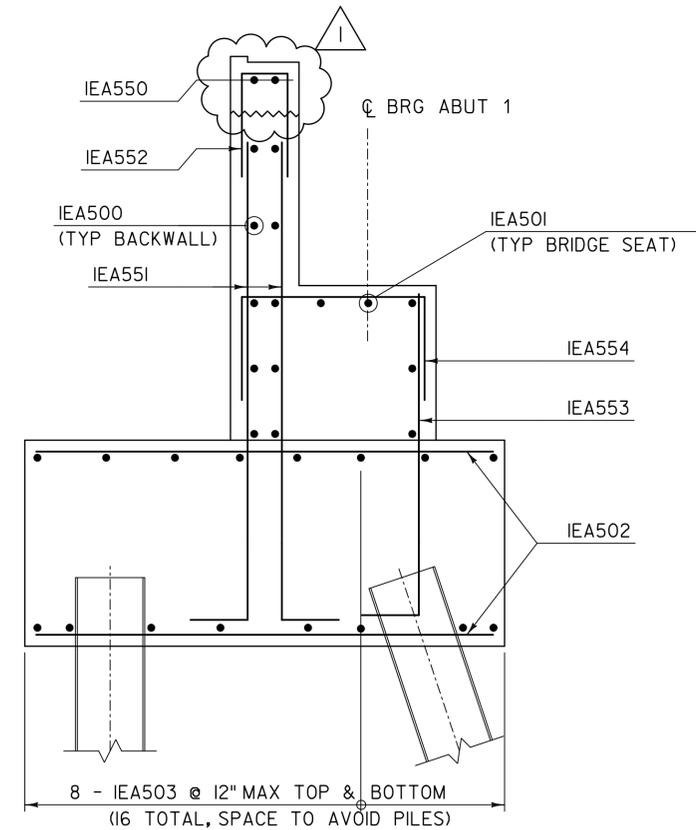


**ABUTMENT I - REINFORCEMENT**  
 SCALE: 3/8" = 1'-0"

- GROUP 1:  
 2-IEA551, 1-IEA552
- GROUP 2:  
 1-IEA553, 1-IEA554
- GROUP 3:  
 2-IEA504, 2-IEA552



**VIEW B-B**  
 SCALE: 3/4" = 1'-0"

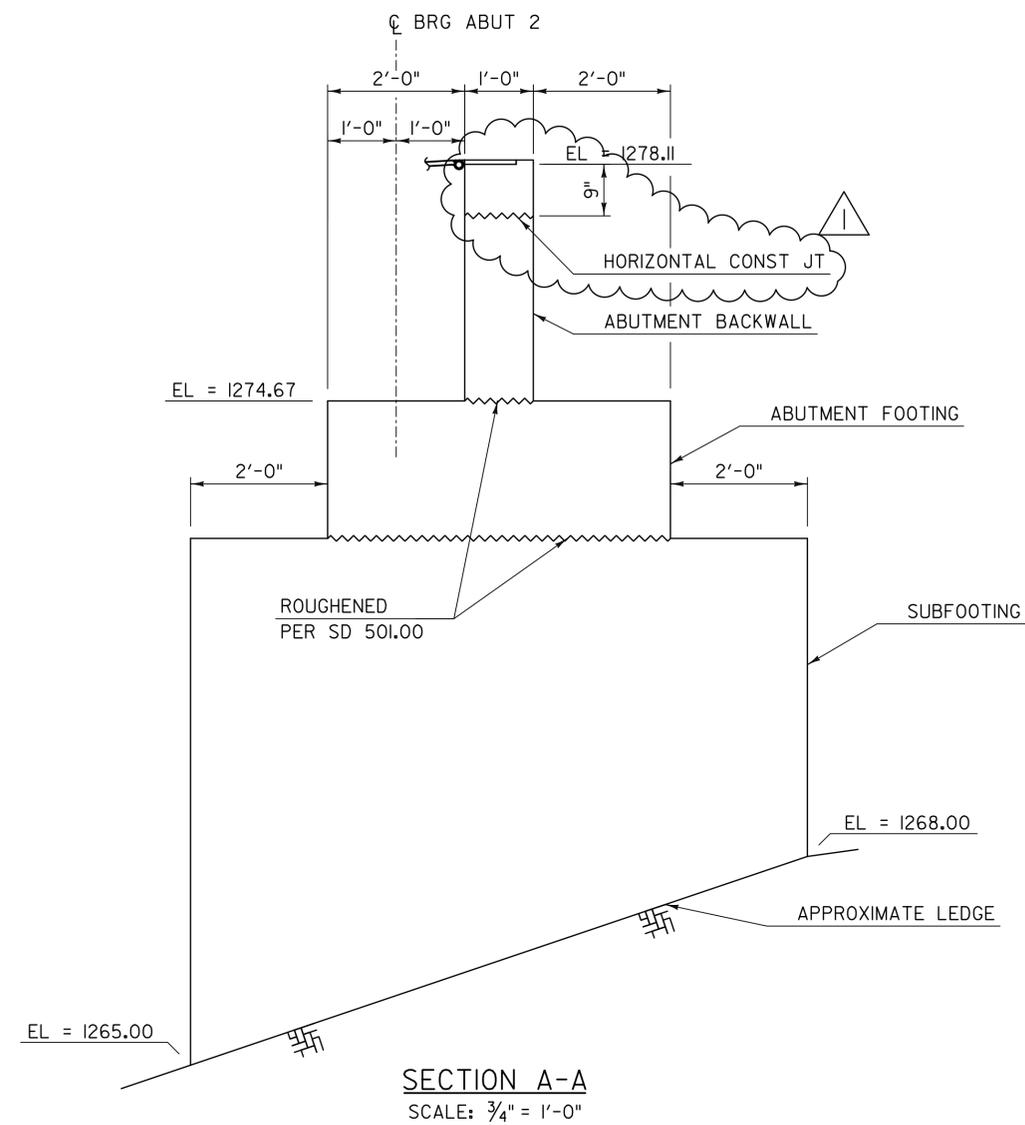
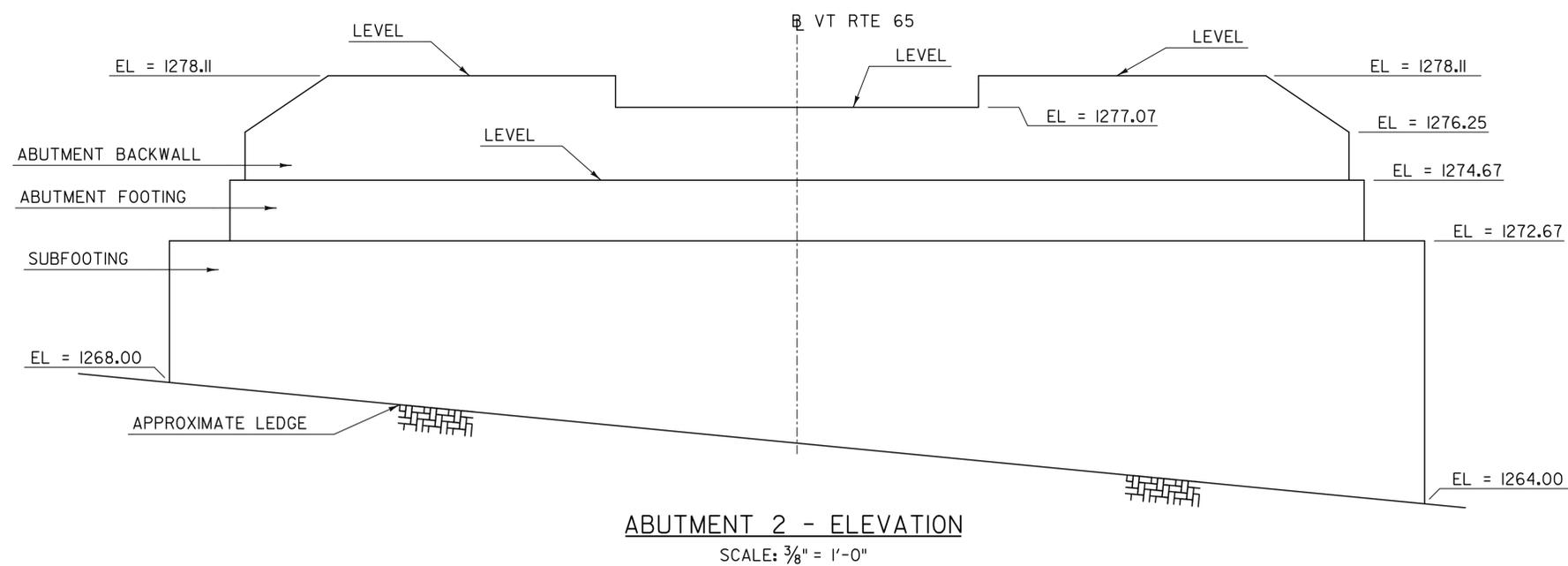
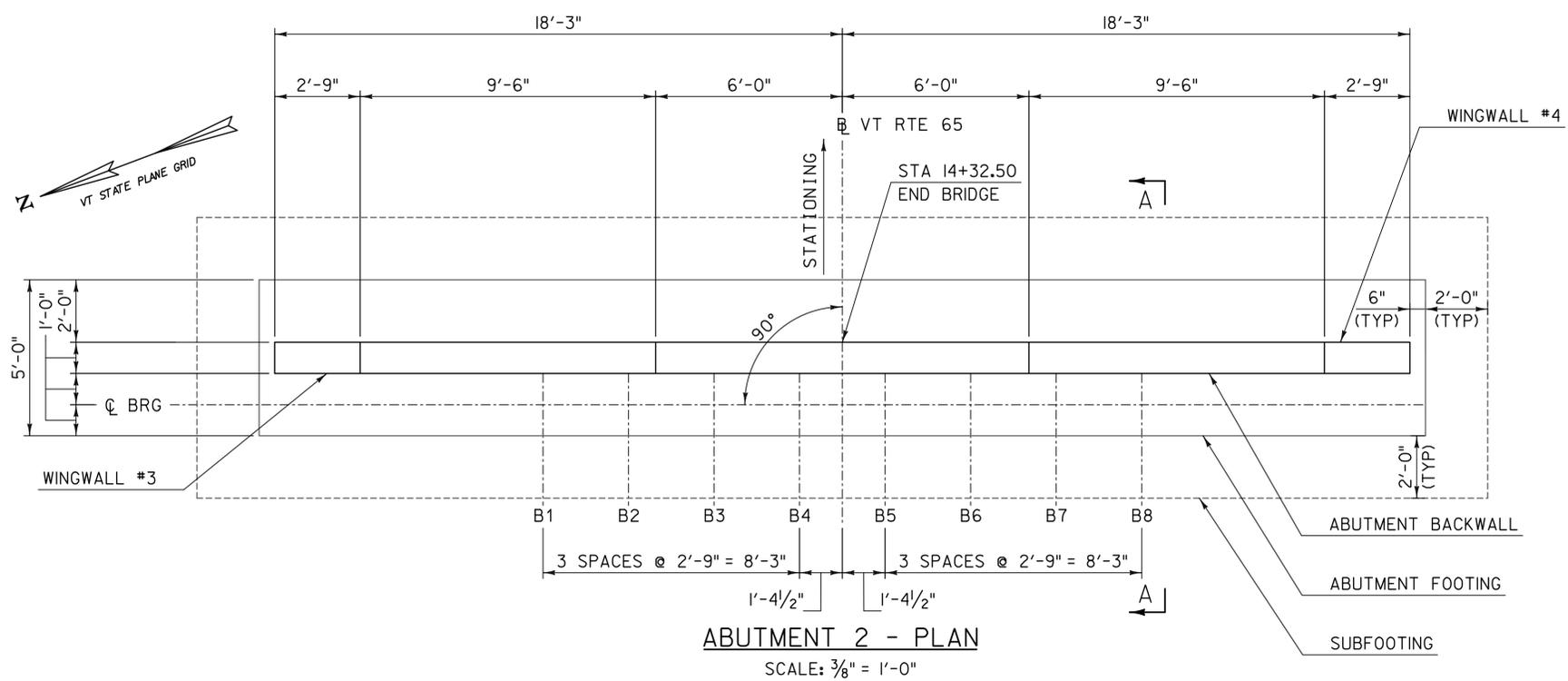


**SECTION A-A**  
 SCALE: 3/4" = 1'-0"

REVISION	DESCRIPTION	DATE
REVISION #1	ADDED CONSTRUCTION JOINT	2/4/2014

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRF FLBR(2)

TYLIN INTERNATIONAL	FILE NAME: z12e134bdrabut1r.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: T. POULIN	CHECKED BY: S. KELLER
	ABUTMENT I REINFORCEMENT	SHEET 55 OF 70



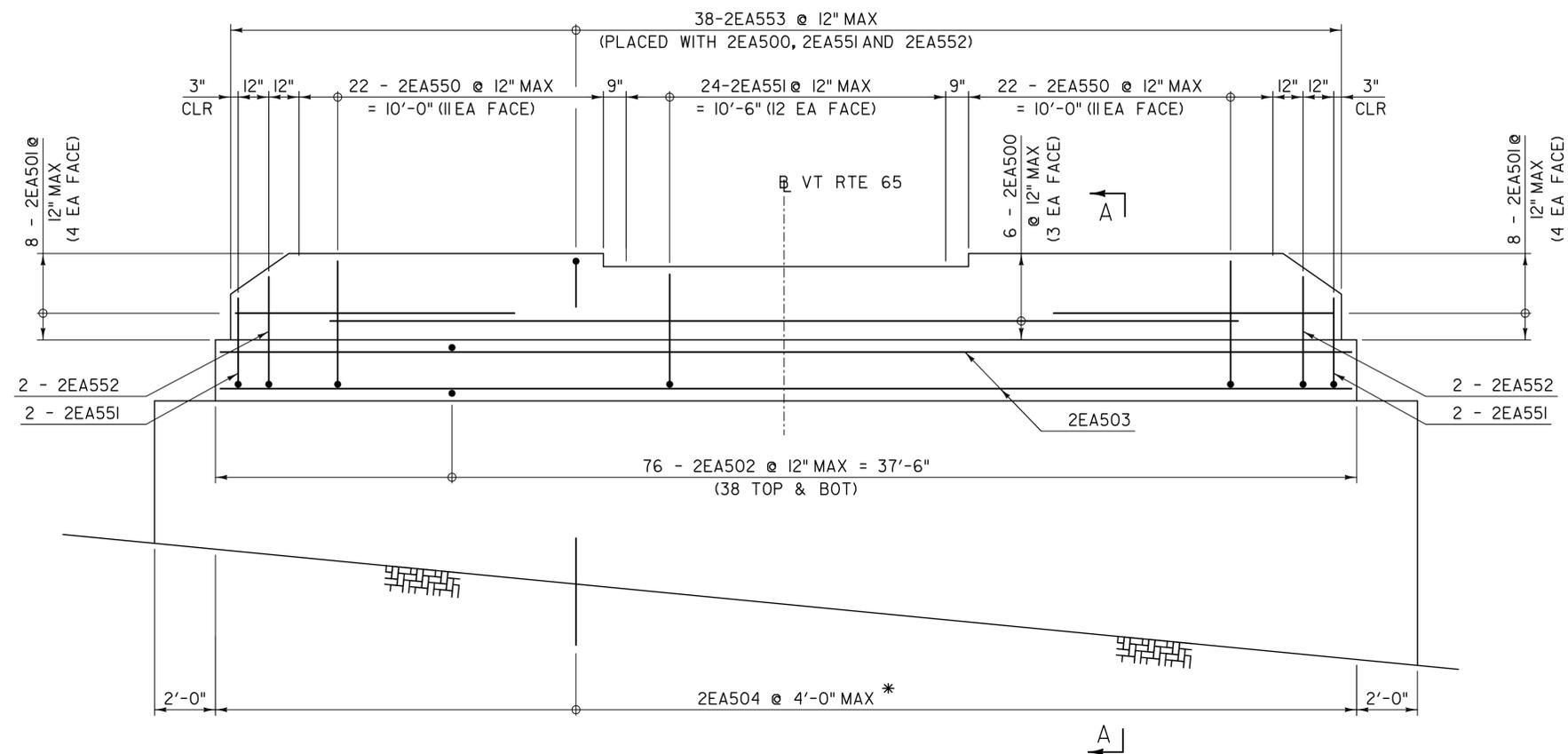
**NOTES:**

1. ALL ELEVATIONS NOTED ARE AT TOP OF CONCRETE, BENEATH HINGED SLIDING PLATE ASSEMBLY.
2. ALL BEDROCK ELEVATIONS ARE APPROXIMATE.

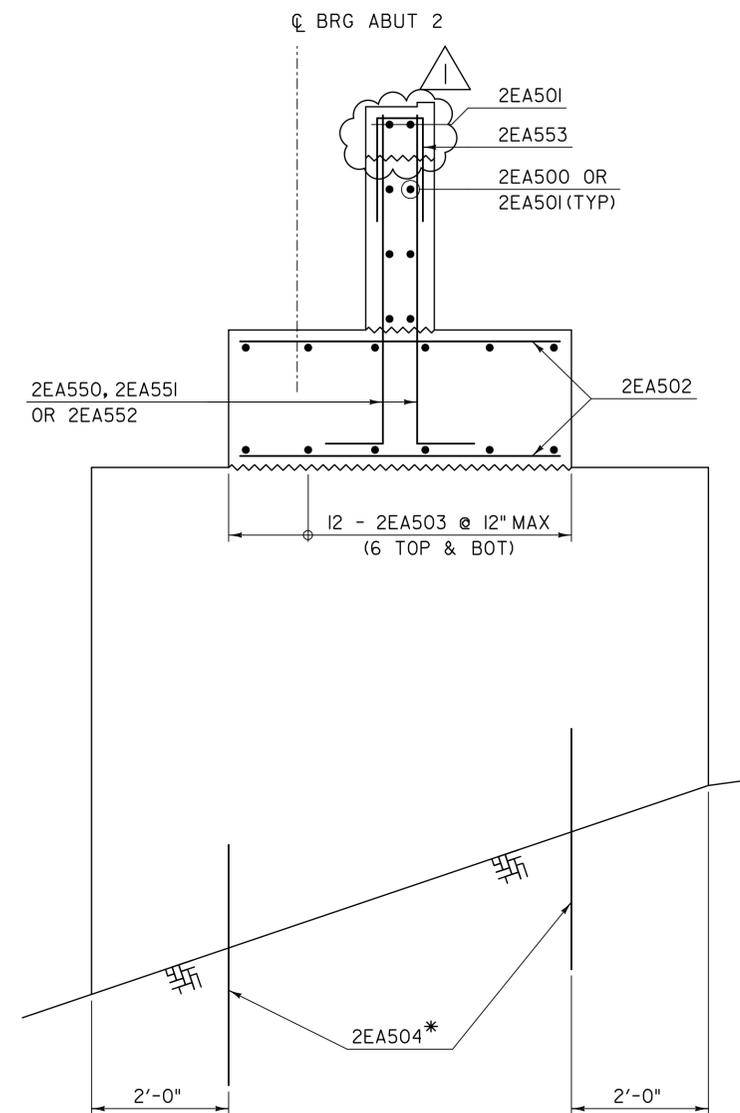
REVISION	DESCRIPTION	DATE
REVISION #1	ADDED CONSTRUCTION JOINT	2/4/2014

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

<b>TYLIN</b> INTERNATIONAL	FILE NAME: z12e134bdrabut2.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: T. POULIN	CHECKED BY: S. KELLER
	ABUTMENT 2 PLAN, ELEVATION & SECTIONS SHEET 56 OF 70	



**ABUTMENT 2 - REINFORCEMENT**  
SCALE: 3/8" = 1'-0"



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

\*2EA504 BARS SHALL BE DRILLED AND GROUTED INTO BEDROCK AS SHOWN HERE AND NOTED IN THE PROJECT NOTES.

REVISION	DESCRIPTION	DATE
REVISION #1	ADDED CONSTRUCTION JOINT	2/4/2014

PROJECT NAME: **BROOKFIELD**  
PROJECT NUMBER: **BRF FLBR(2)**

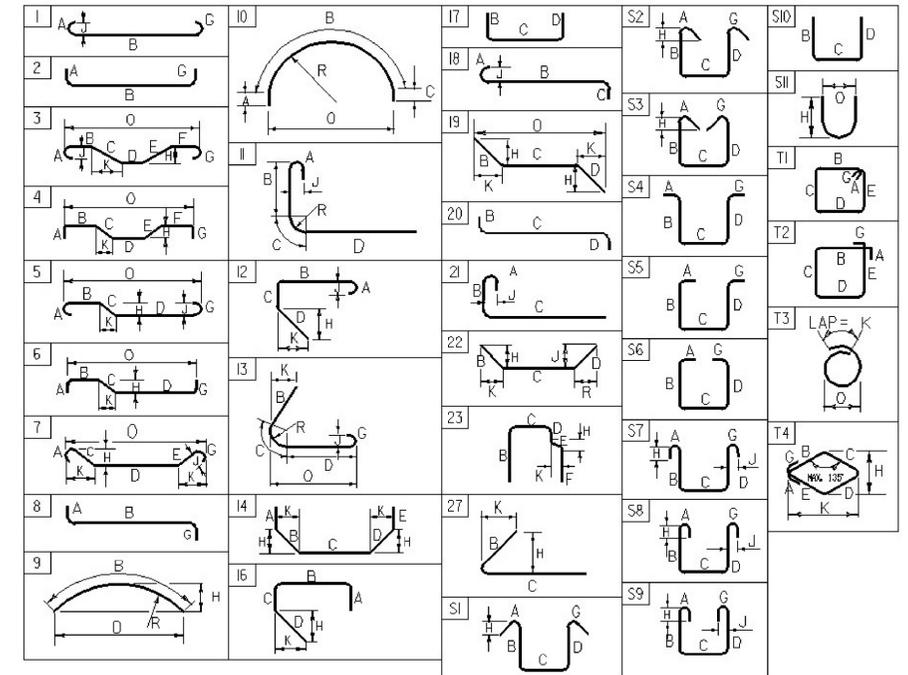
<b>TYLIN</b> INTERNATIONAL	FILE NAME: z12e134bdrabut2r.dgn	PLOT DATE: 2/5/2014
	PROJECT LEADER: J. OLUND	DRAWN BY: S. MORGAN
	DESIGNED BY: T. POULIN	CHECKED BY: S. KELLER
	ABUTMENT 2 REINFORCEMENT	SHEET 57 OF 70

# REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O	ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O		
<b>ABUTMENT 1</b>																																					
	10	5	34'- 6"	1EA500	STR																																
	5	5	21'- 9"	1EA501	STR																																
*	75	5	6'- 6"	1EA502	STR																																
	16	5	35'- 6"	1EA503	STR																																
	12	5	4'- 0"	1EA504	STR																																
	20	5	6'- 6"	1EA505	STR																																
	4	5	11'- 1"	1EA550	19		0'- 0"	7'- 11"	3'- 2"				1'- 5"		2'- 11"																						
	88	5	7'- 9"	1EA551	2	0'- 10"	6'- 11"					0'- 0"																									
	56	5	5'- 6"	1EA552	17		2'- 6"	0'- 6"	2'- 6"																												
	23	5	5'- 7"	1EA553	2	0'- 10"	4'- 9"					0'- 0"																									
	23	5	5'- 6"	1EA554	17		1'- 6"	2'- 6"	1'- 6"																												
<b>ABUTMENT 2</b>																																					
	6	5	20'- 6"	2EA500	STR																																
	16	5	9'- 0"	2EA501	STR																																
	76	5	4'- 6"	2EA502	STR																																
	12	5	37'- 0"	2EA503	STR																																
	22	5	3'- 6"	2EA504	STR																																
	44	5	5'- 5"	2EA550	17		4'- 7"	0'- 10"	0'- 0"																												
	28	5	4'- 7"	2EA551	2	0'- 10"	3'- 9"					0'- 0"																									
	4	5	3'- 11"	2EA552	2	0'- 10"	3'- 1"					0'- 0"																									
	38	5	3'- 4"	2EA553	17		1'- 5"	0'- 6"	1'- 5"																												

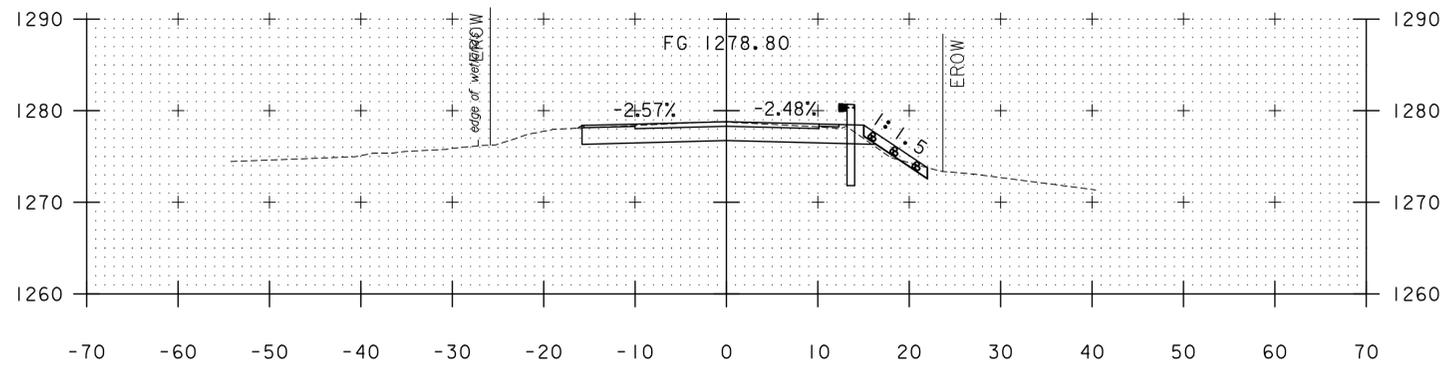
~ NOTES ~

- UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31 (ASTM A 615-SI). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
- FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
- BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
- ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
- "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE. OTHERWISE, STANDARD HOOKS ARE TO BE USED.
- "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
- WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.
- ▲ DENOTES BARS TO BE CUT IN FIELD.
- \* DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.
- △ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.
- E IN BAR MARK PREFIX DENOTES EPOXY COATED REINFORCING STEEL.

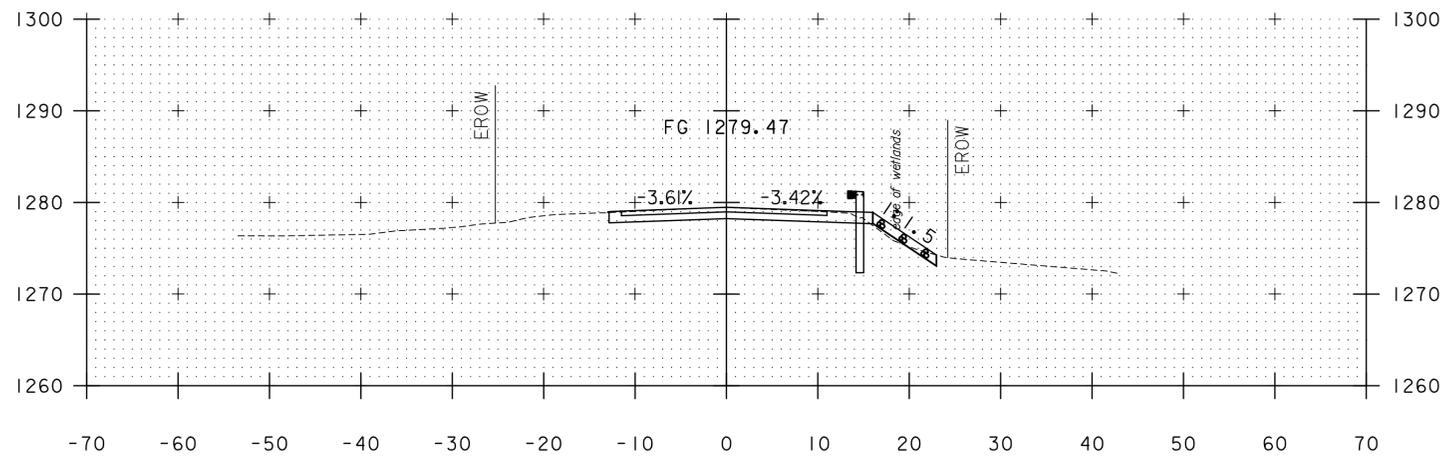


ASTM STANDARD REINFORCING BARS				
BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION		
		DIAMETER INCHES	AREA INCHES <sup>2</sup>	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.044	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.142
#9	3.400	1.128	1.00	3.544
#10	4.303	1.270	1.27	3.990
#11	5.313	1.410	1.56	4.430
#14	7.65	1.693	2.25	5.32
#18	13.60	2.257	4.00	7.09

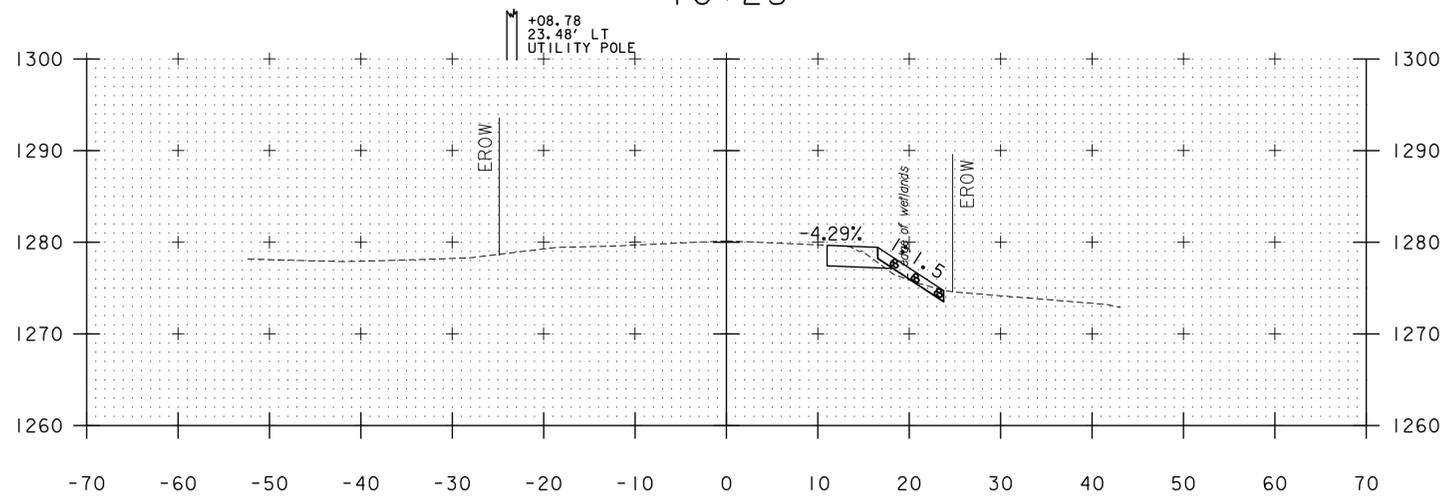
PROJECT NAME: **BROOKFIELD**  
 PROJECT NUMBER: **BRF FLBR(2)**  
 FILE NAME: z12E134rss.xls PLOT DATE: 9/25/2013  
 PROJECT MANAGER: J. OLUND DRAWN BY: T. POULIN  
 DESIGNED BY: T. POULIN CHECKED BY: S. MORGAN  
**REINFORCING STEEL SCHEDULE** SHEET 58 OF 70



