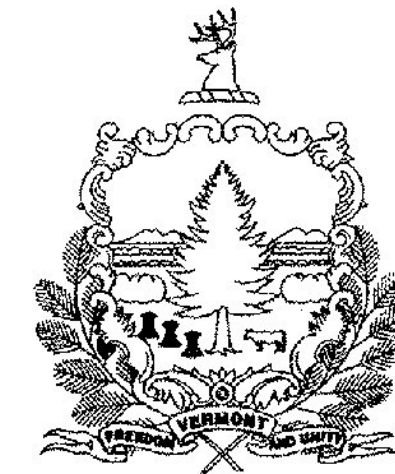
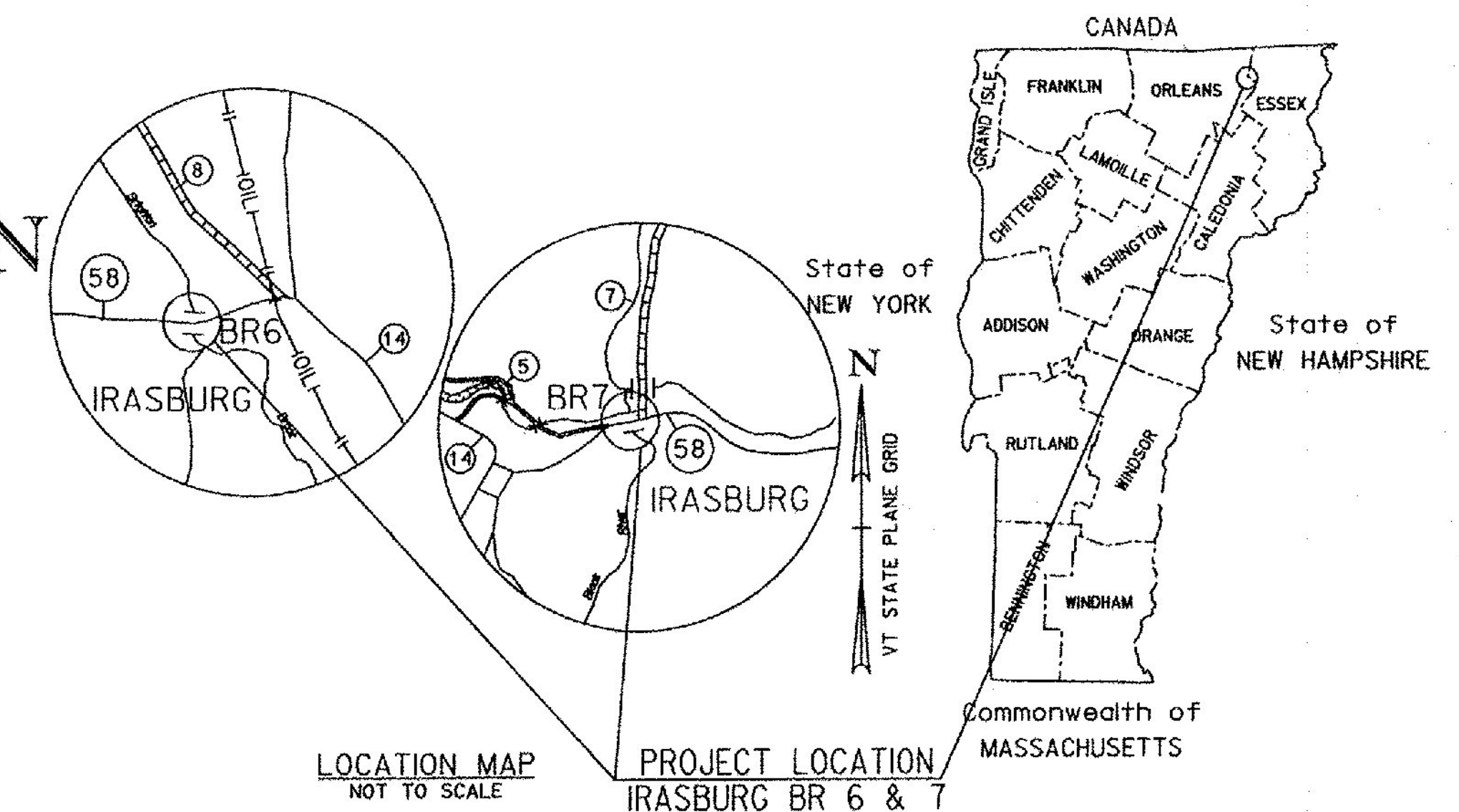


STATE OF VERMONT AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT BRIDGE PROJECT TOWN OF IRASBURG COUNTY OF ORLEANS VT ROUTE 58 (MAJOR COLLECTOR) BRIDGE NUMBERS 6 AND 7



RECORD PLANS	
CONTRACTOR:	J. A. McDONALD INC. - LYNDON CENTER, VT
RESIDENT ENGINEER:	KEVIN MCCLURE
CONSTRUCTION BEGAN:	AUGUST 19, 2015
CONSTRUCTION COMPLETE:	OCTOBER 28, 2015
RECORD PLANS BY:	KEVIN MCCLURE & KEVIN KING
I HEREBY CERTIFY THAT ALL THE CONSTRUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN.	
BY <u>Kevin McClure</u>	RESIDENT ENGINEER
DATE <u>1-4-17</u>	
NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.	

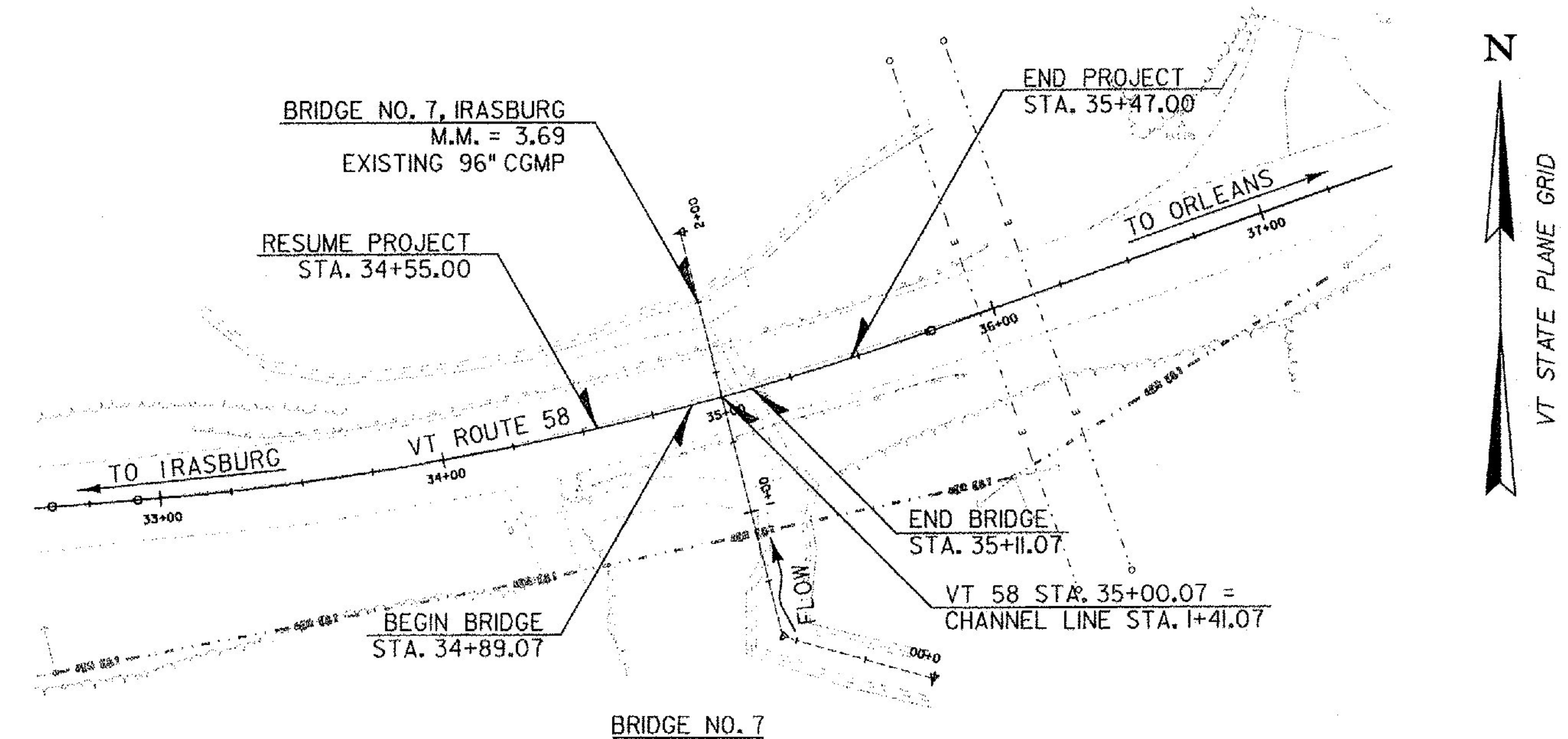
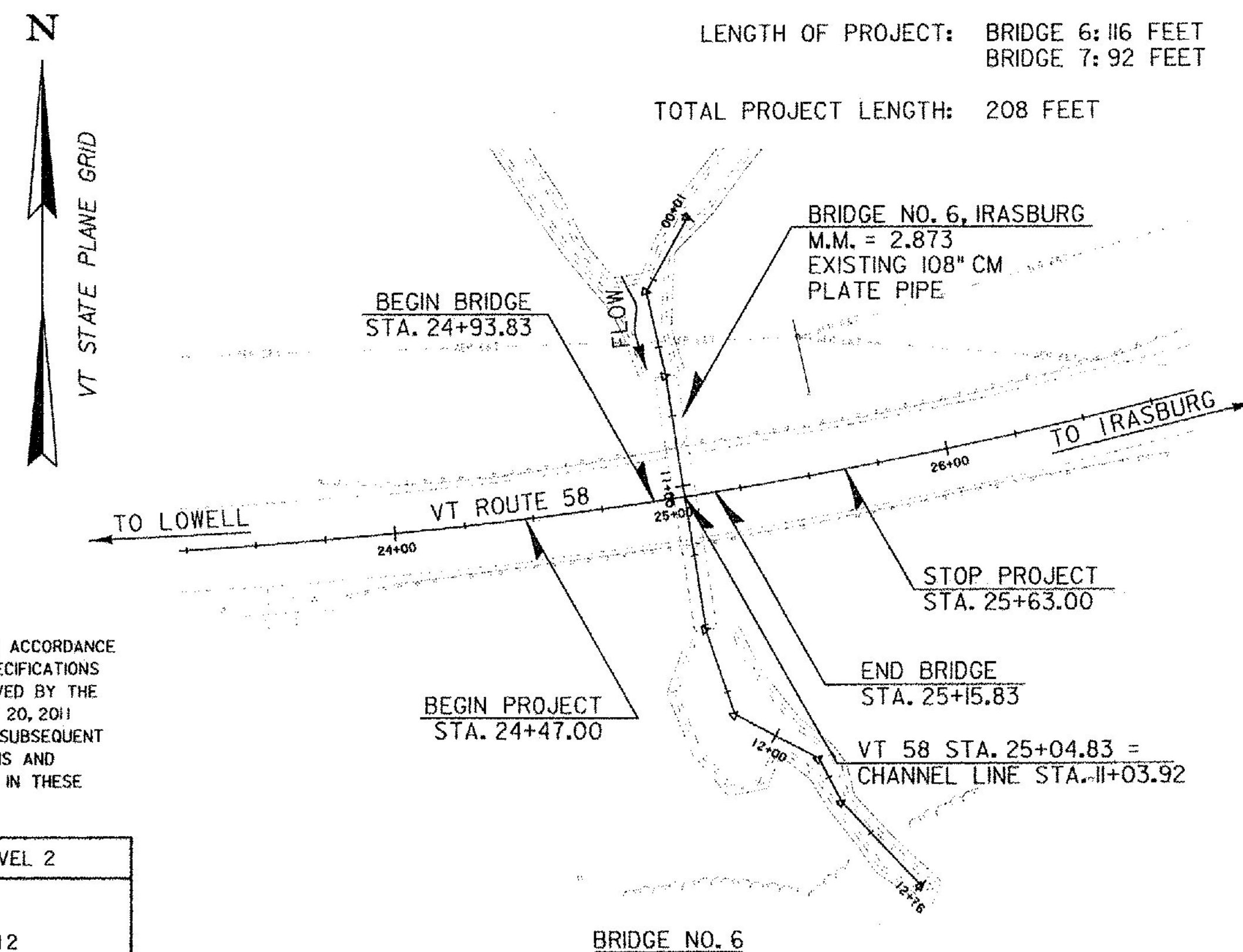
PROJECT LOCATION: BRIDGE NO. 6 IS LOCATED ON VERMONT ROUTE 58, 0.3 MILES WEST OF THE JUNCTION WITH VERMONT ROUTE 14.

BRIDGE NO. 7 IS LOCATED ON VERMONT ROUTE 58, 0.5 MILES EAST OF THE JUNCTION WITH VERMONT ROUTE 14.

PROJECT DESCRIPTION: REPLACEMENT OF EXISTING CORRUGATED STEEL CULVERTS WITH PRECAST CONCRETE STRUCTURES ALONG WITH RELATED ROADWAY AND CHANNEL WORK.

LENGTH OF PROJECT: BRIDGE 6: 116 FEET
BRIDGE 7: 92 FEET

TOTAL PROJECT LENGTH: 208 FEET



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

QUALITY ASSURANCE PROGRAM : LEVEL 2

SURVEYED BY : VTRANS
SURVEYED DATE : FEBRUARY 2012

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83 (07)

0 40 80
SCALE IN FEET



Stantec Consulting Services Inc.
55 Green Mountain Drive
South Burlington VT U.S.A. 05403
Phone: (802) 864-0223
Fax: (802) 864-0165
www.stantec.com

DIRECTOR OF PROJECT DELIVERY
APPROVED [Signature] DATE 9/29/2014
PROJECT MANAGER : MARK SARGENT P.E.
PROJECT NAME : IRASBURG
PROJECT NUMBER : STP CULV (30)
SHEET 1 OF 55 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

LRFD

INDEX OF SHEETS

PLAN SHEETS

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11	CONVENTIONAL SYMBOLOLOGY LEGEND
12	TYPICAL SECTIONS - BR6
13	SURVEY CONTROL AND TIES - BR6
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54	ROW DETAIL SHEET #1
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STRUCTURE DETAIL SHEETS

SD-366.00	LONGSPAN STEEL BEAM GUARDRAIL, GALVANIZED	01/03/14
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STANDARDS LIST

VAOT STANDARD SHEETS

E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	08/08/95
E-123	GUIDE SIGN PLACEMENT - MISCELLANEOUS DETAILS	03/16/04
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E-172	VEHICLE LOOP DETAILS	08/09/95
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FINAL HYDRAULIC REPORT - BRIDGE NO. 6

HYDROLOGIC DATA

Date: 7 January 2014

DRAINAGE AREA : 3.55 sq. mi.
CHARACTER OF TERRAIN : Hilly to mountainous; 45% woods, 55% meadow, small ponds
STREAM CHARACTERISTICS : Perennial, sinuous, moderate slope
NATURE OF STREAMBED : Silty sand; scour susceptible

PEAK FLOW DATA

Q 2.33 =	160 cfs	Q 50 =	650 cfs
Q 10 =	380 cfs	Q 100 =	790 cfs
Q 25 =	520 cfs	Q 500 =	1110 cfs

DATE OF FLOOD OF RECORD : Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ Q50 = 13.2 fps
ICE CONDITIONS : Light
DEBRIS: Light
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: 8' diameter multi-plate pipe (CGMP)
YEAR BUILT: 1965
CLEAR SPAN(NORMAL TO STREAM): 9.0'
VERTICAL CLEARANCE ABOVE STREAMBED: 9.0'
WATERWAY OF FULL OPENING: 63.6 sq. ft.
DISPOSITION OF STRUCTURE: Remove and replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 =	842.1'	VELOCITY =	8.5 fps
Q10 =	845.2'	"	11.1 fps
Q25 =	847.0'	"	12.4 fps
Q50 =	848.7'	"	13.6 fps
Q100 =	851.2'	"	15.0 fps

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 855.1'
DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE

TOWN: Irasburg
HIGHWAY #: TH26
CLEAR SPAN:
YEAR BUILT:
STRUCTURE TYPE:

DISTANCE: 2336'
STRUCTURE #:
CLEAR HEIGHT:
FULL WATERWAY:

DOWNSTREAM STRUCTURE

TOWN: Irasburg
HIGHWAY #:
CLEAR SPAN:
YEAR BUILT:
STRUCTURE TYPE: Confluence w/ Stony Hill Brook

DISTANCE: 360'
STRUCTURE #:
CLEAR HEIGHT:
FULL WATERWAY:

LRFR LOAD RATING FACTORS

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

AS BUILT "REBAR" DETAIL

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

★ SEE GEOTECHNICAL REPORT

PROPOSED STRUCTURE

STRUCTURE TYPE: Precast Concrete Box Culvert

CLEAR SPAN(NORMAL TO STREAM): 20.0'
VERTICAL CLEARANCE ABOVE STREAMBED: 6.0'
WATERWAY OF FULL OPENING: 120 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	839.1'	VELOCITY=	4.8 fps
Q10 =	840.8'	"	6.8 fps
Q25 =	841.7'	"	7.8 fps
Q50 =	842.4'	"	8.6 fps
Q100 =	843.2'	"	9.5 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 855.1'
DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 842.6'
VERTICAL CLEARANCE: @ Q50 = 0.2'

SCOUR: Replacement structure is a box culvert so scour is not a concern.

