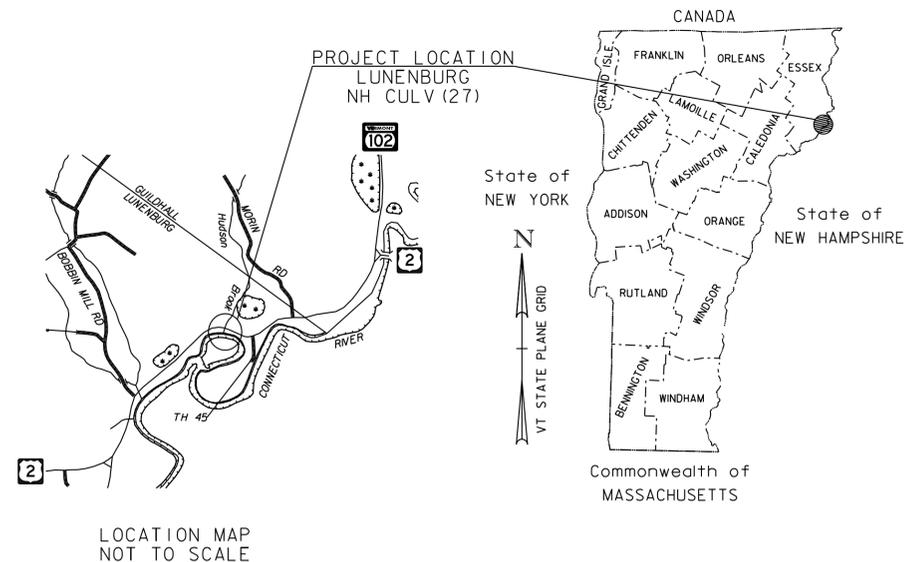


STATE OF VERMONT
 AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
 BRIDGE PROJECT
 TOWN OF LUNENBURG
 COUNTY OF ESSEX

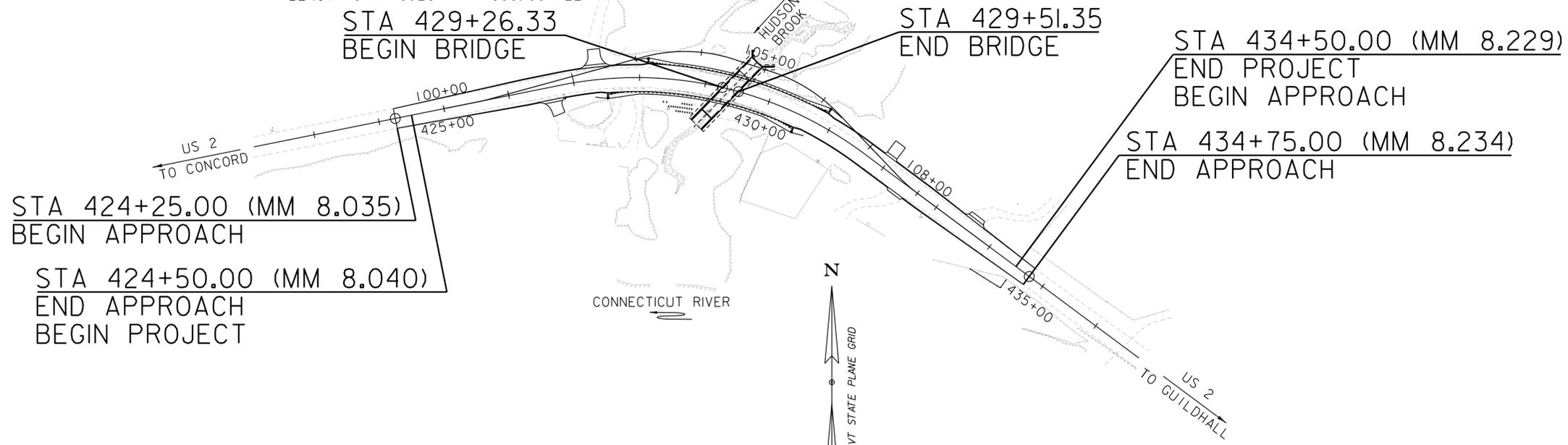
US ROUTE 2 (RURAL PRINCIPAL ARTERIAL - NHS) BRIDGE NO. 126



PROJECT LOCATION: LOCATED IN THE TOWN OF LUNENBURG, ON US ROUTE 2, APPROXIMATELY 0.90 MILES WEST OF THE LUNENBURG/GUILDHALL TOWN LINE.

PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES REPLACEMENT OF THE EXISTING CULVERT, CHANNEL WORK, AND ASSOCIATED ROADWAY IMPROVEMENTS.

LENGTH OF ROADWAY: 974.98 FEET
 LENGTH OF STRUCTURE: 25.02 FEET
 LENGTH OF PROJECT: 1000.00 FEET



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

QUALITY ASSURANCE PROGRAM : LEVEL I
SURVEYED BY : VSE
SURVEYED DATE : 02/27/2012
DATUM
VERTICAL NAVD 88
HORIZONTAL NAD83



**LUNENBURG
 NH CULV(27)
 FINAL PLANS
 DECEMBER 16, 2014**

 540 Commercial Street Manchester, NH 03101 (603) 668-8223 www.cldengineers.com	DIRECTOR OF PROJECT DELIVERY
	APPROVED _____ DATE _____
	PROJECT MANAGER : DAN LANDRY, P. E.
	PROJECT NAME : LUNENBURG PROJECT NUMBER : NH CULV(27)
SHEET 1 OF 73 SHEETS	

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15 - 16	TIE SHEETS
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18 - 19	ROW LAYOUT SHEETS
20 - 21	LAYOUT SHEETS
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STRUCTURES DETAILS

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

STANDARDS LIST

B-71	STANDARD FOR RESIDENTIAL AND COMMERCIAL DRIVES	07-08-2005
D-30	UNDERDRAIN CONSTRUCTION DETAILS	08-13-2007
E-119	UTILITY WORK ZONE	03-01-2004
E-123	GUIDE SIGN PLACEMENT - MISCELLANEOUS DETAILS	03-16-2004
E-193	PAVEMENT MARKING DETAILS	08-18-1995
G-1	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	11-15-2002
G-1d	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	01-04-2000
G-19	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	01-03-2000
J-3	MAIL BOX SUPPORT DETAILS	08-07-1995
T-1	TRAFFIC CONTROL GENERAL NOTES	08-06-2012
T-17	TRAFFIC CONTROL MISCELLANEOUS DETAILS	08-06-2012
T-24	TRAFFIC CONTROL FOR MAINTENANCE PAVEMENT MARKING OPERATION	08-06-2012
T-28	CONSTRUCTION SIGN DETAILS	08-06-2012
T-29	CONSTRUCTION SIGN DETAILS	08-06-2012
T-30	CONSTRUCTION SIGN DETAILS	08-06-2012
T-31	CONSTRUCTION SIGN DETAILS	08-06-2012
T-35	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS	08-06-2012
T-36	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS FOR PAVING	08-06-2012
T-40	DELINEATORS AND MILEPOSTS	01-02-2013
T-42	BRIDGE NUMBER PLAQUE	04-09-2014
T-45	SQUARE TUBE SIGN POST AND ANCHOR	01-02-2013

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: JUNE 3, 2013

DRAINAGE AREA : 3.2 SQ. MI.
 CHARACTER OF TERRAIN : HILLY TO MOUNTAINOUS
 STREAM CHARACTERISTICS : SINUOUS ALLUVIAL CHANNEL
 NATURE OF STREAMBED : FINE SAND & SILTS W/ RIFFLE/POOL BED MORPHOLOGY

PEAK FLOW DATA

Q 2.33 =	130 CFS	Q 50 =	470 CFS
Q 10 =	300 CFS	Q 100 =	550 CFS
Q 25 =	400 CFS	Q 500 =	710 CFS

DATE OF FLOOD OF RECORD : AUGUST 2011 (TROPICAL STORM IRENE)
 ESTIMATED DISCHARGE : UNKNOWN
 WATER SURFACE ELEV. : UNKNOWN
 NATURAL STREAM VELOCITY : @ Q50 = 10.0 FPS
 ICE CONDITIONS : HEAVY
 DEBRIS : HEAVY
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? NO
 IS ORDINARY RISE RAPID? NO
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? NO
 IF YES, DESCRIBE:

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE : 30-INCH IRON PIPE WITH 27-INCH EXT. AND 4X4 BOX EXT.
 YEAR BUILT : UNKNOWN
 CLEAR SPAN(NORMAL TO STREAM): 27 INCH
 VERTICAL CLEARANCE ABOVE STREAMBED: 27 INCH
 WATERWAY OF FULL OPENING: 4 SQ. FT.
 DISPOSITION OF STRUCTURE: REMOVAL
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: SEE BORINGS

WATER SURFACE ELEVATIONS AT:

Q2.33 =	*	VELOCITY =	*
Q10 =	*	"	*
Q25 =	*	"	*
Q50 =	*	"	*
Q100 =	*	"	*

LONG TERM STREAMBED CHANGES: UPSTREAM CHANNEL IS SIGNIFICANTLY WIDER THAN THE DOWNSTREAM CHANNEL AND HAS A LARGE SCOUR HOLE.

IS THE ROADWAY OVERTOPPED BELOW Q100: *
 FREQUENCY: *
 RELIEF ELEVATION: 855.3 FT
 DISCHARGE OVER ROAD @Q100: *

UPSTREAM STRUCTURE

TOWN: GUILDHALL DISTANCE: 1.7 MI
 HIGHWAY #: MORIN ROAD STRUCTURE #: UNKNOWN
 CLEAR SPAN: UNKNOWN CLEAR HEIGHT: UNKNOWN
 YEAR BUILT: UNKNOWN FULL WATERWAY: UNKNOWN
 STRUCTURE TYPE: UNKNOWN

DOWNSTREAM STRUCTURE

TOWN: LUNENBURG DISTANCE: 0.1 MI
 HIGHWAY #: N/A STRUCTURE #: N/A
 CLEAR SPAN: N/A CLEAR HEIGHT: N/A
 YEAR BUILT: N/A FULL WATERWAY: N/A
 STRUCTURE TYPE: N/A DUE TO CONFLUENCE WITH CONNECTICUT RIVER

LRFR LOAD RATING FACTORS*

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A STR.	4A STR.	5A SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:							

* LRFR LOAD RATING FACTORS TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER.

PILE DRIVING AND TESTING REQUIREMENTS

- NOMINAL PILE DRIVING CAPACITY R_{pdr} : 150.00 KIP
- PILE TEST RESISTANCE FACTOR ϕ : ---
- MAXIMUM PILE TIP ELEVATION: 817.00 FT
-

PROPOSED STRUCTURE

STRUCTURE TYPE: PRECAST CONCRETE ARCH ON MAT FOUNDATION

CLEAR SPAN(NORMAL TO STREAM): 20 FT
 VERTICAL CLEARANCE ABOVE STREAMBED: 7.5 FT
 WATERWAY OF FULL OPENING: 115 SF

WATER SURFACE ELEVATIONS AT:

Q2.33 =	836.3 FT	VELOCITY =	5.8 FPS
Q10 =	838.1 FT	"	8.7 FPS
Q25 =	839.0 FT	"	9.9 FPS
Q50 =	839.6 FT	"	10.1 FPS
Q100 =	840.2 FT	"	10.5 FPS

IS THE ROADWAY OVERTOPPED BELOW Q100: NO
 FREQUENCY: N/A
 RELIEF ELEVATION: 856.1 FT
 DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 840.2 FT OUTLET (841.5 FT INLET)
 VERTICAL CLEARANCE: @ Q50 = 1.2 FT AT OUTLET (1.9 FT AT INLET)

SCOUR: CONTRACTION SCOUR 1 FT

REQUIRED CHANNEL PROTECTION: TYPE IV STONE FILL

PERMIT INFORMATION

AVERAGE DAILY FLOW: 30 CFS DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 15 CFS 834.7 FT
 ORDINARY HIGH WATER: 55 CFS 835.2 FT

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: TEMPORARY BRIDGE (SEE NOTE ON PI SHEET)
 CLEAR SPAN (NORMAL TO STREAM): 4 FT
 VERTICAL CLEARANCE ABOVE STREAMBED: 838.1 FT AT INLET
 WATERWAY AREA OF FULL OPENING: 46 SF

ADDITIONAL INFORMATION

* THE EXISTING CULVERT IS SEVERELY UNDERSIZED AND HEC-RAS MODEL DOES NOT ACCURATELY REFLECT EXISTING CONDITIONS. THE ONLY TIME THE ROAD HAS BEEN OVERTOPPED ACCORDING TO LOCAL OBSERVATIONS WAS DURING TROPICAL STORM IRENE.

TRAFFIC MAINTENANCE NOTES

- MAINTAIN ONE-WAY TRAFFIC ON A TEMPORARY BRIDGE.
- INSTALL AND MAINTAIN TRAFFIC SIGNALS.
- SIDEWALKS ARE NOT NECESSARY
- THE APPROACHES FOR THE TEMPORARY BRIDGE SHALL BE PAVED.

DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d_p : 8.0 INCH
3. DESIGN SPAN	L: 20.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ : ---
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f_y : 270 KSI
6. PRESTRESSED CONCRETE STRENGTH	f'_c : 6.0 KSI
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{cr} : 5.0 KSI
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'_c : 4.0 KSI
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'_c : 4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'_c : 3.5 KSI
11. CONCRETE, CLASS C	f'_c : 3.0 KSI
12. REINFORCING STEEL	f_y : 60 KSI
13. STRUCTURAL STEEL AASHTO M270 (WEATHERING)	f_y : 50 KSI
14. SOIL UNIT WEIGHT	γ : 0.125 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q_n : 2.5 KSF
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ : 0.45
17. NOMINAL BEARING RESISTANCE OF ROCK	q_n : ---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ : ---
19. NOMINAL AXIAL PILE RESISTANCE	q_p : ---
20. PILE YIELD STRENGTH ASTM A572	f_y : 50 KSI
21. PILE SIZE	HP 14X 89
22. EST. PILE LENGTHS (THREE SLOPE OFFSET LOCATIONS)	L: ---
(SLOPE 35.3' RT = 33, SLOPE 41.4' RT = 30 AND SLOPE 45.4' RT = 27) FT	
23. PILE RESISTANCE FACTOR	ϕ : ---
24. LATERAL PILE DEFLECTION	Δ : 2.42 INCH
25. BASIC WIND SPEED	V_{3s} : ---
26. MINIMUM GROUND SNOW LOAD	p_g : ---
27. SEISMIC DATA	PGA: 8 %g Ss: 18 %g St: 5 %g

PROJECT NAME: LUNENBURG

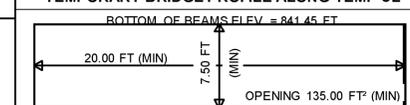
PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/zlb294pi.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: S. BEAUMONT
 DESIGNED BY: S. BEAUMONT CHECKED BY: J. BYATT
 PRELIMINARY INFORMATION SHEET SHEET 2 OF 73

NOTE:
 THE TEMPORARY BRIDGE AS SHOWN IN THESE PLANS WAS DESIGNED FOR TRAFFIC CONTROL PURPOSES ONLY AND WILL MORE THAN MEET THE MINIMUM HYDRAULIC REQUIREMENTS SPECIFIED ON THIS SHEET. AN ALTERNATE METHOD OF BYPASSING STREAM FLOW THROUGH THE PROJECT AREA WILL BE REQUIRED FOR THE DURATION OF THE PROJECT AND SHALL BE DESIGNED BY THE CONTRACTOR TO MEET THE MINIMUM REQUIREMENTS SPECIFIED IN THE VTRANS HYDRAULICS MANUAL.

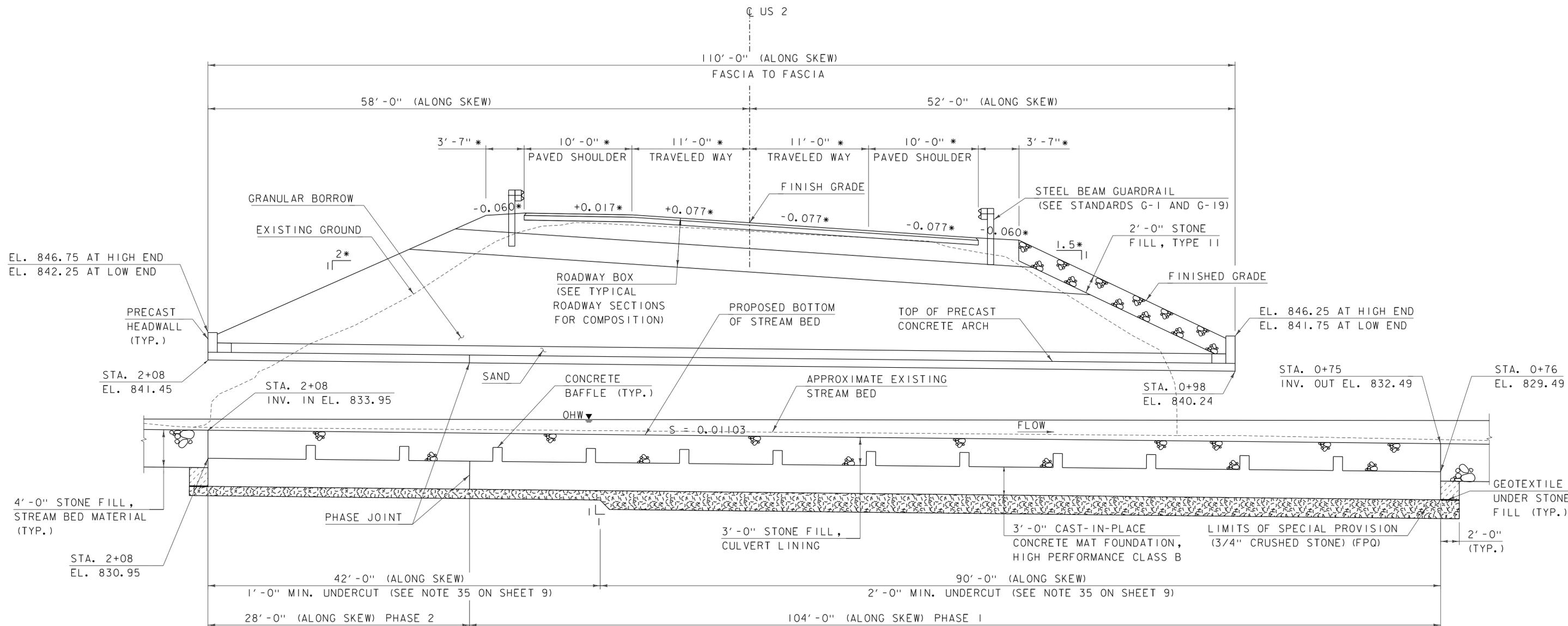
AS BUILT "REBAR" DETAIL		
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

TEMPORARY BRIDGE PROFILE ALONG TEMP CL



TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT	20 year ESAL for flexible pavement from 2014 to 2034 : 4615000
2014	2600	320	57	11.9	400	40 year ESAL for flexible pavement from 2014 to 2054 : 10053000
2024	2700	330	57	13.7	480	Design Speed : 50 mph



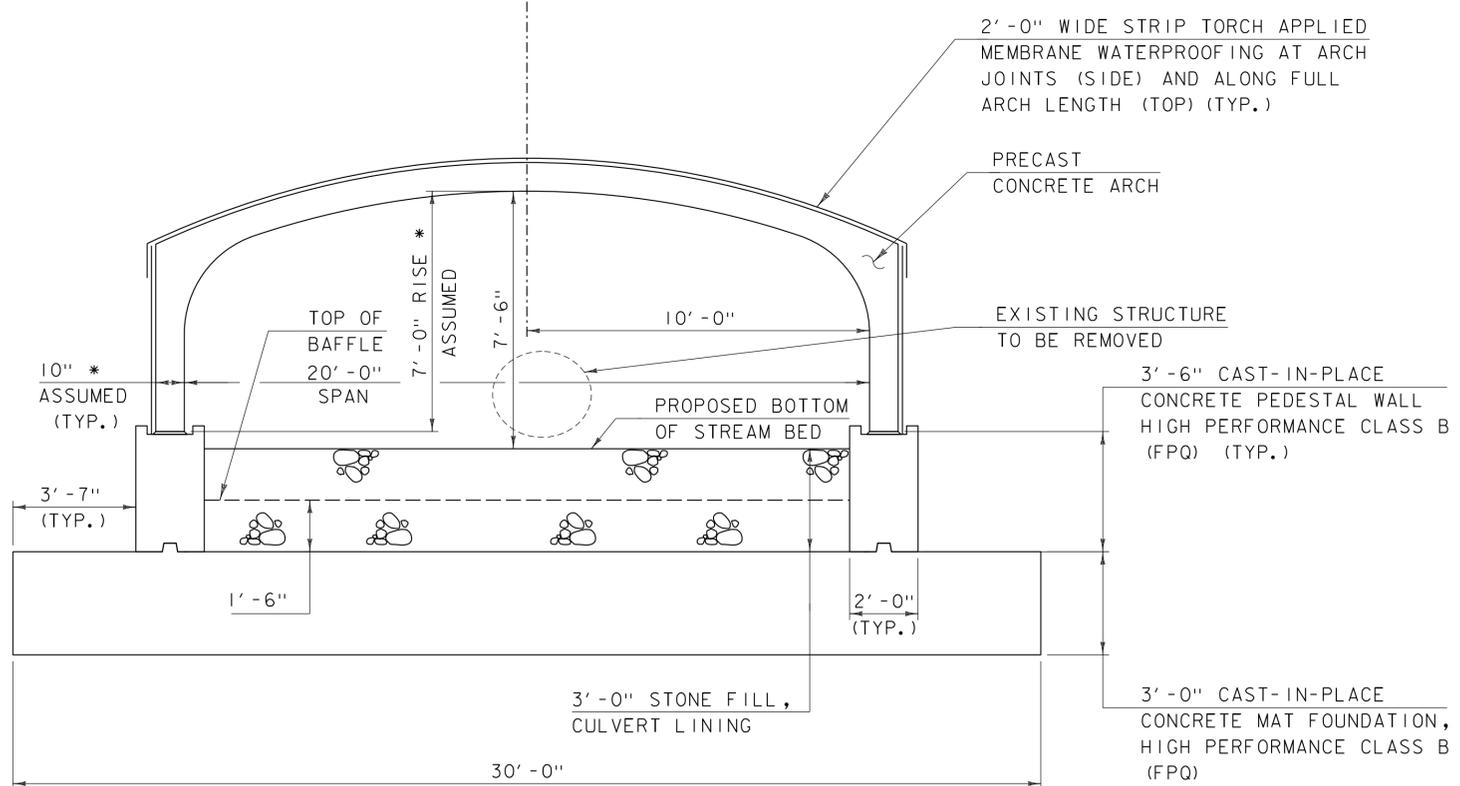
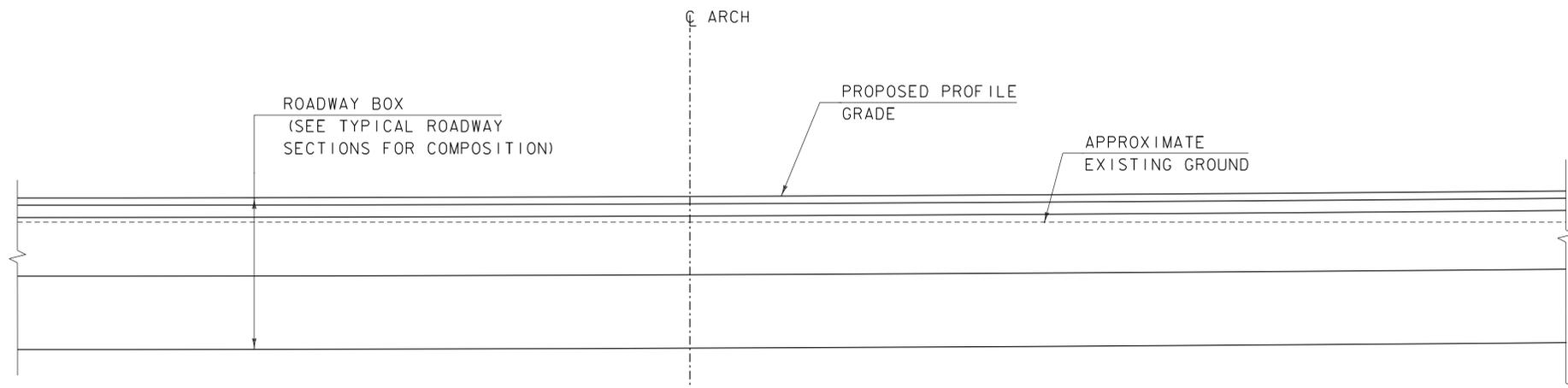
TYPICAL LONGITUDINAL BRIDGE SECTION
 (SHOWN ALONG \bar{C} OF ARCH)
 SCALE: $\frac{3}{16}$ " = 1'-0"

NOTES:
 * DIMENSIONS AND SLOPES GIVEN PERPENDICULAR TO ROADWAY \bar{C}

PROJECT NAME:	LUNENBURG	FILE NAME:	l1b294/cos/z11b294sub.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. SMITH
		DESIGNED BY:	S. BEAUMONT	CHECKED BY:	J. BYATT
		TYPICAL BRIDGE SECTION SHEET 1		SHEET	3 OF 73



CLD 12-0106 MODEL: Sheet 01



PRECAST CONCRETE STRUCTURE TYPICAL SECTION

SCALE: $\frac{3}{8}$ " = 1'-0"

NOTES:

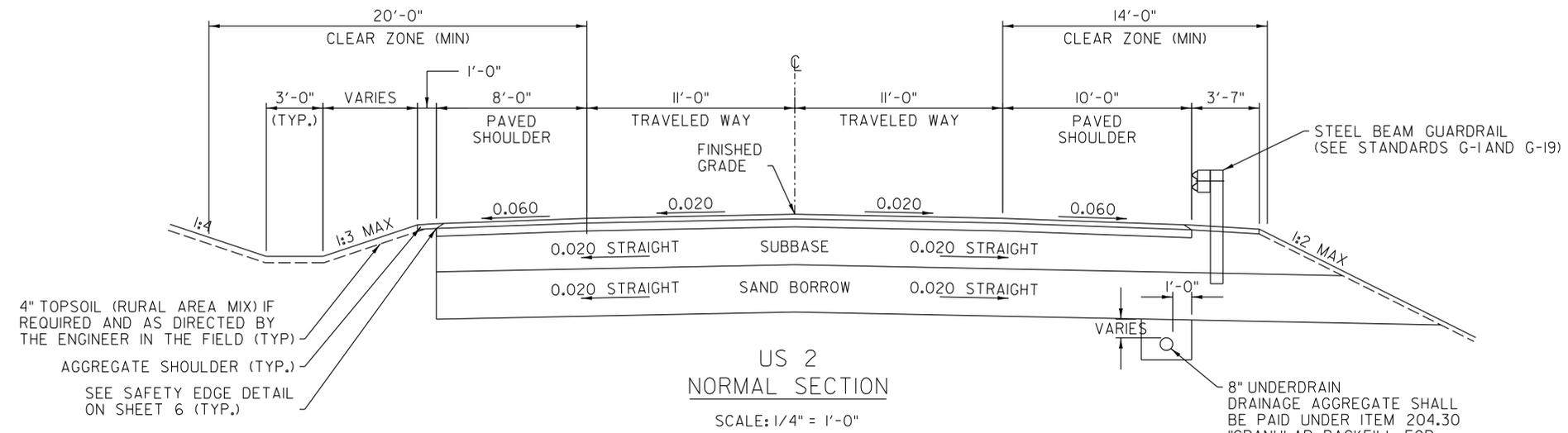
* SEE PRECAST CONCRETE ARCH NOTES ON SHEET 10.



PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: M. SMITH
FILE NAME: l1b294/cos/z1b294sub.dgn	CHECKED BY: J. BYATT
PROJECT LEADER: J. BYATT	SHEET 4 OF 73
DESIGNED BY: S. BEAUMONT	TYPICAL BRIDGE SECTION SHEET 2

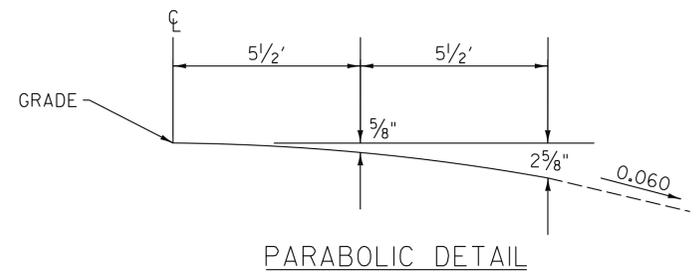
CLD_12-0106 MODEL: Sheet02

- 3" BITUMINOUS CONCRETE PAVEMENT (2-1½" LIFTS) (TYPE IVS)
- 5" BITUMINOUS CONCRETE PAVEMENT (2-2½" LIFTS) (TYPE IIS)
- 24" SUBBASE OF DENSE GRADED CRUSHED STONE
- 30" SAND BORROW

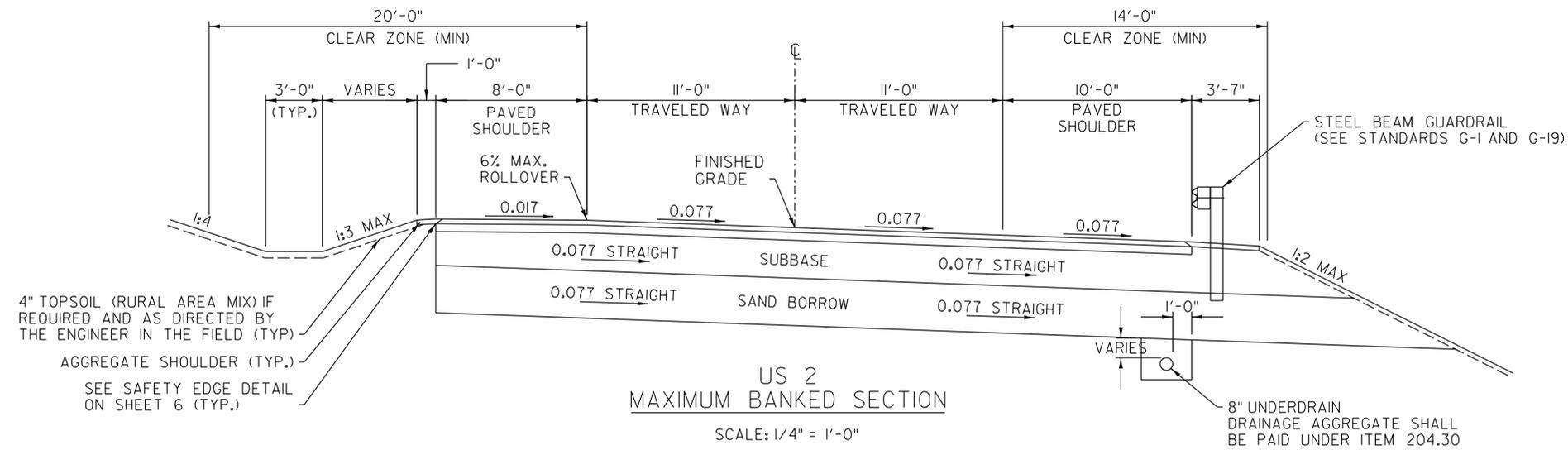


MATERIAL TOLERANCES
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"



- 3" BITUMINOUS CONCRETE PAVEMENT (2-1½" LIFTS) (TYPE IVS)
- 5" BITUMINOUS CONCRETE PAVEMENT (2-2½" LIFTS) (TYPE IIS)
- 24" SUBBASE OF DENSE GRADED CRUSHED STONE
- 30" SAND BORROW



NOTE

THE CONTRACTOR MAY SUBSTITUTE SUBBASE MATERIAL FOR THE SAND BORROW SHOWN ON THE PLANS. THE SUBBASE MATERIAL SHALL BE THE TYPE SPECIFIED IN THE CONTRACT AND SHALL BE PLACED TO MEET THE SUBBASE SPECIFICATIONS. IF SUBBASE IS PLACED IN LIEU OF SAND BORROW, A GEOTEXTILE MEETING THE REQUIREMENTS OF ITEM 649.11 "GEOTEXTILE FOR ROAD BED SEPARATOR" SHALL BE PLACED BETWEEN THE SUBGRADE AND THE SUBBASE MATERIAL. ALL COSTS ASSOCIATED WITH THE SUBSTITUTION INCLUDING THE GEOTEXTILE SHALL BE INCIDENTAL TO ITEM 203.31 "SAND BORROW".

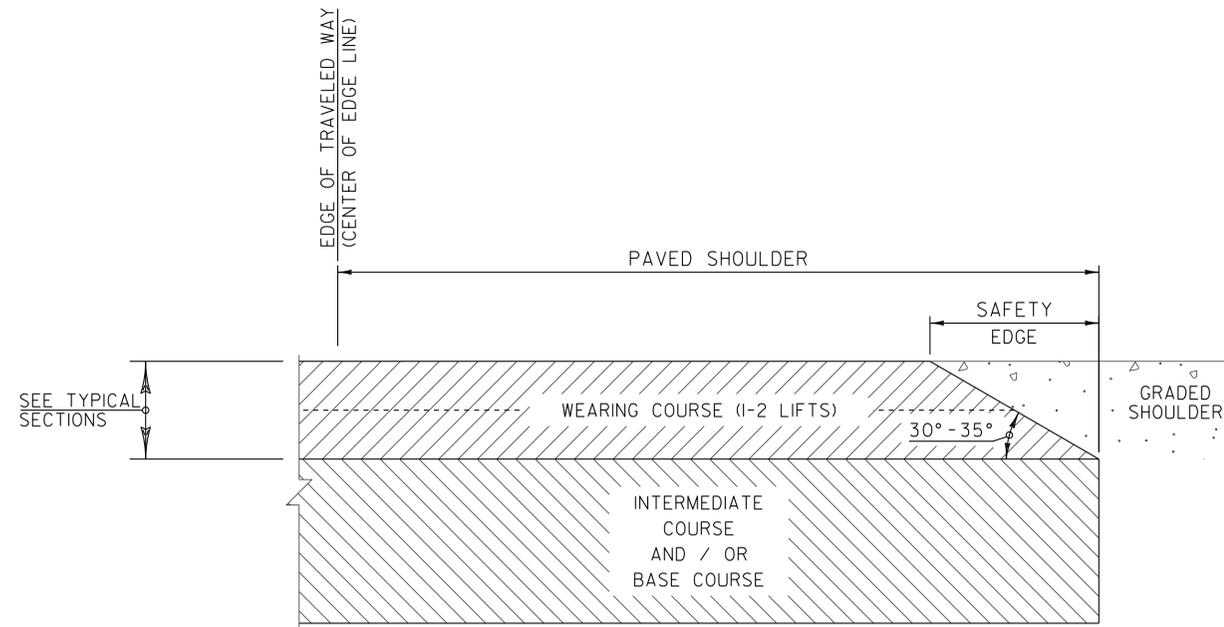
CLD 12-0106 MODEL: TYP01

SCALE 1/4" = 1'-0"

0 4 8



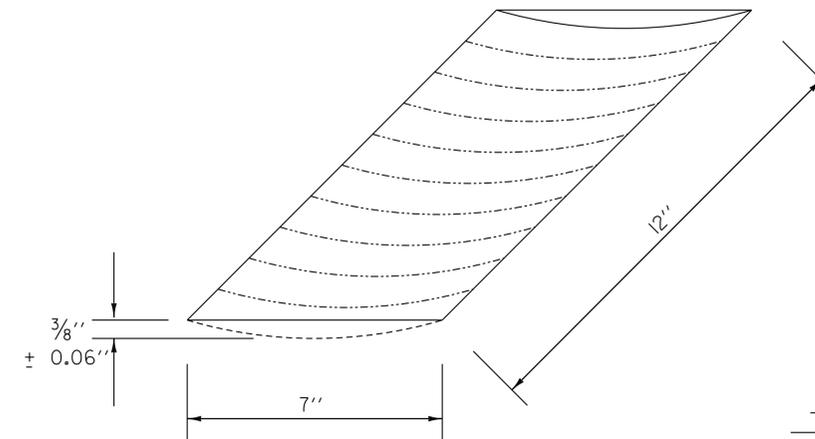
PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: W. GORDON
FILE NAME: lb294/cos/2lb294frm.dgn	CHECKED BY: P. SHEDD
PROJECT LEADER: J. BYATT	SHEET 5 OF 73
DESIGNED BY: M. HALEY	TYPICAL ROADWAY SECTIONS SHEET 1



SAFETY EDGE DETAIL

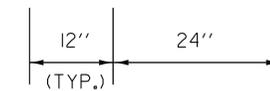
SAFETY EDGE NOTES

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

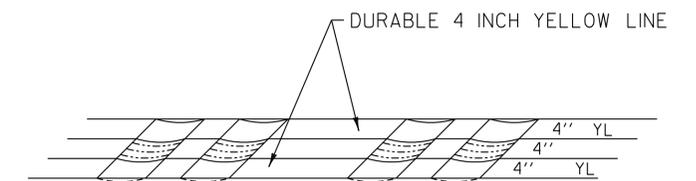


RUMBLE STRIP DETAIL

4"										YL
4"										YL
4"										YL



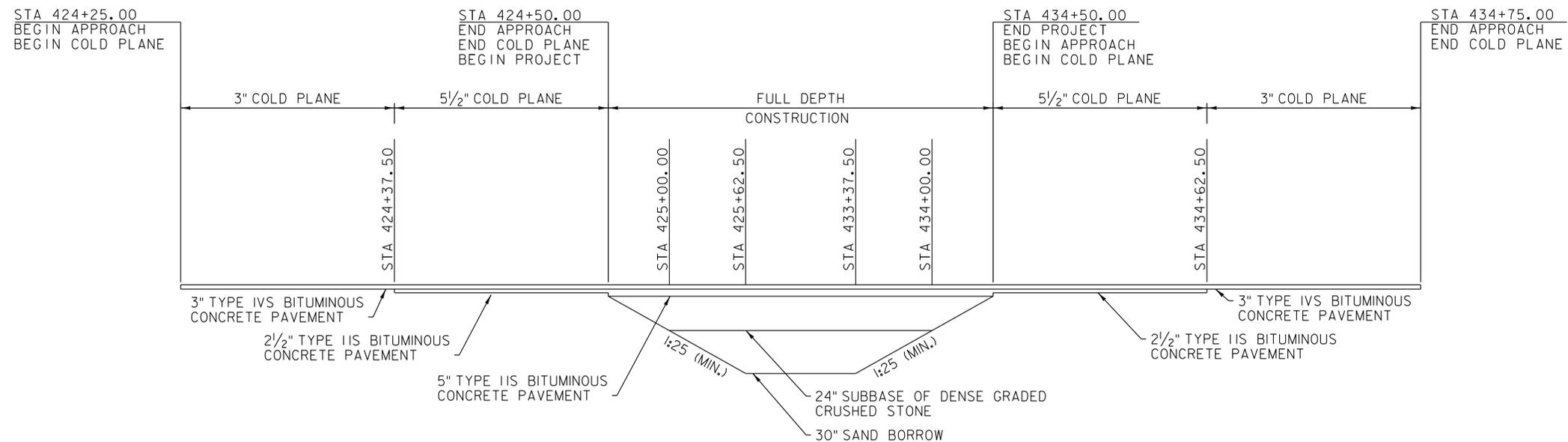
RUMBLE STRIP LAYOUT



RUMBLE STRIP PAVEMENT MARKINGS DETAIL

RUMBLE STRIP NOTE

RUMBLE STRIPS NOT TO EXTEND BEYOND CENTERLINE WHEN CENTERLINE IS A DOUBLE YELLOW LINE, WITH OR WITHOUT A PASSING ZONE.



MATERIAL TRANSITION DIAGRAM

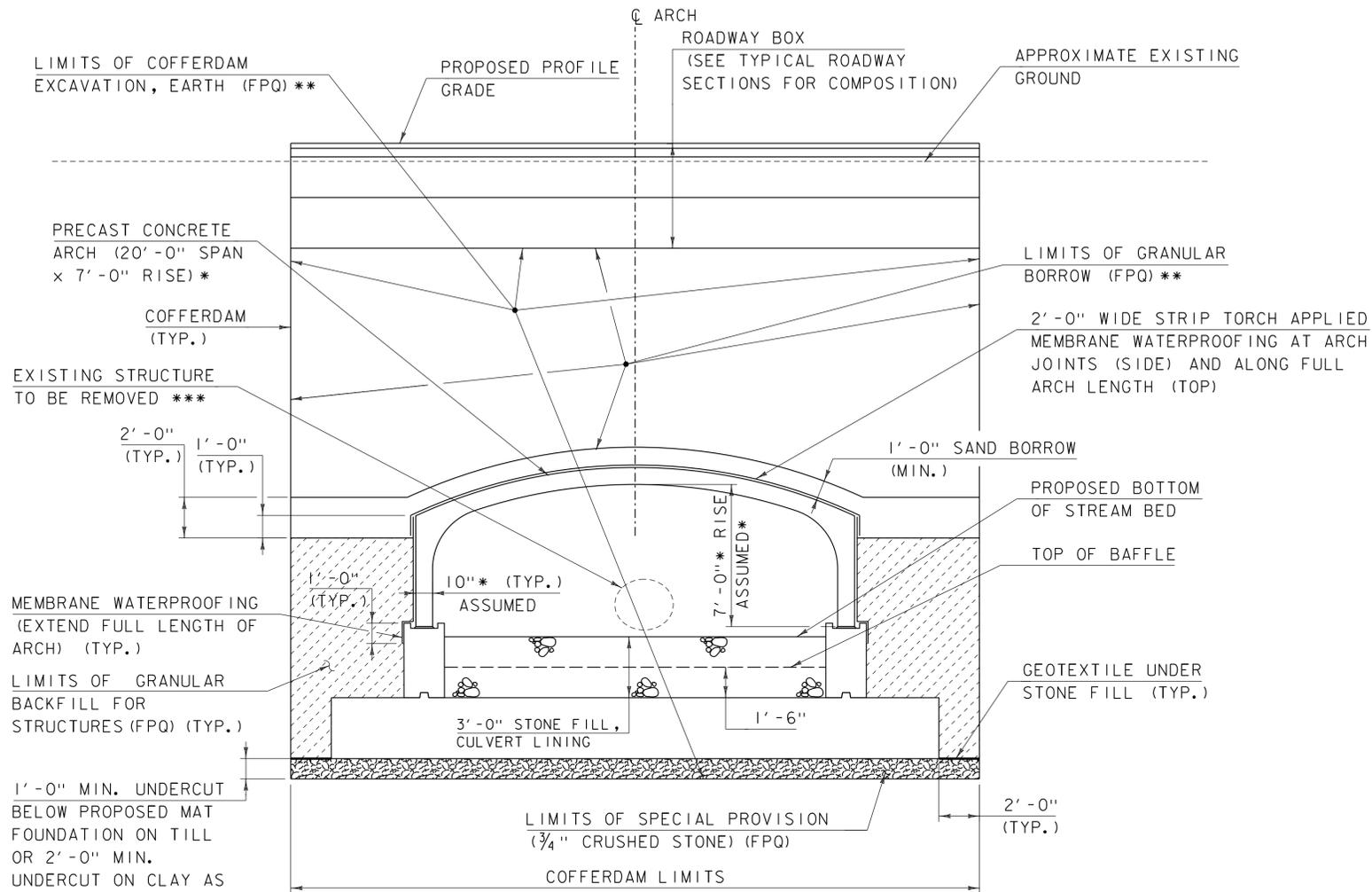
NOT TO SCALE

PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/lb294frm.dgn
 PROJECT LEADER: J. BYATT
 DESIGNED BY: M. HALEY
 TYPICAL ROADWAY SECTIONS SHEET 2

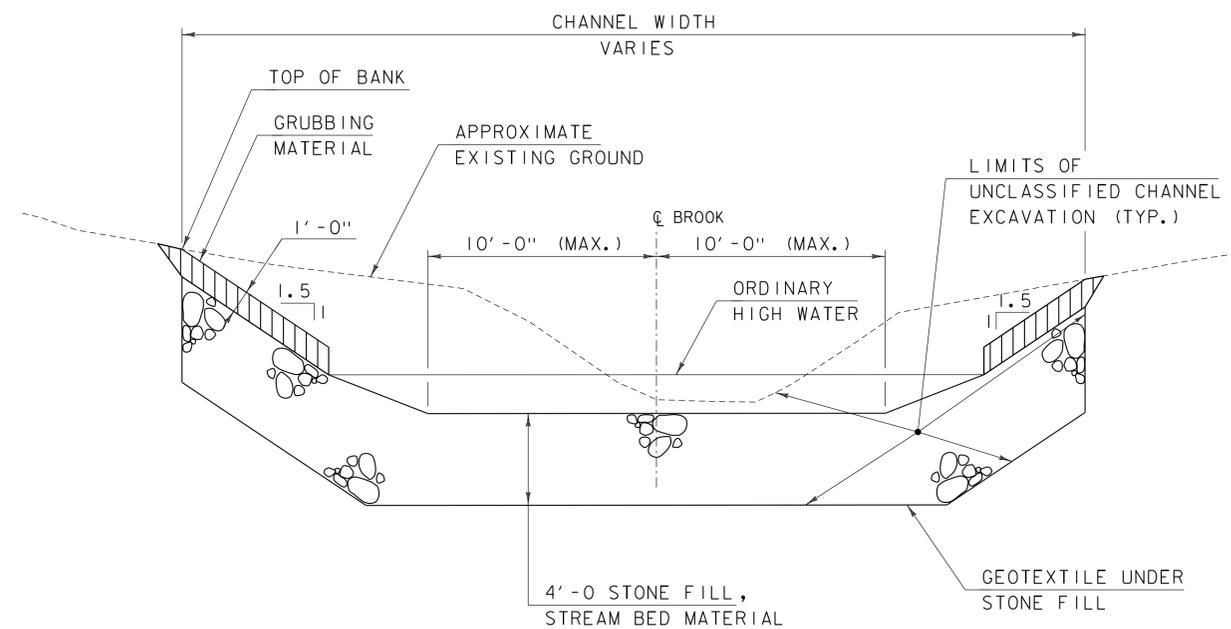
PLOT DATE: 12/16/2014
 DRAWN BY: S. GOODWIN
 CHECKED BY: P. SHEDD
 SHEET 6 OF 73





TYPICAL ARCH EARTHWORK SECTION

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



TYPICAL CHANNEL SECTION

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

NOTE: GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE UNLESS NOTED OTHERWISE.

NOTES:

- * SEE PRECAST CONCRETE ARCH NOTES ON SHEET 10.
- ** ROADWAY SUBBASE EXCAVATION SHALL NOT BE INCLUDED UNDER COFFERDAM EXCAVATION. WHENEVER BACKFILL SLOPE INTERSECTS ROADWAY SUBBASE, GRANULAR BORROW, GRANULAR BACKFILL FOR STRUCTURES AND COFFERDAM EXCAVATION, EARTH SHALL BEGIN AT THE BOTTOM OF SUBBASE.
- *** COST INCLUDED IN COFFERDAM EXCAVATION, ROCK.

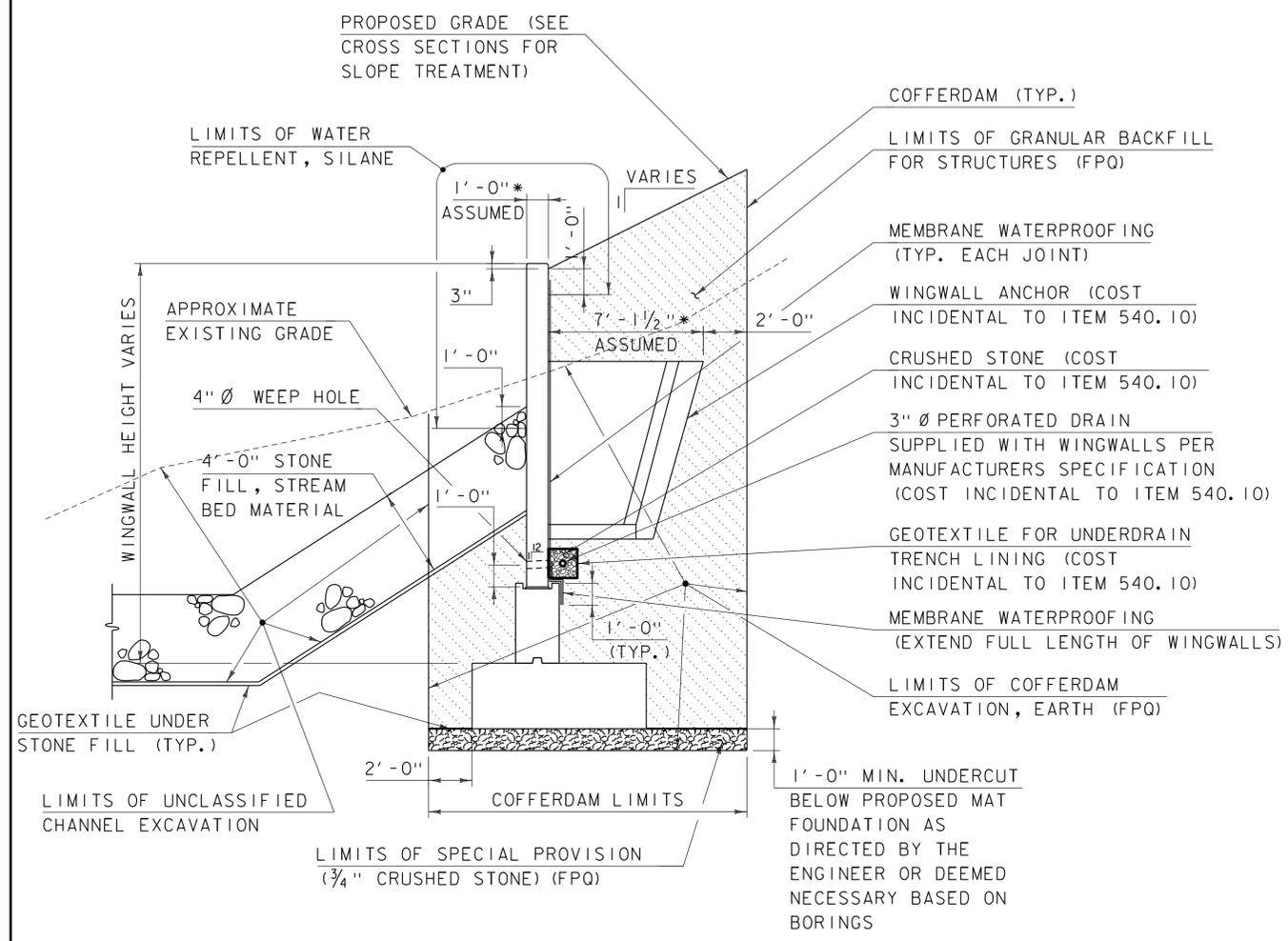
CLD 12-0106 MODEL: Sheet03



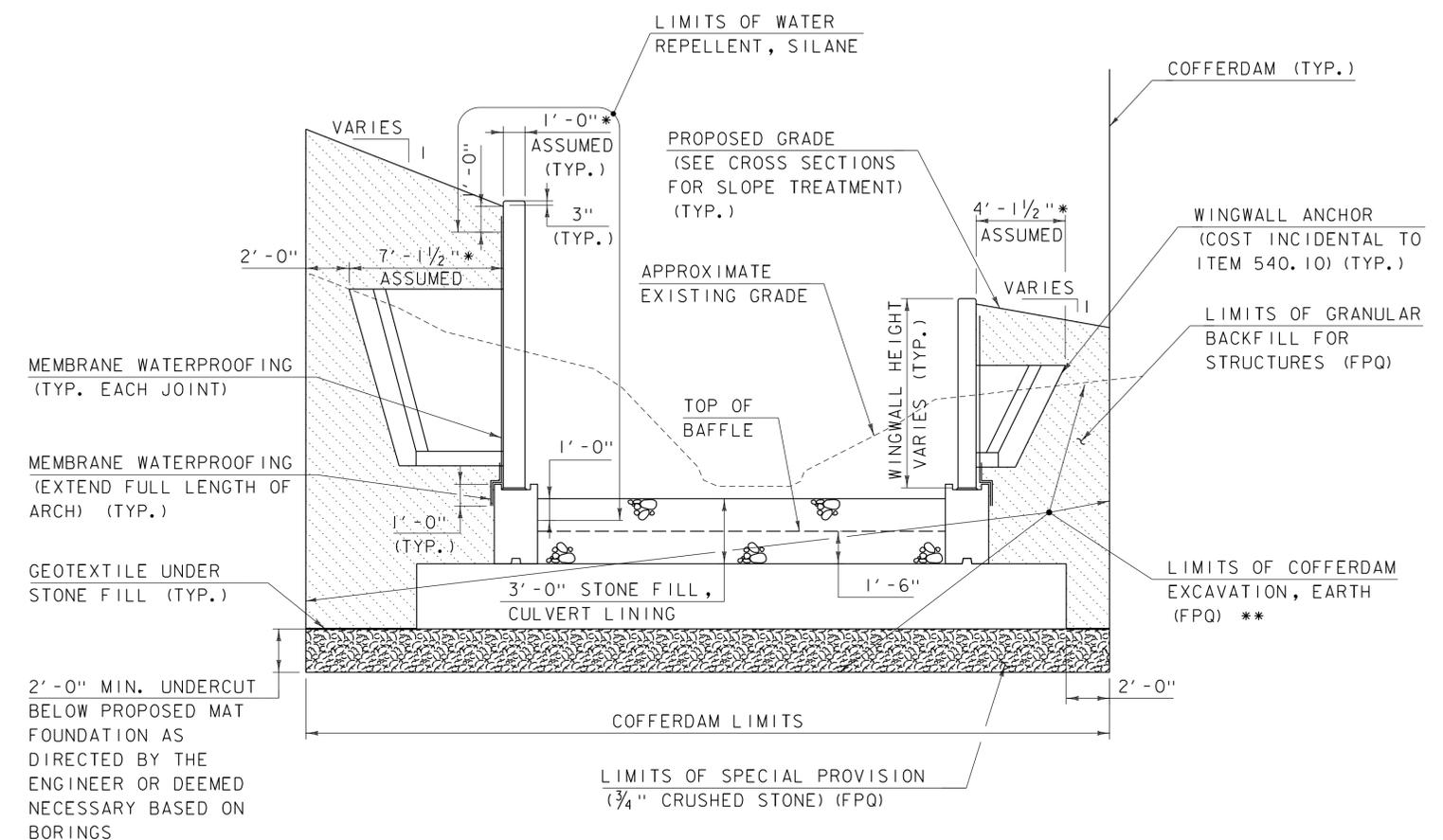
PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: l1b294/cos/z11b294sub.dgn PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT DRAWN BY: M. SMITH
DESIGNED BY: S. BEAUMONT CHECKED BY: J. BYATT
TYPICAL EARTHWORK SECTIONS SHEET 1 SHEET 7 OF 73

CLD 12-0106 MODEL: Sheet04



TYPICAL UPSTREAM WINGWALL EARTHWORK SECTION
SCALE: 1/4" = 1'-0"



TYPICAL DOWNSTREAM WINGWALL EARTHWORK SECTION
SCALE: 1/4" = 1'-0"

NOTES:

- * SEE PRECAST CONCRETE ARCH NOTES ON SHEET 10.
- ** ROADWAY SUBBASE EXCAVATION SHALL NOT BE INCLUDED UNDER COFFERDAM EXCAVATION. WHENEVER BACKFILL SLOPE INTERSECTS ROADWAY SUBBASE, GRANULAR BORROW, GRANULAR BACKFILL FOR STRUCTURES AND COFFERDAM EXCAVATION, EARTH SHALL BEGIN AT THE BOTTOM OF SUBBASE.



PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	M. SMITH
FILE NAME:	11b294/cos/z11b294sub.dgn	DESIGNED BY:	S. BEAUMONT
PROJECT LEADER:	J. BYATT	CHECKED BY:	J. BYATT
TYPICAL EARTHWORK SECTIONS SHEET 2		SHEET 8 OF 73	

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, DATED 2014, AND ITS LATEST REVISIONS.
2. ALL PRECAST CONCRETE ELEMENTS TO BE FABRICATED TO THE SPECIFIED DIMENSIONS WITHIN THE TOLERANCES DICTATED IN THE PRECAST/PRESTRESSED CONCRETE INSTITUTE TOLERANCE MANUAL FOR PRECAST AND PRESTRESSED CONCRETE CONSTRUCTION, MNL 135-00, AND ITS LATEST REVISIONS.
3. EXISTING SIGNS NOT REUSED SHALL REMAIN THE PROPERTY OF THE STATE OF VERMONT. THESE SIGNS SHALL BE STOCKPILED ON THE PROJECT SITE AND THEN LOADED ON A TRUCK SUPPLIED BY DISTRICT 7. CONTACT DALE L. PERON AT (802) 748-6670 TO ARRANGE REMOVAL FROM THE PROJECT SITE.
4. DIMENSIONS, ANGLES, AND ELEVATIONS SHOWN ON THESE PLANS HAVE BEEN OBTAINED FROM SURVEY INFORMATION AND LIMITED FIELD INVESTIGATION AND MAY NOT ACCURATELY REFLECT FIELD MEASUREMENTS FOR ALL STRUCTURE COMPONENTS IMPACTED BY THE WORK (EXISTING OR PROPOSED) TO ASSURE CONSISTENCY WITH THE PROPOSED MODIFICATIONS. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER, OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE ADVANCING THE WORK. FABRICATION DRAWINGS REQUIRED FOR VARIOUS ITEMS OF THE WORK SHALL INDICATE THE ACTUAL FIELD MEASUREMENTS AND SHALL BE SO NOTED.
5. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.
6. THE CONTRACTOR SHALL BE MADE AWARE THAT EXISTING UTILITIES ARE WITHIN THE CONSTRUCTION LIMITS OF BRIDGE 126. THE UTILITIES WILL BE RELOCATED BY OTHERS PRIOR TO THE START OF CONSTRUCTION. NO CLAIMS ARE MADE AS TO THE ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING AND PROTECTING FROM DAMAGE ALL UTILITIES ON SITE DURING ALL STAGES OF CONSTRUCTION. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
7. ALL PG BINDER USED IN BITUMINOUS CONCRETE PAVEMENT SHALL BE INCIDENTAL TO THE WEARING COURSE PAY ITEM.
8. EMULSIFIED ASPHALT SHALL BE APPLIED ON COLD PLANED SURFACES AT THE RATE OF 0.040 GAL/SY AND BETWEEN ALL COURSES OF PAVEMENT AT THE RATE OF 0.025 GAL/SY OR AS DIRECTED BY THE ENGINEER.
9. ANY REQUIRED SAWCUT OF EXISTING PAVEMENT SHALL BE INCIDENTAL TO THE WEARING COURSE PAY ITEM.
10. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION CONDITIONS ARE MET.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTY CAUSED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE ENGINEER.
12. UPON COMPLETION OF THE BRIDGE CONSTRUCTION, THE CONTRACTOR SHALL REMOVE THE DETOUR, RESTORE THE DETOUR SITE TO THE ORIGINAL GRADE OR PROPOSED GRADE AS APPLICABLE, AND STABILIZE AS SHOWN ON THE EPSC FINAL CONDITIONS PLAN.
13. MARKER POST: TO BE PLACED AS INDICATED OR AS DIRECTED BY THE ENGINEER.
14. SLOPE ROUNDING: ALL CUT SLOPES TO BE ROUNDED IN ACCORDANCE WITH STANDARD SHEET B-5.
15. DRIVEWAYS: ALL DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SHEET B-71.

EARTHWORK AND RELATED ITEMS

16. TEMPORARY CONSTRUCTION FILLS WITHIN THE WATERCOURSE FOR ANY PURPOSE SHALL CONSIST OF CLEAN STONE FILL ONLY. NO OTHER FILLING IN THE STREAM SHALL OCCUR WITHOUT THE APPROVAL OF THE STREAM ALTERATION ENGINEER.
17. BACKFILL ARCH EVENLY.

TEMPORARY RELOCATION OF STREAM NOTES

18. ITEM 900.645, "SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)" SHALL BE USED TO DIVERT HUDSON BROOK AROUND THE CONSTRUCTION AREA OF THE NEW STRUCTURE. THE CONTRACTOR SHALL SUBMIT PLANS SHOWING THE PROPOSED METHOD FOR DIVERTING THE BROOK AND ALLOWING THE NEW STRUCTURE TO BE BUILT IN THE DRY. ITEM 900.645, "SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)", SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING WORK:
 - A. THE TEMPORARY PIPE AND HARDWARE.
 - B. ANY EXCAVATION NEEDED TO PLACE AND REMOVE THE TEMPORARY PIPE THAT FALLS OUTSIDE THE PAY LIMITS OF STRUCTURE OR COMMON EXCAVATION AS DEFINED IN THE PLANS.
 - C. ANY BACKFILL NEEDED TO PLACE THE TEMPORARY PIPE SUCH THAT THE EXISTING STREAM ELEVATIONS WILL MAINTAIN THE FLOW OF WATER AT ALL TIMES.
 - D. MATERIAL AND LABOR TO PLACE THE BACKFILL WHICH FALLS OUTSIDE THE PAY LIMITS OF THE ROADWAY SUBBASE AND GRANULAR BACKFILL FOR STRUCTURES AS DEFINED ON THE PLANS.
 - E. INCIDENTALS USED WHILE DIVERTING THE WATER TO THE TEMPORARY PIPES (SANDBAGS, ETC.).

STONE FILL

19. THE INTENT OF THE STONE FILL INSIDE THE CULVERT AND IN THE UPSTREAM AND DOWNSTREAM CHANNELS IS TO CREATE A NATURAL-LIKE STREAM CHANNEL THROUGH THE PROJECT AREA AND WITHIN THE ARCH THAT WILL RESIST SCOUR DURING EXTREME FLOOD EVENTS.
20. THE STONE IN THE UPSTREAM AND DOWNSTREAM CHANNELS SHALL CONSIST OF WELL-GRADED, 4'-0" MAXIMUM DIMENSION NATURAL STREAM BED MATERIAL. THIS MATERIAL SHALL BE PAID FOR UNDER ITEM 900.608, "STONE FILL, STREAM BED MATERIAL)".
21. THE STONE FILL WITHIN THE ARCH SHALL CONSIST OF WELL-GRADED, 3'-0" MAXIMUM DIMENSION NATURAL STREAM BED MATERIAL. THIS MATERIAL SHALL BE PAID FOR UNDER ITEM 900.608, "SPECIAL PROVISIONS (STONE FILL, CULVERT LINING)".
22. 35 TO 40 BOULDERS WITH MIDDLE AXIS MEASURING 2'-6" TO 3'-0" SHALL BE DISTRIBUTED THROUGHOUT THE ARCH LENGTH, WITH THE REMAINING STONE FILL, CULVERT LINING PLACED AROUND THEM.
23. THE STONE FILL SHALL BE PLACED SUCH THAT THERE ARE NO DISCRETE VERTICAL DROPS IN EXCESS OF 3 INCHES, AND SO THE FLOW OF WATER IS GENERALLY CONCENTRATED IN THE CENTER OF THE ARCH RATHER THAN DISPERSES ACROSS THE ENTIRE WIDTH.
24. THE UPSTREAM AND DOWNSTREAM CHANNELS FROM THE ARCH INVERTS TO THE LIMITS OF CHANNEL WORK SHALL BE REGRADED TO PROVIDE A GRADUAL TRANSITION TO THE ARCH. PRESERVE LARGE COBBLES (IF APPLICABLE). AVOID DISCRETE ELEVATION CHANGES GREATER THAN 3 INCHES.

CONCRETE

25. CONCRETE USED FOR FOOTINGS AND PEDESTAL WALLS SHALL BE HIGH PERFORMANCE CONCRETE CLASS B.
26. ITEM 514.10, "WATER REPELLENT, SILANE", SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE INTERIOR OF THE PRECAST CONCRETE ARCH, TO 1'-0" BELOW GRADE.
27. ALL REINFORCING STEEL IN THE FOOTINGS AND PEDESTAL WALLS SHALL BE LEVEL 1 - PLAIN REINFORCING STEEL.
28. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS ON THE "CONCRETE REINFORCING INSTITUTE".
29. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:
 - a. WALL FACES NOT EXPOSED TO DEICING SALTS: 2.0 INCH
 - b. CAST AGAINST EARTH: 3.0 INCH
 - c. ELSEWHERE UNLESS OTHERWISE INDICATED: 3.0 INCH
30. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" X 1".
31. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE "VERMONT AGENCY OF TRANSPORTATION MATERIALS SAMPLING MANUAL".