10+50

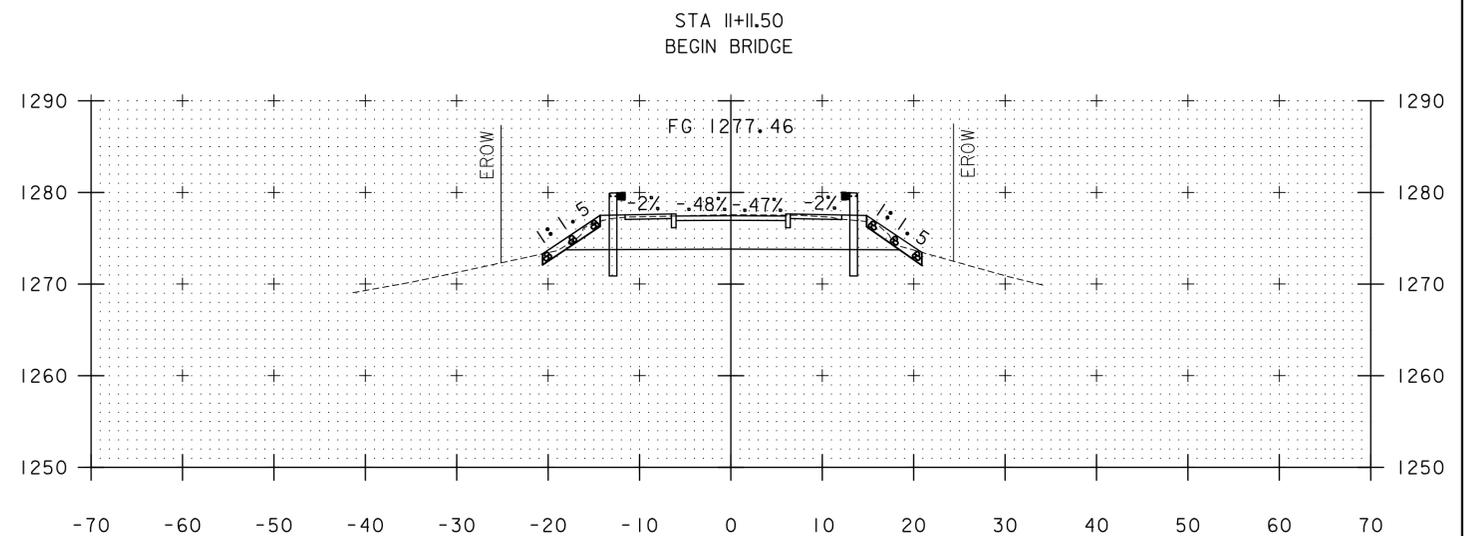


10+25

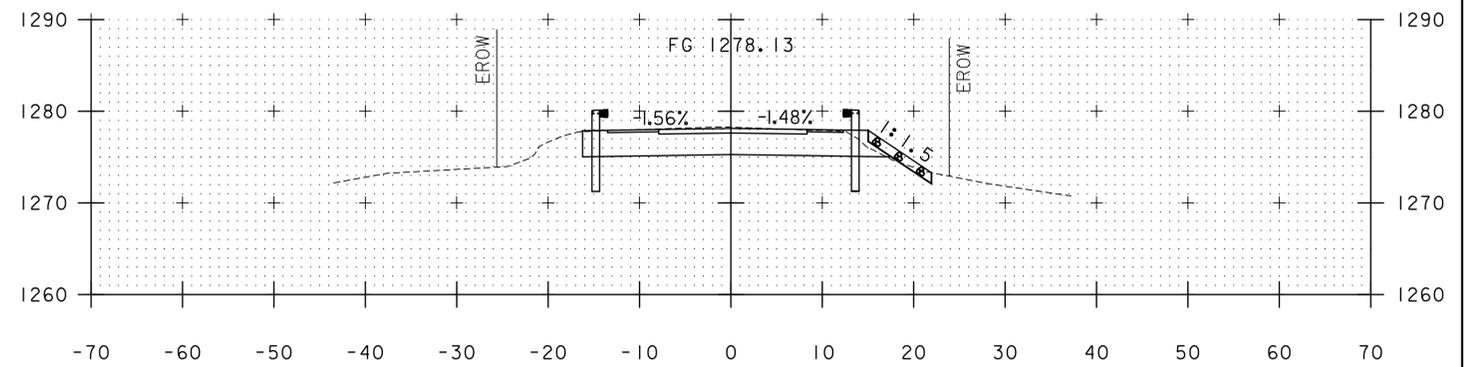


10+03.06

STA 10+03.06  
MATCH EXISTING PAVEMENT  
BEGIN APPROACH



11+00



10+75

STA 10+55.94  
END APPROACH  
BEGIN PROJECT

STA 10+03.06 TO STA 11+00

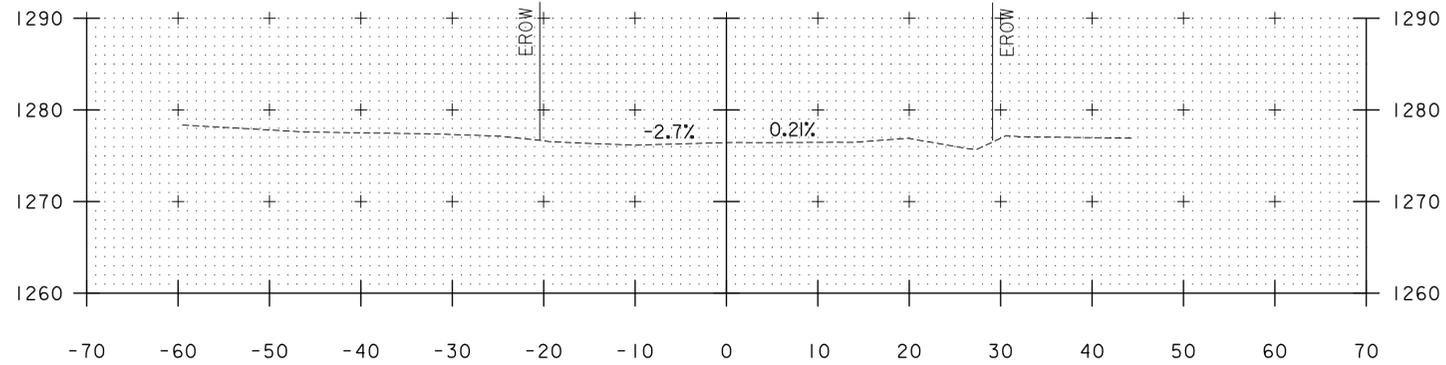
PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

TYLIN INTERNATIONAL

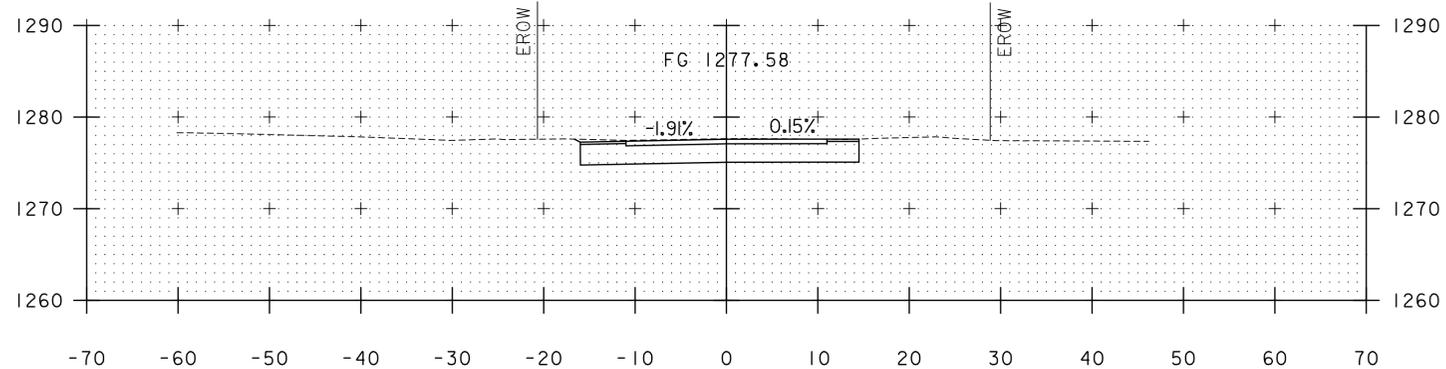
FILE NAME: z12e134bdr\_xs.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: D. BURHANS  
ROADWAY CROSS SECTIONS I

PLOT DATE: 12/3/2013  
DRAWN BY: D. BURHANS  
CHECKED BY: D. BRYANT  
SHEET 59 OF 70

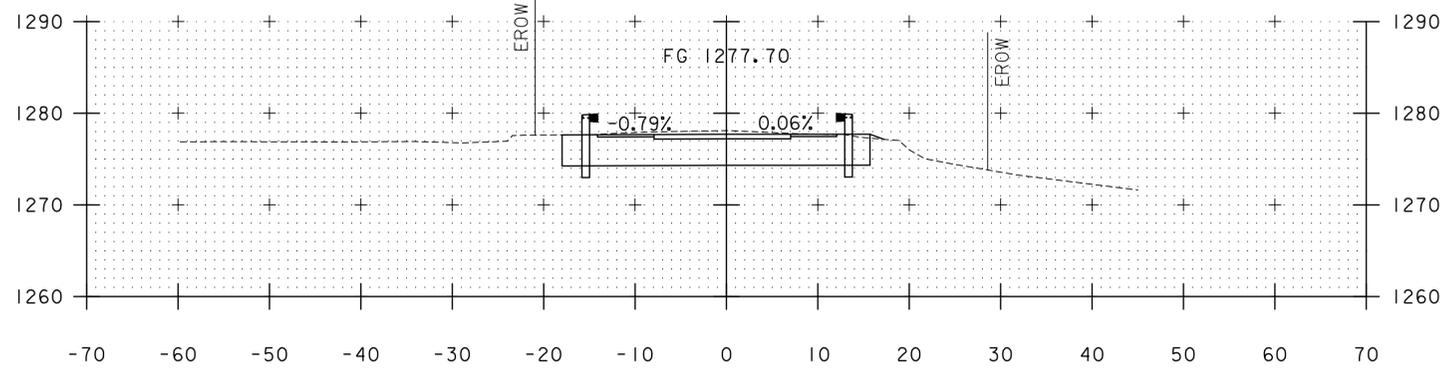
STA 14+92.50  
 END PROJECT  
 MATCH EXISTING GRADE



14+92.50



+64.53  
 22.46' LT  
 UTILITY POLE 14+75



14+50

+49.17  
 14.12' RT  
 DRY HYDRANT

STA 14+32.50  
 END BRIDGE

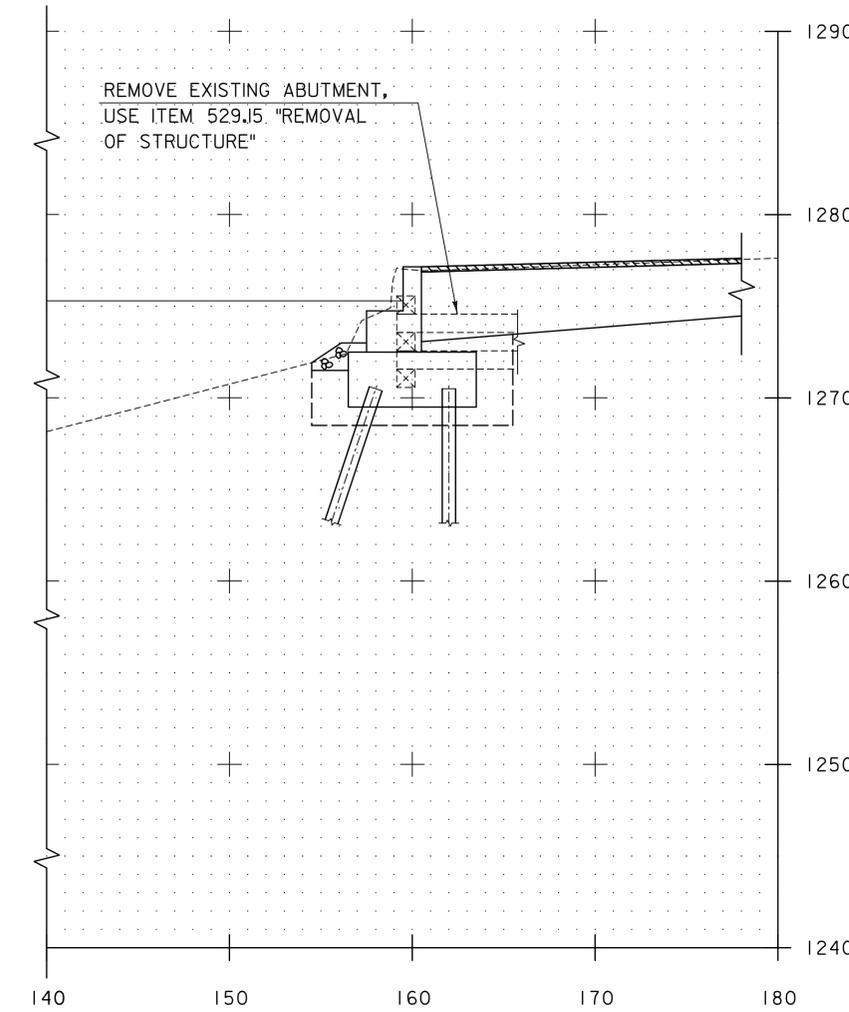
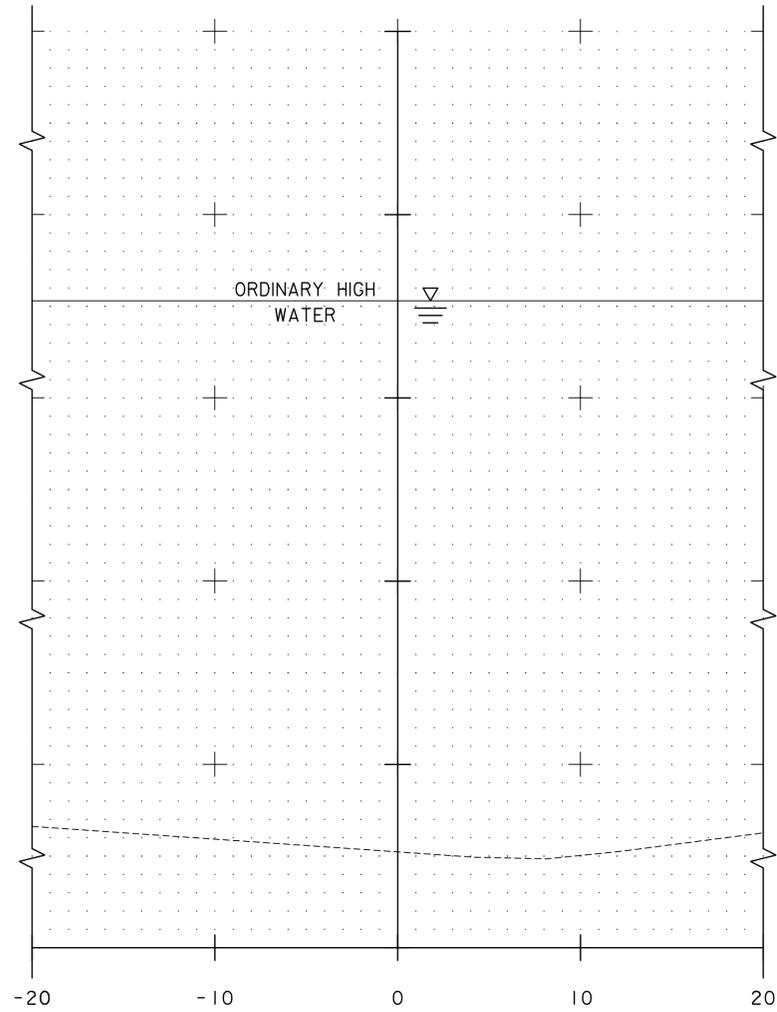
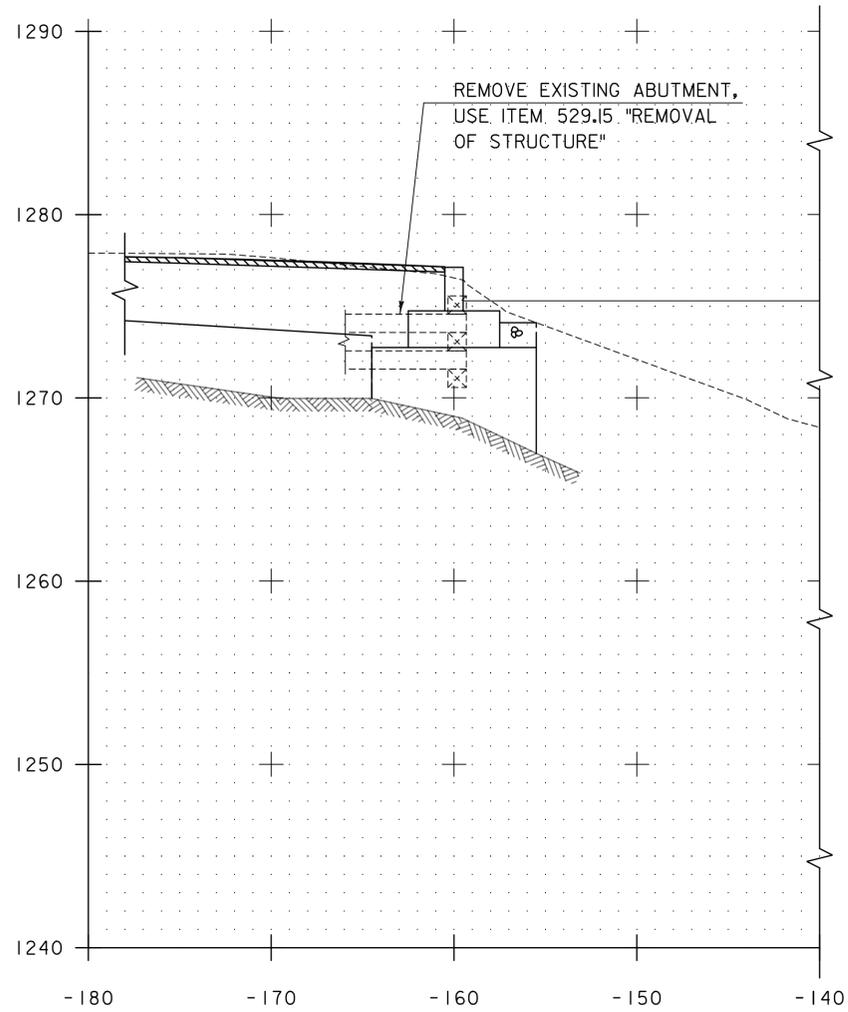
STA 14+50 TO STA 14+92.50

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRF FLBR(2)

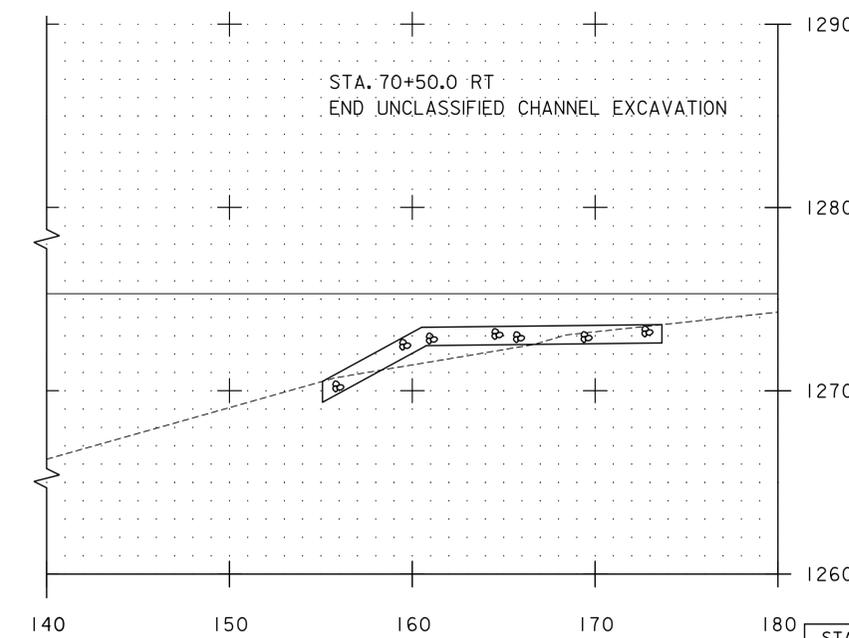
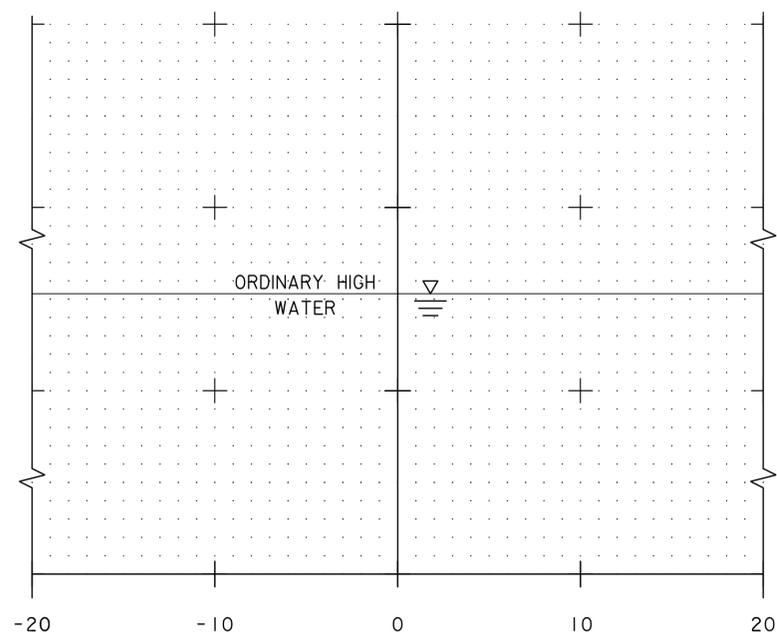
TYLIN INTERNATIONAL

FILE NAME: z12e134bdr\_xs.dgn  
 PROJECT LEADER: J. OLUND  
 DESIGNED BY: D. BURHANS  
 ROADWAY CROSS SECTIONS 2

PLOT DATE: 12/3/2013  
 DRAWN BY: D. BURHANS  
 CHECKED BY: D. BRYANT  
 SHEET 60 OF 70



70+60



70+50

STA. 70+49.0 LT  
BEGIN GEOTEXTILE UNDER STONE FILL  
BEGIN STONE FILL, TYPE I

STA. 70+46.0 RT  
BEGIN UNCLASSIFIED CHANNEL EXCAVATION  
BEGIN GEOTEXTILE UNDER STONE FILL  
BEGIN STONE FILL, TYPE I

SCALE 1" = 5'-0"  
5 0 5

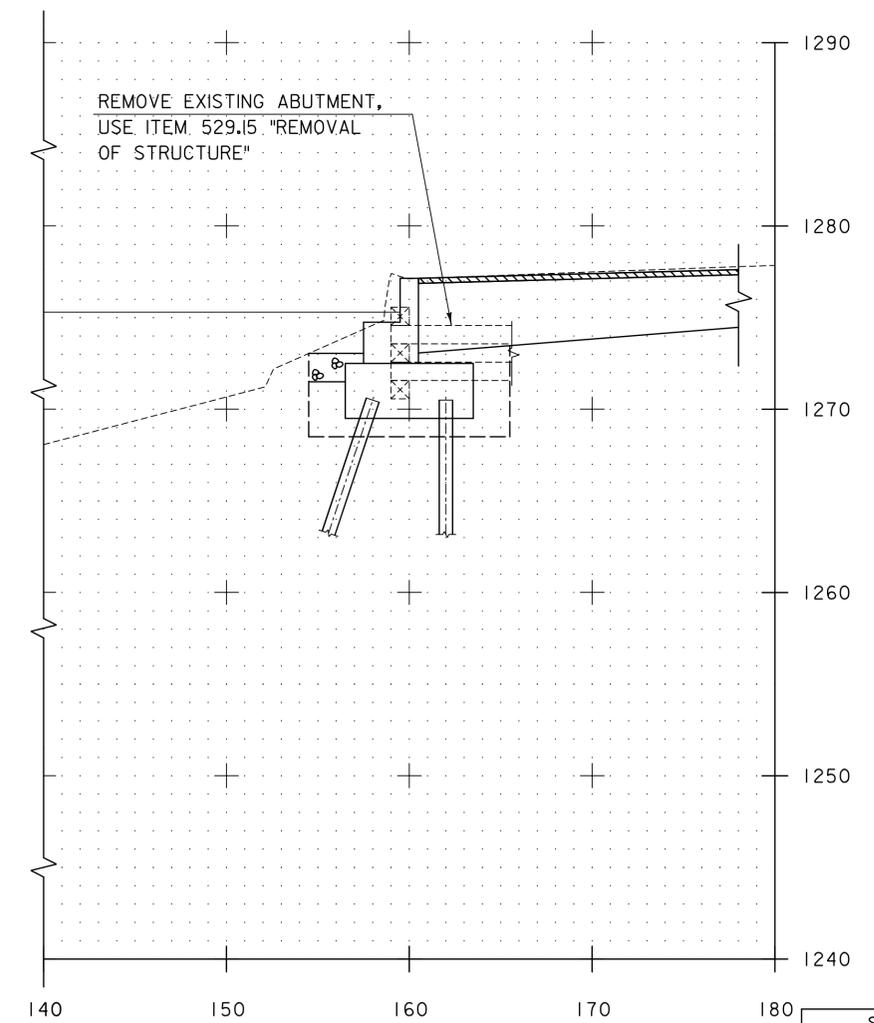
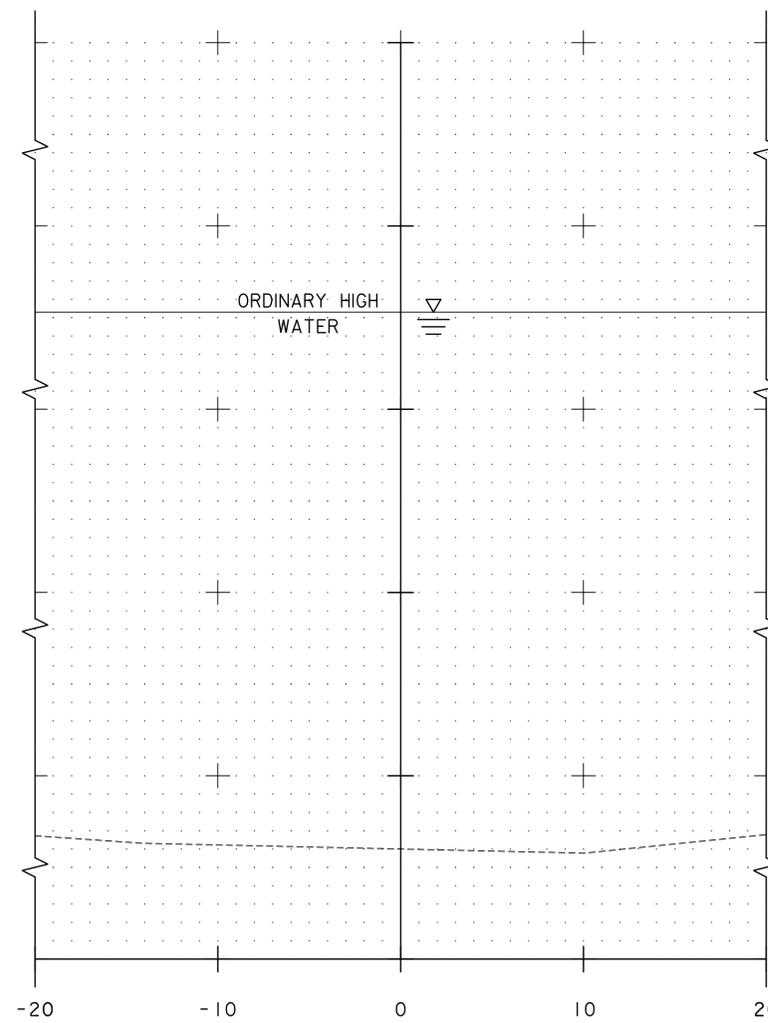
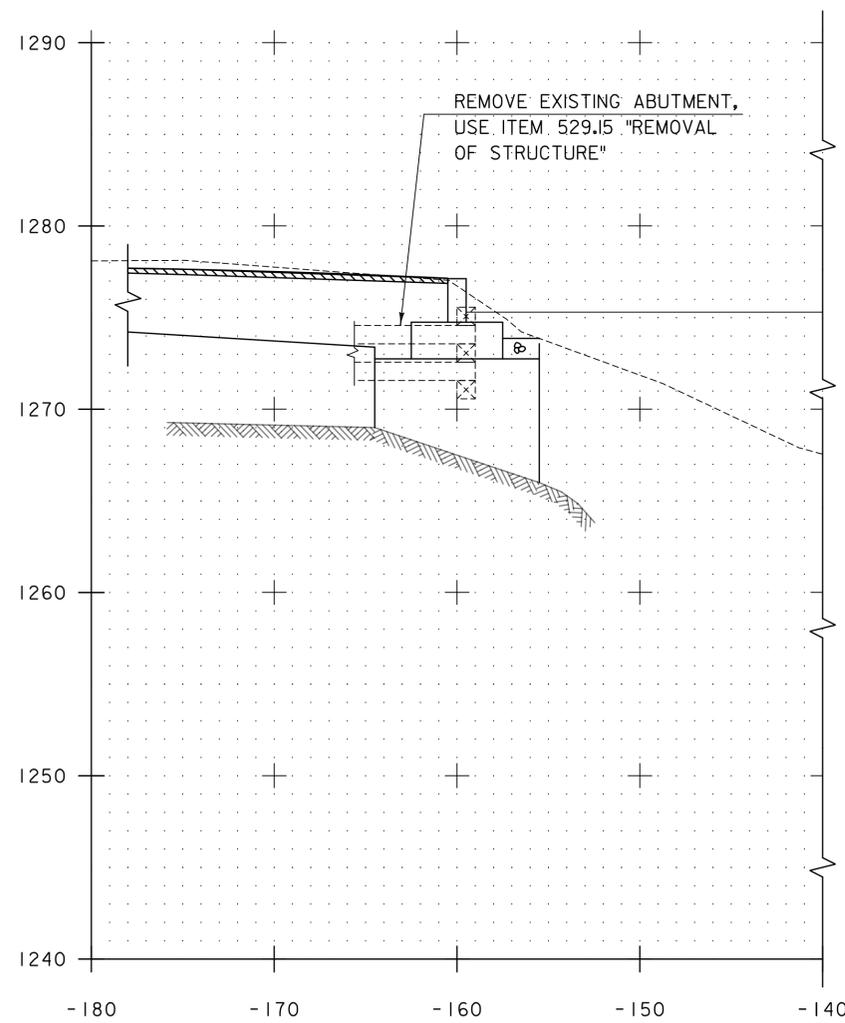
TYLIN INTERNATIONAL

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)

FILE NAME: z12e134bdr\_xs-Lake.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: J. OLUND  
LAKE CROSS SECTIONS I