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: 7.5 cfs
ORDINARY LOW WATER: 4.0 cfs
ORDINARY HIGH WATER: 110 cfs

DEPTH OR ELEVATION: Depth = 0.5'
Depth = 3.0'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: Temporary Bridge not Required
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY AREA OF FULL OPENING: N/A

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN ONE-WAY TRAFFIC UNDER PHASED CONSTRUCTION.
2. TRAFFIC SIGNALS ARE NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d _p : 3.0 INCH
3. DESIGN SPAN	L: 20.0 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ: ---
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX)	f _{ty} : ---
6. PRESTRESSED CONCRETE STRENGTH	f'c: ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'ci: ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'c: ---
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'c: ---
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'c: 3.5 KSI
11. CONCRETE, CLASS C	f'c: ---
12. REINFORCING STEEL	f _y : 60 KSI
13. STRUCTURAL STEEL AASHTO M270	f _y : ---
14. SOIL UNIT WEIGHT	γ: 0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q _n : ★ 4.3 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 : ---
21. PILE SIZE	---
22. EST. PILE LENGTH	L _p : ---
23. PILE RESISTANCE FACTOR	φ: ---
24. LATERAL PILE DEFLECTION	Δ: ---
25. BASIC WIND SPEED	V _{3s} : ---
26. MINIMUM GROUND SNOW LOAD	pg: ---
27. SEISMIC DATA	PGA: --- S _s : --- S ₁ : ---

PROJECT NAME: IRASBURG
PROJECT NUMBER: STP CULV(30)

FILE NAME: z_irasburg_br6_pi.xls
PROJECT LEADER: M. CHENETTE
DESIGNED BY: A. LACHANCE
PLOT DATE: 10/20/2014
DRAWN BY: L. BUXTON
CHECKED BY: J. HUNGERFORD

PRELIMINARY INFORMATION SHEET - BR6
SHEET 2 OF 55

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

LRFD

INDEX OF SHEETS

PLAN SHEETS

STANDARDS LIST

HYDROLOGIC DATA

Date: 7 January 2014

DRAINAGE AREA : 2.03 sq. mi.
CHARACTER OF TERRAIN : Hilly to mountainous; forested with some clearings; small pond
STREAM CHARACTERISTICS : Moderate slope, perennial, sinuous
NATURE OF STREAMBED : Gravelly sand; scour susceptible

PEAK FLOW DATA

Q 2.33 = 100 cfs
Q 10 = 230 cfs
Q 25 = 300

Q 50 = 380 cfs
Q 100 = 450 cfs
Q 500 = 675 cfs

DATE OF FLOOD OF RECORD : Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ Q50 (without tailwater) = 8.0 cfs
ICE CONDITIONS : Light
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No
IS ORDINARY RISE RAPID? No
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes
IF YES, DESCRIBE: The tailwater of the adjacent downstream Black River creates an outlet control condition in the subject culvert.

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

EXISTING STRUCTURE INFORMATION
STRUCTURE TYPE: 8' diameter multi-plate pipe (CGMP)
YEAR BUILT: 1923
CLEAR SPAN(NORMAL TO STREAM): 8.0'
VERTICAL CLEARANCE ABOVE STREAMBED: 8.0'
WATERWAY OF FULL OPENING: 50.2 sq. ft.
DISPOSITION OF STRUCTURE: Remove and replace
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

Q2.33 = 797.4'
Q10 = 799.8'
Q25 = 800.9'
Q50 = 802.2'
Q100 = 803.2'

VELOCITY = 12.4 fps
" 15.2 fps
" 16.1 fps
" 17.0 fps
" 17.7 fps

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 803.7'
DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE
TOWN: Irasburg
HIGHWAY # : TH 4
CLEAR SPAN: 3.0'
YEAR BUILT:
STRUCTURE TYPE: (2) 3' Dia. pipes
DISTANCE: 6800'
STRUCTURE #: BR 12
CLEAR HEIGHT: 3.0'
FULL WATERWAY:

DOWNSTREAM STRUCTURE
TOWN: Irasburg
HIGHWAY # :
CLEAR SPAN:
YEAR BUILT:
STRUCTURE TYPE: Confluence w/ Black River
DISTANCE: 100'
STRUCTURE #:
CLEAR HEIGHT:
FULL WATERWAY:

LRFR LOAD RATING FACTORS
LOADING LEVELS
TONNAGE
INVENTORY
POSTING
OPERATING
COMMENTS:

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

★ SEE GEOTECHNICAL REPORT

FINAL HYDRAULIC REPORT – BRIDGE NO. 7

PROPOSED STRUCTURE
STRUCTURE TYPE: Precast Concrete Box Culvert
CLEAR SPAN(NORMAL TO STREAM): 20.0'
VERTICAL CLEARANCE ABOVE STREAMBED: 7.0'
WATERWAY OF FULL OPENING: 140 sq. ft.
WATER SURFACE ELEVATIONS AT:

Q2.33 = 797.0'
Q10 = 797.1'
Q25 = 797.1'
Q50 = 797.2'
Q100 = 797.4'

VELOCITY= 6.5 fps
" 9.0 fps
" 10.0 fps
" 11.0 fps
" 11.7 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 803.9'
DISCHARGE OVER ROAD @Q100: None
AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 798.70'
VERTICAL CLEARANCE: @ Q50 = 1.5'
SCOUR: Replacement structure is a box culvert so scour is not a concern.
REQUIRED CHANNEL PROTECTION: Stone Fill, Type III
PERMIT INFORMATION
AVERAGE DAILY FLOW: 4.0 cfs
ORDINARY LOW WATER: 2.0 cfs
ORDINARY HIGH WATER: 60 cfs
DEPTH OR ELEVATION: Depth = 0.5'
Depth = 1.0'
TEMPORARY BRIDGE REQUIREMENTS
STRUCTURE TYPE: Temporary Bridge not Required
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY AREA OF FULL OPENING: N/A
ADDITIONAL INFORMATION
The Black River tailwater was considered in the hydraulic analyses of the ex./prop. structures by applying a tailwater at elevation 797.0 for all storm events to determine headwater elevations; this represents flood stage elevation for the Black River based on nearby USGS gauging stage information. Normal tailwater depth of flow was used to determine stream velocities.
TRAFFIC MAINTENANCE NOTES
1. MAINTAIN ONE-WAY TRAFFIC UNDER PHASED CONSTRUCTION.
2. TRAFFIC SIGNALS ARE NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY
DESIGN VALUES
1. DESIGN LIVE LOAD HL-93
2. FUTURE PAVEMENT dp: 3.0 INCH
3. DESIGN SPAN L: 20.0 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS) Δ: ---
5. PRESTRESSING STRAND (0.60 INCH DIAMETER - LOW RELAX) fy: ---
6. PRESTRESSED CONCRETE STRENGTH fc: ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH f'ci: ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA fc: ---
9. CONCRETE, HIGH PERFORMANCE CLASS A fc: ---
10. CONCRETE, HIGH PERFORMANCE CLASS B fc: 3.5 KSI
11. CONCRETE, CLASS C fc: ---
12. REINFORCING STEEL fy: 60 KSI
13. STRUCTURAL STEEL AASHTO M270 fy: ---
14. SOIL UNIT WEIGHT γ: 0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL qn: ★ 3.3 KSF
16. SOIL BEARING FACTOR (REFER TO AASHTO LRFD) φ: 0.45
17. NOMINAL BEARING RESISTANCE OF ROCK qn: ---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD) φ: ---
19. NOMINAL AXIAL PILE RESISTANCE qp: ---
20. PILE YIELD STRENGTH ASTM A572 fy: ---
21. PILE SIZE ---
22. EST. PILE LENGTH Lp: ---
23. PILE RESISTANCE FACTOR φ: ---
24. LATERAL PILE DEFLECTION Δ: ---
25. BASIC WIND SPEED V3s: ---
26. MINIMUM GROUND SNOW LOAD pg: ---
27. SEISMIC DATA PGA: --- Ss: --- S1: ---

PROJECT NAME: IRASBURG
PROJECT NUMBER: STP CULV (30)
FILE NAME: z_irasburg_br7_pl.xls
PLOT DATE: 10/20/2014
PROJECT LEADER: M. CHENETTE
DRAWN BY: L. BUXTON
DESIGNED BY: A. LACHANCE
CHECKED BY: J. HUNGERFORD
PRELIMINARY INFORMATION SHEET – BR7
SHEET 3 OF 55

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2013	2400	270	52	9.7	250
2023	2500	280	52	11.7	330

10 year ESAL for flexible pavement from 2013 to 2023 : 708,000
20 year ESAL for flexible pavement from 2013 to 2033 : 1,541,000
Design Speed : 30 mph

PROJECT NOTES

GENERAL

- 1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION 2011 STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION AND ITS LATEST REVISIONS AND THE 6TH EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND ITS LATEST REVISIONS.
- 2. THE CONTRACTOR SHALL ENSURE ACCESS TO ALL DRIVES AND SIDE ROADS AT ALL TIMES DURING CONSTRUCTION.
- 3. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68°F.
- 4. IN-STREAM CONSTRUCTION SHALL OCCUR ONLY WITHIN THE TIMEFRAME SPECIFIED IN THE PROJECT PERMITS INCLUDED IN THE CONTRACT DOCUMENTS. IF THE CONTRACTOR PROPOSES TO PERFORM IN-STREAM WORK OUTSIDE OF THESE TIMEFRAMES, THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE APPROPRIATE REGULATING ENTITIES PRIOR TO PERFORMING THE WORK.

PRECAST CONCRETE BOX CULVERTS AND WINGWALLS

- 1. THE BOX CULVERT INCLUDING SILLS, HEADWALLS, CUT-OFF WALLS, AND WINGWALLS WILL BE PAID FOR UNDER THE APPROPRIATE SECTION 540 CONTRACT ITEM.
- 2. THE BOX CULVERT INCLUDING THE SILLS, HEADWALLS AND WINGWALL STEMS SHALL BE PRECAST. THE CUT-OFF-WALL AND WINGWALL FOOTINGS MAY BE EITHER PRECAST OR CAST IN PLACE. THE DESIGN OF THESE CULVERTS SHALL BE THE RESPONSIBILITY OF THE FABRICATOR. CULVERT SHALL BE DESIGNED FOR AN HL-93 LIVE LOAD. CAST-IN-PLACE CONCRETE SHALL MEET THE REQUIREMENTS OF SECTION 501 FOR CONCRETE, HIGH PERFORMANCE CLASS B. THE BOTTOM OF WINGWALL FOOTINGS SHALL BE AT THE ELEVATIONS SHOWN IN THE PLANS. CUT-OFF WALLS BELOW WINGWALL FOOTINGS WILL NOT BE ALLOWED.
- 3. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS FOR THE BOX CULVERTS AND ALL ASSOCIATED DETAILS IN ACCORDANCE WITH SUBSECTION 105.03.
- 4. THE BOX CULVERT TYPICAL SECTIONS SHOWN IN THE DRAWINGS ARE FOR SCHEMATIC PURPOSES ONLY. THE ACTUAL SHAPE OF THE BOX CULVERT AND ITS COMPONENTS WILL BE DEPENDENT ON THE FABRICATOR.
- 5. ALL BOX CULVERT JOINTS SHALL BE STRENGTHENED WITH PERMANENT CLOSURE HARDWARE. ALL HARDWARE COMPONENTS SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 726.08.
- 6. ALL REINFORCING TO BE LEVEL 1 (UNCOATED).
- 7. AFTER BOX CULVERT SECTIONS HAVE BEEN SET IN THEIR FINAL POSITION, THE EXTERIOR (TOP AND SIDES) AND INTERIOR (SIDES AND BOTTOM) OF ALL BOX CULVERT JOINTS, AND ALL LIFTING HOLES, SHALL BE GROUTED WITH MORTAR, TYPE IV. PRIOR TO THE APPLICATION OF ANY WATERPROOFING, ALL MORTAR SHALL BE WET CURED A MINIMUM OF 12 HOURS OR UNTIL THE COMPRESSIVE STRENGTH HAS REACHED 2000 psi. APPROVED CURING COMPOUNDS MAY BE USED ON INTERIOR SURFACES IN LIEU OF WET CURING.
- 8. A TWO FOOT WIDE STRIP OF SHEET MEMBRANE WATERPROOFING SHALL BE APPLIED AT EACH SIDE JOINT IN ACCORDANCE WITH SUBSECTION 540.10. THE MEMBRANE SHALL BE CENTERED ON THE JOINT AND SHALL RUN THE ENTIRE HEIGHT OF THE JOINT. THE ENTIRE TOP OF THE BOX CULVERT SHALL THEN BE COVERED WITH TORCH APPLIED MEMBRANE. TORCH APPLIED MEMBRANE WILL BE PAID SEPARATELY UNDER CONTRACT ITEM 519.20. THE MEMBRANE SHEETS SHALL OVERLAP THE EDGES OF THE CULVERT BY ONE FOOT ON EACH SIDE AS SHOWN IN THE PLANS.
- 9. WATER REPELLENT IN ACCORDANCE WITH ITEM 514.10 SHALL BE APPLIED TO ALL EXPOSED SURFACES EXCEPT THE INSIDE OF THE BOX.

SIMULATED STREAM BED

- 1. BED MATERIAL TO BE PLACED IN THE RECONSTRUCTED CHANNEL AND BOX CULVERT IS INTENDED TO MIMIC THE NATIVE CHANNEL. THE MATERIAL SHALL BE STONE FILL TYPE II SUPPLEMENTED WITH THE TAILINGS OF A TOPSOIL SCREENING OPERATION WITH GRADATION ADJUSTED TO CONFORM TO THE FOLLOWING TABLE:

STONE/SIEVE SIZE	% FINER, BY WEIGHT
36"	100
12"	30-85
#4	4-30
#200	4-12

- 2. INSTALLATION OF THE BED MATERIAL MAY REQUIRE INDIVIDUAL PLACEMENT OF LARGE STONES AT SPECIFIC LOCATIONS, AS DIRECTED BY THE ENGINEER. THE BED MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND THE AGENCY OF NATURAL RESOURCES STREAM ALTERATION ENGINEER, AND WILL BE IN ACCORDANCE WITH ITEM 900.608, SPECIAL PROVISION (STONE FILL, CULVERT LINING).