COFFERDAM NOTES

32. ACTUAL EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR. HOWEVER, ONLY THE EXCAVATION BETWEEN THE LIMITS SHOWN WILL BE PAID FOR UNDER ITEM 208.30, "COFFERDAM EXCAVATION, EARTH (FPQ)" OR ITEM 208.35, "COFFERDAM EXCAVATION, ROCK".
33. THE CONTRACTOR IS TO DETERMINE THE COFFERDAM SIZE. ANY COFFERDAMS REQUIRED FOR EXCAVATION AND/OR PHASING SHALL BE PAID FOR UNDER ITEM 208.40, "COFFERDAM (ARCH AND WINGWALLS - PHASE 1)" OR ITEM 208.40, "COFFERDAM (ARCH AND WINGWALLS - PHASE 2)", AS APPLICABLE.
34. THE PAY LIMITS OF (COFFERDAM EXCAVATION, EARTH) (FPQ), (COFFERDAM EXCAVATION, ROCK), AND GRANULAR BACKFILL FOR STRUCTURES (FPQ) SHALL BE TWO FEET OUTSIDE THE PERIMETER OF THE FOOTING OR ANCHOR, AS APPLICABLE.
35. USE A 1'-0" MINIMUM UNDERCUT ON TILL AND 2'-0" MINIMUM UNDERCUT ON CLAY BELOW THE MAT FOUNDATION AS DETERMINED BY THE ENGINEER OR DEEMED NECESSARY BASED ON BORINGS.
36. ALL EXCAVATION AND BACKFILLING SHALL BE CONDUCTED IN THE DRY. DEWATERING SHALL BE CONTINUOUS UNTIL THE PRECAST CONCRETE ARCH AND WINGWALLS ARE BACKFILLED TO THE SURROUNDING WATER TABLE, UNLESS OTHERWISE NOTED.
37. DEWATERING OF EXCAVATION AREAS SHALL MAINTAIN GROUNDWATER LEVELS 2'-0" BELOW THE EXCAVATION SUBGRADE IN AREAS WHERE LEDGE IS NOT ENCOUNTERED, WHICH MAY REQUIRE THE USE OF WELL POINTS OR DEEP WELLS.

PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: l1b294/cos/ z11b294gennotes.dgn PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT DRAWN BY: M. SMITH
DESIGNED BY: N. CARON CHECKED BY: S. BEAUMONT
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PRECAST CONCRETE ARCH

38. THE DESIGN AND DETAILING OF THE PRECAST CONCRETE ARCH AND WINGWALLS AND ALL DETAILS, APPURTENANCES, AND CONNECTIONS FOR THE ARCH AND WINGWALLS, INCLUDING THE CONNECTION BETWEEN THE ARCH/WINGWALL CONNECTION WITH THE PEDESTAL WALLS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. DESIGN SHALL BE BASED ON THE CURRENT AASHTO AND VTRANS STANDARDS USING LOAD AND RESISTANCE FACTOR DESIGN (LRFD). THE JOINTS BETWEEN THE PRECAST ARCH SECTIONS SHALL BE WATERTIGHT UTILIZING FLEXIBLE RUBBER OR PLASTIC GASKETS. MECHANICAL DEVICES SHALL BE USED TO LOCK THE INDIVIDUAL SECTIONS TOGETHER. THE MANUFACTURER SHALL PROVIDE STAMPED DESIGN CALCULATIONS PREPARED BY A REGISTERED VERMONT PROFESSIONAL ENGINEER. THE MANUFACTURER SHALL CONSIDER STRENGTH, SERVICEABILITY, STIFFNESS, AND STABILITY OF THE PRECAST ELEMENTS FOR LOADS GENERATED DURING FABRICATION, TRANSPORTATION, ERECTION, CONSTRUCTION OPERATIONS, AND ULTIMATE TRAFFIC CONDITIONS. THE MANUFACTURER SHALL OBTAIN WRITTEN APPROVAL FROM THE VERMONT AGENCY OF TRANSPORTATION STRUCTURES SECTION PRIOR TO FABRICATION. THE DESIGN SHALL INCLUDE A LOAD RATING COMPLETED USING THE LOAD AND RESISTANCE FACTOR RATING METHOD AND CONFORMING TO STANDARD VTRANS PRACTICE. ALL COSTS SHALL BE INCLUDED IN ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH) OR ITEM 541.10, "PRECAST CONCRETE STRUCTURE (WINGWALLS)", AS APPLICABLE.
39. THE ARCH LAYOUT WAS DETERMINED ASSUMING A TOP CENTER ROOF THICKNESS OF 10" AND INSTALLATION OF AN 7'-0" RISE X 20'-0" SPAN ARCH. THE CONTRACTOR MAY UTILIZE AN ARCH OR FRAME WITH ALTERNATE GEOMETRY FROM THAT SHOWN IN THE PLANS. HOWEVER, IF THE THICKNESSES OF THE STRUCTURE SHAPE VARY FROM THE ASSUMED DIMENSIONS, INVERT ELEVATIONS SHALL REMAIN THE SAME, AND STRUCTURE SPAN, RISE, AND WATERWAY OF FULL OPENING SHALL REMAIN THE SAME OR GREATER. THE HEADWALL SHALL BE ADJUSTED TO MAINTAIN THE PROPOSED ROADWAY PROFILE AND SIDE SLOPE GRADES.
40. QUANTITIES SHOWN FOR STRUCTURAL EARTHWORK AND HIGH PERFORMANCE CONCRETE CLASS B ARE BASED ON THE ASSUMED STRUCTURE DIMENSIONS SHOWN AND SHOULD NOT BE UTILIZED BY THE FABRICATOR AS REQUIRED DIMENSIONS FOR THE STRUCTURE. THESE ITEMS WILL BE PAID AS FINAL PLAN QUANTITIES (FPQ) ACCORDING TO SECTION 109.10. IF ACTUAL QUANTITIES VARY, NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
41. THE PRECAST BRIDGE SYSTEM SHALL BE DESIGNED PER THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION, DATED 2012, AND ITS LATEST REVISIONS, AND SHALL CONSIDER THE FOLLOWING DESIGN CRITERIA:
- | | |
|---|-----------------|
| A. DESIGN LOADING: | HL-93 |
| B. WEIGHT OF BACKFILL MATERIAL: | 125 PCF |
| C. PRECAST CONCRETE COMPRESSIVE STRENGTH: | f'c = 5,000 PSI |
| D. REINFORCING STEEL: | fy = 60,000 PSI |

PRECAST CONCRETE ARCH (CONTINUED)

42. THE CAST-IN-PLACE CONCRETE ARCH PEDESTAL WALLS AND MAT FOUNDATION WERE DESIGNED ASSUMING FULL PORE PRESSURE BELOW THE GROUNDWATER ELEVATION AS SHOWN IN THE BORINGS INCLUDING UPLIFT ON THE MAT FOUNDATION AND UTILIZING THE FOLLOWING UNFACTORED ARCH REACTIONS:
- | | | |
|-------------------------|-------------------|----------------------|
| VERTICAL LOAD PER LEG | (SELF WEIGHT) DC: | 2.20 KLF |
| | (EARTH COVER) EV: | 20.30 KLF |
| | (LIVE LOAD) LL: | 1.90 KLF |
| HORIZONTAL LOAD PER LEG | (OUTWARD THRUST) | |
| | (SELF WEIGHT) DC: | 0.00 KLF TO 1.00 KLF |
| | (EARTH COVER) EV: | 0.00 KLF TO 6.50 KLF |
| | (LIVE LOAD) LL: | 0.00 KLF TO 1.00 KLF |
- THE CAST-IN-PLACE CONCRETE DOWNSTREAM WINGWALL PEDESTAL WALLS WERE DESIGNED ASSUMING PRECAST CONCRETE ANCHORS TAKE THE FULL LATERAL LOAD ABOVE THE PEDESTAL WALL AND FULL PORE PRESSURE BELOW THE APPROXIMATE GROUNDWATER ELEVATION AS SHOWN IN THE BORINGS INCLUDING UPLIFT ON THE MAT FOUNDATION AND UTILIZING A PRECAST CONCRETE WINGWALL STEM VERTICAL LOAD (DC) EQUAL TO 1.91 KIP.
- THE CAST-IN-PLACE CONCRETE UPSTREAM WINGWALL PEDESTAL WALLS WERE DESIGNED ASSUMING PRECAST CONCRETE ANCHORS TAKE THE FULL LATERAL LOAD ABOVE THE PEDESTAL WALL AND FULL PORE PRESSURE BELOW THE WEEPHOLES INCLUDING UPLIFT ON THE MAT FOUNDATION AND UTILIZING A PRECAST CONCRETE WINGWALL STEM VERTICAL LOAD (DC) EQUAL TO 1.67 KIP.
- IF A CHANGE IN STRUCTURE GEOMETRY OR TYPE RESULTS IN DESIGN LOADS THAT VARY FROM THE ABOVE LOADS, THE CONTRACTOR SHALL PROVIDE THESE LOADS TO THE ENGINEER. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR CALCULATING OR SUBMITTING THESE LOADS. THE ENGINEER SHALL UPDATE THE MAT FOUNDATION AND PEDESTAL WALL DESIGN CALCULATIONS TO ACCOMMODATE THE ACTUAL PROVIDED DESIGN LOADS AND PROVIDE THE REVISED MAT FOUNDATION AND PEDESTAL WALL DIMENSIONS AND REINFORCING CHANGES TO THE CONTRACTOR.
43. SHOP DRAWINGS SHALL BE SUBMITTED FOR DOCUMENTATION SHOWING REINFORCING BAR SIZES AND LOCATIONS AND JOINT DETAILS. ALL COSTS FOR THE DESIGN, DRAWINGS, FABRICATION, DELIVERY, AND ERECTION OF ALL THE PRECAST STRUCTURE ELEMENTS SHALL BE INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)" OR ITEM 540.10, "PRECAST CONCRETE STRUCTURE (WINGWALLS)", AS APPLICABLE, INCLUDING ANY INCIDENTALS NECESSARY TO FURNISH THE PRODUCT COMPLETE IN PLACE.
44. THE COST OF ANY CAST-IN-PLACE CONCRETE PROPOSED TO BE USED IN CONJUNCTION WITH PRECAST CONCRETE ELEMENTS (NOT INCLUDING THE CAST-IN-PLACE CONCRETE PEDESTAL WALLS AND MAT FOUNDATION DETAILED IN THE CONTRACT PLANS), IF APPLICABLE, SHALL BE INCLUDED IN ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)" OR ITEM 540.10, "PRECAST CONCRETE STRUCTURE (WINGWALLS)", AS APPLICABLE, INCLUDING ANY REINFORCEMENT OR INCIDENTALS NECESSARY TO PLACE THE CAST-IN-PLACE CONCRETE.
45. THE COST OF ALL REINFORCING BARS THAT ARE CAST INTO THE PRECAST CONCRETE ARCH AND HEADWALLS SHALL BE INCLUDED IN ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)". THE COST OF ALL REINFORCING BARS THAT ARE CAST INTO THE PRECAST CONCRETE WINGWALLS SHALL BE INCLUDED IN ITEM 540.10, "PRECAST CONCRETE STRUCTURE (WINGWALLS)".
46. GALVANIZED STEEL ANGLES AND BOLTS AS SHOWN IN ARCH JOINT DETAIL (SHEET 46) SHALL BE UTILIZED TO DRAW ARCH SECTIONS TOGETHER. THESE HARDWARE ASSEMBLIES SHALL BE ATTACHED AS SHOWN ON THE DETAIL AND SHALL BE LEFT IN PLACE. COST SHALL BE INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)".

PRECAST CONCRETE ARCH (CONTINUED)

47. JOINTS BETWEEN ABUTTING PRECAST UNITS SHALL BE WATERTIGHT. THE EXTERIOR (TOP AND SIDES) JOINTS SHALL BE FILLED WITH MORTAR, TYPE IV, AFTER BEING SET IN THEIR FINAL POSITION. MORTAR SHALL BE WET CURED A MINIMUM OF 4 HOURS PRIOR TO APPLYING WATERPROOFING MEASURES. MORTAR SHALL BE INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)".
48. THE CONTRACTOR SHALL FOLLOW THE MANUFACTURER'S RECOMMENDATIONS REGARDING BACKFILL AND COMPACTION LIMITS, PROPERTIES, AND PROCEDURES, INCLUDING RESTRICTIONS OF CONSTRUCTION MACHINERY AND OPERATIONS.
49. THE CONTRACTOR SHALL PROVIDE EQUIPMENT CAPABLE OF UNLOADING, LIFTING, AND PLACING PRECAST UNITS IN ACCORDANCE WITH THE MANUFACTURER'S FIELD REPRESENTATIVE. COST SHALL BE INCLUDED IN ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)" OR ITEM 540.10, "PRECAST CONCRETE STRUCTURE (WINGWALLS)", AS APPLICABLE.
50. PRIOR TO SHIPPING THE PRECAST ELEMENTS, THE CONTRACTOR SHALL SUPPLY CERTIFICATION STATING THAT THE BACKFILL SOIL MEETS THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS PRIOR TO APPROVAL OF THE ENGINEER.
51. THE DRILLING OF HOLES IN THE PRECAST ELEMENTS SHALL NOT BE PERMITTED, UNLESS APPROVED IN WRITING BY THE VERMONT AGENCY OF TRANSPORTATION STRUCTURES SECTION. ANY LIFTING HOLES SHALL BE FILLER WITH MORTAR, TYPE IV. COST FOR MORTAR SHALL BE INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)" OR ITEM 540.10, "PRECAST CONCRETE STRUCTURE (WINGWALLS)", AS APPLICABLE.
52. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO PRECAST CONCRETE ELEMENTS AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE ENGINEER.
53. A 2 FOOT WIDE STRIP OF MEMBRANE WATERPROOFING SHALL BE APPLIED AT EACH OUTER SIDE JOINT OF THE ARCH AND WINGWALLS, INCLUDING THE JOINT BETWEEN THE ARCH AND EACH WINGWALL. ON THE ARCH, THE MEMBRANE SHALL BE CENTERED ON THE JOINT AND COVER THE FULL HEIGHT OF THE SIDE JOINTS AND EXTEND 1'-0" BELOW THE TOP OF THE PEDESTAL WALLS. ON THE WINGWALLS, THE MEMBRANE SHALL BE CENTERED ON THE JOINT AND EXTEND FROM 6" BELOW THE TOP OF THE WINGWALL TO 1'-0" BELOW THE TOP OF THE PEDESTAL WALLS. THE ENTIRE TOP OF THE ARCH SHALL THEN BE COVERED WITH MEMBRANE. THE MEMBRANE SHALL OVERLAP THE EDGES BY 1'-0" ON EACH SIDE. MEMBRANE SHALL ALSO BE APPLIED ALONG THE FULL LENGTH OF THE PEDESTAL WALL/ARCH LEG JOINT AND THE PEDESTAL WALL/WINGWALL STEM JOINT. PAYMENT FOR THE MEMBRANE SHALL BE INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)".
54. A 3" DIAMETER PERFORATED PVC DRAIN PIPE SHALL BE INSTALLED BEHIND THE ARCH HEADWALLS AND UPSTREAM WINGWALLS PER THE FABRICATOR'S SPECIFICATIONS AND SHALL BE PLACED WITHIN A MINIMUM 16" THICK ZONE OF DRAINAGE AGGREGATE CONFORMING TO SUBSECTION 704.16. STONE SHALL BE COMPLETELY SEPARATED FROM THE IN SITU SOILS BY GEOTEXTILE CONFORMING TO THE REQUIREMENTS OF SECTION 649, GEOTEXTILE FOR UNDERDRAIN TRENCH LINING. PERFORATED PVC PIPE SHALL BE LAID WITH PERFORATIONS DOWN. THIS WORK AND MATERIALS SHALL BE INCIDENTAL ITEM 540.10, "PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)" OR ITEM 540.10, "PRECAST CONCRETE STRUCTURE (WINGWALLS)", AS APPLICABLE.
55. WEEPHOLES IN THE UPSTREAM WINGWALLS AND ARCH HEADWALLS SHALL BE PLACED APPROXIMATELY EVERY 10'-0" OR AS INDICATED ON THE PLANS. WEEPHOLES SHALL BE SCREENED TO RETAIN CRUSHED STONE (MAXIMUM 1#2" SQUARE OPENINGS) AND TO PREVENT ENTRY BY ANIMALS.
56. THE SIDE SLOPES SHALL BE GRADED TO MATCH THE TOP OF THE WINGWALL ELEVATIONS, AS SHOWN.

MODEL: Sheet02
CLD_12-0106



PROJECT NAME:	LUNENBURG
PROJECT NUMBER:	NH CULV(27)
FILE NAME:	11b294/cos/ z11b294gennotes.dgn
PROJECT LEADER:	J. BYATT
DESIGNED BY:	N. CARON
GENERAL NOTES SHEET 2	
PLLOT DATE:	12/16/2014
DRAWN BY:	M. SMITH
CHECKED BY:	S. BEAUMONT
SHEET	10 OF 73

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS			DETAILED SUMMARY OF QUANTITIES				
							ROADWAY	EROSION CONTROL	BRIDGE 126	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							1				1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	-			EARTHWORK SUMMARY
							8700				8700		CY	COMMON EXCAVATION	203.15	11			US ROUTE 2 CONSTRUCTION
									780		780		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	4.7	8700	CY	COMMON EXCAVATION
							3450		185		3635		CY	SAND BORROW	203.31	7.2	190	CY	TRENCH EXCAVATION OF EARTH (ASSUME 100% SUITABLE)
									1025		1025		CY	GRANULAR BORROW (FPQ)	203.32	1.8	195	CY	UNCLASSIFIED CHANNEL EXCAVATION (ASSUME 25% SUITABLE)
							190				190		CY	TRENCH EXCAVATION OF EARTH	204.20	5.2	838	CY	COFFERDAM EXCAVATION, EARTH (ASSUME 25% SUITABLE)
							1				1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	-	9923	CY	TOTAL FILL AVAILABLE
									667		667		CY	GRANULAR BACKFILL FOR STRUCTURES (FPQ)	204.30	0.4	0	CY	TOTAL FILL REQUIRED (INCL. 1.15 FILL FACTOR)
							50				50		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	9.6	9923	CY	EXCESS EXCAVATION
									3351		3351		CY	COFFERDAM EXCAVATION, EARTH (FPQ)	208.30	0.5			SPECIAL PROVISION (TEMPORARY ROADWAY)
									574		574		CY	COFFERDAM EXCAVATION, ROCK	208.35	0.6			DETOUR INSTALLATION
									1		1		LS	COFFERDAM (ARCH AND WINGWALLS - PHASE 1)	208.40	-	995	CY	COMMON EXCAVATION
									1		1		LS	COFFERDAM (ARCH AND WINGWALLS - PHASE 2)	208.40	-	0	CY	TRENCH EXCAVATION OF EARTH (ASSUME 100% SUITABLE)
							250				250		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10	-	0	CY	UNCLASSIFIED CHANNEL EXCAVATION (ASSUME 25% SUITABLE)
							1050				1050		LF	MILLED RUMBLE STRIPS	213.10	-	0	CY	COFFERDAM EXCAVATION, EARTH (ASSUME 25% SUITABLE)
							75				75		CY	SUBBASE OF GRAVEL	301.15	4	995	CY	TOTAL FILL AVAILABLE
							2875				2875		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	8	679	CY	TOTAL FILL REQUIRED (INCL. 1.15 FILL FACTOR)
							15				15		CY	AGGREGATE SURFACE COURSE	401.10	2	316	CY	EXCESS EXCAVATION
							100				100		TON	AGGREGATE SHOULDERS	402.12	11			DETOUR REMOVAL
							15				15		CWT	EMULSIFIED ASPHALT	404.65	0.2	563	CY	COMMON EXCAVATION
							2020				2020		TON	SUPERPAVE BITUMINOUS CONCRETE PAVEMENT	490.30	9	0	CY	TRENCH EXCAVATION OF EARTH (ASSUME 100% SUITABLE)
									554		554		CY	CONCRETE, HIGH PERFORMANCE CLASS B (FPQ)	501.34	0.6	0	CY	UNCLASSIFIED CHANNEL EXCAVATION (ASSUME 25% SUITABLE)
									1		1		LS	FURNISHING EQUIPMENT FOR DRIVING PILING	504.10	-	0	CY	COFFERDAM EXCAVATION, EARTH (ASSUME 25% SUITABLE)
									777		777		LF	STEEL PILING, HP 14 X 89	505.18	-	563	CY	TOTAL FILL AVAILABLE
									46010		46010		LB	REINFORCING STEEL, LEVEL I	507.11	3.4	796	CY	TOTAL FILL REQUIRED (INCL. 1.15 FILL FACTOR)
									10		10		GAL	WATER REPELLENT, SILANE	514.10	0.8	233	CY	FILL REQUIRED
									354		354		SY	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	519.20	0.8			SUPERPAVE BITUMINOUS CONCRETE PAVEMENT
									1		1		LS	PRECAST CONCRETE STRUCTURE (7'-0" X 20'-0" X 110'-0" ARCH)	540.10	-	1242	TON	TYPE IIS
									1		1		LS	PRECAST CONCRETE STRUCTURE (WINGWALLS)	540.10	-	769	TON	TYPE IVS
														BEGIN OPTION AA			2011	TON	SUBTOTAL
							42				42		LF	15" RCP CLASS III	601.0810	-	9	TON	ROUNDING
							42				42		LF	15" CPEP(SL)	601.2610	-	2020	TON	TOTAL
														END OPTION AA					
							750				750		LF	8 INCH UNDERDRAIN PIPE	605.11	-			
							2				2		EACH	UNDERDRAIN FLUSHING BASIN	605.95	-			
							130				130		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	EST			
							11				11		HR	POWER BROOM RENTAL, TYPE II	608.31	EST			
							130				130		HR	LOADER RENTAL, TYPE I	608.40	EST			
							250				250		CY	STONE FILL, TYPE II	613.11	-			
							510				510		CY	STONE FILL, TYPE III	613.12	3			

CLD 12-0106 MODEL: OSS 1



PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)
 FILE NAME: lb294/cos/zlb294frm.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: M. HALEY
 DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
 QUANTITY SHEET I SHEET II OF 73

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
							ROADWAY	EROSION CONTROL	BRIDGE 126	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							1				1		EACH	RELOCATE MAILBOX, SINGLE SUPPORT	617.10	-			
							2				2		EACH	YIELDING MARKER POSTS	619.17	-			
							75				75		LF	REMOVING AND RESETTING FENCE	620.50	3			
							425				425		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20	-			
							4				4		EACH	MANUFACTURED TERMINAL SECTION, FLARED	621.50	-			
							400				400		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80	-			
							800				800		HR	UNIFORMED TRAFFIC OFFICERS	630.10	EST			
							1300				1300		HR	FLAGGERS	630.15	EST			
										1	1		LS	FIELD OFFICE, ENGINEERS	631.10	-			
										1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16	-			
										1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17	-			
										5000	5000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26	-			
							1				1		LS	MOBILIZATION/DEMobilIZATION	635.11	-			
							1				1		LS	TRAFFIC CONTROL	641.10	-			
							2				2		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.15	-			
							2				2		EACH	PORTABLE ARROW BOARD	641.16	-			
							2100				2100		LF	DURABLE 4 INCH WHITE LINE, POLYUREA	646.404	-			
							2100				2100		LF	DURABLE 4 INCH YELLOW LINE, POLYUREA	646.414	-			
							4200				4200		LF	TEMPORARY 4 INCH WHITE LINE, PAINT	646.602	-			
							4200				4200		LF	TEMPORARY 4 INCH YELLOW LINE, PAINT	646.612	-			
							130				130		EACH	LINE STRIPING TARGETS	646.76	4			
							1050		806		1856		SY	GEOTEXTILE UNDER STONE FILL	649.31	22.4			
								125			125		SY	GEOTEXTILE FOR SILT FENCE	649.51	13			
								55			55		SY	GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED	649.515	5			
								50			50		LB	SEED	651.15	1.8			
								450			450		LB	FERTILIZER	651.18	-			
								2			2		TON	AGRICULTURAL LIMESTONE	651.20	0.6			
								2			2		TON	HAY MULCH	651.25	0.6			
							225				225		CY	TOPSOIL	651.35	9			
							575		281		856		SY	GRUBBING MATERIAL	651.40	17			
								1			1		LS	EPSC PLAN	652.10	-			
								400			400		HR	MONITORING EPSC PLAN	652.20	EST			
								1			1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30	-			
								975			975		SY	TEMPORARY EROSION MATTING	653.20	8			
								4			4		CY	TEMPORARY STONE CHECK DAM, TYPE I	653.25	-			
								625			625		LF	BARRIER FENCE	653.50	11			
								1475			1475		LF	PROJECT DEMARCATION FENCE	653.55	5			
							1				1		SF	TRAFFIC SIGNS, TYPE A	675.20	0.17			
							16				16		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341	-			
							5				5		EACH	REMOVING SIGNS	675.50	-			

CLD 12-0106 MODEL: OSS 2



PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/2lb294frm.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: M. HALEY
QUANTITY SHEET 2

PLOT DATE: 12/16/2014
DRAWN BY: M. HALEY
CHECKED BY: P. SHEDD
SHEET 12 OF 73

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
							ROADWAY	EROSION CONTROL	BRIDGE 126	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							5				5		EACH	ERECTING SALVAGED SIGNS	675.60	-			
							14				14		EACH	DELINEATOR WITH STEEL POST	676.10	-			
									306		306		CY	SPECIAL PROVISION (3/4" CRUSHED STONE) (FPQ)	900.608	1			
									277		277		CY	SPECIAL PROVISION (STONE FILL, CULVERT LINING)	900.608	0.8			
									623		623		CY	SPECIAL PROVISION (STONE FILL, STREAM BED MATERIAL)	900.608	1			
									1		1		LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)	900.645	-			
							1				1		LS	SPECIAL PROVISION (TEMPORARY ROADWAY)	900.645	-			
							620				620		SY	SPECIAL PROVISION (HAND-PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES)	900.675	7.2			

CLD 12-0106 MODEL: OSS 3



PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/zlb294frm.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: M. HALEY
QUANTITY SHEET 3

PLOT DATE: 12/16/2014
DRAWN BY: M. HALEY
CHECKED BY: P. SHEDD
SHEET 13 OF 73

GENERAL INFORMATION

SYMBOLGY LEGEND NOTE

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

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

POINT CODE	DESCRIPTION
CH	CHANNEL EASEMENT
CONST	CONSTRUCTION EASEMENT
CUL	CULVERT EASEMENT
D&C	DISCONNECT & CONNECT
DIT	DITCH EASEMENT
DR	DRAINAGE EASEMENT
DRIVE	DRIVEWAY EASEMENT
EC	EROSION CONTROL
HWY	HIGHWAY EASEMENT
I&M	INSTALL & MAINTAIN EASEMENT
LAND	LANDSCAPE EASEMENT
R&RES	REMOVE & RESET
R&REP	REMOVE & REPLACE
SR	SLOPE RIGHT
UE	UTILITY EASEMENT
(P)	PERMANENT EASEMENT
(T)	TEMPORARY EASEMENT
■	BNDNS BOUND SET
□	BNDNS BOUND TO BE SET
●	IPNS IRON PIN SET
⊙	IPNS IRON PIN TO BE SET
⊠	CALC EXISTING ROW POINT
○	PROW PROPOSED ROW POINT
[LENGTH]	LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

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

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

PROPOSED GEOMETRY CODES

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

UTILITY SYMBOLGY

UNDERGROUND UTILITIES

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

ABOVE GROUND UTILITIES (AERIAL)

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

PROJECT CONSTRUCTION SYMBOLGY

PROJECT DESIGN & LAYOUT SYMBOLGY

— CZ —	CLEAR ZONE
—	PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

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

CONVENTIONAL BOUNDARY SYMBOLGY

BOUNDARY LINES

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

EPSC LAYOUT PLAN SYMBOLGY

EPSC MEASURES

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

ENVIRONMENTAL RESOURCES

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

ARCHEOLOGICAL & HISTORIC

— ARCH —	ARCHEOLOGICAL BOUNDARY
— HISTORIC DIST —	HISTORIC DISTRICT BOUNDARY
— HISTORIC —	HISTORIC AREA
Ⓜ	HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLGY

EXISTING FEATURES

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

PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/lb294frm.dgn PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT DRAWN BY: M. HALEY
DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
CONVENTIONAL SYMBOLGY LEGEND SHEET SHEET 14 OF 73



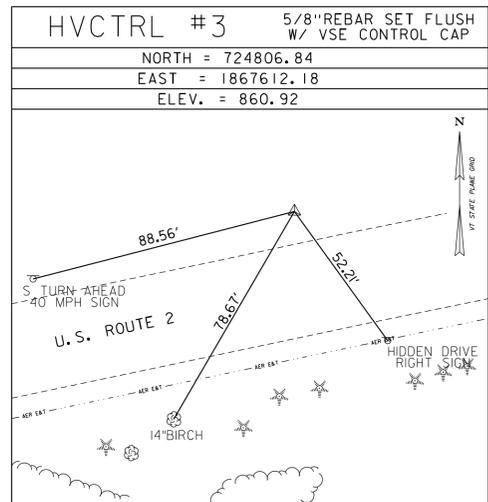
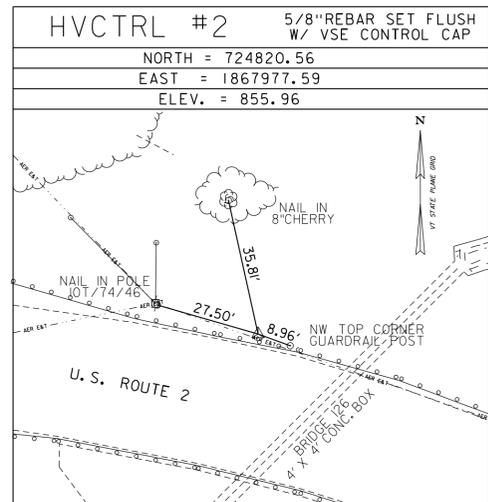
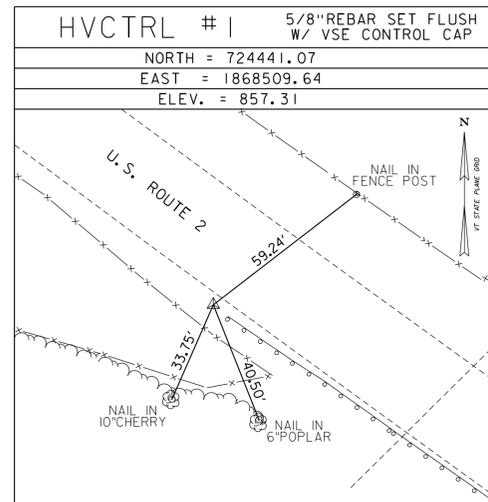
GPS/NGS CONTROL POINTS

SAINT JOHNSBURY CORS ARP

PID DK4107
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 E = 1764393.17
 ELLIP HEIGHT = 546.36

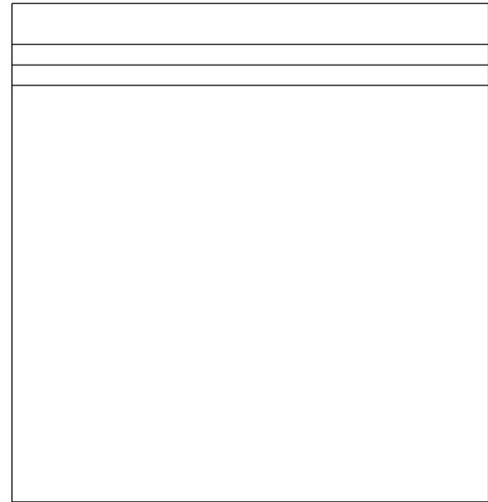
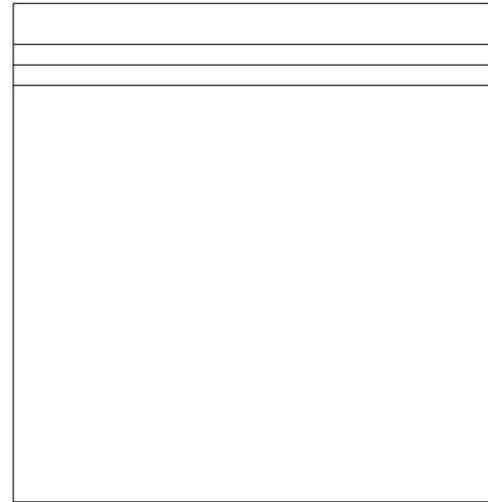
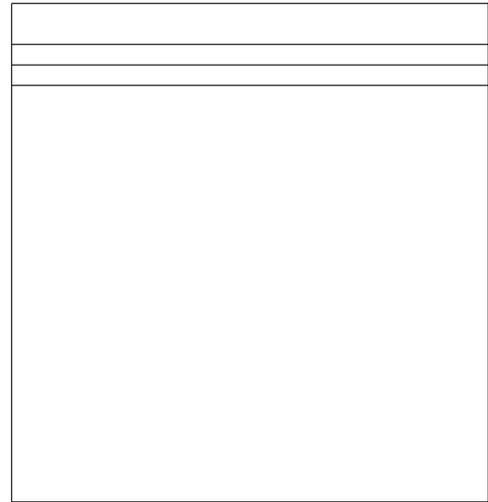
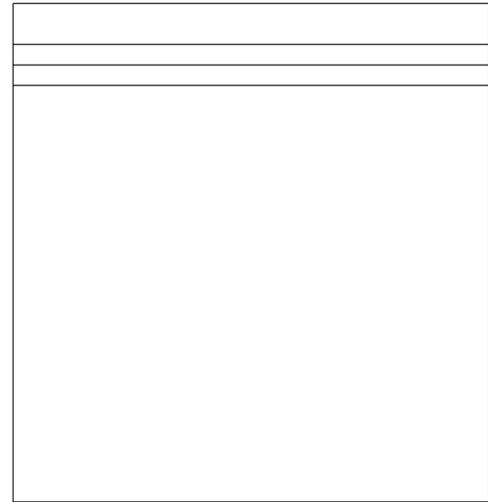
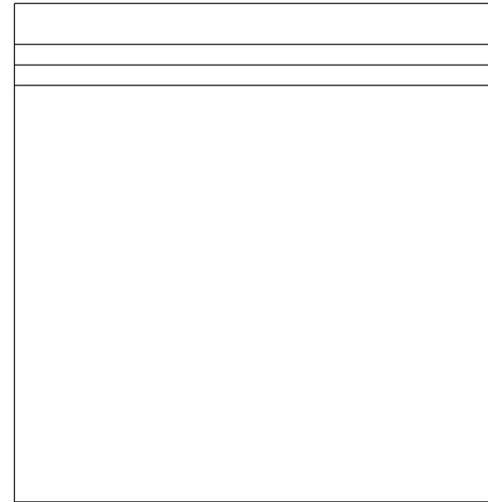
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TRAVERSE TIES



* SURVEY COMPLETED: FEBRUARY 27, 2012 BY VSE, M. YEFCHAK-PC, T. YEFCHAK

ALIGNMENT TIES



DATUM
 VERTICAL NAVD 88(GE01D09) FT
 HORIZONTAL NAD 83(CORS) sFT
 ADJUSTMENT LSO

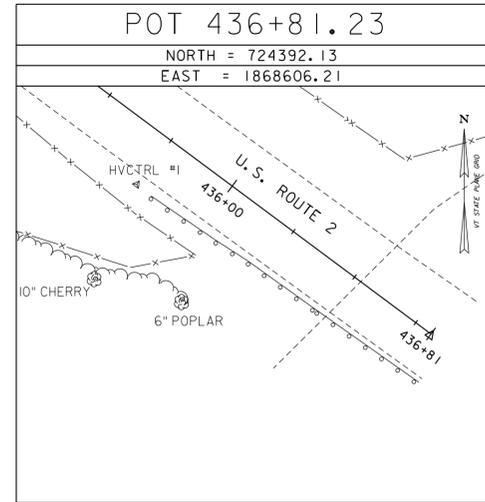
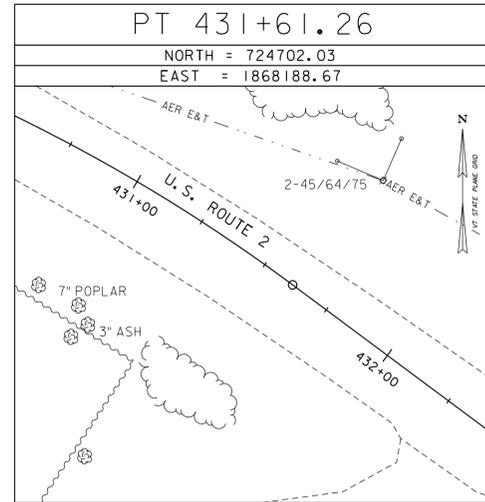
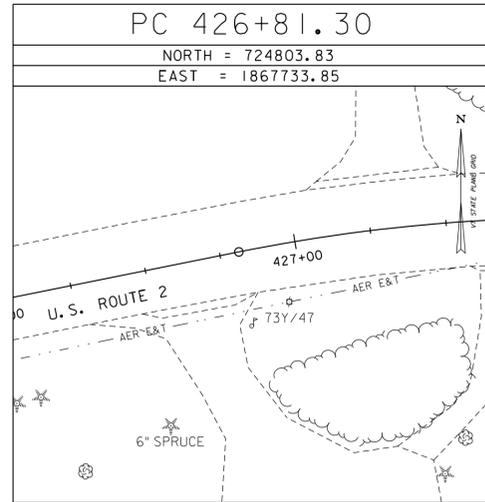
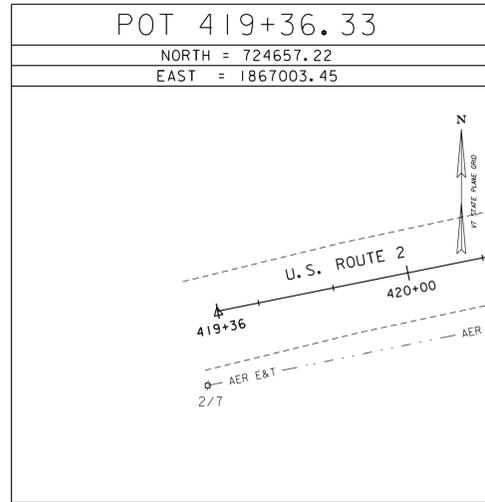


PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

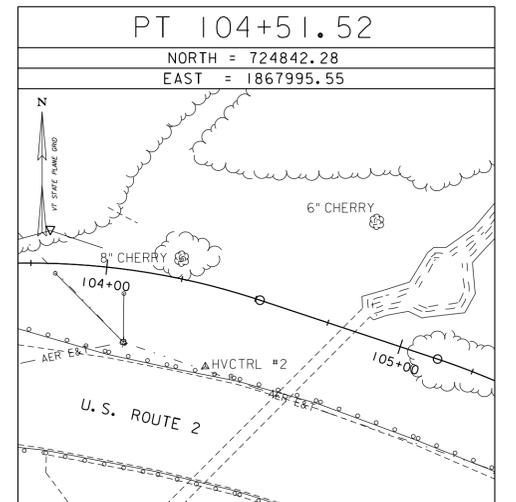
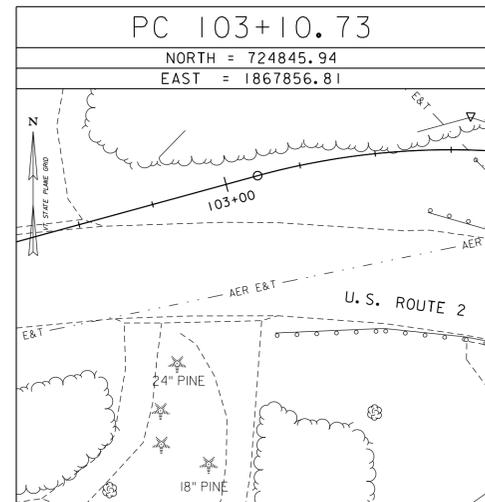
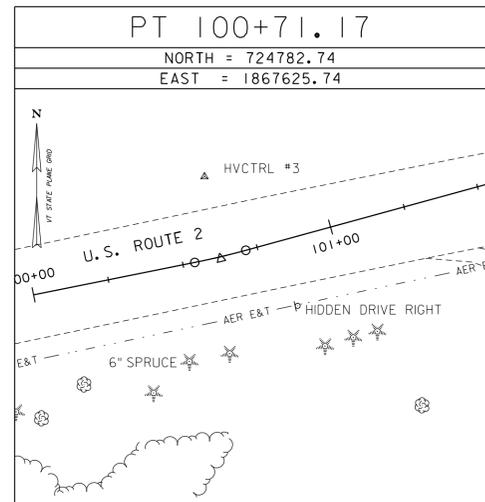
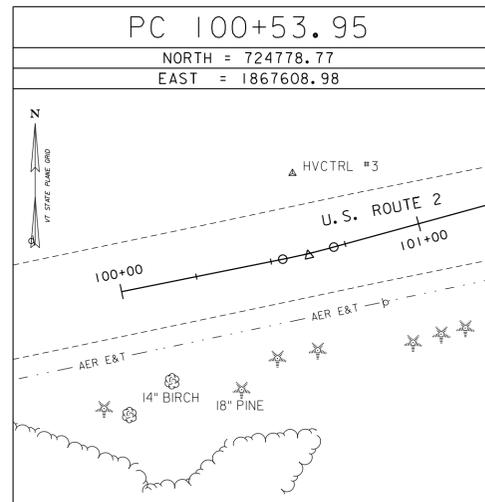
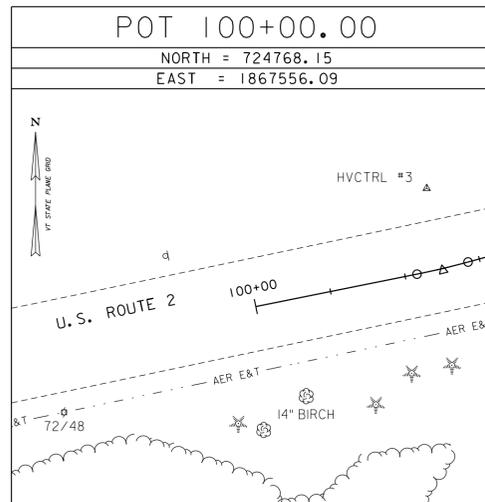
FILE NAME: z11b294t1e.dgn
 PROJECT LEADER: J. BYATT
 DESIGNED BY: VSE
 TIE SHEET 1

PLOT DATE: 12/16/2014
 DRAWN BY: VSE
 CHECKED BY: VSE
 SHEET 15 OF 73

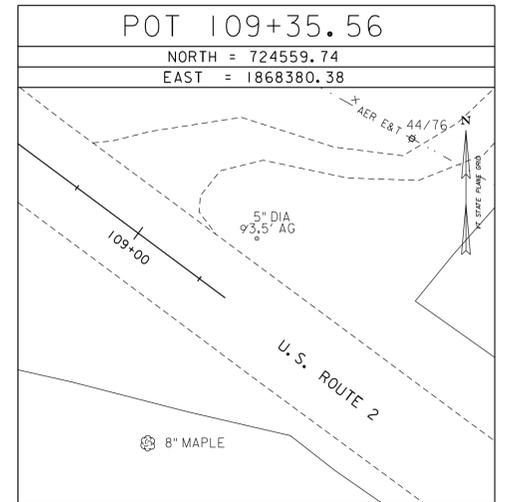
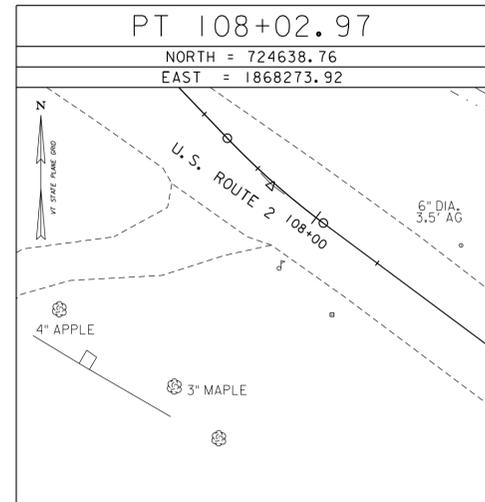
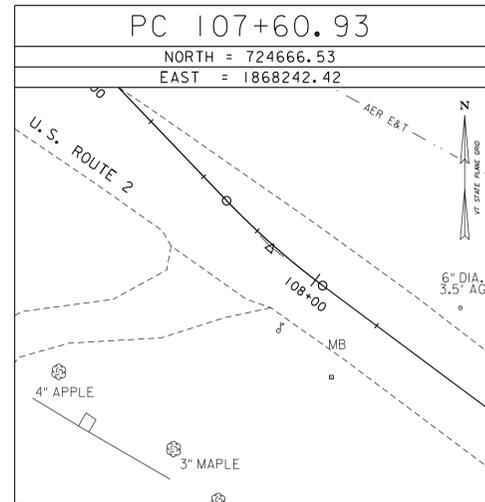
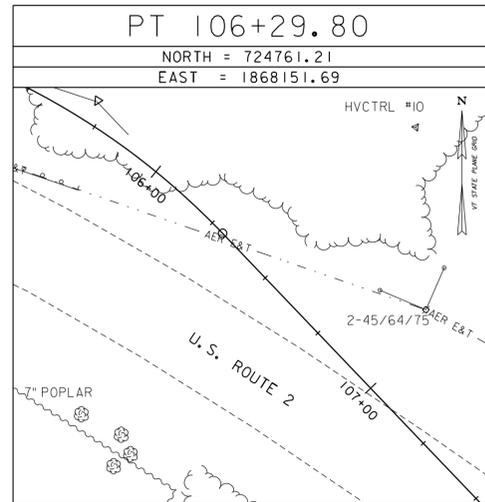
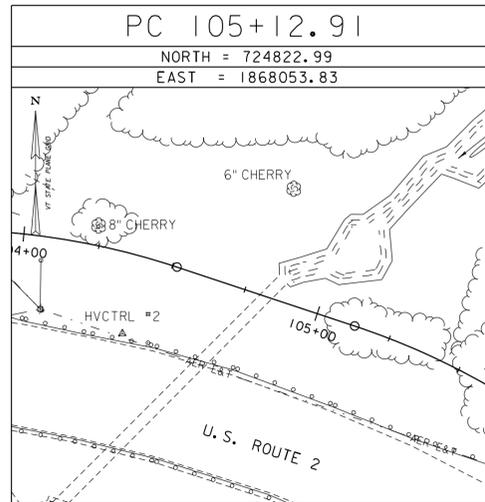
ALIGNMENT TIES



ALIGNMENT TIES



ALIGNMENT TIES



CLD_12-0106 MODEL: TIE02

DATUM	
VERTICAL	NAVD 88(GE01D09) FT
HORIZONTAL	NAD 83(CORS) sFT
ADJUSTMENT	LSO



PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: llb294/cos/zllb294tie.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: M. HALEY
TIE SHEET 2

PLOT DATE: 12/16/2014
DRAWN BY: S. GOODWIN
CHECKED BY: P. SHEDD
SHEET 16 OF 73

TEMPORARY 4 INCH WHITE LINE, PAINT
 DURABLE 4 INCH WHITE LINE, POLYUREA
 424+25 TO 429+75 SOLID LT & RT

TEMPORARY 4 INCH YELLOW LINE, PAINT
 DURABLE 4 INCH YELLOW LINE, POLYUREA
 424+25 TO 429+75 LT & RT

CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
 426+65 RT (18.0 FT WIDE, GRAVEL, RES.)
 427+35 LT (18.4 FT WIDE, GRAVEL, RES.)

RIGHT-OF-WAY PLAN REFERENCE
 "STATE OF VERMONT STATE HIGHWAY DEPARTMENT - PLAN AND PROFILE OF PROPOSED
 STATE HIGHWAY FEDERAL AID PROJECT - TOWNS OF LUNENBURG - GUILDHALL,
 ST. JOHNSBURY VT. - LANCASTER N.H. ROAD, VT F 131-C", DATED 1932, ON FILE
 AT THE VERMONT AGENCY OF TRANSPORTATION.

STEEL BEAM GUARDRAIL, GALVANIZED
 427+87.5 TO 429+75 RT
 428+50.0 TO 429+75 LT

MANUFACTURED
 TERMINAL SECTION, FLARED
 427+50.0 TO 427+87.5 RT
 428+12.5 TO 428+50.0 LT

RELOCATE MAILBOX, SINGLE SUPPORT
 426+82 RT

REMOVAL AND DISPOSAL OF GUARDRAIL
 428+11 TO 429+75 RT
 428+58 TO 429+75 LT

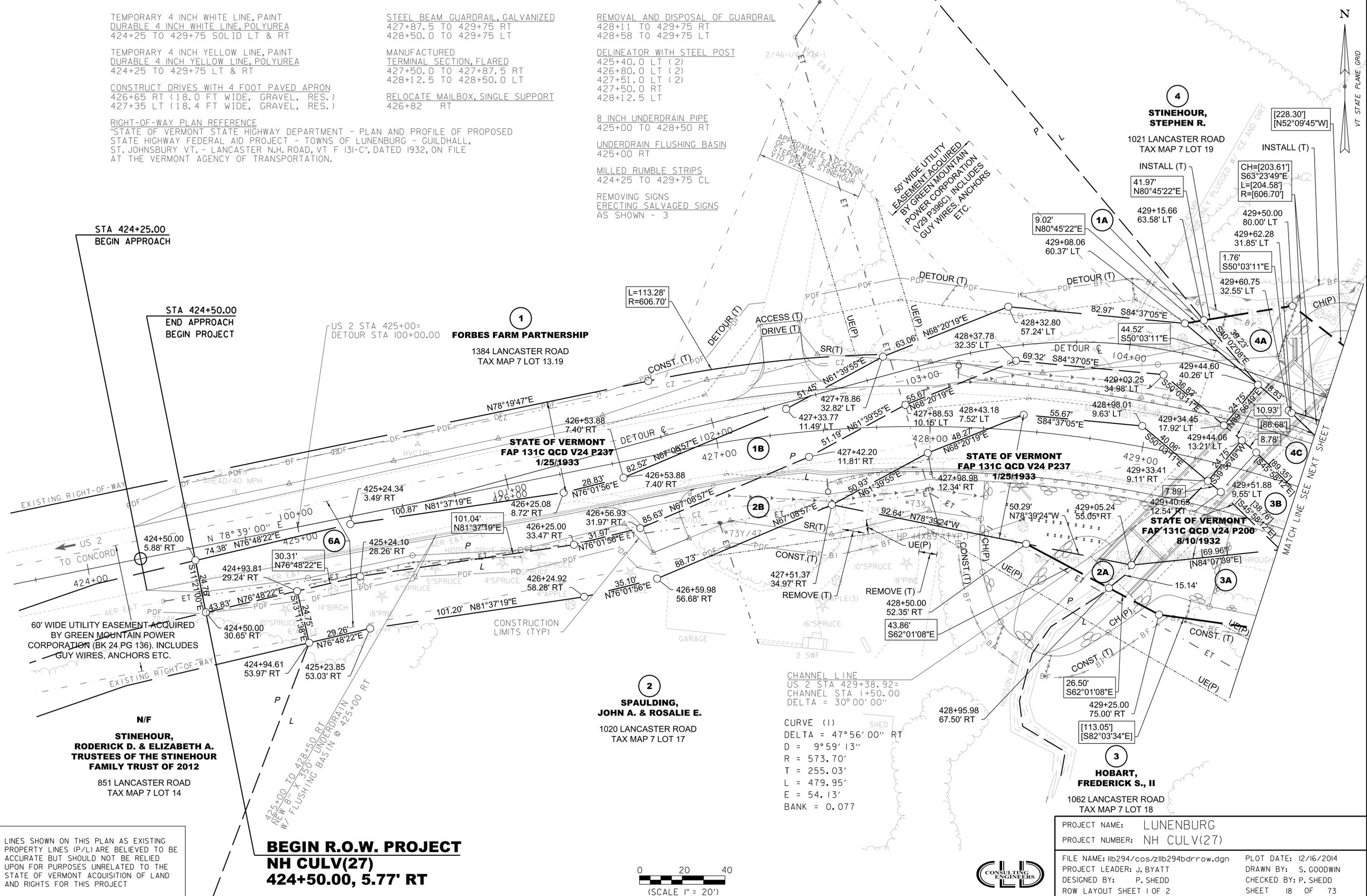
DELINEATOR WITH STEEL POST
 425+40.0 LT (2)
 426+80.0 LT (2)
 427+51.0 LT (2)
 427+50.0 RT
 428+12.5 LT

8 INCH UNDERDRAIN PIPE
 425+00 TO 428+50 RT

UNDERDRAIN FLUSHING BASIN
 425+00 RT

MILLED RUMBLE STRIPS
 424+25 TO 429+75 CL

REMOVING SIGNS
 ERECTING SALVAGED SIGNS
 AS SHOWN - 3



STA 424+25.00
 BEGIN APPROACH

STA 424+50.00
 END APPROACH
 BEGIN PROJECT

**BEGIN R.O.W. PROJECT
 NH CULV(27)
 424+50.00, 5.77' RT**

LINES SHOWN ON THIS PLAN AS EXISTING
 PROPERTY LINES (P/L) ARE BELIEVED TO BE
 ACCURATE BUT SHOULD NOT BE RELIED
 UPON FOR PURPOSES UNRELATED TO THE
 STATE OF VERMONT ACQUISITION OF LAND
 AND RIGHTS FOR THIS PROJECT

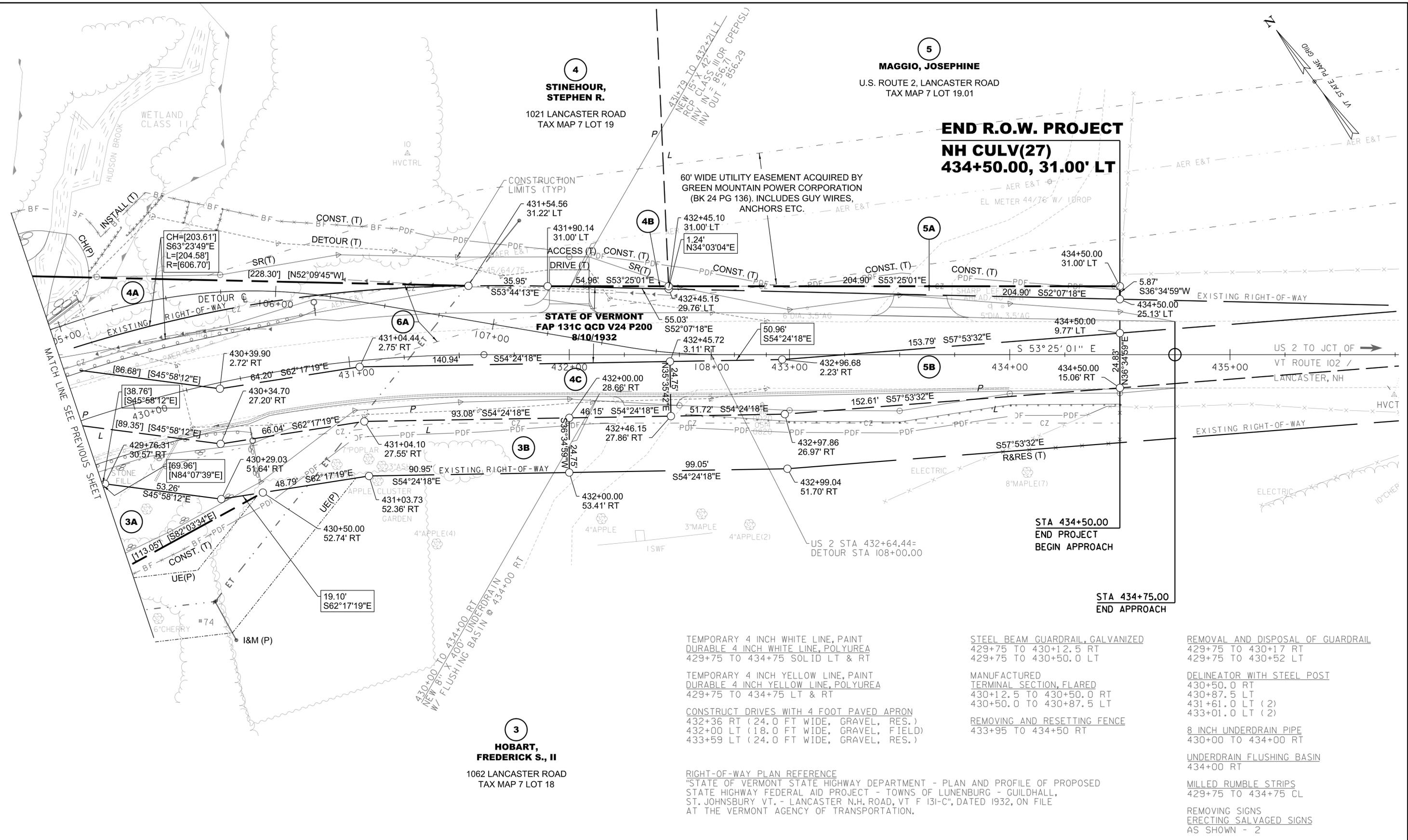


PROJECT NAME:	LUNENBURG
PROJECT NUMBER:	NH CULV(27)
FILE NAME:	l1b294/cos/z1lb294bdrrow.dgn
PROJECT LEADER:	J. BYATT
DESIGNED BY:	P. SHEDD
ROW LAYOUT SHEET 1 OF 2	
PLOT DATE:	12/16/2014
DRAWN BY:	S. GOODWIN
CHECKED BY:	P. SHEDD
SHEET	18 OF 73

CLD-12-0106 MODEL-LOI

CLD_12-0106 MODEL: LO2

LINES SHOWN ON THIS PLAN AS EXISTING PROPERTY LINES (P/L) ARE BELIEVED TO BE ACCURATE BUT SHOULD NOT BE RELIED UPON FOR PURPOSES UNRELATED TO THE STATE OF VERMONT ACQUISITION OF LAND AND RIGHTS FOR THIS PROJECT



- TEMPORARY 4 INCH WHITE LINE, PAINT
- DURABLE 4 INCH WHITE LINE, POLYUREA
- 429+75 TO 434+75 SOLID LT & RT
- TEMPORARY 4 INCH YELLOW LINE, PAINT
- DURABLE 4 INCH YELLOW LINE, POLYUREA
- 429+75 TO 434+75 LT & RT
- CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
- 432+36 RT (24.0 FT WIDE, GRAVEL, RES.)
- 432+00 LT (18.0 FT WIDE, GRAVEL, FIELD)
- 433+59 LT (24.0 FT WIDE, GRAVEL, RES.)
- RIGHT-OF-WAY PLAN REFERENCE
- "STATE OF VERMONT STATE HIGHWAY DEPARTMENT - PLAN AND PROFILE OF PROPOSED STATE HIGHWAY FEDERAL AID PROJECT - TOWNS OF LUNENBURG - GUILDHALL, ST. JOHNSBURY VT. - LANCASTER N.H. ROAD, VT F 131-C", DATED 1932, ON FILE AT THE VERMONT AGENCY OF TRANSPORTATION.
- STEEL BEAM GUARDRAIL, GALVANIZED
- 429+75 TO 430+12.5 RT
- 429+75 TO 430+50.0 LT
- MANUFACTURED TERMINAL SECTION, FLARED
- 430+12.5 TO 430+50.0 RT
- 430+50.0 TO 430+87.5 LT
- REMOVING AND RESETTING FENCE
- 433+95 TO 434+50 RT
- REMOVAL AND DISPOSAL OF GUARDRAIL
- 429+75 TO 430+17 RT
- 429+75 TO 430+52 LT
- DELINEATOR WITH STEEL POST
- 430+50.0 RT
- 430+87.5 LT
- 431+61.0 LT (2)
- 433+01.0 LT (2)
- 8 INCH UNDERDRAIN PIPE
- 430+00 TO 434+00 RT
- UNDERDRAIN FLUSHING BASIN
- 434+00 RT
- MILLED RUMBLE STRIPS
- 429+75 TO 434+75 CL
- REMOVING SIGNS
- ERECTING SALVAGED SIGNS AS SHOWN - 2



PROJECT NAME:	LUNENBURG
PROJECT NUMBER:	NH CULV(27)
FILE NAME:	11b294/cos/z11b294bdrrow.dgn
PLOT DATE:	12/16/2014
PROJECT LEADER:	J. BYATT
DRAWN BY:	S. GOODWIN
DESIGNED BY:	P. SHEDD
CHECKED BY:	P. SHEDD
ROW LAYOUT SHEET 2 OF 2	SHEET 19 OF 73

TEMPORARY 4 INCH WHITE LINE, PAINT
 DURABLE 4 INCH WHITE LINE, POLYUREA
 424+25 TO 429+75 SOLID LT & RT

TEMPORARY 4 INCH YELLOW LINE, PAINT
 DURABLE 4 INCH YELLOW LINE, POLYUREA
 424+25 TO 429+75 LT & RT

CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
 426+65 RT (18.0 FT WIDE, GRAVEL, RES.)
 427+35 LT (18.4 FT WIDE, GRAVEL, RES.)

STEEL BEAM GUARDRAIL, GALVANIZED
 427+87.5 TO 429+75 RT
 428+50.0 TO 429+75 LT

MANUFACTURED
 TERMINAL SECTION, FLARED
 427+50.0 TO 427+87.5 RT
 428+12.5 TO 428+50.0 LT

RELOCATE MAILBOX, SINGLE SUPPORT
 426+82 RT

REMOVAL AND DISPOSAL OF GUARDRAIL
 428+11 TO 429+75 RT
 428+58 TO 429+75 LT

DELINEATOR WITH STEEL POST
 425+40.0 LT (2)
 426+80.0 LT (2)
 427+51.0 LT (2)
 427+50.0 RT
 428+12.5 LT

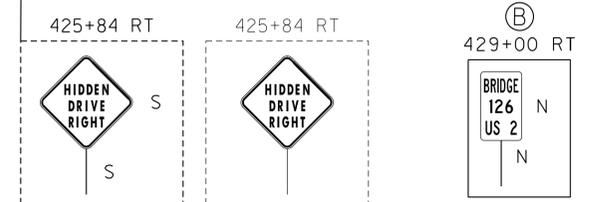
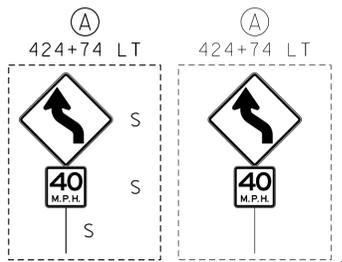
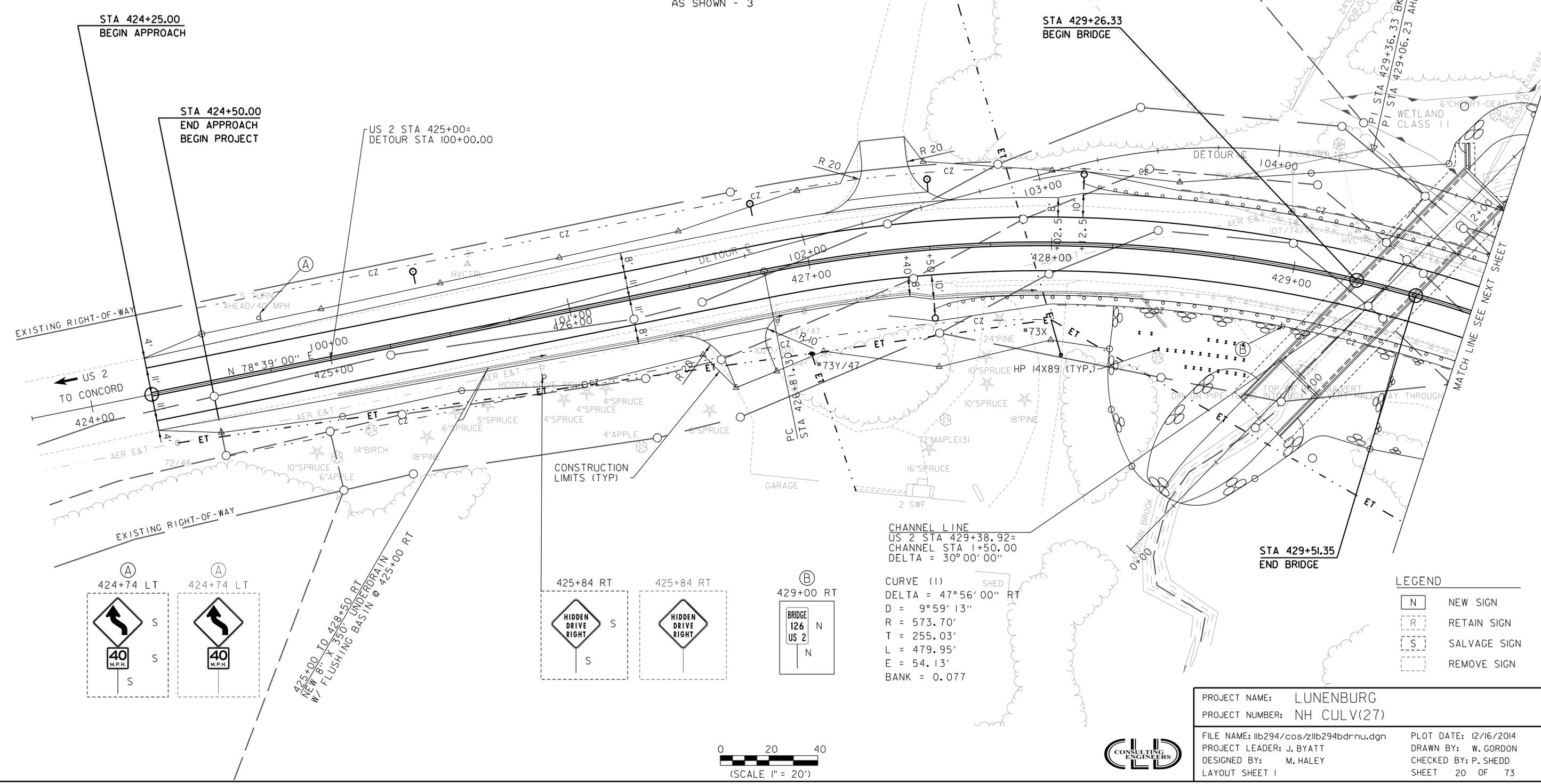
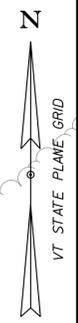
8 INCH UNDERDRAIN PIPE
 425+00 TO 428+50 RT

UNDERDRAIN FLUSHING BASIN
 425+00 RT

MILLED RUMBLE STRIPS
 424+25 TO 429+75 CL

REMOVING SIGNS
 ERECTING SALVAGED SIGNS
 AS SHOWN - 3

RIGHT-OF-WAY PLAN REFERENCE
 "STATE OF VERMONT STATE HIGHWAY DEPARTMENT - PLAN AND PROFILE OF PROPOSED
 STATE HIGHWAY FEDERAL AID PROJECT - TOWNS OF LUNENBURG - GUILDHALL,
 ST. JOHNSBURY VT. - LANCASTER N.H. ROAD, VT F 131-C", DATED 1932, ON FILE
 AT THE VERMONT AGENCY OF TRANSPORTATION.