PLOT DATE: 12/3/2013  
DRAWN BY: T. KELLEY  
CHECKED BY: J. OLUND  
SHEET 61 OF 70

STA 70+50 TO 70+60



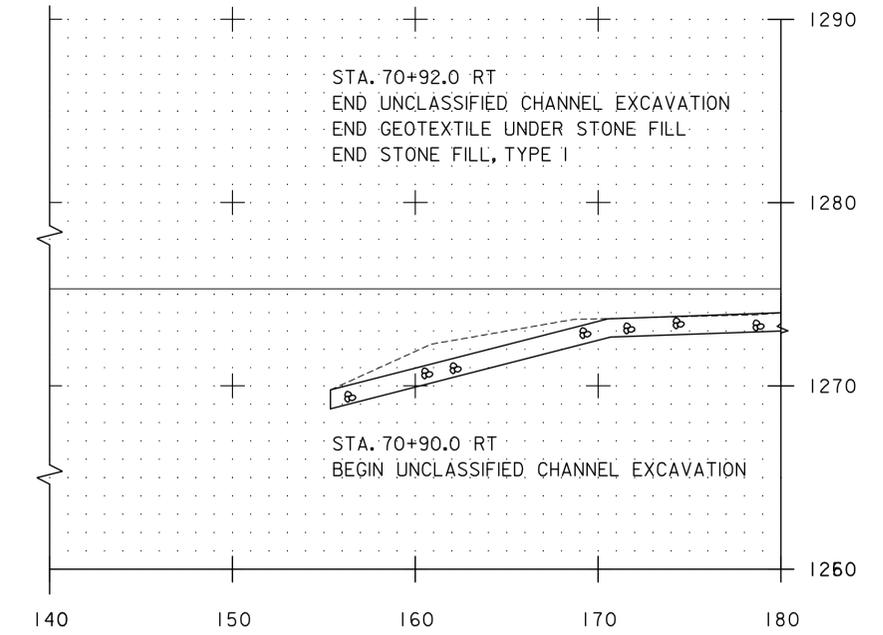
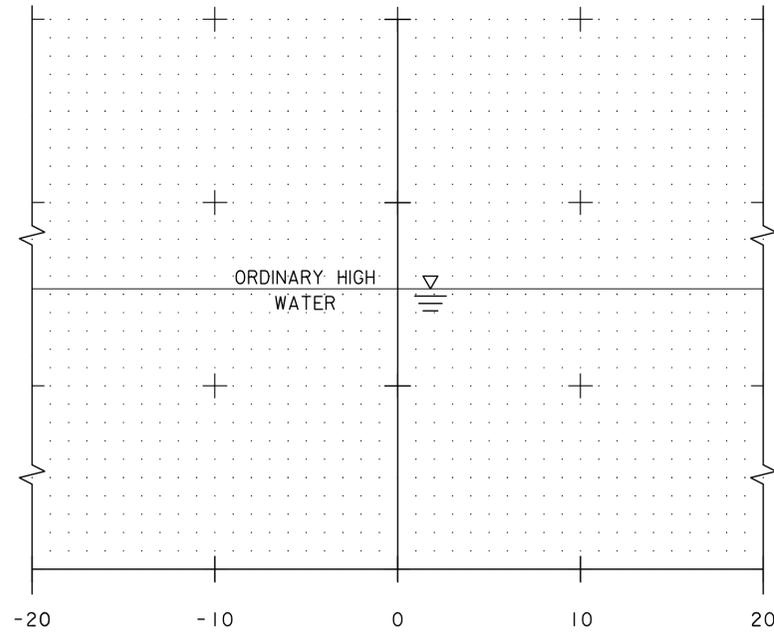
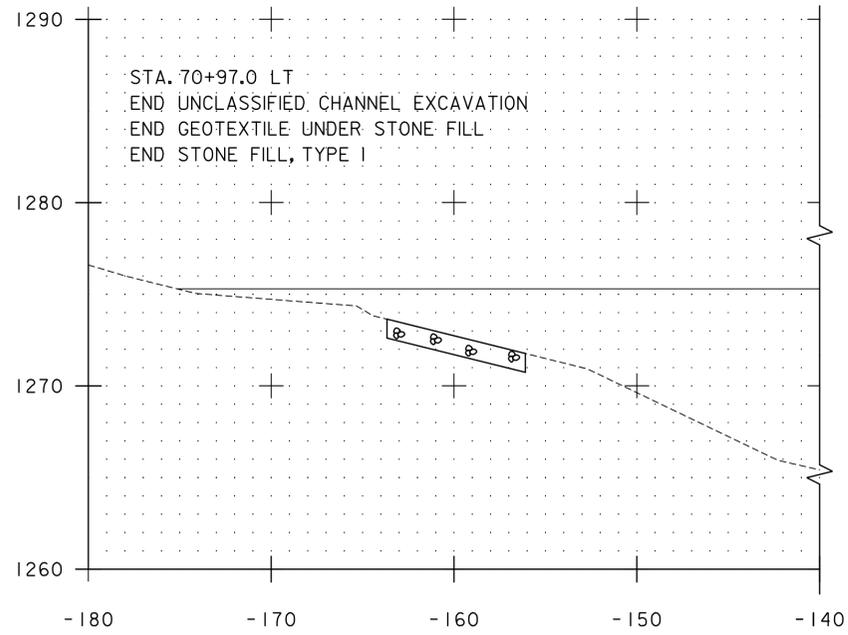
STA 70+70

70+70

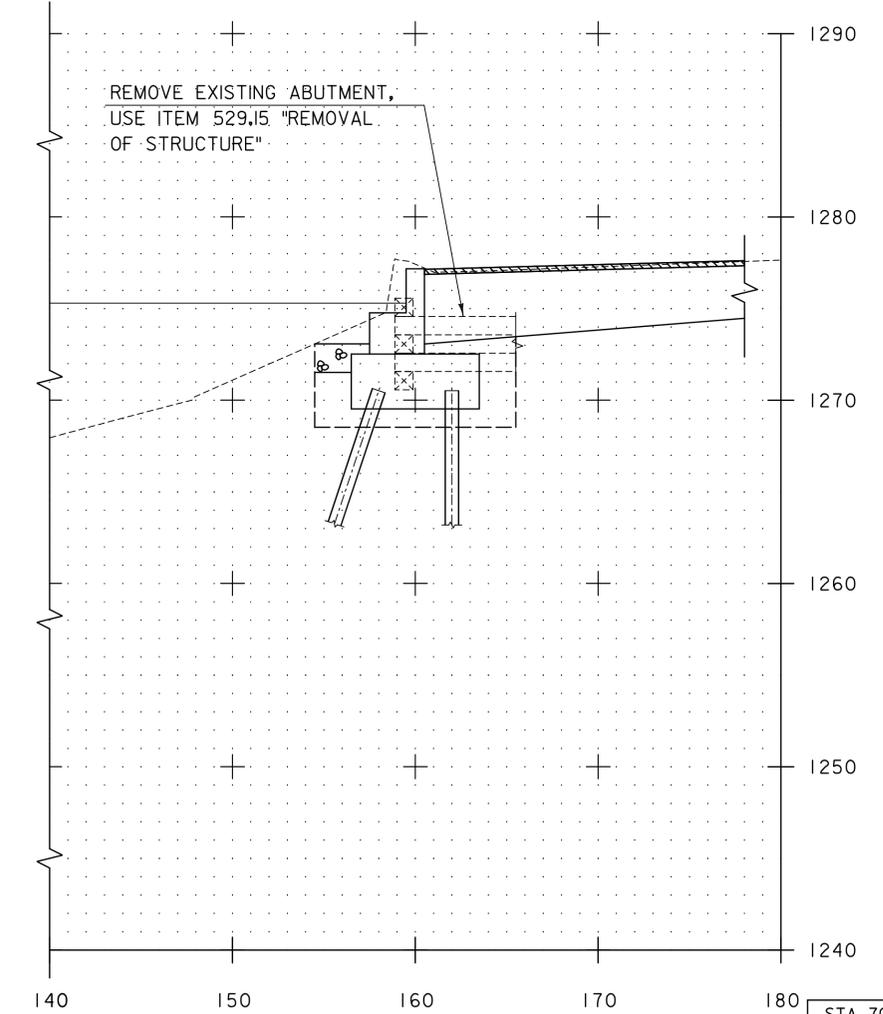
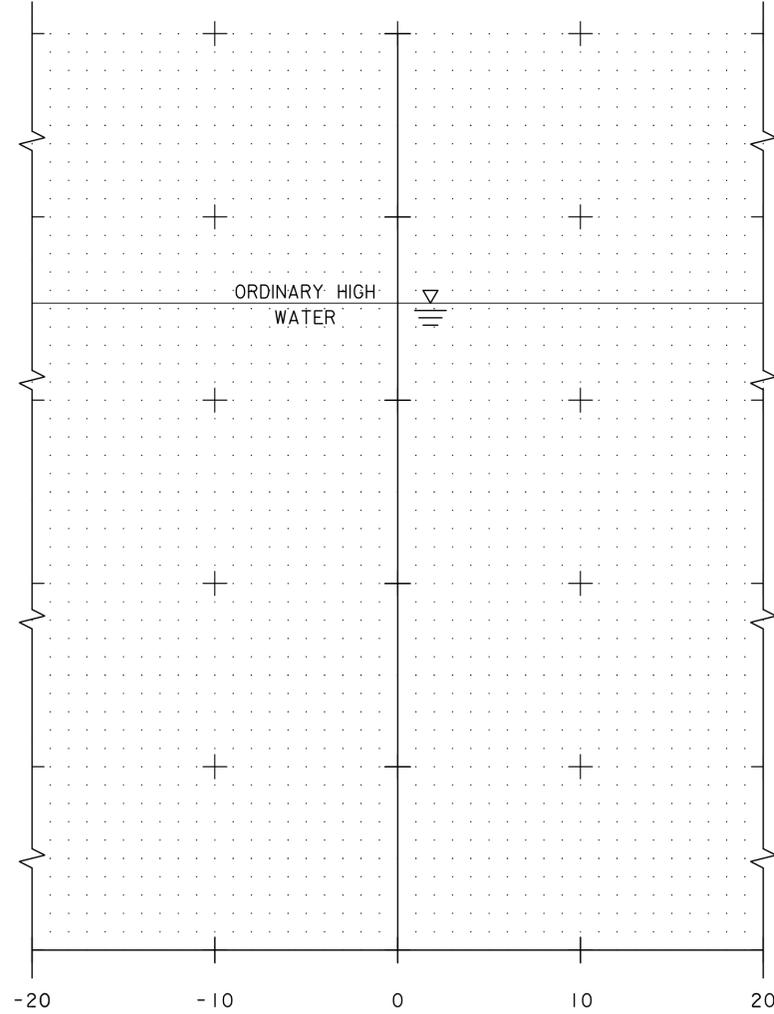
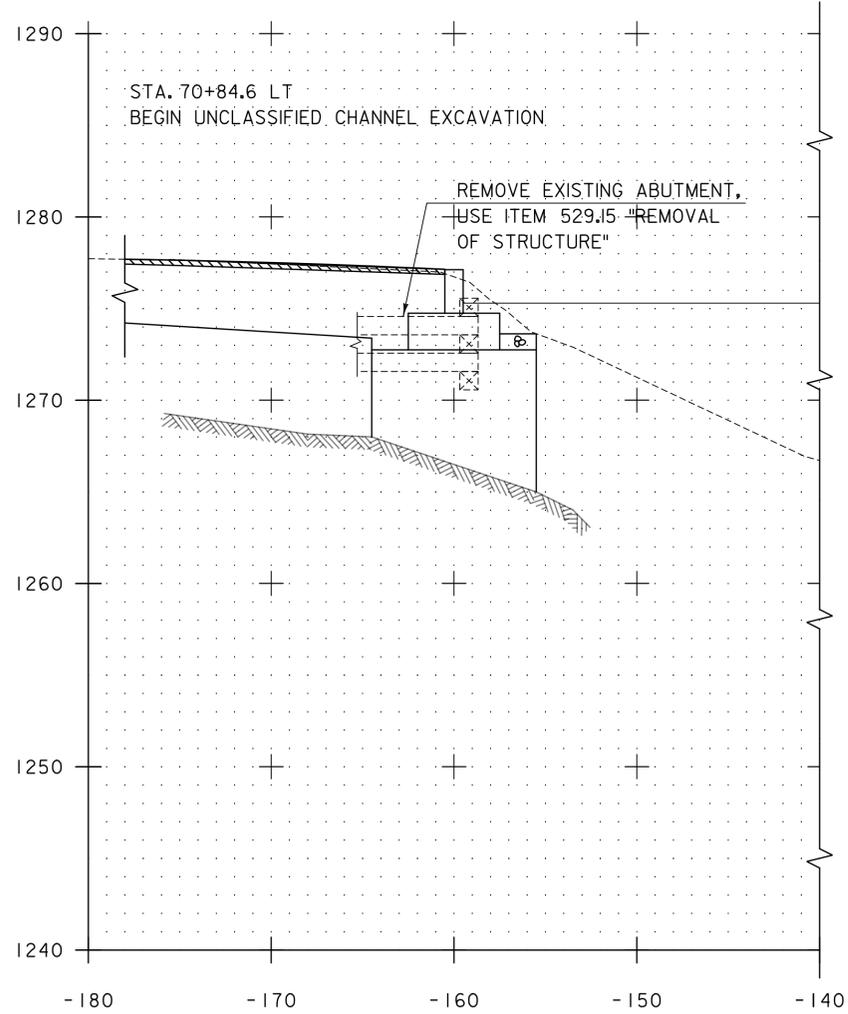
SCALE 1" = 5'-0"  
 5 0 5

**TYL**INTERNATIONAL

PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: T. KELLEY
FILE NAME: z12e134bdr_xs-Lake.dgn	CHECKED BY: J. OLUND
PROJECT LEADER: J. OLUND	SHEET 62 OF 70
DESIGNED BY: J. OLUND	
LAKE CROSS SECTIONS 2	



70+90



70+80

STA 70+80 TO 70+90

SCALE 1" = 5'-0"  
 5 0 5

TYLIN INTERNATIONAL

PROJECT NAME: BROOKFIELD  
 PROJECT NUMBER: BRF FLBR(2)

FILE NAME: z12e134bdr\_xs-Lake.dgn  
 PROJECT LEADER: J. OLUND  
 DESIGNED BY: J. OLUND  
 LAKE CROSS SECTIONS 3

PLOT DATE: 12/3/2013  
 DRAWN BY: T. KELLEY  
 CHECKED BY: J. OLUND  
 SHEET 63 OF 70



# **EROSION CONTROL NARRATIVE**

## **1.1 PROJECT DESCRIPTION**

THIS PROJECT INVOLVES THE REPLACEMENT OF BRIDGE #2 ON VT RTE 65 SPANNING 321 FEET OVER THE BODY OF WATER KNOWN AS SUNSET LAKE IN THE TOWN OF BROOKFIELD. THE PROJECT BEGINS AT A POINT APPROXIMATELY 0.13 MILES WEST OF THE VT RTE 65 /STONE ROAD INTERSECTION AND EXTENDS SOUTHEASTERLY FOR 0.08 MILES ALONG VT RTE 65 . WORK WILL INVOLVE COMPLETE REPLACEMENT OF BRIDGE #2 ALONG WITH RELATED ROADWAY AND REMOVAL OF THE EXISTING FLOATING BRIDGE SUPERSTRUCTURE, ABUTMENTS, AND INCIDENTAL ITEMS.

NOTE: AREA OF DISTURBANCE INCLUDES LIMITS OF EARTH DISTURBANCE WITHIN THE PROJECT AREA AS SHOWN ON THE ATTACHED EPSC PLAN. THE AREA OF DISTURBANCE DOES NOT INCLUDE WASTE, BORROW AND STAGING AREAS. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING THE LOCATION OF THE WASTE, BORROW AND STAGING AREAS, AS WELL AS THE MATERIAL STOCKPILE, REFUELING AND MAINTENANCE AREAS. A MAP SHALL BE ATTACHED IF NECESSARY.

TOTAL AREA OF DISTURBANCE IS APPROXIMATELY 9,209 SQUARE FEET (0.21 ACRES).

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

## **1.2 SITE INVENTORY**

### **1.2.1 TOPOGRAPHY, EXISTING ROADS, UTILITIES**

THE TOPOGRAPHY SURROUNDING THE PROJECT SITE CONSISTS PREDOMINATELY OF ROLLING HILLS SLOPING TOWARD THE LAKE. VT RTE 65 RUNS EAST TO WEST GENERALLY FOLLOWING THE VALLEY BETWEEN ADJACENT HILLS. THE GENERAL TOPOGRAPHY WITHIN THE PROJECT SITE SLOPES TOWARD THE LAKE ON BOTH SIDES OF THE BRIDGE.

THERE IS ONE BUSINESS (BED AND BREAKFAST) NEAR THE SOUTHEAST CORNER OF THE PROJECT AND A RESIDENTIAL PROPERTY ON THE NORTHWEST CORNER OF THE PROJECT. THERE ARE OTHER RESIDENTIAL PROPERTIES IN CLOSE PROXIMITY TO PROJECT IN THE SOUTHEAST QUADRANT.

THERE IS AN INTERSECTION TO THE EAST OF THE PROJECT. ALL ROAD SURFACES IN THE PROJECT AREA ARE GRAVEL OR BITUMINOUS CONCRETE PAVEMENT. THERE IS ONE DRIVE WITHIN THE PROJECT AREA WHICH IS IMPACTED BY THE PROJECT. THIS DRIVE IS GRAVEL.

WITHIN THE PROJECT AREA THERE IS A DRY HYDRANT AS WELL AS AERIAL ELECTRICAL LINES. THE HYDRANT IS ON THE SOUTHEAST CORNER OF THE PROJECT AND IS FED FROM THE LAKE VIA AN EXISTING PIPE EXTENDING FROM THE EDGE OF THE LAKE TO THE HYDRANT. THE ELECTRIC LINES CROSS OVER SUNSET LAKE ON THE NORTH SIDE OF THE EXISTING BRIDGE. THEY PARALLEL THE ROAD WITHIN THE PROJECT LIMITS.

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

THE BRIDGE SPANS THE BODY OF WATER KNOWN AS SUNSET LAKE. IN GENERAL A FLOATING FIBER REINFORCED POLYMER STRUCTURE IS PROPOSED FOR THE LAKE CROSSING WITHIN THE PROJECT SITE. THE LAKE WATER SURFACE IS CONTROLLED BY A WEIR STRUCTURE IMMEDIATELY ADJACENT TO THE BRIDGE CROSSING. THE TRIBUTARY AREA TO THE WEIR IS 4.0 SQUARE MILES. THE TERRAIN AT THE TWO LAKE EDGES AND ADJACENT TO THE PROJECT IS GENTLE TO MODERATELY SLOPED WITH GRASS BANKS ON THE WEST BANK AND DEVELOPED PROPERTY ON THE EAST BANK. THE LAKE BED CONSISTS OF SILTS AND FINE SEDIMENTS. CONSTRUCTION OF THE NEW BRIDGE WILL REQUIRE SOME TEMPORARY AND PERMANENT IMPACTS TO THE LAKE BANKS AND BOTTOM. THE WEIR STRUCTURE AND THE DOWNSTREAM REACH WILL NOT BE IMPACTED BY THE BRIDGE CONSTRUCTION.

THE FOLLOWING DESCRIPTIONS ARE FOR THE EXISTING SITE PLANS: SURFACE DRAINAGE FROM VT RTE 65 FLOWS DOWN VEGETATED SIDESLOPES TOWARDS SUNSET LAKE.

### **1.2.3 VEGETATION**

THE VEGETATION IN THE PROJECT AREA IS A MIX OF GRASS, BRUSH AND TREES. THE GRASSED AREAS BEING PREDOMINANTLY IN THE VICINITY OF THE RESIDENTIAL PROPERTIES, THERE ARE SOME AREAS OF TREES. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS REQUIRED FOR REMOVAL AND REPLACEMENT OF THE EXISTING BRIDGE AND THE PLACEMENT OF THE STONE FILL. THE VEGETATION IN THESE AREAS IS MOSTLY BRUSH. DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES.

### **1.2.4 SOILS**

SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE FOR THE COUNTY OF ORANGE, VERMONT. SOILS ON THE PROJECT SITE ARE:

BUCKLAND.

SEE EPSC EXISTING CONDITIONS LAYOUT SHEETS FOR SOIL LOCATIONS AND ADDITIONAL INFORMATION.

### **1.2.4 SENSITIVE RESOURCE AREAS**

CRITICAL HABITATS: NO  
HISTORICAL OR ARCHAEOLOGICAL AREAS: NO  
PRIME AGRICULTURE LAND: NO  
THREATENED AND ENDANGERED SPECIES: NO  
WATER RESOURCE: SUNSET LAKE  
WETLANDS: YES  
TOTAL IMPACTED AREA 175 SF.

### **1.3 RISK EVALUATION**

THE 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 THE LIFE OF THE PROJECT TO AVOID 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 BASED UPON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING.

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

#### **1.4.1 MARK SITE BOUNDARIES**

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

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

#### **1.4.2 LIMIT DISTURBANCE AREA**

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

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

#### **1.4.3 SITE ENTRANCE/EXIT STABILIZATION**

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTOR'S PROGRESS SCHEDULE. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

THE USE OF STABILIZED CONSTRUCTION ENTRANCES IS NOT ANTICIPATED.

#### **1.4.4 INSTALL SEDIMENT BARRIERS**

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

SILT FENCE WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND DETAIL SHEETS.

FILTER CURTAIN WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND DETAIL SHEETS.

#### **1.4.5 DIVERT UPLAND RUNOFF**

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

DIVERSION OF UPLAND RUNOFF IS NOT ANTICIPATED.

#### **1.4.6 SLOW DOWN CHANNELIZED RUNOFF**

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

THE USE OF CHECK STRUCTURES IS NOT ANTICIPATED FOR THIS PROJECT.

#### **1.4.7 CONSTRUCT PERMANENT CONTROLS**

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED FOR THIS PROJECT.

SEED AND MULCH WILL BE USED AS PERMANENT CONTROLS TO STABILIZE EXPOSED SOIL. STONE FILL WILL BE USED TO STABILIZE THE SHORELINE AROUND THE ABUTMENTS.

#### **1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION**

ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY STABILIZATION IN PLACE WITHIN 48 HOURS OF DISTURBANCE. THE FORECAST OF RAINFALL EVENTS SHALL TRIGGER IMMEDIATE PROTECTION OF EXPOSED SOILS.

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 3:1.

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

THE USE OF EROSION CONTROL MATTING IS NOT ANTICIPATED.

THE USE OF SURFACE ROUGHENING IS NOT ANTICIPATED.

#### **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.

SHOULD EARTH DISTURBANCE BE PERFORMED OUTSIDE THE CONSTRUCTION SEASON, A WINTER EROSION AND SEDIMENT CONTROL PLAN DESCRIBING ALTERNATIVE STABILIZATION METHODS SHALL BE SUBMITTED TO THE RESIDENT ENGINEER PRIOR TO AUGUST 15<sup>TH</sup> FOR APPROVAL.

#### **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.

THE USE OF EROSION CONTROL MATTING IS NOT ANTICIPATED.

#### **1.4.11 DE-WATERING ACTIVITIES**

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

TREATMENT OF DEWATERING COFFERDAM IS ANTICIPATED. A LOCATION FOR THE TREATMENT HAS BEEN PROPOSED AND IS SHOWN ON THE PLANS. THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. PAYMENT FOR TREATMENT OF DISCHARGE WILL BE MADE UNDER CONTRACT ITEM 653.45.

#### **1.4.12 INSPECT YOUR SITE**

INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS.

## **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**

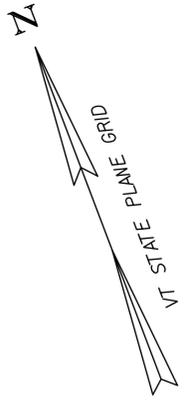
#### **1.5.2 OFF-SITE ACTIVITIES**

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. WASTE, BORROW AND STAGING SITES MUST BE APPROVED BY VTRANS ENVIRONMENTAL SECTION.

<b>TYLIN</b> INTERNATIONAL	PROJECT NAME: BROOKFIELD	
	PROJECT NUMBER: BRF FLBR(2)	
	FILE NAME: z12e134bdr_ero.n.dgn	PLOT DATE: 12/3/2013
	PROJECT LEADER: J. OLUND	DRAWN BY: D. BURHANS
	DESIGNED BY: D. BURHANS	CHECKED BY: D. BRYANT
	EPSC NARRATIVE	SHEET 65 OF 70

SOIL CLASSIFICATION  
 BUCKLAND  
 VERY STONY LOAM  
 8 TO 25% SLOPES  
 "K FACTOR" 0.28  
 MEDIUM ERODIBILITY

SOIL CLASSIFICATION  
 BUCKLAND  
 STONY LOAM  
 8 TO 15% SLOPES  
 "K FACTOR" 0.32  
 MEDIUM ERODIBILITY



STA. 10+03.06  
 BEGIN APPROACH  
 MATCH EXISTING  
 PAVEMENT

STA. 10+55.94  
 END APPROACH  
 BEGIN PROJECT

STA. 14+92.50  
 END PROJECT  
 MATCH EXISTING  
 GRADE

VT RTE 65  
 TO EAST ROXBURY

VT RTE 65  
 TO BROOKFIELD

BRUSH/  
 TREES

GRAVEL/  
 GRASS

EXISTING R.O.W.

PROPOSED VT RTE 65

EPSC EXISTING CONDITIONS

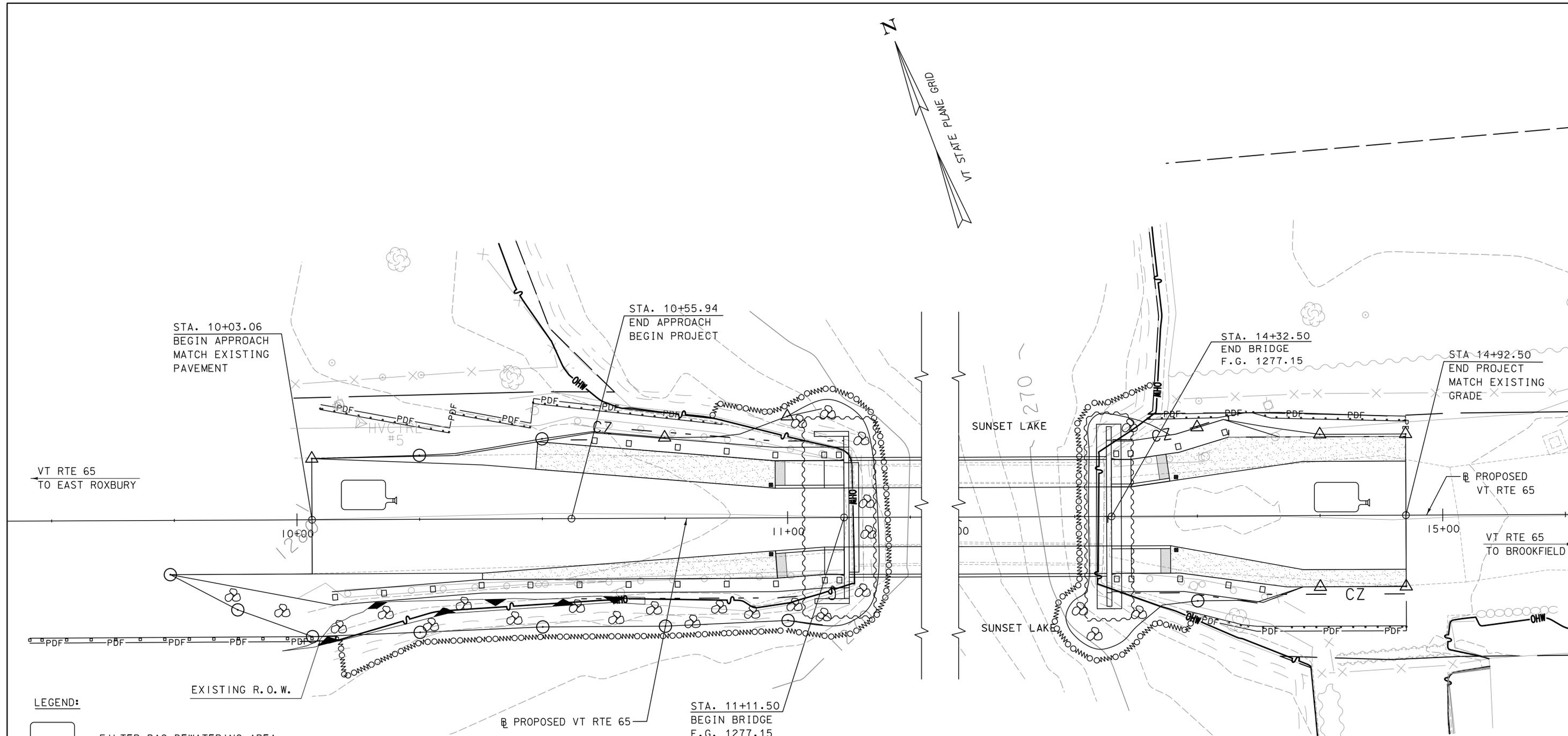
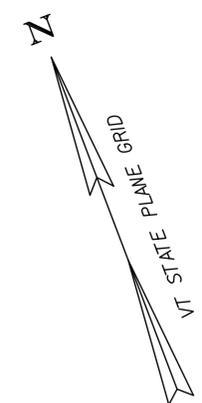
LEGEND:

- SOIL CLASSIFICATION BOUNDARY
- OHW — ORDINARY HIGH WATER LINE

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



PROJECT NAME: BROOKFIELD	
PROJECT NUMBER: BRF FLBR(2)	
FILE NAME: z12e134bdr_ero.E.dgn	PLOT DATE: 12/3/2013
PROJECT LEADER: J. OLUND	DRAWN BY: T. KELLEY
DESIGNED BY: T. KELLEY	CHECKED BY: D. BRYANT
EPSC EXISTING CONDITION LAYOUT	SHEET 66 OF 70



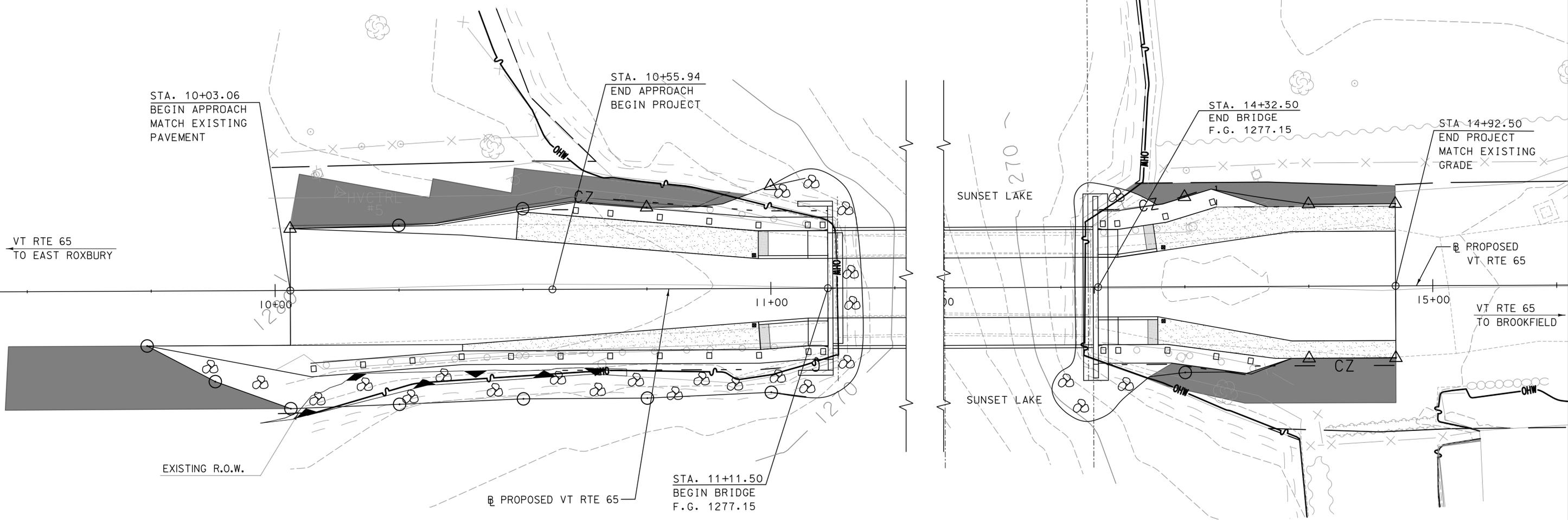
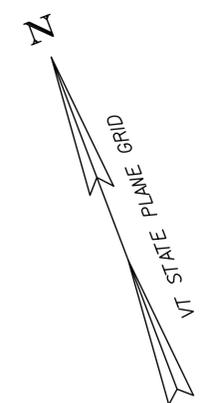
- LEGEND:**
- FILTER BAG DEWATERING AREA
  - FILTER CURTAIN
  - PROJECT DEMARCATION FENCE
  - SILT FENCE
  - COFFERDAM
  - STONE FILL, TYPE I
  - ORDINARY HIGH WATER LINE

**EPSC CONSTRUCTION CONDITIONS**

- NOTES:**
1. ORDINARY HIGH WATER ELEVATION = 1275.3.
  2. CONTOURS REFLECT EXISTING CONDITIONS. FINAL CONTOURS WILL BE SIMILAR. SEE CROSS SECTION SHEETS FOR FINAL GRADES.