UTILITY COORDINATION

- 1. SEE THE LAYOUT SHEETS AND UTILITY SPECIAL PROVISIONS FOR INFORMATION AND REQUIREMENTS RELATED TO UTILITY COORDINATION.

TRAFFIC CONTROL

- 1. THE TRAFFIC CONTROL PLANS ARE SCHEMATIC ONLY AND SHOULD BE USED AS A REFERENCE. THE CONTRACTOR SHALL DEVELOP AND IMPLEMENT A SITE SPECIFIC TRAFFIC CONTROL PLAN FOR ONE LANE CLOSURES PER THE LATEST VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). THE CONTRACTOR SHALL ALLOW THE ENGINEER 14 CALENDAR DAYS TO REVIEW AND ACCEPT THE PROPOSED PLANS BEFORE THEY ARE TO BE IMPLEMENTED. NO WORK SHALL COMMENCE UNTIL THE TRAFFIC CONTROL PLAN HAS BEEN APPROVED. DEVELOPMENT AND IMPLEMENTATION OF TRAFFIC CONTROL PLAN SHALL BE IN ACCORDANCE WITH TRAFFIC CONTROL SECTION 900.
- 2. SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS OR CORNER SIGHT DISTANCE FROM HIGHWAYS OR DRIVES.
- 3. ALL SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA).
- 4. ORANGE SOLID SUBSTRATE CONSTRUCTION SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING "AMERICAN SOCIETY FOR TESTING AND MATERIALS" (ASTM) D 4956 TYPE VII, VIII OR IX REQUIREMENTS, UNLESS OTHERWISE NOTED.
- 5. ROLL UP SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING ASTM D 4956 TYPE VI.
- 6. SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY OR UPON COMPLETION OF THE WORK. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER. SIGNS SHALL BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER.
- 7. FIXED SIGNS SHALL BE IN COMPLIANCE WITH VAOT CONSTRUCTION STANDARD E-121.
- 8. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AT A ONE FOOT MINIMUM ABOVE TRAVELED WAY. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF THE SIGNS SHALL BE REMOVED. WHEN PLACED BEHIND GUARDRAIL, THE BOTTOM OF THE SIGN FACE SHALL BE ABOVE THE TOP OF THE GUARDRAIL.
- 9. WHERE SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARDRAIL OR OTHER APPROVED TRAFFIC BARRIERS, ALL SIGN STANDS AND POST INSTALLATIONS SHALL BE "NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM" (NCHRP) REPORT 350 COMPLIANT. NO SIGN POSTS SHALL EXTEND OVER THE TOP OF THE SIGN INSTALLED ON SAID POST(S). WHEN ANCHORS ARE INSTALLED, STUB SHALL NOT BE GREATER THAN FOUR INCHES ABOVE EXISTING GROUND.
- 10. THE NUMBER OF CHANNELIZING DEVICES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED IS TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE, ETC.).
- 11. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE USED AT THE DISCRETION OF THE ENGINEER AND IN ACCORDANCE WITH SECTION 6F.60 OF THE MUTCD.
- 12. TRAVEL LANES SHALL BE A MINIMUM OF 12 FEET WIDE WITH 1 FOOT MINIMUM WIDTH SHOULDERS.
- 13. THE CONTRACTOR SHALL SHIFT TRAFFIC IN ACCORDANCE WITH AN APPROVED TRAFFIC CONTROL PLAN. ALL EQUIPMENT SHALL BE MOVED TO A LOCATION OUTSIDE OF THE CONSTRUCTION CLEAR ZONE (15') DURING NON-WORK PERIODS IF POSSIBLE. IF NOT POSSIBLE, EQUIPMENT SHALL BE OFF ROADWAY AND MARKED WITH CHANNELIZING DEVICES.

TEMPORARY TRAFFIC SIGNALS:

- 1. TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE PAID AS PART OF ITEM 900.645 SPECIAL PROVISION (TRAFFIC CONTROL ALL-INCLUSIVE)
- 2. DESIGN OF THE SIGNAL SUPPORTS AND ANY REQUIRED GUYING IS THE RESPONSIBILITY OF THE CONTRACTOR.
- 3. SIGNAL PHASING/TIMING ADJUSTMENTS REQUESTED BY THE ENGINEER SHALL BE ACCOMPLISHED WITHIN A 48 HOUR PERIOD.
- 4. SIGNAL FACES SHALL BE LED AND CONSIST OF 12" LENSES. (RED, YELLOW, AND GREEN)
- 5. THE BOTTOM OF THE HOUSING OF A SIGNAL FACE SUSPENDED OVER A ROADWAY SHALL NOT BE LESS THAN 16.5 FEET NOR MORE THAN 19 FEET ABOVE THE PAVEMENT GRADE AT THE CENTER OF THE ROADWAY. THE BOTTOM OF A SIGNAL FACE NOT MOUNTED OVER A ROADWAY SHALL NOT BE LESS THAN 8 FEET NOR MORE THAN 15 FEET ABOVE THE GROUND. CAUTION SHOULD BE USED TO ENSURE COMPLIANCE WITH THE HEIGHT REQUIREMENTS IN THE EVENT THE NEW APPROACH GRADES DIFFER SIGNIFICANTLY FROM THE OLD ROAD GRADE.
- 6. SIGNAL FACES FOR ANY ONE APPROACH SHALL NOT BE LESS THAN 8 FEET APART MEASURED HORIZONTALLY BETWEEN CENTER FACES.
- 7. SIGNAL HEADS MAY BE HUNG ON A SPAN WIRE OR ON A CANTILEVER MAST ARM. HOWEVER, THE USE OF PORTABLE SIGNALS IS ENCOURAGED. AT LEAST ONE SIGNAL HEAD SHALL BE UNMISTAKABLY IN LINE WITH THE CENTER OF APPROACHING TRAFFIC AT ALL TIMES. THE SECOND SIGNAL HEAD MAY BE POST MOUNTED, LOCATED AT A DISTANCE OF NO GREATER THAN 14.5 FEET FROM THE CENTER OF THE APPROACH LANE WHEN THE STOP BAR IS 40 FEET FROM THE SIGNAL HEAD. CONSULT THE CURRENT EDITION OF THE MUTCD FOR ADDITIONAL INFORMATION CONCERNING SIGNAL PLACEMENT.
- 8. SIGNAL HEAD PLACEMENT IS CRITICAL. HEADS SHALL BE ADJUSTED TO REFLECT LANE LOCATION CHANGES.
- 9. THE SIGNAL SYSTEM SHALL CONSIST OF POLES, SIGNS AND POSTS, WARNING SIGNS, LUMINAIRES, FLASHING BEACONS, ASSOCIATED PAVEMENT MARKINGS, AND SIGNAL EQUIPMENT TO PROVIDE FOR AN ADEQUATE DESIGN. IT ALSO INCLUDES PERMITS AND COSTS ASSOCIATED WITH PROVIDING ELECTRICAL POWER.
- 10. INSTALL WIRING BETWEEN SIGNAL POLES TO PROVIDE FOR A SAFE INSTALLATION. ATTACHMENT TO UTILITY POLES TO BE COORDINATED BY THE CONTRACTOR WITH THE UTILITY COMPANY.
- 11. PLACE TEMPORARY POLES BEHIND GUARDRAIL OR OUTSIDE OF THE CLEAR ZONE.
- 12. POLES SUPPORTING SPAN WIRES AND/OR MAST ARMS SHALL BE ADEQUATELY BRACED OR GUYED AND SHALL NOT BE PLACED SO AS TO CREATE A HAZARD TO THE TRAVELING PUBLIC.
- 13. ALL TEMPORARY SIGNAL EQUIPMENT, SIGNS, ETC., SHALL BELONG TO THE CONTRACTOR AT THE END OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR REMOVAL INCLUDING ANY TEMPORARY PAVEMENT MARKINGS, UTILITY POLES, WIRES, ETC.
- 14. A 250 WATT MER/150 WATT HPS LUMINAIRE AND MAST ARM SHALL BE PROVIDED ON A POLE ON EACH APPROACH AT A MOUNTING HEIGHT OF 30 FEET ABOVE ROADWAY CENTERLINE. THE INTENT IS TO ILLUMINATE THE AREA AROUND THE SIGNAL HEADS AND STOP BAR FOR INCREASED VISIBILITY. THE ENGINEER SHALL DETERMINE THE ADEQUACY OF THE LIGHTING AND DIRECT CHANGES IF THE LIGHTING IS INSUFFICIENT.
- 15. SEE STD. E-121 FOR SIGN PLACEMENT. SEE STDS. E-171A AND E-172 FOR ADDITIONAL INFORMATION ON SIGNALS.
- 16. ALL ELECTRICAL WORK SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
- 17. ALL STOP SIGNS AND ANY TRAFFIC SIGNS MADE IRRELEVANT DUE TO THE TEMPORARY SIGNAL SHALL BE COMPLETELY COVERED DURING OPERATION OF THE TEMPORARY SIGNAL OR AT THE DISCRETION OF THE ENGINEER.
- 18. CONSTRUCTION APPROACH SIGNS SHALL BE PROVIDED ON EACH APPROACH PER THE "TRAFFIC CONTROL APPROACH SIGN PACKAGE" SHOWN ON THE TRAFFIC CONTROL PLAN SHEETS. ADDITIONAL CONSTRUCTION APPROACH SIGNS SHALL BE INSTALLED AS REQUIRED BY THE ENGINEER PER STANDARDS T-1, T-10 AND T-17.
- 19. THE SIGNAL SYSTEM SHALL UTILIZE VEHICLE DETECTION AND BE PROGRAMMED TO DWELL ON RED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIGNAL PHASING AND TIMING. THE CONTRACTOR SHALL SUBMIT A PHASING DIAGRAM TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL MAKE SIGNALS OPERATIONAL ONLY AFTER RECEIVING APPROVAL OF THE PHASING DIAGRAM BY THE ENGINEER.

PROJECT NAME: IRASBURG
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266frm.dgn
PROJECT LEADER: M. CHENETTE
DESIGNED BY: J. HUNGERFORD
PROJECT NOTES

PLOT DATE: 10/21/2014
DRAWN BY: L. BUXTON
CHECKED BY: M. CHENETTE
SHEET 4 OF 55



STATE OF VERMONT AGENCY OF TRANSPORTATION													QUANTITY SHEET 1											
SUMMARY OF ESTIMATED QUANTITIES													TOTALS		DESCRIPTIONS					DETAILED SUMMARY OF QUANTITIES				
								ROADWAY	EROSION CONTROL	BRIDGE NO. 6	BRIDGE NO. 7	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 (VT 58 - BRIDGE NO. 6)	201.10							
								1					1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (VT 58 - BRIDGE NO. 7)	201.10							
								1260					1260		CY	COMMON EXCAVATION	203.15							
										600	540		1140		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27							
								1					1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22							
										1620	960		2580		CY	STRUCTURE EXCAVATION	204.25							
										870	330		1200		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30							
											1		1		LS	COFFERDAM (OUTLET, STA. 1+85.00)	208.40							
								680					680		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10							
								940					940		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35							
								1					1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50							
										5	5		10		GAL	WATER REPELLENT, SILANE	514.10							
										220	200		420		SY	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	519.20							
											1		1		EACH	REMOVAL OF STRUCTURE (96" X 65' CGMP)	529.15							
										1			1		EACH	REMOVAL OF STRUCTURE (96" X 90' CGMP)	529.15							
											1		1		LS	PRECAST CONCRETE STRUCTURE (20'-0" X 10'-0" X 56'-0" BOX)	540.10							
										1			1		LS	PRECAST CONCRETE STRUCTURE (20'-0" X 8'-0" X 66'-6" BOX)	540.10							
								1					1		MGAL	DUST CONTROL WITH WATER	609.10							
								1					1		TON	DUST AND ICE CONTROL WITH CALCIUM CHLORIDE	609.15							
										100	410		510		CY	STONE FILL, TYPE III	613.12							
											210		210		CY	RIPRAP, HEAVY TYPE	613.15							
								263					263		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20							
								638					638		LF	STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS	621.205							
								150					150		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED	621.21							
								50					50		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED/NESTED	621.216							
								8					8		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60							
								1063					1063		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80							
										170	230		400		TON	CRUSHED STONE BEDDING	629.54							
								20					20		HR	UNIFORMED TRAFFIC OFFICERS	630.10							
								100					100		HR	FLAGGERS	630.15							
												1	1		LS	FIELD OFFICE, ENGINEERS	631.10							
												1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17							
												3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26							
								1					1		LS	MOBILIZATION/DEMOBILIZATION	635.11							
								1230					1230		LF	DURABLE 4 INCH WHITE LINE	646.400							
								1230					1230		LF	DURABLE 4 INCH YELLOW LINE	646.410							
										310	440		750		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11							
										100	570		670		SY	GEOTEXTILE UNDER STONE FILL	649.31							
									60				60		SY	GEOTEXTILE FOR SILT FENCE	649.51							
NOTE: FOR DETAILED BREAKDOWN OF QUANTITIES BETWEEN BR6 AND BR7 SEE BR6 AND BR7 QUANTITY SHEETS																								
																	PROJECT NAME: IRASBURG PROJECT NUMBER: STP CULV(30)							
																	FILE NAME: zllc266frm.dgn PROJECT LEADER: M. CHENETTE DESIGNED BY: J. HUNGERFORD QUANTITY SHEET 1							
																	PLOT DATE: 9/26/2014 DRAWN BY: L. BUXTON CHECKED BY: M. CHENETTE SHEET 5 OF 55							



**STATE OF VERMONT
AGENCY OF TRANSPORTATION**

QUANTITY SHEET 2

[illegible]

NOTE: FOR DETAILED BREAKDOWN OF QUANTITIES BETWEEN BR6 AND
BR7 SEE BR6 AND BR7 QUANTITY SHEETS

PROJECT NAME: IRASBURG
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266frm.dgn	PLOT DATE: 10/21/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
QUANTITY SHEET 2	SHEET 6 OF 55