CHANNEL LINE
 US 2 STA 429+38.92=
 CHANNEL STA 1+50.00
 DELTA = 30°00'00"

CURVE (1)
 DELTA = 47°56'00" RT
 D = 9°59'13"
 R = 573.70'
 T = 255.03'
 L = 479.95'
 E = 54.13'
 BANK = 0.077

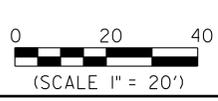
LEGEND

N	NEW SIGN
R	RETAIN SIGN
S	SALVAGE SIGN
	REMOVE SIGN

PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

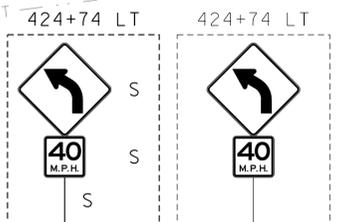
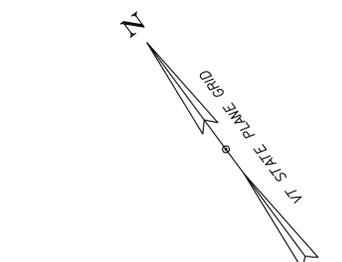
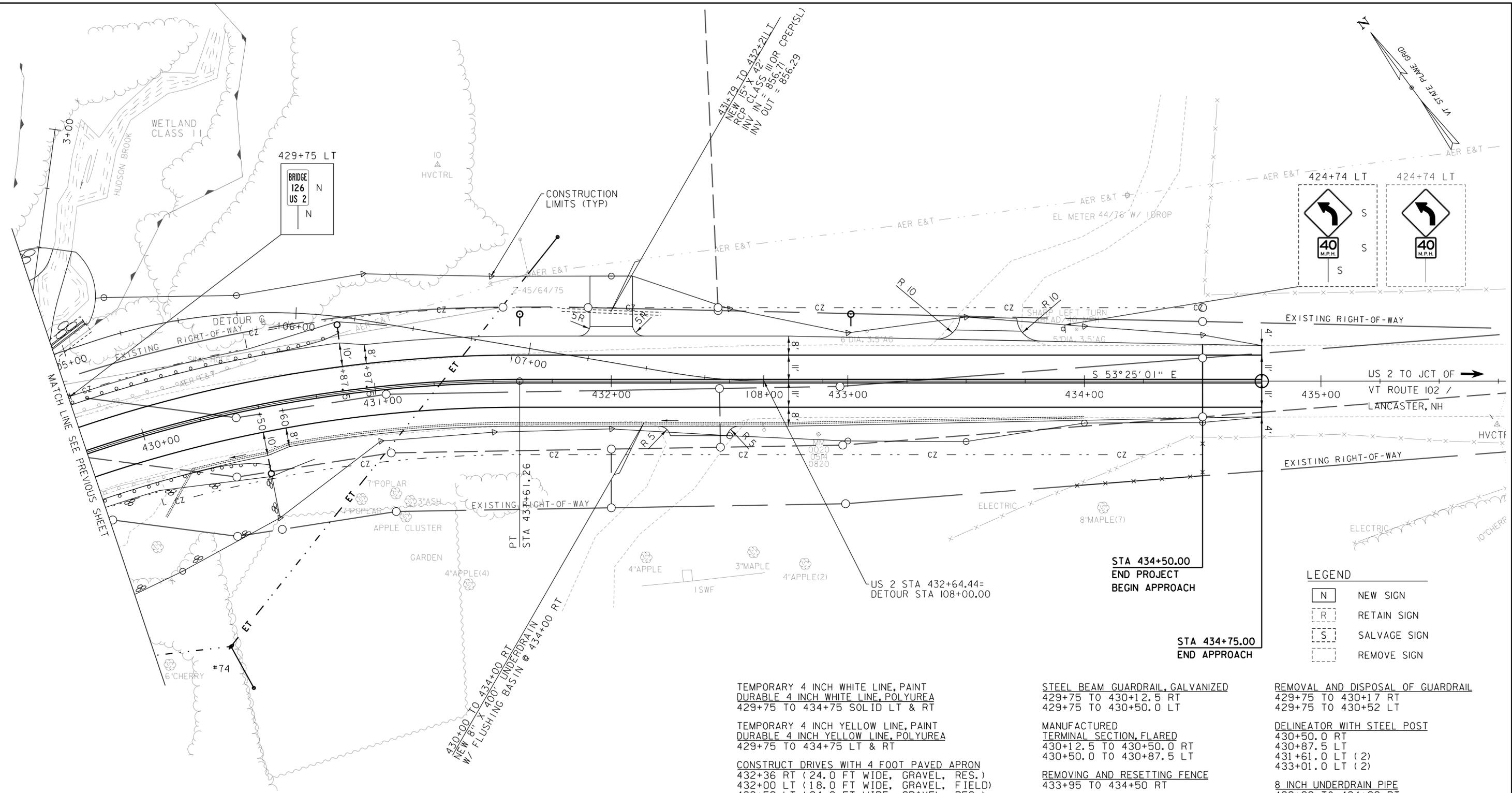
FILE NAME: l1b294/cos/z1b294bdrnu.dgn
 PROJECT LEADER: J. BYATT
 DESIGNED BY: M. HALEY
 LAYOUT SHEET 1

PLOT DATE: 12/16/2014
 DRAWN BY: W. GORDON
 CHECKED BY: P. SHEDD
 SHEET 20 OF 73



CLD 12-0106 MODEL: LOI

CLD 12-0106 MODEL: L02



LEGEND

N	NEW SIGN
R	RETAIN SIGN
S	SALVAGE SIGN
□	REMOVE SIGN

STA 434+50.00
END PROJECT
BEGIN APPROACH

STA 434+75.00
END APPROACH

- TEMPORARY 4 INCH WHITE LINE, PAINT
 DURABLE 4 INCH WHITE LINE, POLYUREA
 429+75 TO 434+75 SOLID LT & RT
- TEMPORARY 4 INCH YELLOW LINE, PAINT
 DURABLE 4 INCH YELLOW LINE, POLYUREA
 429+75 TO 434+75 LT & RT
- CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
 432+36 RT (24.0 FT WIDE, GRAVEL, RES.)
 432+00 LT (18.0 FT WIDE, GRAVEL, FIELD)
 433+59 LT (24.0 FT WIDE, GRAVEL, RES.)

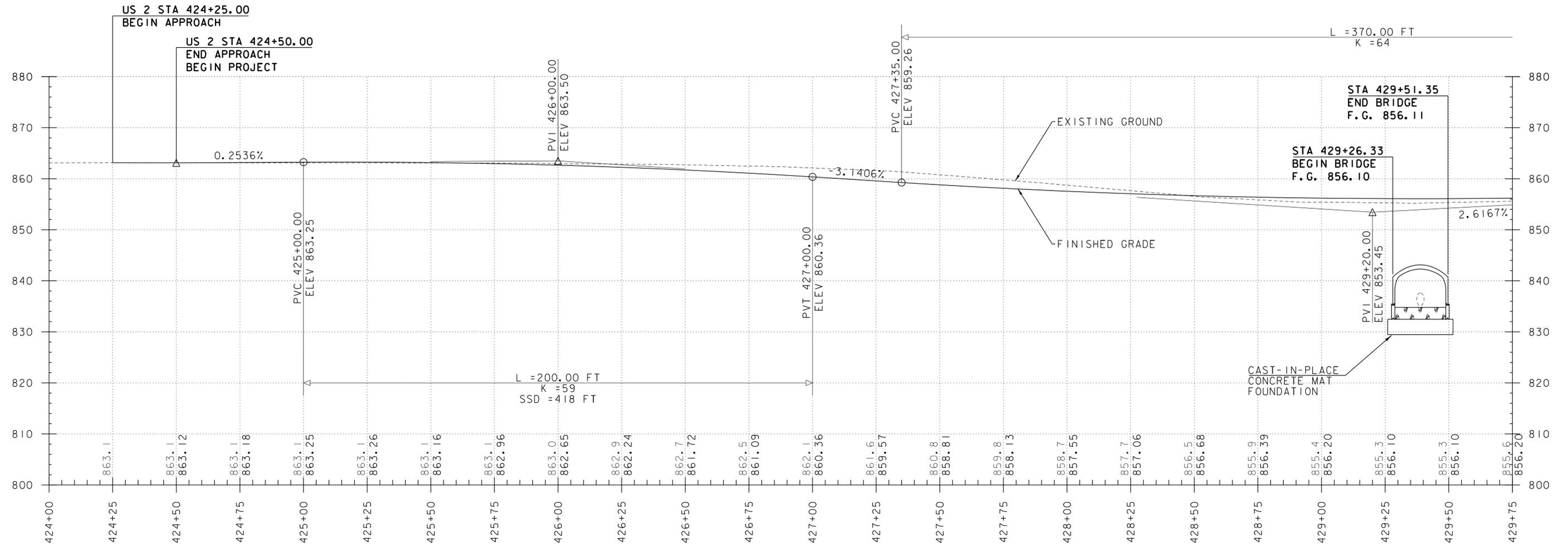
- STEEL BEAM GUARDRAIL, GALVANIZED
 429+75 TO 430+12.5 RT
 429+75 TO 430+50.0 LT
- MANUFACTURED TERMINAL SECTION, FLARED
 430+12.5 TO 430+50.0 RT
 430+50.0 TO 430+87.5 LT
- REMOVING AND RESETTING FENCE
 433+95 TO 434+50 RT

- REMOVAL AND DISPOSAL OF GUARDRAIL
 429+75 TO 430+17 RT
 429+75 TO 430+52 LT
- DELINEATOR WITH STEEL POST
 430+50.0 RT
 430+87.5 LT
 431+61.0 LT (2)
 433+01.0 LT (2)
- 8 INCH UNDERDRAIN PIPE
 430+00 TO 434+00 RT
- UNDERDRAIN FLUSHING BASIN
 434+00 RT
- MILLED RUMBLE STRIPS
 429+75 TO 434+75 CL
- REMOVING SIGNS
 ERECTING SALVAGED SIGNS
 AS SHOWN - 2

RIGHT-OF-WAY PLAN REFERENCE
 "STATE OF VERMONT STATE HIGHWAY DEPARTMENT - PLAN AND PROFILE OF PROPOSED STATE HIGHWAY FEDERAL AID PROJECT - TOWNS OF LUNENBURG - GUILDHALL, ST. JOHNSBURY VT. - LANCASTER N.H. ROAD, VT F 131-C", DATED 1932, ON FILE AT THE VERMONT AGENCY OF TRANSPORTATION.



PROJECT NAME:	LUNENBURG
PROJECT NUMBER:	NH CULV(27)
FILE NAME:	11b294/cos/z11b294bdrnu.dgn
PLOT DATE:	12/16/2014
PROJECT LEADER:	J. BYATT
DRAWN BY:	W. GORDON
DESIGNED BY:	M. HALEY
CHECKED BY:	P. SHEDD
LAYOUT SHEET 2	SHEET 21 OF 73

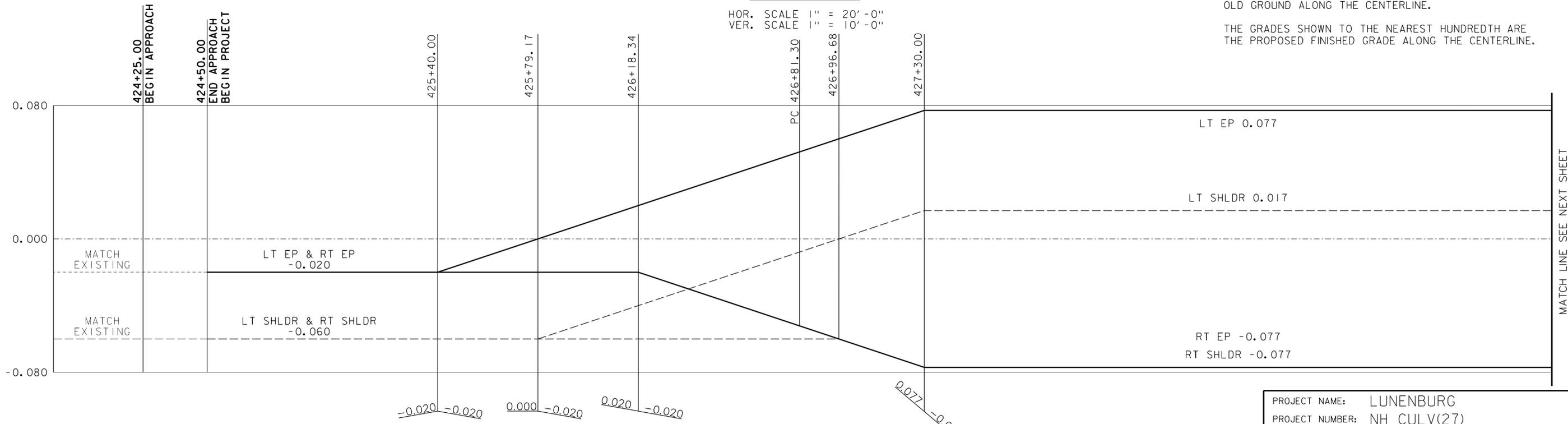


US 2 PROFILE

HOR. SCALE 1" = 20' - 0"
 VER. SCALE 1" = 10' - 0"

THE GRADES SHOWN TO THE NEAREST TENTH ARE THE OLD GROUND ALONG THE CENTERLINE.

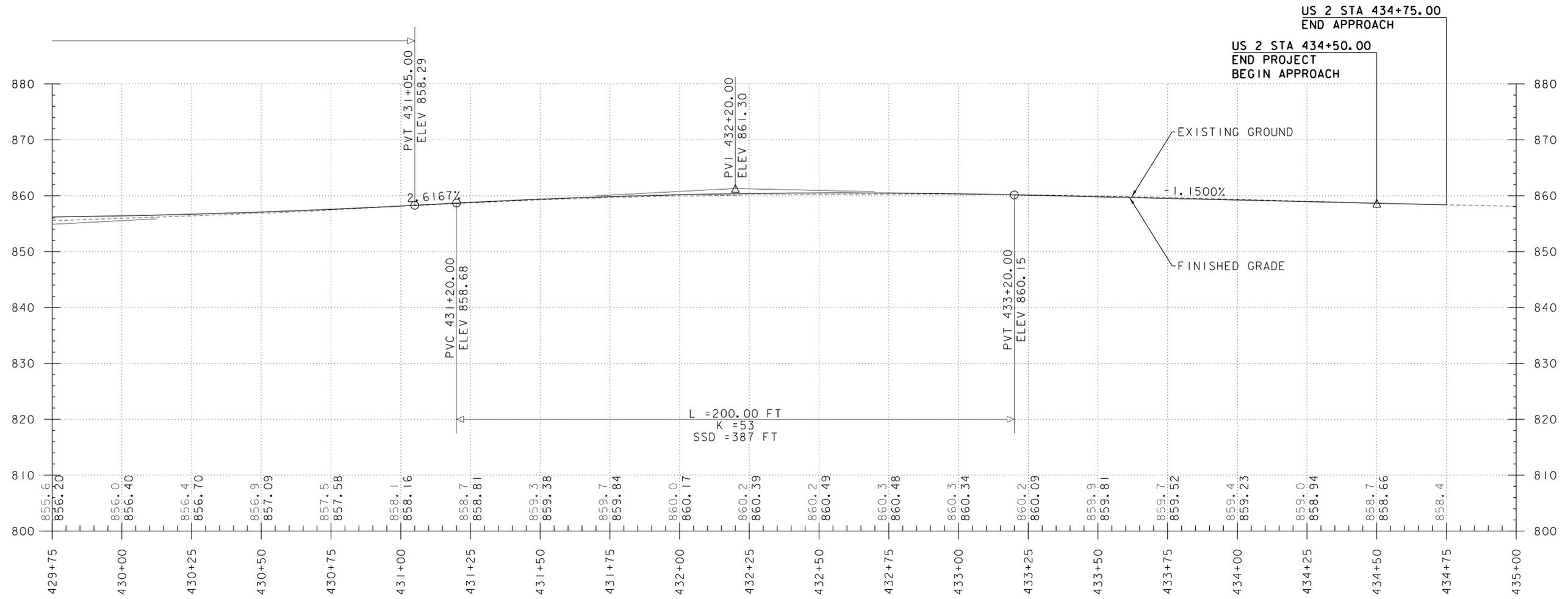
THE GRADES SHOWN TO THE NEAREST HUNDREDTH ARE THE PROPOSED FINISHED GRADE ALONG THE CENTERLINE.



PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	W. GORDON
FILE NAME:	11b294/cos/z11b294pro.dgn	DESIGNED BY:	M. HALEY
PROJECT LEADER:	J. BYATT	CHECKED BY:	P. SHEDD
US 2 PROFILE AND BANKING DIAGRAM 1		SHEET 22 OF 73	



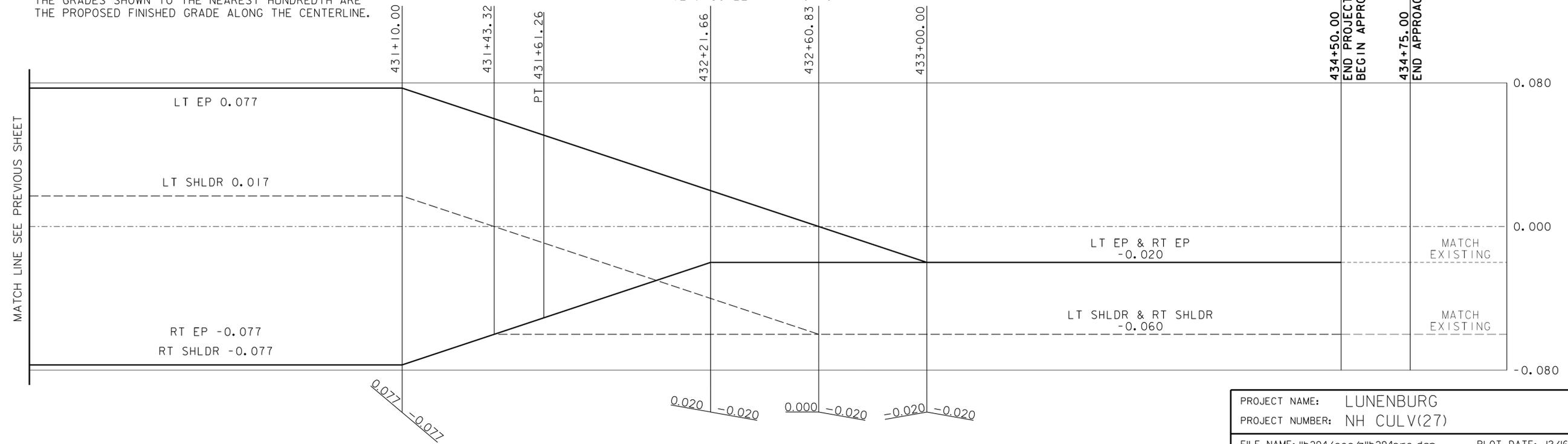
CLD_12-0106 MODEL: PROOF



THE GRADES SHOWN TO THE NEAREST TENTH ARE THE OLD GROUND ALONG THE CENTERLINE.

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

US 2 PROFILE
 HOR. SCALE 1" = 20' - 0"
 VER. SCALE 1" = 10' - 0"



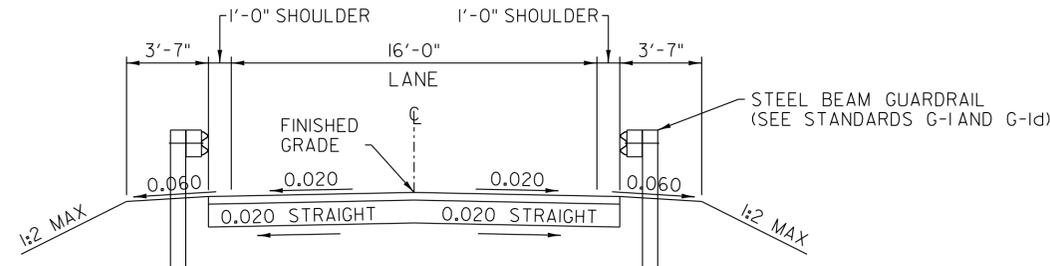
PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)
 FILE NAME: Iib294/cos/zIib294pro.dgn
 PROJECT LEADER: J. BYATT
 DESIGNED BY: M. HALEY
 US 2 PROFILE AND BANKING DIAGRAM 2

PLOT DATE: 12/16/2014
 DRAWN BY: W. GORDON
 CHECKED BY: P. SHEDD
 SHEET 23 OF 73



CLD 12-0106 MODEL: PRO02

4" BITUMINOUS CONCRETE PAVEMENT (2-2" LIFTS) (TYPE 111)
 12" SUBBASE OF DENSE GRADED CRUSHED STONE



TYPICAL DETOUR ROADWAY SECTION WITH
 ALTERNATING ONE-WAY TRAFFIC

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

TRAFFIC CONTROL NOTES

1. ANY USE OF UNIFORMED TRAFFIC OFFICERS SHALL BE PAID UNDER ITEM 630.10, "UNIFORMED TRAFFIC OFFICERS". ANY USE OF FLAGGERS SHALL BE PAID UNDER ITEM 630.15, "FLAGGERS".
2. TRAFFIC CONTROL SHALL CONSIST OF ONE-WAY ALTERNATING TRAFFIC UNDER SIGNALIZED CONTROL. ANY EXCAVATION, GRANULAR BACKFILL FOR STRUCTURES, SUBBASE MATERIALS, DRAINAGE CULVERTS, TEMPORARY BRIDGE, TEMPORARY TRAFFIC BARRIER, TRAFFIC CONTROL DEVICES, TEMPORARY SIGNALS, PAVEMENT MARKINGS, BITUMINOUS CONCRETE PAVEMENT AND OTHER ITEMS REQUIRED TO CONSTRUCT, INSPECT, MAINTAIN AND REMOVE THE TEMPORARY DETOUR SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 900.645, "SPECIAL PROVISION (TEMPORARY ROADWAY)". ALL OTHER ITEMS RELATED TO TRAFFIC CONTROL, INCLUDING THE PROJECT TRAFFIC CONTROL PLAN AND ALL OTHER ON AND OFF-PROJECT TEMPORARY CONSTRUCTION SIGNING, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM 641.10, "TRAFFIC CONTROL".
3. ANY VEGETATION WITHIN OR OUTSIDE THE CONSTRUCTION LIMITS SHOWN ON THE PLANS WHICH IS DISTURBED IN ORDER TO MAINTAIN TRAFFIC IN CONJUNCTION WITH THIS PLAN OR ANY OTHER PLAN, SHALL BE RE-ESTABLISHED TO THE SATISFACTION OF THE ENGINEER. PAYMENT WILL BE MADE UNDER THE APPROPRIATE PAY ITEM.
4. NO ADDITIONAL ACCOMMODATIONS NEED TO BE MADE FOR PEDESTRIAN AND BICYCLE TRAFFIC.
5. ACCESS TO ALL EXISTING DRIVES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
6. INSTALLATION OF NECESSARY SIGNS SHALL NOT BLOCK ANY EXISTING TRAFFIC CONTROL SIGN ASSEMBLIES. THE CONTRACTOR SHALL ATTEMPT TO MAINTAIN AT LEAST 100 FEET BETWEEN SIGN ASSEMBLIES.
7. THE CONTRACTOR SHALL CONTACT DIG SAFE AT 1-888-344-7233 PRIOR TO COMMENCING ANY WORK.
8. ALL SIGNS THAT ARE 36" X 36" OR LARGER SHALL BE MOUNTED ON TWO POSTS.
9. ALL SIGN PACKAGES SHALL CONFORM TO THE 2009 MUTCD OR ITS LATEST REVISION.
10. NON CRASHWORTHY FEATURES RESULTING FROM CONSTRUCTION ACTIVITIES THAT ARE LOCATED WITHIN THE CLEAR ZONE SHALL BE PROPERLY PROTECTED. ALL TEMPORARY DEVICES SHALL BE NCHRP REPORT 350 OR MASH COMPLIANT AND SHALL BE FURNISHED IN ACCORDANCE WITH SECTION 621.
11. WHERE TEMPORARY BARRIER IS USED, BARRIER ENDS FACING ONCOMING TRAFFIC SHALL BE TAPERED BEYOND THE CLEAR ZONE OR PROTECTED WITH AN ENERGY ABSORPTION ATTENUATOR. ENERGY ABSORPTION ATTENUATORS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 900.645, "SPECIAL PROVISION (TEMPORARY ROADWAY)".
12. REFER TO MUTCD FIGURE 6H-12, LANE CLOSURE ON A TWO-LANE ROAD USING TRAFFIC CONTROL SIGNALS (TA-12) FOR ADDITIONAL INFORMATION REGARDING REQUIRED SIGNAGE AND SIGN LOCATIONS.
13. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION. THE COST OF PREPARING THE PLAN (AND MAKING CHANGES IF NECESSARY) SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 641.10, "TRAFFIC CONTROL".
14. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PAID FOR UNDER ITEM 641.15, "PORTABLE CHANGEABLE MESSAGE SIGN".
15. PORTABLE ARROW BOARDS SHALL BE PAID FOR UNDER ITEM 641.16, "PORTABLE ARROW BOARD".

CLD 12-0106 MODEL: TYP03

SCALE 1/4" = 1'-0"
 0 4 8



PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: 11b294/cos/z11b294frm.dgn
 PROJECT LEADER: J. BYATT
 DESIGNED BY: M. HALEY
 TYPICAL DETOUR SECTION SHEET

PLOT DATE: 12/16/2014
 DRAWN BY: W. GORDON
 CHECKED BY: P. SHEDD
 SHEET 24 OF 73

TEMPORARY 4 INCH WHITE LINE, PAINT
100+50 TO 104+96 SOLID LT & RT

TEMPORARY 4 INCH YELLOW LINE, PAINT
100+50 TO 101+95 SOLID LT & RT

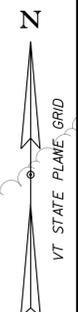
TEMPORARY 24 INCH STOP BAR, PAINT
101+95 RT

CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
102+38 LT (18.4 FT WIDE, GRAVEL, RES.)

STEEL BEAM GUARDRAIL, GALVANIZED
102+90.0 TO 104+40.0 LT
103+65.0 TO 104+40.0 RT

ANCHOR FOR STEEL BEAM RAIL
102+90.0 LT
103+65.0 RT

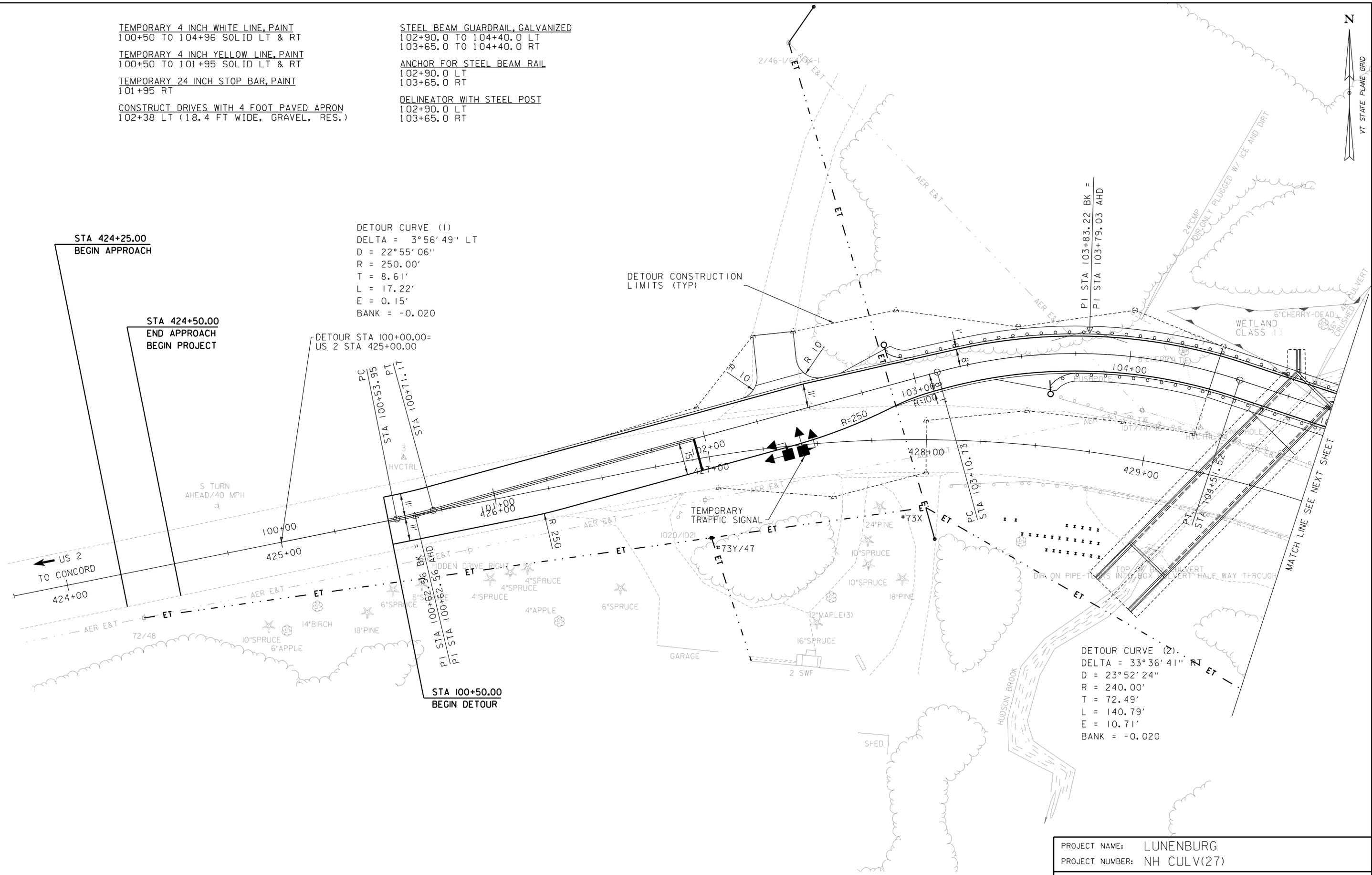
DELINEATOR WITH STEEL POST
102+90.0 LT
103+65.0 RT



DETOUR CURVE (1)
DELTA = 3°56' 49" LT
D = 22°55' 06"
R = 250.00'
T = 8.61'
L = 17.22'
E = 0.15'
BANK = -0.020

DETOUR STA 100+00.00=
US 2 STA 425+00.00

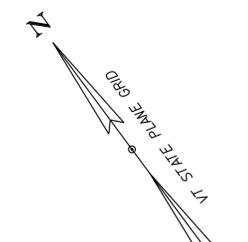
DETOUR CURVE (2)
DELTA = 33°36' 41" RT
D = 23°52' 24"
R = 240.00'
T = 72.49'
L = 140.79'
E = 10.71'
BANK = -0.020



CLD 12-0106 MODEL: L01

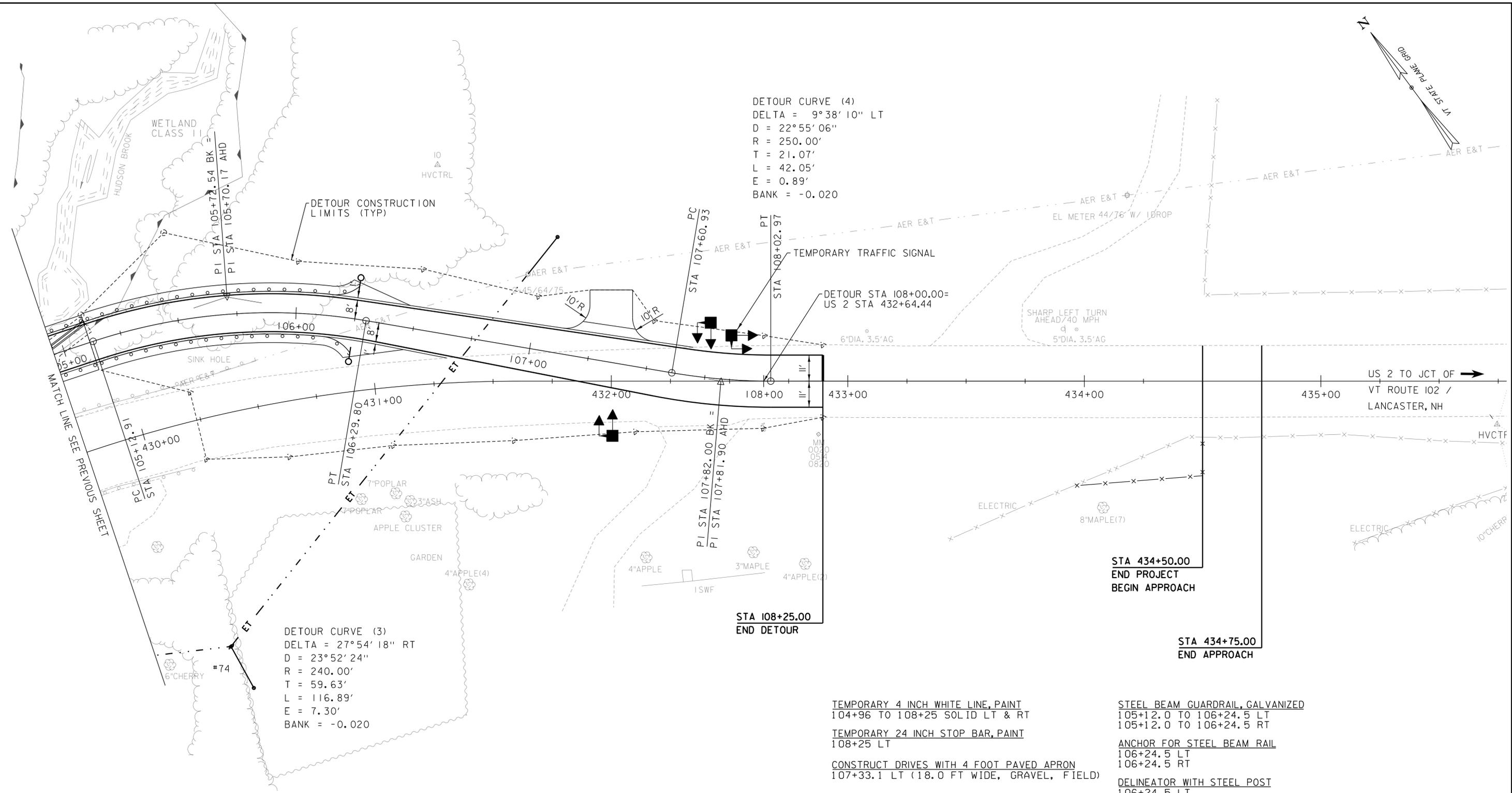


PROJECT NAME:	LUNENBURG	FILE NAME:	lb294/cos/2lb294bdr+cppl.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. HALEY
		DESIGNED BY:	M. HALEY	CHECKED BY:	P. SHEDO
		PHASE I TRAFFIC CONTROL SHEET 1		SHEET	25 OF 73



DETOUR CURVE (4)
 DELTA = 9°38'10" LT
 D = 22°55'06"
 R = 250.00'
 T = 21.07'
 L = 42.05'
 E = 0.89'
 BANK = -0.020

DETOUR CURVE (3)
 DELTA = 27°54'18" RT
 D = 23°52'24"
 R = 240.00'
 T = 59.63'
 L = 116.89'
 E = 7.30'
 BANK = -0.020



STA 434+50.00
 END PROJECT
 BEGIN APPROACH

STA 434+75.00
 END APPROACH

STA 108+25.00
 END DETOUR

TEMPORARY 4 INCH WHITE LINE, PAINT
 104+96 TO 108+25 SOLID LT & RT

TEMPORARY 24 INCH STOP BAR, PAINT
 108+25 LT

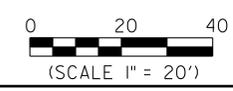
CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
 107+33.1 LT (18.0 FT WIDE, GRAVEL, FIELD)

STEEL BEAM GUARDRAIL, GALVANIZED
 105+12.0 TO 106+24.5 LT
 105+12.0 TO 106+24.5 RT

ANCHOR FOR STEEL BEAM RAIL
 106+24.5 LT
 106+24.5 RT

DELINEATOR WITH STEEL POST
 106+24.5 LT
 106+24.5 RT

CLD 12-0106 MODEL: L02



PROJECT NAME: LUNENBURG	
PROJECT NUMBER: NH CULV(27)	
FILE NAME: l1b294/cos/z1b294bdr+cppl.dgn	PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT	DRAWN BY: M. HALEY
DESIGNED BY: M. HALEY	CHECKED BY: P. SHEDD
PHASE I TRAFFIC CONTROL SHEET 2	SHEET 26 OF 73

TEMPORARY 4 INCH WHITE LINE, PAINT
425+50 TO 427+75 LT & RT

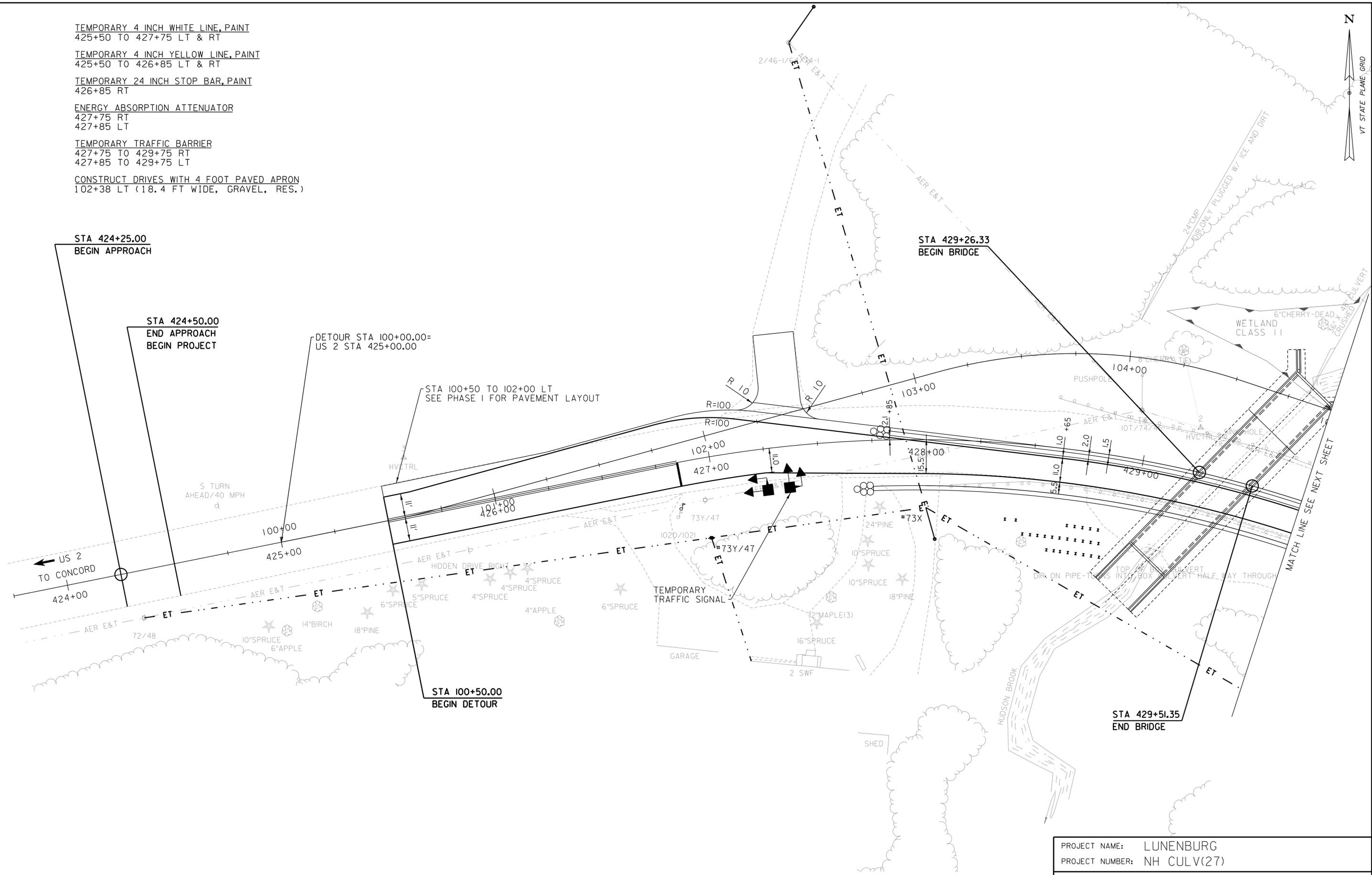
TEMPORARY 4 INCH YELLOW LINE, PAINT
425+50 TO 426+85 LT & RT

TEMPORARY 24 INCH STOP BAR, PAINT
426+85 RT

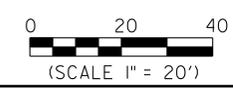
ENERGY ABSORPTION ATTENUATOR
427+75 RT
427+85 LT

TEMPORARY TRAFFIC BARRIER
427+75 TO 429+75 RT
427+85 TO 429+75 LT

CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
102+38 LT (18.4 FT WIDE, GRAVEL, RES.)



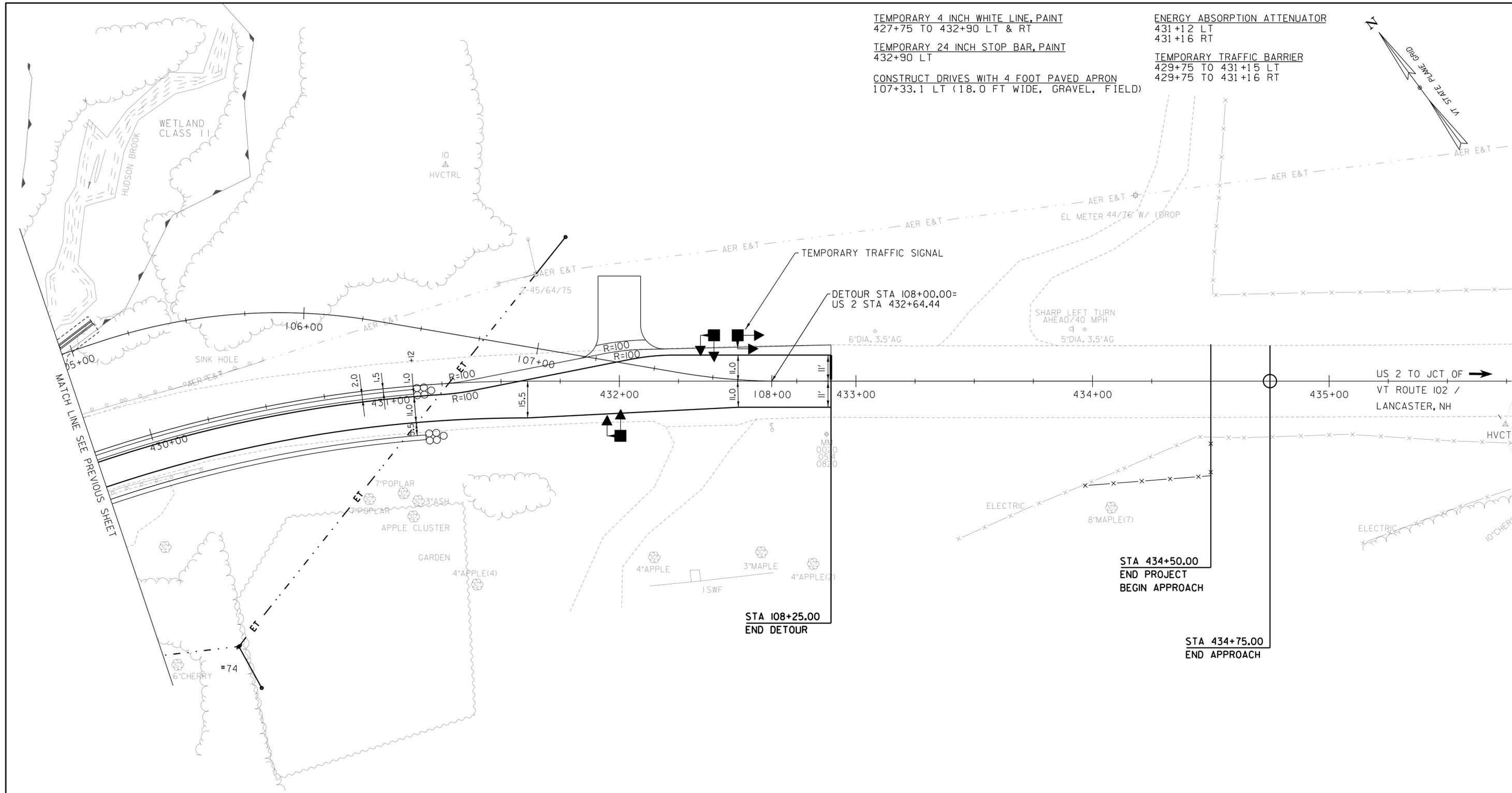
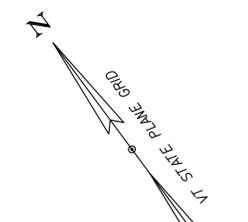
CLD 12-0106 MODEL: L01



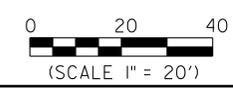
PROJECT NAME:	LUNENBURG	FILE NAME:	lb294/cos/2lb294bdr+cpp2.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. HALEY
		DESIGNED BY:	M. HALEY	CHECKED BY:	P. SHEDD
		PHASE 2 TRAFFIC CONTROL SHEET 1		SHEET	27 OF 73

TEMPORARY 4 INCH WHITE LINE, PAINT
 427+75 TO 432+90 LT & RT
 TEMPORARY 24 INCH STOP BAR, PAINT
 432+90 LT
 CONSTRUCT DRIVES WITH 4 FOOT PAVED APRON
 107+33.1 LT (18.0 FT WIDE, GRAVEL, FIELD)

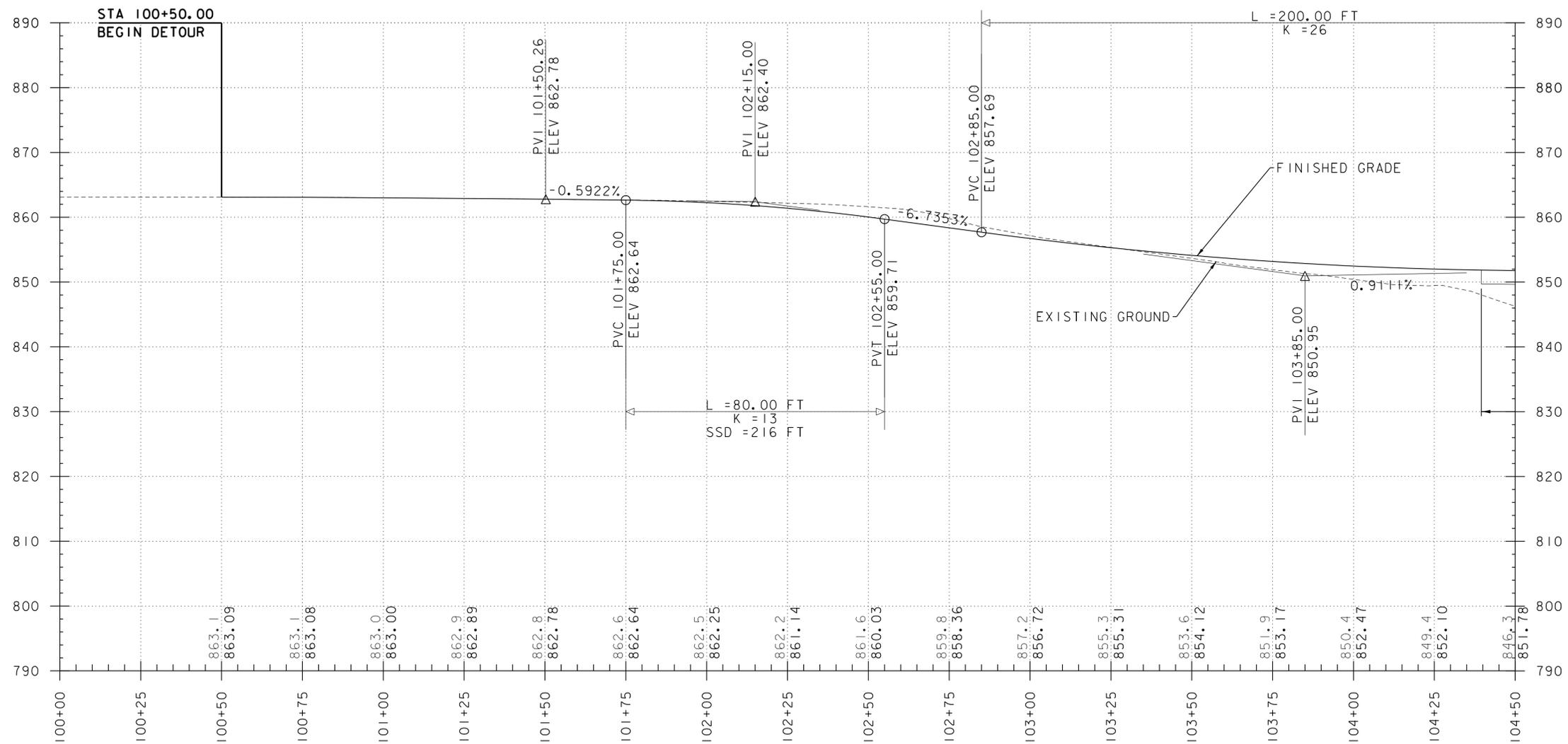
ENERGY ABSORPTION ATTENUATOR
 431+12 LT
 431+16 RT
 TEMPORARY TRAFFIC BARRIER
 429+75 TO 431+15 LT
 429+75 TO 431+16 RT



CLD 12-0106 MODEL: L02



PROJECT NAME:	LUNENBURG	FILE NAME:	11b294/cos/z11b294bdr+cpp2.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. HALEY
		DESIGNED BY:	M. HALEY	CHECKED BY:	P. SHEDD
		PHASE 2 TRAFFIC CONTROL SHEET 2		SHEET	28 OF 73



US 2 DETOUR PROFILE

HOR. SCALE 1" = 20' - 0"
 VER. SCALE 1" = 10' - 0"

CLD_12-0106 MODEL: PROOF

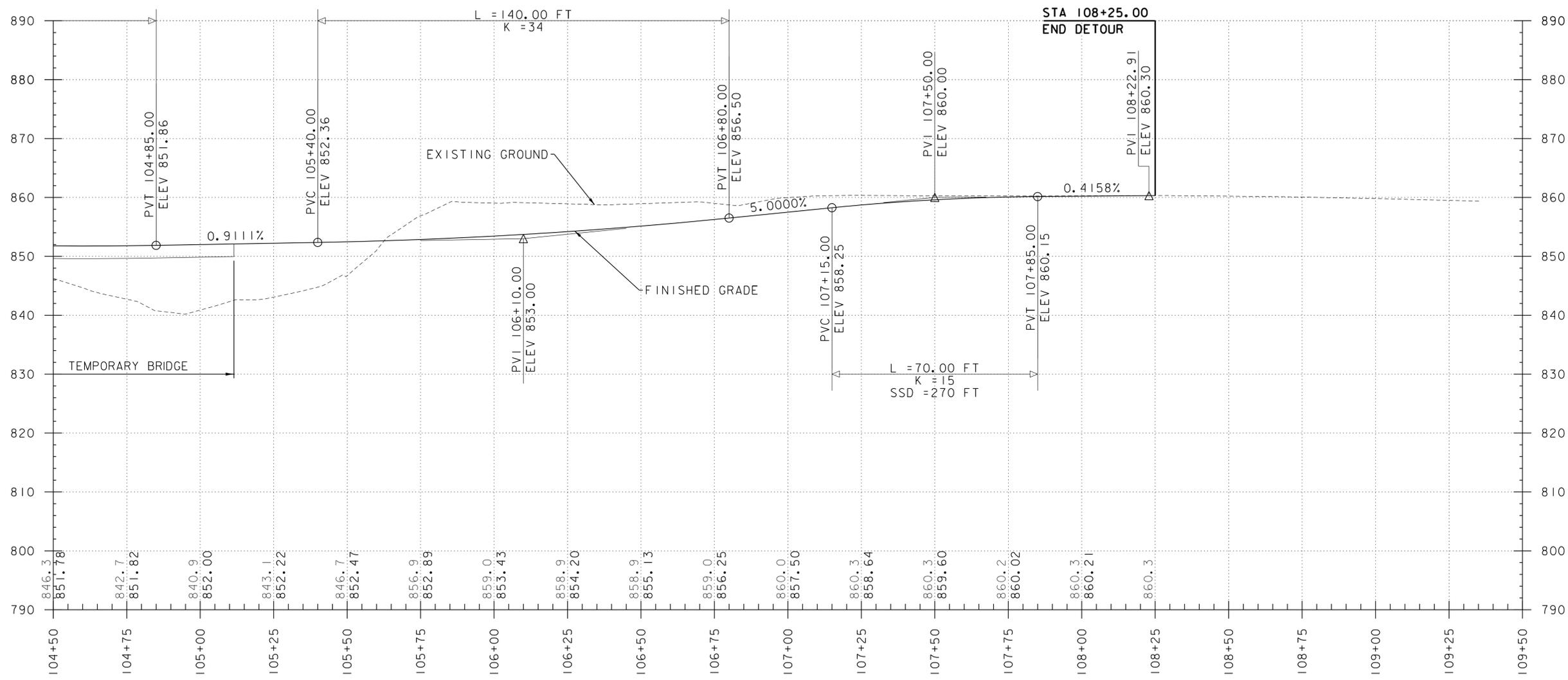
THE GRADES SHOWN TO THE NEAREST TENTH ARE THE OLD GROUND ALONG THE CENTERLINE.

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



PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: I1b294/cos/z1b294prodtr.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: M. HALEY
 DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
 TEMPORARY DETOUR PROFILE SHEET 1 SHEET 29 OF 73



US 2 DETOUR PROFILE

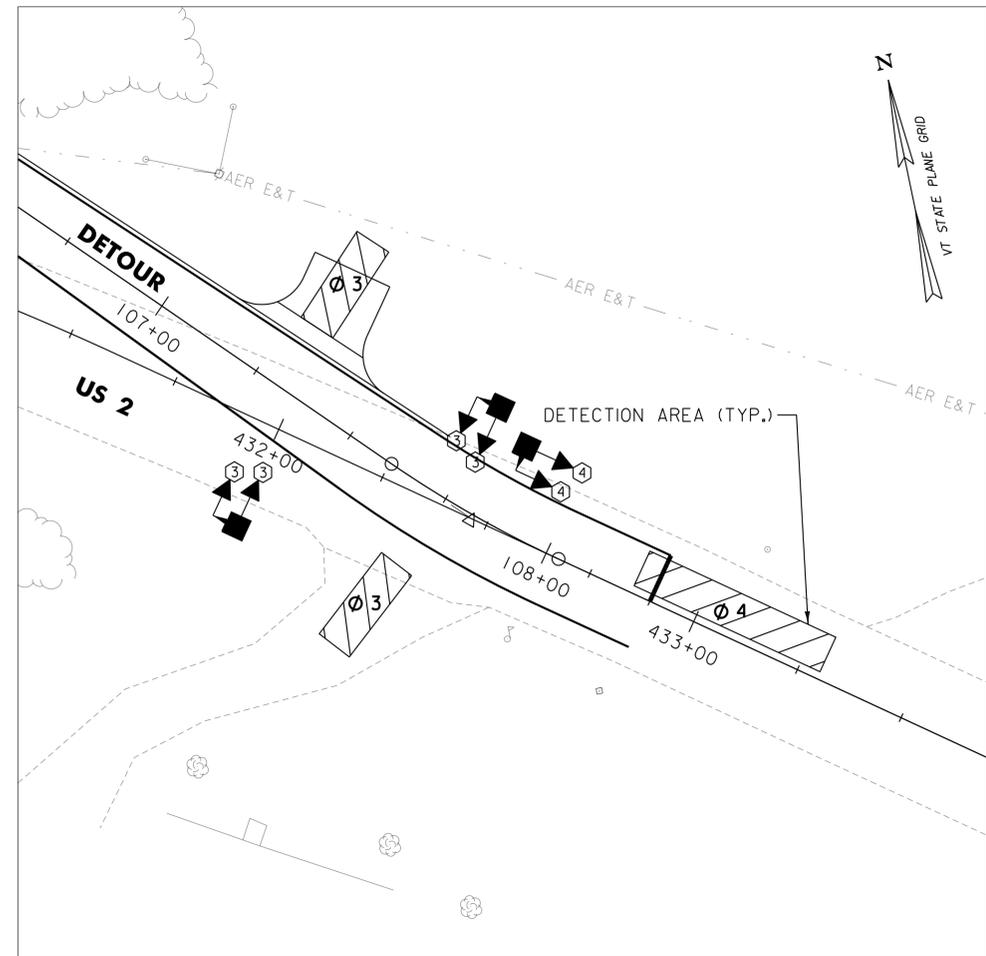
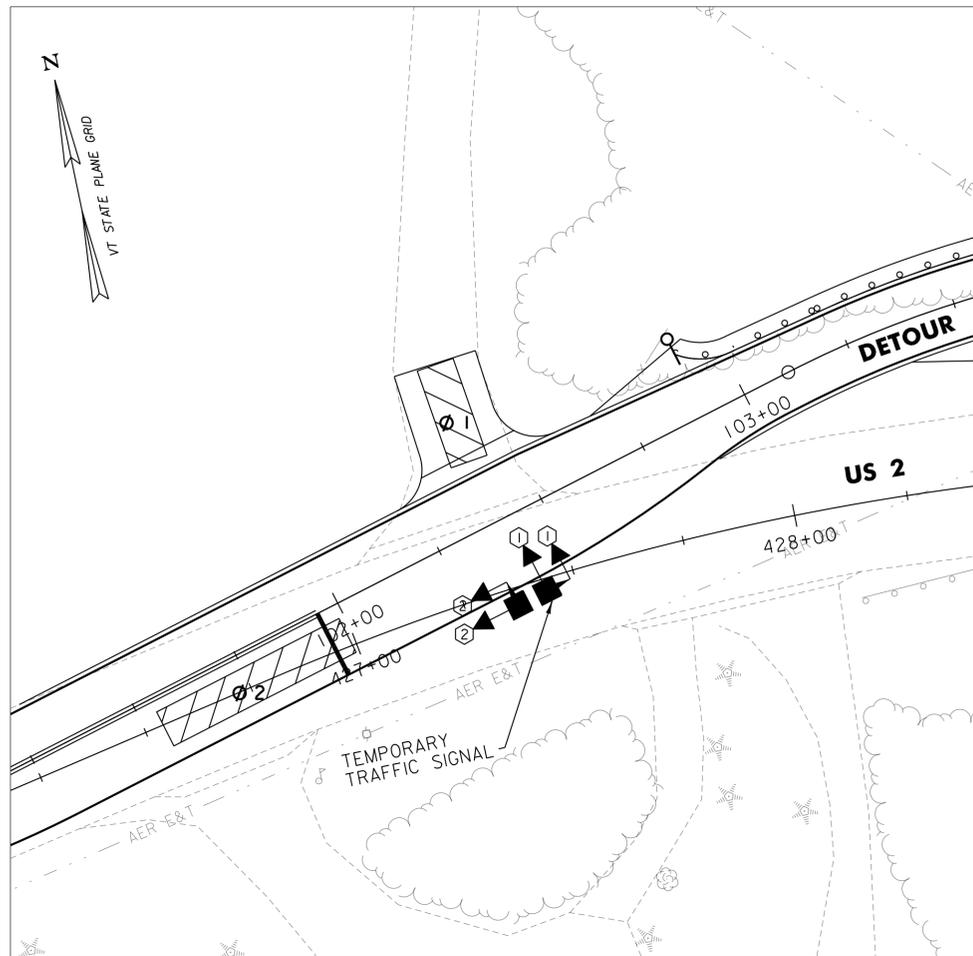
HOR. SCALE 1" = 20' -0"
 VER. SCALE 1" = 10' -0"

CLD_12-0106 MODEL: PRO02

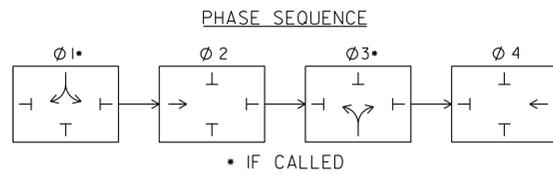
THE GRADES SHOWN TO THE NEAREST TENTH ARE THE OLD GROUND ALONG THE CENTERLINE.
 THE GRADES SHOWN TO THE NEAREST HUNDREDTH ARE THE PROPOSED FINISHED GRADE ALONG THE CENTERLINE.



PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: M. HALEY
FILE NAME: I:\b294\cos\zlb294prodtr.dgn	CHECKED BY: P. SHEDD
PROJECT LEADER: J. BYATT	TEMPORARY DETOUR PROFILE SHEET 2
DESIGNED BY: M. HALEY	SHEET 30 OF 73



NEW	LEGEND
	SIGNAL HEAD
	PORTABLE TRAFFIC SIGNAL TRAILER WITH TRAFFIC ACTUATORS, EMERGENCY VEHICLE PRE-EMPTION, AND RADIO COMMUNICATION.