SCALE 1" = 10'-0"

<b>TYLIN</b> INTERNATIONAL	PROJECT NAME: BROOKFIELD	PLOT DATE: 12/3/2013
	PROJECT NUMBER: BRF FLBR(2)	DRAWN BY: T. KELLEY
	FILE NAME: z12e134bdr_ero_C.dgn	CHECKED BY: D. BRYANT
	PROJECT LEADER: J. OLUND	SHEET 67 OF 70
	DESIGNED BY: T. KELLEY	
	EPSC CONSTRUCTION CONDITION LAYOUT	



**LEGEND:**

- DISTURBED AREAS REQUIRING RE-VEGETATION
- STONE FILL, TYPE I
- ORDINARY HIGH WATER LINE

**EPSC FINAL CONDITIONS**

**NOTES:**

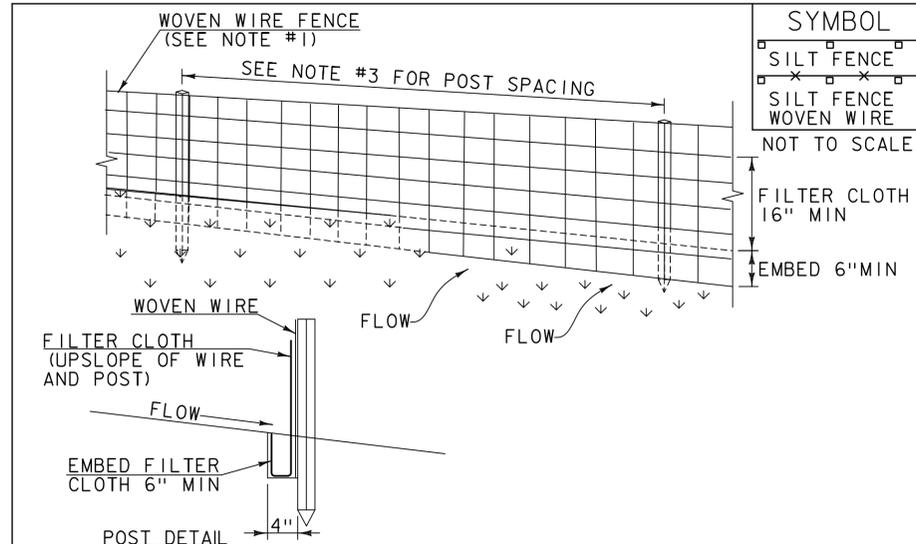
1. ORDINARY HIGH WATER ELEVATION = 1275.3.
2. CONTOURS REFLECT EXISTING CONDITIONS. FINAL CONTOURS WILL BE SIMILAR. SEE CROSS SECTION SHEETS FOR FINAL GRADES.

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

<b>TYLIN</b> INTERNATIONAL	PROJECT NAME: BROOKFIELD	
	PROJECT NUMBER: BRF FLBR(2)	
FILE NAME: z12e134bdr_ero.F.dgn	PLOT DATE: 12/3/2013	
PROJECT LEADER: J. OLUND	DRAWN BY: T. KELLEY	
DESIGNED BY: T. KELLEY	CHECKED BY: D. BRYANT	
EPSC FINAL CONDITION LAYOUT	SHEET 68 OF 70	

**LEGEND:**

-  FILTER BAG
-  FILTER CURTAIN
-  PROJECT DEMARCATION FENCE
-  SILT FENCE
-  DISTURBED AREAS REQUIRING RE-VEGETATION
-  COFFERDAM
-  STONE FILL, TYPE I
-  ORDINARY HIGH WATER LINE



**CONSTRUCTION SPECIFICATIONS**

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

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

**SILT FENCE**

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

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 AND AS SHOWN IN THE PLANS FOR GEOTEXTILE FOR SILT FENCE (PAY ITEM 649.5) OR GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED (PAY ITEM 649.515).

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

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

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

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

**CONSTRUCTION GUIDANCE**

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

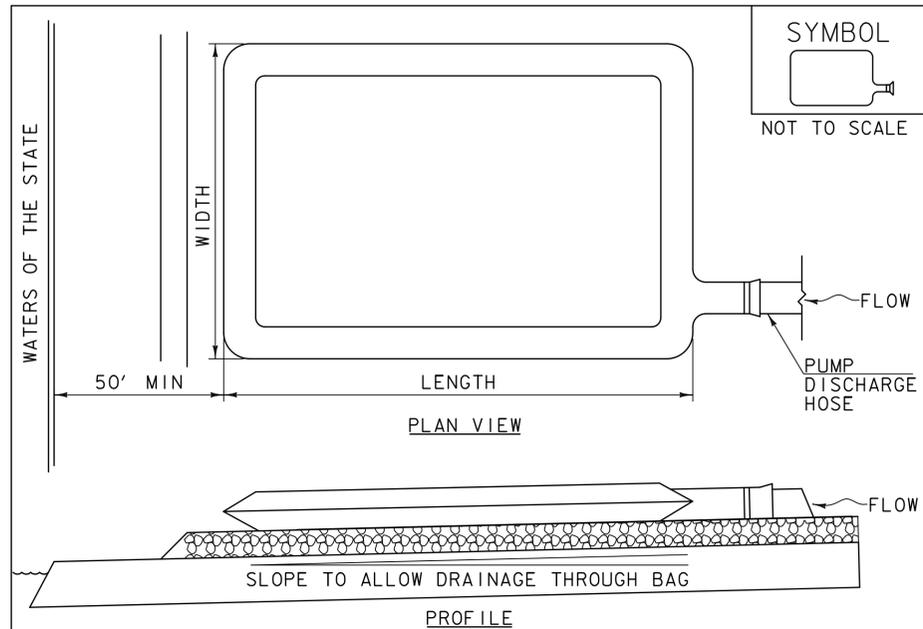
ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

**TURF ESTABLISHMENT**

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

**TYLIN** INTERNATIONAL

PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRFLBR(2)  
FILE NAME: z12e134bdr\_epsc\_details.dgn PLOT DATE: 12/3/2013  
PROJECT LEADER: J. OLUND DRAWN BY: T. KELLEY  
DESIGNED BY: T. KELLEY CHECKED BY: D. BRYANT  
EPSC DETAILS I SHEET 69 OF 70



**CONSTRUCTION SPECIFICATIONS**

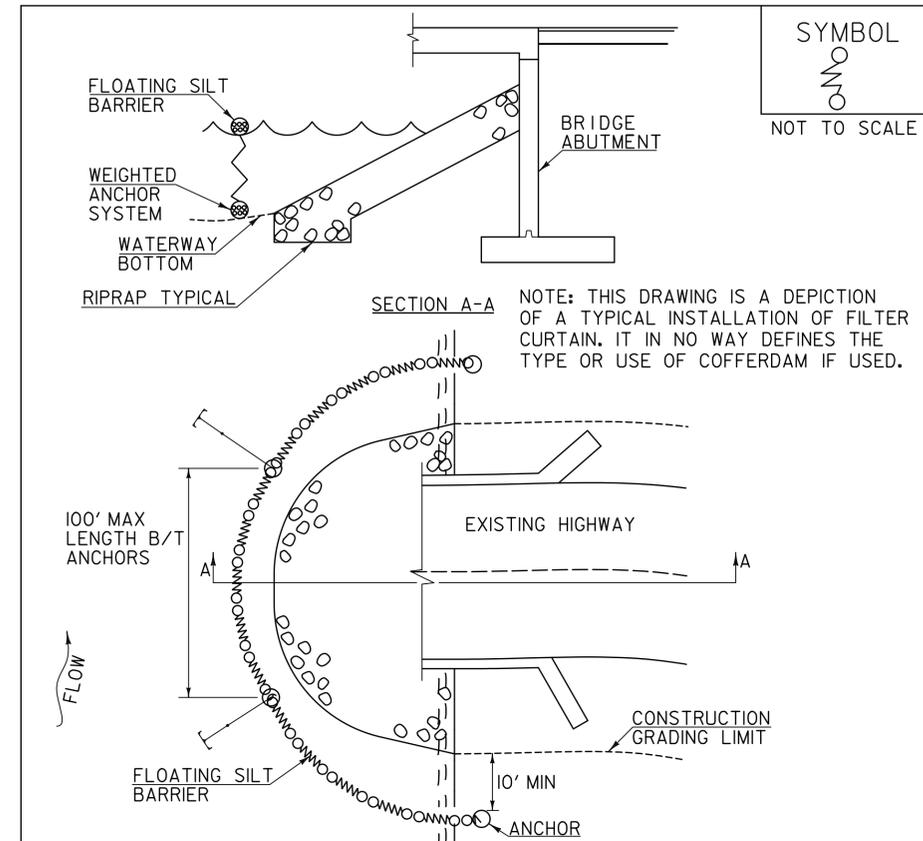
1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION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

FILTER BAG

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

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR FILTER BAG (PAY ITEM 653.45) AND AS SPECIFIED IN THE CONTRACT.

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



**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

TYLIN INTERNATIONAL

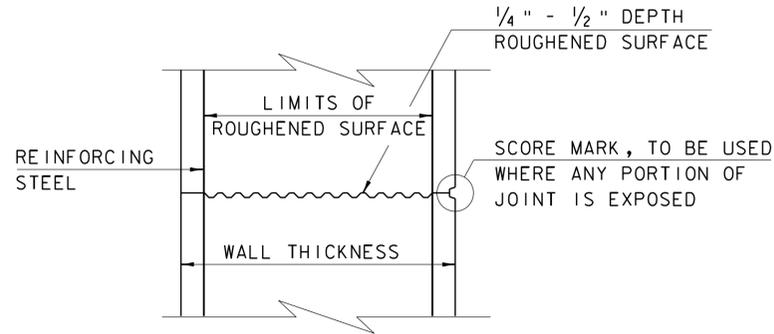
PROJECT NAME: BROOKFIELD  
PROJECT NUMBER: BRF FLBR(2)

FILE NAME: z12e134bdr\_epsc\_dets2.dgn  
PROJECT LEADER: J. OLUND  
DESIGNED BY: T. KELLEY  
EPSC DETAILS 2

PLOT DATE: 12/3/2013  
DRAWN BY: T. KELLEY  
CHECKED BY: D. BRYANT  
SHEET 70 OF 70

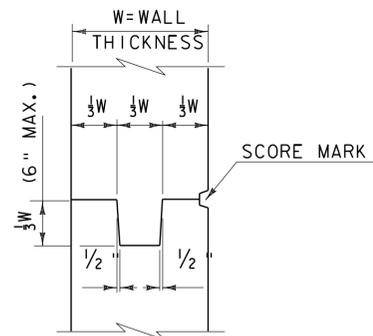
**CONCRETE GENERAL NOTES**

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

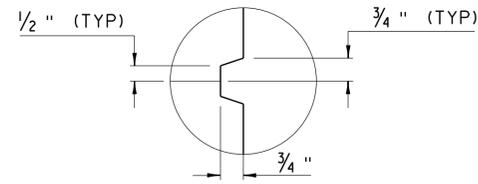


**TYPICAL HORIZONTAL CONSTRUCTION JOINT**  
(NOT TO SCALE)

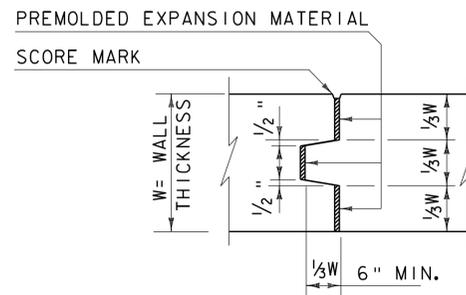
- THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
- IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



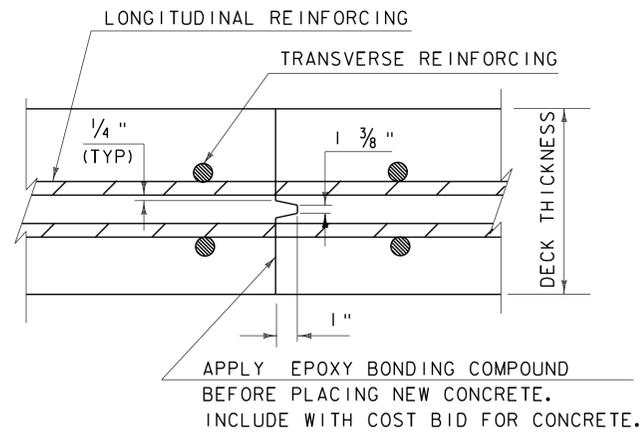
**TYPICAL CONCRETE CONSTRUCTION JOINT**  
(NOT TO SCALE)



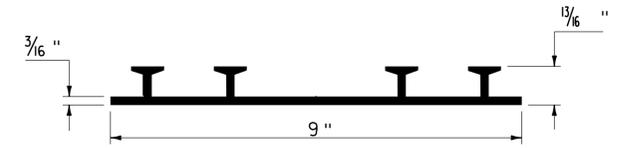
**SCORE MARK DETAIL**  
(NOT TO SCALE)



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



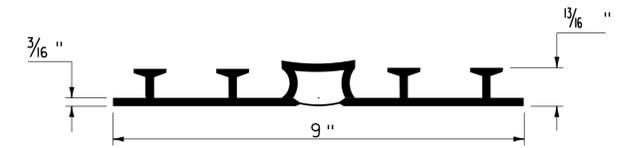
**TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS**  
(NOT TO SCALE)



**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.

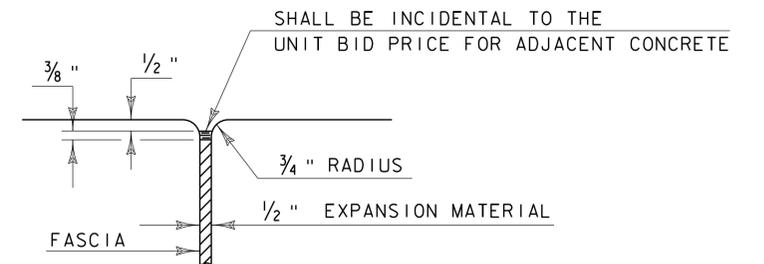
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



**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.

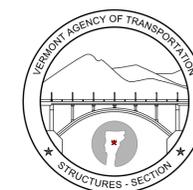
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



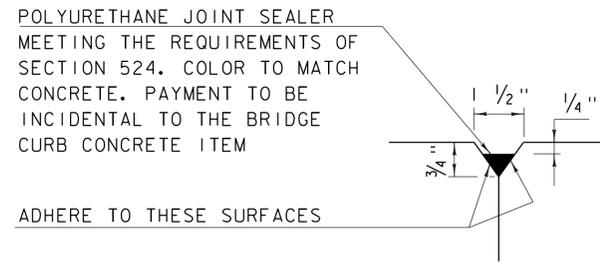
**JOINT BETWEEN FASCIA AND WINGWALL**  
(NOT TO SCALE)

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

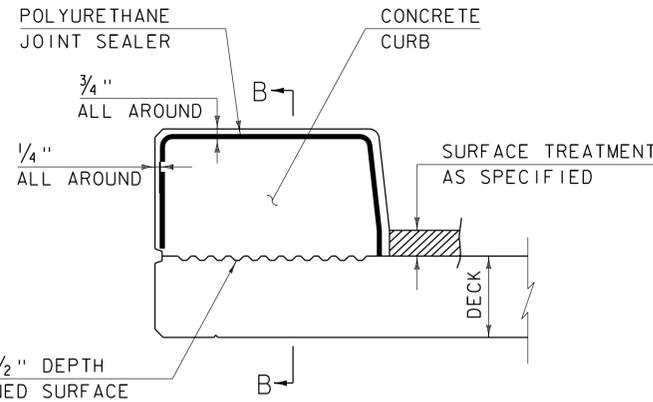
**CONCRETE DETAILS AND NOTES**



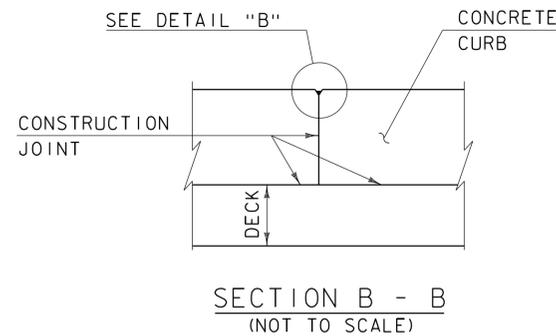
**STRUCTURES  
DETAIL  
SD-5 01.00**



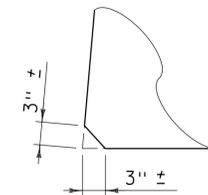
DETAIL "B"  
(NOT TO SCALE)



CONCRETE CURB JOINT SECTION  
(NOT TO SCALE)



SECTION B - B  
(NOT TO SCALE)

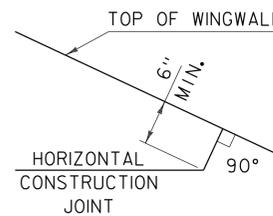


ACUTE ANGLE  
CLIP DETAIL  
(NOT TO SCALE)

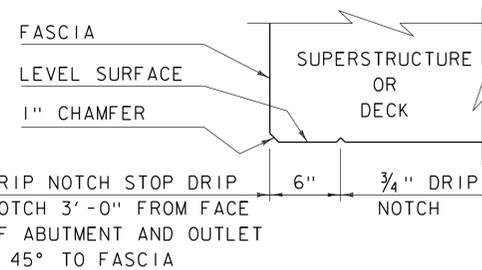
1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION

CONCRETE CURB JOINT NOTES

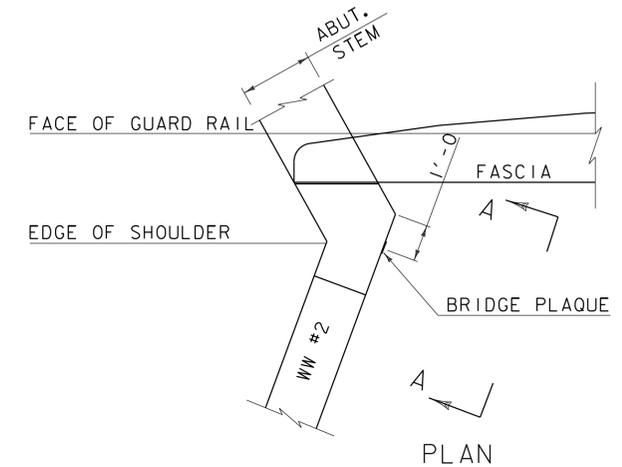
1. CONCRETE CURBS MAY BE PLACED IN ONE CONTINUOUS OPERATION IF AN APPROVED SHRINKAGE REDUCING ADMIXTURE LISTED IN THE SPECIAL PROVISIONS IS USED WITH THE CONCRETE MIX DESIGN. PAYMENT FOR THE SHRINKAGE REDUCING ADMIXTURE WILL BE INCIDENTAL TO THE BRIDGE CURB CONCRETE ITEM.
2. IF THE CONTRACTOR CHOOSES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



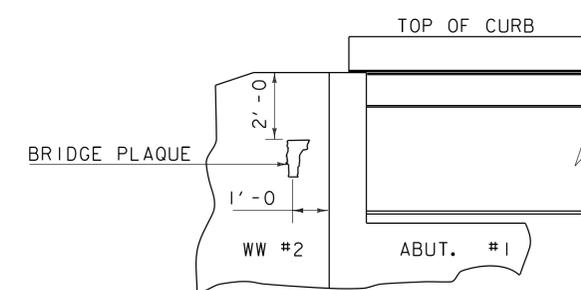
HORIZONTAL WINGWALL  
CONSTRUCTION JOINT  
(NOT TO SCALE)



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

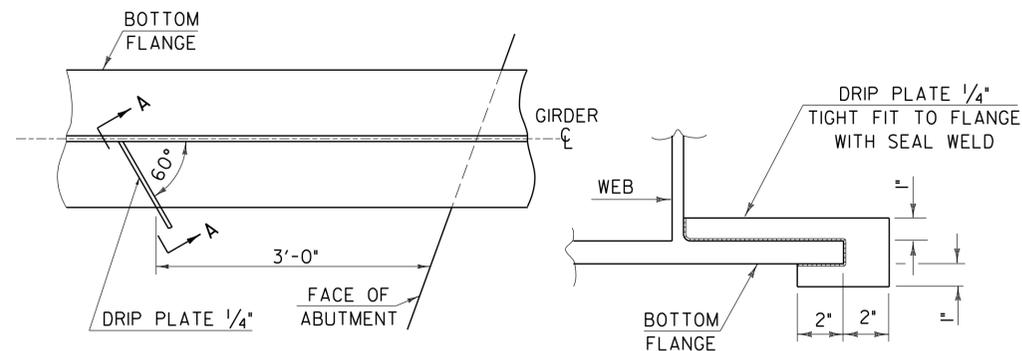
CONCRETE  
DETAILS AND NOTES



STRUCTURES  
DETAIL  
SD-502.00

STRUCTURAL STEEL GENERAL NOTES:

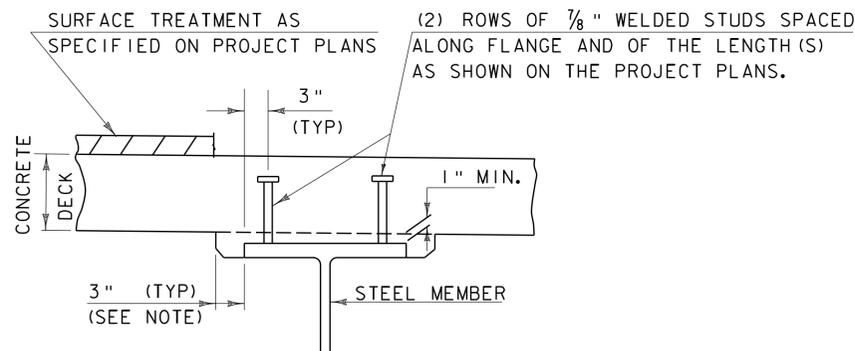
1. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER HIGH-STRENGTH BOLTS IN 15/16" DIAMETER HOLES, PER SUBSECTION 506.I9, UNLESS OTHERWISE SPECIFIED.
2. ALL HOLES IN THE WEBS OF THE FASCIA GIRDERS THAT ARE NOT OTHERWISE FILLED, SHALL BE FILLED WITH EITHER BUTTON HEAD OR HEX HEAD BOLTS. THESE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.I9.
3. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF SUBSECTION 506.I0.
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