BR6 QUANTITY SHEET I

SUMMARY OF ESTIMATED QUANTITIES												TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
								ROADWAY	EROSION CONTROL	BRIDGE NO. 6	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 (VT 58 - BRIDGE NO. 6)	201.10				
								680				680		CY	COMMON EXCAVATION	203.15				
										600		600		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27				
								0.5				0.5		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22				
										1620		1620		CY	STRUCTURE EXCAVATION	204.25				
										870		870		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				
								340				340		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10				
								500				500		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35				
								0.5				0.5		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				
										5		5		GAL	WATER REPELLENT, SILANE	514.10				
										220		220		SY	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	519.20				
										1		1		EACH	REMOVAL OF STRUCTURE (96" X 90' CGMP)	529.15				
										1		1		LS	PRECAST CONCRETE STRUCTURE (20'-0" X 8'-0" X 66'-6" BOX)	540.10				
								0.5				0.5		MGAL	DUST CONTROL WITH WATER	609.10				
								0.5				0.5		TON	DUST AND ICE CONTROL WITH CALCIUM CHLORIDE	609.15				
										100		100		CY	STONE FILL, TYPE III	613.12				
								638				638		LF	STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS	621.205				
								4				4		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
								625				625		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
										170		170		TON	CRUSHED STONE BEDDING	629.54				
								10				10		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
								50				50		HR	FLAGGERS	630.15				
											0.5	0.5		LS	FIELD OFFICE, ENGINEERS	631.10				
											0.5	0.5		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
											1500	1500		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
								0.5				0.5		LS	MOBILIZATION/DEMOBILIZATION	635.11				
								640				640		LF	DURABLE 4 INCH WHITE LINE	646.400				
								640				640		LF	DURABLE 4 INCH YELLOW LINE	646.410				
										310		310		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
										100		100		SY	GEOTEXTILE UNDER STONE FILL	649.31				
									30			30		SY	GEOTEXTILE FOR SILT FENCE	649.51				
								30				30		LB	SEED	651.15				
								200				200		LB	FERTILIZER	651.18				
								1				1		TON	AGRICULTURAL LIMESTONE	651.20				
								1				1		TON	HAY MULCH	651.25				
								130				130		CY	TOPSOIL	651.35				
								100				100		SY	GRUBBING MATERIAL	651.40				
									1			1		LS	EPSC PLAN (VT 58 - BRIDGE NO. 6)	652.10				
									40			40		HR	MONITORING EPSC PLAN	652.20				
									1			1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.) (VT 58 - BRIDGE NO. 6)	652.30				

PROJECT NAME: IRASBURG

PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266frm.dgn

PROJECT LEADER: M. CHENETTE

DESIGNED BY: J. HUNGERFORD

BR6 QUANTITY SHEET I

PLOT DATE: 9/26/2014

DRAWN BY: L. BUXTON

CHECKED BY: M. CHENETTE

SHEET 7 OF 55



BR6 QUANTITY SHEET 2

[illegible]

PROJECT NAME: IRASBURG
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266frm.dgn
PROJECT LEADER: M. CHENETTE
DESIGNED BY: J. HUNGERFORD
BR6 QUANTITY SHEET 2

PLOT DATE: 9/26/2014
DRAWN BY: L. BUXTON
CHECKED BY: M. CHENETTE
SHEET 8 OF 55



BR7 QUANTITY SHEET I

SUMMARY OF ESTIMATED QUANTITIES													TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
								ROADWAY	EROSION CONTROL ITEMS -	BRIDGE NO. 7	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 (VT 58 - BRIDGE NO. 7)	201.10				
								580					580		CY	COMMON EXCAVATION	203.15				
										540			540		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27				
								0.5					0.5		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22				
										960			960		CY	STRUCTURE EXCAVATION	204.25				
										330			330		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				
										1			1		LS	COFFERDAM (OUTLET, STA. 1+85.00)	208.40				
								340					340		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10				
								440					440		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35				
								0.5					0.5		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				
										5			5		GAL	WATER REPELLENT, SILANE	514.10				
										200			200		SY	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	519.20				
										1			1		EACH	REMOVAL OF STRUCTURE (96" X 85' CGMP)	529.15				
										1			1		LS	PRECAST CONCRETE STRUCTURE (20'-0" X 10'-0" X 56'-0" BOX)	540.10				
								0.5					0.5		MGAL	DUST CONTROL WITH WATER	609.10				
								0.5					0.5		TON	DUST AND ICE CONTROL WITH CALCIUM CHLORIDE	609.15				
										410			410		CY	STONE FILL, TYPE III	613.12				
										210			210		CY	RIPRAP, HEAVY TYPE	613.15				
								263					263		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20				
								150					150		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED	621.21				
								50					50		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED/NESTED	621.216				
								4					4		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
								438					438		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
										230			230		TON	CRUSHED STONE BEDDING	629.54				
								10					10		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
								50					50		HR	FLAGGERS	630.15				
											0.5		0.5		LS	FIELD OFFICE, ENGINEERS	631.10				
											0.5		0.5		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
											1500		1500		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26				
								0.5					0.5		LS	MOBILIZATION/DEMOBILIZATION	635.11				
								590					590		LF	DURABLE 4 INCH WHITE LINE	646.400				
								590					590		LF	DURABLE 4 INCH YELLOW LINE	646.410				
										440			440		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
										570			570		SY	GEOTEXTILE UNDER STONE FILL	649.31				
									30				30		SY	GEOTEXTILE FOR SILT FENCE	649.51				
								10					10		LB	SEED	651.15				
								70					70		LB	FERTILIZER	651.18				
								1					1		TON	AGRICULTURAL LIMESTONE	651.20				
								1					1		TON	HAY MULCH	651.25				
								50					50		CY	TOPSOIL	651.35				

PROJECT NAME: IRASBURG
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266frm.dgn
PROJECT LEADER: M. CHENETTE
DESIGNED BY: J. HUNGERFORD
BR7 QUANTITY SHEET I

PLOT DATE: 9/26/2014
DRAWN BY: L. BUXTON
CHECKED BY: M. CHENETTE
SHEET 9 OF 55



BR7 QUANTITY SHEET 2

[illegible]

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 STONE/WOOD
⊕	RRSIG RAILROAD SIGNAL
⊕	RRSL RAILROAD SWITCH LEVER
⊕	S TREE SOFTWOOD
⊕	SAT SATELLITE DISH
⊕	SHRUB SHRUB
⊕	SIGN SIGN
⊕	STUMP STUMP
⊕	TEL TELEPHONE POLE
○	TIE TIE
⊕	TSIGN SIGN W/DOUBLE POST
⊕	VCTRL CONTROL VERTICAL
○	WELL WELL
×	WSO WATER SHUT OFF

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

PROPOSED GEOMETRY CODES

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

UTILITY SYMBOLGY

UNDERGROUND UTILITIES

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

ABOVE GROUND UTILITIES (AERIAL)

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

PROJECT CONSTRUCTION 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 — PDF —	PROJECT DEMARCATION FENCE
BF — BF —	BARRIER FENCE
XXXXXXXXXXXXXXXXXX	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. (LIMITED ACCESS)
———	STATE ROW (LIMITED ACCESS)	STATE ROW (LIMITED ACCESS)
———	STATE ROW	STATE ROW
———	TOWN ROW	TOWN ROW
———	PERMANENT EASEMENT LINE (P)	PERMANENT EASEMENT LINE (P)
———	TEMPORARY EASEMENT LINE (T)	TEMPORARY EASEMENT LINE (T)
———	SURVEY LINE	SURVEY LINE
———	PROPERTY LINE (P/L)	PROPERTY LINE (P/L)
△ — SR — SR — SR —	SLOPE RIGHTS	SLOPE RIGHTS
6f — 6f —	6F PROPERTY BOUNDARY	6F PROPERTY BOUNDARY
4f — 4f —	4F PROPERTY BOUNDARY	4F PROPERTY BOUNDARY
HAZ — HAZ —	HAZARDOUS WASTE	HAZARDOUS WASTE

EPSC LAYOUT PLAN SYMBOLGY

EPSC MEASURES

ONNOONNOONNO	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
—————	THREATENED & ENDANGERED SPECIES
HAZ — HAZ —	HAZARDOUS WASTE AREA
AG — AG —	AGRICULTURAL LAND
HABITAT —	FISH & WILDLIFE HABITAT
FLOOD PLAIN —	FLOOD PLAIN
OHW — 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
(H)	HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLGY

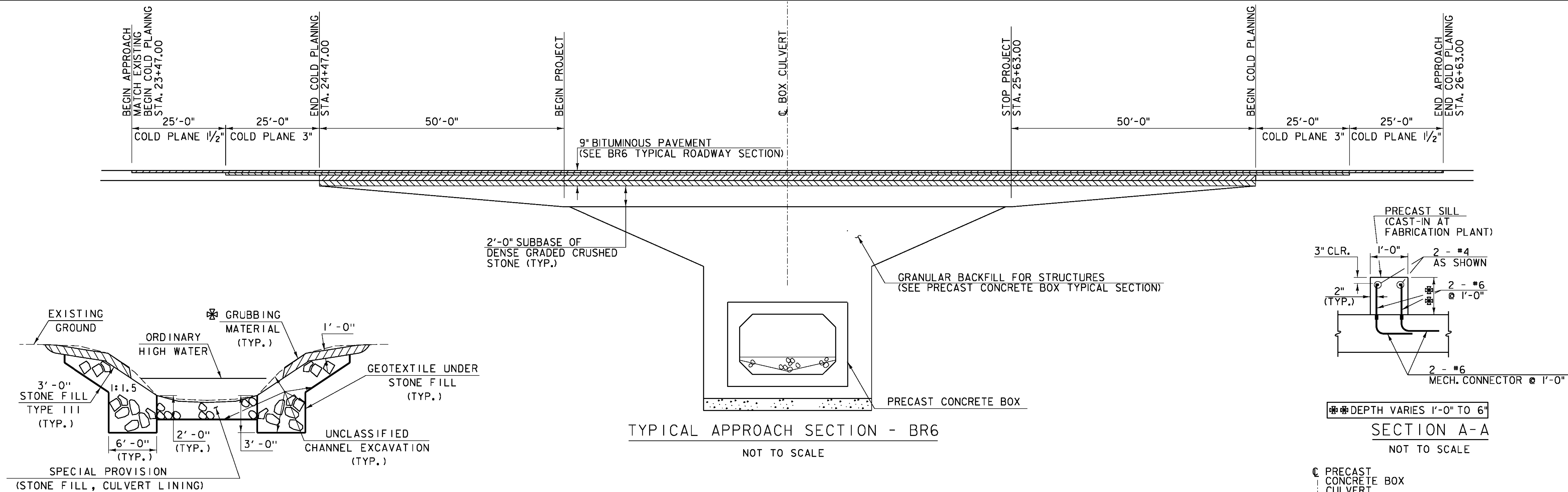
EXISTING FEATURES

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

PROJECT NAME:	IRASBURG
PROJECT NUMBER:	STP CULV(30)
FILE NAME:	zllc266legend.dgn
PROJECT LEADER:	M. CHENETTE
DESIGNED BY:	VTRANS
CONVENTIONAL SYMBOLGY LEGEND	PLOT DATE: 9/26/2014
	DRAWN BY: VTRANS
	CHECKED BY: VTRANS
	SHEET II OF 55

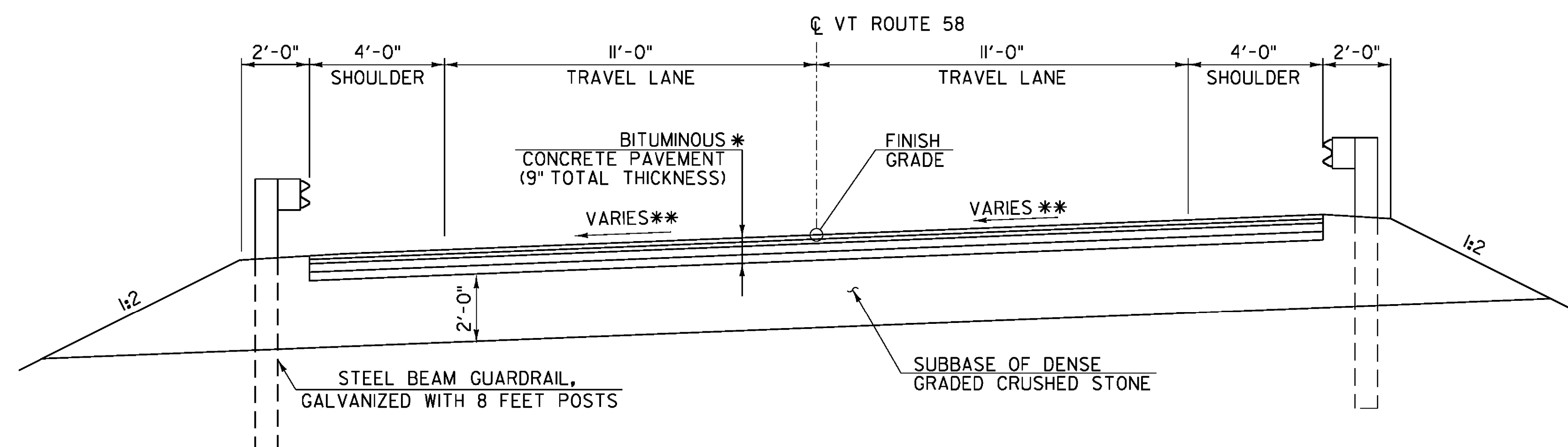






CHANNEL TYPICAL SECTION  
NOT TO SCALE

✱ WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.



* BITUMINOUS CONCRETE PAVEMENT:  
1/2" TYPE IVS OVER  
1/2" TYPE IVS OVER  
3" TYPE IIS OVER  
3" TYPE IIS

BR6 TYPICAL ROADWAY SECTION

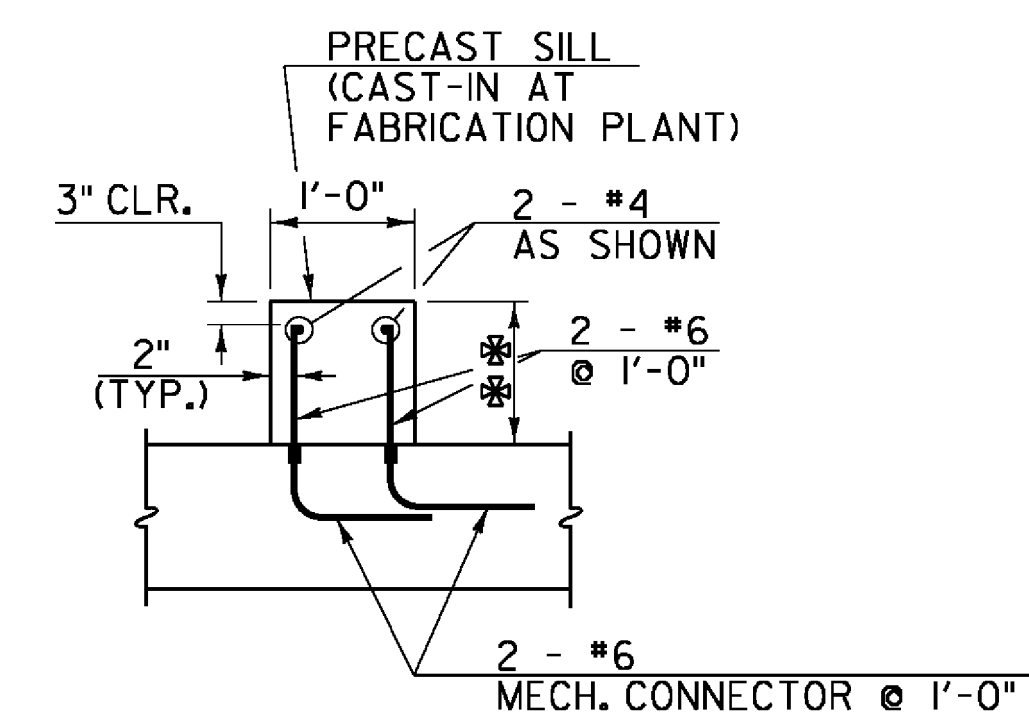
SCALE 3/8" = 1'-0"

** SEE BANKING DIAGRAM ON SHEET 15,  
MATCH EXISTING CROSS SLOPE ON APPROACHES.

MATERIAL TOLERANCES  
(IF USED ON PROJECT)