US 2

SIGNAL PHASING DATA				
SIGNAL PHASING (ALL ENTRIES BELOW ARE IN SECONDS)				
PHASE	Ø1	Ø2	Ø3	Ø4
INITIAL	5	10	5	10
VEHICLE EXT.	3	3	3	3
MAX. 1	10	30	10	30
MAX. 2	--	--	--	--
YELLOW	4	4	4	4
RED	1	30	1	30
RECALL	NONE	SOFT	NONE	NONE
DELAY	10	0	10	0

SIGNAL OPERATION NOTES

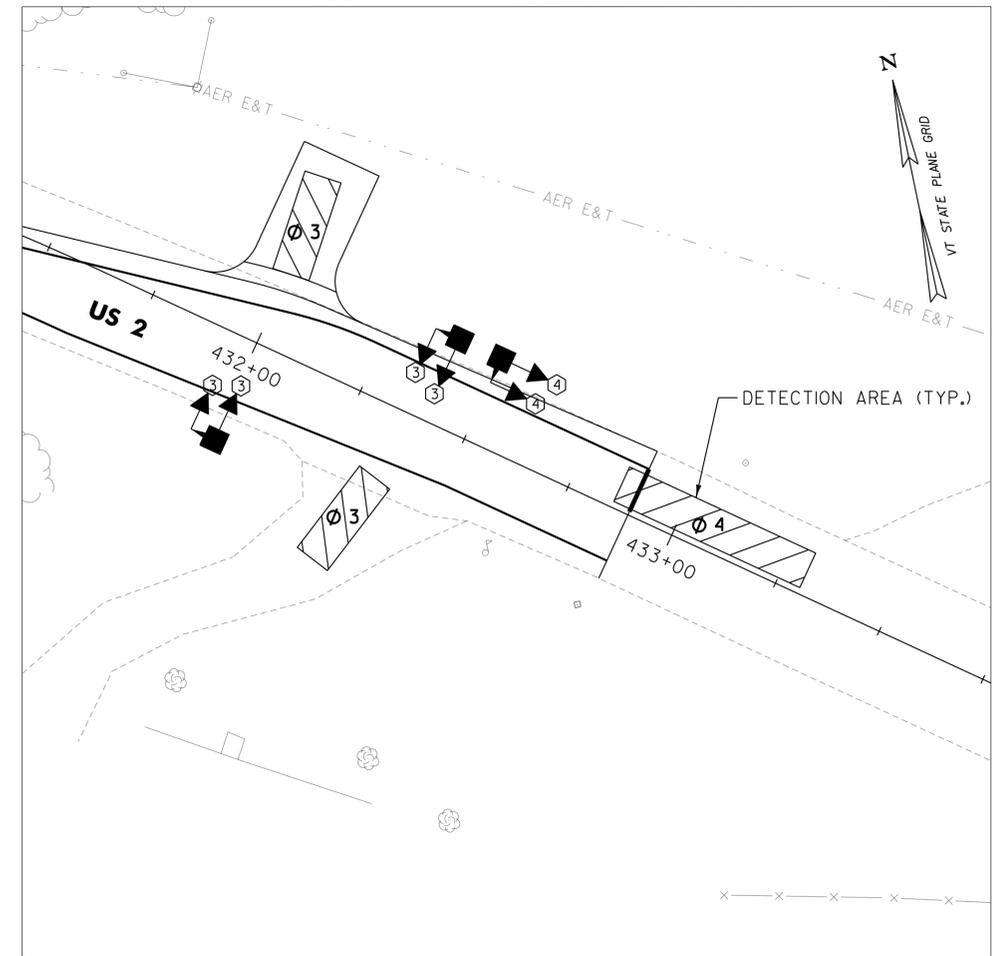
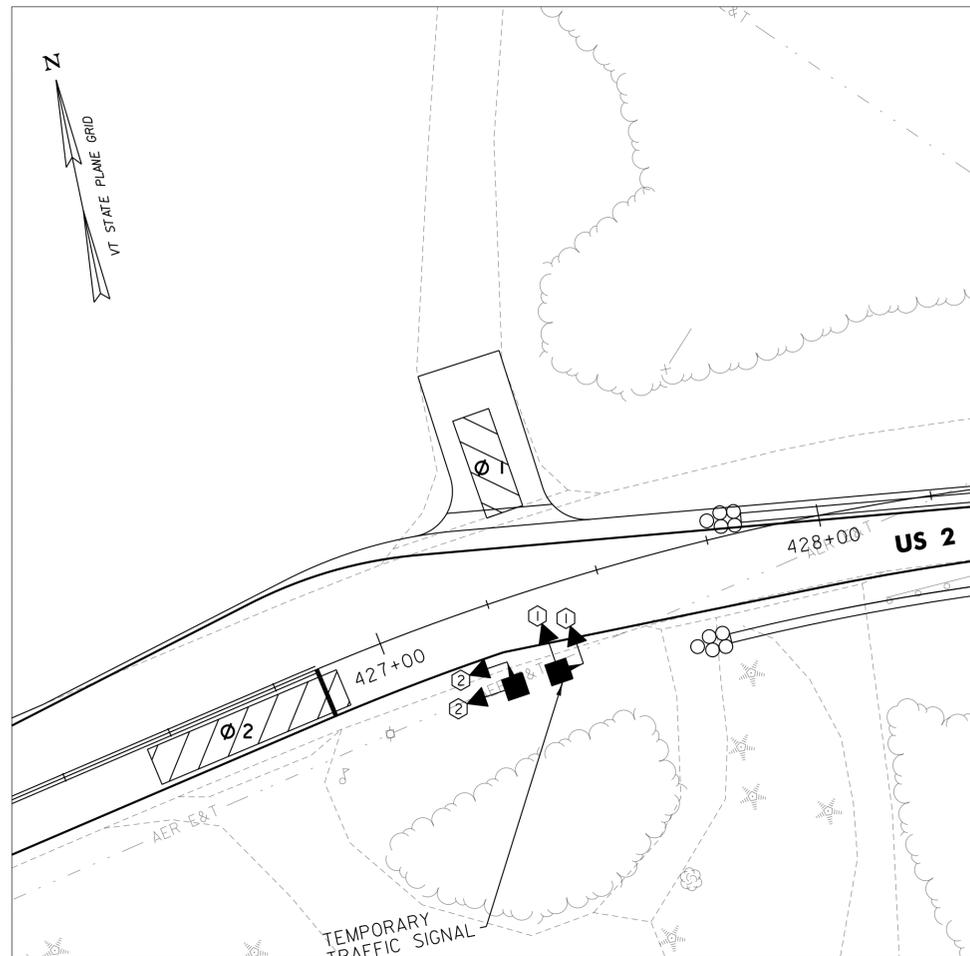
- TEMPORARY TRAFFIC CONTROL (TTC) SIGNALS SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE PROVISIONS OF PART 4 OF THE MUTCD. TTC SIGNALS SHALL MEET THE PHYSICAL DISPLAY AND OPERATIONAL REQUIREMENTS OF CONVENTIONAL TRAFFIC CONTROL SIGNALS.
- SIGNAL TIMING SHOWN ON THE PLANS MAY REQUIRE FINE-TUNING IN THE FIELD BASED ON TRAFFIC OBSERVATION (COST OF ADJUSTMENTS SHALL BE INCIDENTAL TO OTHER ITEMS).
- WHEN THE TTC SIGNAL IS CHANGED TO FLASHING MODE, EITHER MANUALLY OR AUTOMATICALLY, RED SIGNAL INDICATION SHALL BE FLASHED TO ALL APPROACHES.
- THE TRAFFIC SIGNALS SHALL NOT OPERATE WITHOUT THE PAVEMENT MARKINGS AND SIGNAL RELATED SIGNING IN PLACE.



PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

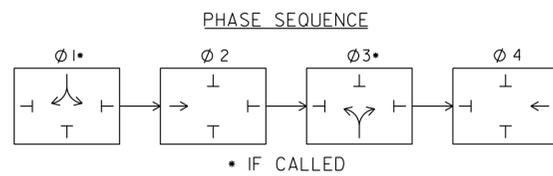
FILE NAME: lb294/cos/lb294trf.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: R. LYFORD
PHASE I TEMPORARY TRAFFIC SIGNAL SHEET

PLOT DATE: 12/16/2014
DRAWN BY: S. GOODWIN
CHECKED BY: P. KONIECZKA
SHEET 31 OF 73



US 2

NEW	LEGEND
	SIGNAL HEAD
	PORTABLE TRAFFIC SIGNAL TRAILER WITH TRAFFIC ACTUATORS, EMERGENCY VEHICLE PRE-EMPTION, AND RADIO COMMUNICATION.



SIGNAL PHASING DATA				
SIGNAL PHASING (ALL ENTRIES BELOW ARE IN SECONDS)				
PHASE	Ø1	Ø2	Ø3	Ø4
INITIAL	5	10	5	10
VEHICLE EXT.	3	3	3	3
MAX. 1	10	30	10	30
MAX. 2	--	--	--	--
YELLOW	4	4	4	4
RED	1	30	1	30
RECALL	NONE	SOFT	NONE	NONE
DELAY	10	0	10	0

SIGNAL OPERATION NOTES

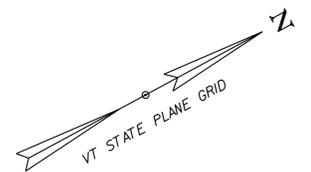
- TEMPORARY TRAFFIC CONTROL (TTC) SIGNALS SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE PROVISIONS OF PART 4 OF THE MUTCD. TTC SIGNALS SHALL MEET THE PHYSICAL DISPLAY AND OPERATIONAL REQUIREMENTS OF CONVENTIONAL TRAFFIC CONTROL SIGNALS.
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- THE TRAFFIC SIGNALS SHALL NOT OPERATE WITHOUT THE PAVEMENT MARKINGS AND SIGNAL RELATED SIGNING IN PLACE.



PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/lb294trf.dgn PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT DRAWN BY: S. GOODWIN
DESIGNED BY: R. LYFORD CHECKED BY: P. KONIECZKA
PHASE 2 TEMPORARY TRAFFIC SIGNAL SHEET SHEET 32 OF 73

US 2 STA 429+38.92 =
 CHANNEL STA. I+50.00
 ASKEW ANGLE = 30° 00' 00"



G20-2
 END
 ROAD WORK

R10-6
 STOP
 HERE ON
 RED
 ↙

W3-3

W20-4
 ONE LANE
 ROAD
 AHEAD

W20-1
 ROAD
 WORK
 AHEAD



ROAD
 WORK
 AHEAD
 W20-1

ONE LANE
 ROAD
 AHEAD
 W20-4

W3-3

STOP
 HERE ON
 RED
 ↙
 R10-6

END
 ROAD WORK
 G20-2



PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/zlb294tcp.dgn
 PROJECT LEADER: J. BYATT
 DESIGNED BY: M. HALEY
 TRAFFIC CONTROL PLAN

PLOT DATE: 12/16/2014
 DRAWN BY: M. HALEY
 CHECKED BY: P. SHEDD
 SHEET 33 OF 73

CLD 12-0106 MODEL: TCF01

GENERAL NOTES

SIGN DESIGN AND FABRICATION NOTES

1. ALL SIGNS SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST REVISION OF THE 2009 MUTCD, THE 2004 STANDARD HIGHWAY SIGNS AND MARKINGS (SHSM), AND THE 2012 SUPPLEMENT TO THE 2004 EDITION (SHSM) DETAILS AS AVAILABLE, VAOT STANDARDS OR AS DETAILED IN THE PLANS.
2. ALL LETTERS AND NUMBERS USED FOR ALL SIGNS SHALL CONFORM TO THE APPLICABLE FONT AS DEFINED AND DETAILED IN THE 2004 SHSM AND THE 2012 SUPPLEMENT.
3. ALL ARROWS AND SYMBOLS SHALL CONFORM WITH THE 2004 SHSM AND THE 2012 SUPPLEMENT UNLESS OTHERWISE DETAILED IN THE PLANS.
4. COLORS USED ON ALL SIGNS SHALL CONFORM WITH THE REQUIREMENTS OF SECTION 1A.12 OF THE LATEST REVISION OF THE 2009 MUTCD.
5. SIGN SHEETING FOR FLUORESCENT YELLOW AND FLUORESCENT YELLOW GREEN SHALL BE AASHTO M268 (ASTM D4956) TYPE VII, VIII OR IX. ALL OTHER SIGN SHEETING SHALL BE TYPE III OR IV.
6. SHEETING TYPES AND MANUFACTURERS SHALL NOT BE MIXED ON A SINGLE SIGN ASSEMBLY. SHEETING COLOR/TYPE SHALL BE BY THE SAME MANUFACTURER AND BE CONSISTENT THROUGHOUT THE PROJECT UNLESS OTHERWISE DETAILED ON THE PLANS.
7. SIGN BASE MATERIAL FOR DELINEATORS AND MILE MARKER PLAQUES (VD-700) SHALL BE 0.063" THICK FLAT SHEET ALUMINUM. ALL TOWN HIGHWAY SIGNS (D3-1) SHALL BE 0.125" THICK FLAT SHEET ALUMINUM OR EXTRUDED ALUMINUM WITH 0.25 INCH FLANGE AND 0.090 INCH WEB. UNLESS OTHERWISE NOTED ON THE PLANS, ALL OTHER SIGNS SHALL BE FLAT SHEET ALUMINUM WITH THE FOLLOWING MINIMUM THICKNESSES:

SIGN SIZE	12" X 12"		
	18" X 18"		
	21" X 15"		
	24" X 8"		
	24" X 10"		48" X 18"
	24" X 12"	36" X 12"	48" X 24"
	24" X 18"	36" X 15"	48" X 30"
	24" X 24"	36" X 18"	48" X 42"
	24" X 30"	36" X 24"	48" X 48"
	30" X 15"	36" X 36"	48" X 60"
	30" X 18"	36" X 42"	72" X 10"
	30" X 30"	36" X 48"	72" X 12"
	30" X 42"	36" X 54"	72" X 20"
THICKNESS	0.080"	0.100"	0.125"

SIGN POST NOTES

1. ALL SIGN POSTS SHALL BE INSTALLED IN A NEW ANCHOR. ALL SIGNS INSTALLED IN PAVED OR CONCRETE ISLANDS OR SIDEWALKS SHALL ALSO BE INSTALLED WITH AN 18" SLEEVE. PAYMENT FOR SLEEVE SHALL BE INCIDENTAL TO THE SIGN POST.
2. 1.75" SQUARE STEEL POSTS SHALL BE 14 GAUGE STEEL. 2.0" AND 2.5" SQUARE STEEL POSTS SHALL BE 12 GAUGE STEEL.

SIGN INSTALLATION NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE TO PRIVATE OR PUBLIC PROPERTY CAUSED BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE.
2. ALL SIGNS WITHIN THE PROJECT LIMITS ARE TO BE REPLACED UNLESS OTHERWISE NOTED OR AS DIRECTED BY THE ENGINEER. SIGN LOCATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD.
3. ALL SIGN PLACEMENT SHALL BE IN CONFORMANCE WITH VTRANS STANDARD E-121 STANDARD SIGN PLACEMENT CONVENTIONAL ROADS, UNLESS OTHERWISE NOTED.
4. ALL SIGNS, FRAMES, MOUNTING HARDWARE, POSTS, AND ANCHORS FOR ANY SIGN ASSEMBLY SHALL BE REPLACED AT THE SAME TIME. MIXING OF OLD AND NEW SIGNS ON THE SAME ASSEMBLY WILL NOT BE ALLOWED EXCEPT AS NOTED ON THE PLANS.
5. NEW SIGNS WITH THEIR GREATER NIGHTTIME REFLECTIVITY CAN OBSCURE OLDER SIGNS MOUNTED ADJACENT TO THEM. TO AVOID CONFUSION OF ROAD USERS, WORK SHALL BE COORDINATED SUCH THAT ALL SIGNS ASSOCIATED WITH A CURVE, INTERSECTION, OR SPEED CHANGE, SHALL BE REPLACED ON THE SAME DAY AND NOT LEFT INCOMPLETE NOR WITH A MIXTURE OF OLD AND NEW SIGNS WITHIN A GROUP OF ASSOCIATED SIGNS.

PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/zlb294tsdet.dgn PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT DRAWN BY: M. HALEY
DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
SIGN DETAIL SHEET SHEET 34 OF 73

NOT TO SCALE



SOIL CLASSIFICATION

AASHTO

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

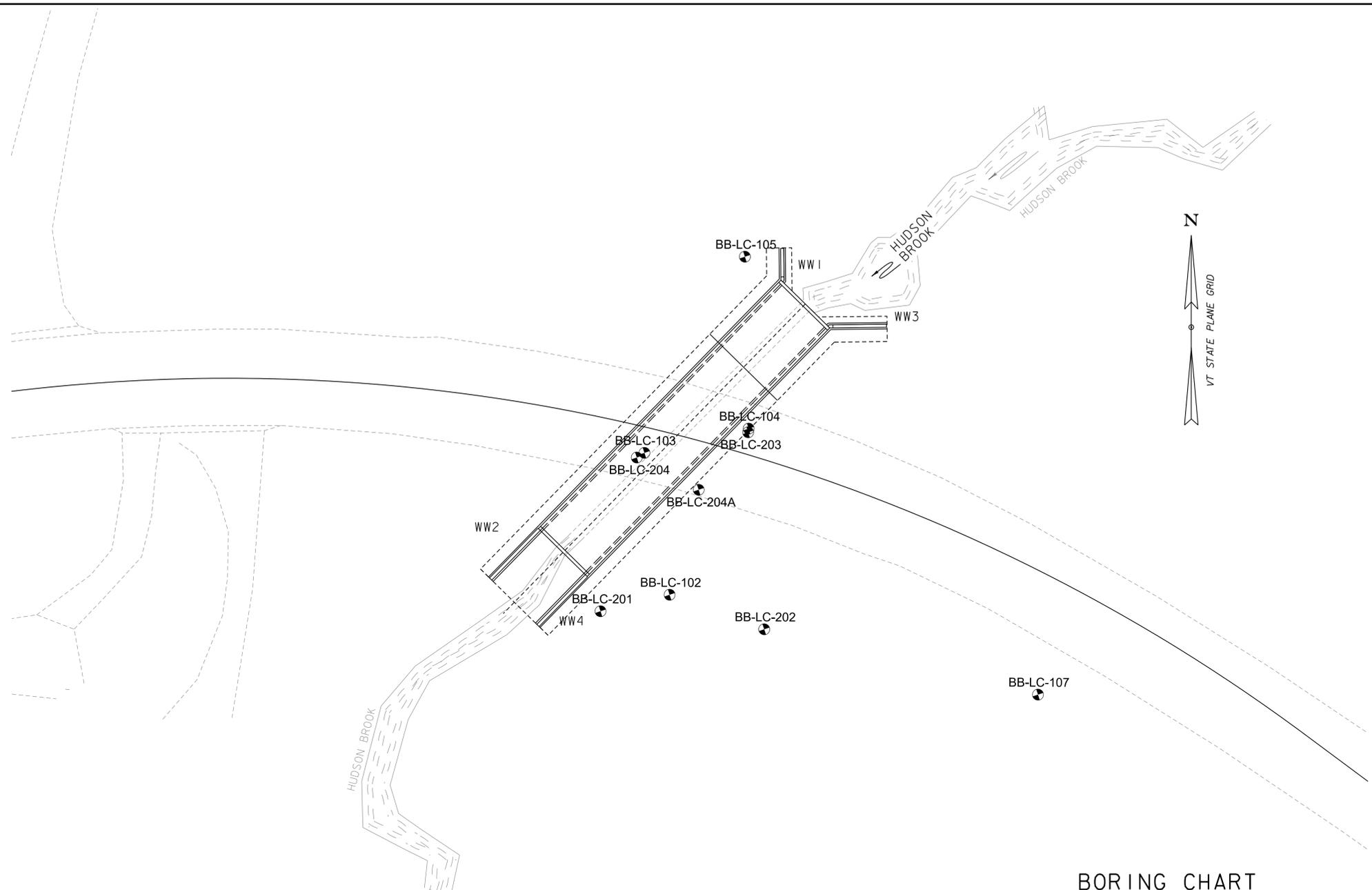
DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

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

COLOR

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



BORING PLAN

SCALE 1" = 20'-0"
 20 0 10
 SCALE IN FEET

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
BB-LC-102	429+50	50 RT	838.0 FT	N/A
BB-LC-103	429+30	8 RT	854.0 FT	N/A
BB-LC-104	429+60	8 LT	855.0 FT	N/A
BB-LC-105	429+45	60 LT	843.0 FT	N/A
BB-LC-107	430+80	35 RT	850.0 FT	N/A
BB-LC-201	429+28	60 RT	839.0 FT	809.0 FT
BB-LC-202	429+85	51 RT	844.0 FT	811.0 FT
BB-LC-203	429+60	7 LT	856.0 FT	822.0 FT
BB-LC-204	429+28	10 RT	854.0 FT	N/A
BB-LC-204A	429+48	15 RT	854.0 FT	N/A

DEFINITIONS (AASHTO)

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

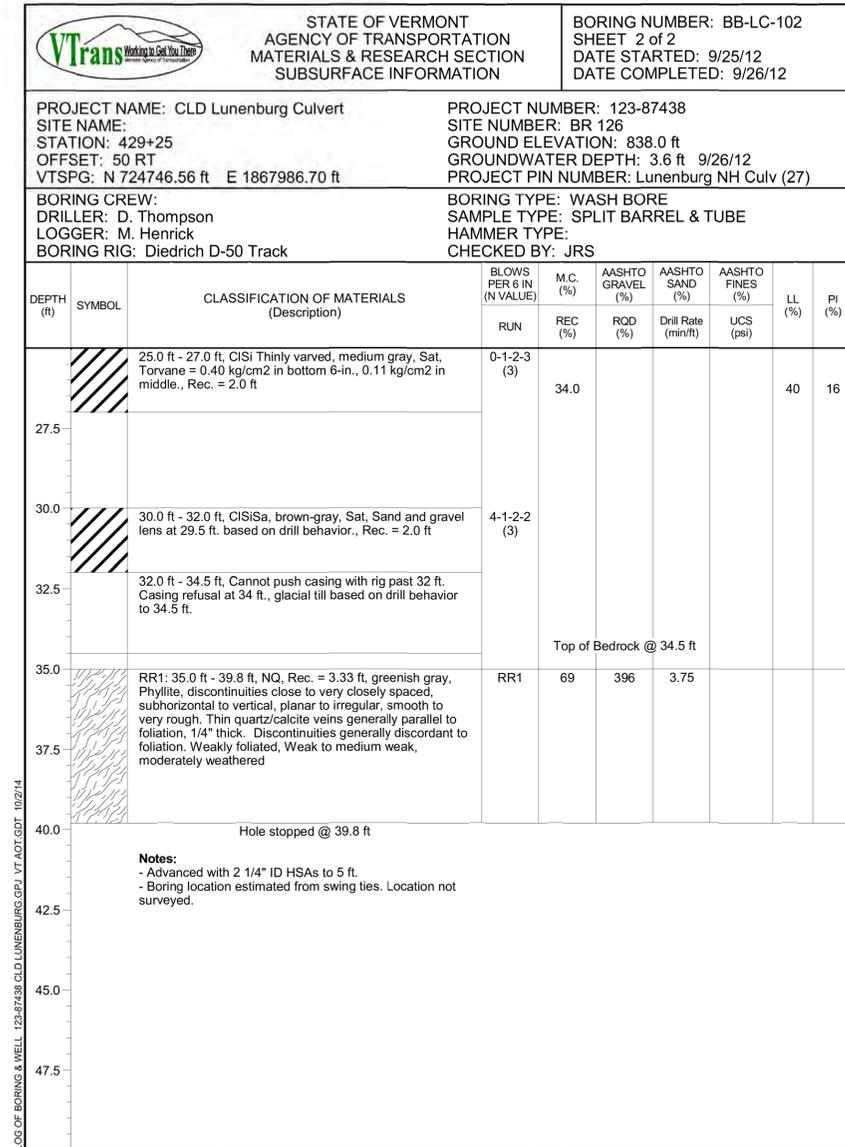
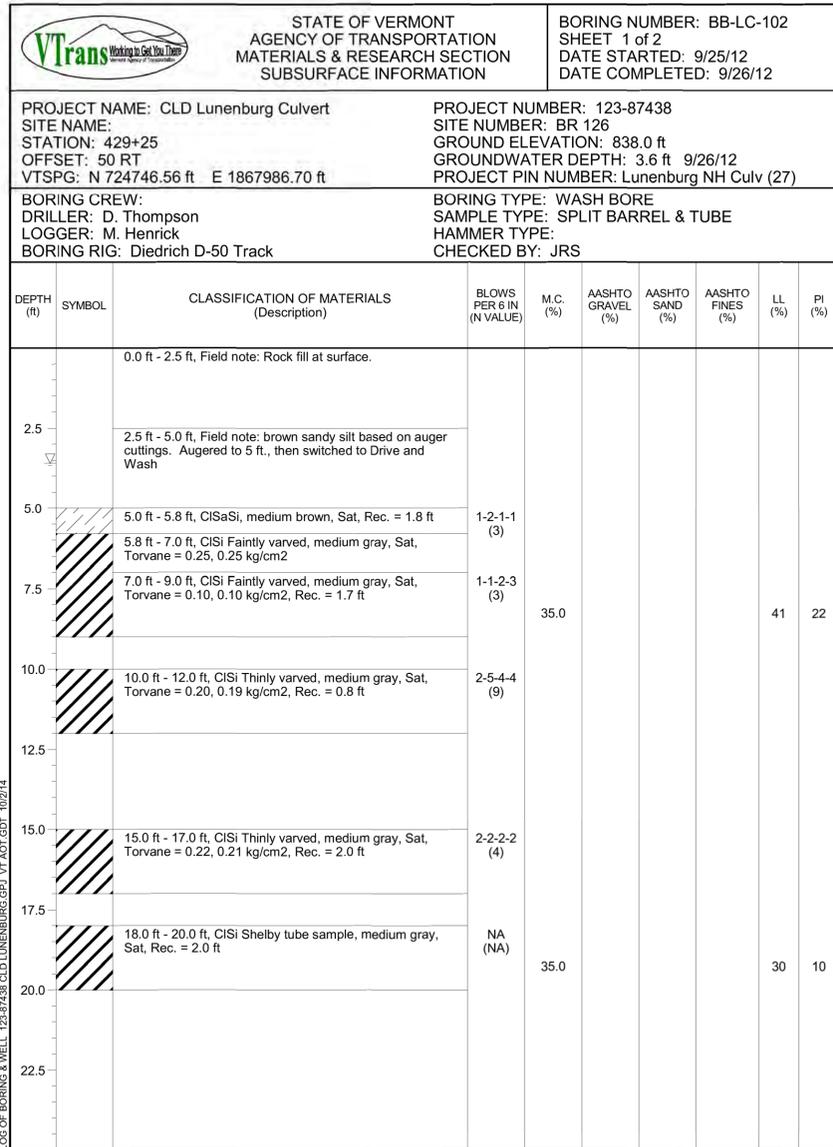
GENERAL NOTES

- The subsurface explorations shown herein were made between 9/24/12 and 9/28/12 and between 1/25/13 and 2/1/13 by New Hampshire Boring, Inc.
- Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
- Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
- Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.
- Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
- Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.
- Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.



PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: l1b294/cos/z1b294bor.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: M. SMITH
 DESIGNED BY: S. BEAUMONT CHECKED BY: J. BYATT
 BORING INFORMATION SHEET SHEET 35 OF 73



CLD_12-0106 MODEL: Bor-02

PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: M. SMITH
FILE NAME: I1b294/cos/z1b294bor.dgn	CHECKED BY: J. BYATT
PROJECT LEADER: J. BYATT	SHEET 36 OF 73
DESIGNED BY: S. BEAUMONT	
BORING LOGS SHEET 1	



PROJECT NAME: CLD Lunenburg Culvert
 SITE NAME:
 STATION: 429+30
 OFFSET: 8 RT
 VTSPG: N 724791.44 ft E 1867978.72 ft

PROJECT NUMBER: 123-87438
 SITE NUMBER: BR 126
 GROUND ELEVATION: 854.0 ft
 GROUNDWATER DEPTH: 14.1 ft 9/27/12
 PROJECT PIN NUMBER: Lunenburg NH Culv (27)

BORING CREW:
 DRILLER: D. Thompson
 LOGGER: M. Henrick
 BORING RIG: Diedrich D-50 Track

BORING TYPE: WASH BORE
 SAMPLE TYPE: SPLIT BARREL
 HAMMER TYPE:
 CHECKED BY: JRS

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)	LL (%)	PI (%)
0.0 - 1.4		Field Note: Approximately 1.4 ft. of asphalt at roadway surface.							
1.5 - 2.0		Field Note: Gravel subbase, Rec. = 0.4 ft	50 (50)						
4.0 - 6.0		GrSaSi, medium brown, Wet, Rec. = 1.7 ft	18-15-16-26 (31)		20.0	27.0	53.0		
9.0 - 11.0		SaSiGr Resampled with 3" spoon, medium brown, Wet, Rec. = 0.0 ft	29-17-17-18 (34)						
14.0 - 14.9		ClSaSi, medium brown, Wet, Rec. = 1.0 ft	3-2-3-3 (5)						
14.9 - 16.0		SaSi Organic PEAT, dark gray, Wet							
16.0 - 18.0		ClSaSi Trace organics, medium brown, Wet, Rec. = 0.7 ft	1-1-1-3 (2)						
20.0 - 22.0		A-6, ClSaSi, medium brown, Wet, Rec. = 2.0 ft	2-1-1-2 (2)		0.0	29.0	71.0	35	13
22.0 - 30.0		Field Note: Gravel lenses based on drill behavior							

BOTTOM OF
 MAT FOUNDATION
 EL. 827.20 +/-

SLOPE
 STABILIZATION
 PILE TIP
 EL. 811.00 +/-

PROJECT NAME: CLD Lunenburg Culvert
 SITE NAME:
 STATION: 429+30
 OFFSET: 8 RT
 VTSPG: N 724791.44 ft E 1867978.72 ft

PROJECT NUMBER: 123-87438
 SITE NUMBER: BR 126
 GROUND ELEVATION: 854.0 ft
 GROUNDWATER DEPTH: 14.1 ft 9/27/12
 PROJECT PIN NUMBER: Lunenburg NH Culv (27)

BORING CREW:
 DRILLER: D. Thompson
 LOGGER: M. Henrick
 BORING RIG: Diedrich D-50 Track

BORING TYPE: WASH BORE
 SAMPLE TYPE: SPLIT BARREL
 HAMMER TYPE:
 CHECKED BY: JRS

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)		AASHTO SAND (%)		LL (%)	PI (%)
					REC (%)	RQD (%)	Drill Rate (min/ft)	UCS (psi)		
25.0 - 27.0		ClSaSi, medium brown, Wet, Rec. = 0.8 ft	12-20-20-26 (40)							
30.0 - 32.0		SaGrSi, brown-gray, Wet, Rec. = 0.7 ft	39-29-18-17 (47)							
34.0 - 36.0		SaGrSi, brown-gray, Wet, Rec. = 0.5 ft	28-21-29-11 (50)							
38.5 - 44.0		Field Note: Cobbles based on drill behavior								
44.0 - 44.5		No recovery, cobbles based on drill behavior, Rec. = 0.0 ft	53 (50)							
44.5 - 48.8		RR1: 45.0 ft - 48.8 ft, NQ, Rec. = 1.3 ft. Casing refusal at 44.5 ft. Began core run at 45 feet, cobbles and boulders to 48.8 ft.		22	1183	3.3				
48.8 - 51.0		Dark gray, Phyllite, discontinuities very close to close, generally parallel to foliation, irregular to								

Top of Bedrock @ 48.8 ft

PROJECT NAME: CLD Lunenburg Culvert
 SITE NAME:
 STATION: 429+30
 OFFSET: 8 RT
 VTSPG: N 724791.44 ft E 1867978.72 ft

PROJECT NUMBER: 123-87438
 SITE NUMBER: BR 126
 GROUND ELEVATION: 854.0 ft
 GROUNDWATER DEPTH: 14.1 ft 9/27/12
 PROJECT PIN NUMBER: Lunenburg NH Culv (27)

BORING CREW:
 DRILLER: D. Thompson
 LOGGER: M. Henrick
 BORING RIG: Diedrich D-50 Track

BORING TYPE: WASH BORE
 SAMPLE TYPE: SPLIT BARREL
 HAMMER TYPE:
 CHECKED BY: JRS

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	RUN	REC (%)	RQD (%)	Drill Rate (min/ft)	UCS (psi)
52.5		curved to planar, rough to smooth. Moderately foliated, very fine grained, Medium strong, moderately weathered Hole stopped @ 51.0 ft					
55.0							
57.5							
60.0							
62.5							
65.0							
67.5							
70.0							
72.5							

Notes:
 - Boring location estimated from swing ties. Location not surveyed.



		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION			BORING NUMBER: BB-LC-104 SHEET 1 of 1 DATE STARTED: 9/28/12 DATE COMPLETED: 9/28/12		
PROJECT NAME: CLD Lunenburg Culvert SITE NAME: STATION: 429+60 OFFSET: 8 LT VTSPG: N 724799.12 ft E 1868011.78 ft		PROJECT NUMBER: 123-87438 SITE NUMBER: BR 126 GROUND ELEVATION: 855.0 ft GROUNDWATER DEPTH: 11.9 ft 9/28/12 PROJECT PIN NUMBER: Lunenburg NH Culv (27)					
BORING CREW: DRILLER: D. Thompson LOGGER: M. Henrick BORING RIG: Diedrich D-50 Track		BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL HAMMER TYPE: CHECKED BY: JRS					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)
		0.0 ft - 1.5 ft, Field note: Approximately 1.5 ft. of Asphalt.					
2.5		2.0 ft - 4.0 ft, SiSaGr, Dark gray, Moist, Roadway subbase, Rec. = 0.8 ft	22-19-15-11 (34)				
5.0		4.0 ft - 4.7 ft, SiSaGr, brown, Moist, Roadway subbase, Rec. = 1.0 ft 4.7 ft - 5.0 ft, SaSi, brown-gray, Moist	16-11-7-7 (18)				
10.0		9.0 ft - 11.0 ft, SaSi, brown, Moist, Rec. = 0.3 ft	2-3-10-6 (13)				
15.0		14.0 ft - 16.0 ft, SaSiGr, brown, Wet, Rec. = 0.4 ft	15-29-17-9 (46)				
20.0		19.0 ft - 19.9 ft, SaSi Some organics (wood), brown, Wet, Field note: Drilling obstruction encountered at 19.9 ft, could not advance button bit., Rec. = 0.5 ft Hole stopped @ 19.9 ft	5-50 (Refusal)				
Notes: - Boring location estimated from swing ties. Location not surveyed.							

LOG OF BORING & WELL 123-87438 CLD LUNENBURG.GPJ VT AOT GDT 10/2/14

		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION			BORING NUMBER: BB-LC-105 SHEET 1 of 2 DATE STARTED: 9/24/12 DATE COMPLETED: 9/25/12		
PROJECT NAME: CLD Lunenburg Culvert SITE NAME: STATION: 429+45 OFFSET: 60 LT VTSPG: N 724853.50 ft E 1868010.59 ft		PROJECT NUMBER: 123-87438 SITE NUMBER: BR 126 GROUND ELEVATION: 843.0 ft GROUNDWATER DEPTH: 4.2 ft 9/25/12 PROJECT PIN NUMBER: Lunenburg NH Culv (27)					
BORING CREW: DRILLER: D. Thompson LOGGER: M. Henrick BORING RIG: Diedrich D-50 Track		BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL HAMMER TYPE: CHECKED BY: JRS					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)
2.5		0.0 ft - 2.0 ft, GrSaSi, brown, Moist, Rec. = 0.7 ft	9-14-19-11 (33)				
5.0		2.0 ft - 4.0 ft, SaSiGr, medium gray, Moist, Rec. = 0.8 ft 4.0 ft - 6.0 ft, SaSiGr, medium gray, Wet, Rec. = 0.7 ft	5-40-43-55 (83) 31-30-58-19 (88)		41.0	31.0	28.0
7.5		6.0 ft - 8.0 ft, SaSiGr, medium gray, Wet, Rec. = 1.0 ft	27-19-15-17 (34)				
10.0		10.0 ft - 12.0 ft, SaSiGr, medium gray, Wet, Rec. = 0.5 ft	5-20-24-16 (44)				
12.5		12.0 ft - 13.8 ft, SaSiGr, medium gray, Wet, Rec. = 1.6 ft	19-31-38-50 (69)		46.0	33.0	21.0
16.0		14.0 ft - 14.7 ft, SaSiGr, medium brown, Wet, Boulder 14.7-15.8 ft., Rec. = 0.6 ft	58-50 (Refusal)				
17.5		16.0 ft - 16.8 ft, SaSiGr, medium gray, Wet, Rec. = 0.2 ft RR1: 17.0 ft - 17.7 ft, NQ, Rec. = 0.0 ft, No recovery, boulder based on drill behavior	12-50 (Refusal) RR1	0	0	1.2	
20.0		19.0 ft - 19.7 ft, SaSiGr, medium gray, Wet, Rec. = 9.0 ft 19.7 ft - 30.5 ft, Cobbles based on drill behavior.	33-50 (Refusal)				
B.O.F. WWI EL. 827.95							

LOG OF BORING & WELL 123-87438 CLD LUNENBURG.GPJ VT AOT GDT 10/2/14

		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION			BORING NUMBER: BB-LC-105 SHEET 2 of 2 DATE STARTED: 9/24/12 DATE COMPLETED: 9/25/12		
PROJECT NAME: CLD Lunenburg Culvert SITE NAME: STATION: 429+45 OFFSET: 60 LT VTSPG: N 724853.50 ft E 1868010.59 ft		PROJECT NUMBER: 123-87438 SITE NUMBER: BR 126 GROUND ELEVATION: 843.0 ft GROUNDWATER DEPTH: 4.2 ft 9/25/12 PROJECT PIN NUMBER: Lunenburg NH Culv (27)					
BORING CREW: DRILLER: D. Thompson LOGGER: M. Henrick BORING RIG: Diedrich D-50 Track		BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL HAMMER TYPE: CHECKED BY: JRS					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	RUN	REC (%)	RQD (%)	Drill Rate (min/ft)	UCS (psi)
27.5							
30.0							
32.5		RR2: 30.5 ft - 35.6 ft, NQ, Rec. = 4.95 ft, medium gray, Phyllite, discontinuities spaced very close to close, high angle (60-70 degrees), generally parallel to foliation, planar to irregular, very smooth to rough, some light brown iron oxide staining, weak to medium weak, moderately weathered	RR2	97	608	4.8	
35.0							
37.5							
40.0							
42.5							
45.0							
47.5							
Notes: - Boring location estimated from swing ties. Location not surveyed.							

LOG OF BORING & WELL 123-87438 CLD LUNENBURG.GPJ VT AOT GDT 10/2/14

CLD_12-0106 MODEL: Bor-04

PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: M. SMITH
FILE NAME: I1b294/cos/z1b294bor.dgn	CHECKED BY: J. BYATT
PROJECT LEADER: J. BYATT	SHEET 38 OF 73
DESIGNED BY: S. BEAUMONT	
BORING LOGS SHEET 3	



VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-LC-107 SHEET 1 of 2 DATE STARTED: 9/26/12 DATE COMPLETED: 9/26/12					
PROJECT NAME: CLD Lunenburg Culvert		PROJECT NUMBER: 123-87438		SITE NUMBER: BR 126					
SITE NAME:		STATION: 430+80		GROUND ELEVATION: 850.0 ft					
OFFSET: 35 RT		VTSPG: N 724714.97 ft E 1868103.54 ft		GROUNDWATER DEPTH: NM 9/28/12					
BORING CREW:		BORING TYPE: WASH BORE		SAMPLE TYPE: SPLIT BARREL					
DRILLER: D. Thompson		LOGGERS: M. Henrick		HAMMER TYPE:					
BORING RIG: Diedrich D-50 Track		CHECKED BY: JRS							
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)	LL (%)	PI (%)
2.5	[Diagonal Hatching]	0.0 ft - 0.7 ft, SaSi Topsoil, Dark gray, Moist, Rec. = 0.7 ft	1-6-9-15 (15)	27.0					
		0.7 ft - 2.0 ft, SaSiGr, brown, Moist							
	2.0 ft - 3.0 ft, Field note: Cobbles based on drill behavior.								
		3.0 ft - 5.0 ft, Field Note: Sandy silt based on auger cuttings.							
5.0	[Diagonal Hatching]	5.0 ft - 7.0 ft, SiCl Varved, gray, Wet, Torvane = 0.25 kg/cm2, Rec. = 1.8 ft	3-3-4-5 (7)					26	8
10.0	[Diagonal Hatching]	10.0 ft - 12.0 ft, SiCl Varved, gray, Wet, Torvane = 0.15 kg/cm2, Rec. = 2.0 ft	2-2-3-3 (5)						
15.0	[Diagonal Hatching]	15.0 ft - 17.0 ft, SiCl Varved, gray, Wet, Torvane = 0.22 kg/cm2, Rec. = 2.0 ft	0-2-1-3 (3)					38	18
20.0	[Diagonal Hatching]	20.0 ft - 22.0 ft, SiCl Varved, gray, Wet, Torvane = 0.20, 0.22 kg/cm2, Rec. = 2.0 ft	0-2-2-3 (4)						

LOG OF BORING & WELL: 123-87438 CLD LUNENBURG.GPJ, VT AOT.GDT, 10/2/14

VT Trans		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: BB-LC-107 SHEET 2 of 2 DATE STARTED: 9/26/12 DATE COMPLETED: 9/26/12					
PROJECT NAME: CLD Lunenburg Culvert		PROJECT NUMBER: 123-87438		SITE NUMBER: BR 126					
SITE NAME:		STATION: 430+80		GROUND ELEVATION: 850.0 ft					
OFFSET: 35 RT		VTSPG: N 724714.97 ft E 1868103.54 ft		GROUNDWATER DEPTH: NM 9/28/12					
BORING CREW:		BORING TYPE: WASH BORE		SAMPLE TYPE: SPLIT BARREL					
DRILLER: D. Thompson		LOGGERS: M. Henrick		HAMMER TYPE:					
BORING RIG: Diedrich D-50 Track		CHECKED BY: JRS							
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)	LL (%)	PI (%)
27.5	[Diagonal Hatching]	25.0 ft - 27.0 ft, SiCl Varved, gray, Wet, Torvane = 0.24, 0.20 kg/cm2, Rec. = 2.0 ft	0-2-3-3 (5)					33	11
30.0	[Diagonal Hatching]	30.0 ft - 32.0 ft, SiCl Varved, gray, Wet, Torvane = 0.25 kg/cm2, Rec. = 2.0 ft	0-0-2-3 (2)						
32.5		Hole stopped @ 32.0 ft							
<p>Notes:</p> <ul style="list-style-type: none"> - Used 2 1/4" HSAs to 30 ft. - Boring location estimated from swing ties. Location not surveyed. 									

LOG OF BORING & WELL: 123-87438 CLD LUNENBURG.GPJ, VT AOT.GDT, 10/2/14

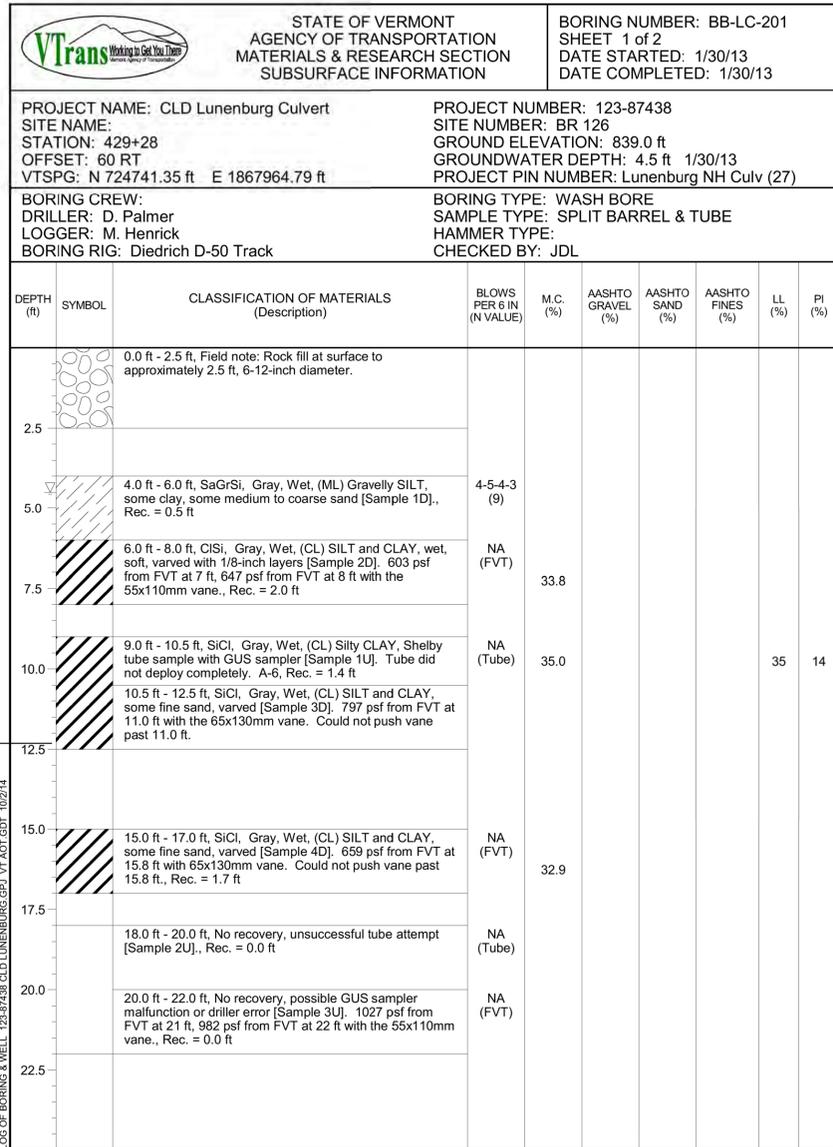
CLD_12-0106 MODEL: Bor-05



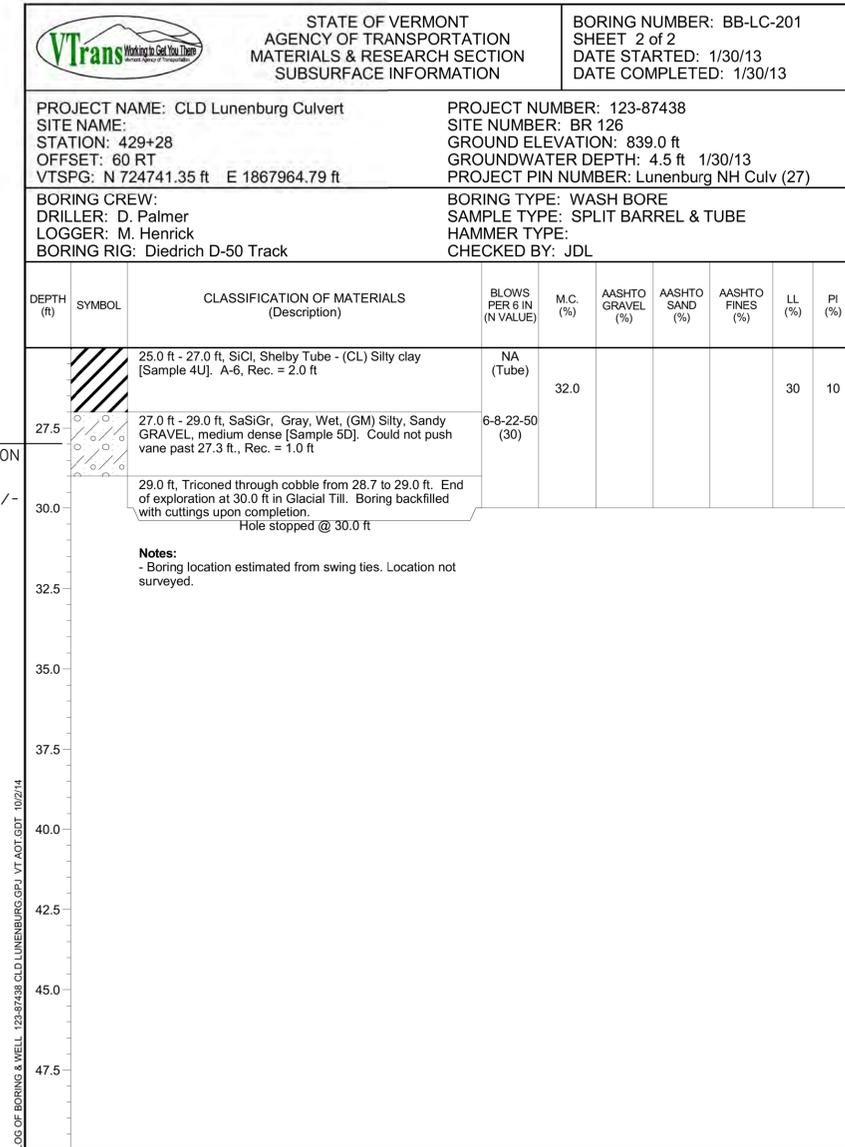
PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: I1b294/cos/z1b294bor.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: S. BEAUMONT
BORING LOGS SHEET 4

PLOT DATE: 12/16/2014
DRAWN BY: M. SMITH
CHECKED BY: J. BYATT
SHEET 39 OF 73



SLOPE
STABILIZATION
PILE TIP
EL. 811.00 +/-



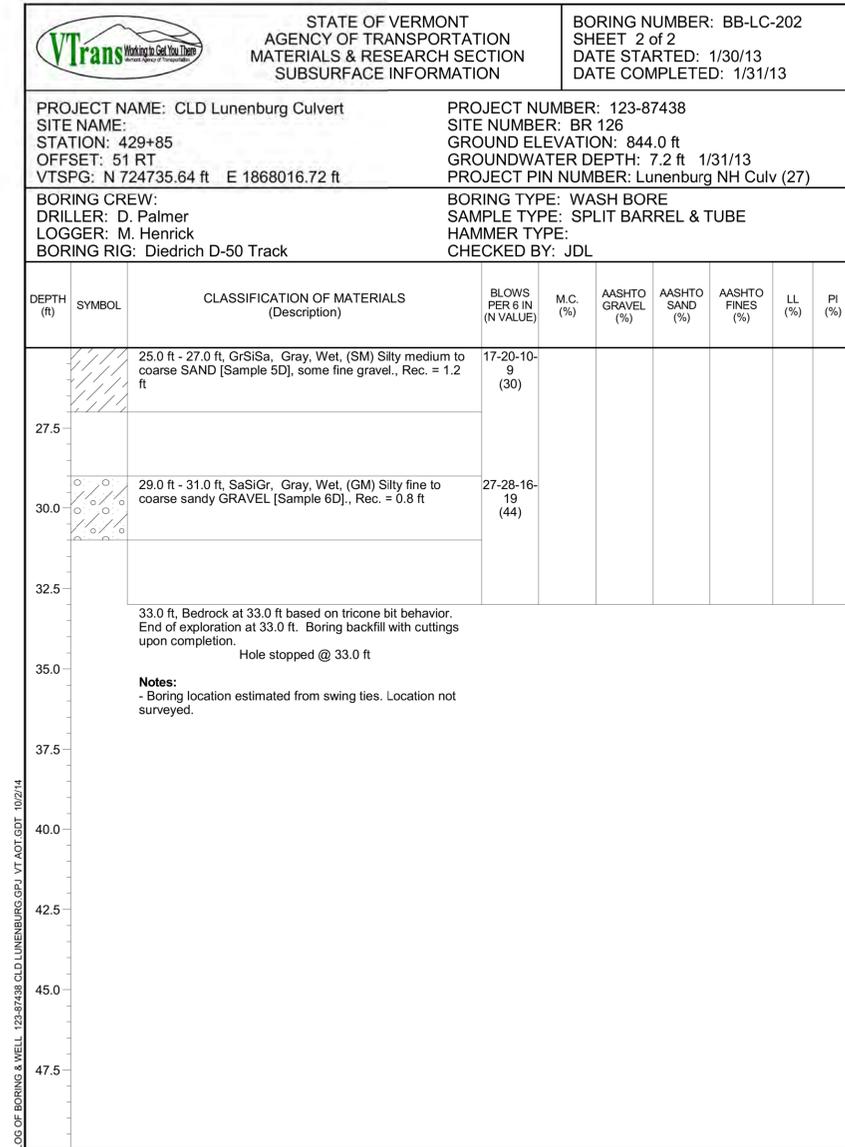
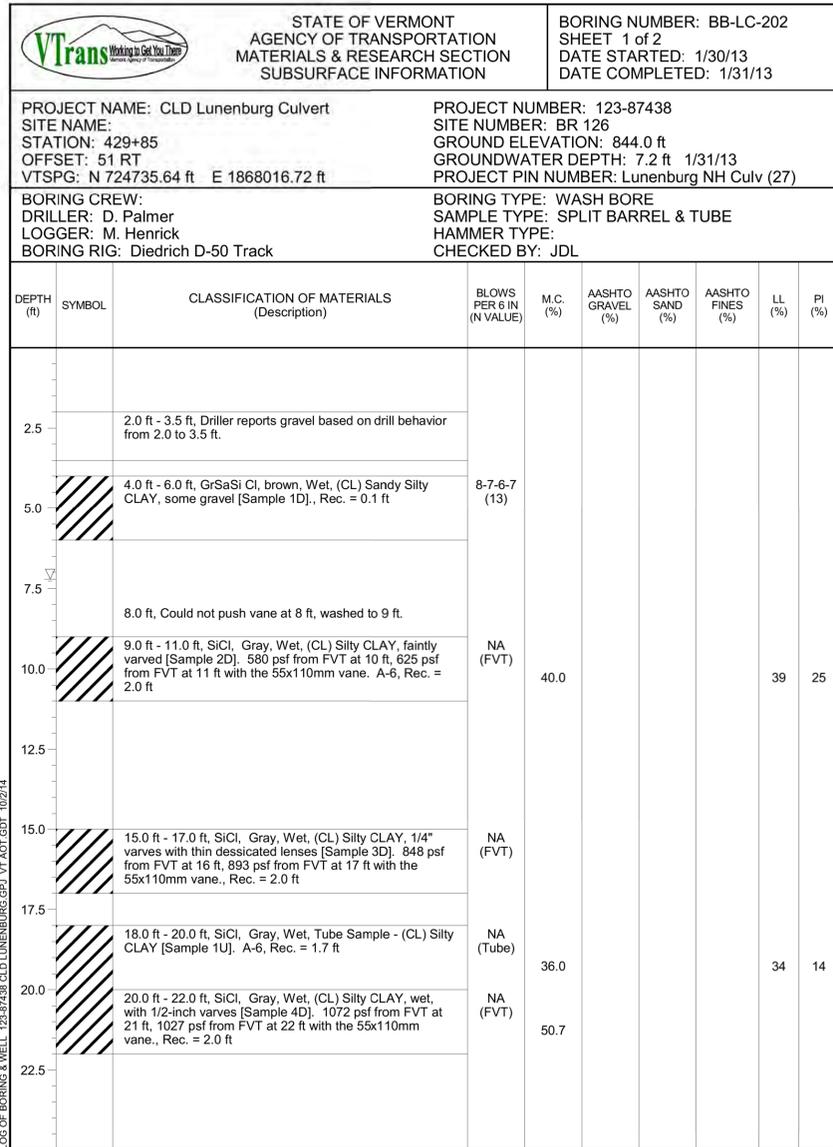
CLD_12-0106 MODEL: Bor-06



PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: I1b294/cos/z1b294bor.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: S. BEAUMONT
BORING LOGS SHEET 5

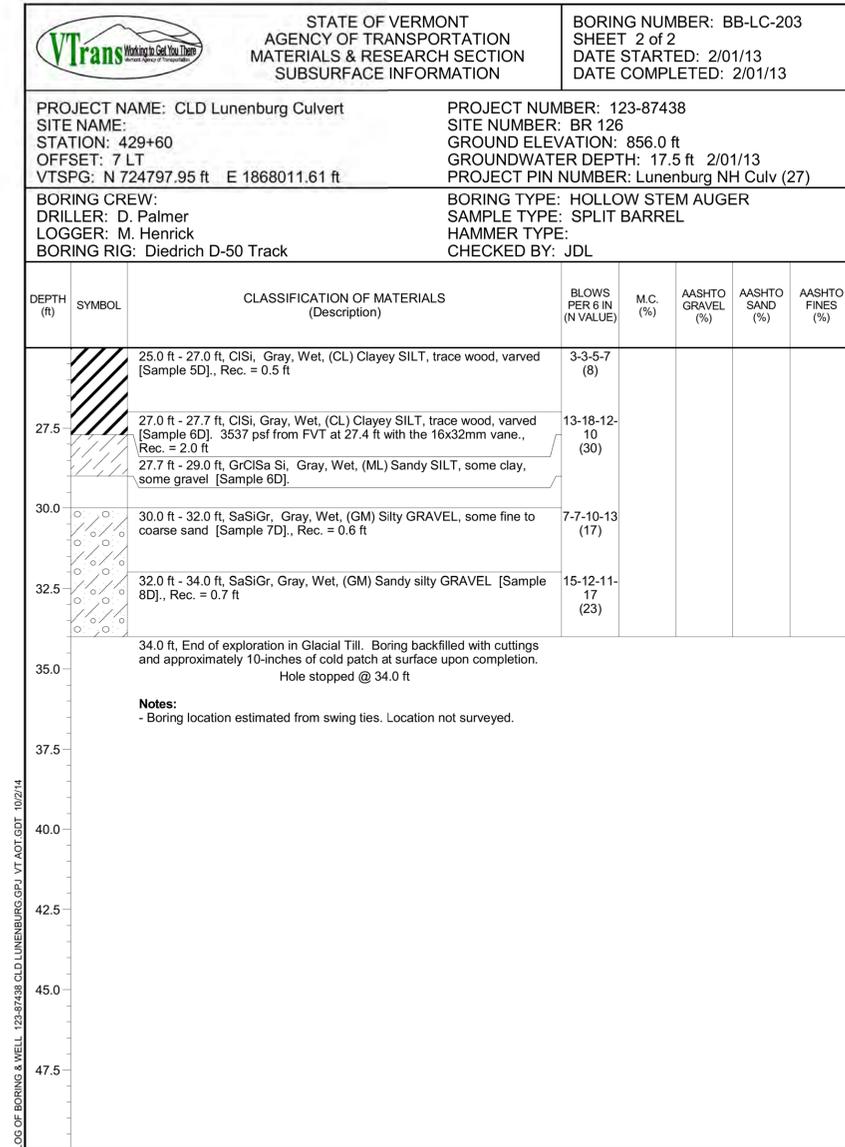
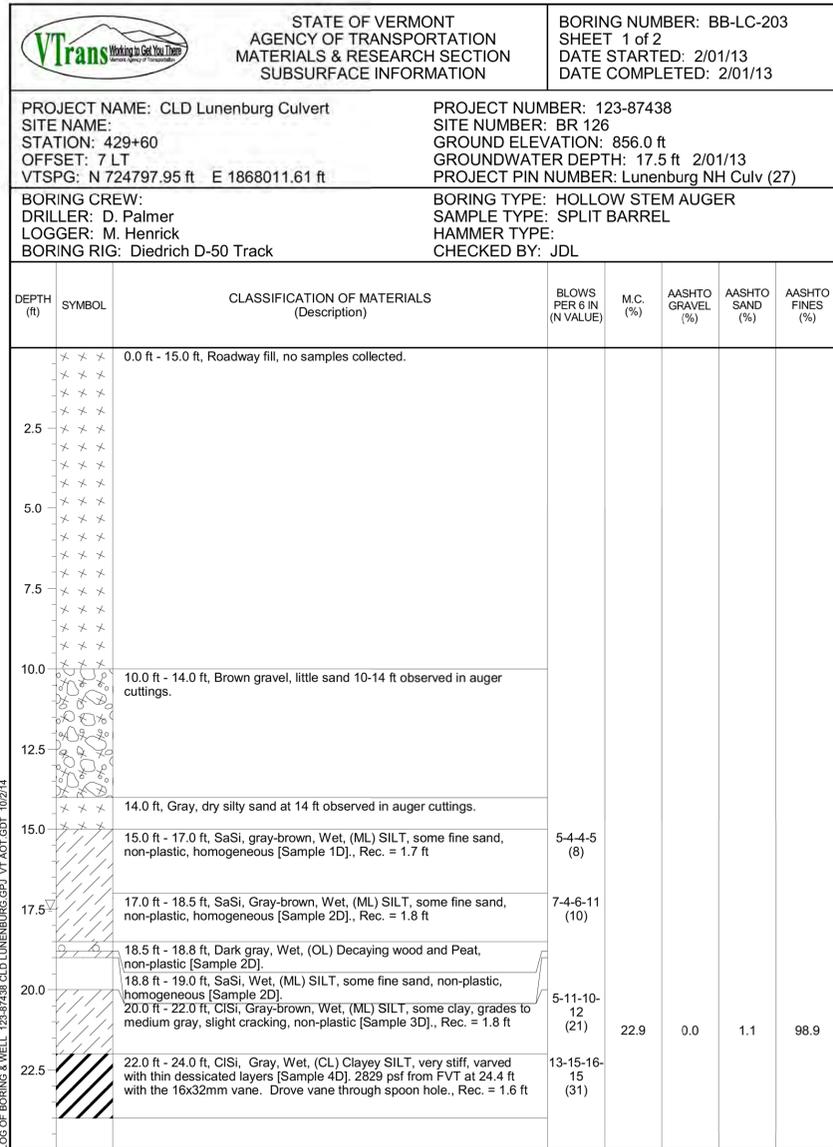
PLOT DATE: 12/16/2014
DRAWN BY: M. SMITH
CHECKED BY: J. BYATT
SHEET 40 OF 73



CLD_12-0106 MODEL: Bor-07



PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: M. SMITH
FILE NAME: I1b294/cos/z1b294bor.dgn	CHECKED BY: J. BYATT
PROJECT LEADER: J. BYATT	SHEET 41 OF 73
DESIGNED BY: S. BEAUMONT	
BORING LOGS SHEET 6	



CLD_12-0106 MODEL: Bor-08



PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: M. SMITH
FILE NAME: I1b294/cos/z1b294bor.dgn	CHECKED BY: J. BYATT
PROJECT LEADER: J. BYATT	SHEET 42 OF 73
DESIGNED BY: S. BEAUMONT	
BORING LOGS SHEET 7	

		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION			BORING NUMBER: BB-LC-204 SHEET 1 of 1 DATE STARTED: 1/29/13 DATE COMPLETED: 1/29/13		
PROJECT NAME: CLD Lunenburg Culvert SITE NAME: STATION: 429+28 OFFSET: 10 RT VTSPG: N 724789.97 ft E 1867976.29 ft		PROJECT NUMBER: 123-87438 SITE NUMBER: BR 126 GROUND ELEVATION: 854.0 ft GROUNDWATER DEPTH: NE 1/29/13 PROJECT PIN NUMBER: Lunenburg NH Culv (27)					
BORING CREW: DRILLER: D. Palmer LOGGER: M. Henrick BORING RIG: Diedrich D-50 Track		BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL HAMMER TYPE: CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)
0.0 - 9.0	X X X X	0.0 ft - 9.0 ft, Asphalt at roadway surface, no samples collected until 9 ft.					
2.5	X X X X	4.0 ft, Gravel and small cobbles at 5 ft based on drill behavior.					
9.0 - 11.0	○ ○ ○ ○	9.0 ft - 11.0 ft, SiSiGr, Light brown, Wet, (GM) Silty coarse GRAVEL, some fine to coarse sand, medium dense [Sample 1D], Rec. = 0.2 ft	24-12-11-14 (23)				
11.0 - 13.0	○ ○ ○ ○	11.0 ft - 13.0 ft, SaGrSi, Light brown, Wet, (ML) Gravelly SILT, some fine to medium sand, dense [Sample 2D], Rec. = 0.9 ft	44-20-27-13 (47)				
13.0 - 15.0	○ ○ ○ ○	13.0 ft - 15.0 ft, No recovery - suspect spoon pushed cobble [Sample 3D], Rec. = 0.0 ft	35-21-17-12 (38)				
15.0 - 16.3	○ ○ ○ ○	15.0 ft - 16.3 ft, SaSiGr, Tan, Wet, (GM) Silty, fine to medium sandy, GRAVEL, dense [Sample 4D]. Hit refusal at 16.3 ft, Rec. = 0.2 ft	15-21-100 (121)				
16.3 - 17.2	○ ○ ○ ○	16.3 ft - 17.2 ft, Triconed through concrete culvert. Abandoned hole at 17.2 ft. Plugged hole with bentonite chips and soil cuttings from 7 ft. Placed and compacted approximately 10 inches of cold patch at surface. Hole stopped @ 17.2 ft					
Notes: - Boring location estimated from swing ties. Location not surveyed.							