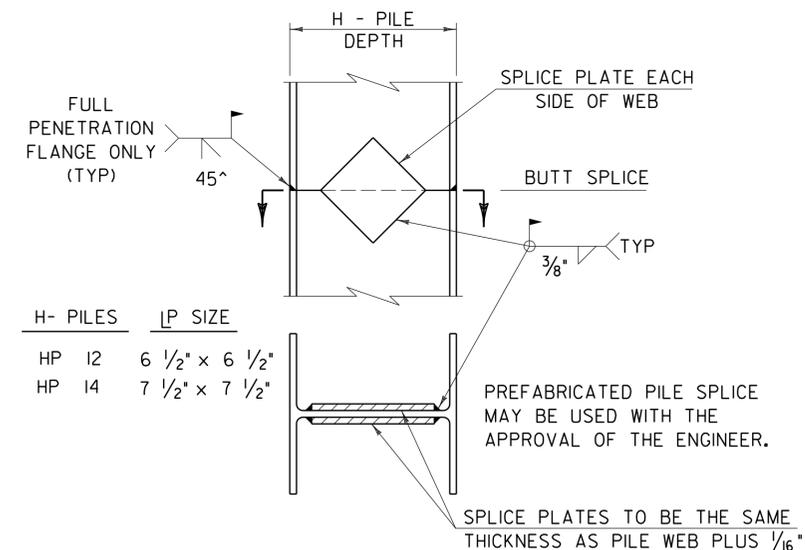
SECTION A - A

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

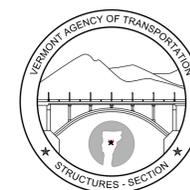


DETAIL OF PILE SPLICE

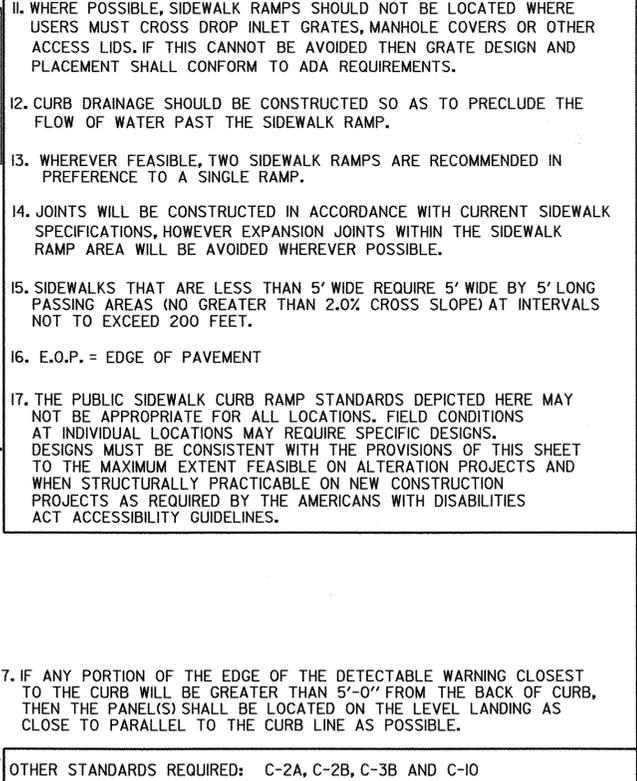
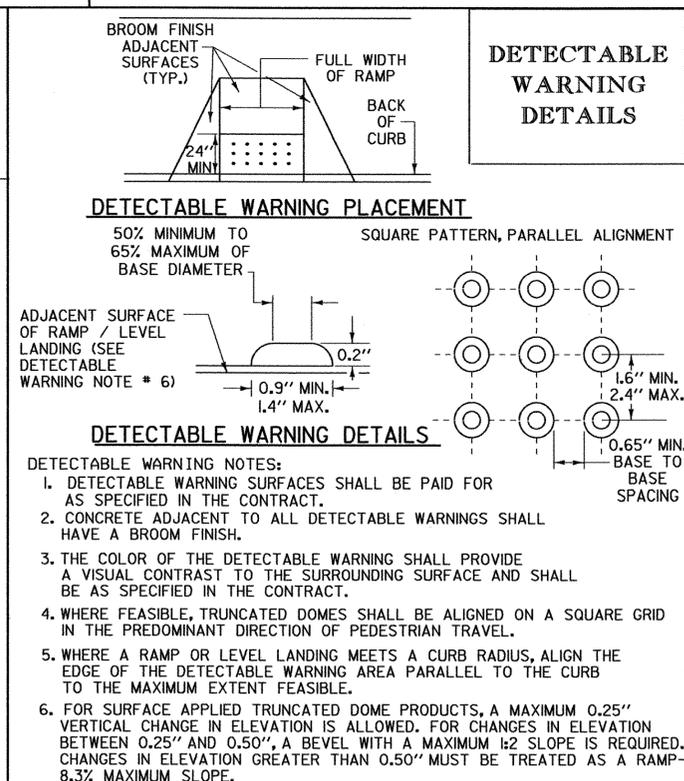
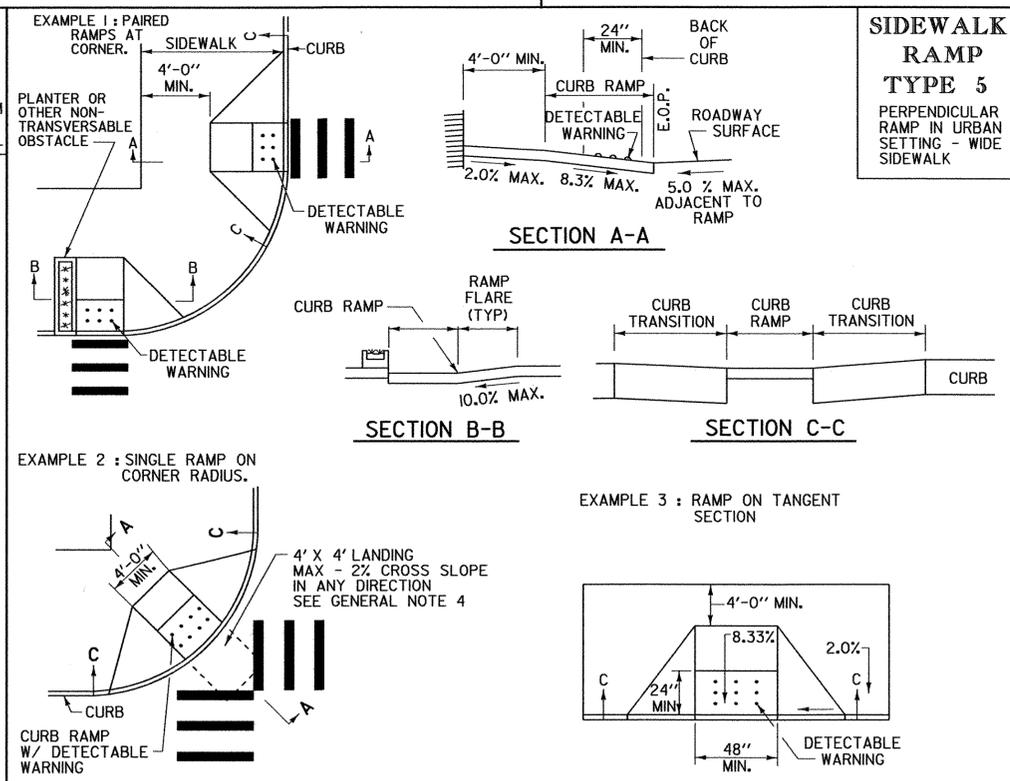
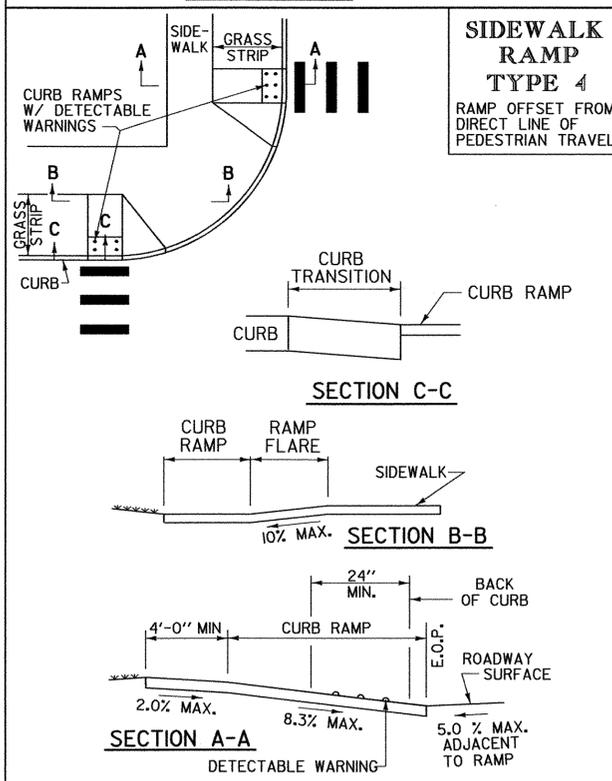
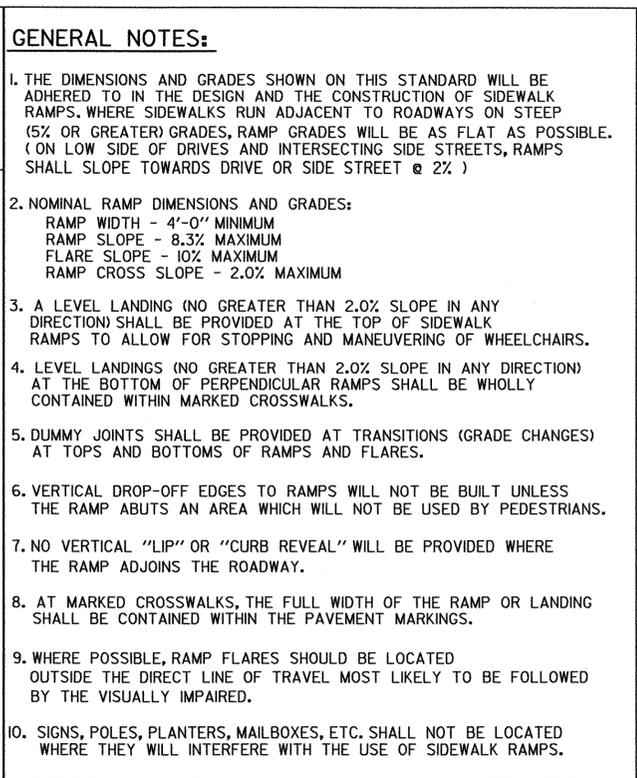
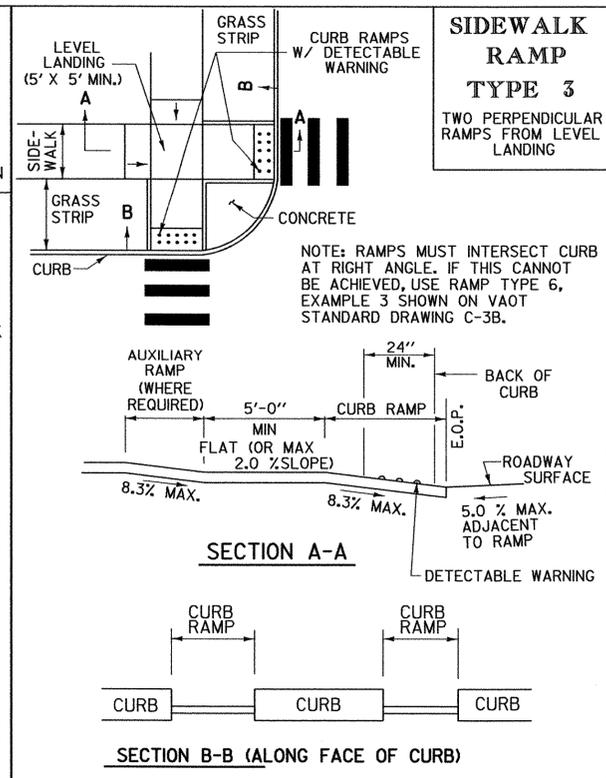
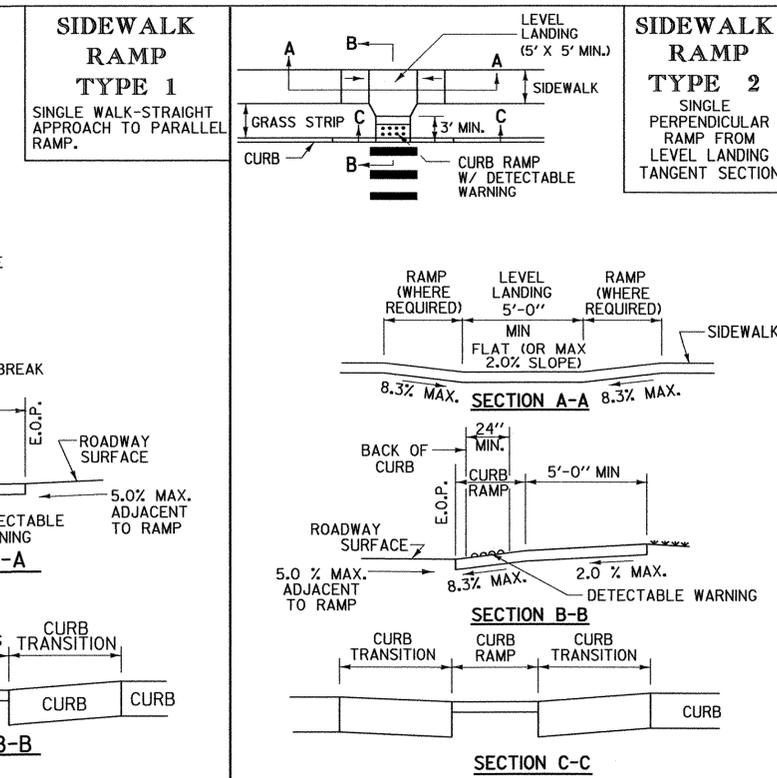
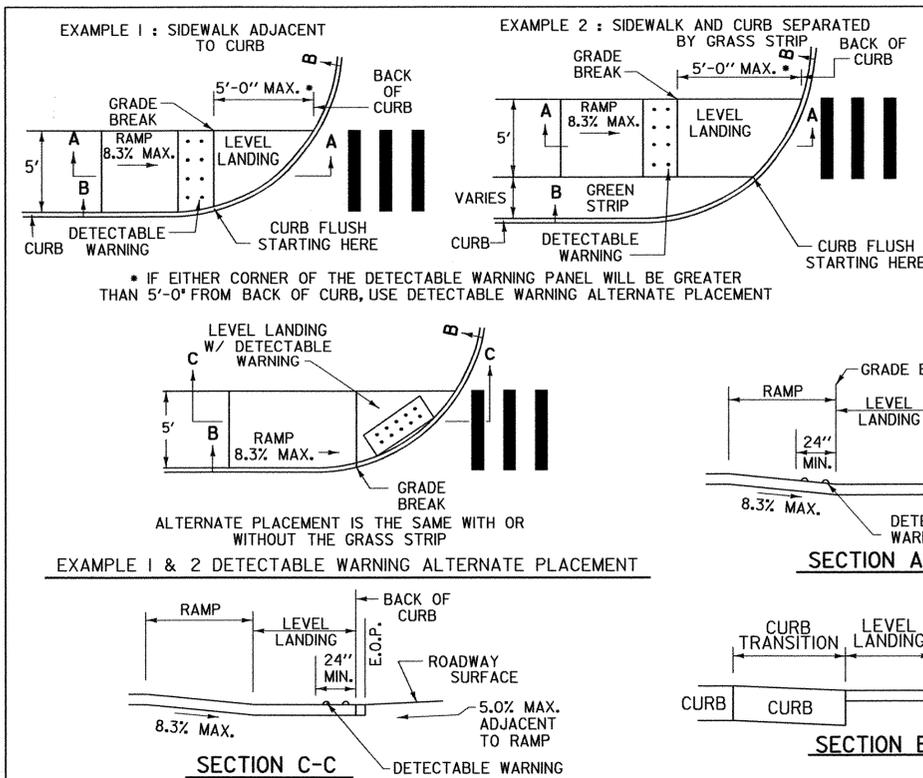
DETAILS ON THIS SHEET ARE "NOT TO SCALE" UNLESS NOTED OTHERWISE.

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

# STRUCTURAL STEEL DETAILS & NOTES



# STRUCTURES DETAIL SD-6 01.00



REVISIONS AND CORRECTIONS

FEB. 2, 2004 - DATE OF ORIGINAL ISSUE

SEPT. 1, 2004 - MINOR REVISIONS TO COMPLY WITH ADAAG

MAR. 10, 2008 - MINOR REVISIONS TO COMPLY WITH ADA STANDARDS

APPROVED

*Alan E. Newson*  
LOCAL TRANSPORTATION FACILITIES PROGRAM MANAGER

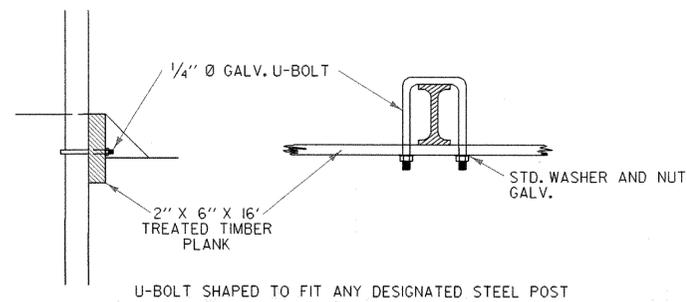
*Rudolf Fetscher*  
DIRECTOR OF PROGRAM DEVELOPMENT

*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

SIDEWALK RAMPS

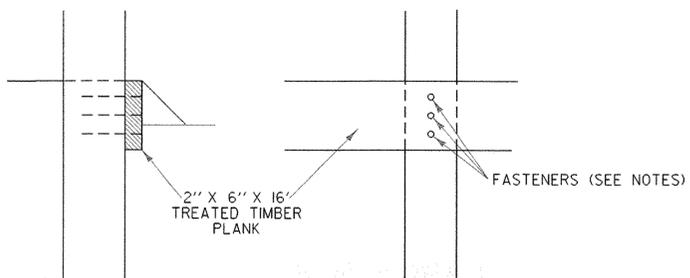
VERMONT AGENCY OF TRANSPORTATION

STANDARD C-3A

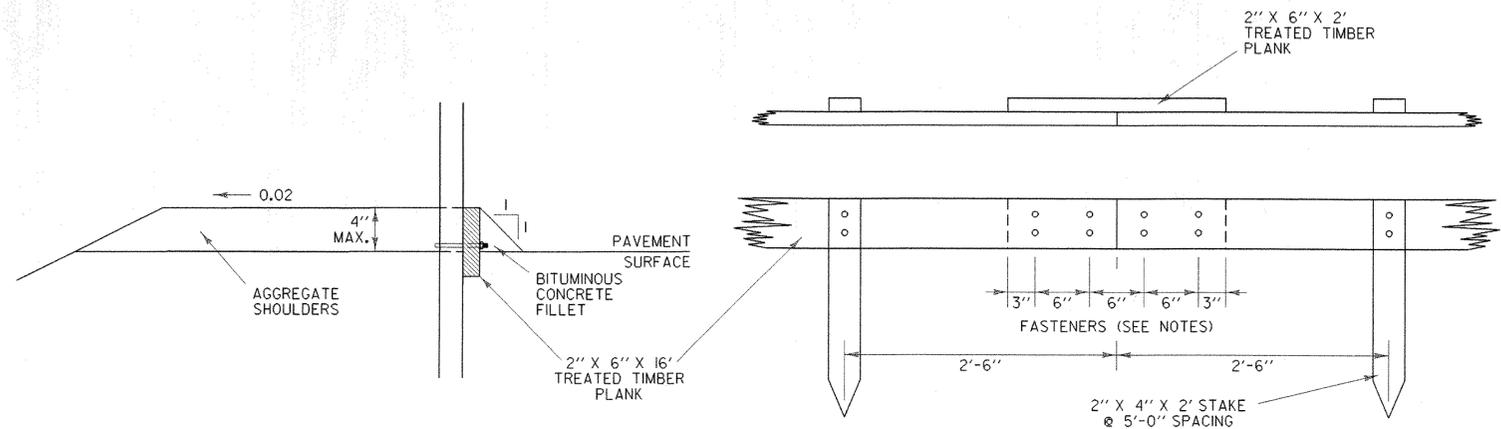


U-BOLT SHAPED TO FIT ANY DESIGNATED STEEL POST

WITH STEEL POSTS



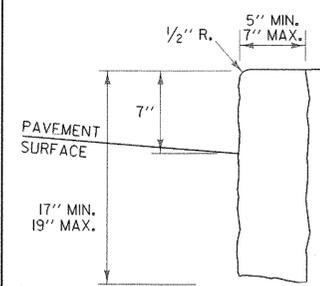
WITH WOOD POSTS (EXISTING CONDITION)



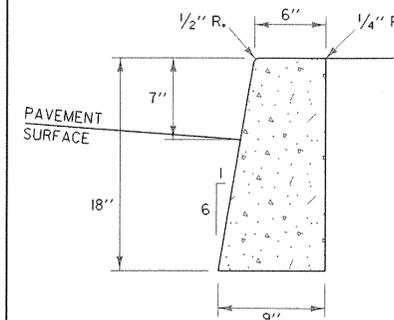
BITUMINOUS CONCRETE FILLET DETAIL

TREATED TIMBER CURB

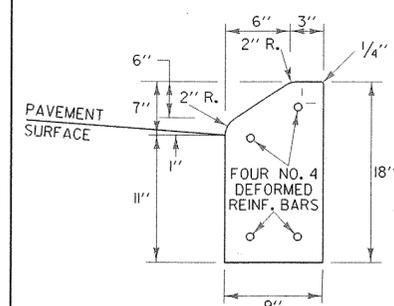
SPLICE DETAIL



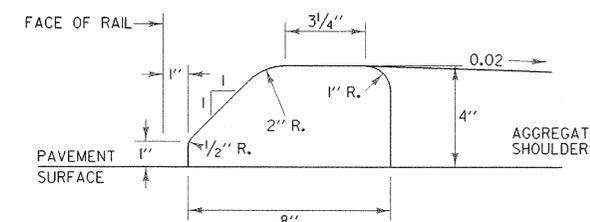
VERTICAL GRANITE CURB



CAST IN PLACE CONCRETE CURB, TYPE B

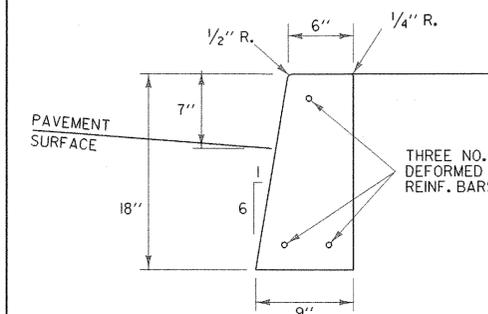


PRECAST REINFORCED CONCRETE CURB, TYPE A

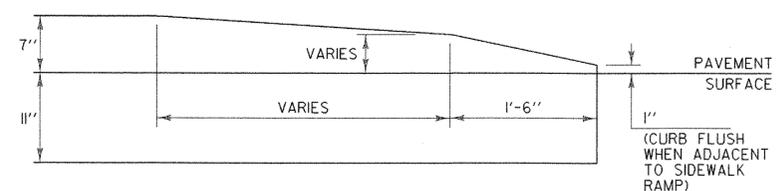


USE ONLY WITH STEEL BEAM GUARDRAIL

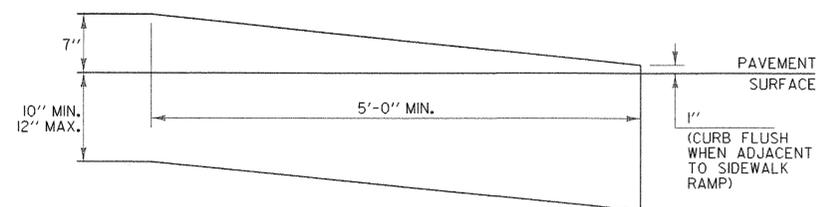
BITUMINOUS CONCRETE CURB, TYPE A



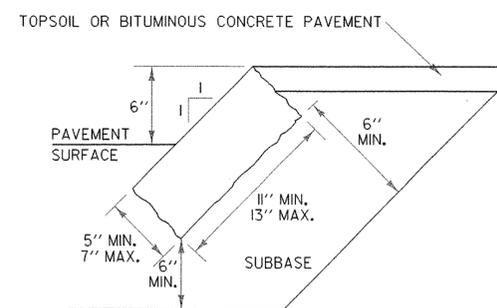
PRECAST REINFORCED CONCRETE CURB, TYPE B



CONCRETE CURB END



VERTICAL GRANITE CURB END



EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.

GRANITE SLOPE EDGING

**GENERAL NOTES:**

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

**OTHER STDS. REQUIRED: NONE**

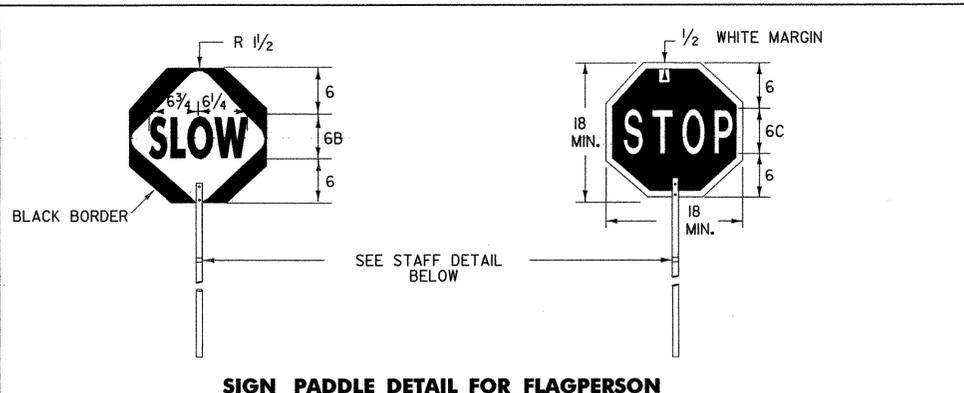
REVISIONS AND CORRECTIONS  
FEB. II, 2008 - ORIGINAL APPROVAL DATE

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

**CURBING**



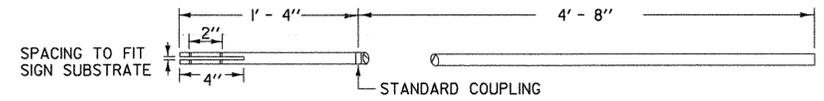
**STANDARD  
C-10**



**SIGN PADDLE DETAIL FOR FLAGPERSON**

**COLORS**  
ORANGE ASTM TYPE VIII  
RETROREFLECTORIZED DIAMOND  
WITH BLACK TEXT AND BORDER

**COLORS**  
RED ASTM TYPE III OR TYPE VIII  
RETROREFLECTORIZED OCTAGON  
WITH WHITE ASTM TYPE III OR TYPE VIII  
RETROREFLECTORIZED TEXT AND BORDER



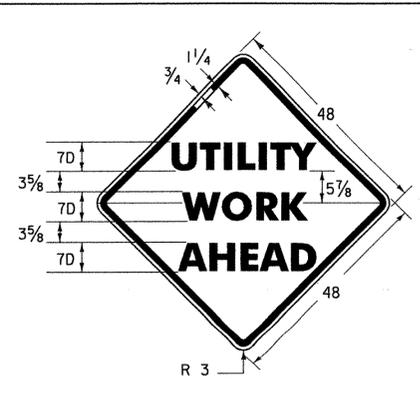
**STAFF DETAIL**

**MATERIALS**

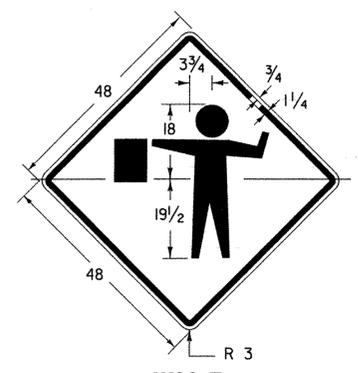
THE SIGN MATERIALS SHALL BE ALUMINUM, ABS PLASTIC OR EQUIVALENT, WITH COLORS AS INDICATED ON DETAILS. RETROREFLECTIVE SHEETING SHALL BE ASTM TYPE III OR TYPE VIII. THE STAFF MAY BE RIGID ALUMINUM TUBING, ABS PLASTIC OR WOOD.

**MOUNTING**

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



**W21-7 OR W20-1**



**W20-7a**

**NOTES**

**DESIGN**

LETTERS, DIGITS, SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE "STANDARD HIGHWAYS 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 WARNING SIGNS ON THIS SHEET MAY BE OF ANY OF THE FOLLOWING WITH MINIMUM THICKNESS AS NOTED.  
FLAT SHEET ALUMINUM - 0.125 INCHES  
HIGH DENSITY OVERLAYED PLYWOOD - 5/8 INCHES  
ROLL-UP SIGN MATERIAL ASTM TYPE VI

**REFLECTORIZATION**

ALL RETROREFLECTORIZED MATERIAL SHALL CONSIST OF ASTM TYPE III, TYPE VI OR TYPE VIII RETROREFLECTIVE SHEETING. THE TEXT AND BORDERS MAY BE SILK SCREENED OR LETTERING FILM.

**COLORS**

THE WARNING SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT BORDER AND SYMBOLS ON A RETROREFLECTORIZED FLUORESCENT ORANGE BACKGROUND THE ORANGE SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY AASHTO AND APPROVED BY THE FHWA.

**INSTALLATION**

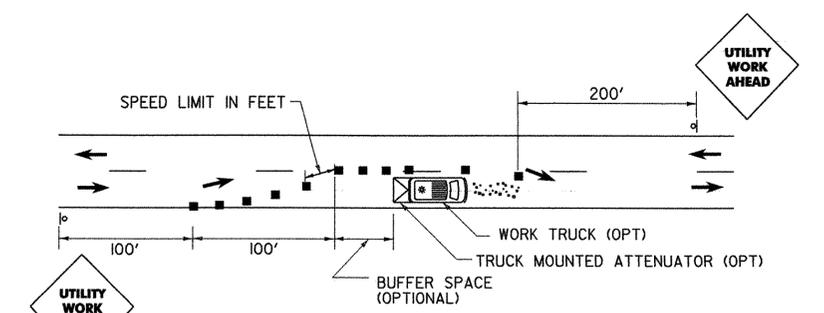
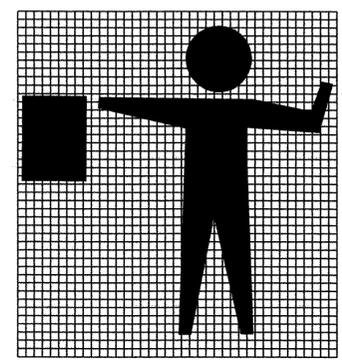
THE SIGNS SHALL BE IN-PLACE AT THE TIME THE PROJECT COMMENCES, AND WHERE APPLICABLE EACH POST MOUNTED SIGN SHALL BE ERECTED IN A NEAT AND PROFESSIONAL MANNER ON METAL POSTS SET SECURELY IN THE GROUND, UNLESS OTHERWISE NOTED ON THIS SHEET. THE BOTTOM OF A SIGN, UNLESS OTHERWISE NOTED SHALL BE AT LEAST 7 FEET ABOVE EDGE OF THE TRAVELED WAY, 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. SIGNS MOUNTED ON BARRICADES OR TEMPORARY SUPPORTS SHALL BE POSITIONED SUCH THAT THE BOTTOM OF THE SIGN IS NOT LESS THAN ONE FOOT ABOVE THE PAVEMENT ELEVATION. ALL SIGN INSTALLATIONS SHALL BE NCHRP 350 COMPLIANT FOR THE SIGN SUBSTRATE MATERIAL BEING USED. FOR MOBILE OPERATIONS REFER TO THE MUTCD PART VI (TA-17)

**SPECIFICATIONS**

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

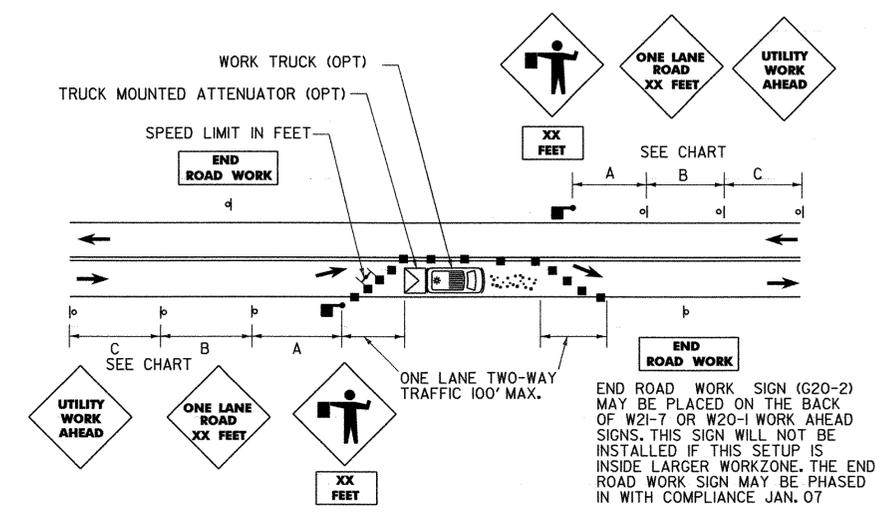
**LEGEND**

- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- WORK AREA
- SIGN & POSTS
- FLAGPERSON
- CHANNELIZING DEVICES (CONES OR DRUMS)



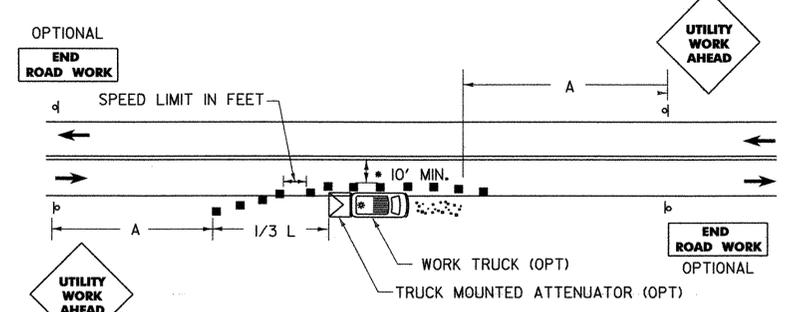
**TWO LANE RESIDENTIAL STREET LOW VOLUME TRAFFIC (TA-18)**

THIS LAYOUT SHALL ONLY BE USED ON ROADS WITH SPEED LIMITS LESS THAN 30 MPH AND WHERE SIGHT DISTANCE MEETS MINIMUM STOPPING SIGHT DISTANCES REQUIREMENTS FOR BOTH DIRECTIONS OF APPROACHING TRAFFIC.



**TWO LANE ROAD REQUIRING LANE CLOSURE (TA-10)**

SINGLE FLAGGER OPERATION MAY BE USED IF SIGHT DISTANCE IS AVAILABLE ON LOW VOLUME ROADS



**TWO LANE ROAD SHOULDER WORK AREA (TA-6)**

$L = \frac{WS^2}{60}$   
 $L = WS \geq 45 \text{ MPH}$

\* IF LESS THAN 10' USE THE FLAGGING OPERATION AS SHOWN ABOVE

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

**WORK DURATION**

WORK DURATION IS A MAJOR FACTOR IN DETERMINING THE NUMBER AND TYPES OF DEVICES USED IN UTILITY TRAFFIC CONTROL ZONES. THE DURATION OF A TEMPORARY TRAFFIC CONTROL ZONE IS DEFINED RELATIVE TO THE LENGTH OF TIME A WORK OPERATION OCCUPIES A SPOT LOCATION.

SHORT DURATION IS WORK THAT OCCUPIES A LOCATION UP TO 1 HOUR. SIMPLIFIED CONTROL PROCEDURES MAY BE WARRANTED FOR SHORT-DURATION WORK. ALL WORK VEHICLES SHALL BE EQUIPPED AND OPERATING ROTATING OR STROBE LIGHTS DURING SHORT-DURATION WORK. THE SUPERVISOR WILL DETERMINE IF ADDITIONAL SIGNS AND TRAFFIC CONTROL IS NECESSARY. SAFETY IN SHORT-DURATION WORK ZONES SHOULD NOT BE COMPROMISED BY USING FEWER DEVICES SIMPLY BECAUSE THE OPERATION WILL FREQUENTLY CHANGE LOCATIONS.

SHORT-TERM STATIONARY IS DAYTIME WORK THAT OCCUPIES A LOCATION FOR MORE THAN 1 HOUR BUT LESS THAN 12 HOURS (MOST MAINTENANCE AND UTILITY OPERATIONS ARE SHORT-TERM STATIONARY WORK). ADVANCE WARNING SIGNS SHALL BE PLACED TO WARN TRAVELING PUBLIC THAT WORK IS TAKING PLACE. THE NUMBER AND SPACING OF THESE WARNING DEVICES WILL DEPEND ON THE LOCATION OF THE WORKZONE.

**SIGN SPACING**

WHERE HIGHWAY CONDITIONS PERMIT, WARNING SIGNS SHOULD BE PLACED A VARYING DISTANCE IN ADVANCE OF THE WORK AREA, DEPENDING ON THE ROADWAY TYPE, CONDITION, AND SPEED. WHERE A SERIES OF TWO OR MORE WARNING SIGNS IS USED, THE CLOSEST SIGN TO THE WORK AREA SHOULD BE PLACED APPROXIMATELY 100 FT AWAY FOR LOW-SPEED URBAN STREETS 1,000 FT AWAY OR MORE FOR EXPRESSWAYS AND FREEWAYS. SEE TABLE BELOW.