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

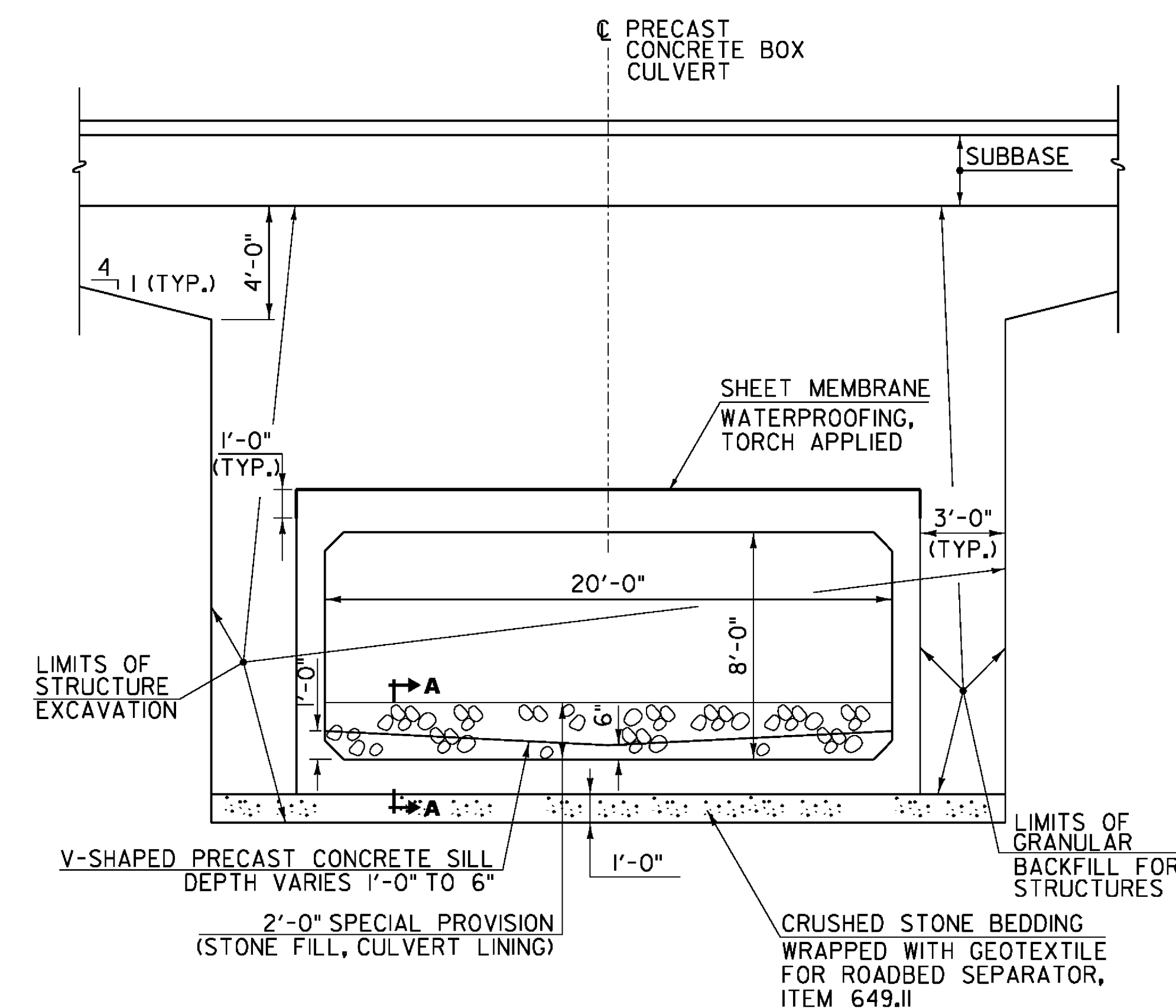
BUILT AS DESIGNED



✱ DEPTH VARIES 1'-0" TO 6"

SECTION A-A

NOT TO SCALE



PRECAST CONCRETE BOX TYPICAL SECTION - BR6

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

PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266typsec.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
TYPICAL SECTIONS - BR6

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 12 OF 55





GEODETIC CONTROL

Geodetic control was established from a static GPS survey on temporary marks. No descriptions are available. Horizontal values were derived from a network adjustment tied to the following Continuously Operating Reference Stations (CORS):

VTTH Hardwick  
VTIP Brighton  
VTD9 Derby

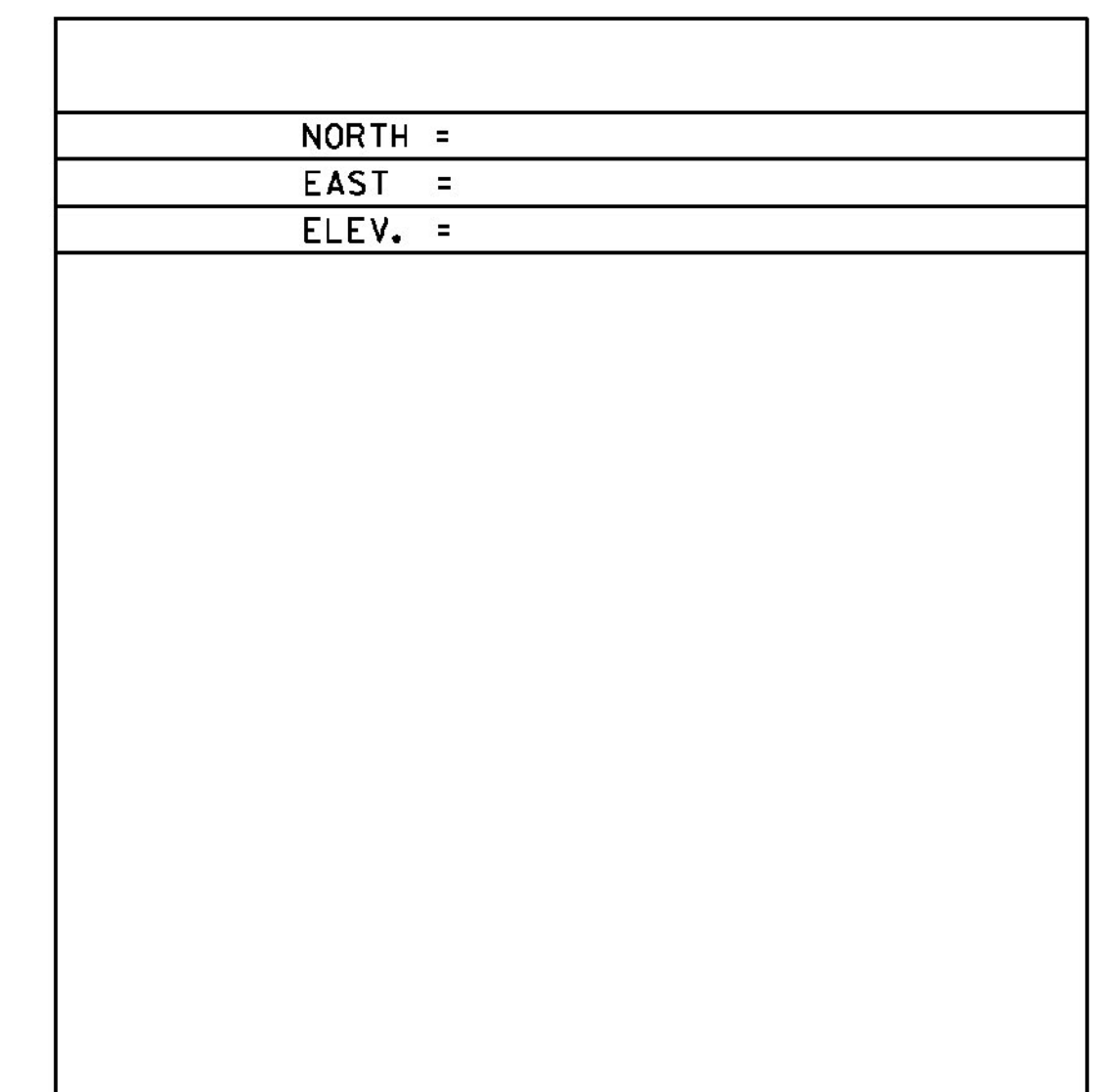
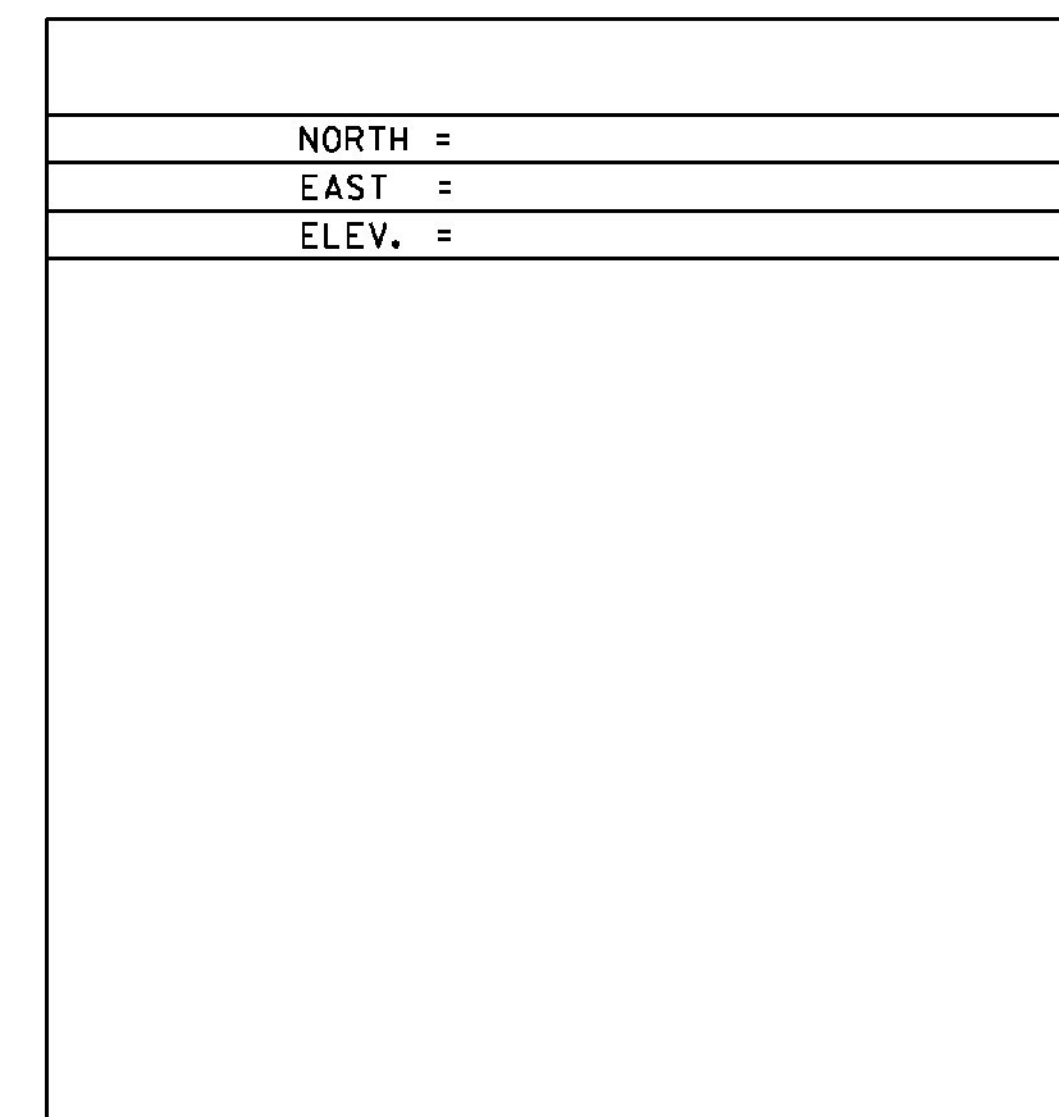
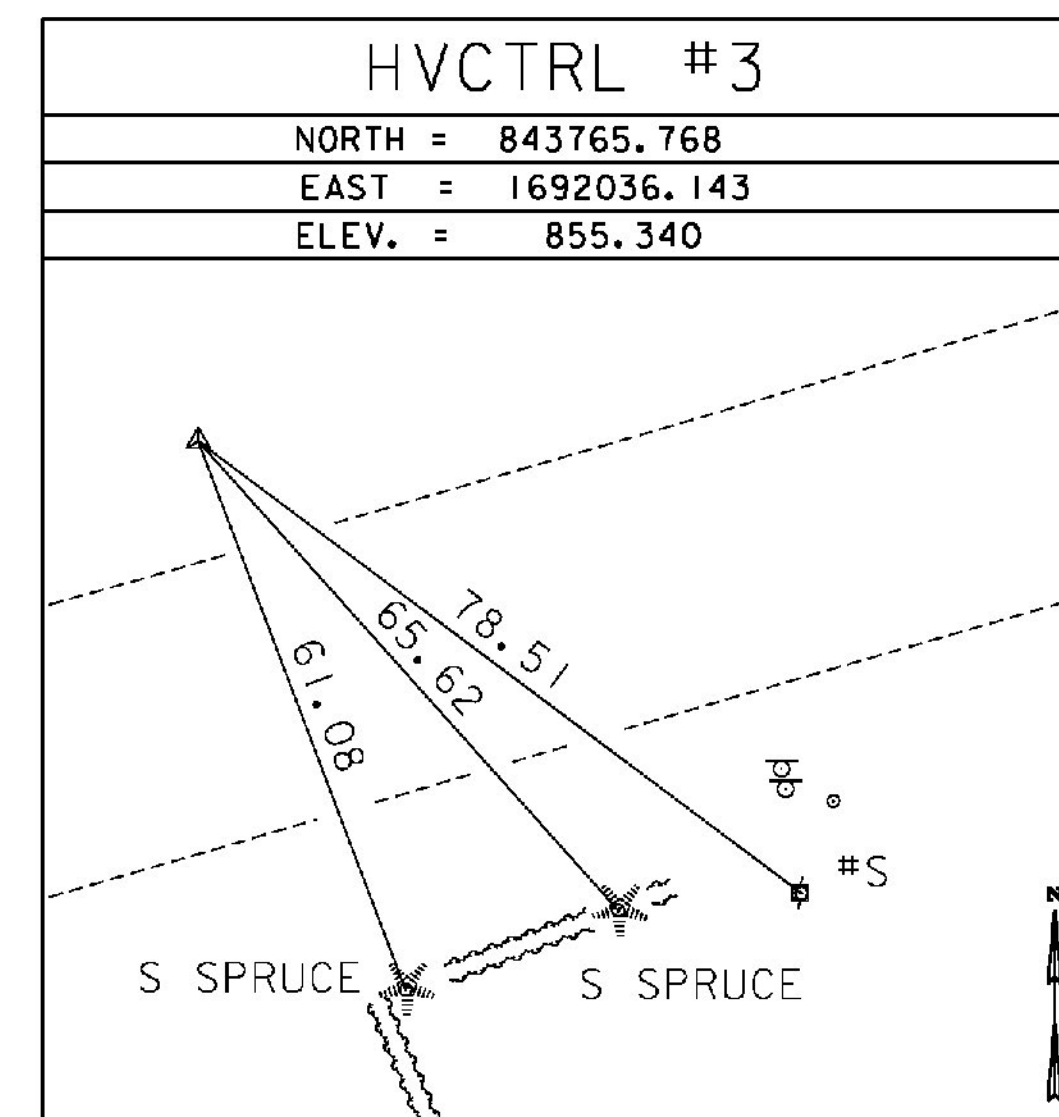
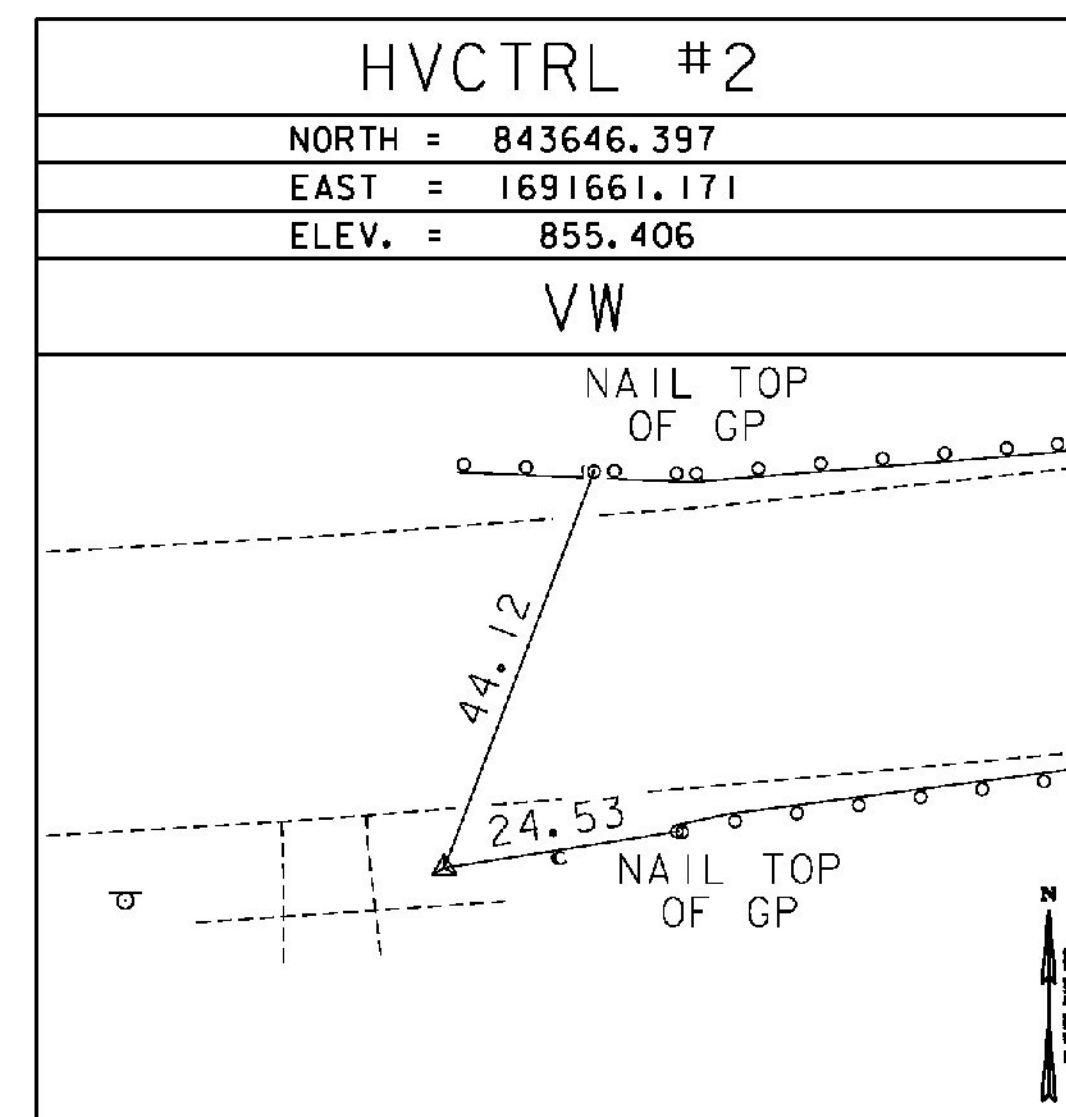
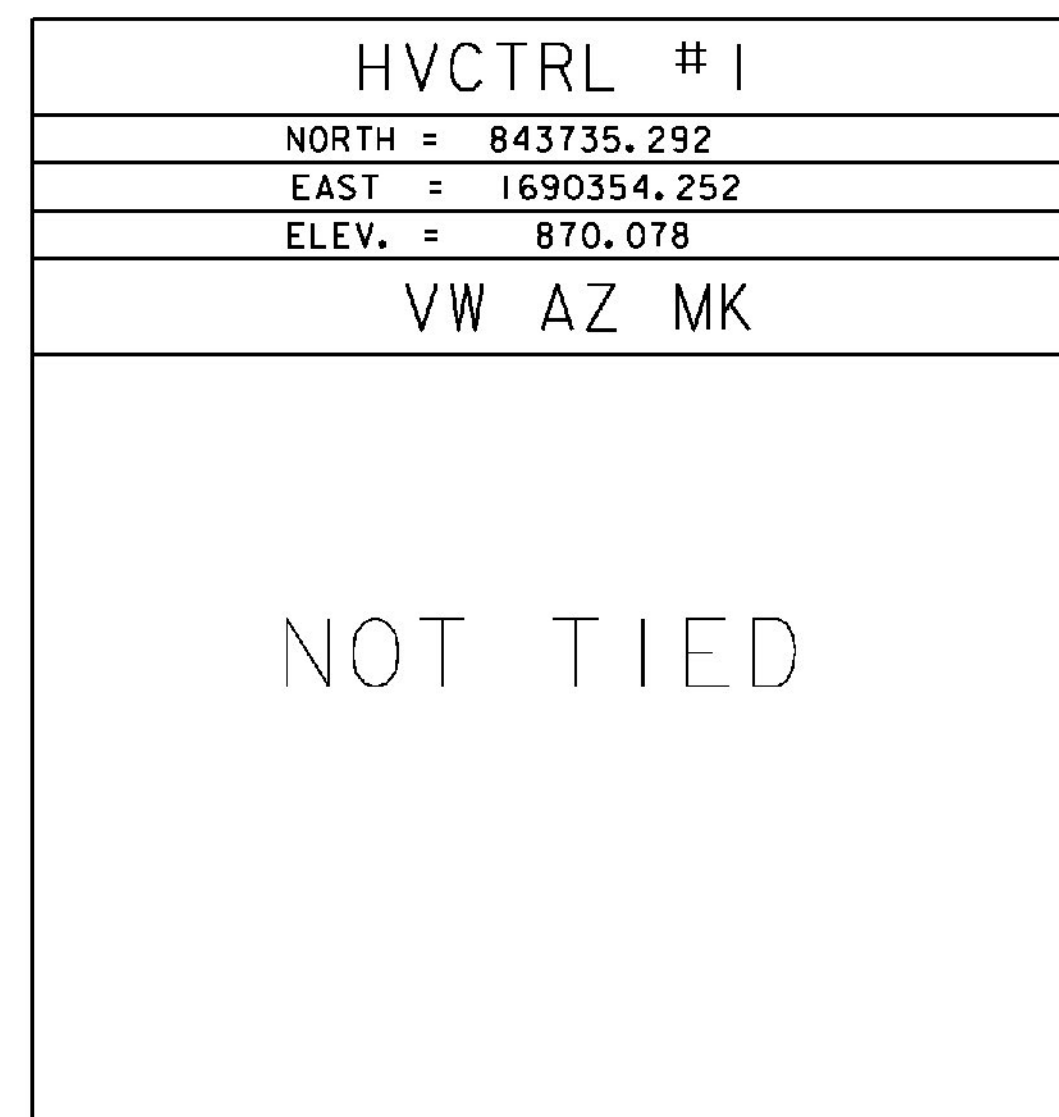
And the following Cooperative Base Network Control Station (CBN):