		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION			BORING NUMBER: BB-LC-204A SHEET 1 of 2 DATE STARTED: 2/01/13 DATE COMPLETED: 2/01/13		
PROJECT NAME: CLD Lunenburg Culvert SITE NAME: STATION: 429+48 OFFSET: 15 RT VTSPG: N 724779.77 ft E 1867995.92 ft		PROJECT NUMBER: 123-87438 SITE NUMBER: BR 126 GROUND ELEVATION: 854.0 ft GROUNDWATER DEPTH: 19.0 ft 2/01/13 PROJECT PIN NUMBER: Lunenburg NH Culv (27)					
BORING CREW: DRILLER: D. Palmer LOGGER: M. Henrick BORING RIG: Diedrich D-50 Track		BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL & TUBE HAMMER TYPE: CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)
0.0 - 15.0	X X X X	0.0 ft - 15.0 ft, Embankment fill, no samples collected.					
15.0 - 17.0	○ ○ ○ ○	15.0 ft - 17.0 ft, No recovery, suspect spoon pushed cobbles/gravel [Sample 1D]. Failed vane attempt at 15 ft, could not push vane., Rec. = 0.0 ft	11-7-6-3 (13)				
17.0 - 19.0	○ ○ ○ ○	17.0 ft - 19.0 ft, GrSiCl, Gray, Wet, (CL) Silty gravelly CLAY, [Sample 2D], low recovery, suspect spoon pushed cobble/gravel. Failed vane attempt at 17 ft, could not push vane., Rec. = 0.2 ft	5-3-7-6 (10)				
19.0 - 20.0	○ ○ ○ ○	19.0 ft, Driller reported gravel in wash to 20 ft.					
20.0 - 22.0	○ ○ ○ ○	20.0 ft - 22.0 ft, SiCl, Gray, Wet, No recovery, gray silty clay on outside of spoon [Sample 3D]. Suspect spoon pushed a cobble. Failed vane attempt at 20 ft, could not push vane., Rec. = 0.0 ft	19-21-16-16 (3" Spoon)				
22.0 - 24.0	○ ○ ○ ○	22.0 ft - 24.0 ft, SiCl, Gray, Wet, (CL) Silty CLAY, faintly varved in 1/2-inch layers [Sample 4D]. 1126 psf from FVT at 23 ft, 1071 psf from FVT at 24 ft with the 65x130mm vane. A-6, Rec. = 2.0 ft	NA (FVT)	35.0			34 14

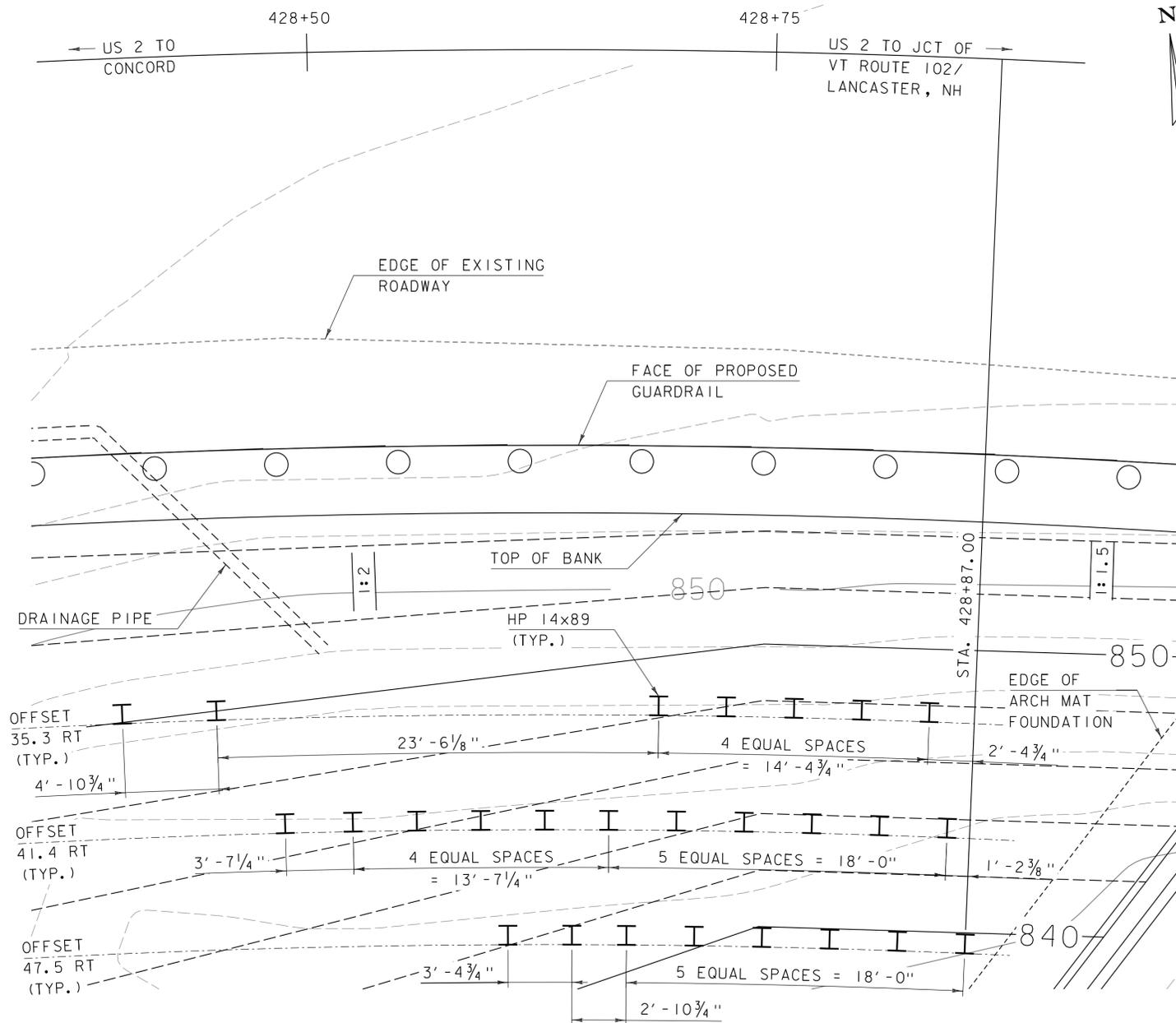
		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION			BORING NUMBER: BB-LC-204A SHEET 2 of 2 DATE STARTED: 2/01/13 DATE COMPLETED: 2/01/13		
PROJECT NAME: CLD Lunenburg Culvert SITE NAME: STATION: 429+48 OFFSET: 15 RT VTSPG: N 724779.77 ft E 1867995.92 ft		PROJECT NUMBER: 123-87438 SITE NUMBER: BR 126 GROUND ELEVATION: 854.0 ft GROUNDWATER DEPTH: 19.0 ft 2/01/13 PROJECT PIN NUMBER: Lunenburg NH Culv (27)					
BORING CREW: DRILLER: D. Palmer LOGGER: M. Henrick BORING RIG: Diedrich D-50 Track		BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL & TUBE HAMMER TYPE: CHECKED BY: JDL					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 6 IN (N VALUE)	M.C. (%)	AASHTO GRAVEL (%)	AASHTO SAND (%)	AASHTO FINES (%)
25.0 - 27.0	▨	25.0 ft - 27.0 ft, SiCl, Gray, Wet, (CL) Silty CLAY, Shelby tube sample with GUS sampler [Sample 1U]. A-6, Rec. = 2.0 ft		38.0			34 13
27.0 - 29.0	▨	27.0 ft - 29.0 ft, SiCl, Gray, Wet, No spoon collected. 1049 psf from FVT at 28 ft, 1027 psf from FVT at 29 ft with the 55x110mm vane.					
32.0 - 34.0		32.0 ft - 34.0 ft, Driller reported sand and gravel lenses from 32 to 34 ft.					
34.0 - 36.0		34.0 ft - 36.0 ft, Till based on drill behavior from 34 to 36 ft. End of boring at 36.0 ft in Glacial Till. Boring backfilled with soil cuttings upon completion. Placed and compacted approximately 8 inches of cold patch at surface.					
Hole stopped @ 36.0 ft							
Notes: - Boring location estimated from swing ties. Location not surveyed.							

BOTTOM OF MAT FOUNDATION EL. 827.20 +/-

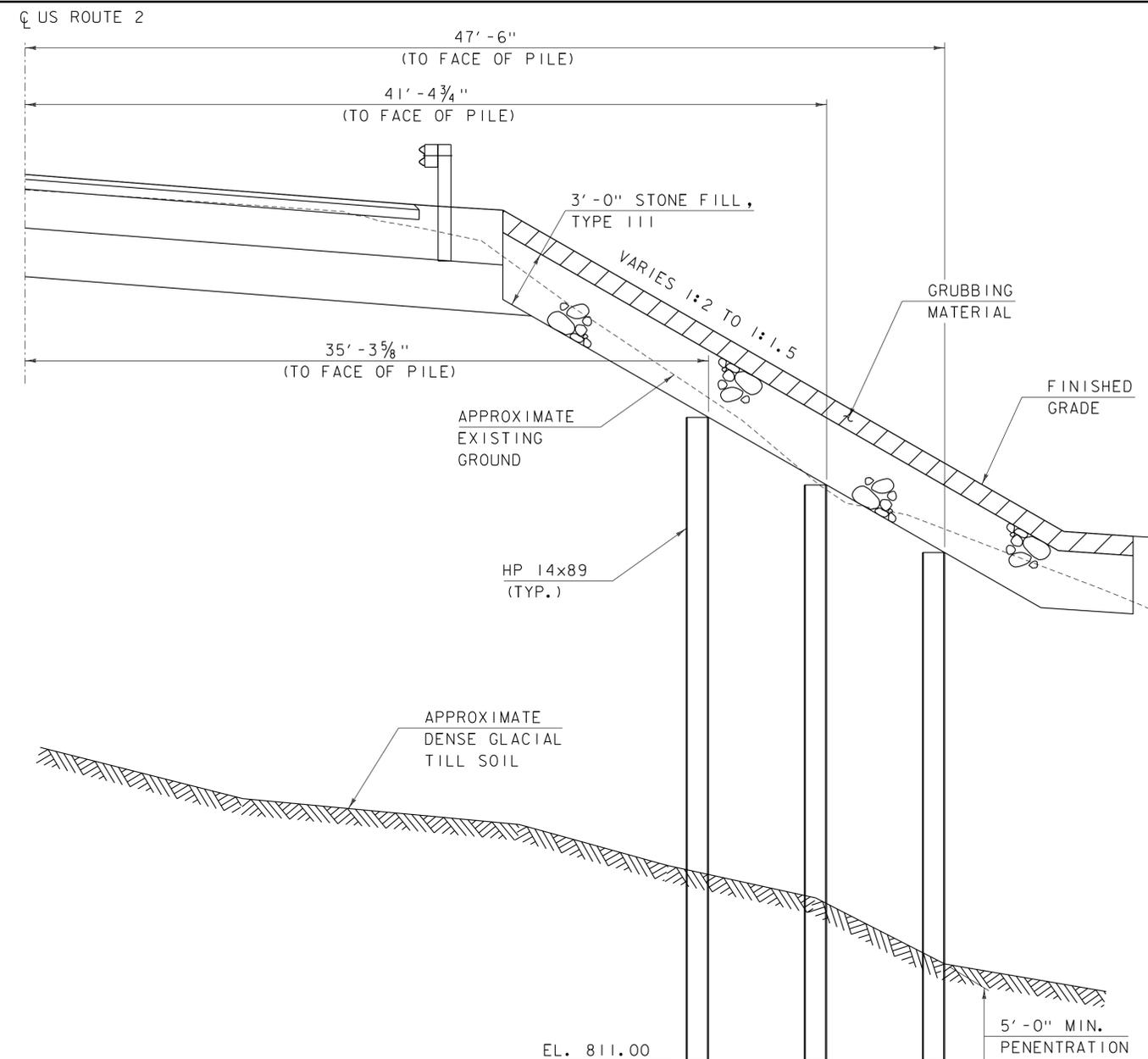
CLD_12-0106 MODEL: Bor-09



PROJECT NAME: LUNENBURG	PLOT DATE: 12/16/2014
PROJECT NUMBER: NH CULV(27)	DRAWN BY: M. SMITH
FILE NAME: I1b294/cos/z1b294bor.dgn	CHECKED BY: J. BYATT
PROJECT LEADER: J. BYATT	SHEET 43 OF 73
DESIGNED BY: S. BEAUMONT	
BORING LOGS SHEET 8	



SLOPE STABILIZATION PILE LAYOUT PLAN



TYPICAL SLOPE STABILIZATION PILE SECTION

SLOPE STABILIZATION PILE NOTES:

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

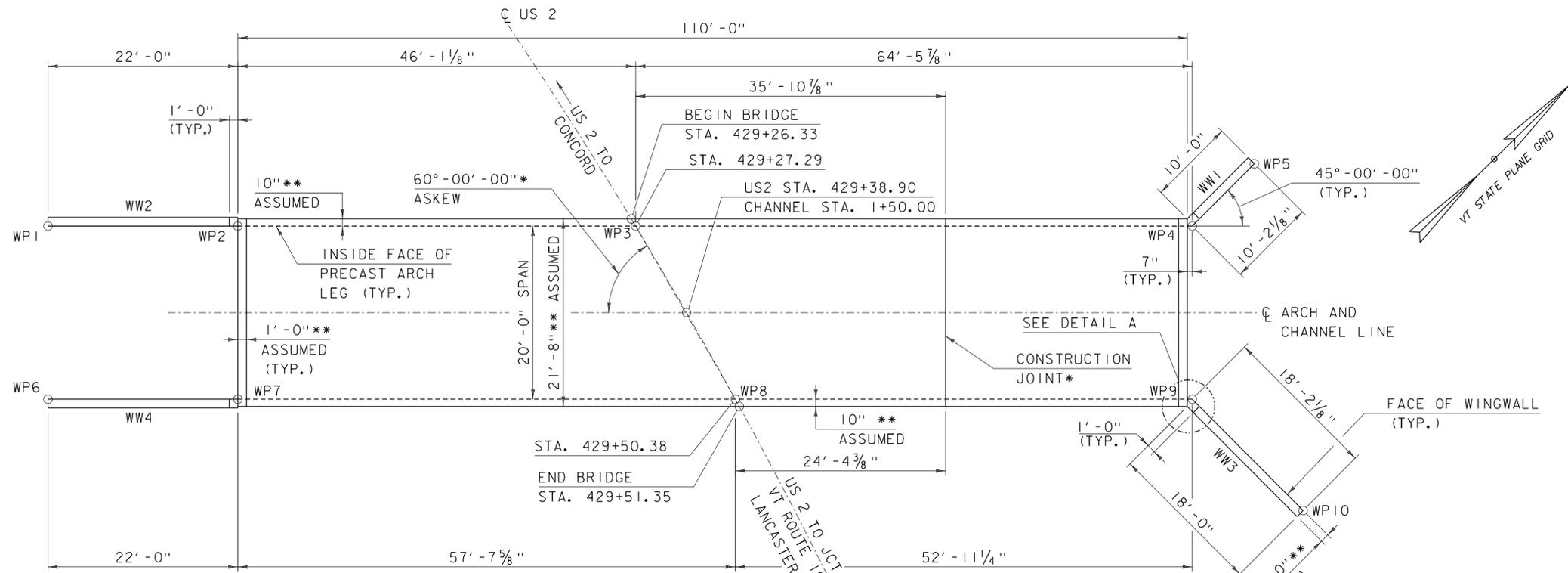
1. THE PILES THAT WILL BE USED FOR SLOPE STABILIZATION ARE AVAILABLE AT THE VTRANS DISTRICT OFFICE AND SHALL BE DELIVERED TO THE SITE AT THE CONTRACTOR'S EXPENSE.
2. ALL SLOPE STABILIZATION PILING SHALL BE IN ACCORDANCE WITH VTRANS STANDARD SPECIFICATION SECTION 505 UNLESS OTHERWISE NOTED IN THE PLANS.
3. EQUIPMENT USED TO INSTALL THE PILES SHALL BE LOCATED AT THE BASE OF THE EXISTING EMBANKMENT AREA AND NOT AT THE CREST OF THE EMBANKMENT UNLESS THE CONTRACTOR SUBMITS DESIGN CALCULATIONS, SEALED BY A LICENSED ENGINEER IN THE STATE OF VERMONT, THAT DEMONSTRATE A SATISFACTORY SLOPE STABILITY FACTOR OF SAFETY OF THE EMBANKMENT UNDER THE EQUIPMENT LOAD.
4. ACCEPTANCE OF THE PILES SHALL BE BASED ON INSTALLATION OF THE PILES TO A MINIMUM DEPTH OF 5 FEET BELOW THE SURFACE OF DENSE GLACIAL TILL SOILS AS DETERMINED BY THE ENGINEER. THE PILE TIP ELEVATIONS SHOWN ON THE PLANS ARE APPROXIMATED BASED ON BORINGS AND ARE USED SOLELY FOR ESTIMATING PURPOSES. A MAXIMUM ULTIMATE AXIAL PILE CAPACITY OR NOMINAL AXIAL PILE RESISTANCE IS NOT A PROJECT REQUIREMENT. PILE LOAD TESTS ARE NOT REQUIRED.
5. THE NOMINAL AXIAL PILE RESISTANCE IS ESTIMATED TO BE 150 KIPS BASED ON STATIC CAPACITY ANALYSES. THE CONTRACTOR'S GEOTECHNICAL CONSULTANT SHALL PERFORM WAVE EQUATION ANALYSES (WEAP) PRIOR TO THE DRIVING OF PILES TO ENSURE THAT THE SELECTED PILE DRIVING EQUIPMENT DOES NOT OVERSTRESS THE PILES. THE CONTRACTOR'S GEOTECHNICAL CONSULTANT SHALL SUBMIT COPIES OF THE WAVE EQUATION ANALYSIS A MINIMUM OF 14 CALENDAR DAYS PRIOR TO THE BEGINNING OF ANY PILE DRIVING.
6. THE PILES SHALL BE INSTALLED PRIOR TO PLACEMENT OF ADDITIONAL EMBANKMENT FILL OR EXCAVATION AT THE TOE OF SLOPE WEST OF THE CULVERT TO MAINTAIN SATISFACTORY GLOBAL SLOPE STABILITY DURING CONSTRUCTION.
7. VIBRATORY OR SONIC METHODS TO INSTALL THE PILES SHALL BE ACCEPTABLE PROVIDED THAT THE PILES ARE INSTALLED TO THE MINIMUM DEPTH OF 5 FEET BELOW THE SURFACE OF DENSE GLACIAL TILL SOILS.
8. PILE LENGTH ESTIMATES ARE BASED ON THE ESTIMATED ELEVATION OF THE SURFACE OF DENSE GLACIAL TILL SOILS IN THE PILE STABILIZATION AREA. PILE TIP ELEVATIONS SHOWN ARE FOR ESTIMATING PURPOSES ONLY AND ACTUAL PILE LENGTHS MAY VARY FROM THE LENGTHS SHOWN ON THE PLANS.
9. THE TOPS OF THE PILES AFTER DRIVING SHALL NOT VARY FROM THE POSITION SHOWN ON THE PLANS BY MORE THAN 4 INCHES.
10. PREDRILLING OF THE PILES SHALL NOT BE PERMITTED.
11. PILE SPLICES SHALL NOT BE PERMITTED.
12. A HARDENED DRIVING POINT IS NOT REQUIRED, HOWEVER ANY PILES SUPPLIED BY THE AGENCY THAT ALREADY HAVE A DRIVING POINT SHALL BE PREFERABLY USED OVER PILES THAT HAVE NO TIP.
13. PILES SHALL BE CUT OFF AT THE BOTTOM OF THE RIPRAP LAYER, APPROXIMATELY 4 FEET BELOW FINISHED GRADE.

PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: NAME\$DGN
PROJECT LEADER: J. BYATT
DESIGNED BY: S. BEAUMONT
SLOPE STABILIZATION PILES SHEET

PLOT DATE: 12/16/2014
DRAWN BY: M. SMITH
CHECKED BY: J. BYATT
SHEET 45 OF 73



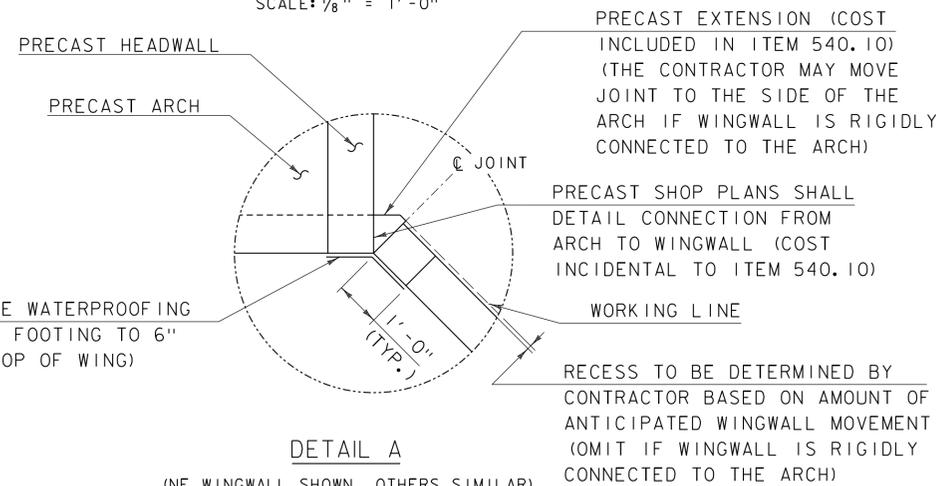


WORKING POINTS		
	STA.	OFFSET
WP1	428+83.63	62.78
WP2	428+98.10	43.89
WP3	429+27.29	0.00
WP4	429+57.69	-56.07
WP5	429+55.04	-65.82
WP6	429+02.32	74.14
WP7	429+16.42	54.83
WP8	429+50.38	0.00
WP9	429+74.00	-46.89
WP10	429+89.79	-52.90

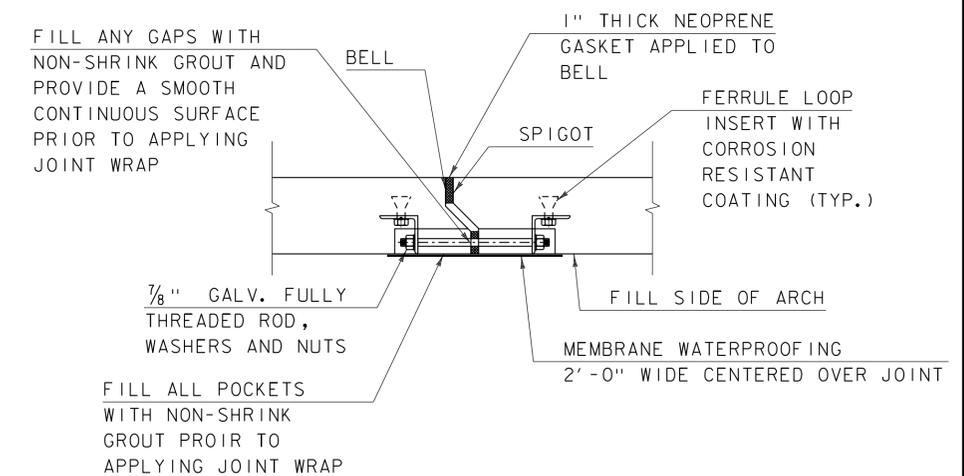
NOTES:

- * ANGLE IS TO A CHORD BETWEEN WP3 AND WP8.
- ** SEE PRECAST CONCRETE ARCH NOTES ON SHEET 10.

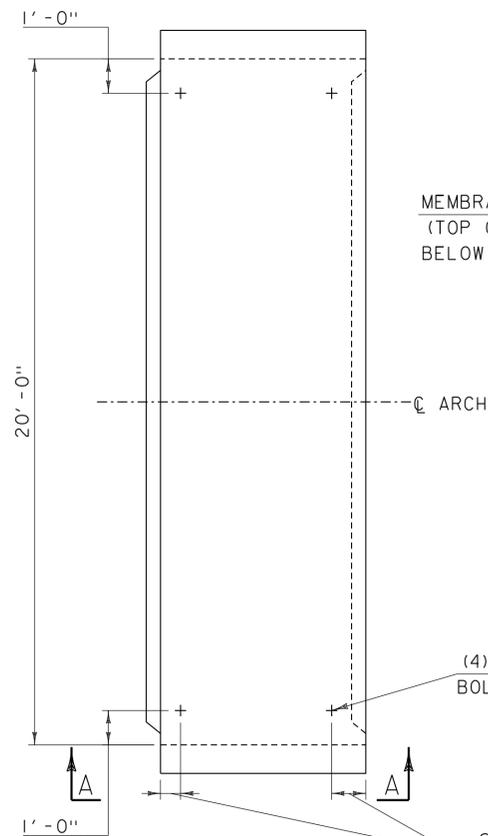
ARCH LAYOUT
SCALE: 1/8" = 1'-0"



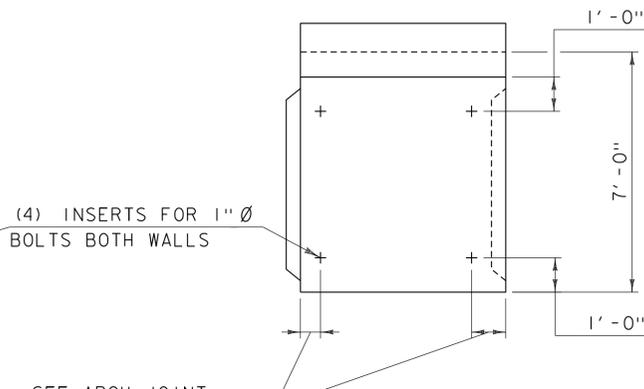
DETAIL A
(ONE WINGWALL SHOWN, OTHERS SIMILAR)
SCALE: 1" = 1'-0"



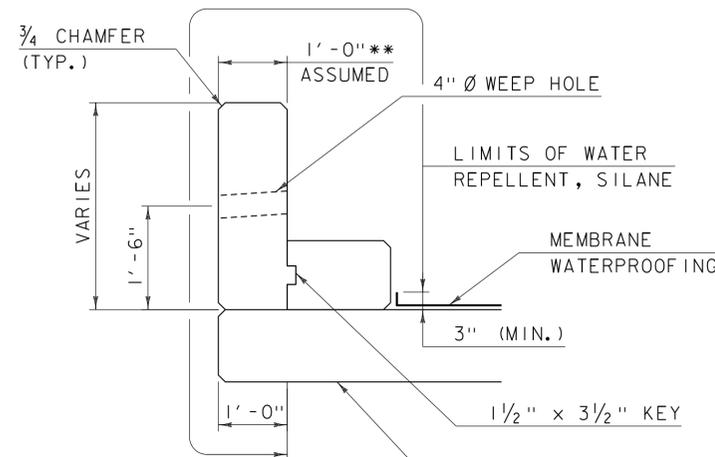
ARCH JOINT DETAIL
SCALE: 1" = 1'-0"



FERRULE LOOP INSERT PLAN
SCALE: 3/8" = 1'-0"



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



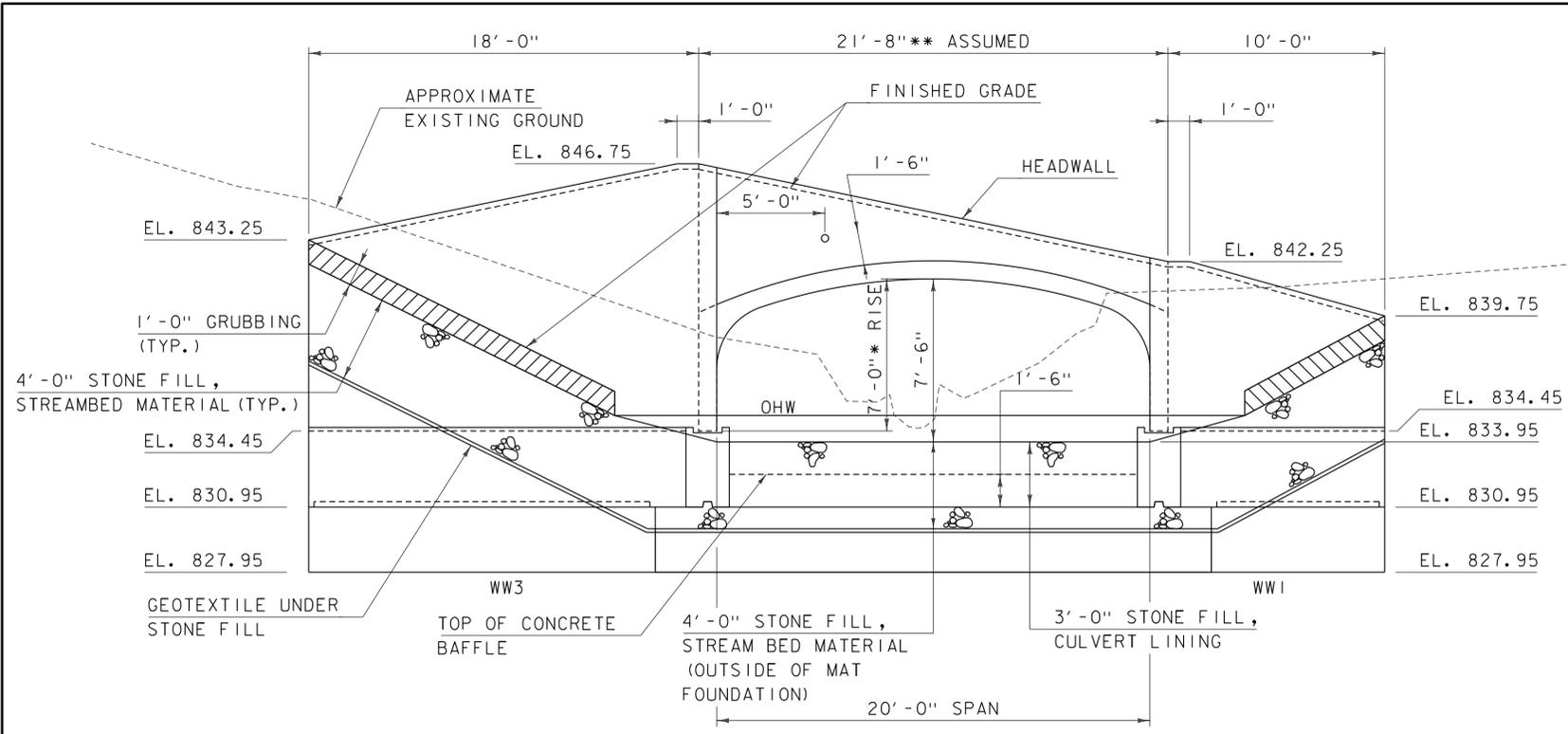
TYPICAL DETACHED HEADWALL DETAIL
SCALE: 3/4" = 1'-0"



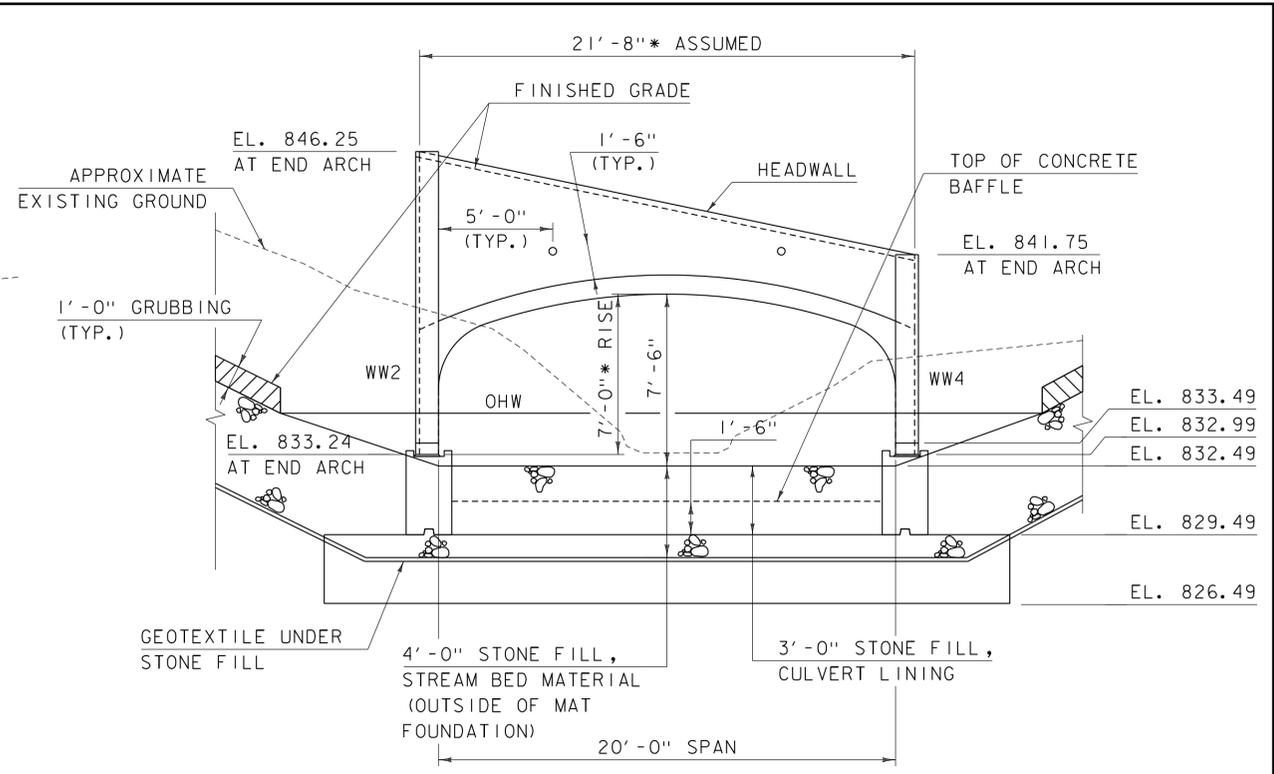
PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: llb294/cos/zllb294sub.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: S. BEAUMONT
ARCH AND WINGWALL DETAILS SHEET I

PLOT DATE: 12/16/2014
DRAWN BY: M. SMITH
CHECKED BY: J. BYATT
SHEET 46 OF 73

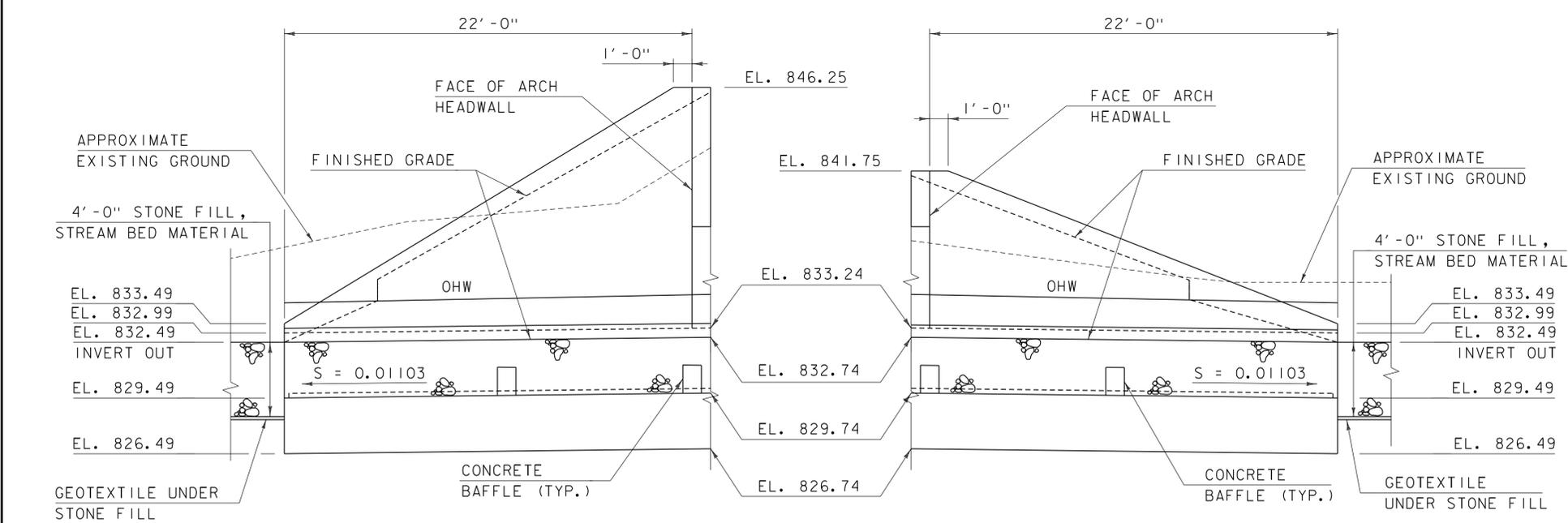


UPSTREAM ELEVATION
SCALE: 1/4" = 1'-0"

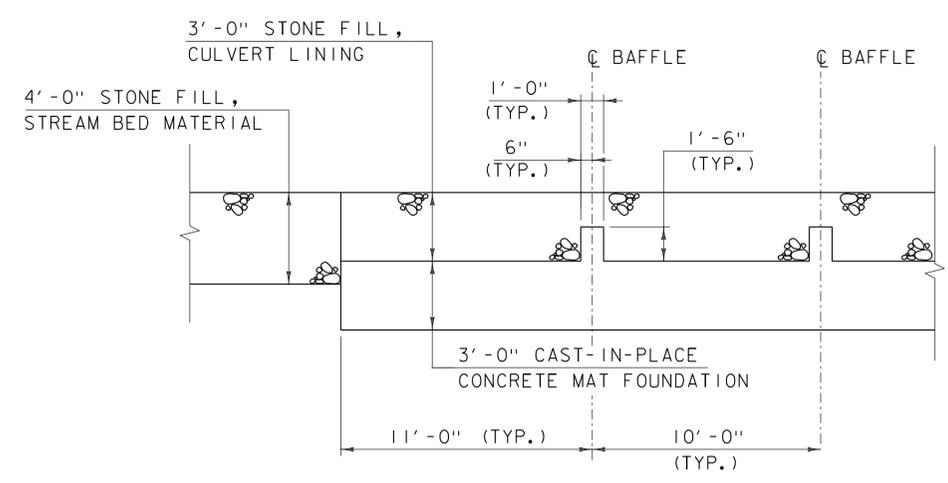


DOWNSTREAM ELEVATION
SCALE: 1/4" = 1'-0"

NOTE: ALL ELEVATIONS SHOWN AT END OF MAT FOUNDATION (INVERT OUT) LOCATION UNLESS OTHERWISE NOTED.



WW2 ELEVATION
WW4 ELEVATION
DOWNSTREAM WINGWALL ELEVATIONS
SCALE: 1/4" = 1'-0"



TYPICAL BAFFLE DETAIL
SCALE: 1/4" = 1'-0"

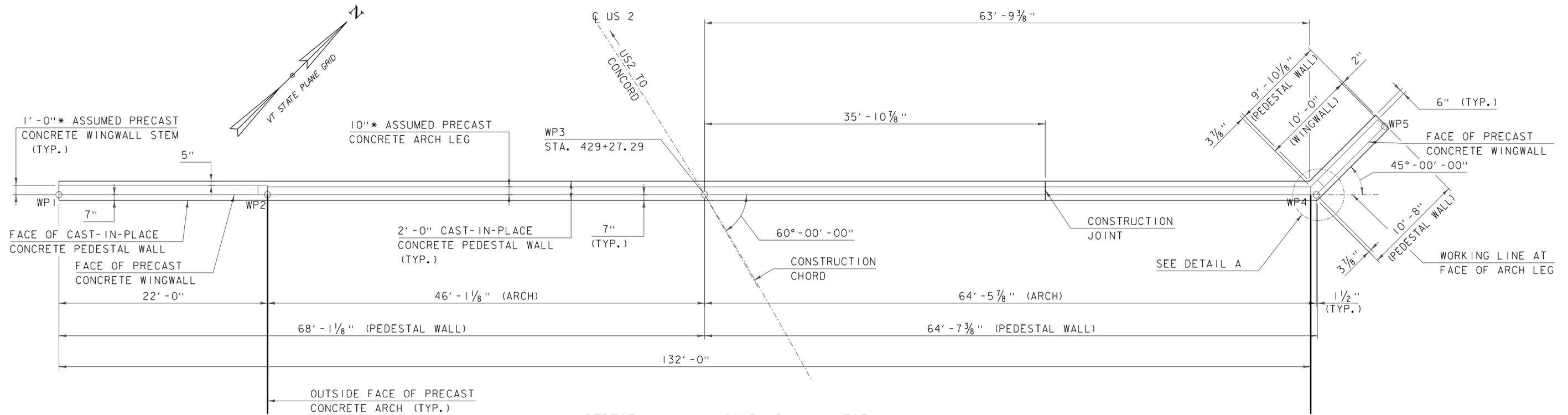
NOTES:
* SEE PRECAST CONCRETE ARCH NOTES ON SHEET 10.



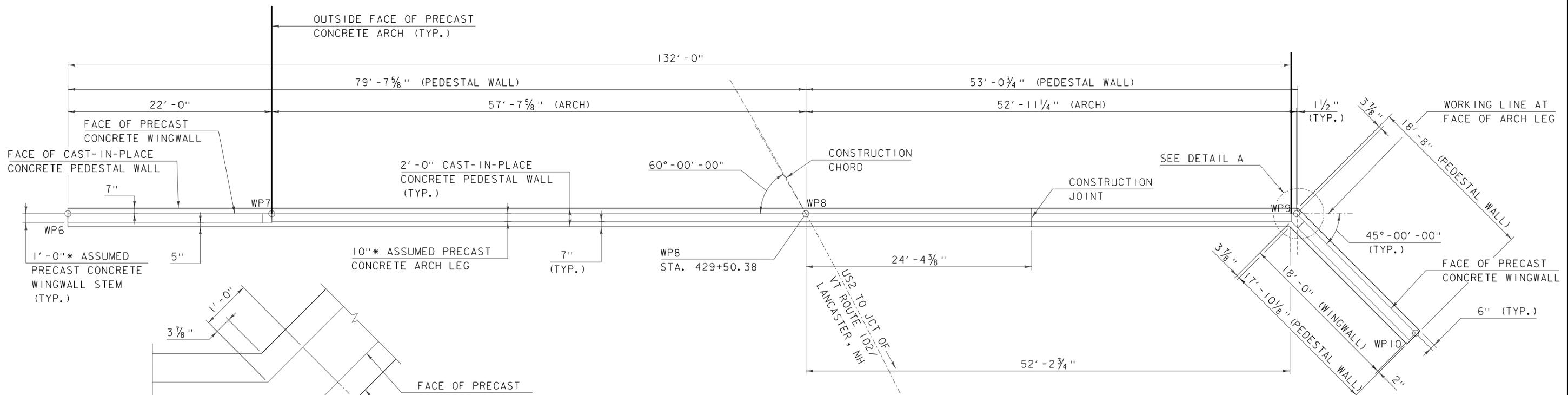
PROJECT NAME:	LUNENBURG	FILE NAME:	llb294/cos/zllb294sub.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. SMITH
		DESIGNED BY:	S. BEAUMONT	CHECKED BY:	J. BYATT
		ARCH AND WINGWALL DETAILS SHEET 2		SHEET	47 OF 73

CLD_12-0106 MODEL: Sheet06

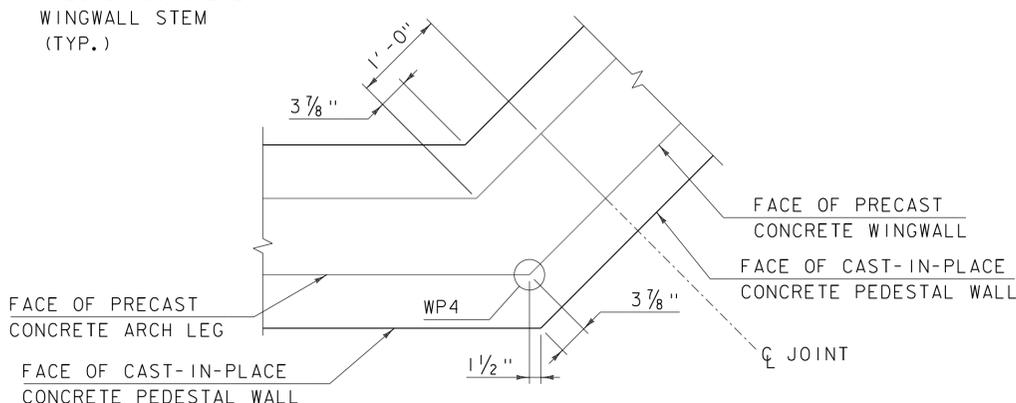
CLD 12-0106 MODEL: Sheet07



PEDESTAL WALL MASONRY PLAN - WEST
SCALE: 3/16" = 1'-0"



PEDESTAL WALL MASONRY PLAN - EAST
SCALE: 3/16" = 1'-0"

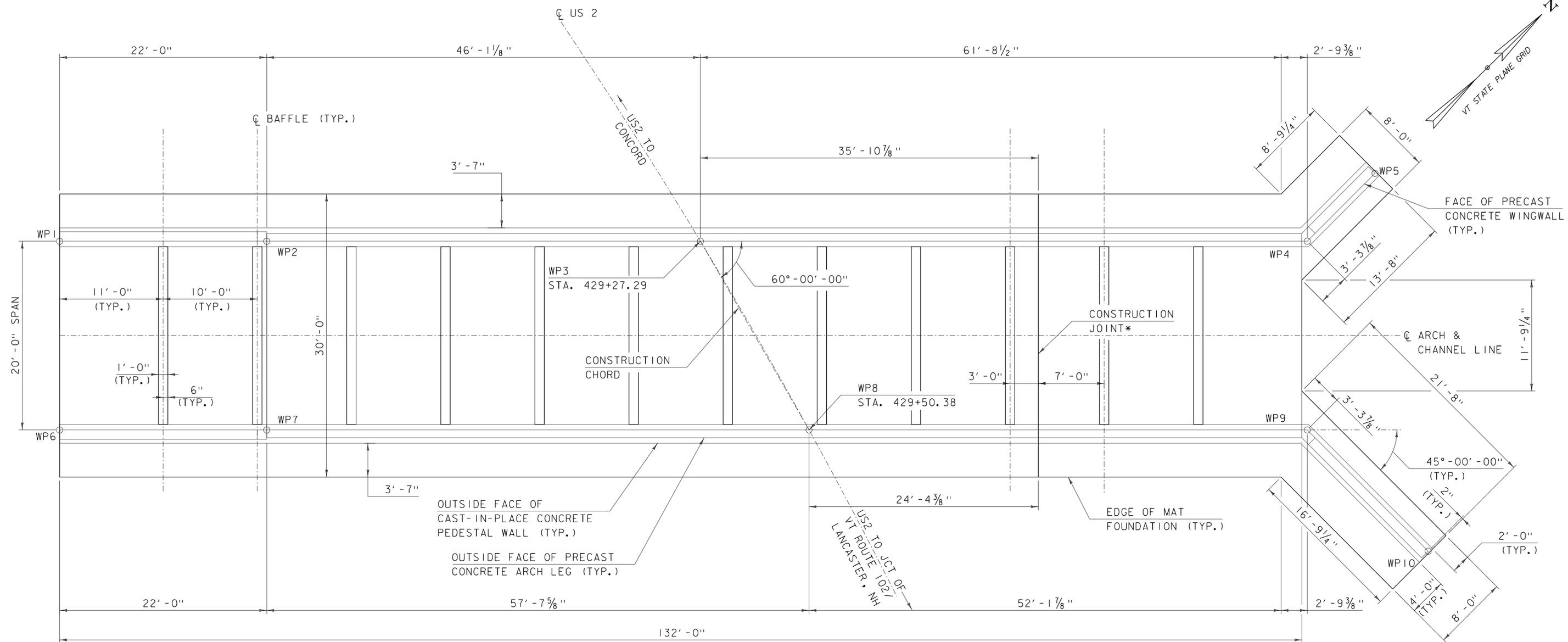


DETAIL A
(NORTHWEST WINGWALL SHOWN,
OTHER WINGWALLS SIMILAR)
SCALE: 1" = 1'-0"

NOTES:
* SEE PRECAST CONCRETE ARCH NOTES ON SHEET 10.

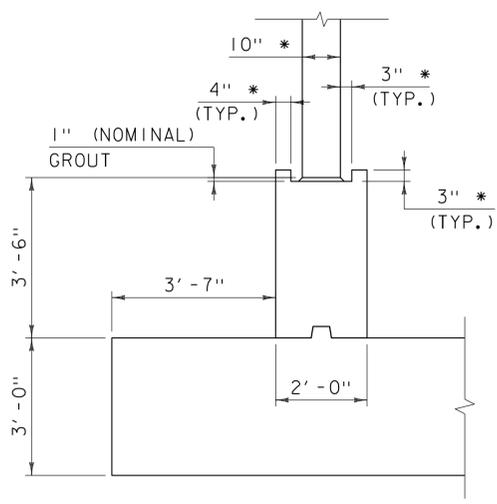


PROJECT NAME:	LUNENBURG	FILE NAME:	lib294/cos/zlib294sub.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. SMITH
		DESIGNED BY:	S. BEAUMONT	CHECKED BY:	N. CARON
		SUBSTRUCTURE DETAILS SHEET I			SHEET 48 OF 73

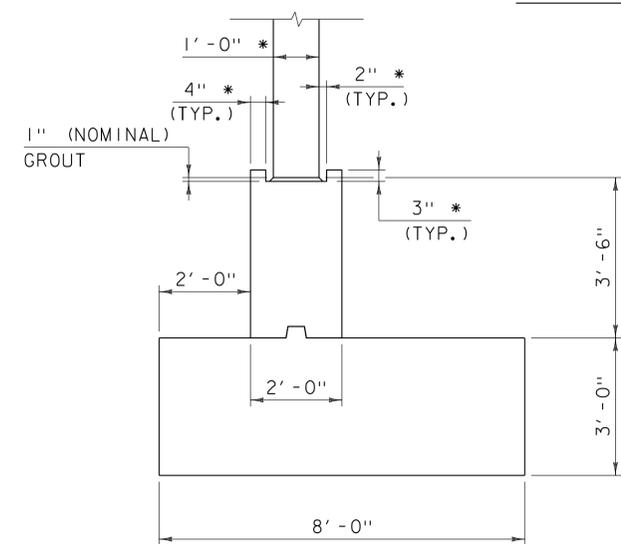


MAT FOUNDATION MASONRY PLAN

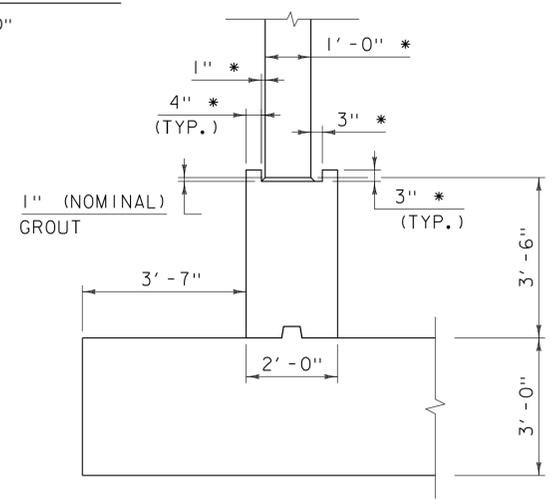
SCALE: 3/16" = 1'-0"



TYPICAL ARCH MAT FOUNDATION SECTION
SCALE: 3/4" = 1'-0"



TYPICAL UPSTREAM WINGWALL MAT FOUNDATION SECTION
SCALE: 3/4" = 1'-0"



TYPICAL DOWNSTREAM WINGWALL MAT FOUNDATION SECTION
SCALE: 3/4" = 1'-0"

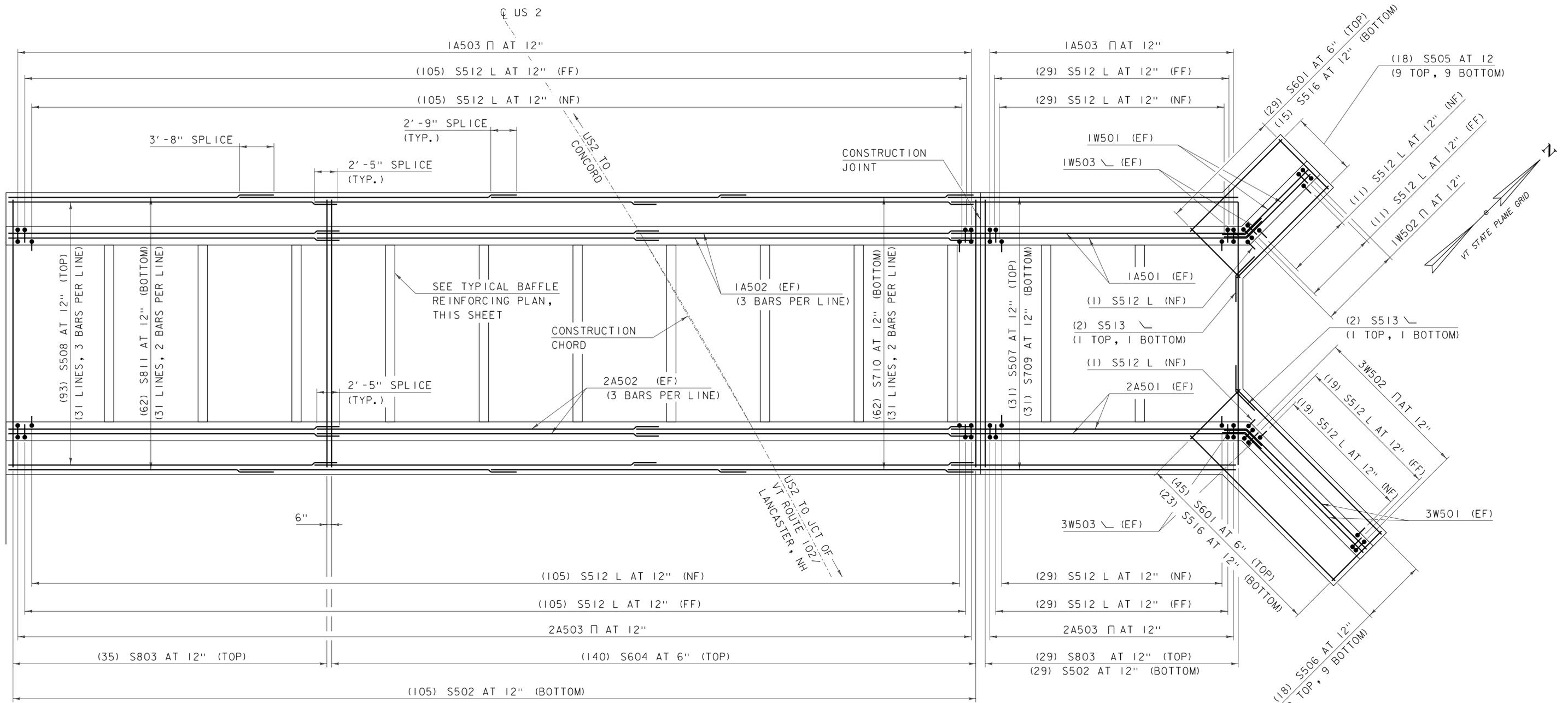
NOTES:

* ASSUMED. SEE PRECAST CONCRETE ARCH NOTES ON SHEET 10.

PROJECT NAME:	LUNENBURG	FILE NAME:	lb294/cos/zlb294sub.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. SMITH
		DESIGNED BY:	S. BEAUMONT	CHECKED BY:	N. CARON
		SUBSTRUCTURE DETAILS SHEET 2		SHEET	49 OF 73

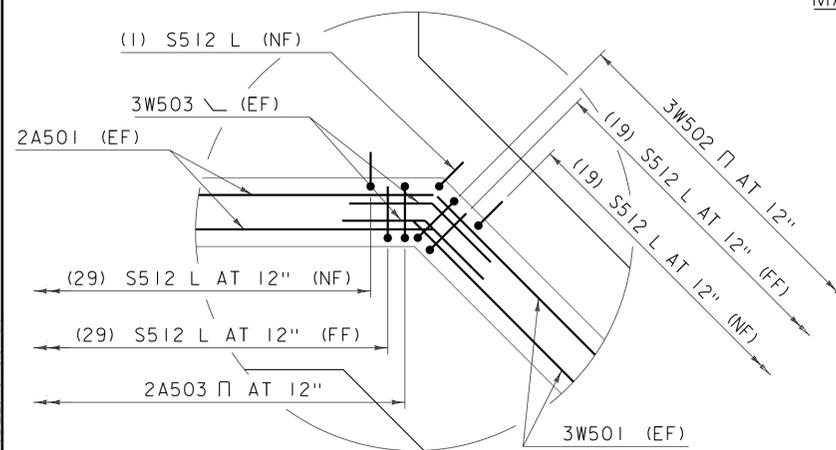


CLD 12-0106 MODEL: Sheet08

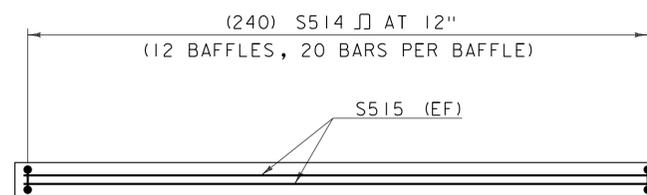


MAT FOUNDATION AND PEDESTAL WALL REINFORCING PLAN

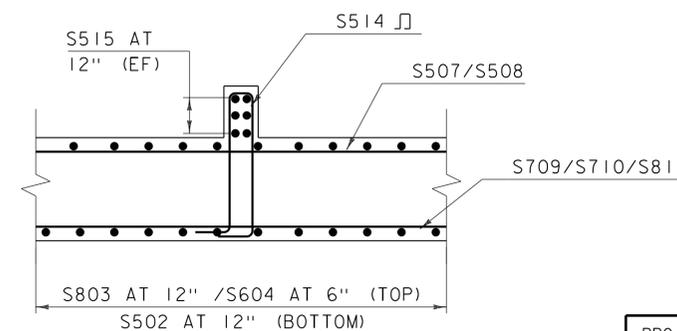
SCALE: 3/16" = 1' - 0"



TYPICAL PEDESTAL WALL CORNER REINFORCING SECTION
(NE CORNER SHOWN, NW CORNER SIMILAR)
SCALE: 3/4" = 1' - 0"



TYPICAL BAFFLE REINFORCING PLAN
SCALE: 3/8" = 1' - 0"



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

NOTES:

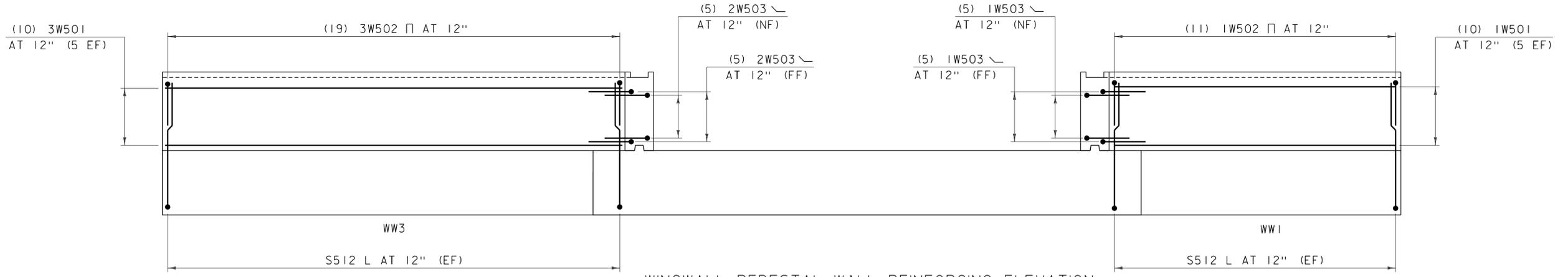
- NF = NEAR FACE
- FF = FAR FACE
- EF = EACH FACE
- 3" CLEAR IN MAT FOUNDATION,
- 2" CLEAR AT ALL OTHER LOCATIONS.
- 2' - 5" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS

PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

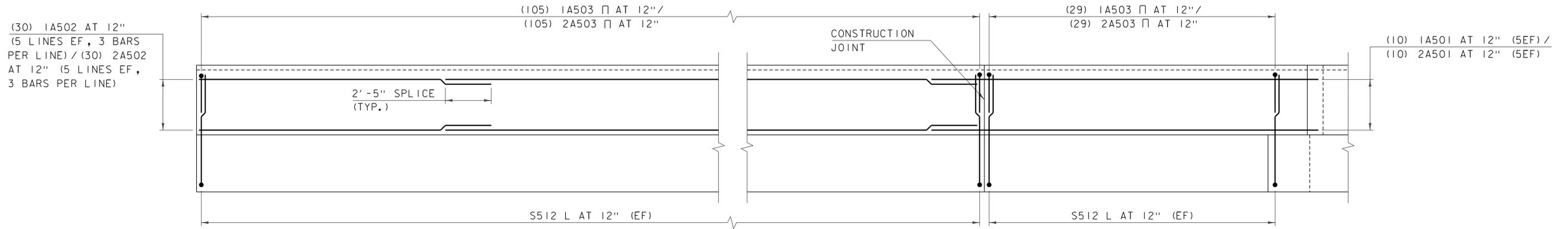
FILE NAME: llb294/cos/zllb294sub.dgn
PROJECT LEADER: J. BYATT
DESIGNED BY: S. BEAUMONT
SUBSTRUCTURE REINFORCING SHEET 1

PLOT DATE: 12/16/2014
DRAWN BY: M. SMITH
CHECKED BY: N. CARON
SHEET 50 OF 73

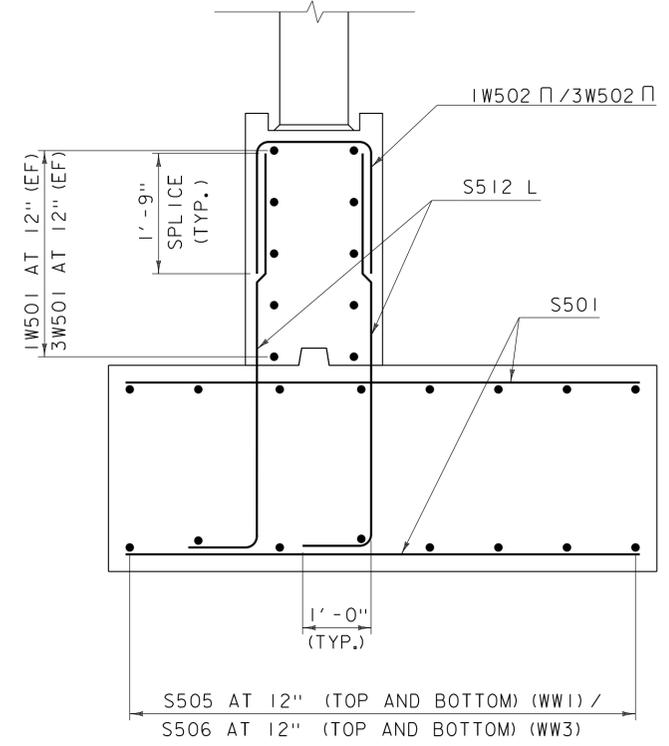




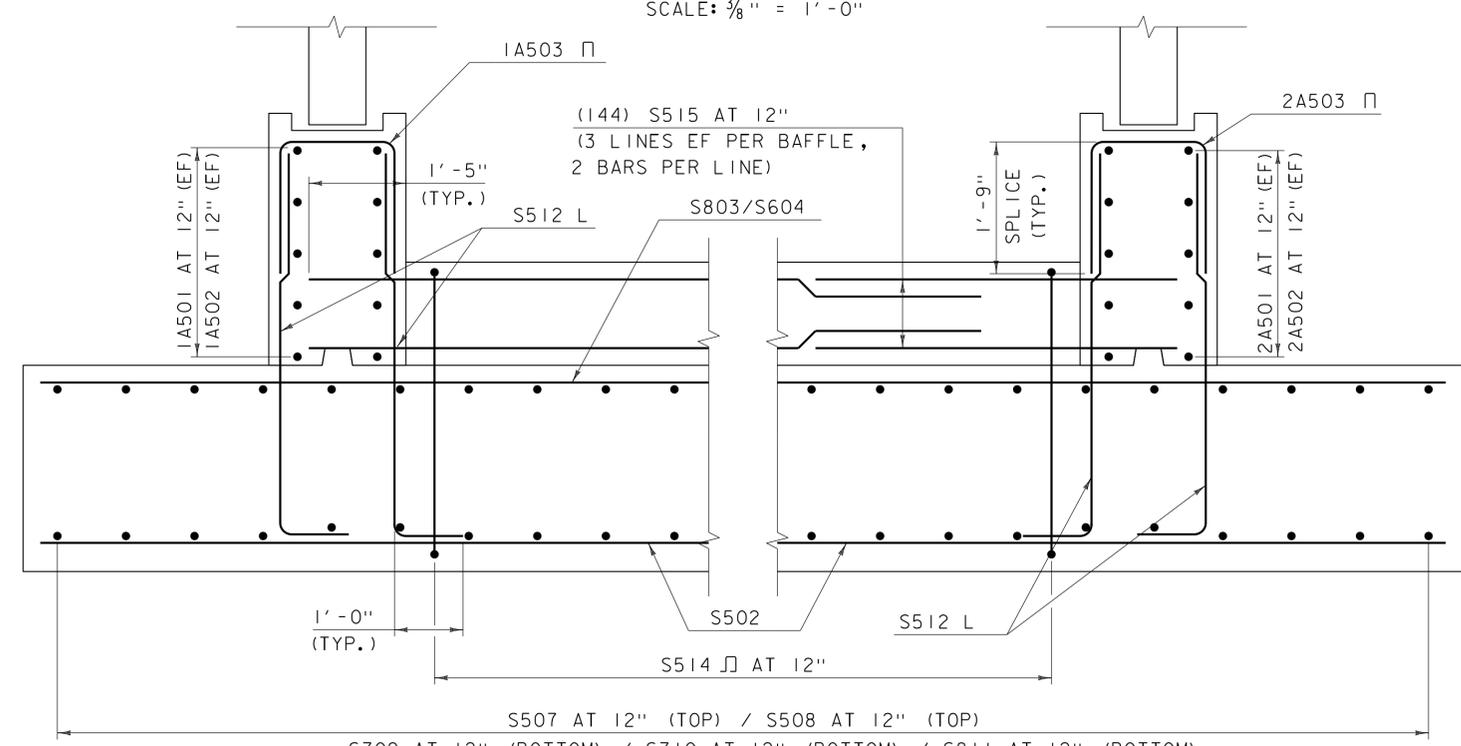
WINGWALL PEDESTAL WALL REINFORCING ELEVATION
SCALE: 3/8" = 1'-0"



ARCH PEDESTAL WALL REINFORCING ELEVATION
SCALE: 3/8" = 1'-0"



TYPICAL UPSTREAM WINGWALL MAT FOUNDATION REINFORCING SECTION
SCALE: 3/4" = 1'-0"



TYPICAL ARCH MAT FOUNDATION REINFORCING SECTION (AT BAFFLE)
(TYPICAL DOWNSTREAM WINGWALL MAT FOUNDATION REINFORCING SECTION SIMILAR)
SCALE: 3/4" = 1'-0"

- NOTES:
- NF = NEAR FACE
 - FF = FAR FACE
 - EF = EACH FACE
 - 3" CLEAR IN MAT FOUNDATION,
 - 2" CLEAR AT ALL OTHER LOCATIONS.
 - 2'-5" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS

PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	M. SMITH
FILE NAME:	11b294/cos/z11b294sub.dgn	DESIGNED BY:	S. BEAUMONT
PROJECT LEADER:	J. BYATT	CHECKED BY:	J. BYATT
SUBSTRUCTURE REINFORCING SHEET 2		SHEET	51 OF 73

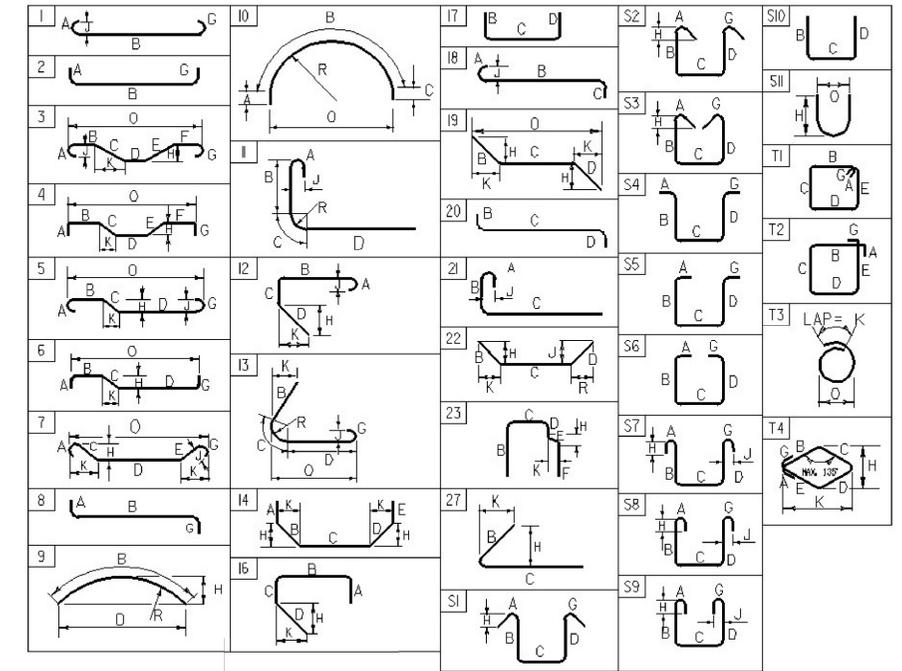
CLD_12-0106 MODEL: Sheet10

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
ARCH WALL #1 (WEST)																																			
10	5	31'- 4"	1A501	STR	31'- 4"																														
30	5	36'- 2"	1A502	STR	36'- 2"																														
134	5	5'- 2"	1A503	17		1'- 9"	1'- 8"	1'- 9"																											
ARCH WALL #2 (EAST)																																			
10	5	31'- 4"	2A501	STR	31'- 4"																														
30	5	36'- 2"	2A502	STR	36'- 2"																														
134	5	5'- 2"	2A503	17		1'- 9"	1'- 8"	1'- 9"																											
WINGWALL #1																																			
10	5	10'- 4"	1W501	STR	10'- 4"																														
* 12	5	5'- 2"	1W502	17		1'- 9"	1'- 8"	1'- 9"																											
10	5	4'- 10"	1W503	22		2'- 5"	2'- 5"	---				1'- 8.5"	---	1'- 8.5"	---																				
WINGWALL #3																																			
10	5	18'- 4"	3W501	STR	18'- 4"																														
19	5	5'- 2"	3W502	17		1'- 9"	1'- 8"	1'- 9"																											
10	5	4'- 10"	3W503	22		2'- 5"	2'- 5"	---				1'- 8.5"	---	1'- 8.5"	---																				
MAT FOUNDATION																																			
74	6	7'- 6"	S601	STR	7'- 6"																														
134	5	29'- 6"	S502	STR	29'- 6"																														
* 65	8	29'- 6"	S803	STR	29'- 6"																														
140	6	29'- 6"	S604	STR	29'- 6"																														
18	5	13'- 5"	S505	STR	13'- 5"																														
18	5	21'- 5"	S506	STR	21'- 5"																														
31	5	30'- 5"	S507	STR	30'- 5"																														
93	5	36'- 2"	S508	STR	36'- 2"																														
31	7	30'- 9"	S709	STR	30'- 9"																														
62	7	27'- 3"	S710	STR	27'- 3"																														
62	8	29'- 1"	S811	STR	29'- 1"																														
598	5	7'- 1"	S512	17		6'- 1"	1'- 0"	---																											
4	5	4'- 10"	S513	22		2'- 5"	2'- 5"	---																											
240	5	10'- 10"	S514	S5	1'- 0"	4'- 1"	0'- 8"	4'- 1"				1'- 0"																							
144	5	13'- 3"	S515	STR	13'- 3"																														
38	5	7'- 6"	S516	STR	7'- 6"																														

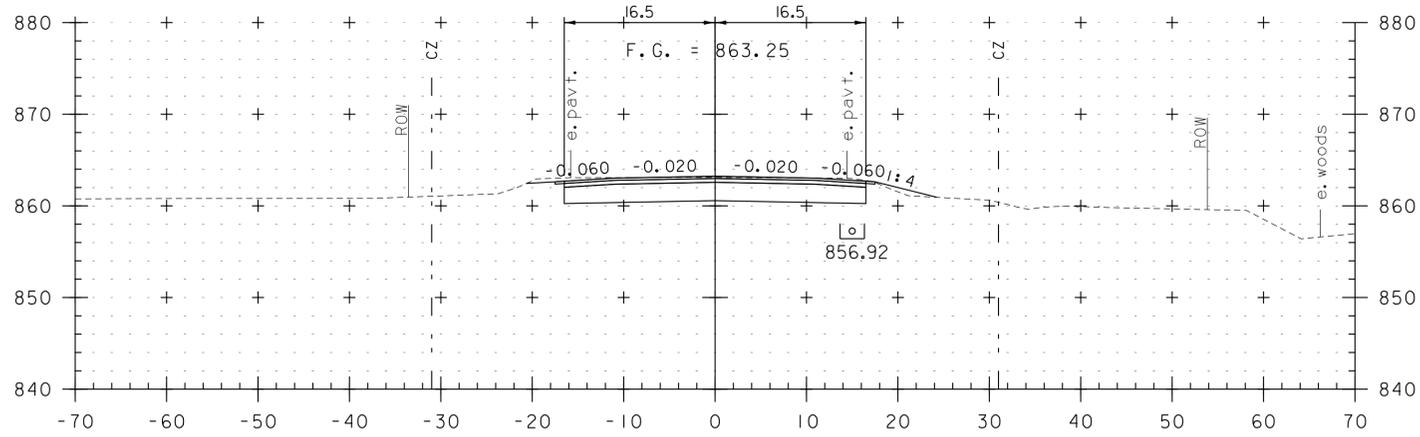
~ NOTES ~

- 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-S1). 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.