ROAD TYPE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
URBAN (LOW SPEED)	100	100	100
URBAN (HIGH SPEED)	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,500	2,640

**SIGN SPACING NOTES**

**REVISIONS AND CORRECTIONS**

AUG 08, 1995 - SUPERSEDES STD E-9 AND UPDATED TO NEW CHAPTER VI OF MUTCD  
APRIL 18, 2002 - CHANGED REFLECTIVE SHEETING TO TYPE III  
MARCH 01, 2004 - UPDATED SIGN PACKAGES TO MEET MUTCD

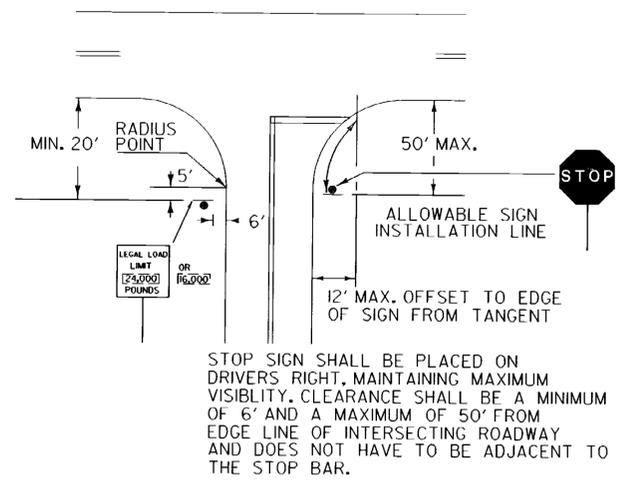
**APPROVED**

*[Signature]*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*[Signature]*  
TRAFFIC OPERATIONS ENGINEER  
*[Signature]*  
FEDERAL HIGHWAY ADMINISTRATION

**UTILITY WORK ZONE**

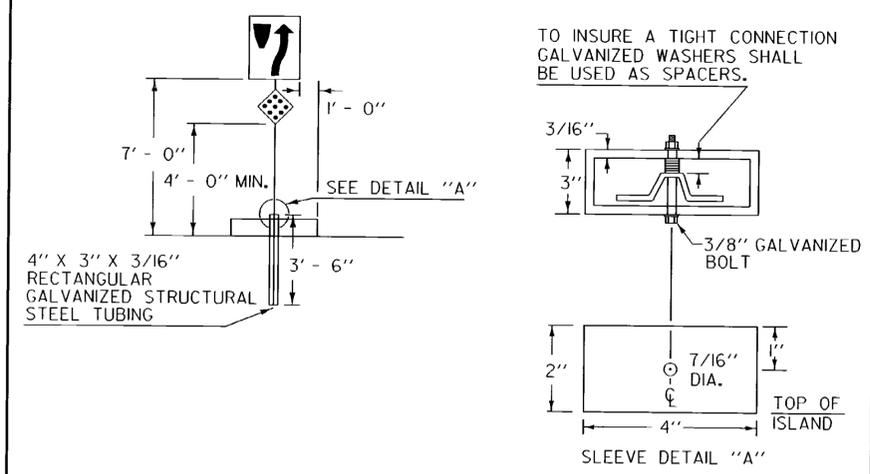


**STANDARD E-119**



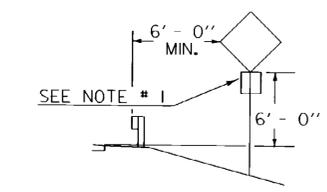
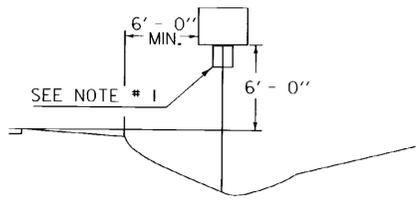
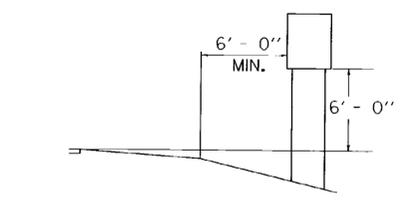
**LEGAL LOAD LIMIT AND STOP SIGNS AT INTERSECTIONS WITH TOWN HIGHWAYS**

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

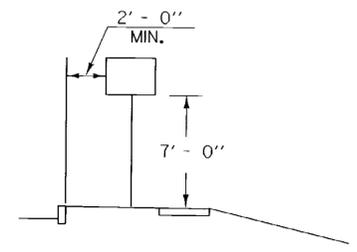
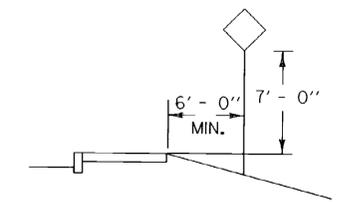


**SIGNS ON MEDIAN ISLANDS IN THE LINE OF TRAFFIC**

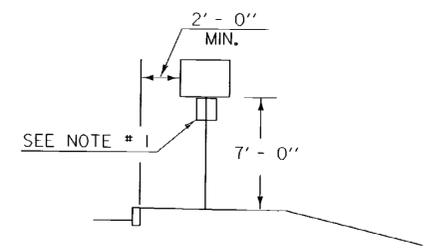
INCREASE VERTICAL CLEARANCE TO 7' IN AREAS OF FREQUENT ROADSIDE PARKING OR PEDESTRIAN ACTIVITY



**RURAL**



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



**URBAN**

**NOTES:**

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

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

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

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

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

**STANDARD SIGN PLACEMENT  
CONVENTIONAL ROAD**

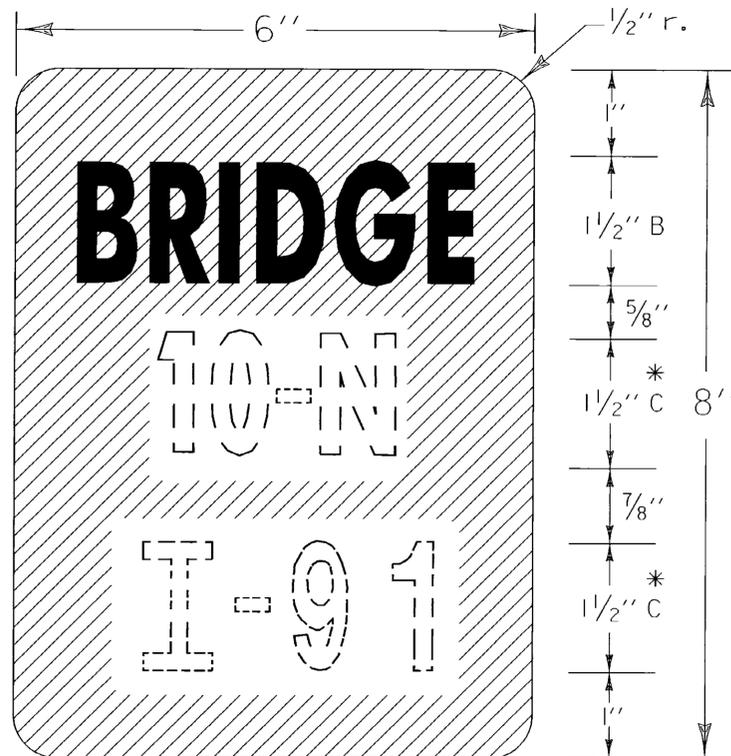
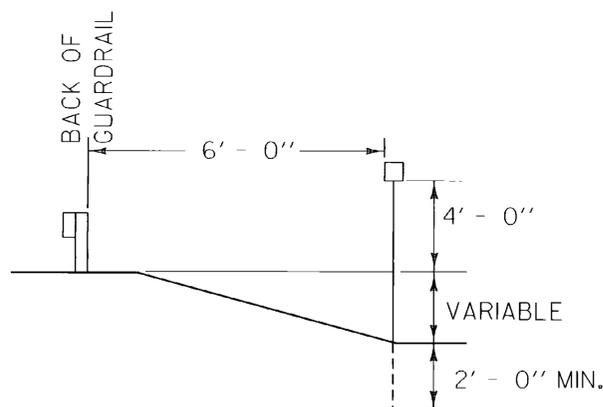
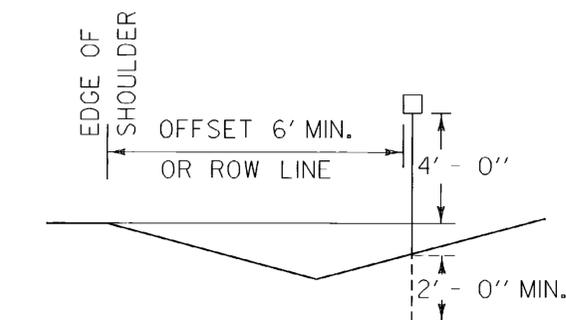


**STANDARD  
E-121**

I-91  
 ← 2" →

**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 BACKGROUND. THE COLORS SHALL CONFORM WITH THOSE FOUND  
 IN STANDARD COLOR TOLERANCE CHARTS AS APPROVED BY THE U.S.  
 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:**  
 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**

*Gordon S. MacArthur*  
 DIRECTOR OF ENGINEERING

*David A. Ross*  
 TRAFFIC AND SAFETY ENGINEER

**BRIDGE NUMBER PLAQUE**



**STANDARD  
 E-134**

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

**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.

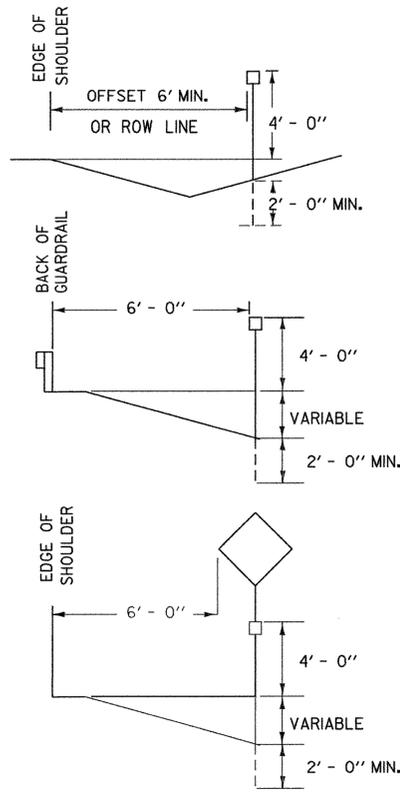
ON CLASS I TOWN HIGHWAYS (CITIES, VILLAGES) OR OTHER CONGESTED AREAS, MILEMARKERS WILL ONLY BE INSTALLED ON EXISTING SIGN POSTS AND WILL CARRY THE ACTUAL MILEAGE TO THAT LOCATION. A MILEMARKER EACH 0.10 +/- MILE IS DESIRABLE THROUGH SUCH AREAS.

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 AND PROGRESS CHARTS' AS A GUIDE.

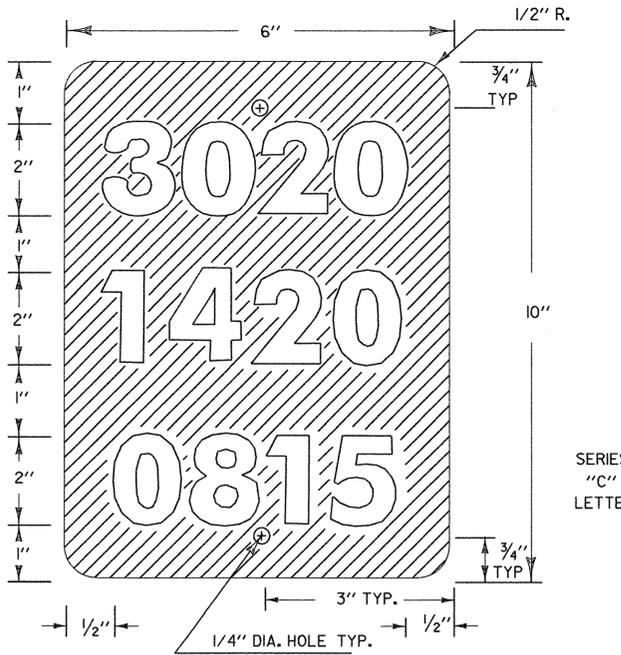


1 - ADDISON	2 - BENNINGTON	3 - CALEDONIA	4 - CHITTENDEN	5 - ESSEX	6 - FRANKLIN	7 - GRAND ISLE
0101 ADDISON 0102 BRIDPORT 0103 BRISTOL 0104 CORNWALL 0105 FERRISBURGH 0106 GOSHEN 0107 GRANVILLE 0108 HANCOCK 0109 LEICESTER 0110 LINCOLN 0111 MIDDLEBURY 0112 MONKTON 0113 NEW HAVEN 0114 ORWELL 0115 PANTON 0116 RIPTON 0117 SALISBURY 0118 SHOREHAM 0119 STARKSBORO 0120 VERGENNES 0121 WALTHAM 0122 WEYBRIDGE 0123 WHITING	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	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 WHELOCK	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	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	0601 BAKERSFIELD 0602 BENSHIRE 0603 ENOSBURGH 0604 FAIRFAX 0605 FAIRFIELD 0606 FLETCHER 0607 FRANKLIN 0608 GEORCIA 0609 HIGHGATE 0610 MONTGOMERY 0611 RICHFORD 0612 ST. ALBANS CITY 0613 ST. ALBANS TOWN 0614 SHELDON 0615 SWANTON	0701 ALBURG 0702 GRAND ISLE 0703 ISLE LA MOTTE 0704 NORTH HERO 0705 SOUTH HERO

8 - LAMOILLE	9 - ORANGE	10 - ORLEANS	11 - RUTLAND	12 - WASHINGTON	13 - WINDHAM	14 - WINDSOR
0801 BELVIDERE 0802 CAMBRIDGE 0803 EDEN 0804 ELMORE 0805 HYDE PARK 0806 JOHNSON 0807 MORRISTOWN (MORRISVILLE) 0808 STOWE 0809 WATERVILLE 0810 WOLCOTT	0901 BRADFORD 0902 BRAINTREE 0903 BROOKFIELD (ORLEANS VILLAGE) 0904 CHELSEA 0905 CORINTH 0906 FAIRLEE 0907 MORRISTOWN (MORRISVILLE) 0908 ORANGE 0909 RANDOLPH 0910 STRAFFORD 0911 THETFORD 0912 TOPSHAM 0913 TUNBRIDGE 0914 VERSHIRE 0915 WASHINGTON 0916 WEST FAIRLEE 0917 WILLIAMSTOWN	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	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 TOWNMOUTH 1125 WALLINGFORD 1126 WELLS 1127 WEST HAVEN 1128 WEST RUTLAND	1201 BARRE CITY 1202 BARRE TOWN 1203 BROOKLINE 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	1301 ATHENS 1302 BRATTLEBORO 1303 BROOKLINE 1304 DOVER 1305 DUMMERSTON 1306 GRAFTON 1307 GUILFORD 1308 HALIFAX 1309 JAMAICA (WHITE RIVER JUNCTION) 1310 LONDONDERRY 1311 MARLBORO 1312 MORETOWN 1313 NORTHFIELD 1314 ROCKINGHAM (SAXTONS RIVER) (BELLOWS FALLS) 1315 SOMERSET 1316 STRATTON 1317 TOWNSEND 1318 VERNON 1319 WARDSBORO 1320 WESTMINSTER 1321 WHITINGHAM 1322 WILMINGTON 1323 WINDHAM	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

**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	QUECHEE 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



**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 1 3/4" 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 2 1/4" SQUARE STEEL ANCHOR OR 2 LB/FT FLANGED CHANNEL STEEL POST.

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

**REVISIONS AND CORRECTIONS**

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

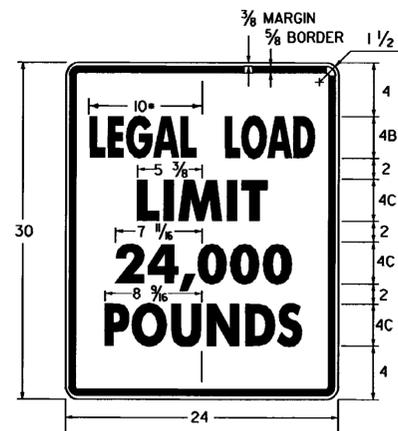
**APPROVED**

*[Signature]*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*[Signature]*  
TRAFFIC OPERATIONS ENGINEER  
*[Signature]*  
FEDERAL HIGHWAY ADMINISTRATION

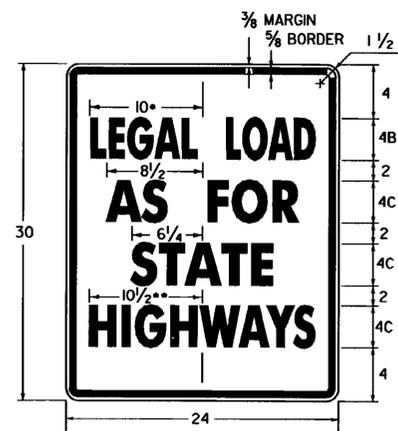
**MILEMARKER DETAILS  
STATE AND TOWN  
HIGHWAYS**



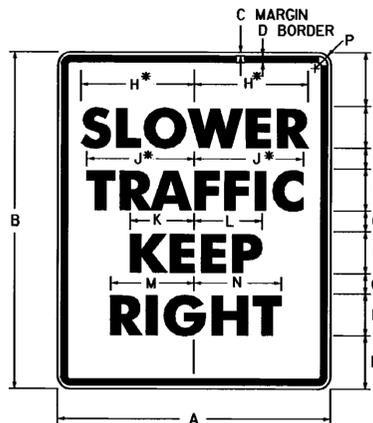
**STANDARD  
E-138**



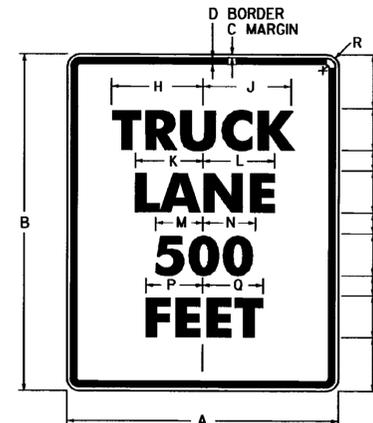
\* REDUCE SPACING 50 %  
LINE 3 ALTERNATE - 16,000  
**VR-017**



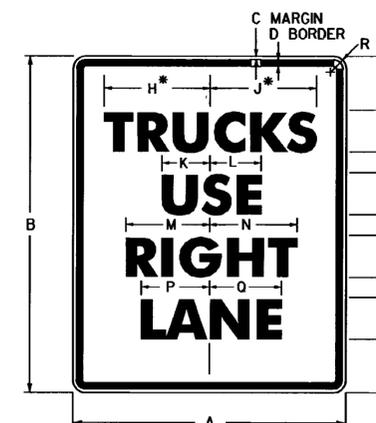
\* REDUCE SPACING 50 %  
\*\* REDUCE SPACING 38 %  
**VR-079**



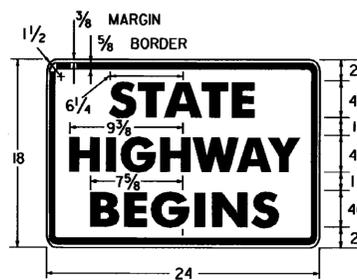
\* REDUCE SPACING 25 %  
**R4-3**



**R4-6**



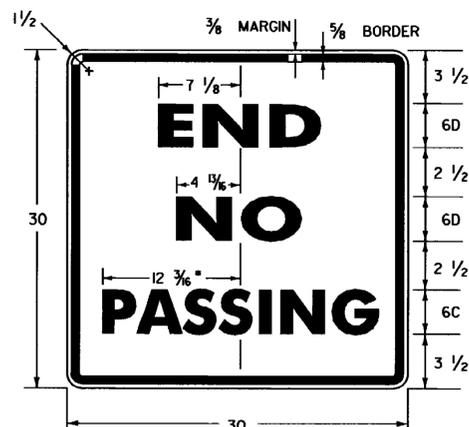
\* REDUCE SPACING 32 %  
**R4-5**



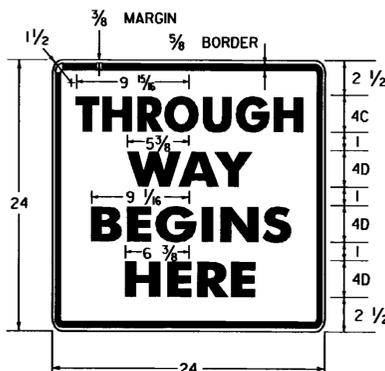
**VR-039**



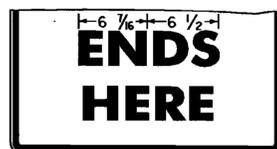
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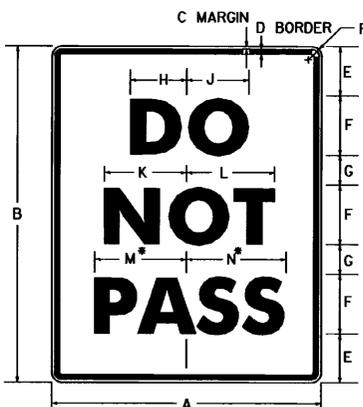
\* REDUCE SPACING 50 %  
**VR-417**



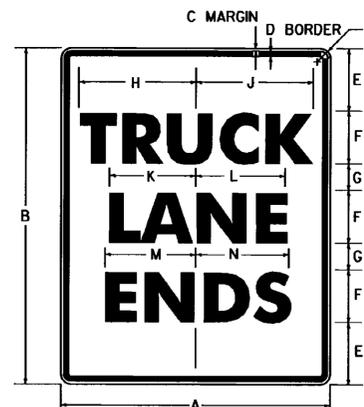
**VR-041**



**VR-040**



\* REDUCE SPACING 40 %  
**R4-1**



**VR-186**

SIGN	DIMENSIONS ( INCHES )													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
STD.	24	30	3/8	5/8	3 3/8	4D	2 1/4	9 3/4	10	6	6 3/8	7 1/8	7 3/8	1 1/2
EXPWY.	36	48	5/8	7/8	6	6D	4	14 5/8	15	9	9 1/8	10 1/8	11 3/8	2 1/4
FWY.	48	60	3/4	1 1/4	7 1/4	8D	4 1/2	19 1/2	20	12	13 3/8	14 1/4	15 1/4	3

SIGN	DIMENSIONS ( INCHES )															
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
STD.	24	30	3/8	5/8	3 3/8	4E	2 1/4	9 1/8	9 1/8	7 3/8	7 1/8	5 1/8	5 1/8	6 7/8	7 1/8	1 1/2
EXPWY.	36	48	5/8	7/8	6	6E	4	14 3/4	14 1/2	11 5/8	11 1/2	8 1/2	8 3/4	10 5/8	10 5/8	2 1/4
FWY.	48	60	3/4	1 1/4	7 1/4	8E	4 1/2	19 5/8	19 3/8	15 1/8	15 3/8	11 3/8	11 5/8	13 3/4	14 1/8	3

SIGN	DIMENSIONS ( INCHES )																	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R		
STD.	24	30	3/8	5/8	3 3/8	4D	2 1/4	9 1/8	9 3/8	4 3/4	5	7 1/8	7 3/8	6 1/4	6 5/8	1 1/2		
EXPWY.	36	48	5/8	7/8	6	6D	4	14 5/8	13 3/8	7 1/8	7 1/2	10 1/8	11 3/8	9 3/8	9 5/8	2 1/4		
FWY.	48	60	3/4	1 1/4	7 1/4	8D	4 1/2	19 1/8	18 3/8	9 1/2	10	14 1/4	15 1/4	12 1/2	13 1/4	3		

**GENERAL:**

1. ALL DIMENSIONS IN INCHES.

**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.

24' X 18'	
24' X 24'	
24' X 30'	36' X 48'
30' X 30'	48' X 60'

FLAT SHEET ALUMINUM  
HIGH DENSITY OVERLAID PLYWOOD  
GALVANIZED FLAT SHEET STEEL

0.080"	0.100"
1/2"	5/8"
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. 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. : NONE REQUIRED**

**REVISIONS AND CORRECTIONS**

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE  
SEPT. 20, 1995 - ADDED AND DELETED SIGN DETAIL,  
ADDED SIGN ID NUMBERS, MINOR NOTE REVISIONS.

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

**APPROVED**

*Stephen D. MacCittol*  
DIRECTOR OF ENGINEERING

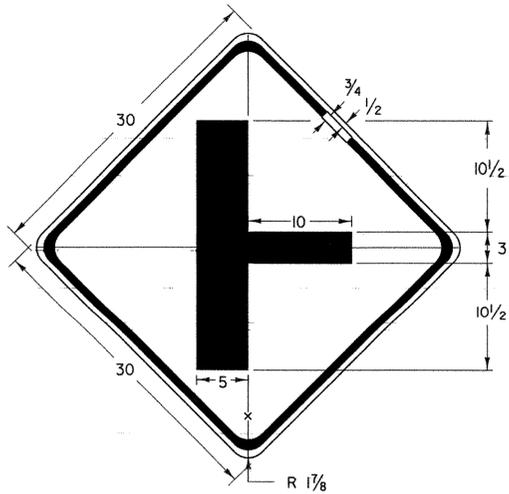
*David A. Ross*  
TRAFFIC AND SAFETY ENGINEER

**REGULATORY SIGN  
DETAILS**

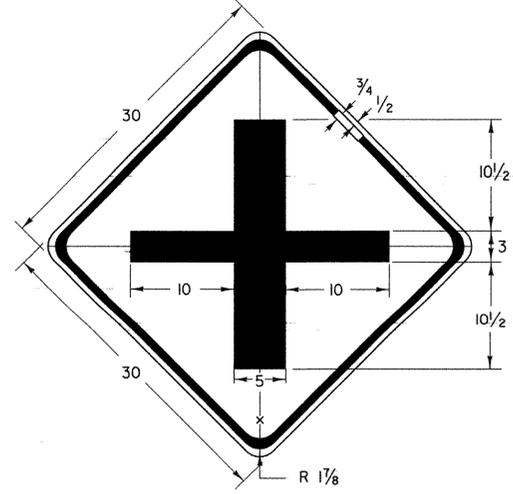
/traf/std/stdel4l.dgn : stdel4l.l



**STANDARD  
E-141**

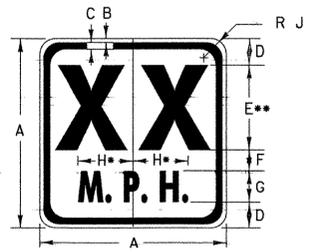


**W2-2M**



**W2-1M**

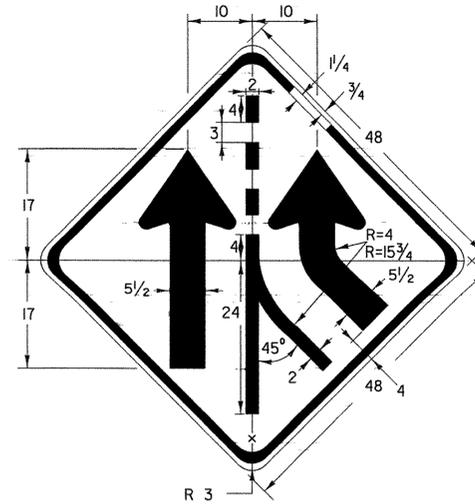
**STATE ROUTE /MINOR TOWN HIGHWAY INTERSECTION SIGNS (TYP.)**



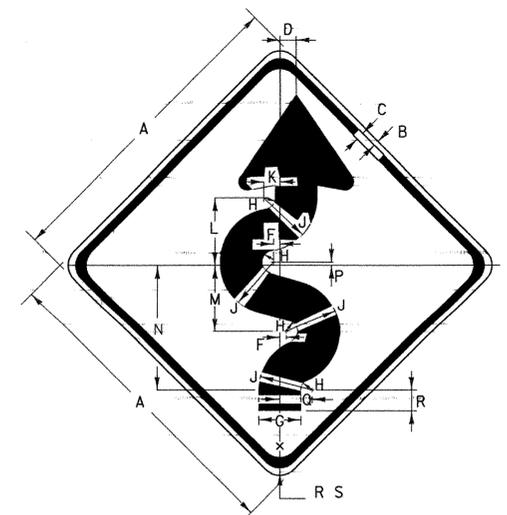
**W13-1**

- \* INCREASE SPACING 100%
- \*\* OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTERLINE

SIGN	DIMENSIONS (INCHES)								
	A	B	C	D	E	F	G	H	J
STD.	18	3/8	5/8	2 1/2	8E	2	3E	5 5/16	1 1/2
SPECIAL	24	3/8	5/8	3 3/8	10E	2 3/4	4E	7 1/16	1 1/2

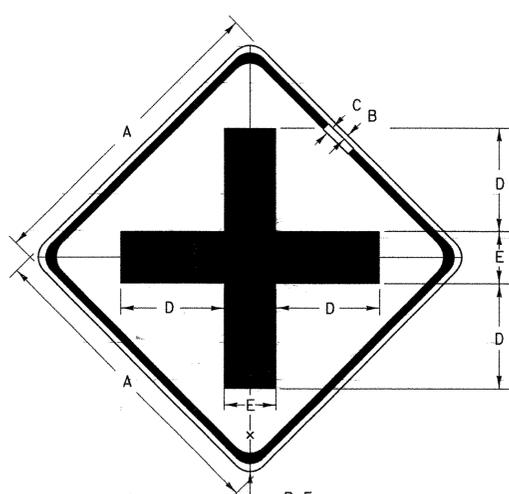


**W4-3**

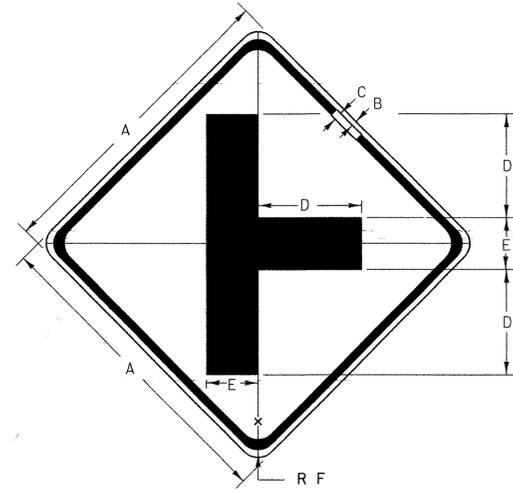


**W1-5**

SIGN	DIMENSIONS (INCHES)																
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
PATH	18	3/8	5/8	1	9 5/8	3/8	2 1/2	5/8	3	1	4	4	8 5/8	1/4	2	1 1/4	1 1/2
MIN.	24	3/8	5/8	1 1/4	12 3/4	1/2	3 1/4	7/8	4 1/8	1 1/4	5 5/8	5 1/4	11 3/8	1/4	2 1/2	1 7/8	1 1/2
STD.	30	1/2	3/4	1 5/8	15 5/8	5/8	4 1/8	1 3/8	5 5/8	1 5/8	6 3/4	6 9/16	14 1/8	5/16	3 1/8	2	1 7/8
EXPWY.	36	5/8	7/8	1 7/8	19 1/8	3/4	4 1/8	1 5/8	6 3/8	1 7/8	7 3/8	7 7/8	17 1/8	3/8	3 3/4	2 9/16	2 1/4
SPECIAL	48	3/4	1 1/4	2 1/2	25 1/2	1	6 1/2	1 3/4	8 1/4	2 1/2	10 3/8	10 1/2	22 3/4	1/2	5	3 3/16	3



**W2-1**

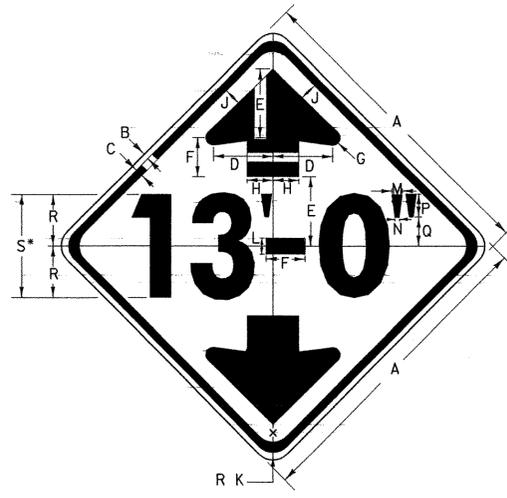


**W2-2**

SIGN	DIMENSIONS (INCHES)					
	A	B	C	D	E	F
PATH	18	3/8	5/8	6	3	1 1/2
MIN.	24	3/8	5/8	8	4	1 1/2
STD.	30	1/2	3/4	10	5	1 7/8
EXPWY.	36	5/8	7/8	12	6	2 1/4
SPECIAL	48	3/4	1 1/4	16	8	3

SIGN	DIMENSIONS (INCHES)					
	A	B	C	D	E	F
PATH	18	3/8	5/8	6	3	1 1/2
MIN.	24	3/8	5/8	8	4	1 1/2
STD.	30	1/2	3/4	10	5	1 7/8
EXPWY.	36	5/8	7/8	12	6	2 1/4
SPECIAL	48	3/4	1 1/4	16	8	3

**STATE ROUTE /STATE ROUTE OR MAJOR TOWN HIGHWAY INTERSECTION SIGNS (TYP.)**



**W12-2**

- \* OPTICALLY SPACE VERTICAL CLEARANCE ABOUT VERTICAL CENTERLINE (WHERE 10" IS USED IN VERT. CLEARANCE, USE SERIES C NUMERALS)

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

(ALL DIMENSIONS SHOWN IN INCHES EXCEPT WHERE NOTED)

**NOTES**

**DESIGN**

LETTERS, DIGITS, ARROWS, SYMBOLS, SPACINGS, 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). SEE STANDARD SHEET E-151 FOR ARROWHEAD DETAILS.