ASBESTOS

Elevations were computed from a network adjustment using GEOID 09 and local ties to the following benchmarks:

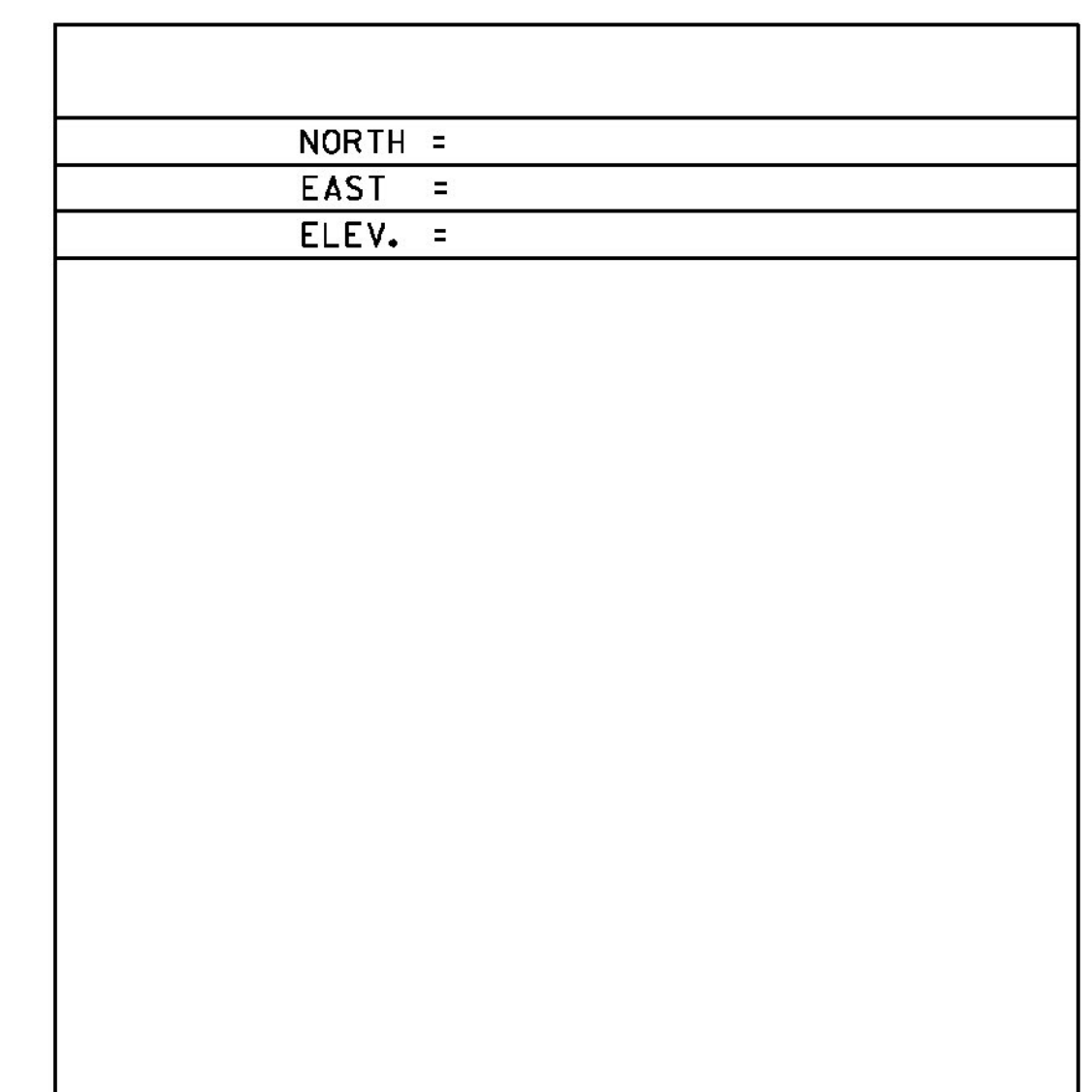
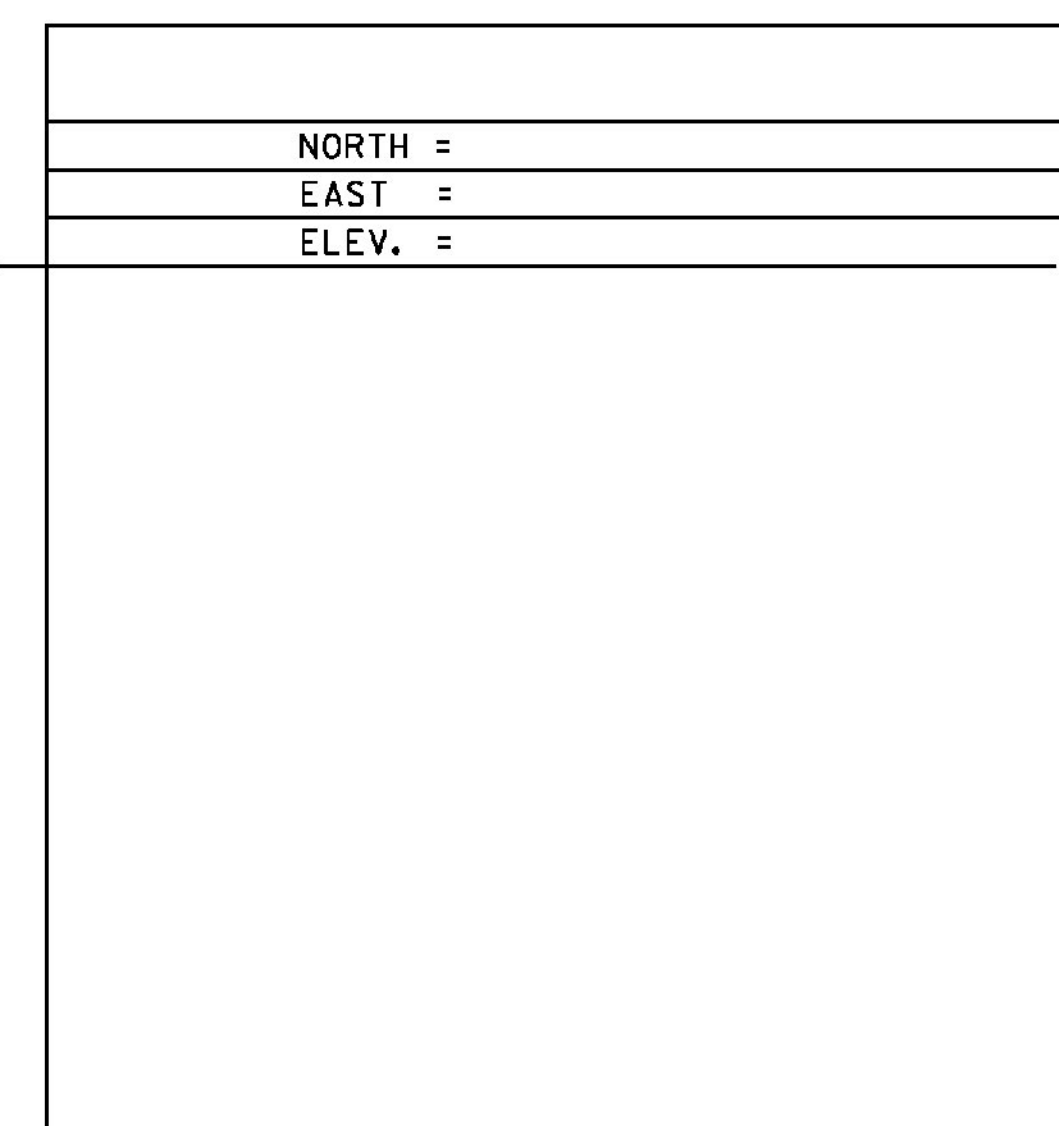
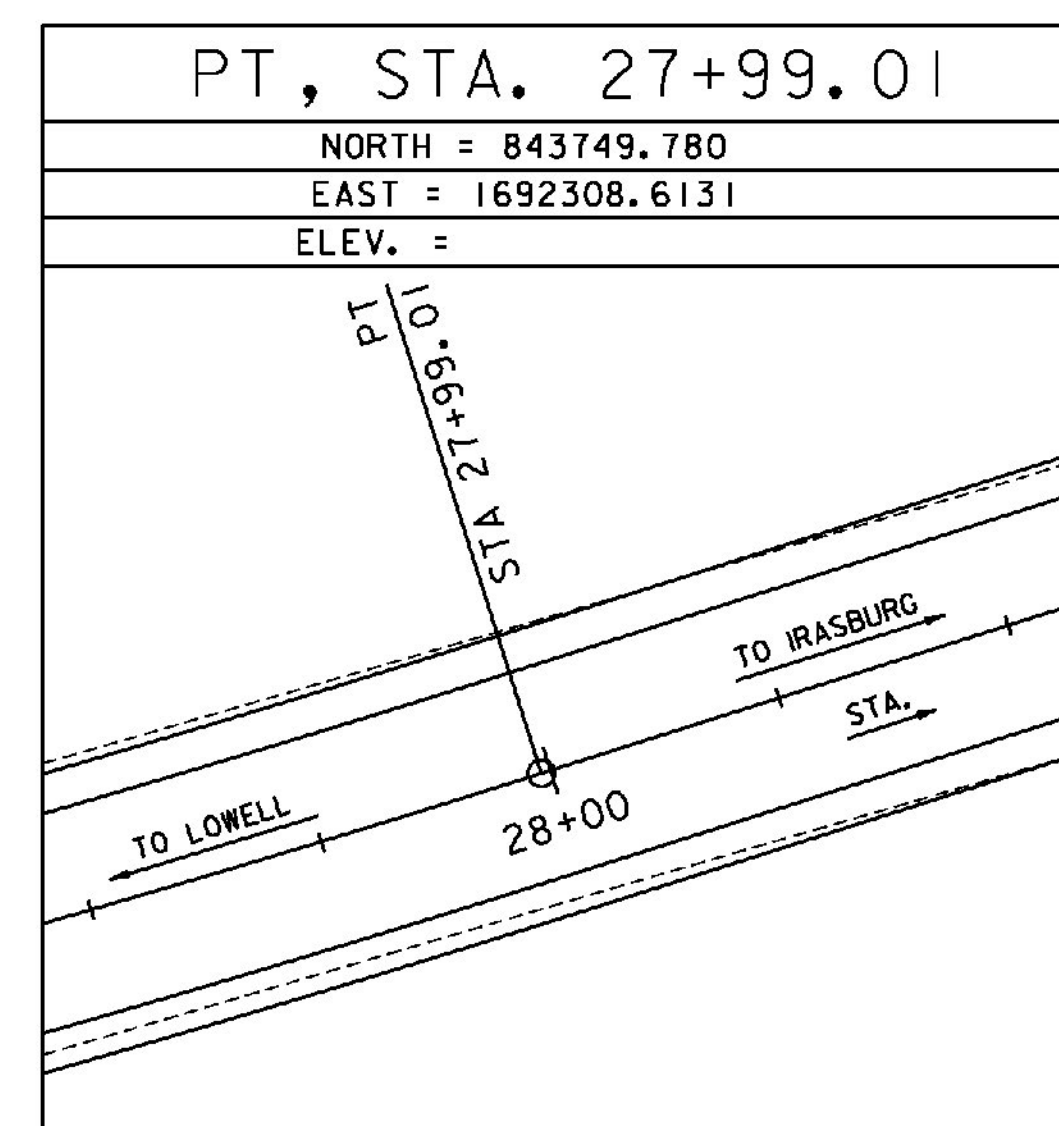
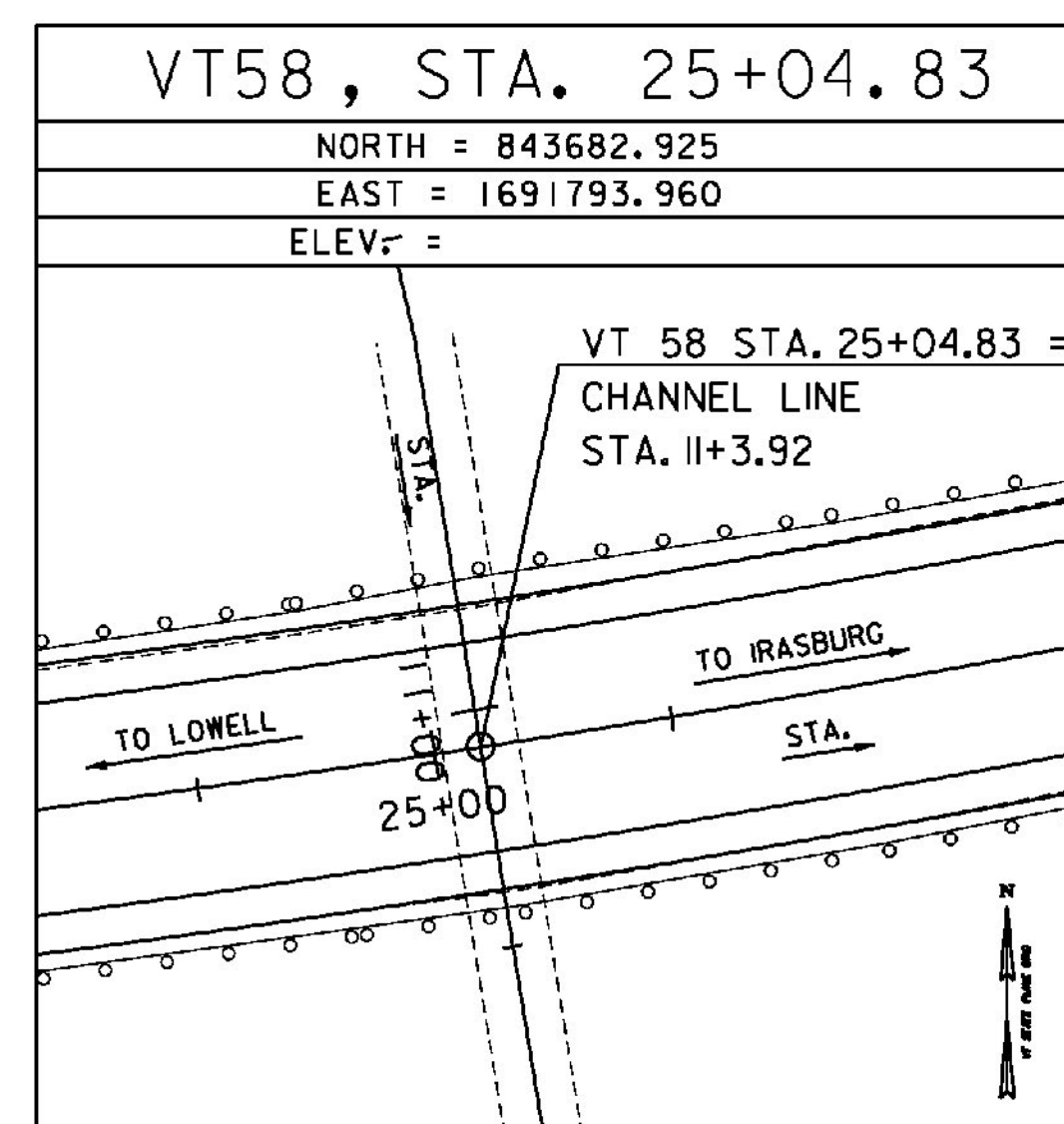
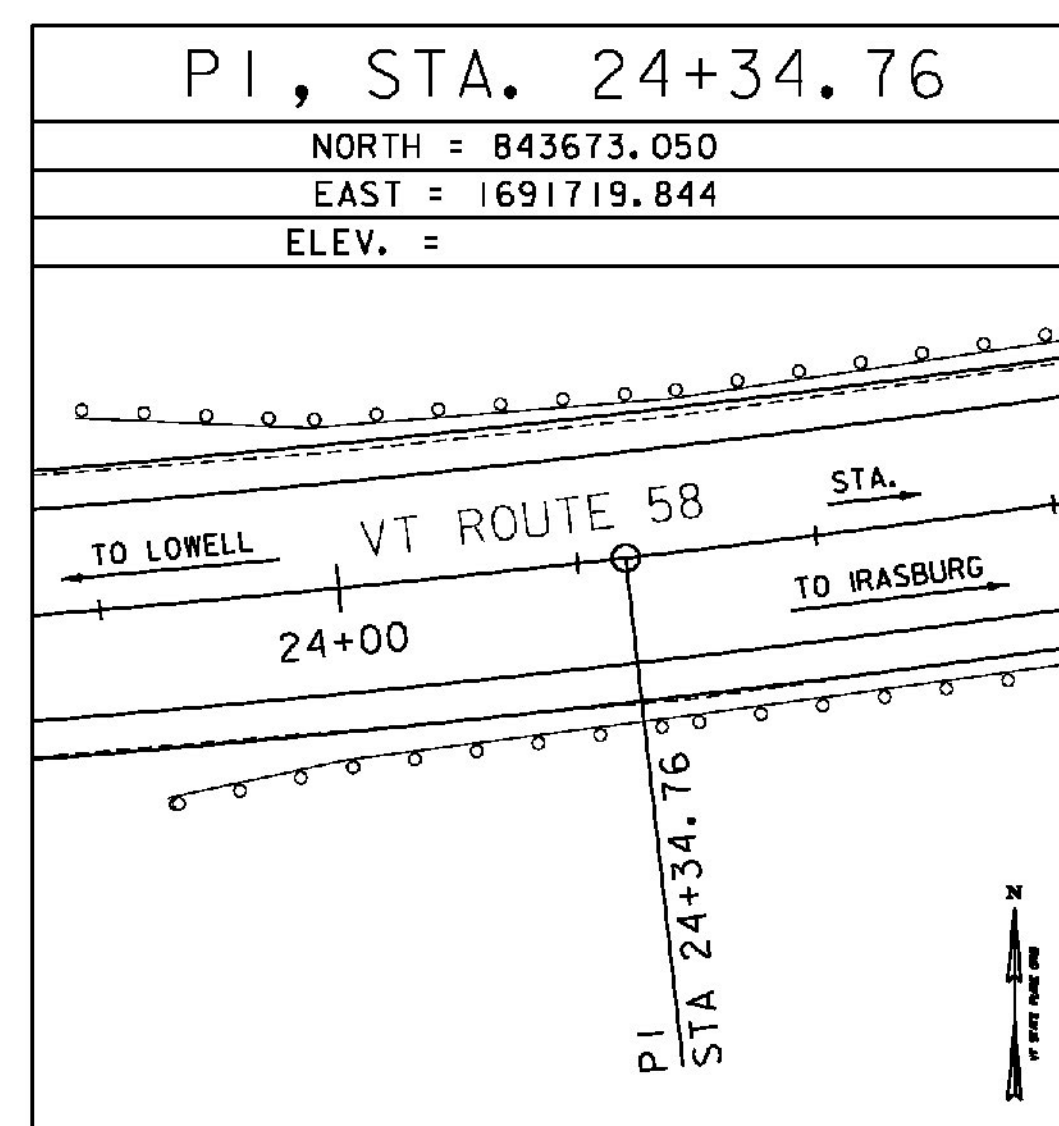
ASBESTOS  
D 55  
P 55

TRAVERSE TIES



* MAIN TRAVERSE COMPLETED 2/7/2012 BY R. GILMAN P.C. & P. WINTERS

ALIGNMENT TIES



DATUM			
VERTICAL	NAVD 88	ZONE	Vermont 4400
HORIZONTAL	NAD 83(07)	GEOID	GEOID09 (Conus)
ADJUSTMENT	COMPASS		



PROJECT NAME:	IRASBURG	PLOT DATE:	9/26/2014
PROJECT NUMBER:	STP CULV(30)	DRAWN BY:	L. BUXTON