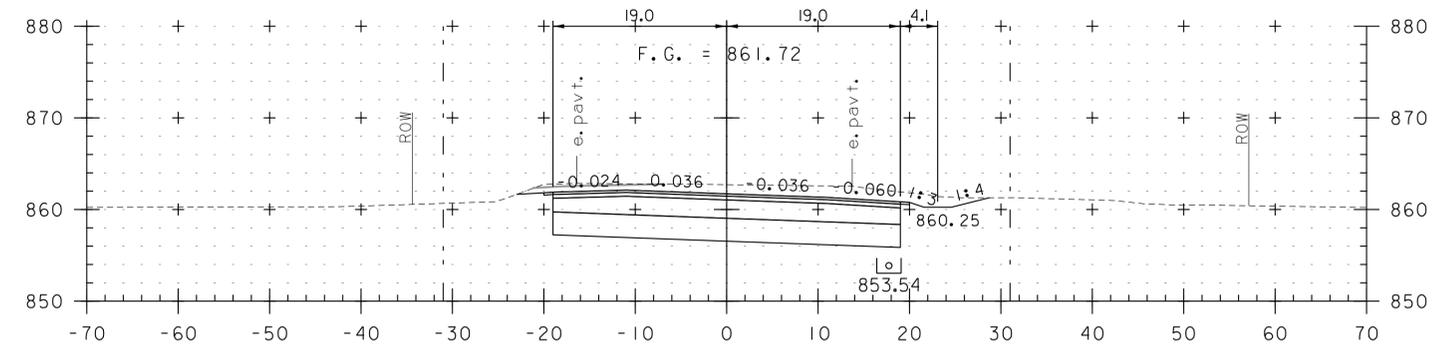


ASTM STANDARD REINFORCING BARS				
BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION		
		DIAMETER INCHES	AREA INCHES ²	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.044	0.875	0.60	2.749
#8	2.670	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

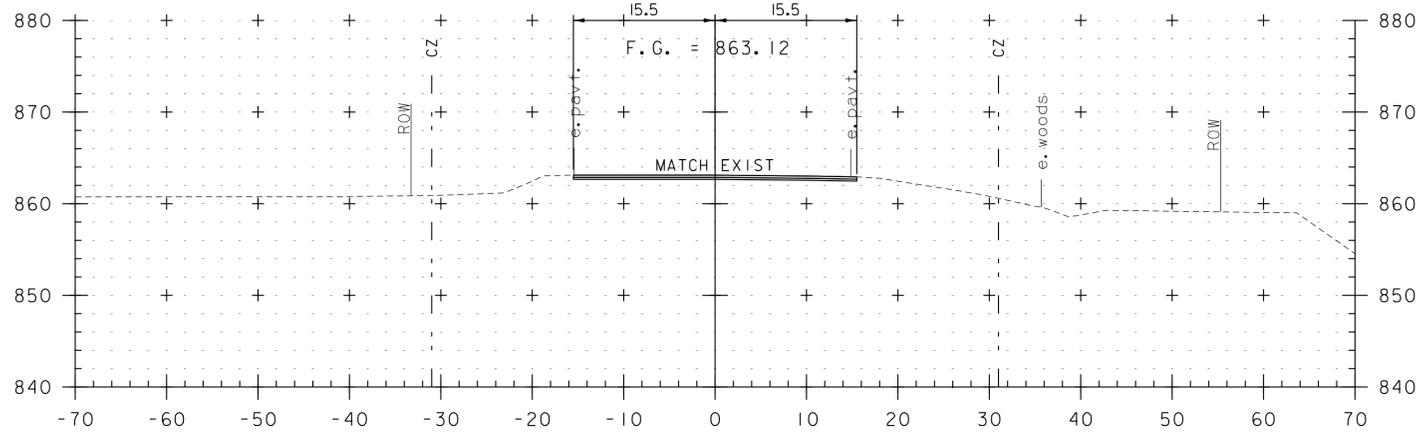
PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)
FILE NAME: IOc412/cos/21lb294schedule.dgn PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT DRAWN BY: M. SMITH
DESIGNED BY: S. BEAUMONT CHECKED BY: N. CARON
REINFORCING STEEL SCHEDULE SHEET 52 OF 73



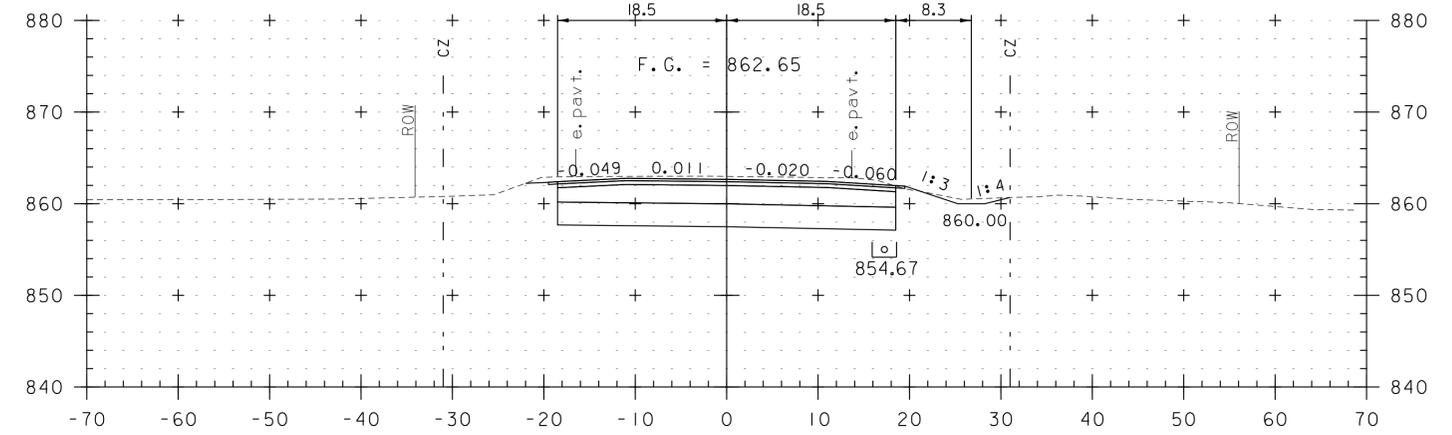
425+00



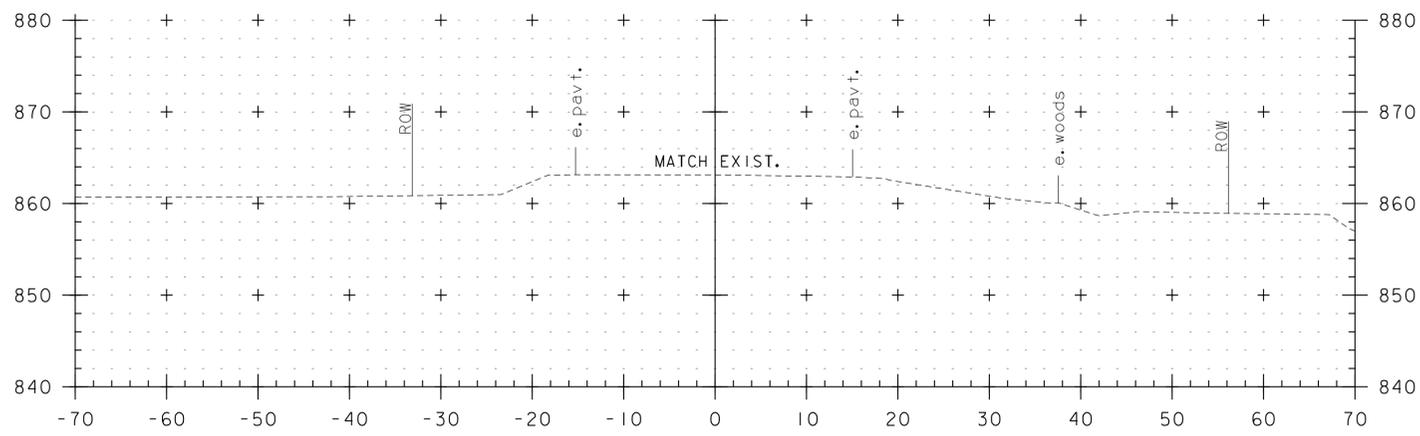
426+50



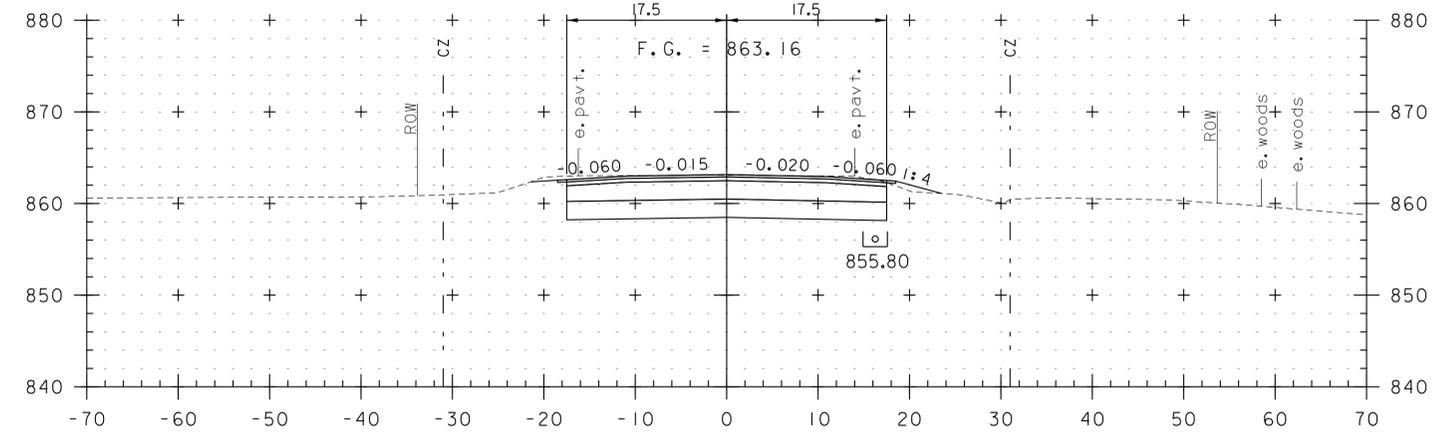
424+50
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426+00



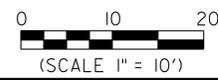
424+25
BEGIN APPROACH



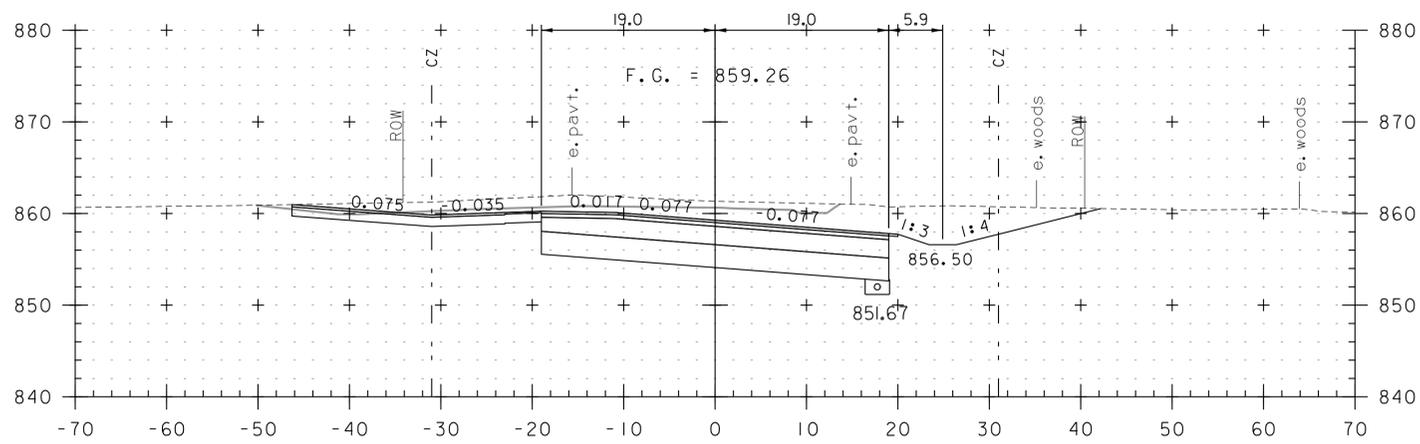
425+50

STA. 424+25 TO STA. 426+50

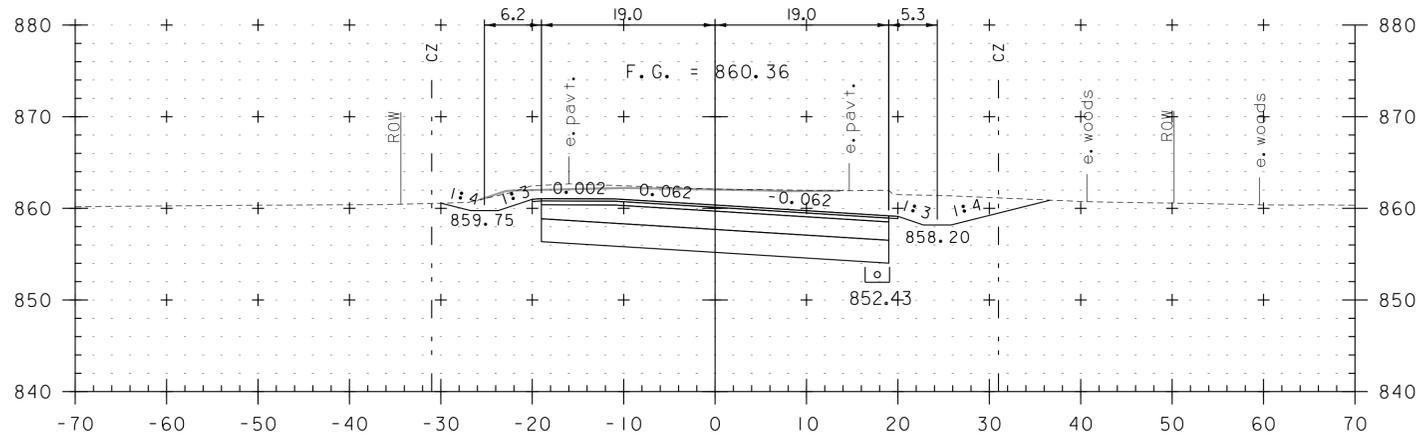
PROJECT NAME:	LUNENBURG
PROJECT NUMBER:	NH CULV(27)
FILE NAME:	IIB294/cos/zlb294xsl.dgn
PROJECT LEADER:	J. BYATT
DESIGNED BY:	M. HALEY
ROADWAY CROSS SECTIONS:	
PLOT DATE:	12/16/2014
DRAWN BY:	M. HALEY
CHECKED BY:	P. SHEDD
SHEET:	53 OF 73



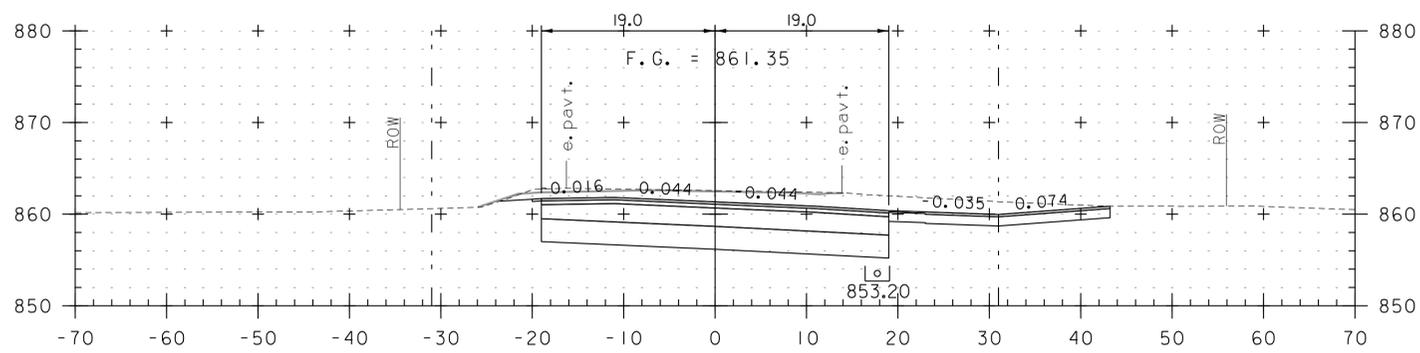
CLD 12-0106 MODEL: XSO1



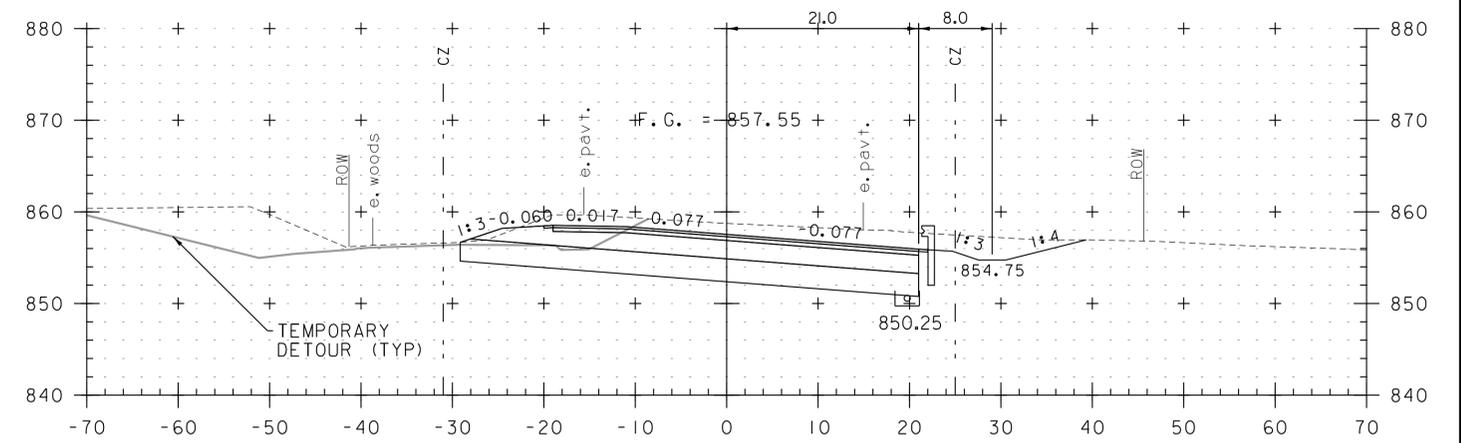
427+35
DRIVE LT



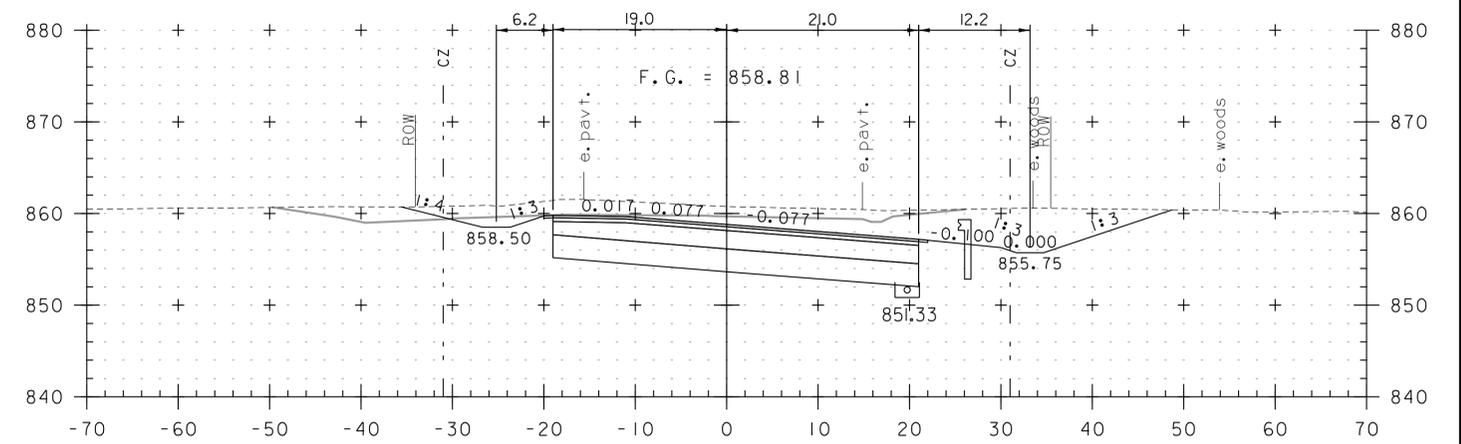
427+00



426+65
DRIVE RT

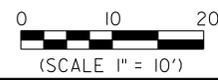


428+00

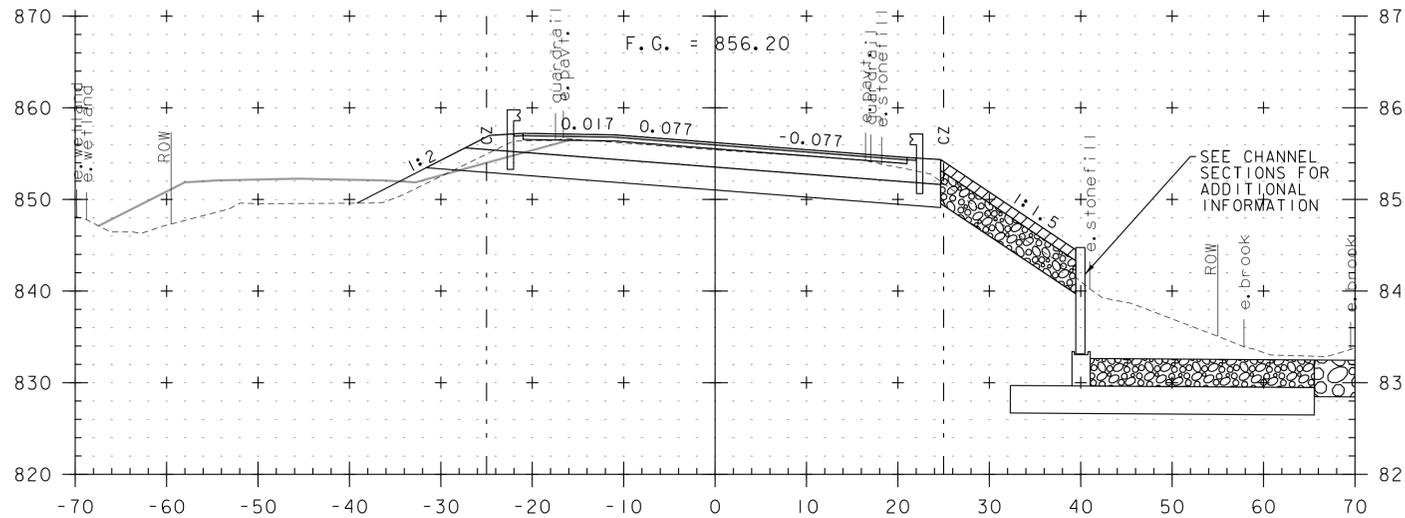


427+50

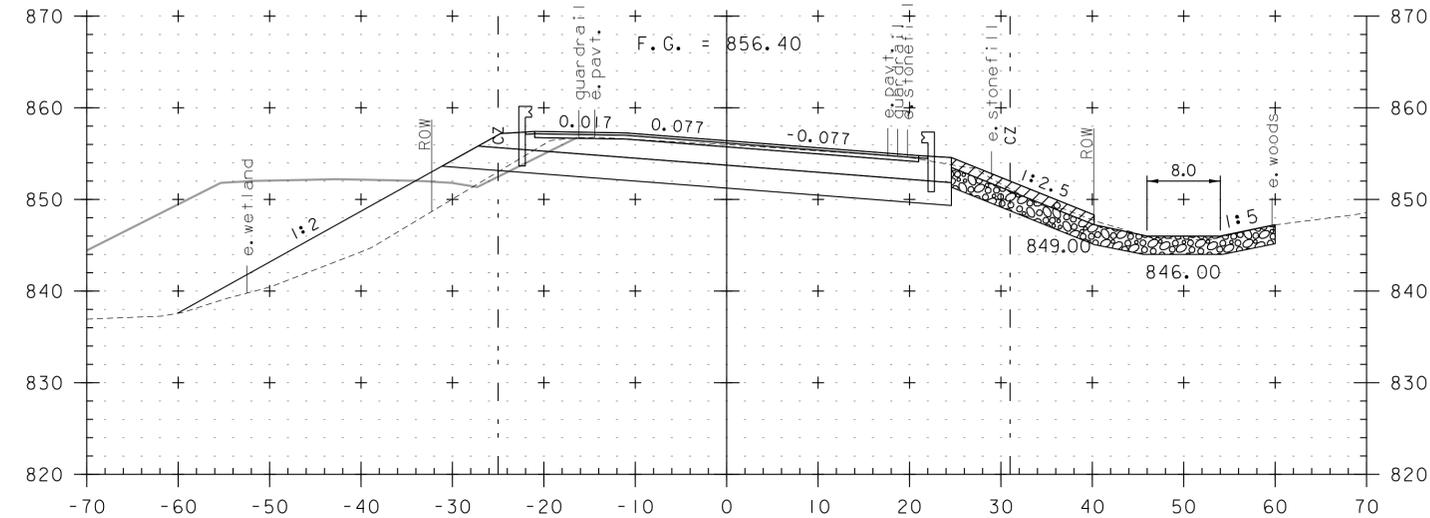
STA. 426+65 TO STA. 428+00



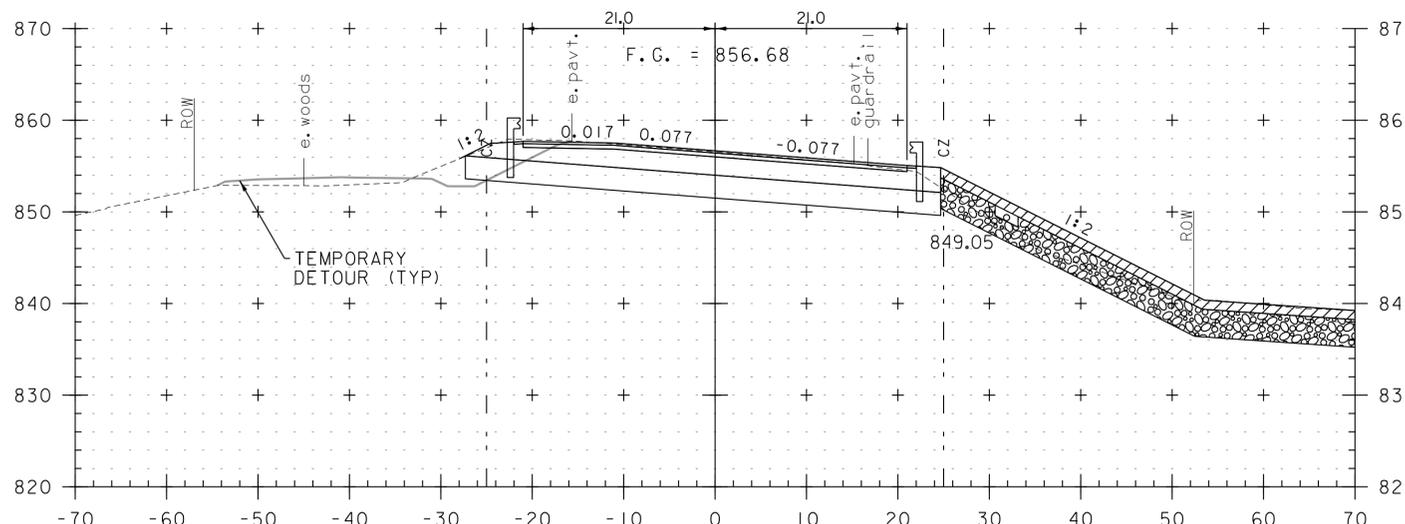
PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	M. HALEY
FILE NAME:	IIB294/cos/zlb294xsl.dgn	CHECKED BY:	P. SHEDD
PROJECT LEADER:	J. BYATT	ROADWAY CROSS SECTIONS 2	SHEET 54 OF 73
DESIGNED BY:	M. HALEY		



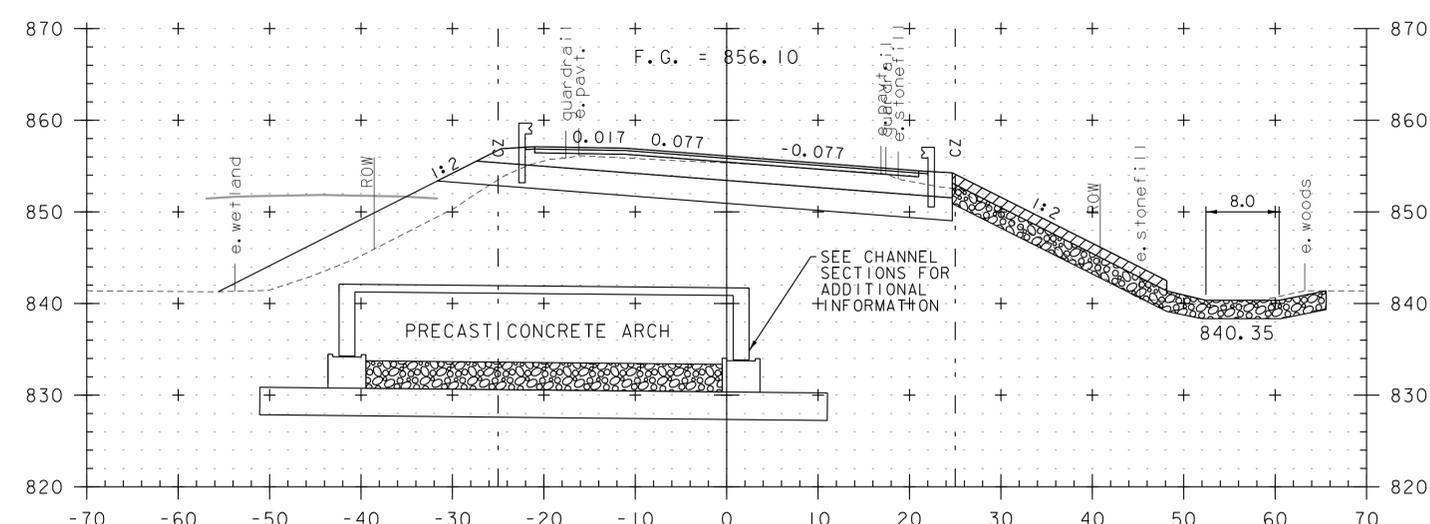
429+00



430+00



428+50



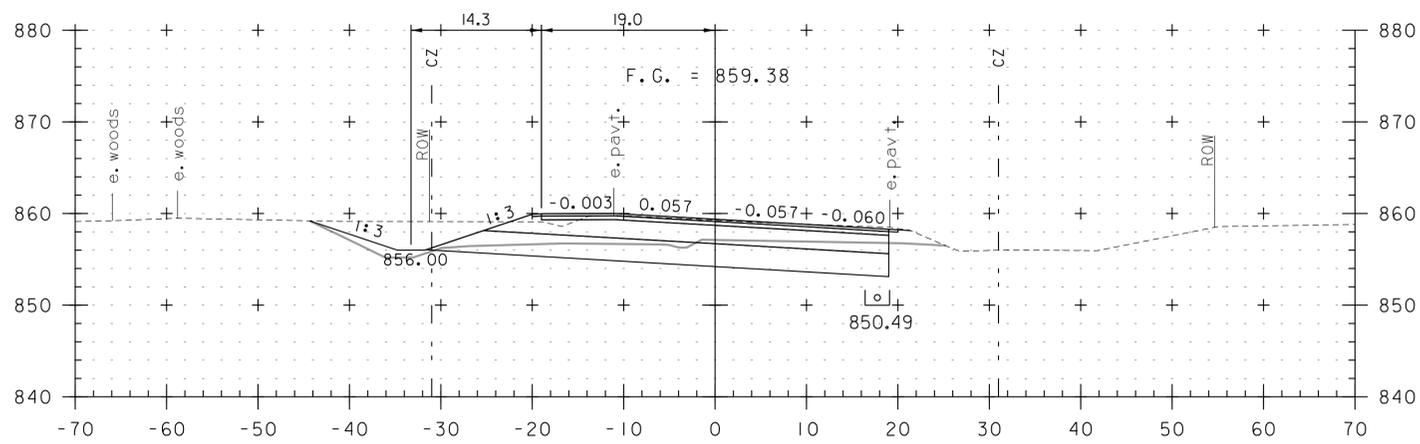
429+50

STA. 428+50 TO STA. 430+00

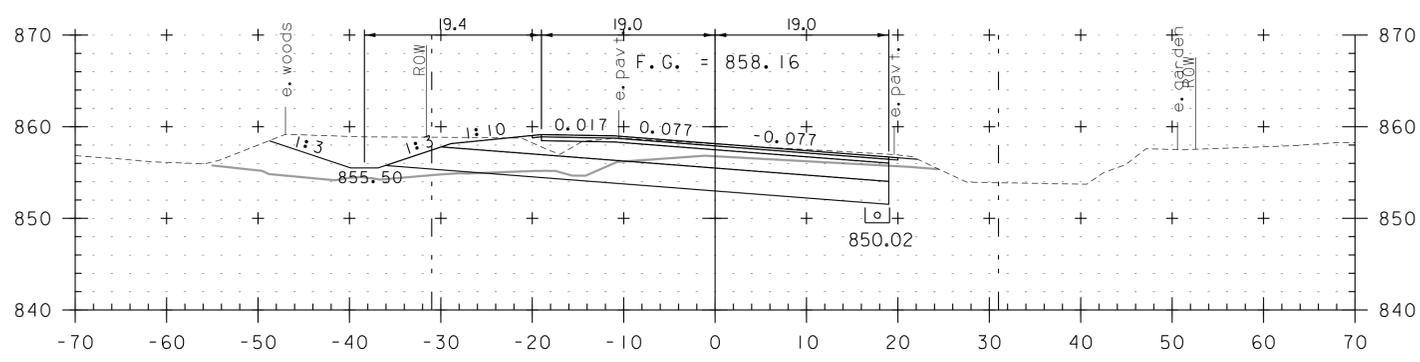


PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	M. HALEY
FILE NAME:	IIB294/cos/zlb294xsl.dgn	CHECKED BY:	P. SHEDD
PROJECT LEADER:	J. BYATT	ROADWAY CROSS SECTIONS 3	SHEET 55 OF 73
DESIGNED BY:	M. HALEY		

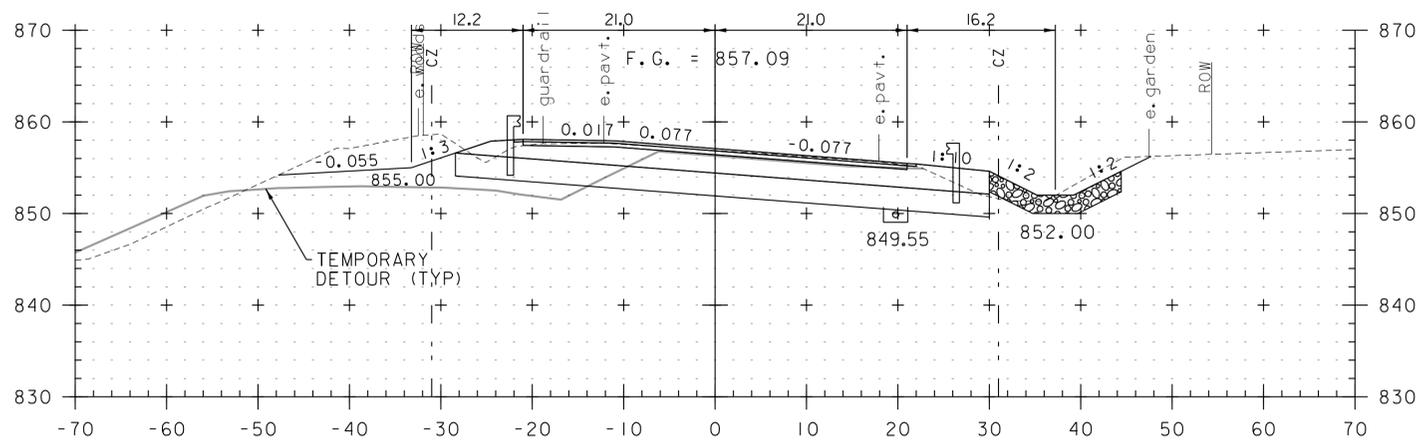
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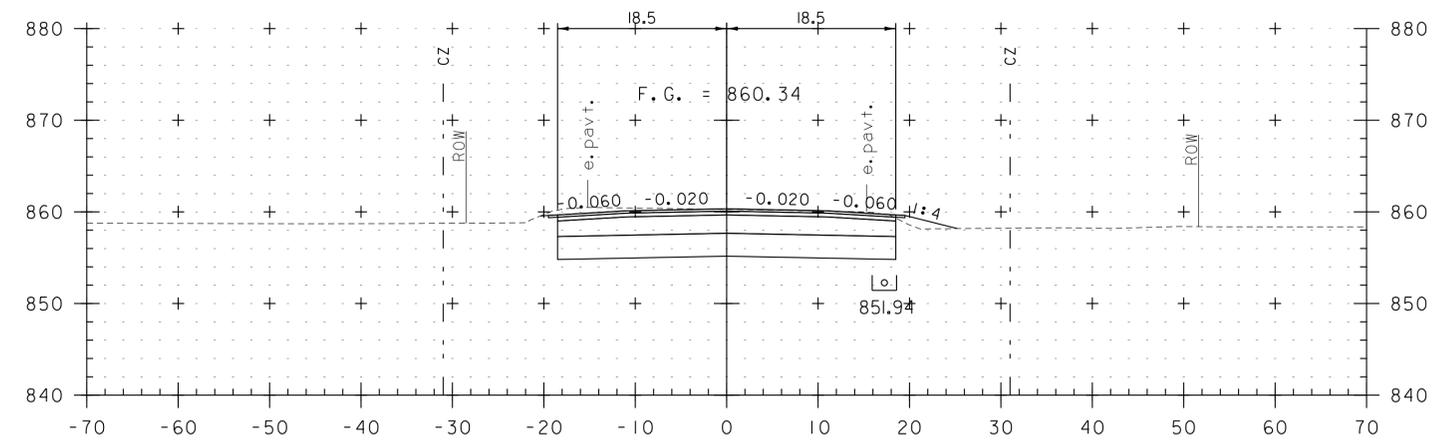
431+50



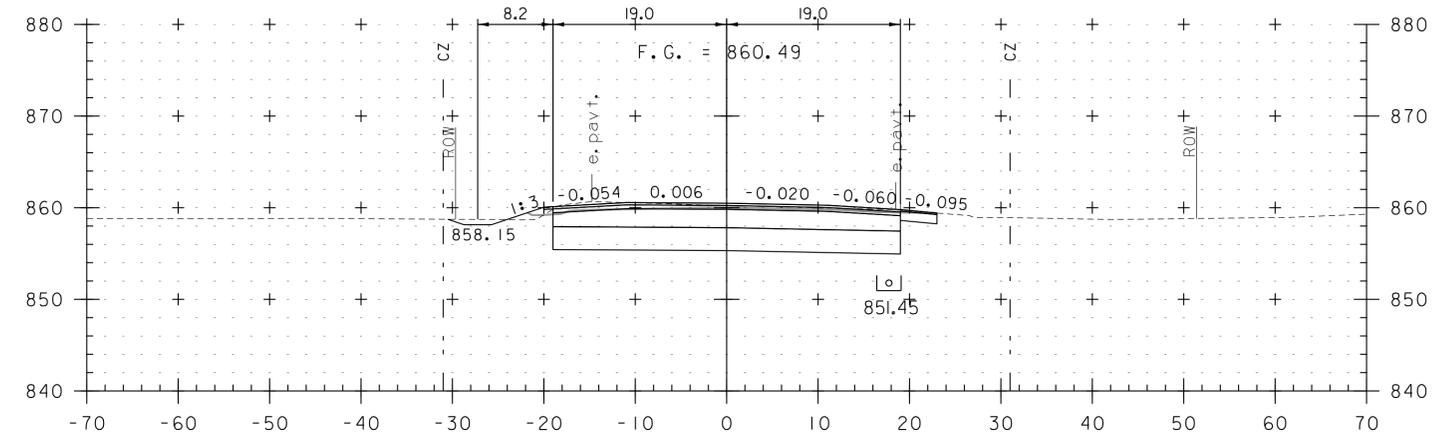
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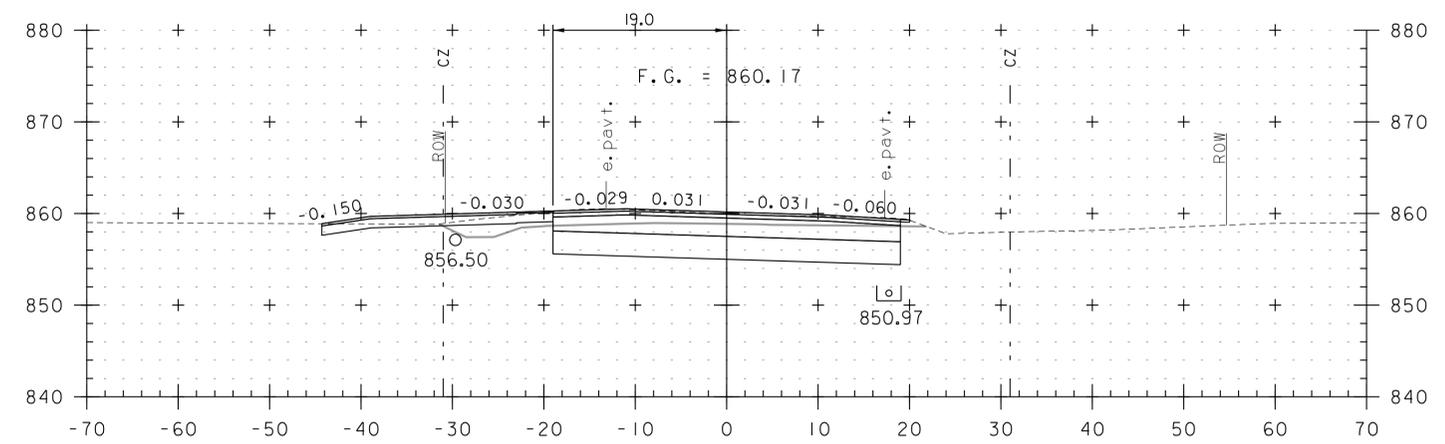
430+50



433+00



432+50



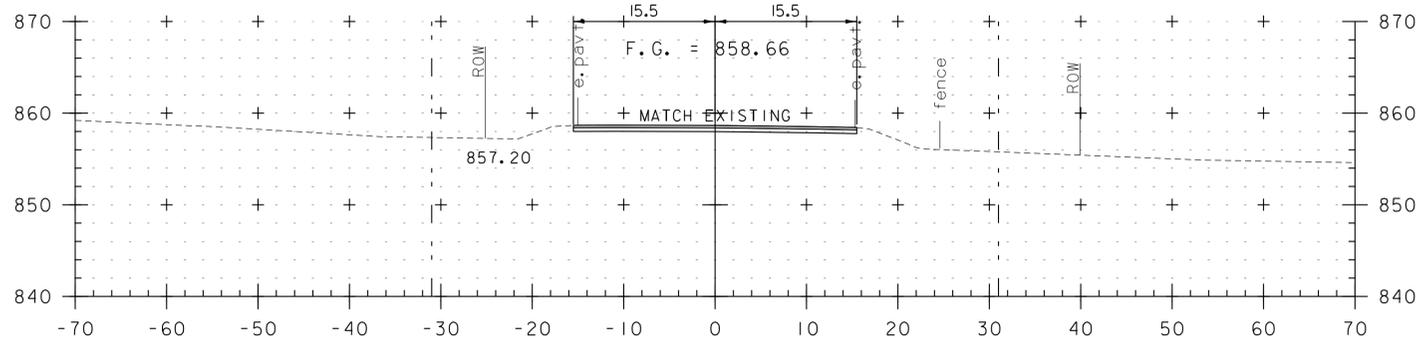
432+00
DRIVE LT

STA. 430+50 TO STA. 433+00

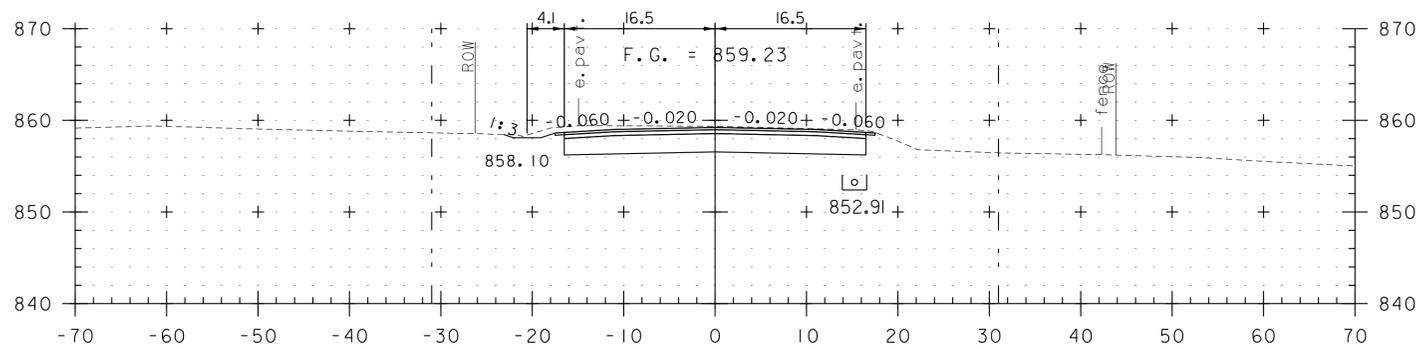
PROJECT NAME:	LUNENBURG
PROJECT NUMBER:	NH CULV(27)
FILE NAME:	IIB294/cos/zlb294xsl.dgn
PROJECT LEADER:	J. BYATT
DESIGNED BY:	M. HALEY
ROADWAY CROSS SECTIONS:	4
PLOT DATE:	12/16/2014
DRAWN BY:	M. HALEY
CHECKED BY:	P. SHEDD
SHEET:	56 OF 73



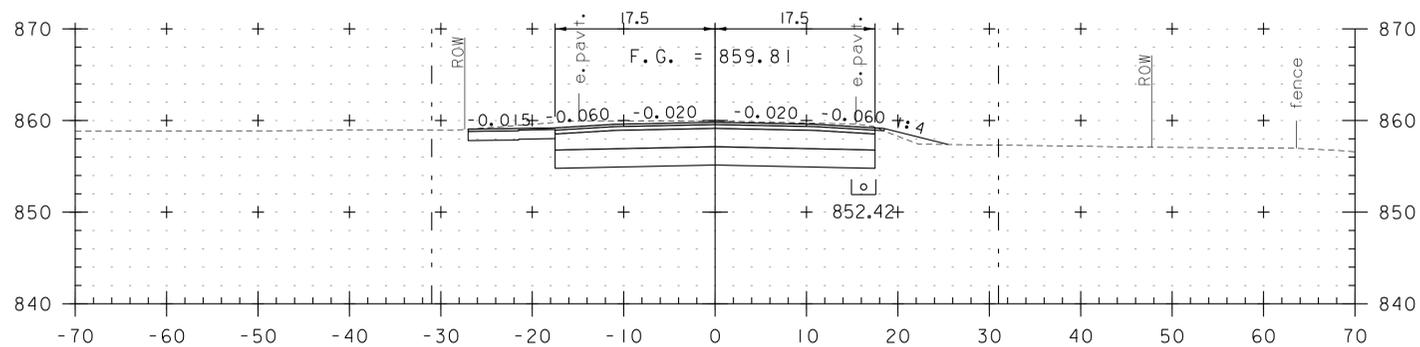
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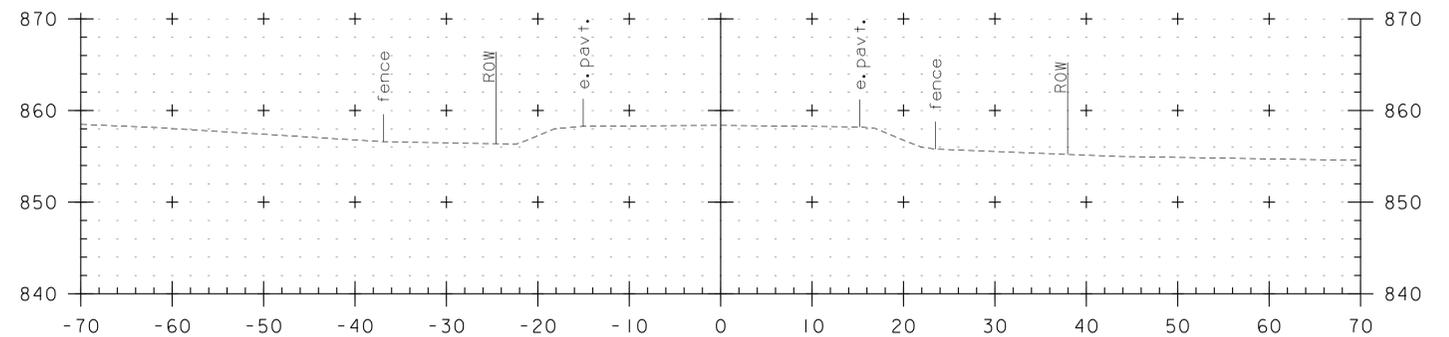
434+50
END PROJECT



434+00



433+50
DRIVE LT



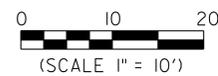
434+75
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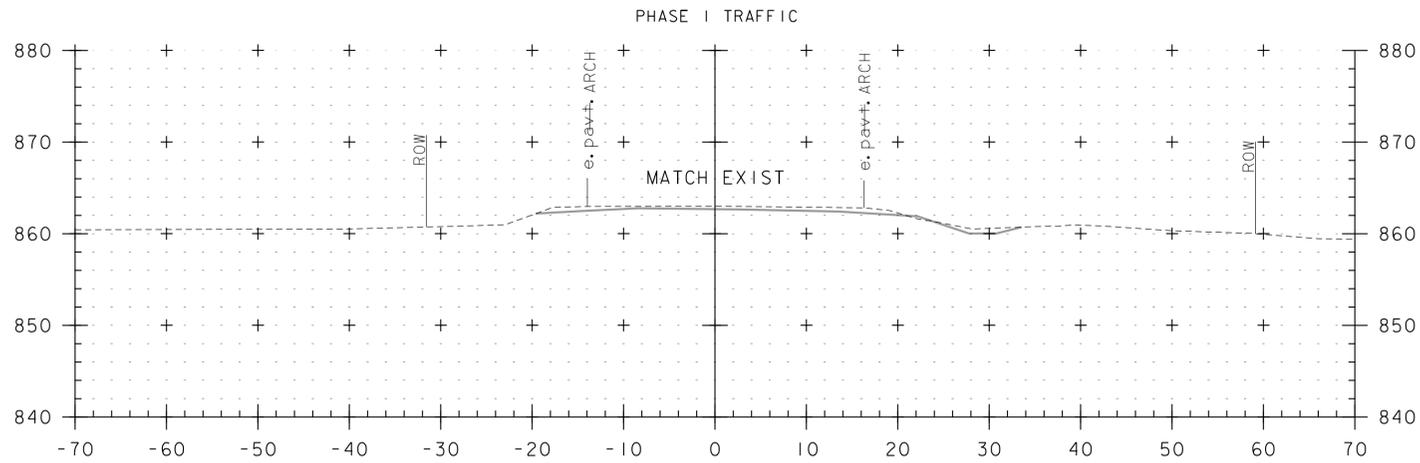
STA. 433+50 TO STA. 434+75

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PROJECT NUMBER: NH CULV(27)

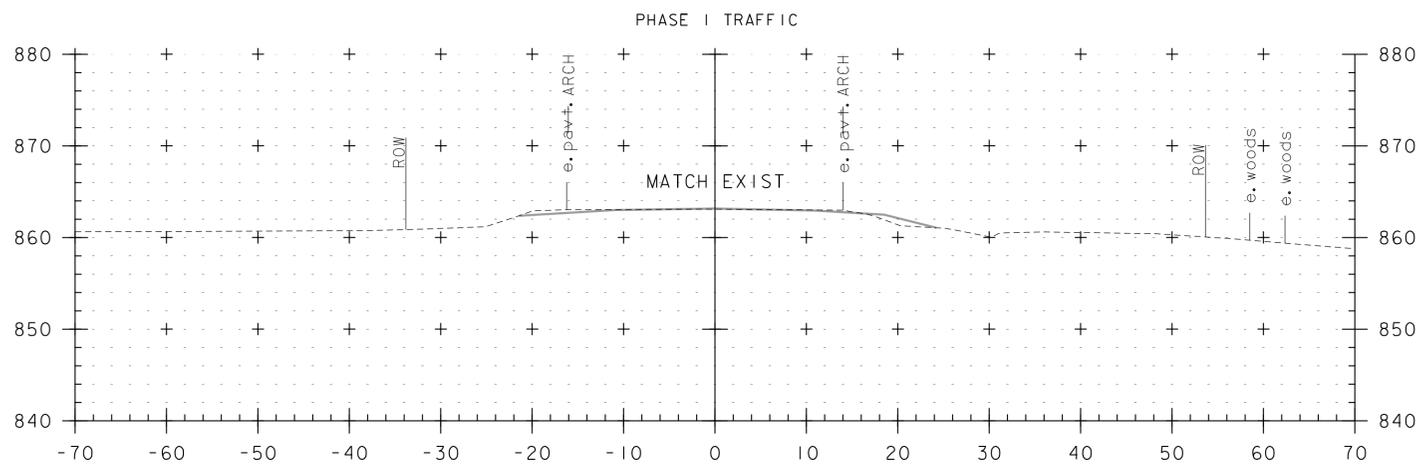
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PROJECT LEADER: J. BYATT
DESIGNED BY: M. HALEY
ROADWAY CROSS SECTIONS 5