**MATERIALS**

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

FLAT SHEET ALUMINUM	24"X24"	30"X30"	36"X36"	48"X48"
0.060"	0.080"	0.100"	0.125"	

**REFLECTORIZATION**

THE BACKGROUND RETROREFLECTIVE MATERIAL SHALL BE ASTM TYPE III, TYPE VIII OR TYPE IX RETROREFLECTIVE SHEETING APPLIED TO THE ENTIRE SIGN.

THE TEXT, BORDER AND SYMBOLS SHALL BE LETTERING FILM OR SILK SCREENED.

**COLORS**

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

**SPECIFICATIONS**

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

**OTHER STDS. E-151 REQUIRED:**

**REVISIONS AND CORRECTIONS**

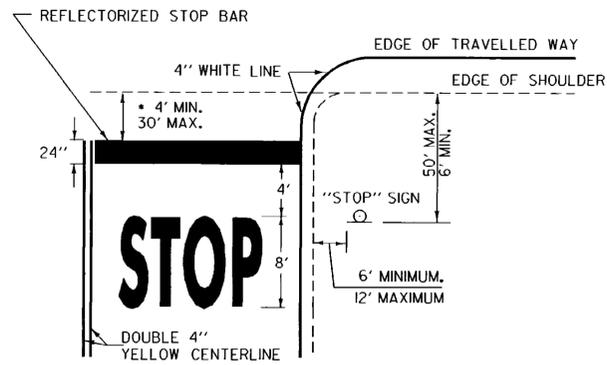
AUG. 08, 1995 - DATE OF ORIGINAL ISSUE  
MAY 01, 2004 - CHANGED REFLECTIVE SHEETING TO TYPE III  
MINOR NOTE CHANGES

APPROVED  
*[Signature]*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*[Signature]*  
TRAFFIC OPERATIONS ENGINEER  
*[Signature]*  
FEDERAL HIGHWAY ADMINISTRATION

**WARNING SIGN  
DETAILS**

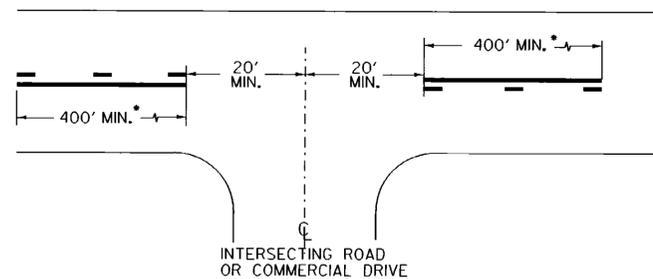


**STANDARD  
E-155**



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

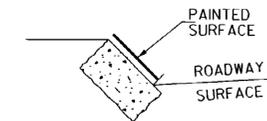
**STOP BAR LAYOUT**



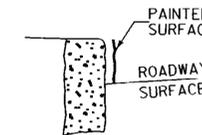
\* THE SOLID LINE SHALL BE PAIRED WITH EITHER A SOLID OR DASHED LINE DEPENDING ON SIGHT DISTANCE AVAILABILITY IN THE OPPOSING DIRECTION. ADJUSTMENTS TO THE 40 FOOT CENTERLINE OPENING MAY BE MADE TO ACCOMMODATE SKEWED INTERSECTIONS.

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

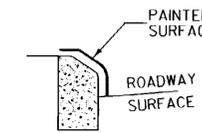
**CENTERLINE LAYOUT**



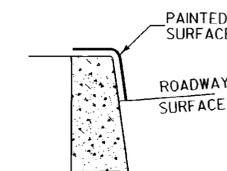
**GRANITE SLOPE EDGING**



**VERTICAL GRANITE CURB**

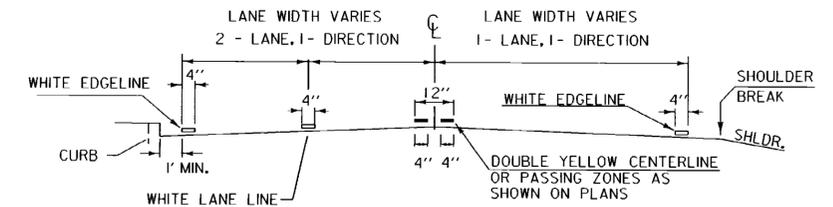


**TYPE A (CONCRETE)**

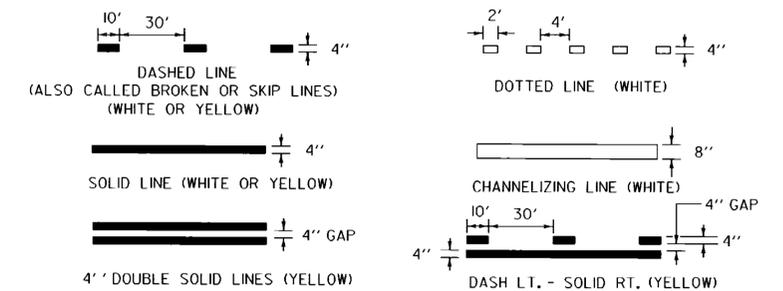


**TYPE B (CONCRETE)**

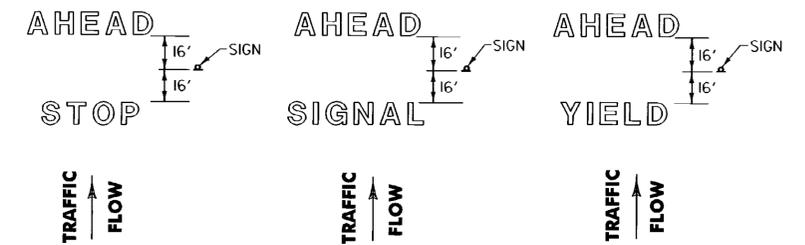
**PAINTED CURB**



**PAVEMENT MARKING PLACEMENT DETAIL**

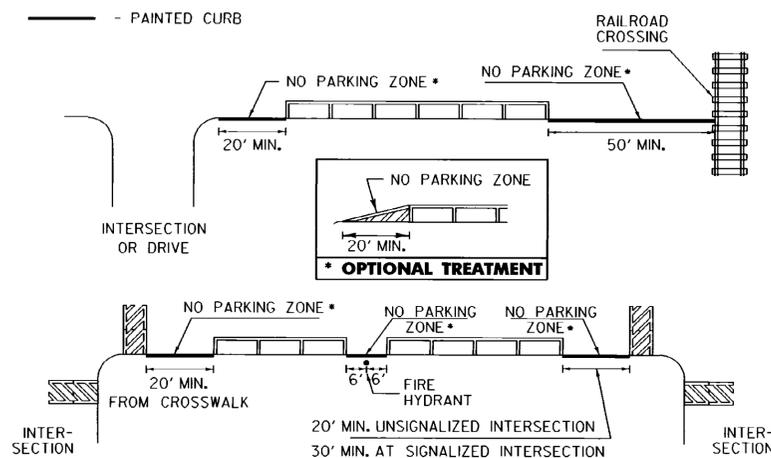


**PAVEMENT MARKING LINE DETAILS**

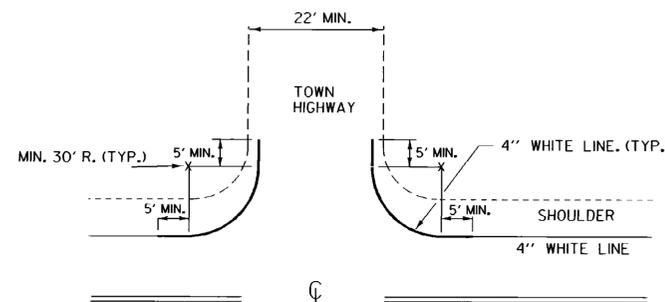


**LETTER IN WORD MARKING SPACING DETAIL**

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



**NO PARKING LAYOUT DETAILS**

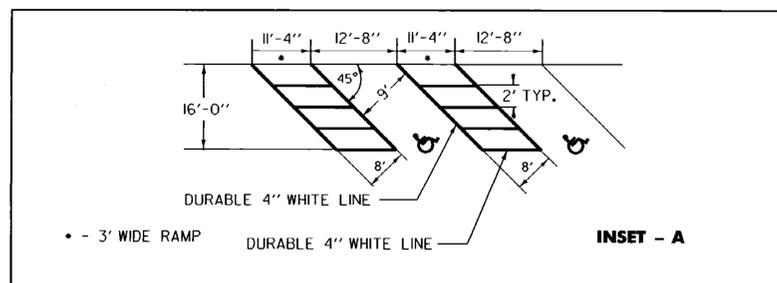


EDGE LINES SHALL BE APPLIED TO ALL STATE HIGHWAYS AND SHOULD BE MAINTAINED AT A CONSTANT DISTANCE FROM THE CENTERLINE UNLESS PAVEMENT WIDTH INCREASES TO ALLOW WIDER LANES.

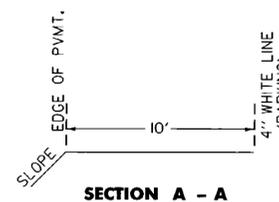
APPLY EDGE LINE AS DETAILED ON ALL PAVED CLASS 1 & CLASS 2 TOWN HIGHWAYS AND ANY CLASS 3 TOWN HIGHWAY 22 FEET OR MORE IN WIDTH.

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

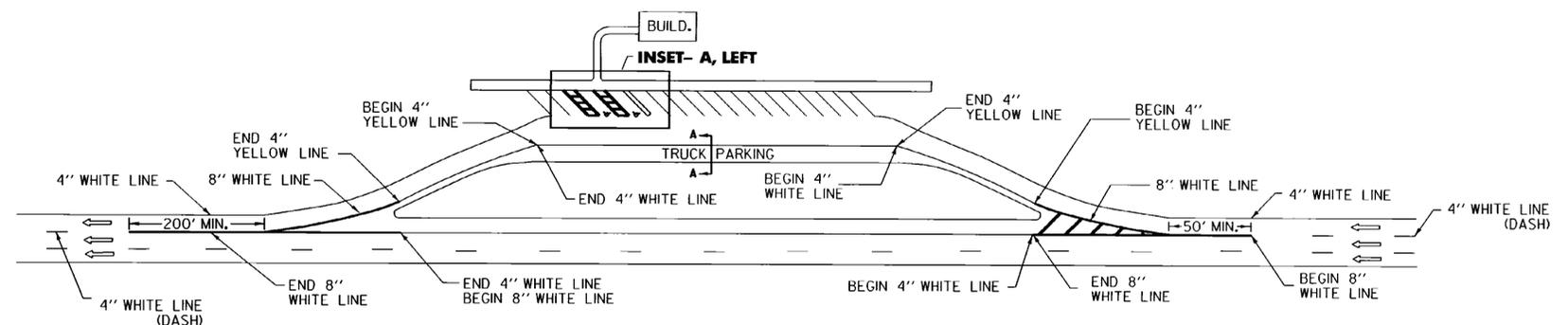
**EDGE LINE LAYOUTS**



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



**TRUCK PARKING DETAIL**



**REST AREA PARKING DETAILS**

THIS SHEET IS NOT TO SCALE

OTHER STDS. E - 191, E - 192 REQUIRED

**REVISIONS AND CORRECTIONS**

AUG. 18, 1995 - DATE OF ORIGINAL ISSUE

**APPROVED**

*Sandra S. McCutchen*  
DIRECTOR OF ENGINEERING

*David A. Ross*  
TRAFFIC AND SAFETY ENGINEER

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

**PAVEMENT MARKING DETAILS**



**STANDARD E-193**

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

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

OTHER STDS. REQUIRED: **NONE**

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

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

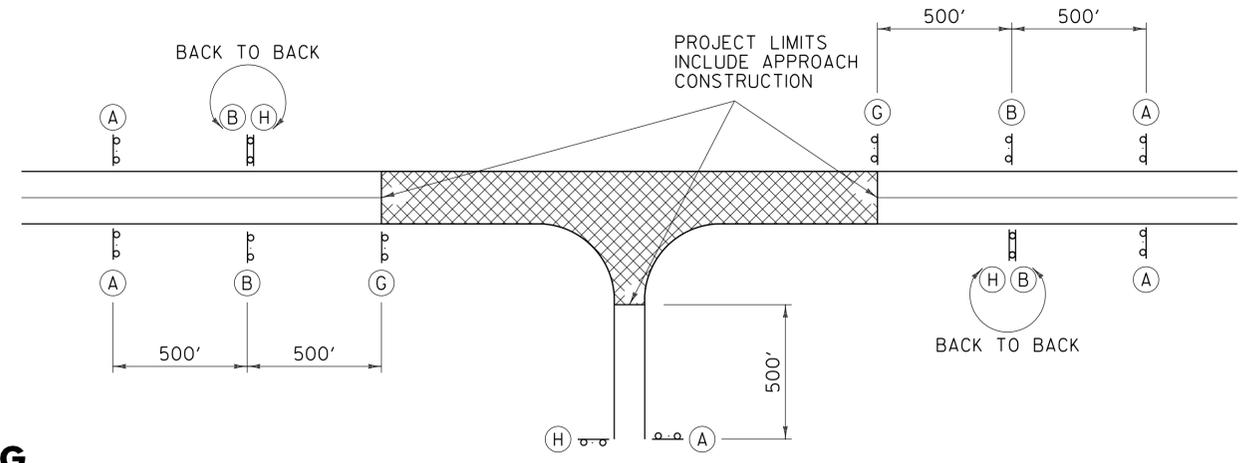
## TRAFFIC CONTROL GENERAL NOTES



STANDARD  
T-1

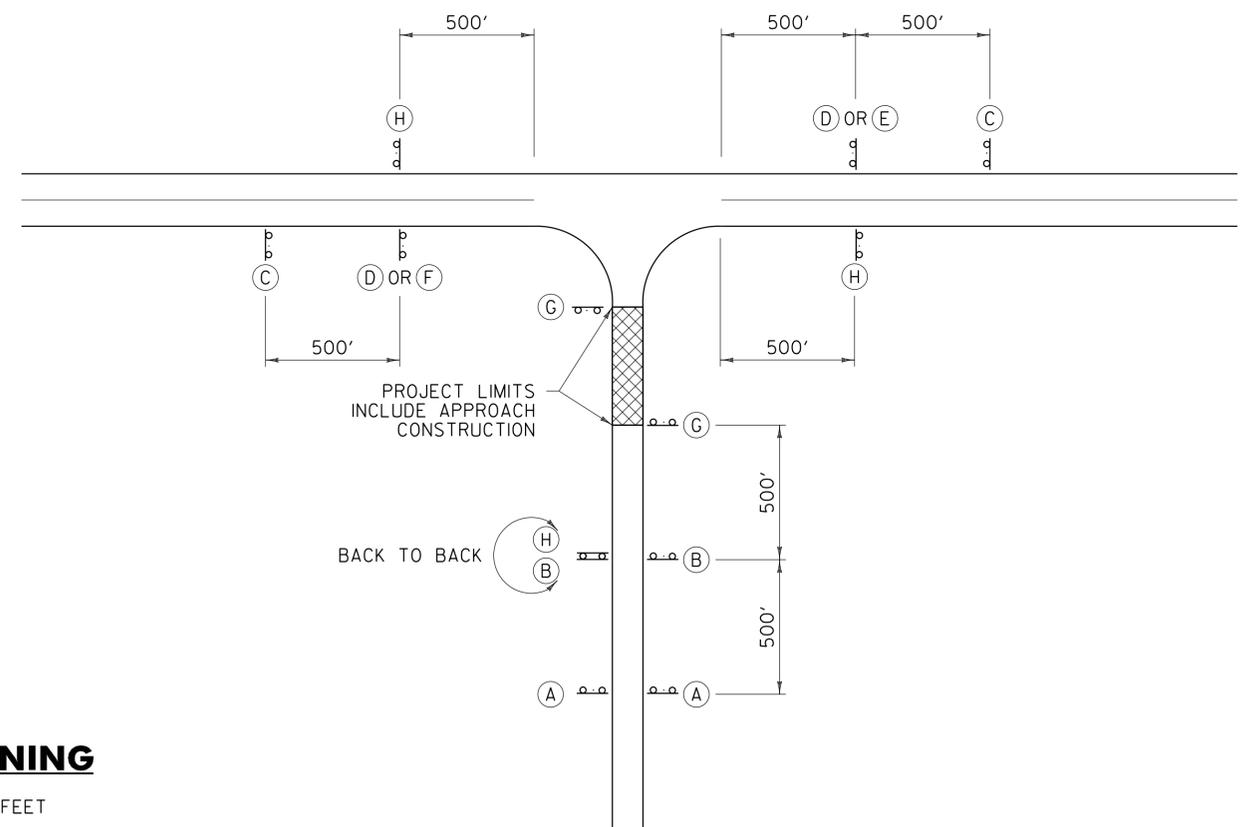
**LEGEND**

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



**TYPICAL APPROACH SIGNING**

FIELD CONDITIONS MAY DICTATE THE ACTUAL PLACEMENT.



**SIDE ROAD APPROACH SIGNING**

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

**GENERAL NOTES:**

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

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

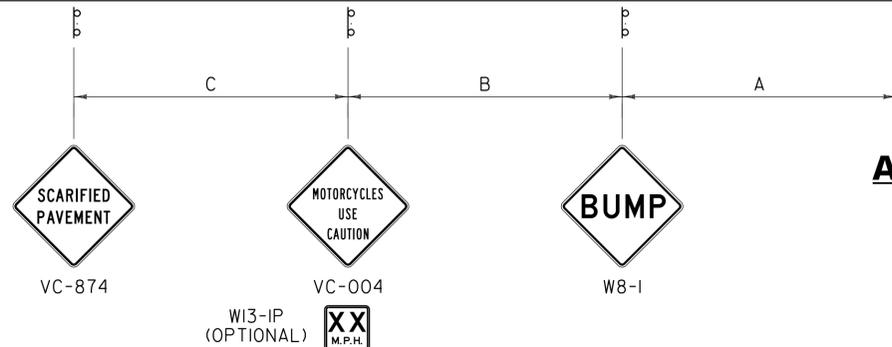
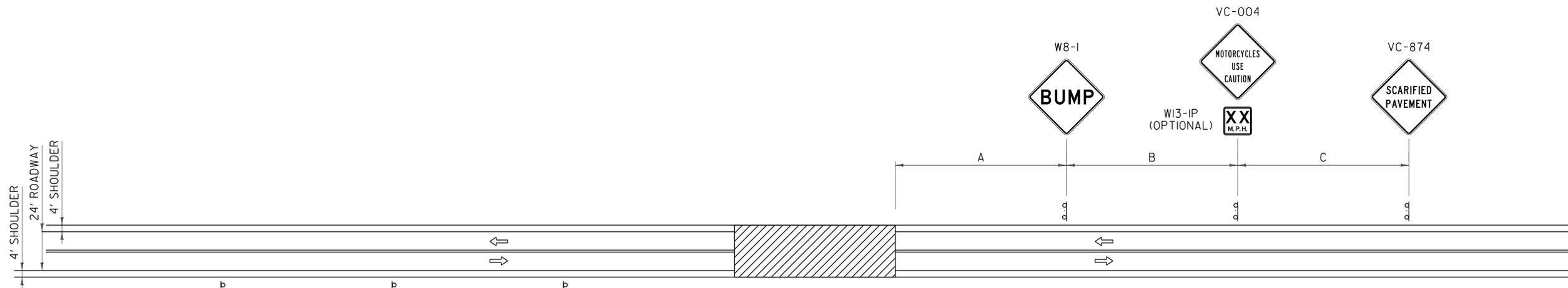
REVISIONS AND CORRECTIONS  
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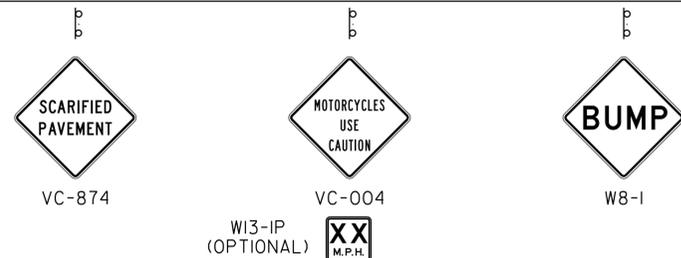
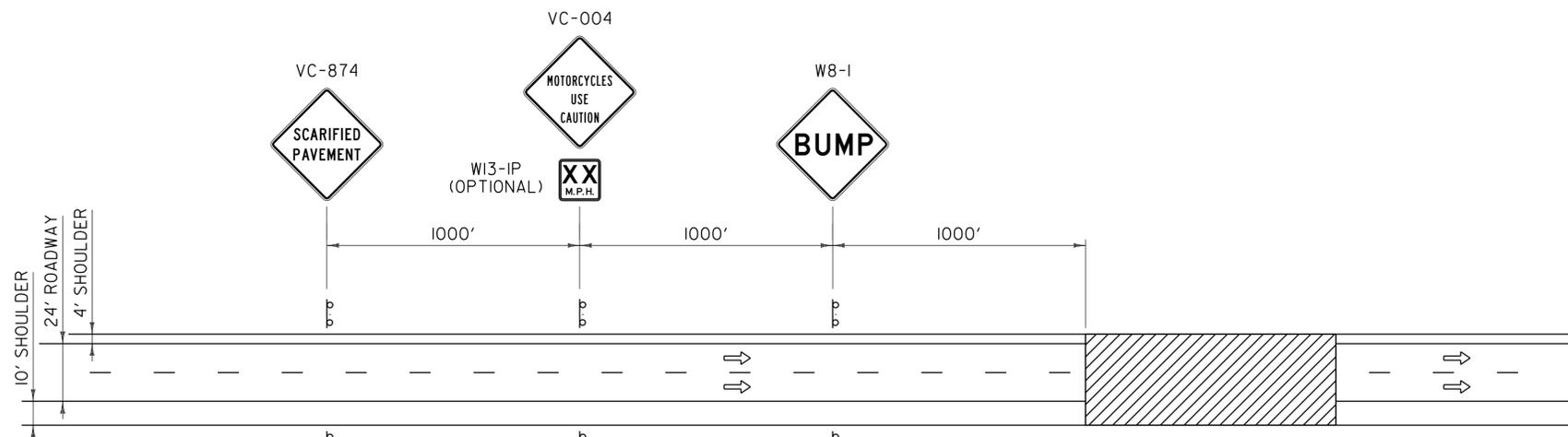
**CONVENTIONAL ROADS  
CONSTRUCTION APPROACH  
SIGNING**



STANDARD  
T-10



**ADVANCE WARNING SIGN PACKAGE FOR  
COLD PLANED (SCARIFIED) SURFACES  
TWO LANE ROADWAY**



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

**LEGEND**

- FLOW OF TRAFFIC
- ▨ WORK AREA

**GENERAL NOTES:**

1. 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 THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) FOR ADDITIONAL INFORMATION.
2. GATE POSTING OF SIGNS IS AN OPTION AS DETERMINED BY THE ENGINEER FOR TWO LANE ROADWAY WHEN PASSING, TURNING OR CLIMBING LANES LIMIT VISIBILITY.
3. FOR DIMENSIONS A, B AND C, REFER TO THE MUTCD, USE TABLE 6C-1 (RECOMMENDED ADVANCE WARNING SIGN MINIMUM SPACING), FOR SIGN SPACING.

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

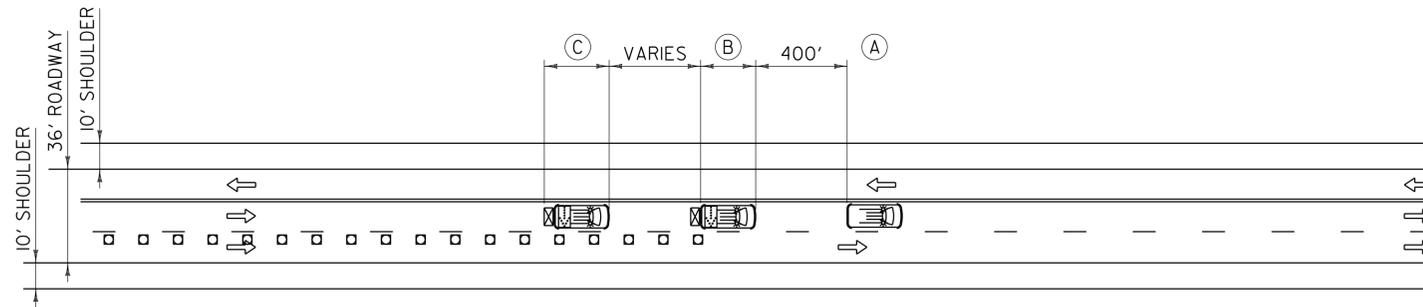
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TRAFFIC CONTROL  
MISCELLANEOUS DETAILS



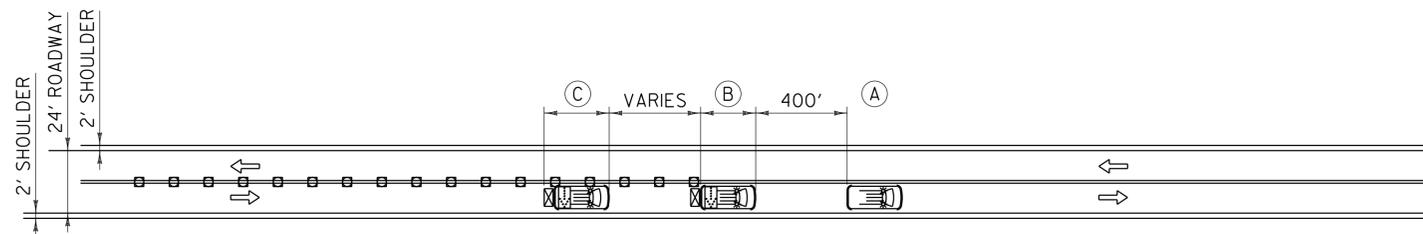
STANDARD  
T-17



**PAVEMENT MARKING OPERATION  
ON MULTI-LANE ROAD**

**NOTES:**

1. PAVEMENT MARKING OPERATION VEHICLE (C) SHOULD TRAVEL AT A VARYING DISTANCE FROM THE PAVEMENT MARKING OPERATION SO AS TO PROVIDE ADEQUATE SIGHT DISTANCE FOR TRAFFIC APPROACHING FROM THE REAR.
2. ON HIGH SPEED ROADWAYS, A THIRD PROTECTION VEHICLE SHOULD BE USED - THE FIRST PROTECTION VEHICLE ON THE SHOULDER (IF POSSIBLE), THE SECOND PROTECTION VEHICLE IN THE CLOSED LANE, AND THE THIRD PROTECTION VEHICLE IN THE CLOSED LANE.
3. ARROW PANELS SHALL BE AS A MINIMUM TYPE B, 60 INCHES BY 30 INCHES (MUTCD FIGURE 6F-6, SECTION 6F.6I).
4. WORK SHOULD BE PERFORMED DURING OFF-PEAK TRAFFIC HOURS WHEN PRACTICAL.



**PAVEMENT MARKING OPERATION  
ON TWO LANE ROAD**

**NOTES:**

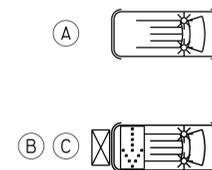
1. ALL PAVEMENT MARKING VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW TRAFFIC TO PASS.
2. THE DISTANCE BETWEEN THE WORK AND PROTECTION VEHICLES MAY VARY ACCORDING TO TERRAIN AND OTHER FACTORS. PROTECTION VEHICLES ARE USED TO WARN TRAFFIC OF THE OPERATION AHEAD.
3. UNIFORMED TRAFFIC OFFICERS MAY BE USED TO CONTROL TRAFFIC AT INTERSECTIONS.
4. VEHICLE MOUNTED SIGNS SHALL BE MOUNTED WITH BOTTOM OF THE SIGN AT A MINIMUM HEIGHT OF ONE FOOT ABOVE THE PAVEMENT. SIGNS SHALL BE COVERED OR TURNED FROM VIEW WHEN WORK IS NOT IN PROGRESS.
5. ARROW PANELS ARE OPTIONAL; WHEN USED ARROW PANELS SHALL BE DISPLAYED IN CAUTION MODE.

- FLOW OF TRAFFIC
- ⚡ FLASHING ARROW PANEL
- ☒ TRUCK MOUNTED ATTENUATOR (TMA)
- CONE
- 🚚 PAVEMENT MARKING OPERATION VEHICLE
- Ⓐ PAVEMENT MARKING VEHICLE WITH FLASHING ARROW PANEL, "WET PAINT WITH LEFT ARROW" VC-886L, "WET PAINT WITH RIGHT ARROW" VC-886R SIGNS.
- Ⓑ PROTECTION VEHICLE WITH CONE CAPABILITIES AND TMA.
- Ⓒ PROTECTION VEHICLE WITH FLASHING ARROW PANEL, TMA, "WET PAINT" VC-885, "WET PAINT WITH LEFT ARROW" VC-886L, "WET PAINT WITH RIGHT ARROW" VC-886R SIGNS.

**GENERAL NOTES:**

1. ALL VEHICLES SHALL DISPLAY HIGH-INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS IN ADDITION TO VEHICLE HAZARD LIGHTS.
2. PROTECTION VEHICLE SHOULD SLOW DOWN IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES THAT RESTRICT SIGHT DISTANCE.
3. SIGNS LOCATED ON PAVEMENT MARKING OPERATION VEHICLES SHALL BE PLACED SO AS NOT TO OBSCURE OTHER SIGNS OR FLASHING ARROW PANELS.
4. REPEAT "WET PAINT" (VC-885) SIGN AS NEEDED AT SIDE ROADS
5. ALL DISTANCES ARE DESIRABLE MINIMUMS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL SPACING OF THE VEHICLES.
6. CONE SPACING SHALL BE ADEQUATE SO THAT DRIVERS CAN ALWAYS SEE ONE CONE.