FILE NAME:	z11c266+1e_br6.dgn	CHECKED BY:	M. CHENETTE
PROJECT LEADER:	M. CHENETTE	SHEET	13 OF 55
DESIGNED BY:	J. HUNGERFORD		
SURVEY CONTROL AND TIES - BR6			



621.205 - STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS  
STA. 23+70.18, LT. TO 26+94.55, LT. 23+70, LT. TO 26+95, LT.  
STA. 23+77.40, RT. TO 26+84.27, RT. 23+59, RT. TO 26+84, RT.

621.60 - ANCHOR FOR STEEL BEAM RAIL  
STA. 23+70.18, LT.  
STA. 23+77.40, RT. 23+59  
STA. 26+84.27, RT.  
STA. 26+94.55, LT. 26+95

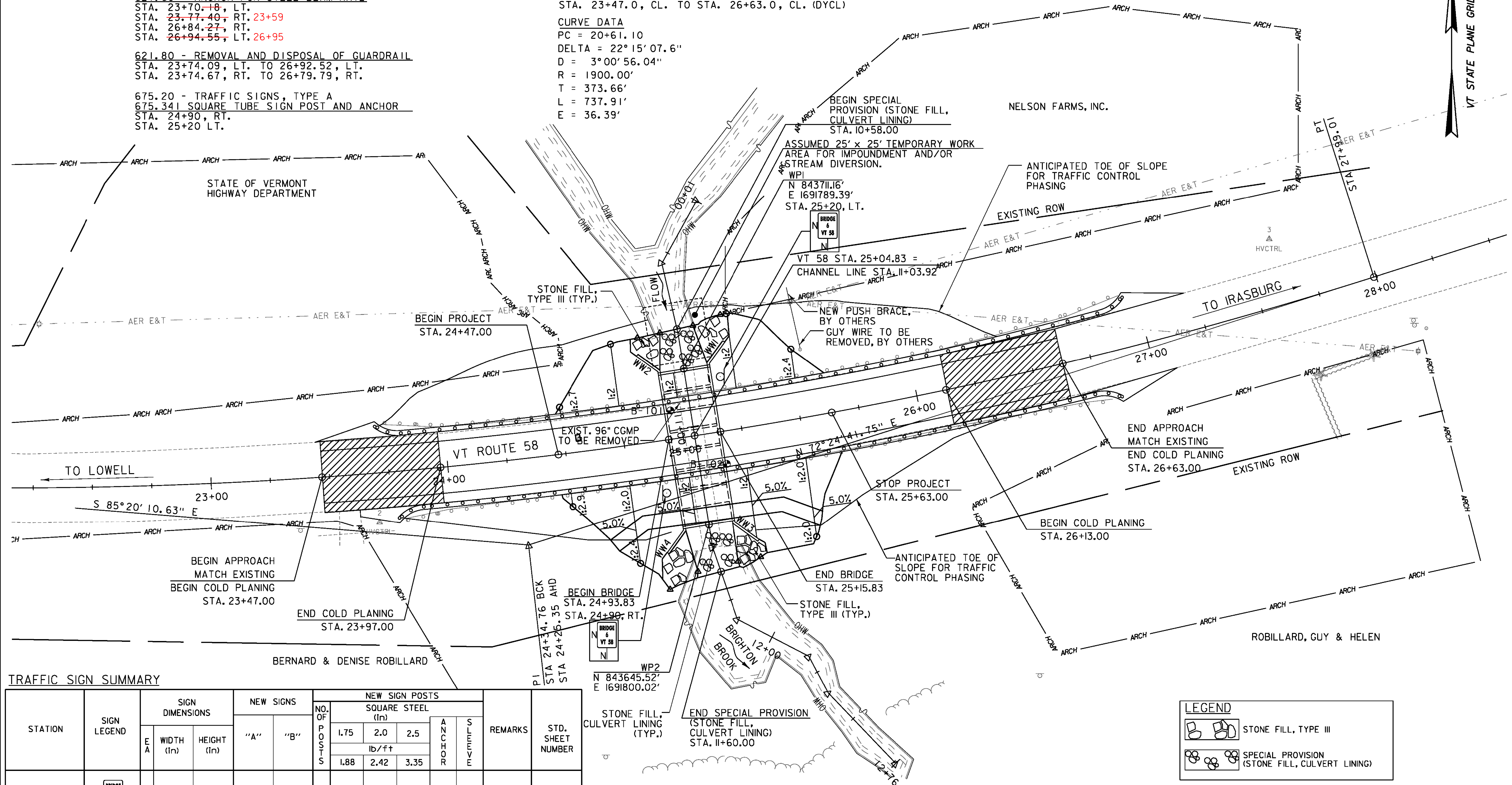
621.80 - REMOVAL AND DISPOSAL OF GUARDRAIL  
STA. 23+74.09, LT. TO 26+92.52, LT.  
STA. 23+74.67, RT. TO 26+79.79, RT.