PLOT DATE: 12/16/2014
DRAWN BY: M. HALEY
CHECKED BY: P. SHEDD
SHEET 57 OF 73

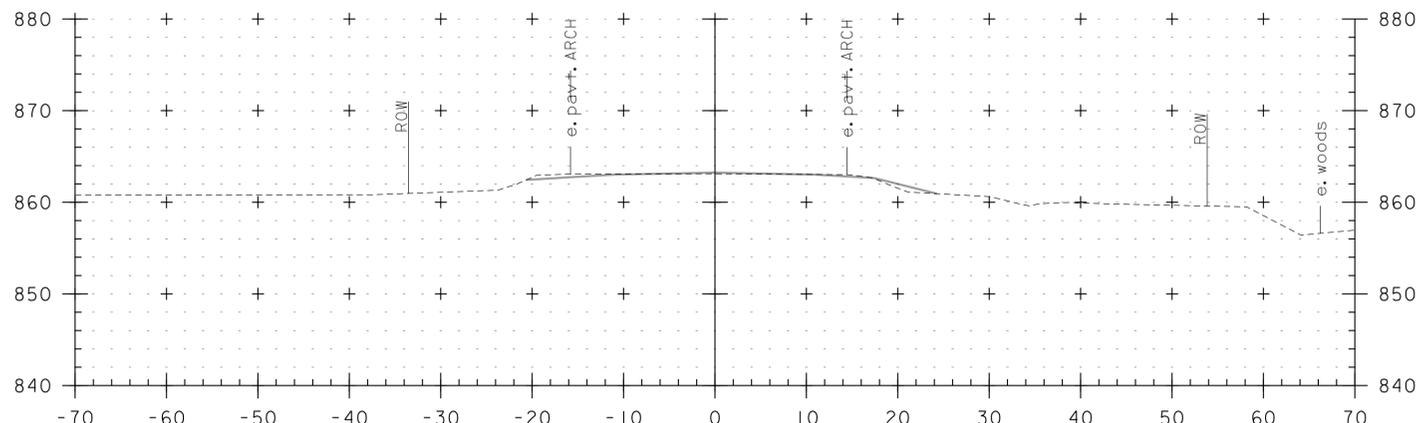




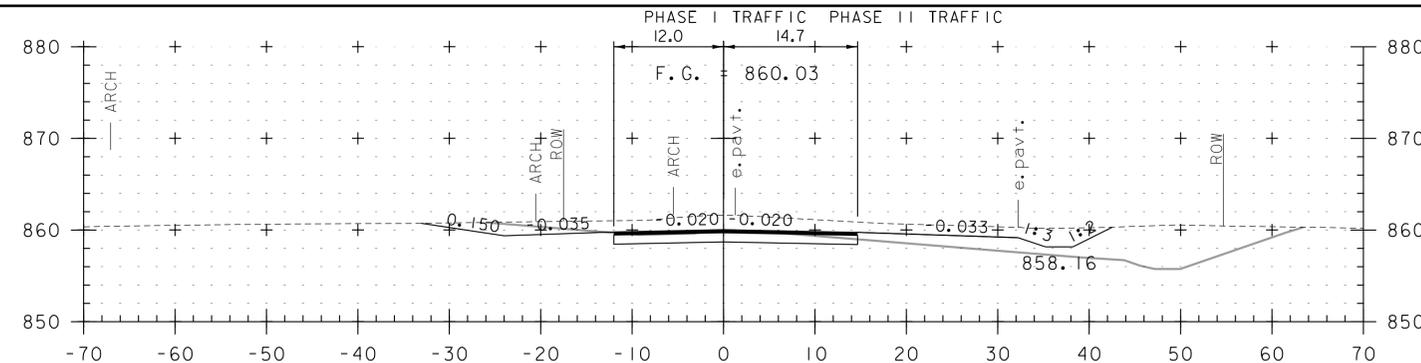
101+00



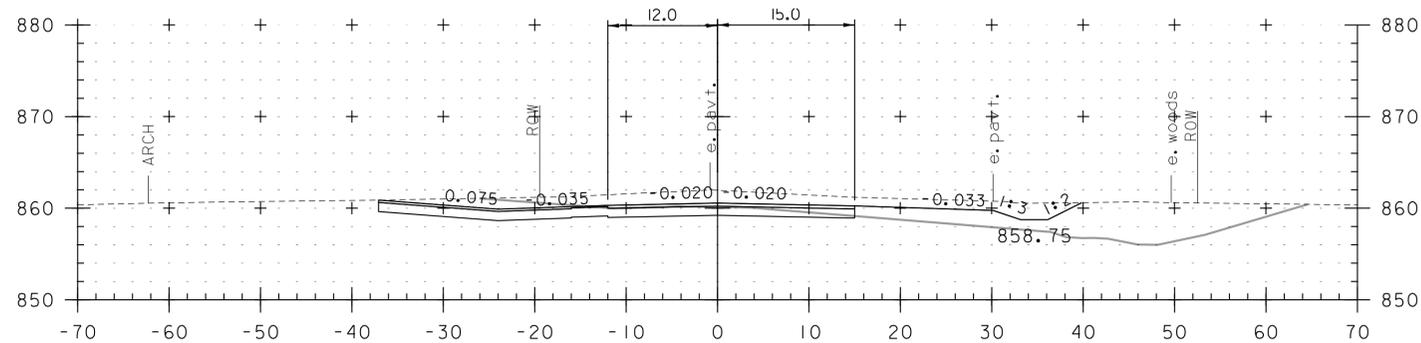
100+50
BEGIN DETOUR



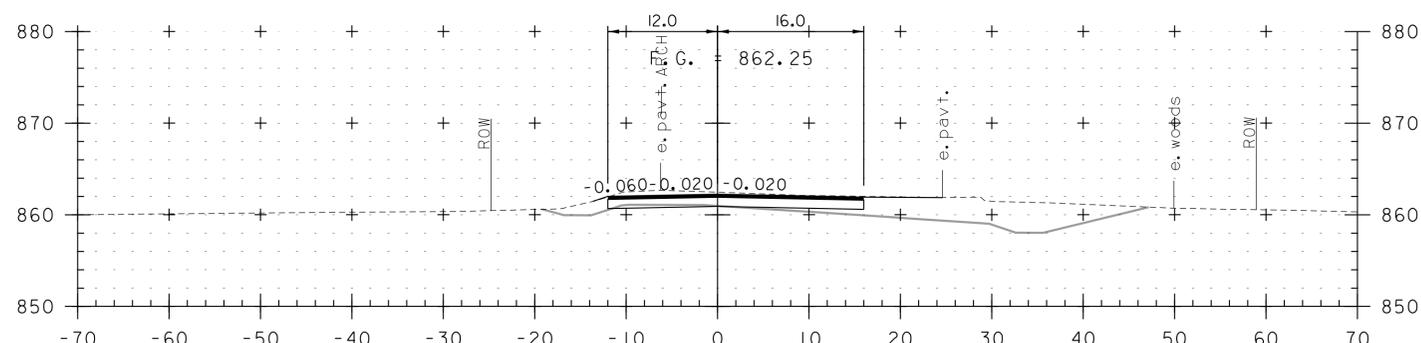
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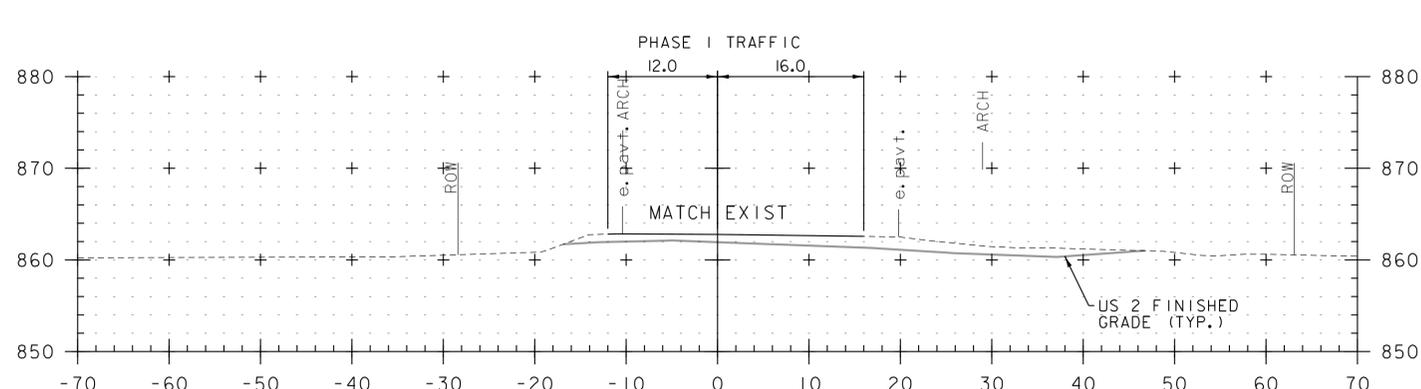
102+50



102+38
DRIVE LT



102+00



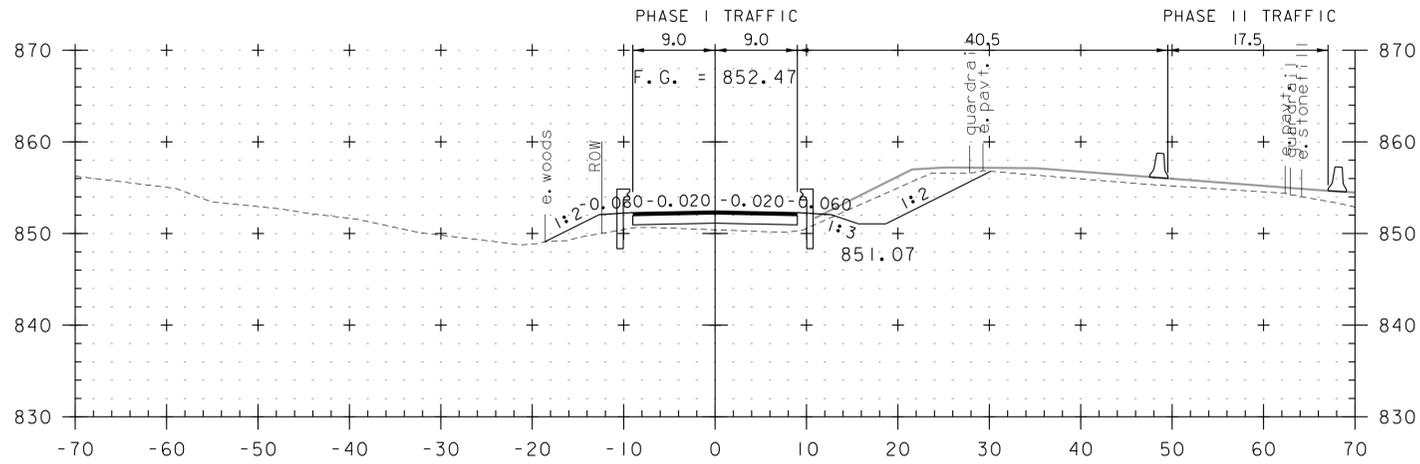
101+50

STA. 100+00 TO STA. 102+50

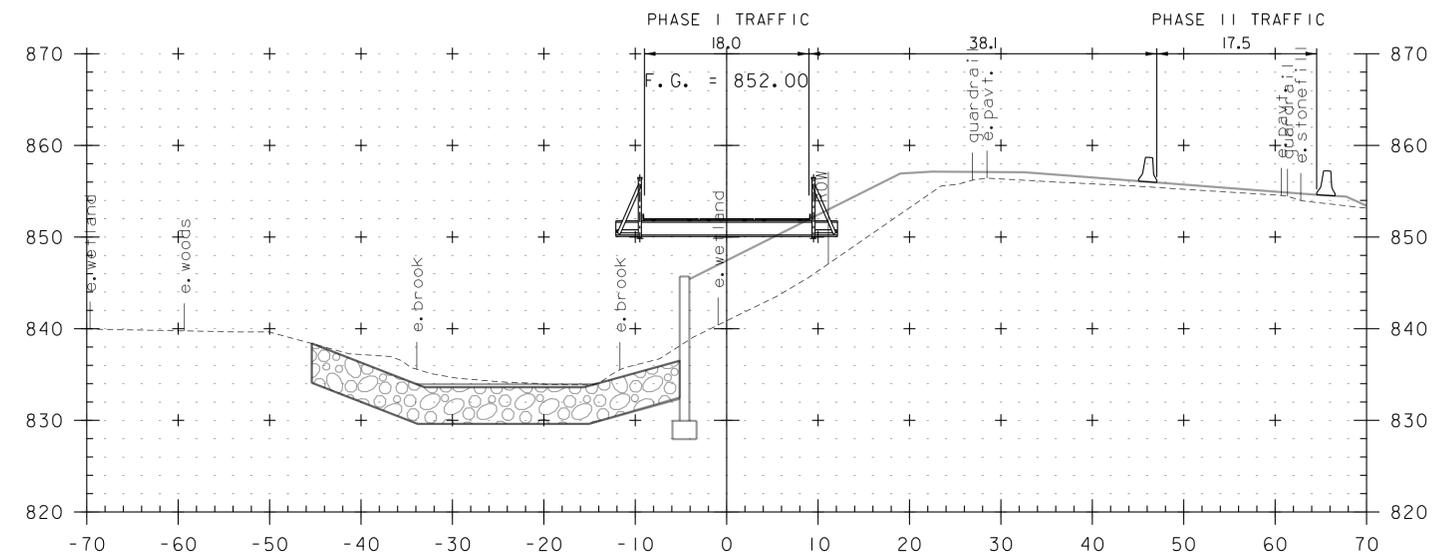
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PROJECT NUMBER:	NH CULV(27)
FILE NAME:	IIB294/cos/zl1b294xsl.dgn
PROJECT LEADER:	J. BYATT
DESIGNED BY:	M. HALEY
TEMPORARY DETOUR CROSS SECTIONS 1	
PLOT DATE:	12/16/2014
DRAWN BY:	M. HALEY
CHECKED BY:	P. SHEDD
SHEET	58 OF 73



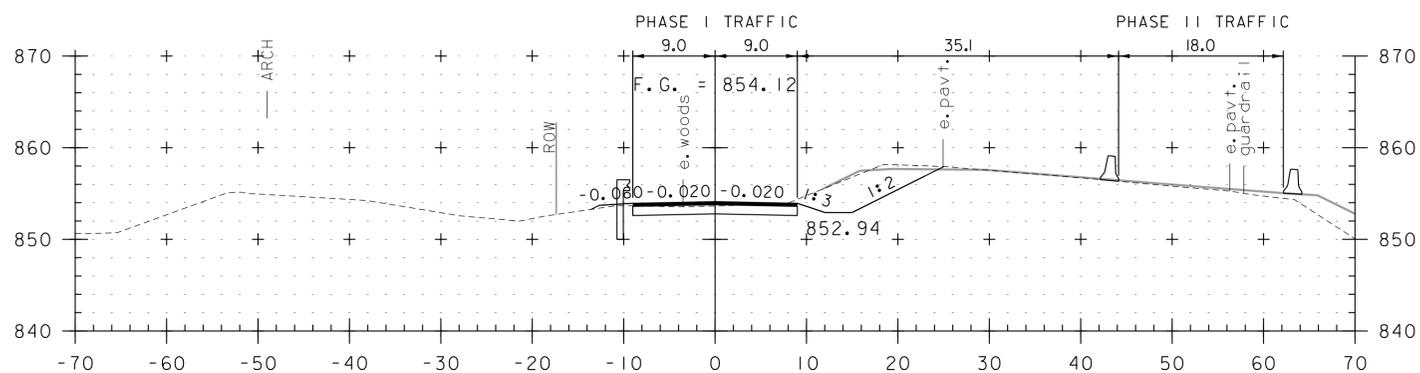
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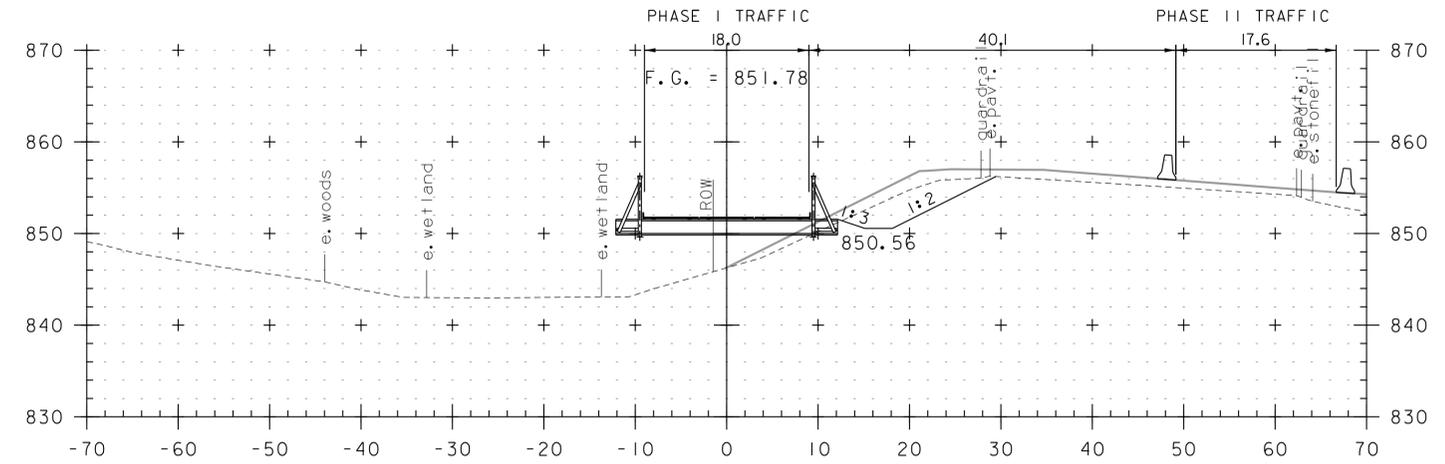
104+00



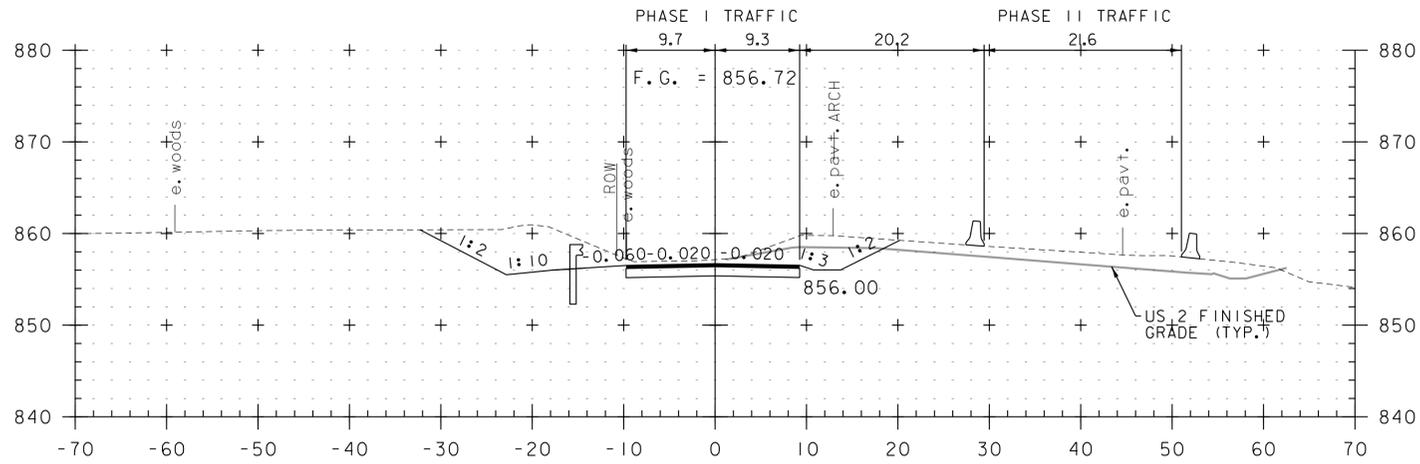
105+00



103+50



104+50



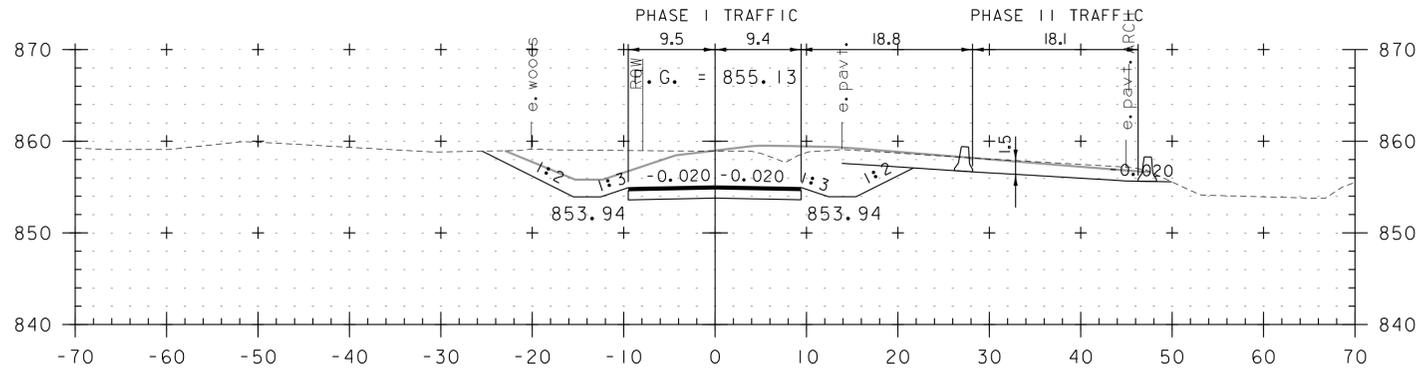
103+00

STA. 103+00 TO STA. 105+00

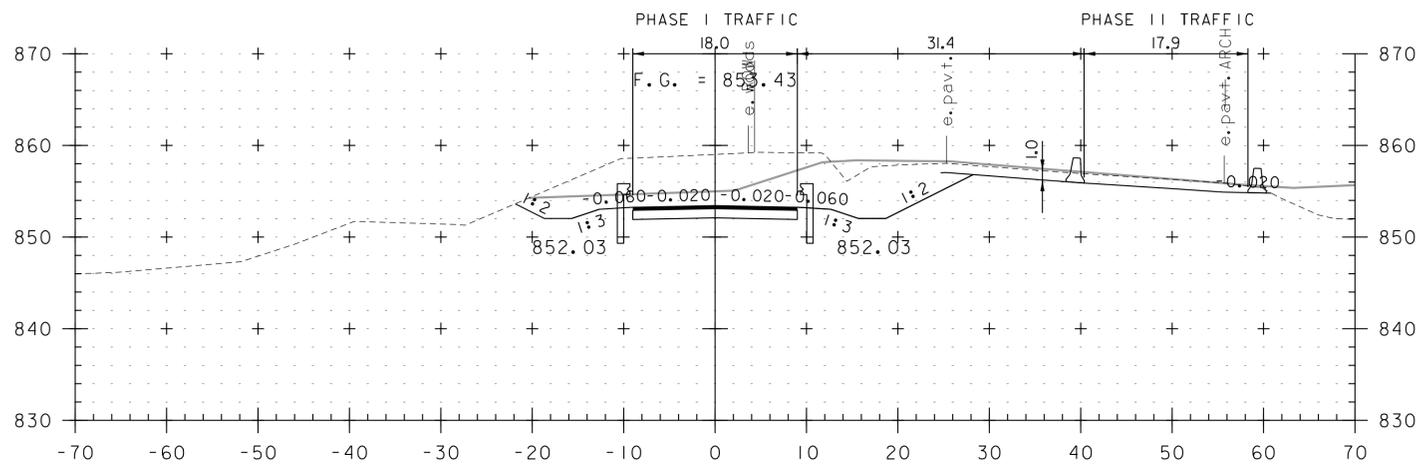


PROJECT NAME:	LUNENBURG	FILE NAME:	IIB294/cos/zlb294xsl.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	M. HALEY
		DESIGNED BY:	M. HALEY	CHECKED BY:	P. SHEDD
		TEMPORARY DETOUR CROSS SECTIONS 2		SHEET	59 OF 73

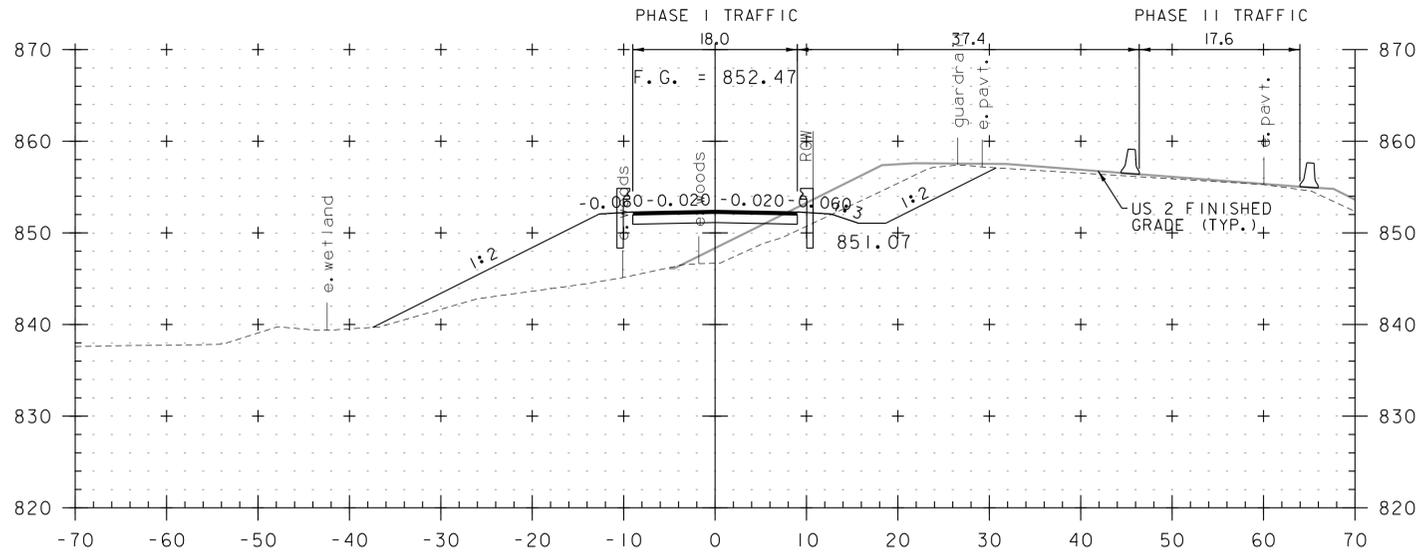
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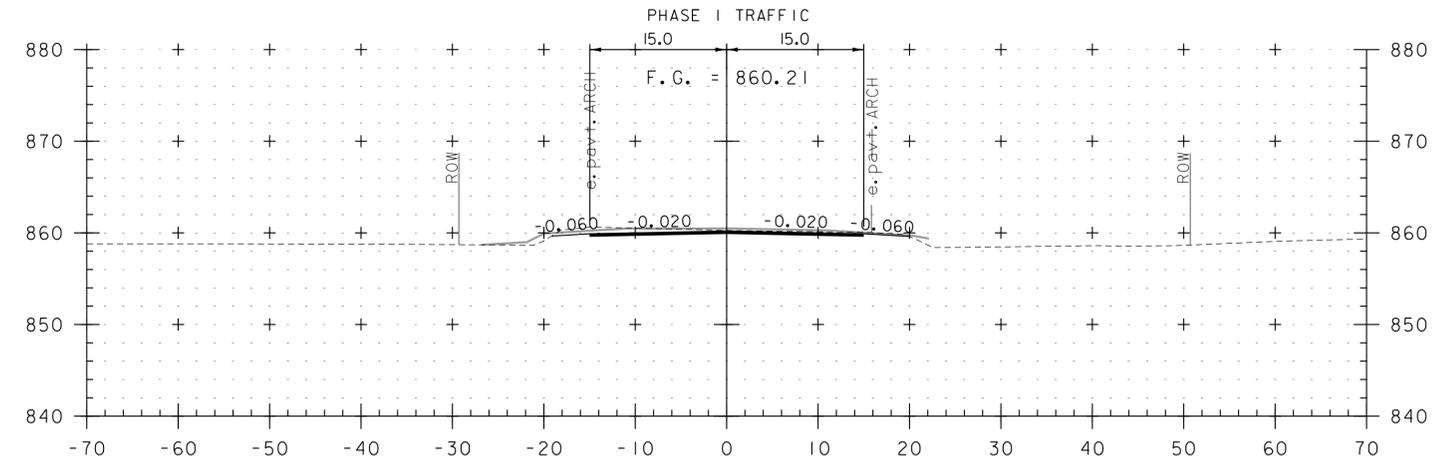
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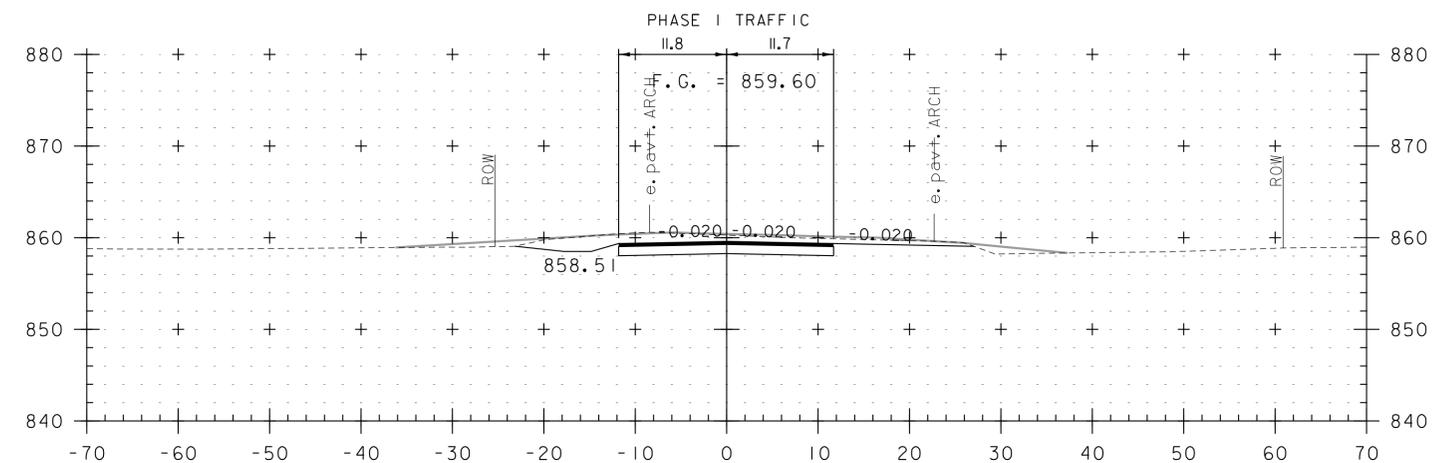
106+00



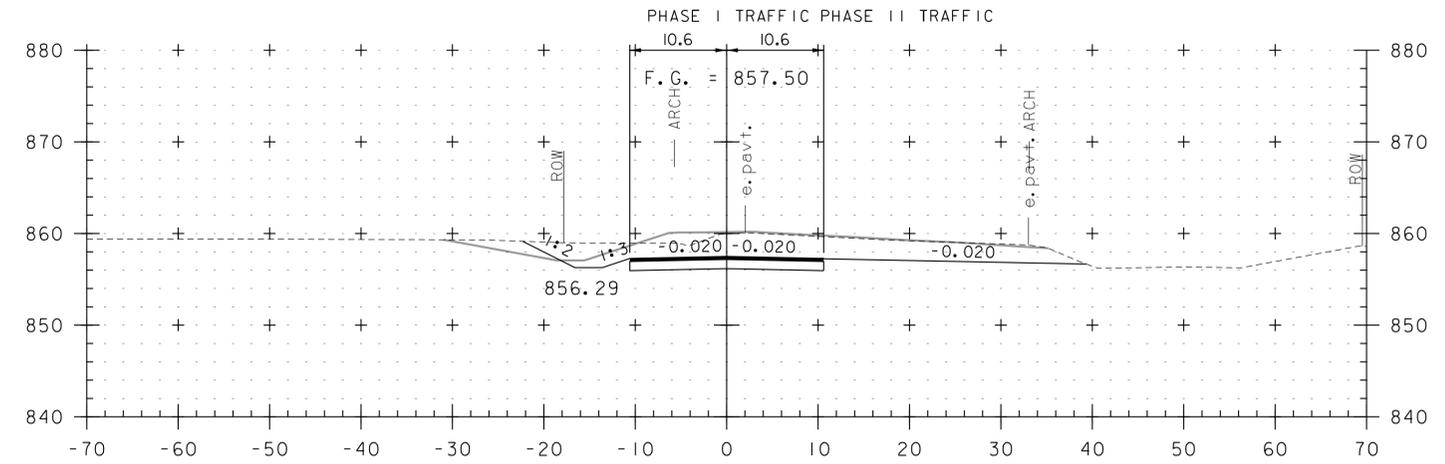
105+50



108+00



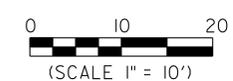
107+50



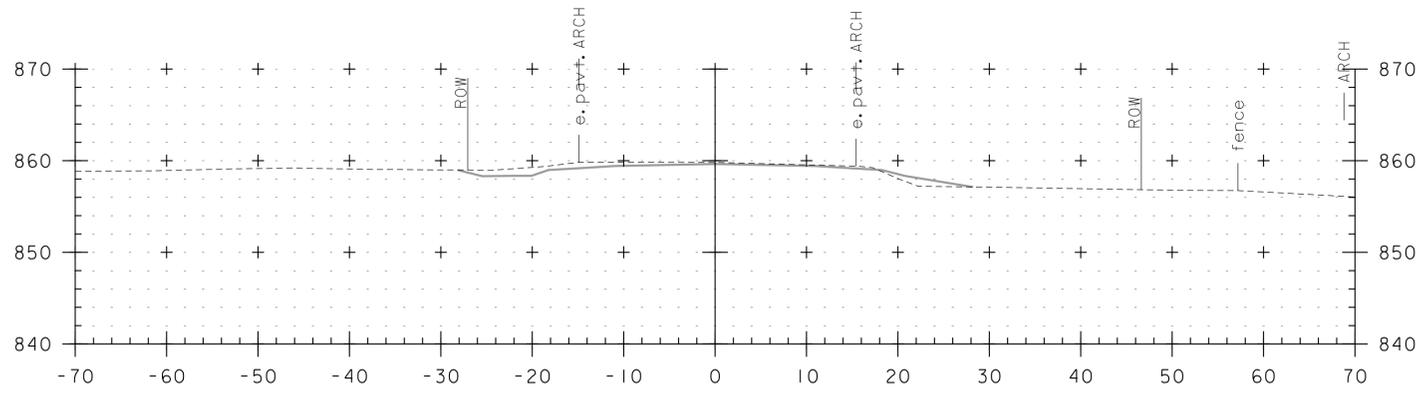
107+00

STA. 105+50 TO STA. 108+00

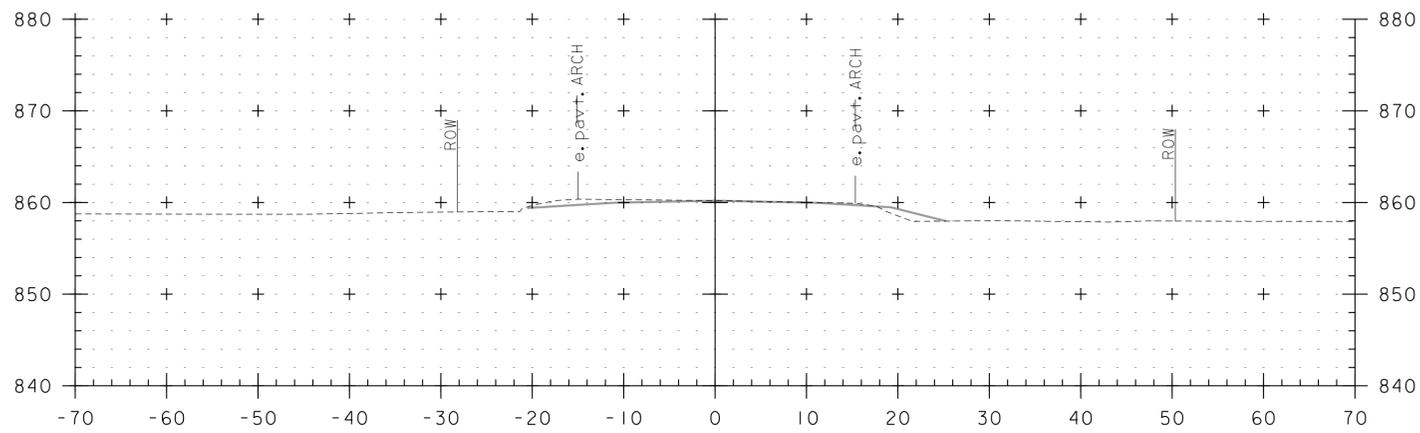
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PROJECT NUMBER:	NH CULV(27)
FILE NAME:	IIB294/cos/zlb294xsl.dtr
PROJECT LEADER:	J. BYATT
DESIGNED BY:	M. HALEY
TEMPORARY DETOUR CROSS SECTIONS	3
PLOT DATE:	12/16/2014
DRAWN BY:	M. HALEY
CHECKED BY:	P. SHEDD
SHEET	60 OF 73



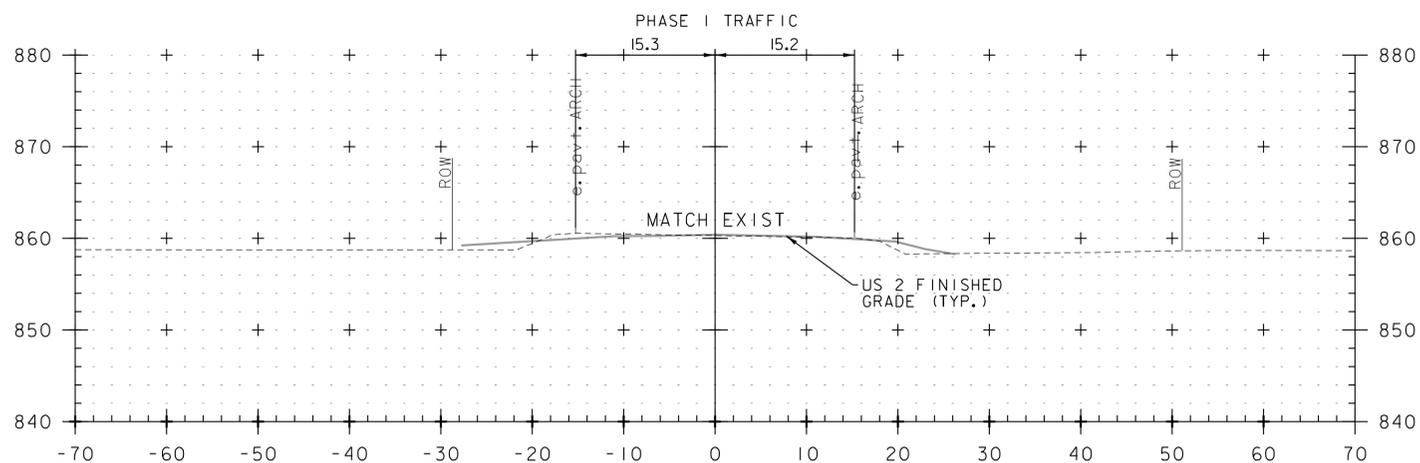
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109+00



108+50



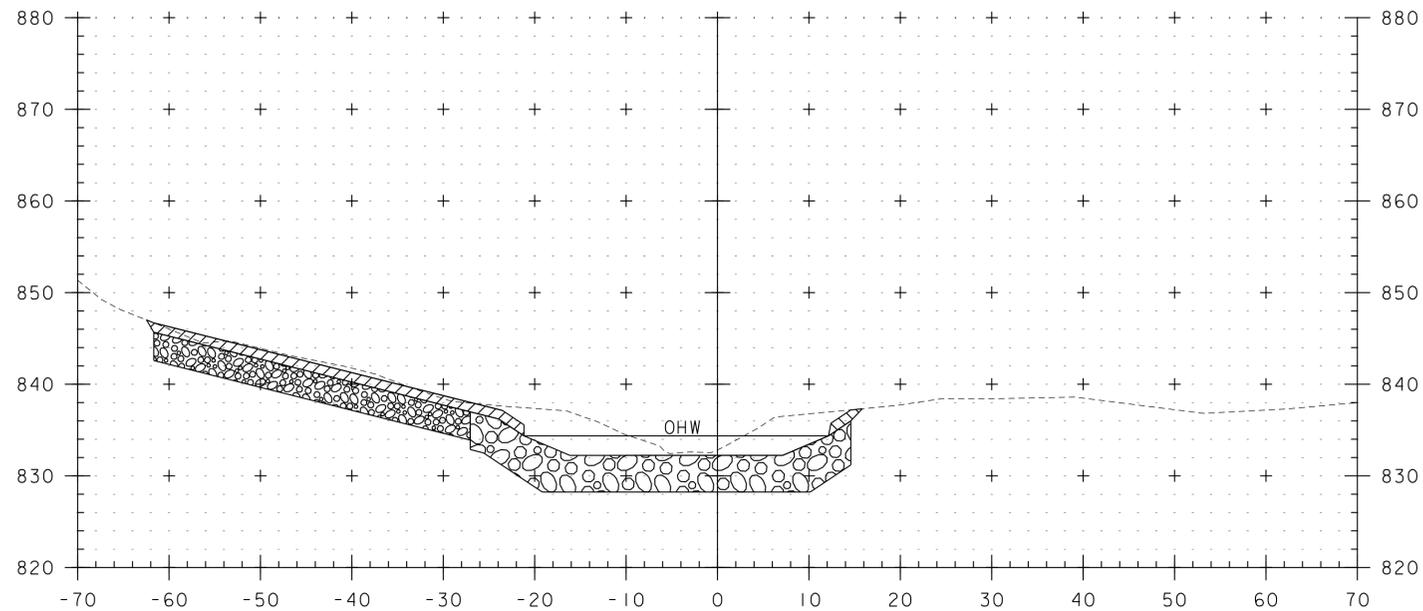
108+25
END DETOUR

STA. 108+25 TO STA. 109+00

PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	M. HALEY
FILE NAME:	IIB294/cos/zlb294xsltr.dgn	CHECKED BY:	P. SHEDD
PROJECT LEADER:	J. BYATT	TEMPORARY DETOUR CROSS SECTIONS 4	SHEET 61 OF 73
DESIGNED BY:	M. HALEY		

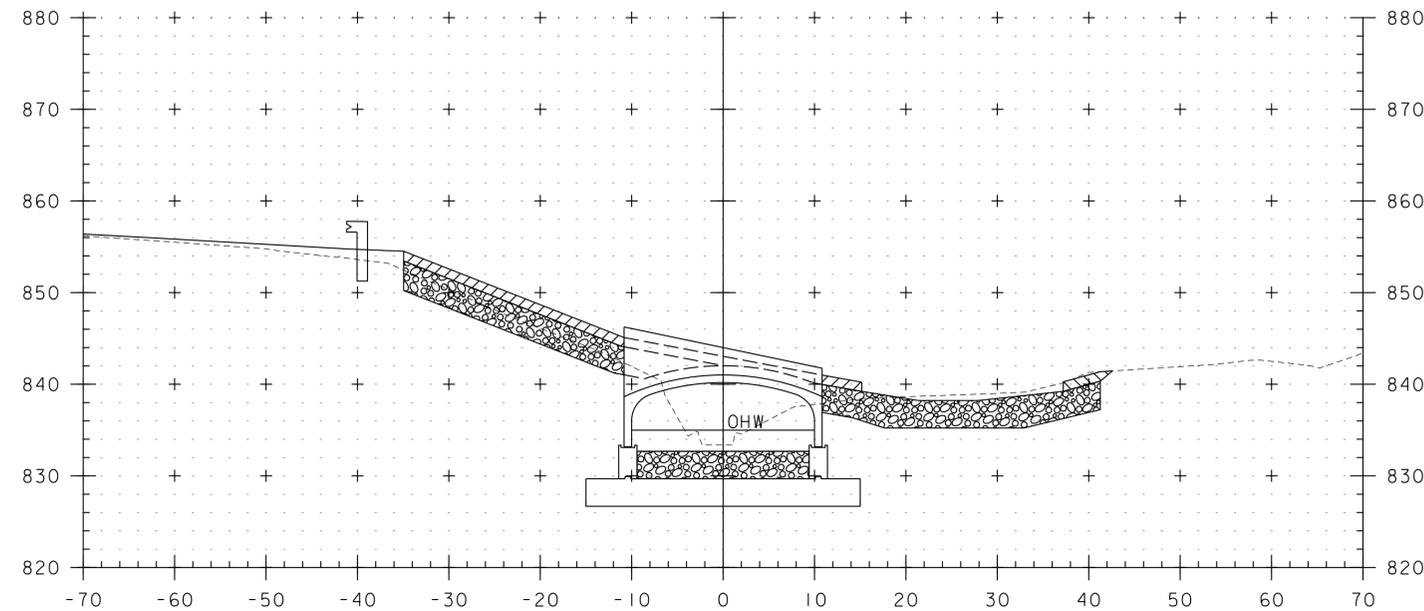


CLD 12-0106 MODEL: XS04



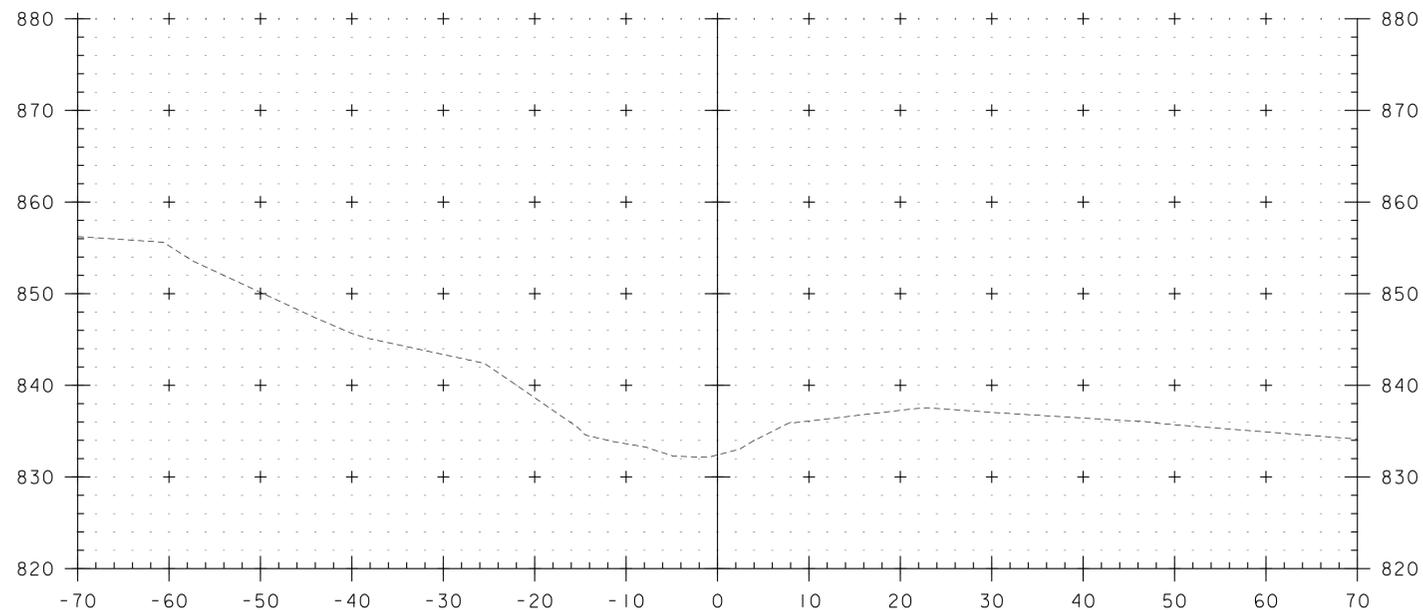
0+50

STA. 0+27 RT
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION
 STONE FILL, STREAM BED MATERIAL
 GEOTEXTILE UNDER STONE FILL
 GRUBBING MATERIAL



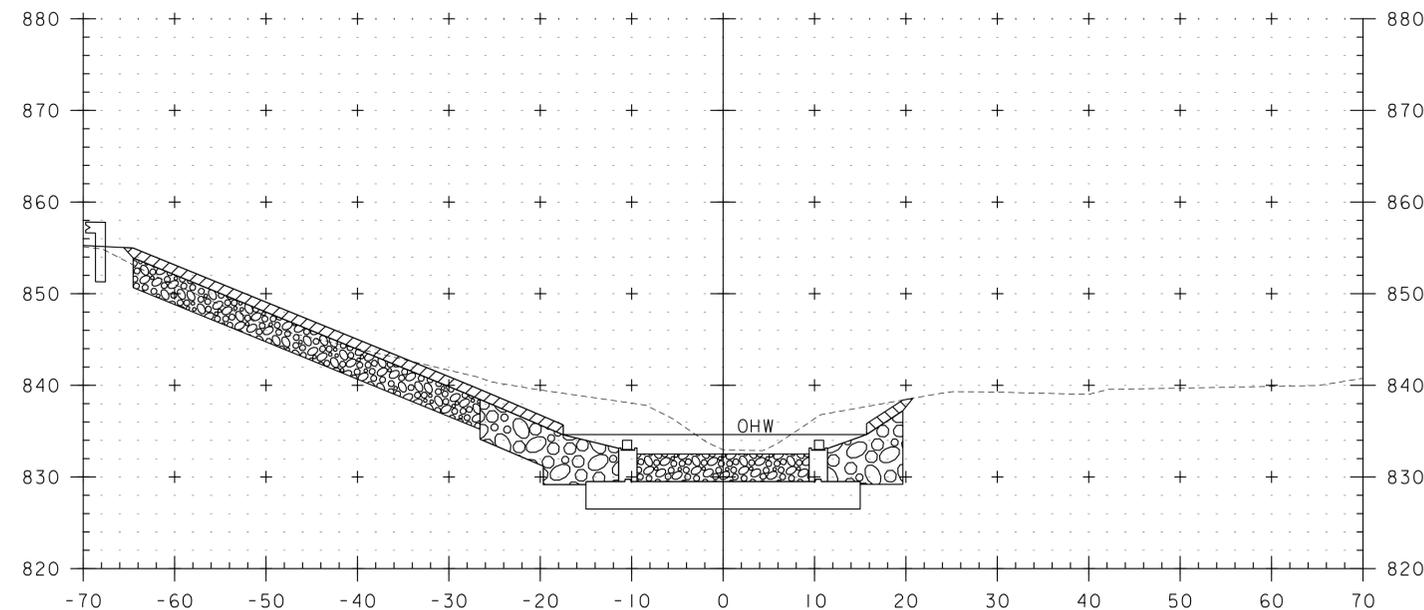
0+98 END ARCH

STA. 0+86 LT AND RT
 END UNCLASSIFIED CHANNEL EXCAVATION
 STONE FILL, STREAM BED MATERIAL
 GEOTEXTILE UNDER STONE FILL
 GRUBBING MATERIAL



0+25 LIMIT OF WORK

STA. 0+25 LT
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION
 STONE FILL, STREAM BED MATERIAL
 GEOTEXTILE UNDER STONE FILL
 GRUBBING MATERIAL



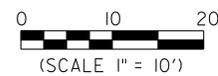
0+76 INVERT OUT

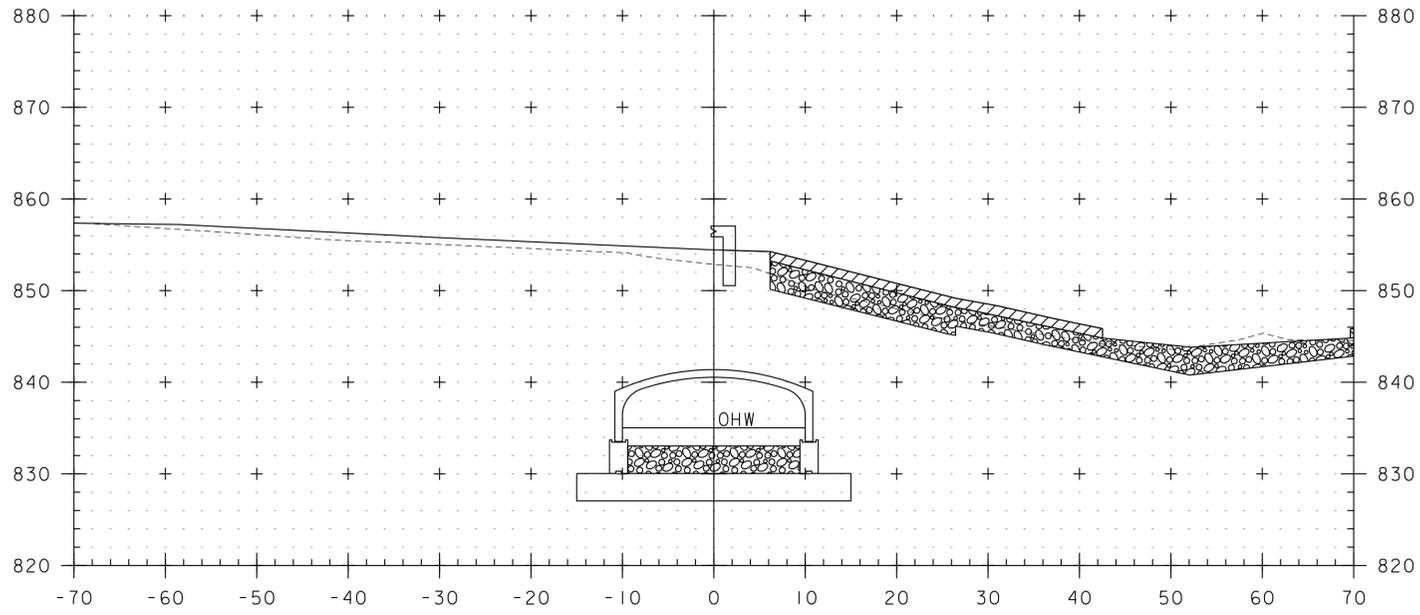
STA. 0+76 LT AND RT
 BEGIN STONE FILL, CULVERT LINING

STA. 0+25 TO STA. 0+92

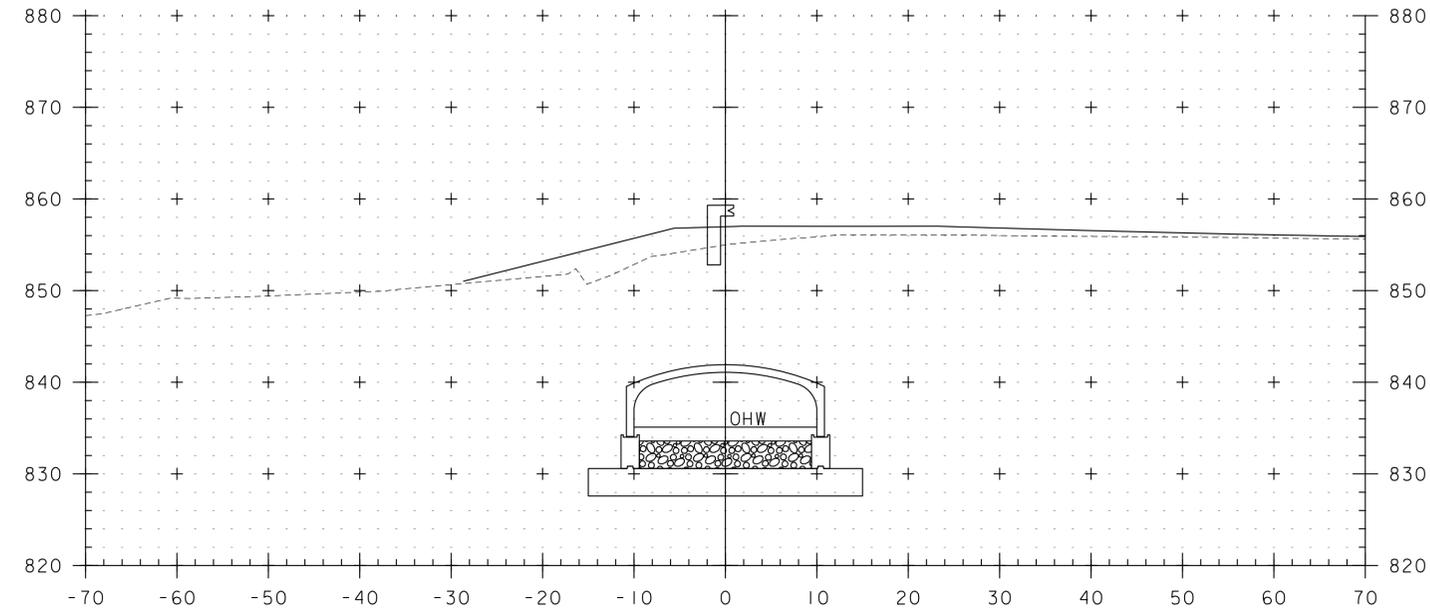
PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: IIB294/cos/zlb294xschan.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: M. SMITH
 DESIGNED BY: S. BEAUMONT CHECKED BY: J. BYATT
 CHANNEL CROSS SECTIONS 1 SHEET 62 OF 73

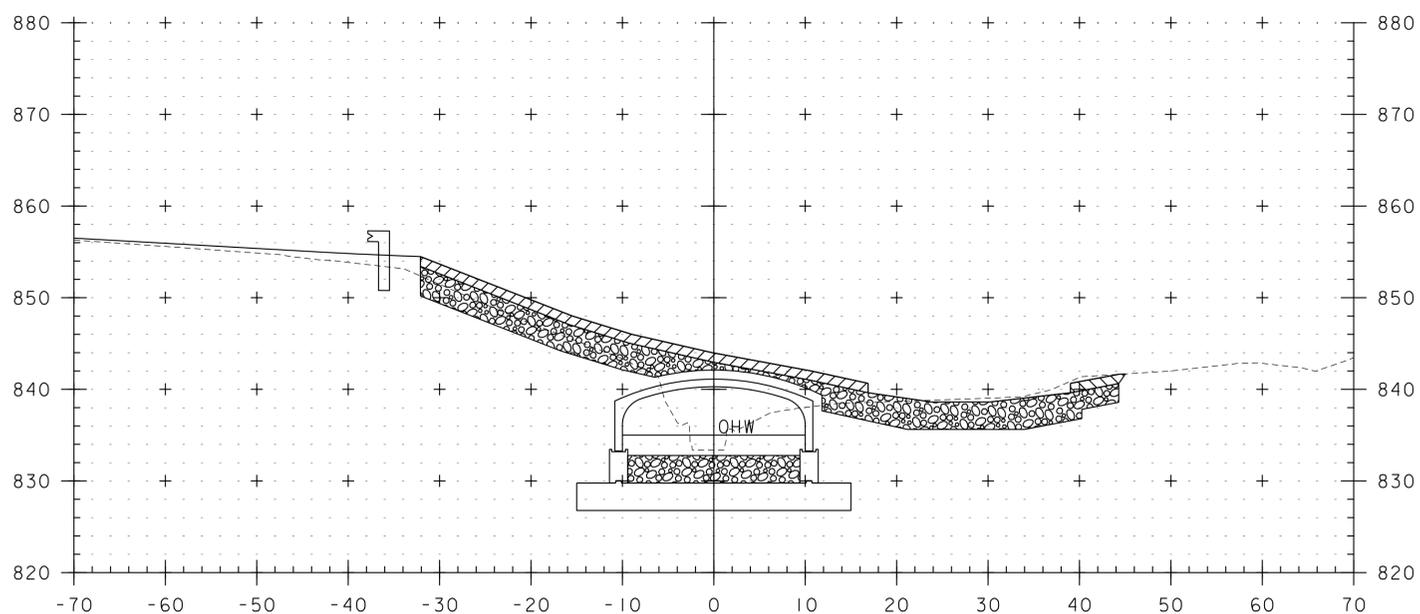




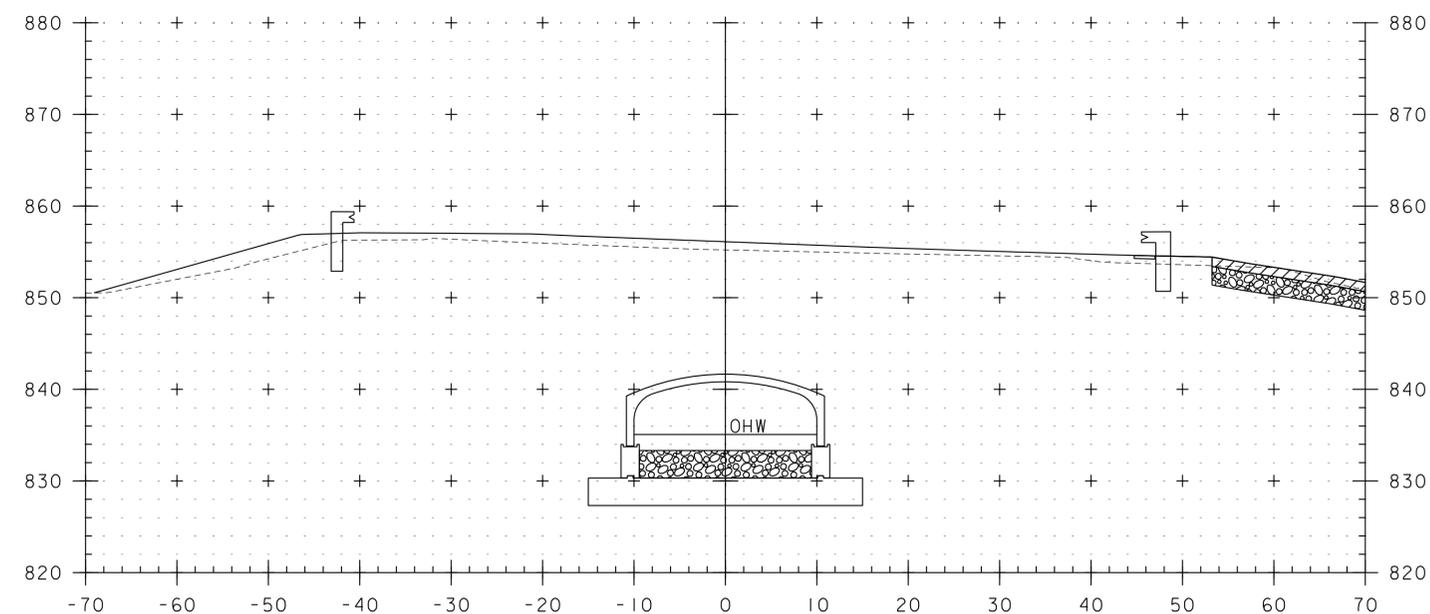
I+25



I+75



I+00



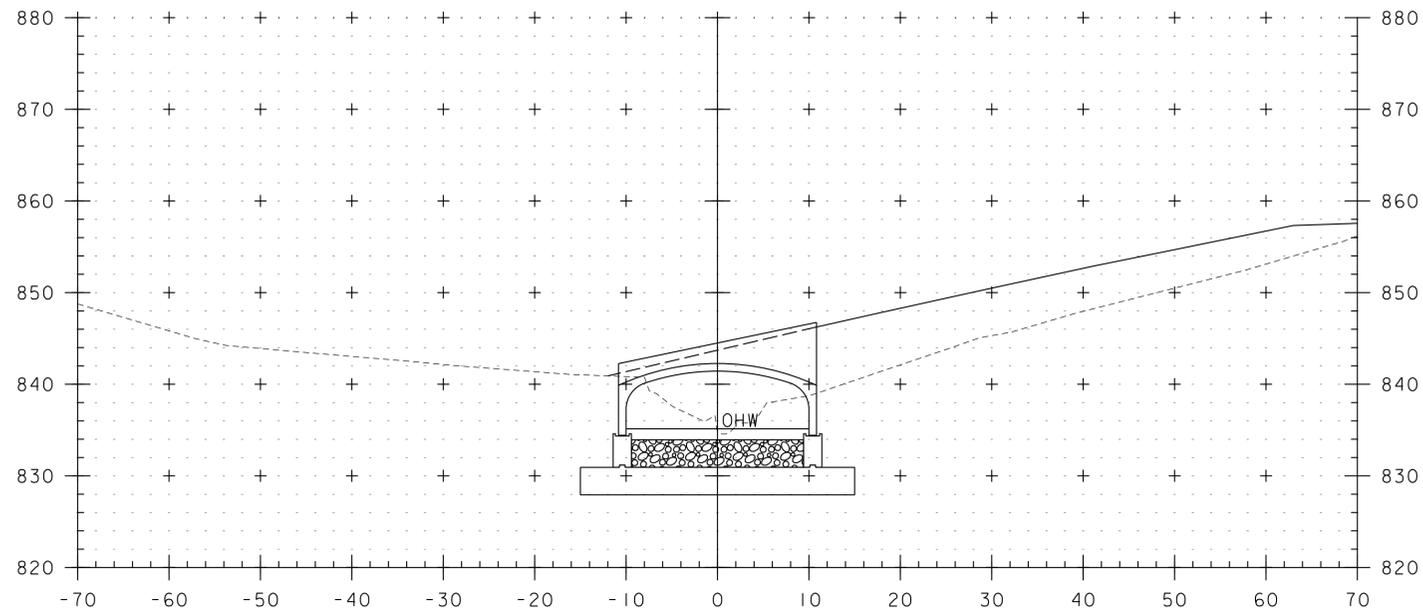
I+50

STA. I+00 TO STA. I+75



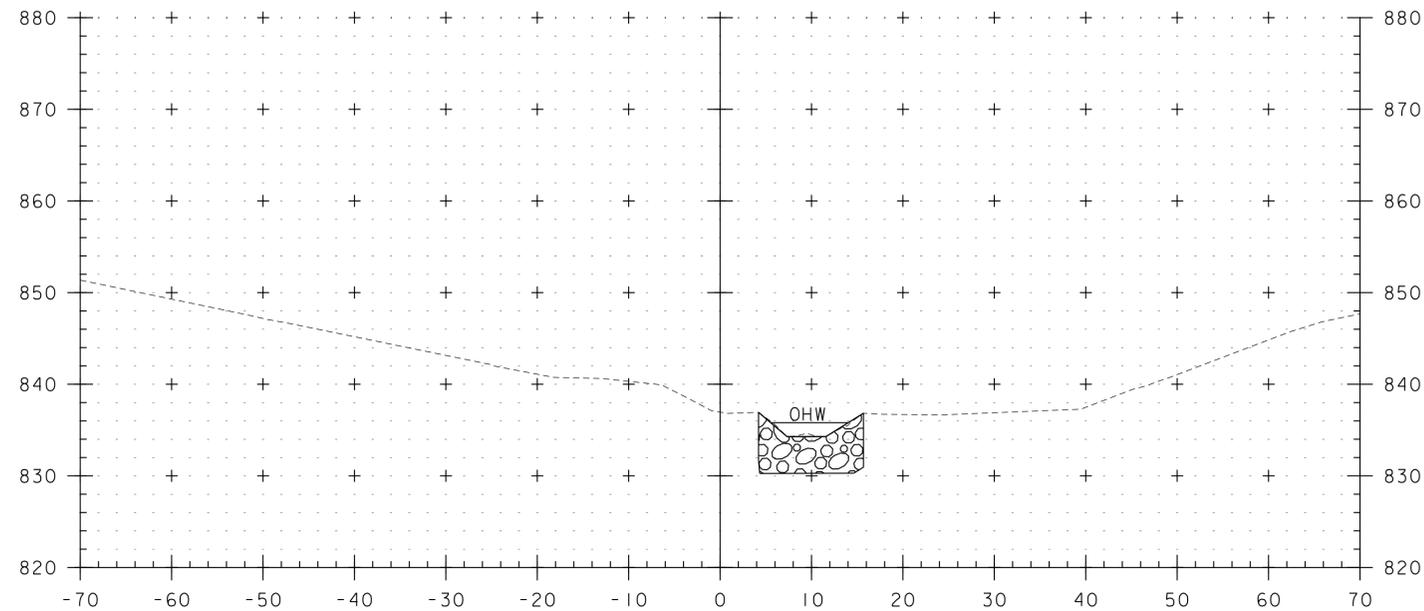
PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	M. SMITH
FILE NAME:	IIB294/cos/zlb294xslchan.dgn	DESIGNED BY:	S. BEAUMONT
PROJECT LEADER:	J. BYATT	CHECKED BY:	J. BYATT
CHANNEL CROSS SECTIONS 2		SHEET	63 OF 73

CLD_12-0106 MODEL: XS02



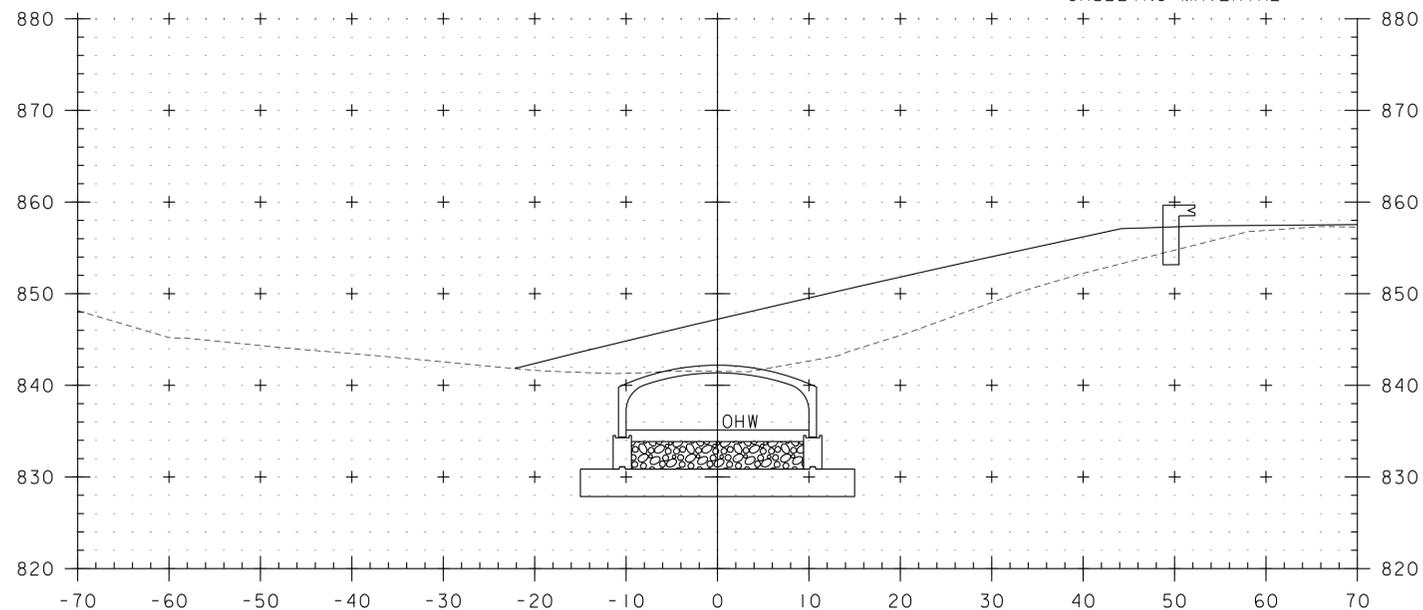
2+08 INVERT IN

STA. 2+08 LT AND RT
 END STONE FILL, CULVERT LINING
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION
 STONE FILL, STREAM BED MATERIAL
 GEOTEXTILE UNDER STONE FILL
 GRUBBING MATERIAL

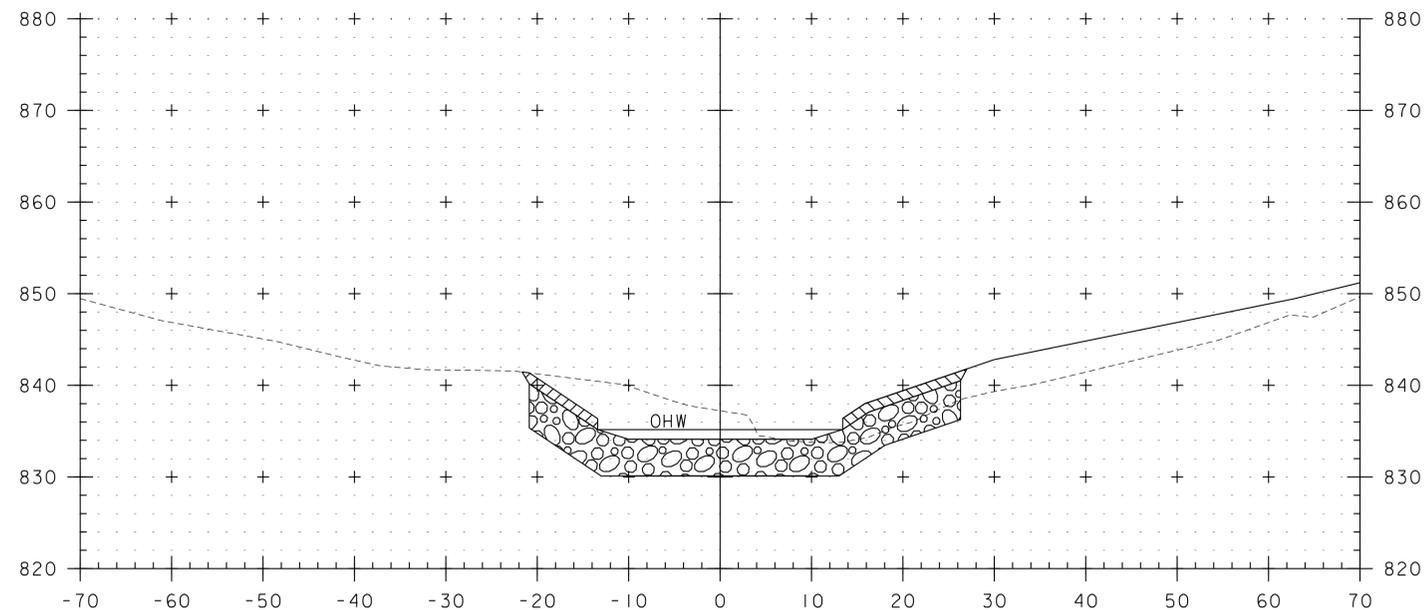


2+50 LIMIT OF WORK

STA. 2+50 LT AND RT
 END UNCLASSIFIED CHANNEL EXCAVATION
 STONE FILL, STREAM BED MATERIAL
 GEOTEXTILE UNDER STONE FILL
 GRUBBING MATERIAL



2+00



2+25

STA. 2+00 TO STA. 2+50

PROJECT NAME:	LUNENBURG	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	DRAWN BY:	M. SMITH
FILE NAME:	IIB294/cos/zlb294xschan.dgn	DESIGNED BY:	S. BEAUMONT
PROJECT LEADER:	J. BYATT	CHECKED BY:	J. BYATT
CHANNEL CROSS SECTIONS	3	SHEET	64 OF 73



EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REMOVAL OF BRIDGE 126 WHICH IS A 30" IRON PIPE EXTENDED AT THE OUTLET WITH A 4'-0"x4'-0" CONCRETE BOX CONSTRUCTED IN 1932 AND EXTENDED AT THE INLET WITH A 27"/28" LINER AND ITS HEADWALLS. BRIDGE 126 WILL BE REPLACED WITH A 116 FOOT PRECAST ARCH WITH A 10 FOOT RISE, SPANNING 20 FEET OVER THE HUDSON BROOK, ON NEW FOOTINGS ALONG THE SAME ALIGNMENT. BRIDGE 126 IS LOCATED IN THE TOWN OF LUNENBURG, ON US ROUTE 2, APPROXIMATELY 0.90 MILES WEST OF THE LUNENBURG/GUILDHALL TOWN LINE.