**OTHER STDS. REQUIRED: T-1, T-29**



**OPERATION VEHICLE  
SYMBOLGY**

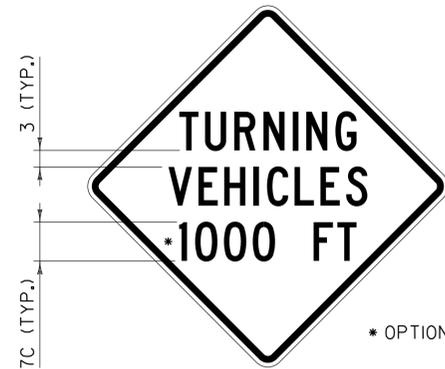
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TRAFFIC CONTROL FOR  
MAINTENANCE PAVEMENT  
MARKING OPERATION

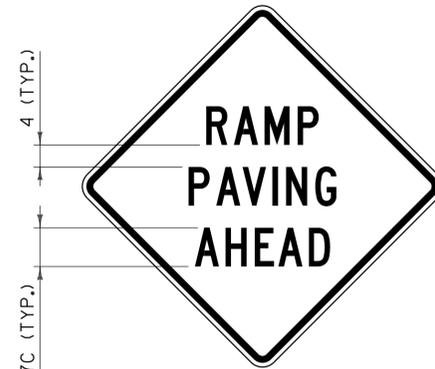


STANDARD  
T-24

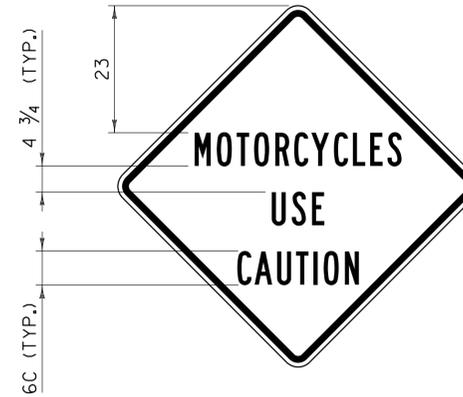


**VC-001**

\* OPTIONS { 500  
1500



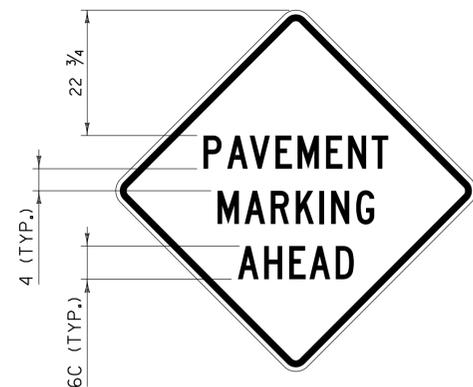
**VC-003**



**VC-004**



**VC-008**



**VC-813**



**VC-869**

\* OPTIONS { AHEAD  
LEFT  
RIGHT



**VC-874**

**GENERAL NOTES:**

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

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

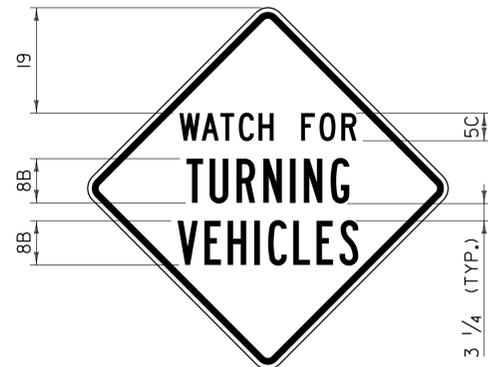
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CONSTRUCTION SIGN  
DETAILS



STANDARD  
T-28



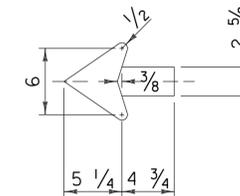
**VC-883**



**VC-885**



**VC-886L**



**VC-886R**

**NOTES:**

1. SIGNS SHALL BE 24 INCH BY 24 INCH. IF SOLID SUBSTRATE SIGNS ARE USED, SIGNS SHALL HAVE CORNERS ROUNDED TO A 1 1/2 INCH RADIUS.
2. SIGNS SHALL HAVE 5/8 INCH WIDE BORDERS THAT ARE INDENTED 3/8 INCH FROM THE EDGE OF THE SIGN.



**VC-887**

**GENERAL NOTES:**

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

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

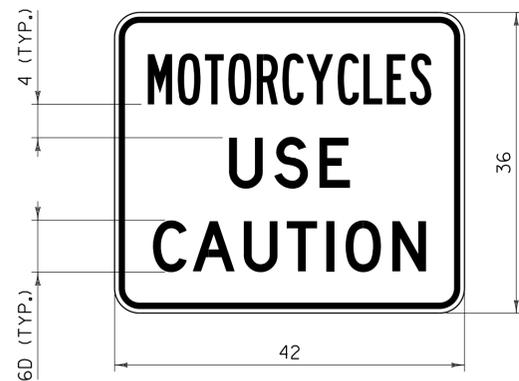
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CONSTRUCTION SIGN  
DETAILS



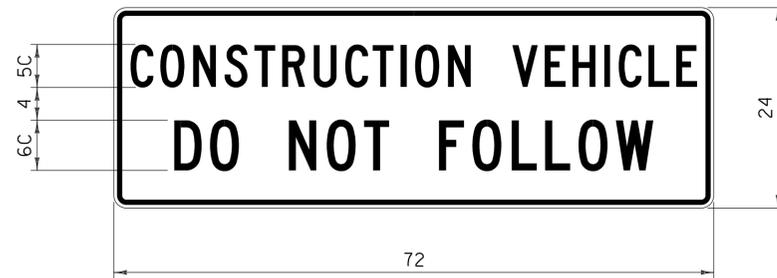
STANDARD  
T-29



**VC-004P**

**NOTES:**

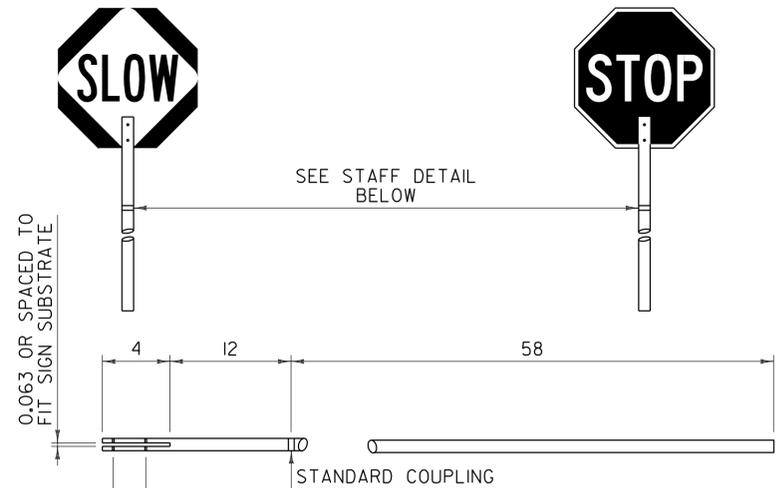
1. CORNERS SHALL BE ROUNDED TO A THREE INCH RADIUS.
2. THE BORDER SHALL BE 3/4 INCH WIDE WITH A 1/2 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "MOTORCYCLES" SHALL HAVE A SPECIFIED WIDTH OF 34 INCHES.
4. "USE" SHALL HAVE A SPECIFIED WIDTH OF 14 1/2 INCHES.
5. "CAUTION" SHALL HAVE A SPECIFIED WIDTH OF 32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



**VC-007**

**NOTES:**

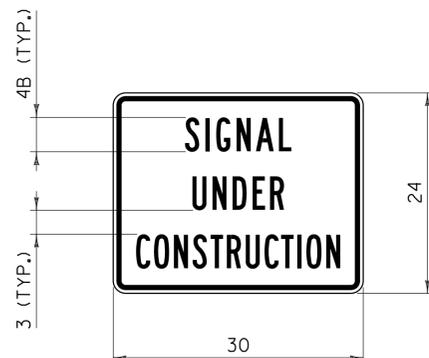
1. CORNERS SHALL BE ROUNDED TO A 1 1/2 INCH RADIUS.
2. THE BORDER SHALL BE 5/8 INCH WIDE WITH A 3/8 INCH INDENT FROM THE EDGE OF THE SIGN.
3. "CONSTRUCTION VEHICLE" SHALL HAVE A SPECIFIED WIDTH OF 68 INCHES.
4. "DO NOT FOLLOW" SHALL HAVE A SPECIFIED WIDTH OF 57 1/2 INCHES.
5. SIGN SHALL BE MOUNTED IN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



**STOP-SLOW PADDLE & STAFF DETAIL**

**NOTES:**

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



**VC-820**

**NOTES:**

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

**GENERAL NOTES:**

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

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

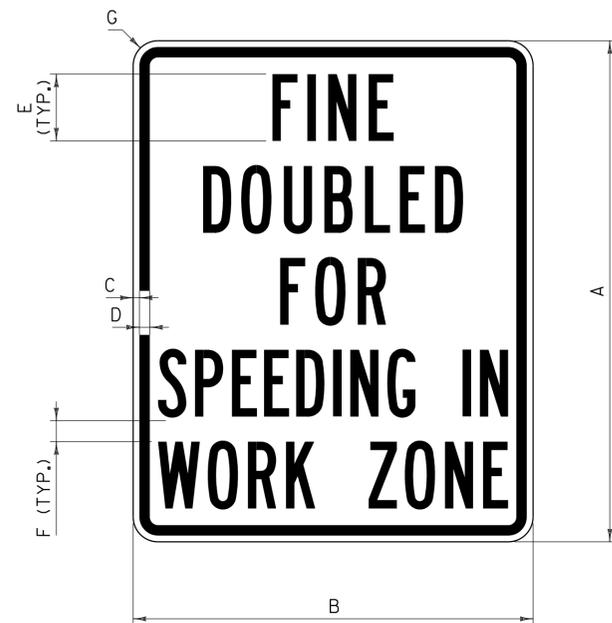
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**CONSTRUCTION SIGN  
DETAILS**



**STANDARD  
T-30**

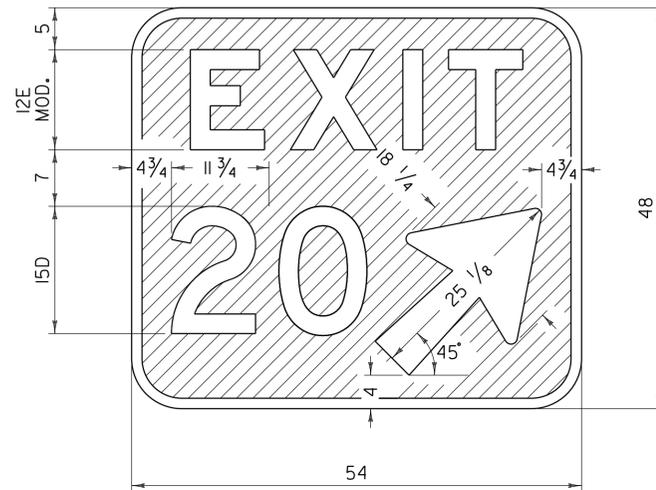


**VR-355**

SIGN	DIMENSIONS						
	A	B	C	D	E	F	G
STANDARD	36	30	1/2	3/4	4C	2 1/4	1 7/8
EXPRESSWAY/ FREEWAY	60	48	3/4	1 1/4	8B	3	3

**NOTES:**

- "SPEEDING IN" AND "WORK ZONE" SHALL EACH HAVE A SPECIFIED WIDTH OF 26 INCHES FOR STANDARD AND 42 INCHES FOR EXPRESSWAY/FREEWAY.
- THE SIGN SHALL HAVE BLACK LEGEND AND BORDER ON A WHITE BACKGROUND WITH RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE III.
- LEGEND SHALL BE CENTERED HORIZONTALLY AND VERTICALLY.



**VC5-1A**

**NOTES:**

- THE SIGN SHALL BE WHITE RETROREFLECTIVE LEGEND ON A GREEN RETROREFLECTIVE BACKGROUND. BOTH SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) M 268 ["AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956] TYPE III.
- CORNERS SHALL BE ROUNDED TO A SIX INCH RADIUS.
- THE SIGN SHALL HAVE A 1/4 INCH WIDE BORDER ALONG THE EDGE OF THE SIGN.
- EXIT NUMBER SHALL BE AS PER PLANS, OPTICALLY SPACED.
- "EXIT" SHALL BE CENTERED HORIZONTALLY.

**GENERAL NOTES:**

- ALL DIMENSIONS IN INCHES.

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

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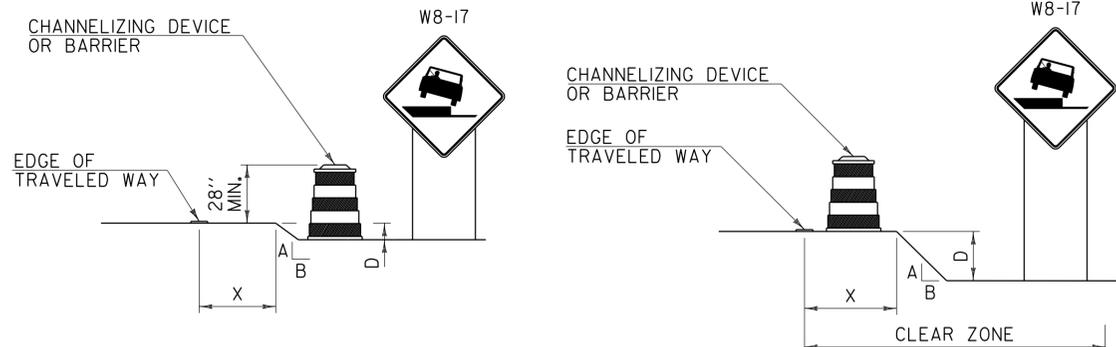
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CONSTRUCTION SIGN  
DETAILS



STANDARD  
T-31

**DROP-OFF ADJACENT TO TRAVELED WAY**



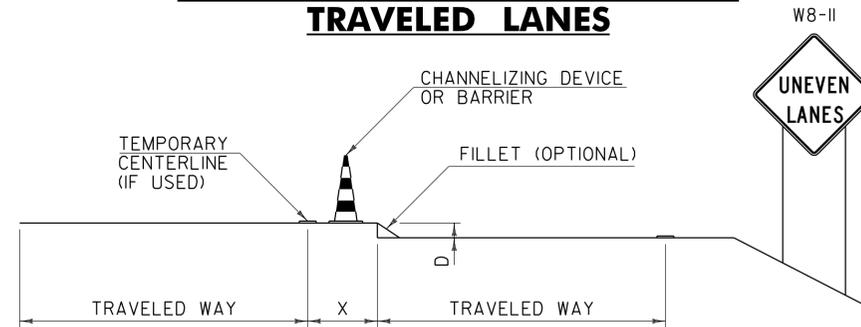
**TYPE 1**

**TYPE 2**

**NOTES:**

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

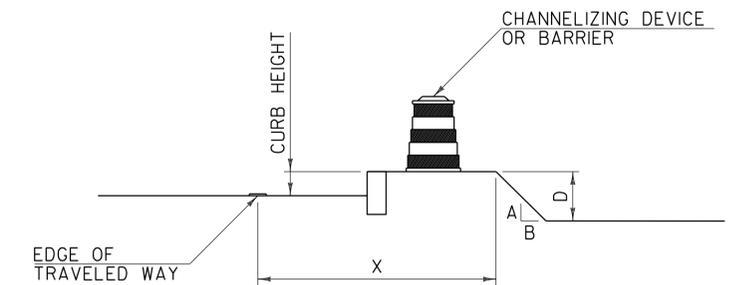
**DROP-OFF BETWEEN ADJACENT TRAVELED LANES**



**NOTES:**

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

**DROP-OFF BEYOND SHOULDER OR CURB**



**NOTES:**

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

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

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

**NOTES:**

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

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

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

**GENERAL NOTES:**

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

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

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

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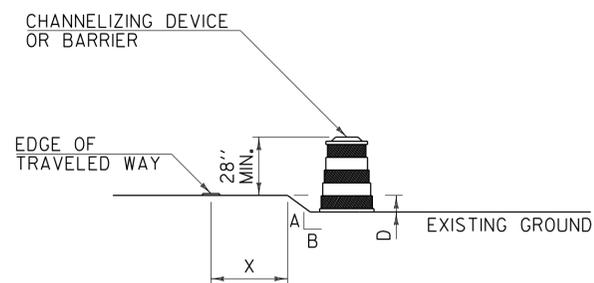
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**CONSTRUCTION ZONE  
LONGITUDINAL DROP-OFFS**



**STANDARD  
T-35**

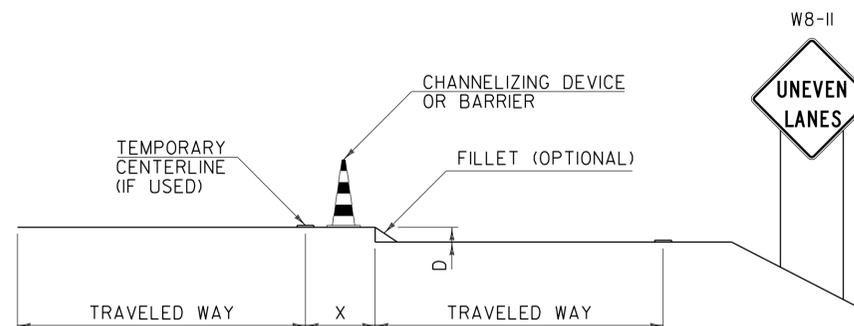
**DROP-OFF ADJACENT TO TRAVELED WAY**



**NOTES:**

1. CHANNELIZING DEVICES SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELED WAY.
2. SEE CHART "A" FOR SPECIFIC REQUIREMENTS.
3. IF THE DROP-OFF REQUIRES CHANNELIZING DEVICES TO REMAIN IN PLACE OVERNIGHT, THEN "LOW SHOULDER" (W8-9) OR "SHOULDER DROP-OFF SYMBOL" (W8-17) SIGNS SHOULD BE INSTALLED.

**DROP-OFF BETWEEN ADJACENT TRAVELED LANES**



**NOTES:**

1. WHENEVER A LONGITUDINAL DROP-OFF BETWEEN ADJACENT TRAVELED LANES IS TO BE LEFT OVERNIGHT, THEN "UNEVEN LANES" (W8-II) SIGNS AND CHANNELIZING DEVICES SHOULD BE INSTALLED.
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. A BITUMINOUS CONCRETE FILLET WITH A 1.5:1 SLOPE MAY BE USED IN PLACE OF CHANNELIZING DEVICES, HOWEVER THE "UNEVEN LANES" (W8-II) SIGNS SHOULD STILL BE INSTALLED.
4. SEE CHART "A" FOR SPECIFIC REQUIREMENTS.

**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"	1:1.5 OR FLATTER STEEPER THAN 1:1.5	NONE CHANNELIZING DEVICE
	GREATER THAN 6"	1:3 OR FLATTER STEEPER THAN 1:3	NONE BARRIER
4' TO 10'	LESS THAN 6"	ANY	NONE
	6" TO 12"	1:3 OR FLATTER STEEPER THAN 1:3	NONE BARRIER

**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 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) COMPLIANT CHANNELIZING DEVICES:
  - A. VERTICAL PANEL
  - B. TYPE I OR TYPE II BARRICADE
  - C. PLASTIC DRUM
  - D. CONE - WHERE APPLICABLE
  - E. TUBULAR MARKERS

IF CHANNELIZING DEVICES ARE REQUIRED TO STAY IN PLACE DURING NIGHTTIME HOURS, THEY SHALL BE STABILIZED WHILE UNATTENDED IN ACCORDANCE WITH THE MUTCD.
3. WHERE BARRIER IS NECESSARY, THE BARRIER SHALL BE TAPERED BEYOND THE CLEAR ZONE. WHEN THE BARRIER CANNOT BE TAPERED BEYOND THE CLEAR ZONE, A MUTCD COMPLIANT END TREATMENT SHALL BE USED. BARRIER AND END TREATMENT SHALL MEET "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 OR THE "AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS" (AASHTO) "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH). THE APPROPRIATE RESOURCE SHALL BE DETERMINED AS DESCRIBED IN THE MASH PUBLICATION.
4. CHANNELIZING DEVICE SPACING ALONG A LONGITUDINAL DROP-OFF (TANGENT) SHALL BE AS FOLLOWS:
 

TANGENT - CHANNELIZING DEVICES SHALL BE SPACED "2S"  
("S" IS EQUAL TO THE POSTED SPEED LIMIT IN FEET) APART.
5. "LOW SHOULDER" (W8-9) AND "SHOULDER DROP-OFF SYMBOL" (W8-17) SIGNS, WHEN USED, SHOULD BEGIN PRIOR TO THE DROP-OFF CONDITION AND SHOULD BE REPEATED EVERY 1500 FEET.

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

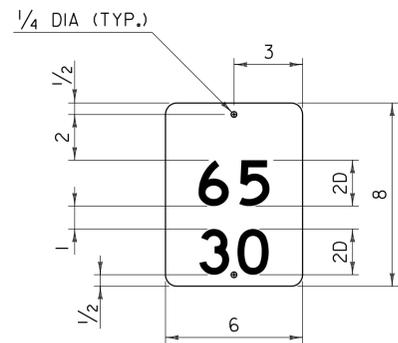
REVISIONS AND CORRECTIONS  
AUG. 6, 2012 - ORIGINAL APPROVAL DATE

APPROVED  
*W.A.C.M.*  
HIGHWAY SAFETY & DESIGN ENGINEER  
*Rickard Stewart*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

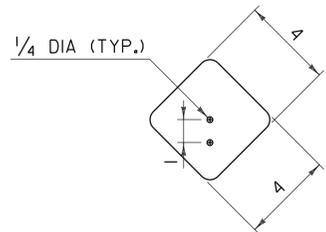
**CONSTRUCTION ZONE  
LONGITUDINAL DROP-OFFS  
FOR PAVING**



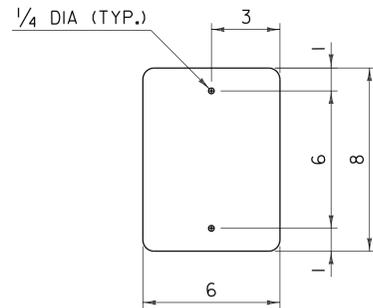
**STANDARD  
T-36**



**INTERSTATE MILEPOST PLAQUE**



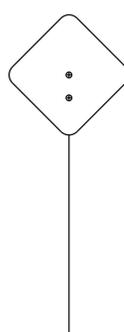
**TYPE I DELINEATOR**



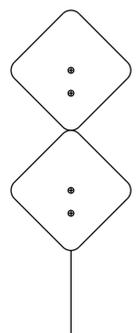
**TYPE II DELINEATOR**

**GENERAL NOTES:**

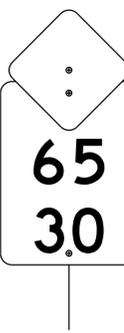
1. THE FIRST LINE OF TEXT ON INTERSTATE MILEPOST PLAQUES INDICATES THE WHOLE NUMBER MILEAGE FROM THE BEGINNING OF A ROUTE. MILEAGE IS ALWAYS MEASURED TRAVELING FROM THE SOUTH TO NORTH OR FROM THE WEST TO EAST. THE ROUTE DIRECTION IS ESTABLISHED USING THE VERMONT AGENCY OF TRANSPORTATION (VAOT) ROUTE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



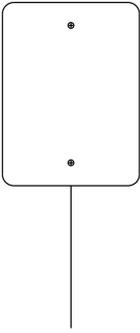
**TYPE I**



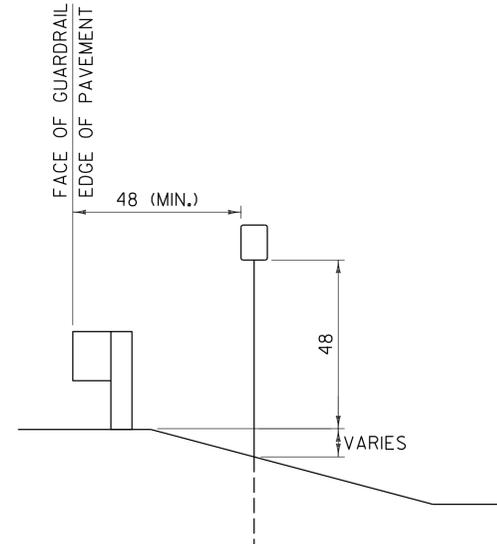
**TYPE I - U-TURNS**



**WHITE TYPE I WITH MILEPOST PLAQUE**



**TYPE II**



**INSTALLATION DETAIL\***

\* INSTALLATION DETAIL APPLICABLE TO ALL DELINEATOR ASSEMBLIES

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

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

APPROVED  
*W.A.C. [Signature]*  
HIGHWAY SAFETY & DESIGN ENGINEER  
*Rubén [Signature]*  
DIRECTOR OF PROGRAM DEVELOPMENT  
*Mark D. Richter*  
FEDERAL HIGHWAY ADMINISTRATION

**DELINEATORS AND MILEPOSTS**



**STANDARD  
T-40**

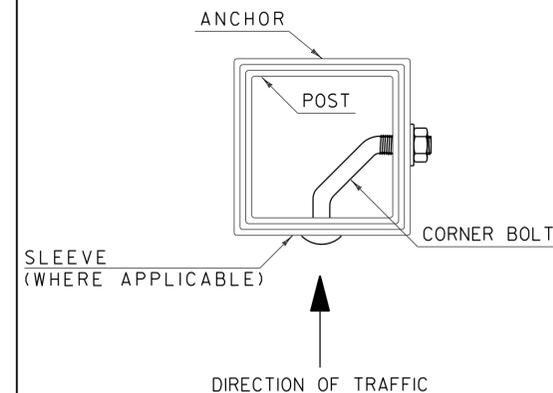
## POST AND ANCHOR SELECTION CHART

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

### NOTES:

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

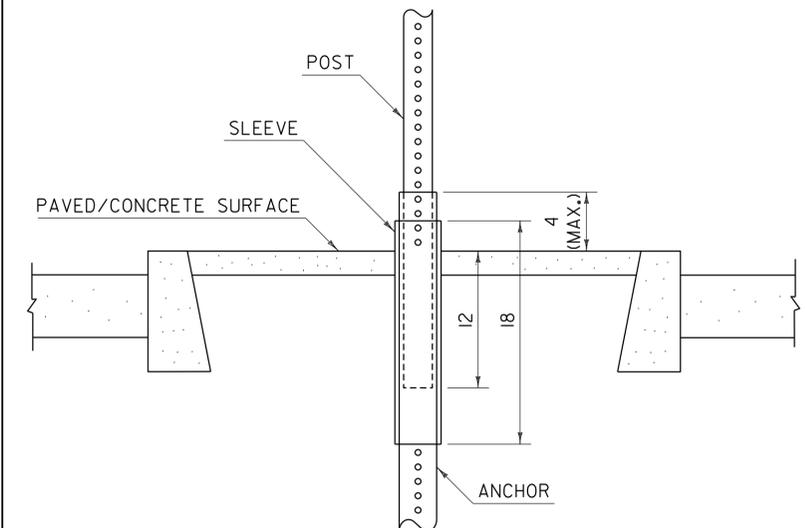
### CORNER BOLT INSTALLATION DETAIL



### NOTES:

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

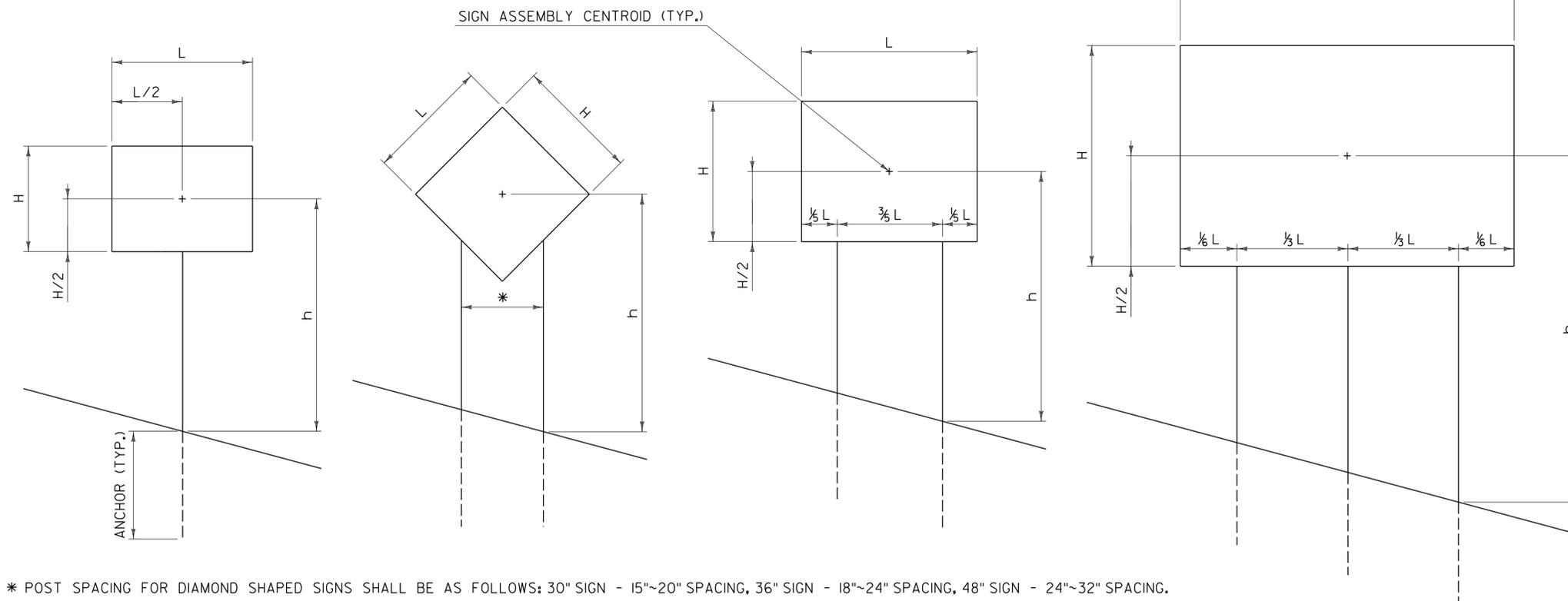
### SLEEVE /ANCHOR INSTALLATION DETAIL



### NOTES:

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

### POST SPACING DETAILS



\* POST SPACING FOR DIAMOND SHAPED SIGNS SHALL BE AS FOLLOWS: 30" SIGN - 15"~20" SPACING, 36" SIGN - 18"~24" SPACING, 48" SIGN - 24"~32" SPACING.

### GENERAL NOTES:

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

**OTHER STDS. REQUIRED: NONE**

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

APPROVED  
*[Signature]*  
HIGHWAY SAFETY & DESIGN ENGINEER  
*[Signature]*  
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MARK B. RICHTER  
FEDERAL HIGHWAY ADMINISTRATION

## SQUARE TUBE SIGN POST AND ANCHOR



# STANDARD T-45