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

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 1.82 ACRES. IT IS ANTICIPATED THAT THIS PROJECT WILL LAST 18 MONTHS.

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS A SADDLE THAT IS MOSTLY WELL ESTABLISHED OPEN AREAS WITH SOME WOODED AREAS. US ROUTE 2, A PAVED DRIVEWAY, AND FOUR GRAVEL DRIVEWAYS ARE WITHIN THE PROJECT SITE. THERE ARE TWO RESIDENCES ON THE SOUTH SIDE OF THE SITE AND A RESIDENCE ON THE NORTHEAST SIDE OF THE PROJECT WITH GRASS AND TREE BUFFERS AT EACH RESIDENCE.

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

THE HUDSON BROOK IS THE ONLY WATER SOURCE ON THE PROJECT SITE. THE BROOK IS CLASSIFIED AS LOW-GRADIENT, VEGETATED WETLAND AT THE SITE. THE STREAM BED CONSISTS OF SILTS AND FINE SAND WITH OCCASIONAL SMALL POCKETS OF FINE GRAVEL. THE TRIBUTARY AREA AT THE CULVERT CROSSING IS 3.2 MILES². DUE TO THE NATURE OF THE SURROUNDING TERRAIN THE PROJECT SITE COULD RECEIVE RUNOFF WATER FROM A FEW NEARBY SLOPES.

1.2.3 VEGETATION

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

1.2.4 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF ESSEX, VERMONT. SOILS ON THE PROJECT SITE ARE KINSMAN SAND, 0 TO 3% SLOPES, "K FACTOR" = 0.17. THE SOIL IS NOT CONSIDERED HIGHLY ERODIBLE.

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:

0.0-0.23 = LOW EROSION POTENTIAL

0.24-0.36 = MODERATE EROSION POTENTIAL

0.37 AND HIGHER = HIGH EROSION POTENTIAL

1.2.5 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: NO

HISTORICAL OR ARCHEOLOGICAL AREAS: YES, FOUR ARCHAEOLOGICAL AREAS IN EACH QUADRANT

PRIME AGRICULTURAL LAND: YES, PRIME(b) ON WEST SIDE OF US ROUTE 2

THREATENED AND ENDANGERED SPECIES: NO

WATER RESOURCE: HUDSON BROOK

WETLANDS: YES, UPSTREAM OF THE CULVERT

1.3 RISK EVALUATION

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

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM

WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING.

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

1.4.1 MARK SITE BOUNDARIES

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

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BECAUSE THIS PROJECT FALLS UNDER THE CGP 3-9020, BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC).

1.4.2 LIMIT DISTURBANCE AREA

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

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

1.4.3 SITE ENTRANCE/EXIT STABILIZATION

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

STABILIZED CONSTRUCTION ENTRANCES ARE NOT ANTICIPATED ON THIS PROJECT. THE EXISTING ROADWAY WILL BE UTILIZED TO ACCESS THE BRIDGE.

1.4.4 INSTALL SEDIMENT BARRIERS

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

SILT FENCE WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN. BECAUSE THIS PROJECT FALLS UNDER THE CGP 3-9020, WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF RECEIVING WATERS.

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.

THIS PROJECT WILL HAVE A PAVED DETOUR. CONSTRUCTION VEHICLES WILL BE ABLE TO UTILIZE THE EXISTING ROADWAY. THEREFORE IT IS NOT ANTICIPATED THAT DIVERSION MEASURES WILL BE NECESSARY.

1.4.6 SLOW DOWN CHANNELIZED RUNOFF

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

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

1.4.7 CONSTRUCT PERMANENT CONTROLS

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

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED ON THIS PROJECT.

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

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

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

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

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

1.4.9 WINTER STABILIZATION

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

1.4.10 STABILIZE SOIL AT FINAL GRADE

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

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED INSTEAD OF MULCH. STONE FILL SHALL BE USED TO STABILIZE ROADWAY SLOPES AND THE CHANNEL AS SHOWN ON THE PLANS.

1.4.11 DE-WATERING ACTIVITIES

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

TREATMENT OF DEWATERING COFFERDAM IS ANTICIPATED. THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR.

1.4.12 INSPECT YOUR SITE

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

1.5 SEQUENCE AND STAGING

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

1.5.1 CONSTRUCTION SEQUENCE

1.5.2 OFF-SITE ACTIVITIES

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

1.5.3 UPDATES

PROJECT NAME: LUNENBURG

PROJECT NUMBER: NH CULV(27)

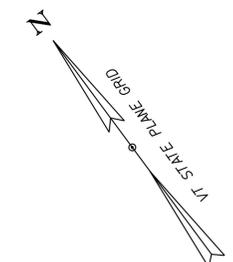
FILE NAME: lb294/cos/zlb294erode+.dgn PLOT DATE: 12/16/2014

PROJECT LEADER: J. BYATT DRAWN BY: M. HALEY

DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD

EROSION CONTROL NARRATIVE SHEET 65 OF 73





SOIL INFORMATION: KINSMAN SAND
K = 0.17, NOT HIGHLY ERODIBLE
HYDROLOGIC SOIL GROUP: C

SOIL INFORMATION: KINSMAN SAND
K = 0.17, NOT HIGHLY ERODIBLE
HYDROLOGIC SOIL GROUP: C

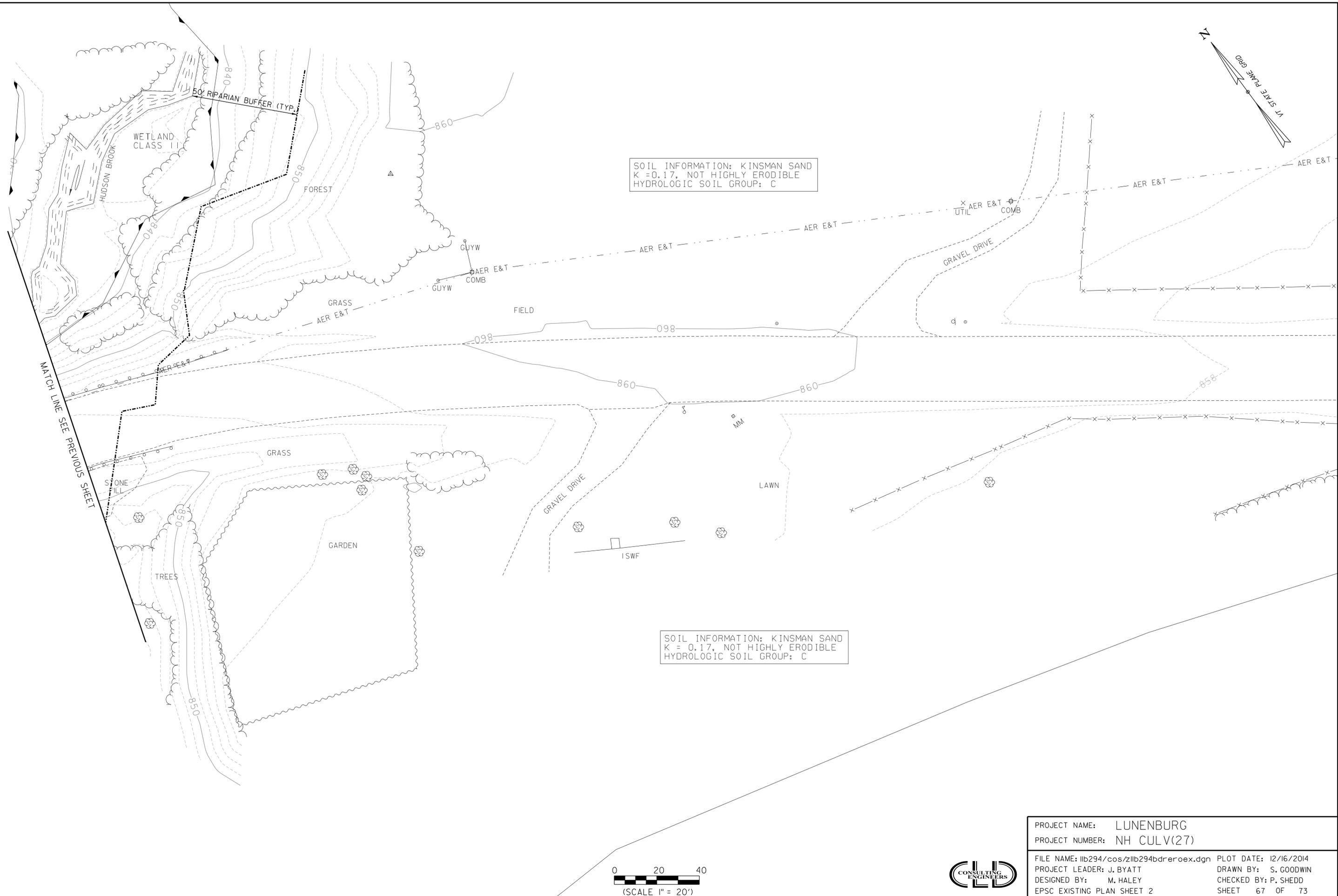
MATCH LINE SEE PREVIOUS SHEET



PROJECT NAME: LUNENBURG
PROJECT NUMBER: NH CULV(27)

FILE NAME: lb294/cos/zlb294bdrer0ex.dgn PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT DRAWN BY: S. GOODWIN
DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
EPSC EXISTING PLAN SHEET 2 SHEET 67 OF 73

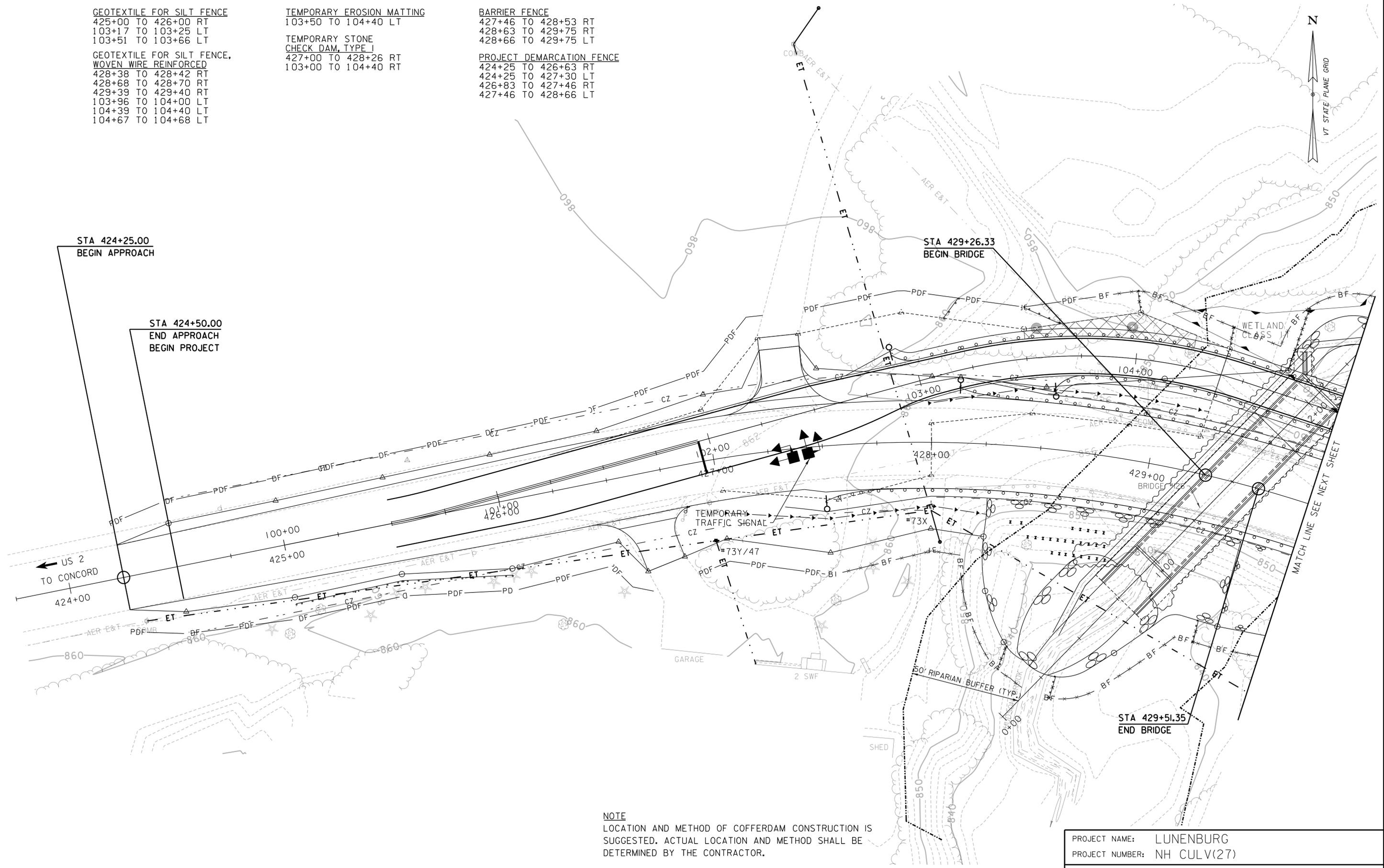
CLD_12-0106 MODEL: L02



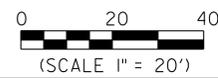
GEOTEXTILE FOR SILT FENCE
 425+00 TO 426+00 RT
 103+17 TO 103+25 LT
 103+51 TO 103+66 LT
GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED
 428+38 TO 428+42 RT
 428+68 TO 428+70 RT
 429+39 TO 429+40 RT
 103+96 TO 104+00 LT
 104+39 TO 104+40 LT
 104+67 TO 104+68 LT

TEMPORARY EROSION MATTING
 103+50 TO 104+40 LT
TEMPORARY STONE CHECK DAM, TYPE I
 427+00 TO 428+26 RT
 103+00 TO 104+40 RT

BARRIER FENCE
 427+46 TO 428+53 RT
 428+63 TO 429+75 RT
 428+66 TO 429+75 LT
PROJECT DEMARCATION FENCE
 424+25 TO 426+63 RT
 424+25 TO 427+30 LT
 426+83 TO 427+46 RT
 427+46 TO 428+66 LT



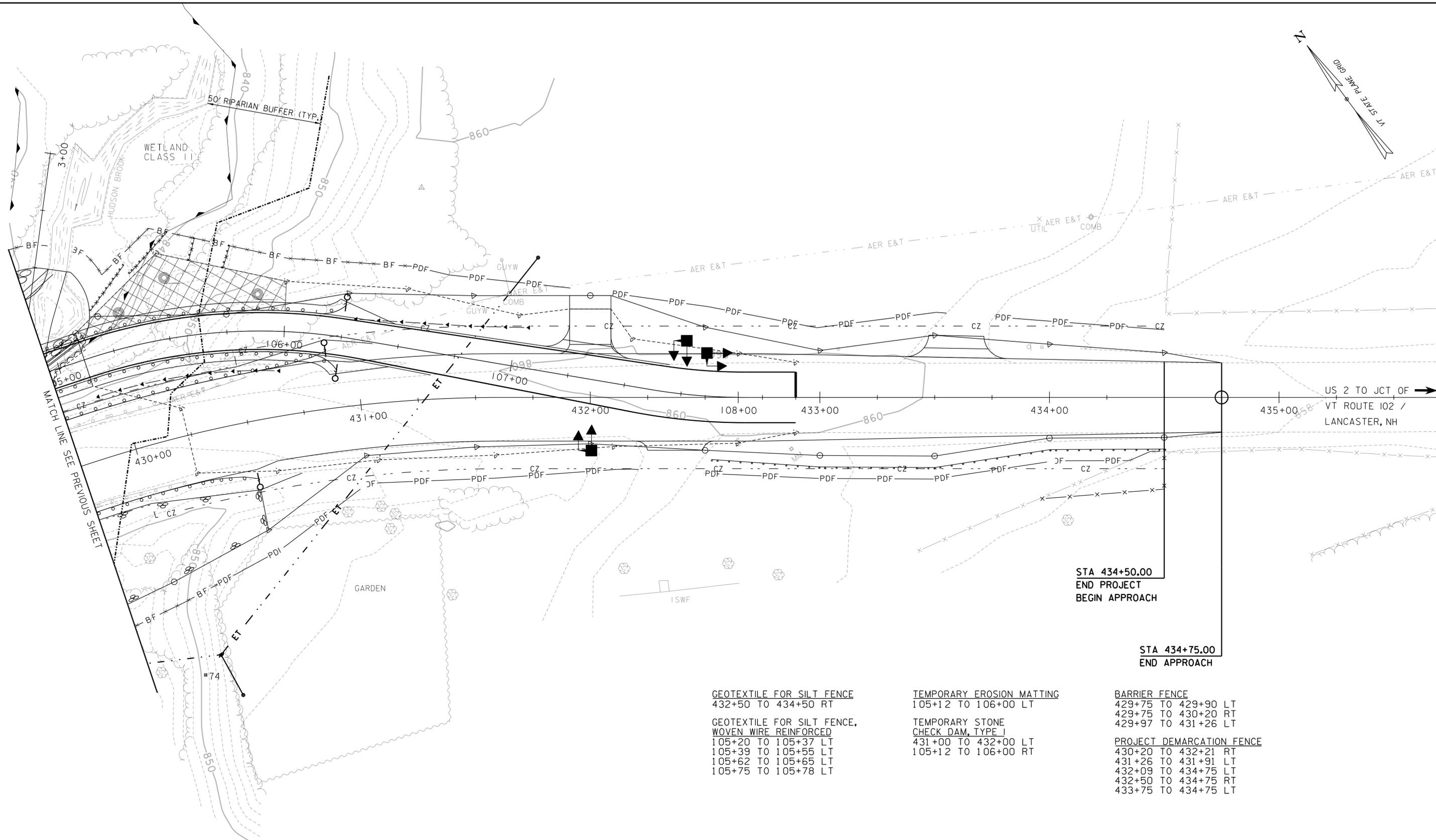
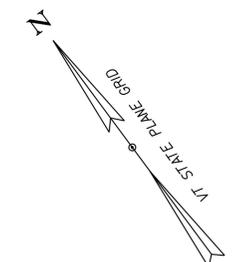
NOTE
 LOCATION AND METHOD OF COFFERDAM CONSTRUCTION IS SUGGESTED. ACTUAL LOCATION AND METHOD SHALL BE DETERMINED BY THE CONTRACTOR.



PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: l1b294/cos/z1b294bdrerocn.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: S. GOODWIN
 DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
 EPSC CONSTRUCTION SHEET I SHEET 68 OF 73

CLD_12-0106 MODEL: LOI



STA 434+50.00
END PROJECT
BEGIN APPROACH

STA 434+75.00
END APPROACH

GEOTEXTILE FOR SILT FENCE
432+50 TO 434+50 RT

GEOTEXTILE FOR SILT FENCE,
WOVEN WIRE REINFORCED
105+20 TO 105+37 LT
105+39 TO 105+55 LT
105+62 TO 105+65 LT
105+75 TO 105+78 LT

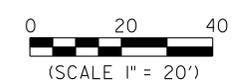
TEMPORARY EROSION MATTING
105+12 TO 106+00 LT

TEMPORARY STONE
CHECK DAM, TYPE I
431+00 TO 432+00 LT
105+12 TO 106+00 RT

BARRIER FENCE
429+75 TO 429+90 LT
429+75 TO 430+20 RT
429+97 TO 431+26 LT

PROJECT DEMARCATION FENCE
430+20 TO 432+21 RT
431+26 TO 431+91 LT
432+09 TO 434+75 LT
432+50 TO 434+75 RT
433+75 TO 434+75 LT

NOTE
LOCATION AND METHOD OF COFFERDAM CONSTRUCTION IS SUGGESTED. ACTUAL LOCATION AND METHOD SHALL BE DETERMINED BY THE CONTRACTOR.



PROJECT NAME:	LUNENBURG
PROJECT NUMBER:	NH CULV(27)
FILE NAME:	11b294/cos/z11b294bdrerocn.dgn
PLOT DATE:	12/16/2014
PROJECT LEADER:	J. BYATT
DRAWN BY:	S. GOODWIN
DESIGNED BY:	M. HALEY
CHECKED BY:	P. SHEDD
EPSC CONSTRUCTION PLAN SHEET 2	SHEET 69 OF 73

CLD_12-0106 MODEL: L02

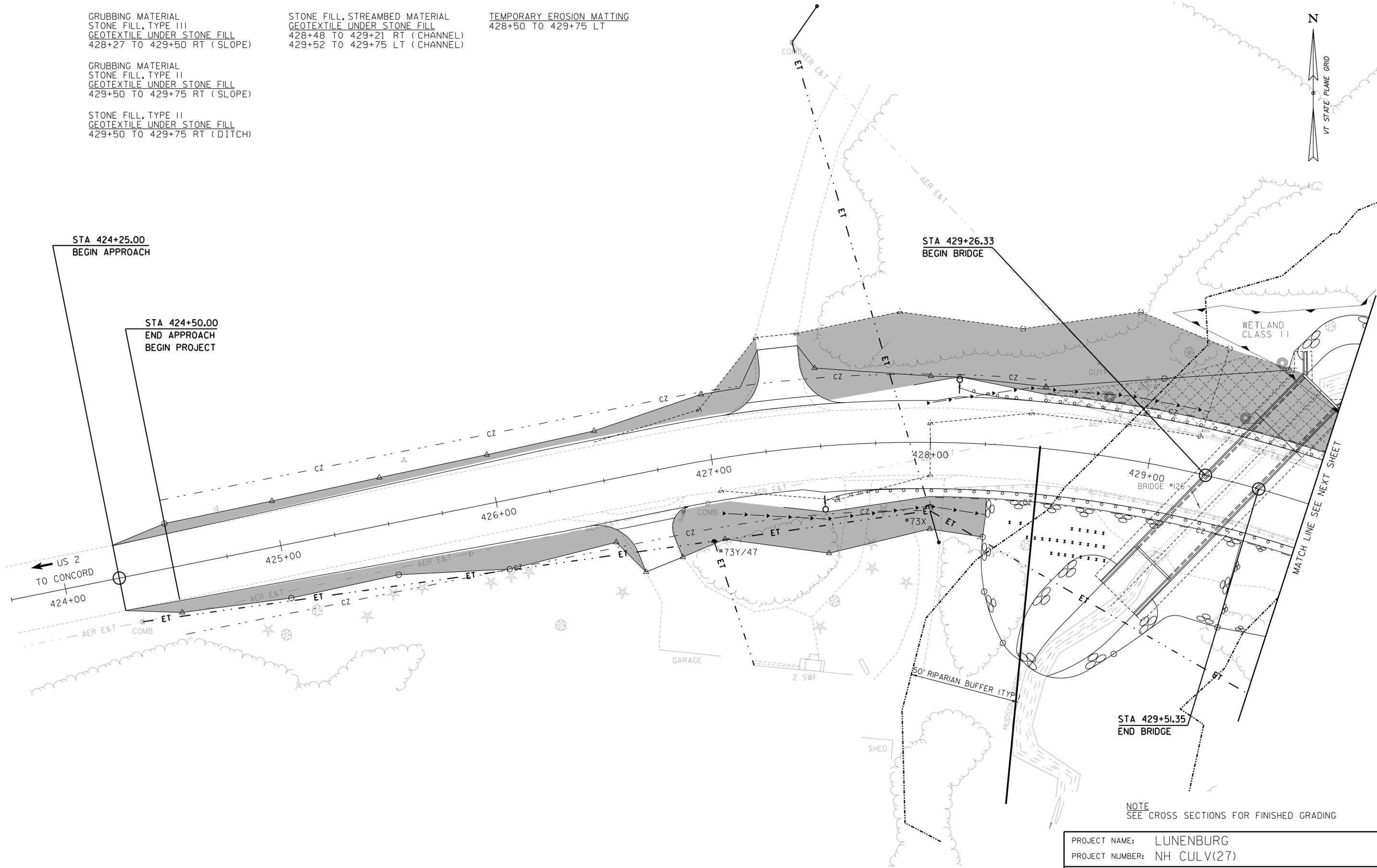
GRUBBING MATERIAL
 STONE FILL, TYPE III
 GEOTEXTILE UNDER STONE FILL
 428+27 TO 429+50 RT (SLOPE)

GRUBBING MATERIAL
 STONE FILL, TYPE II
 GEOTEXTILE UNDER STONE FILL
 429+50 TO 429+75 RT (SLOPE)

STONE FILL, TYPE II
 GEOTEXTILE UNDER STONE FILL
 429+50 TO 429+75 RT (DITCH)

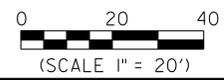
STONE FILL, STREAMBED MATERIAL
 GEOTEXTILE UNDER STONE FILL
 428+48 TO 429+21 RT (CHANNEL)
 429+52 TO 429+75 LT (CHANNEL)

TEMPORARY EROSION MATTING
 428+50 TO 429+75 LT



NOTE
 SEE CROSS SECTIONS FOR FINISHED GRADING

PROJECT NAME:	LUNENBURG	FILE NAME:	lb294/cos/zlb294bdrerofl.dgn	PLOT DATE:	12/16/2014
PROJECT NUMBER:	NH CULV(27)	PROJECT LEADER:	J. BYATT	DRAWN BY:	S. GOODWIN
		DESIGNED BY:	M. HALEY	CHECKED BY:	P. SHEDD
		EPSC FINAL PLAN SHEET 1		SHEET	70 OF 73



CLD 12-0106 MODEL: LOI

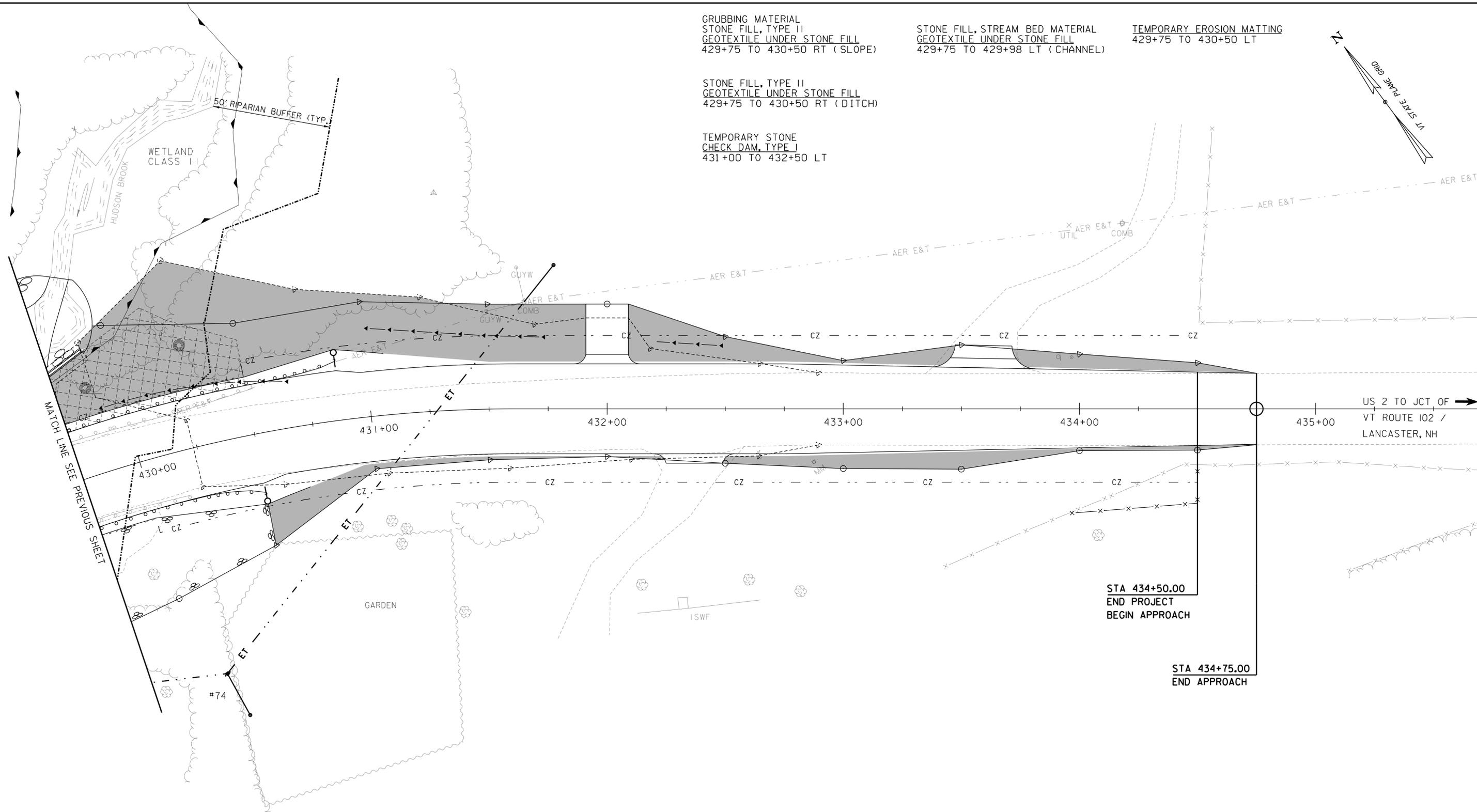
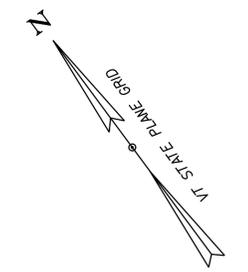
GRUBBING MATERIAL
 STONE FILL, TYPE II
 GEOTEXTILE UNDER STONE FILL
 429+75 TO 430+50 RT (SLOPE)

STONE FILL, STREAM BED MATERIAL
 GEOTEXTILE UNDER STONE FILL
 429+75 TO 429+98 LT (CHANNEL)

TEMPORARY EROSION MATTING
 429+75 TO 430+50 LT

STONE FILL, TYPE II
 GEOTEXTILE UNDER STONE FILL
 429+75 TO 430+50 RT (DITCH)

TEMPORARY STONE
 CHECK DAM, TYPE I
 431+00 TO 432+50 LT



MATCH LINE SEE PREVIOUS SHEET

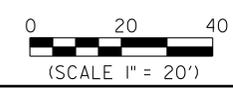
US 2 TO JCT. OF
 VT ROUTE 102 /
 LANCASTER, NH

STA 434+50.00
 END PROJECT
 BEGIN APPROACH

STA 434+75.00
 END APPROACH

NOTE
 SEE CROSS SECTIONS FOR FINISHED GRADING

PROJECT NAME: LUNENBURG	
PROJECT NUMBER: NH CULV(27)	
FILE NAME: lb294/cos/zlb294bdrerofl.dgn	PLOT DATE: 12/16/2014
PROJECT LEADER: J. BYATT	DRAWN BY: S. GOODWIN
DESIGNED BY: M. HALEY	CHECKED BY: P. SHEDD
EPSC FINAL PLAN SHEET 2	SHEET 71 OF 73



CLD_12-0106 MODEL: L02

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

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

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

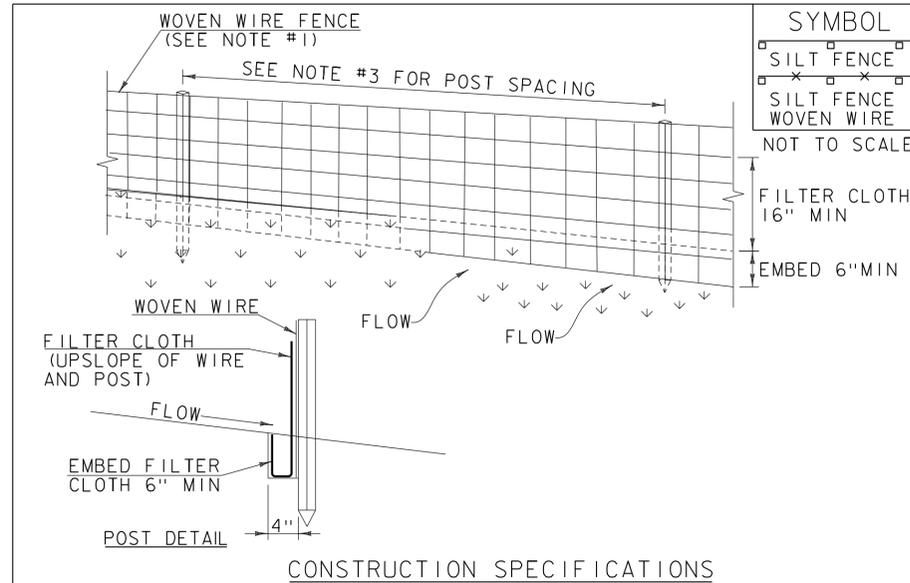
CONSTRUCTION GUIDANCE

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

ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

TURF ESTABLISHMENT

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



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

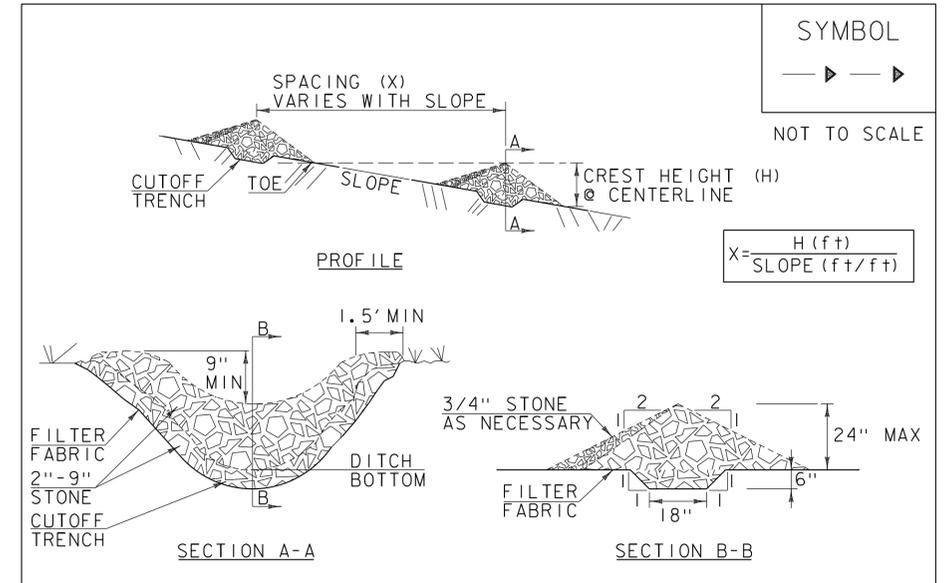
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
 ORIGINALLY DEVELOPED BY USDA-NRCS
 VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SILT FENCE

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

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 AND AS SHOWN IN THE PLANS FOR GEOTEXTILE FOR SILT FENCE (PAY ITEM 649.5) 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



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

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

CHECK DAM

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

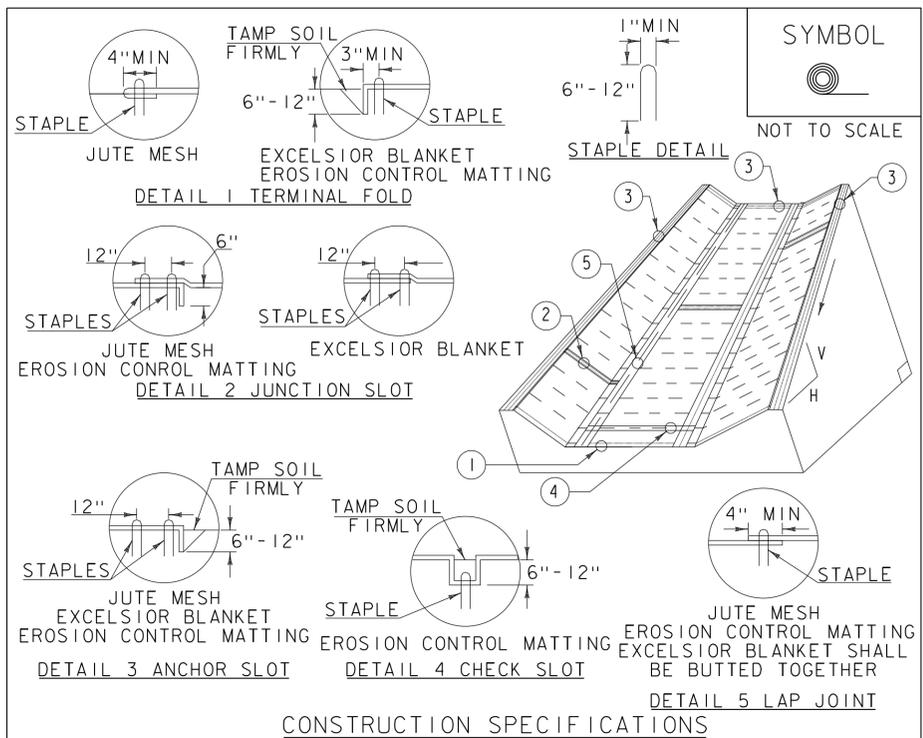
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR TEMPORARY STONE CHECK DAM, TYPE I (PAY ITEM 653.25)

REVISIONS	
MARCH 21, 2008	WHF
JANUARY 8, 2009	WHF

PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)

FILE NAME: llb294/cos/zllb294erodet.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: M. HALEY
 DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
 EPSC DETAILS I SHEET 72 OF 73





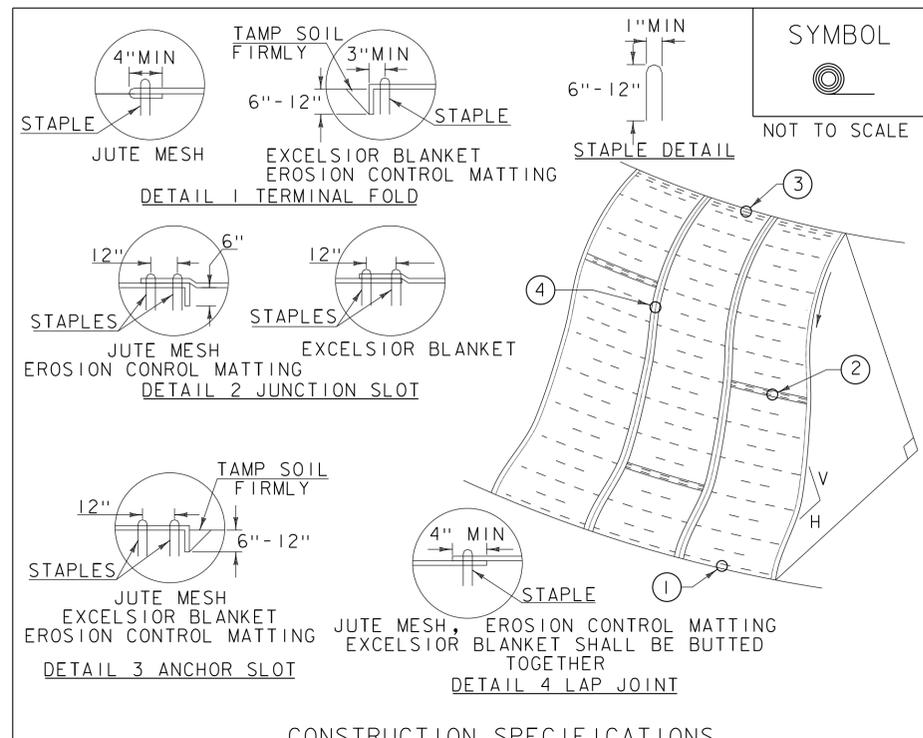
- CONSTRUCTION SPECIFICATIONS**
1. EROSION MATTING, CHECK SLOTS, SHALL BE SPACED IN DITCH CHANNEL SO THAT ONE OCCURS WITHIN EACH 50' ON SLOPES OF MORE THAN 4% AND LESS THAN 6%. ON SLOPES OF 6% OR MORE, THEY SHALL BE SPACED SO THAT ONE OCCURS WITHIN EACH 25'.
 2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
 3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4'X225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4'X150' ROLL OF MATERIAL.
 4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
 5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
 VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ROLLED EROSION CONTROL PRODUCT (RECP) DITCH

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

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



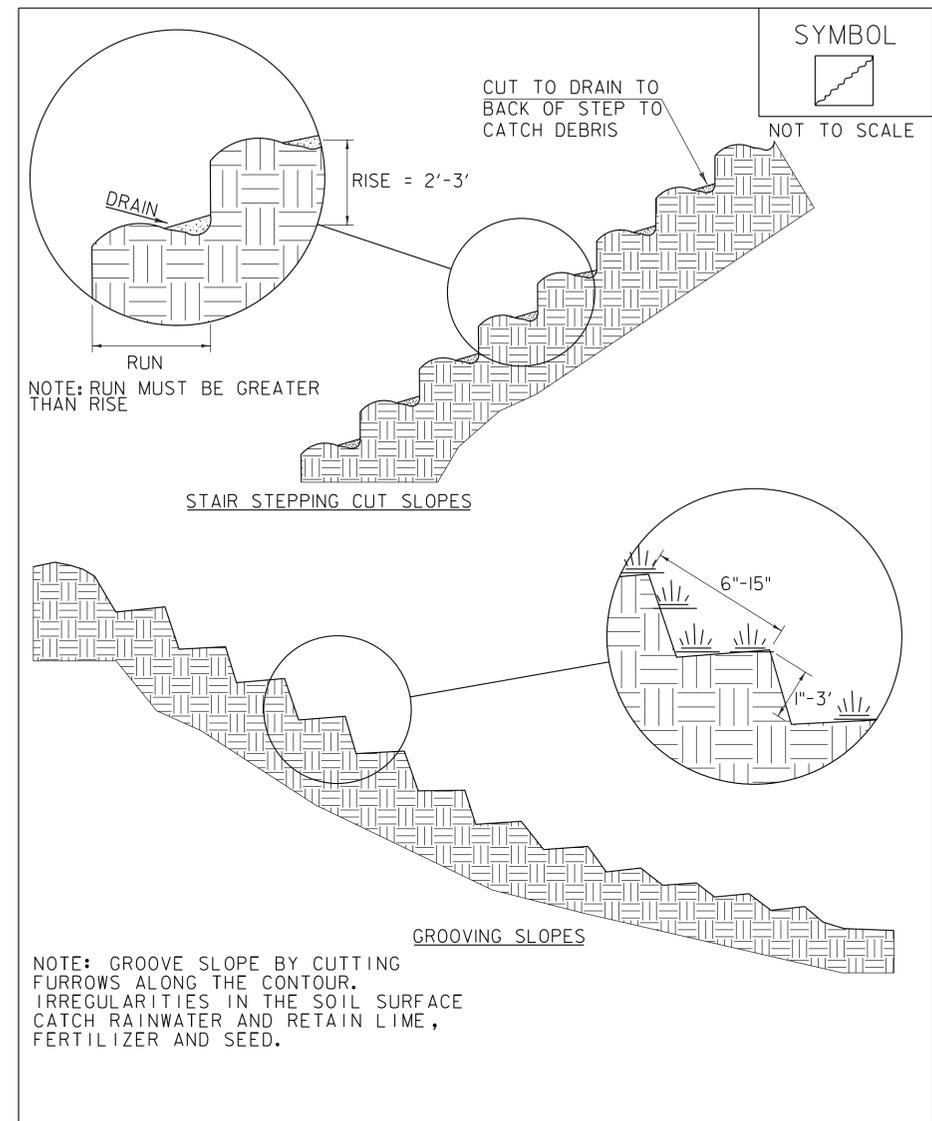
- CONSTRUCTION SPECIFICATIONS**
1. APPLY TO SLOPES GREATER THAN 3H:1V OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.
 2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
 3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY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

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
 VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE

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

REVISIONS		
APRIL 16, 2007	JMF	
JANUARY 13, 2009	WHF	



ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
 VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SURFACE ROUGHENING

NOTES:
 REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
 THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT

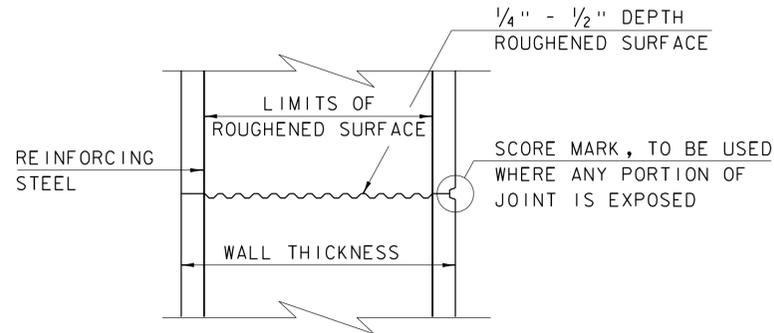
REVISIONS		
APRIL 1, 2008	WHF	
JANUARY 13, 2009	WHF	

PROJECT NAME: LUNENBURG
 PROJECT NUMBER: NH CULV(27)
 FILE NAME: l1b294/cos/z1b294erode.t.dgn PLOT DATE: 12/16/2014
 PROJECT LEADER: J. BYATT DRAWN BY: M. HALEY
 DESIGNED BY: M. HALEY CHECKED BY: P. SHEDD
 EPSC DETAILS 2 SHEET 73 OF 73



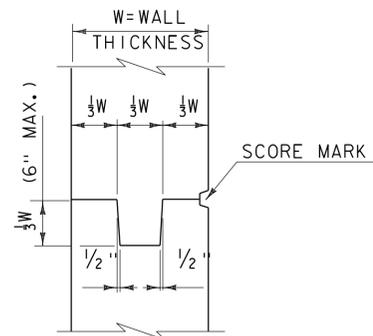
CONCRETE GENERAL NOTES

1. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1"
2. REINFORCING STEEL SIZE AND SPACING SHOWN IN THE PLANS IS BASED ON 60 KSI STEEL, UNLESS NOTED OTHERWISE. WITH THE ENGINEER'S PERMISSION, BAR SIZE AND SPACING MAY BE MODIFIED ACCORDING TO THE LATEST AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND STRUCTURES DESIGN MANUAL WHEN USING HIGHER STRENGTH STEEL.

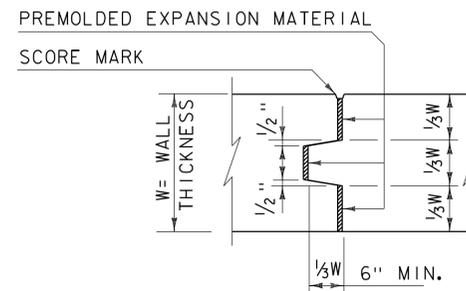
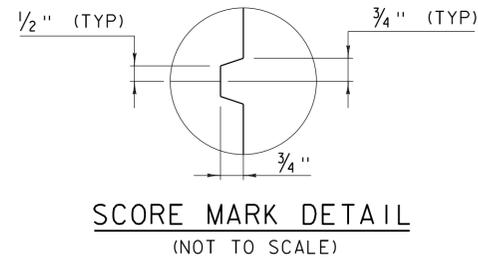


TYPICAL HORIZONTAL CONSTRUCTION JOINT
(NOT TO SCALE)

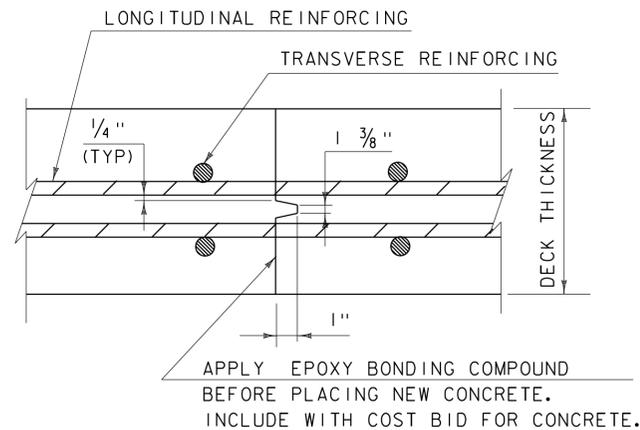
1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



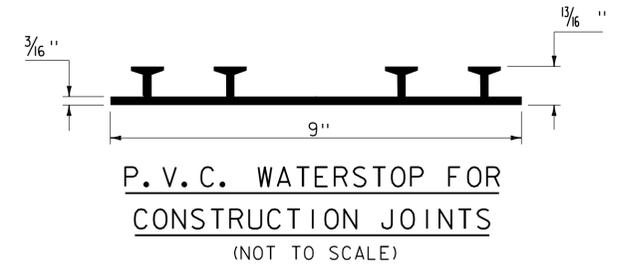
TYPICAL CONCRETE CONSTRUCTION JOINT
(NOT TO SCALE)



TYPICAL CONCRETE EXPANSION JOINT
(NOT TO SCALE)

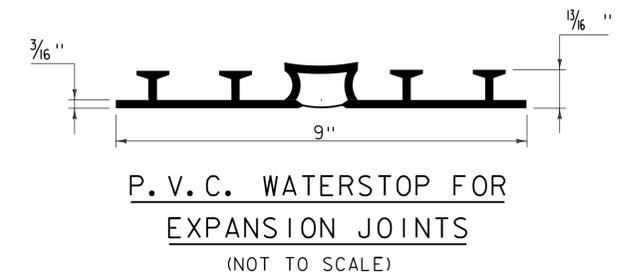


TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS
(NOT TO SCALE)



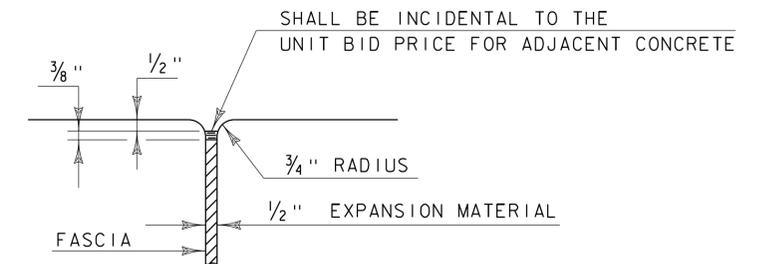
PAYMENT FOR THE P.V.C. WATERSTOP SHALL BE INCIDENTAL TO THE UNIT BID PRICE FOR THE ADJACENT CONCRETE.

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



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

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



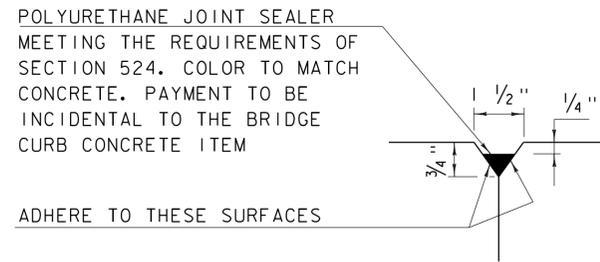
JOINT BETWEEN FASCIA AND WINGWALL
(NOT TO SCALE)

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

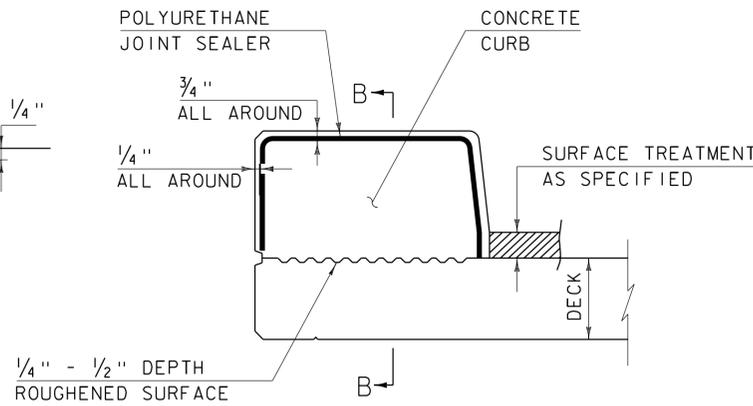
**CONCRETE
DETAILS AND NOTES**



**STRUCTURES
DETAIL
SD-501.00**

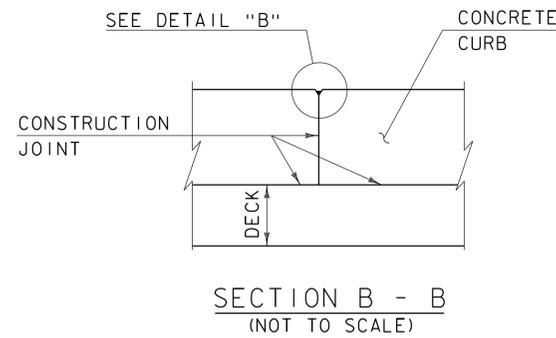


DETAIL "B"
(NOT TO SCALE)

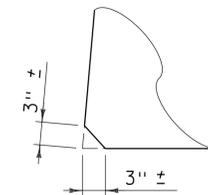


CONCRETE CURB JOINT SECTION
(NOT TO SCALE)

1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION



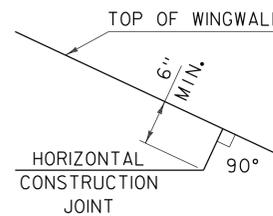
SECTION B - B
(NOT TO SCALE)



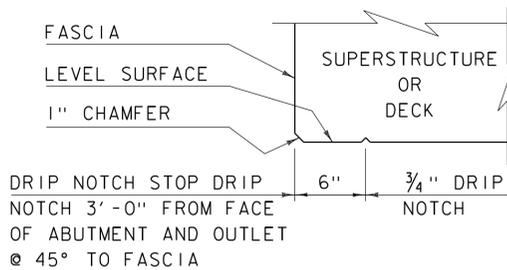
ACUTE ANGLE
CLIP DETAIL
(NOT TO SCALE)

CONCRETE CURB JOINT NOTES

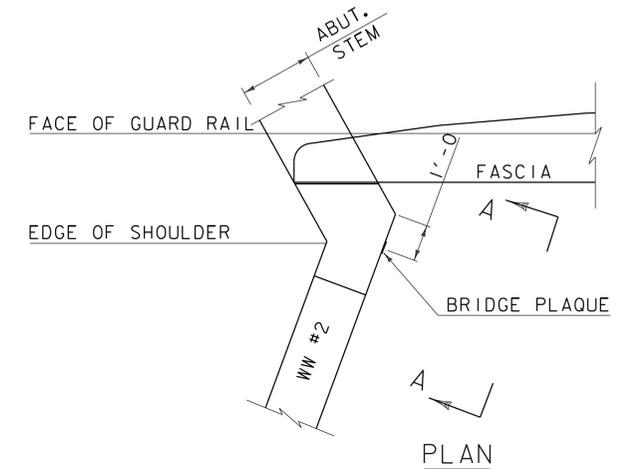
1. CONCRETE CURBS MAY BE PLACED IN ONE CONTINUOUS OPERATION IF AN APPROVED SHRINKAGE REDUCING ADMIXTURE LISTED IN THE SPECIAL PROVISIONS IS USED WITH THE CONCRETE MIX DESIGN. PAYMENT FOR THE SHRINKAGE REDUCING ADMIXTURE WILL BE INCIDENTAL TO THE BRIDGE CURB CONCRETE ITEM.
2. IF THE CONTRACTOR CHOOSES NOT TO USE AN APPROVED SHRINKAGE REDUCING ADMIXTURE, THE CURBS SHALL BE CONSTRUCTED WITH CONSTRUCTION JOINTS SPACED AT A MAXIMUM OF 15'-0" CENTER TO CENTER AND 2'-0" MINIMUM FROM THE CENTER OF NEAREST BRIDGE RAILING POST.
3. ON MULTI-SPAN CONTINUOUS SUPERSTRUCTURES, REGARDLESS OF WHETHER APPROVED SHRINKAGE REDUCING ADMIXTURE IS USED, CURB JOINTS SHALL BE LOCATED OVER THE CENTERLINE OF PIERS AND 7'-0" EACH SIDE OF THE CENTERLINE OF EACH PIER.
4. WHEN CURB JOINTS ARE USED THE CURBS SHALL BE PLACED IN ALTERNATE SECTIONS WITH A MINIMUM OF 48 HOUR DELAY BETWEEN ADJACENT PLACEMENTS.
5. LONGITUDINAL REINFORCING SHALL BE CONTINUOUS THROUGH CURB CONSTRUCTION JOINTS. CURB STIRRUP BARS SHALL BE TURNED AS NECESSARY TO MAINTAIN COVER IN THE FLARED CURB ENDS.
6. THE JOINT SPACING AND DETAILS SHOWN SHALL APPLY TO SIDEWALKS WHEN SHOWN IN THE PLANS.



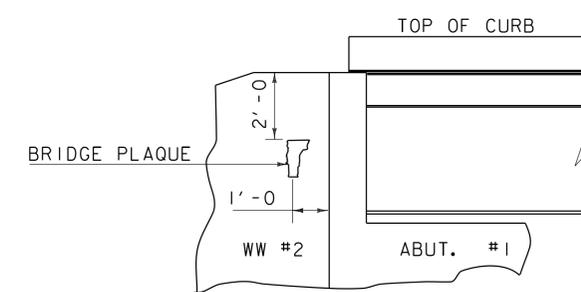
HORIZONTAL WINGWALL
CONSTRUCTION JOINT
(NOT TO SCALE)



DRIP NOTCH DETAIL
(NOT TO SCALE)



PLAN



VIEW "A - A"

BRIDGE PLAQUE
(NOT TO SCALE)

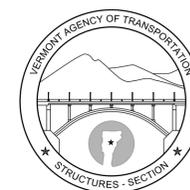
THE BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR AT ABUTMENT #1 ON THE RIGHT SIDE AS SHOWN OR AS DIRECTED BY THE ENGINEER.

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

REVISIONS

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

CONCRETE
DETAILS AND NOTES



STRUCTURES
DETAIL
SD-502.00