675.20 - TRAFFIC SIGNS, TYPE A  
675.341 SQUARE TUBE SIGN POST AND ANCHOR  
STA. 24+90, RT.  
STA. 25+20 LT.

646.400- DURABLE 4 INCH WHITE LINE  
STA. 23+47.0, RT. TO STA. 26+63.0, RT.  
STA. 23+47.0, LT. TO STA. 26+63.0, LT.

646.410- DURABLE 4 INCH YELLOW LINE  
STA. 23+47.0, CL. TO STA. 26+63.0, CL. (DYCL)

CURVE DATA  
PC = 20+61.10  
DELTA = 22° 15' 07.6"  
D = 3° 00' 56.04"  
R = 1900.00'  
T = 373.66'  
L = 737.91'  
E = 36.39'



#### TRAFFIC SIGN SUMMARY

STATION	SIGN LEGEND	SIGN DIMENSIONS		NEW SIGNS		NO. OF POSTS	NEW SIGN POSTS					REMARKS	STD. SHEET NUMBER	
							SQUARE STEEL (In)							
		E A	WIDTH (In)	HEIGHT (In)	“A”		“B”	1.75	2.0	2.5	ANCHOR			S H E E T
								lb/ft						
								1.88	2.42	3.35				
24+90, RT		I	6	8	0.33		I	X			X		VR-701	T-42
25+20, LT		I	6	8	0.33		I	X			X		VR-701	T-42
TOTALS					SF 0.66	SF		FT 30						

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

PLAN  
SCALE: 1" = 20'-0"  
0 20 40

LEGEND	
	STONE FILL, TYPE III
	SPECIAL PROVISION (STONE FILL, CULVERT LINING)

NOTES:  
1. GRADE IN ACCORDANCE WITH TYPICAL ROADWAY SECTION AND ROADWAY CROSS SECTIONS UNLESS NOTED OTHERWISE.

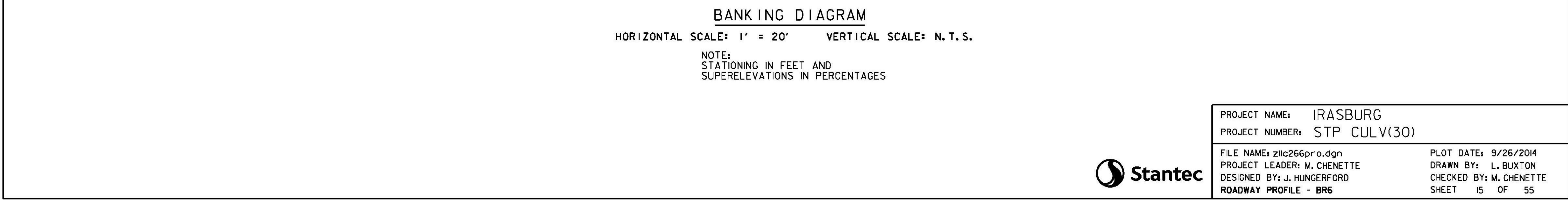
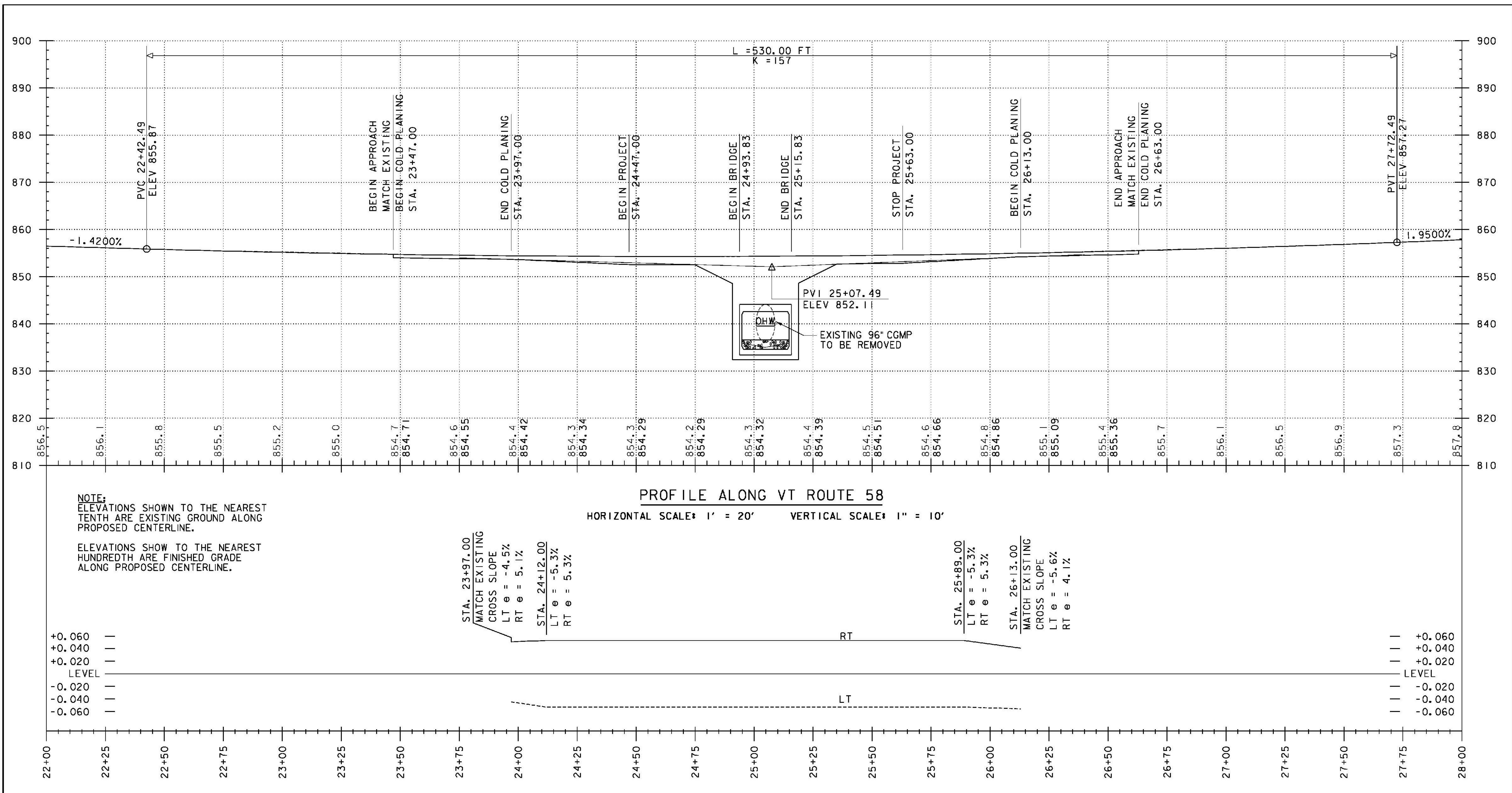
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266bdr_br6.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
PLAN LAYOUT SHEET - BR6

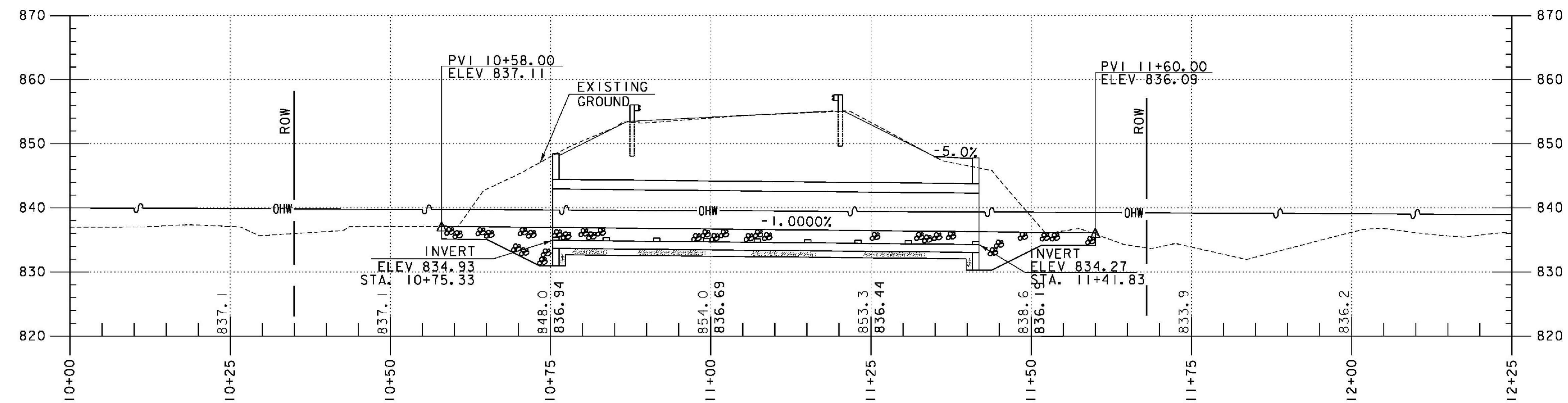
PLOT DATE: 10/21/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 14 OF 55



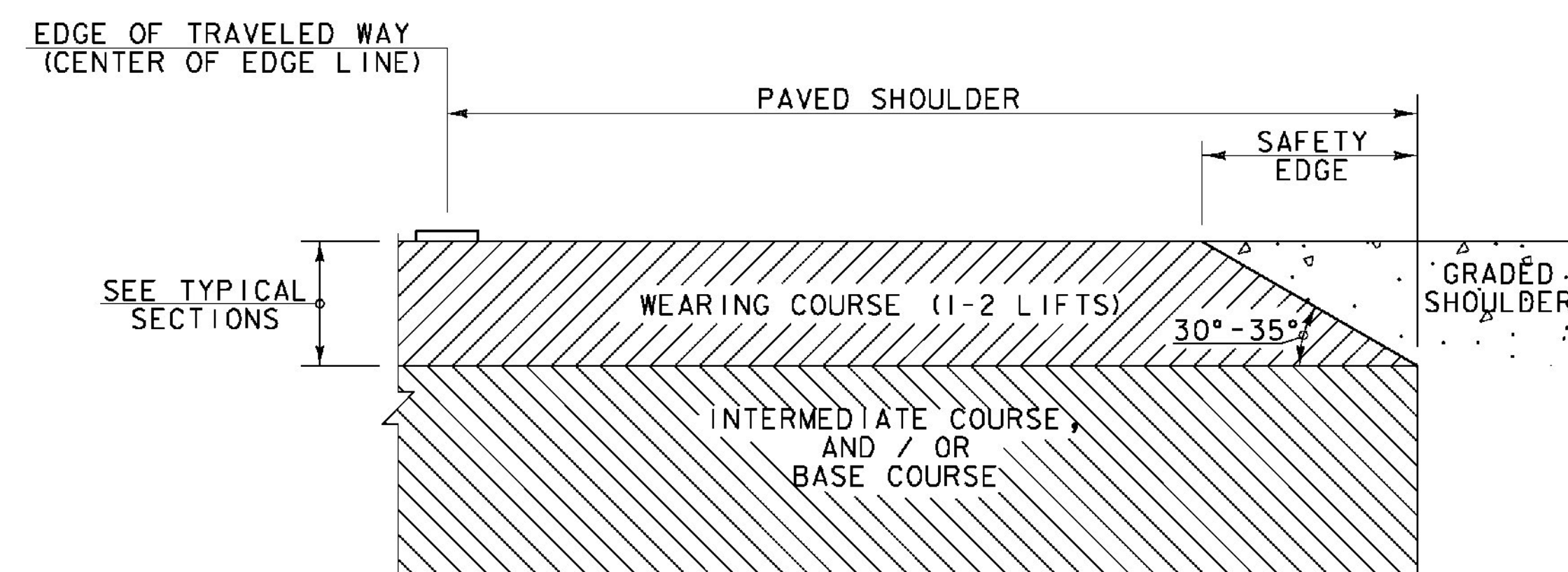
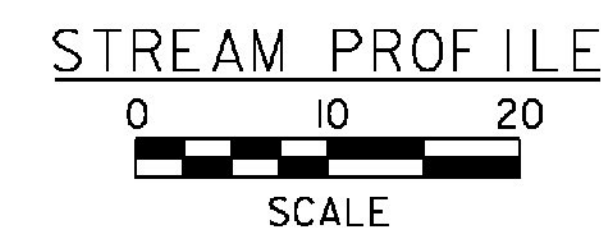








NOTE:  
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG PROPOSED CENTERLINE.  
  
ELEVATIONS SHOW TO THE NEAREST HUNDREDTH ARE FINISHED GRADE ALONG PROPOSED CENTERLINE.

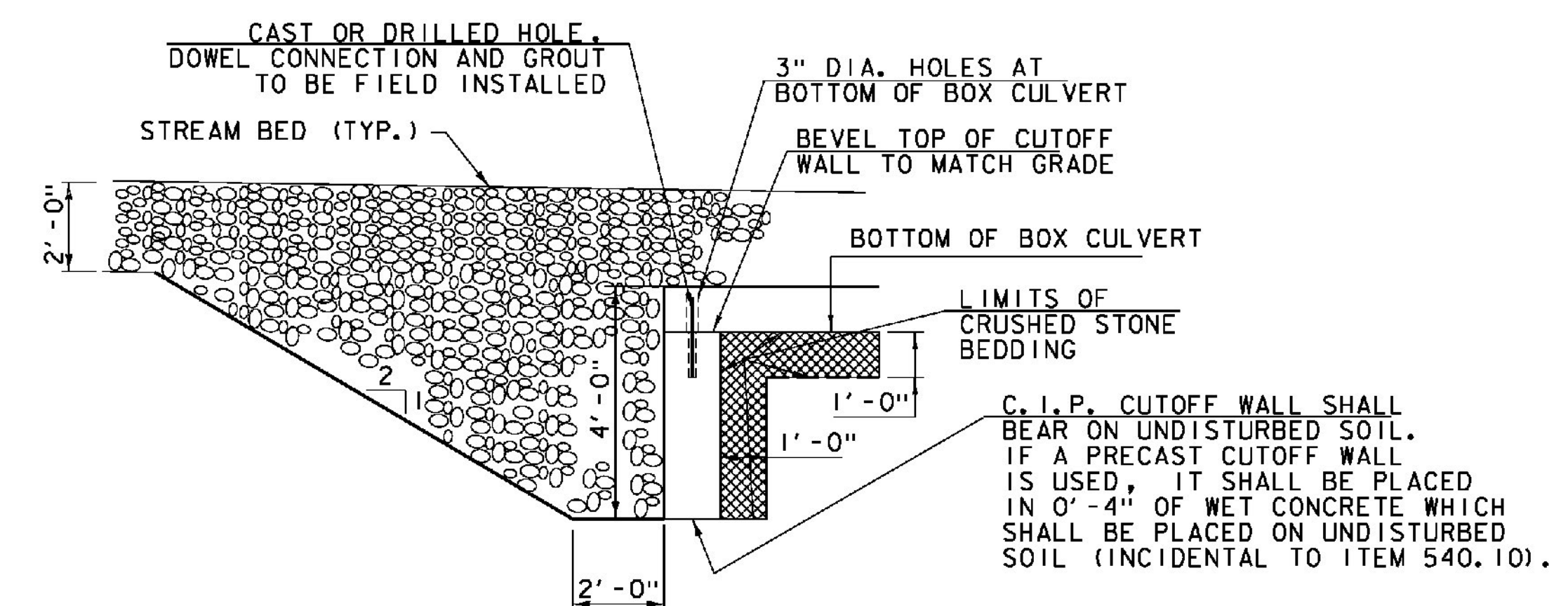


**SAFETY EDGE DETAIL**

NOT TO SCALE

**NOTES:**

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



**CUTOFF WALL DETAIL**

NOT TO SCALE

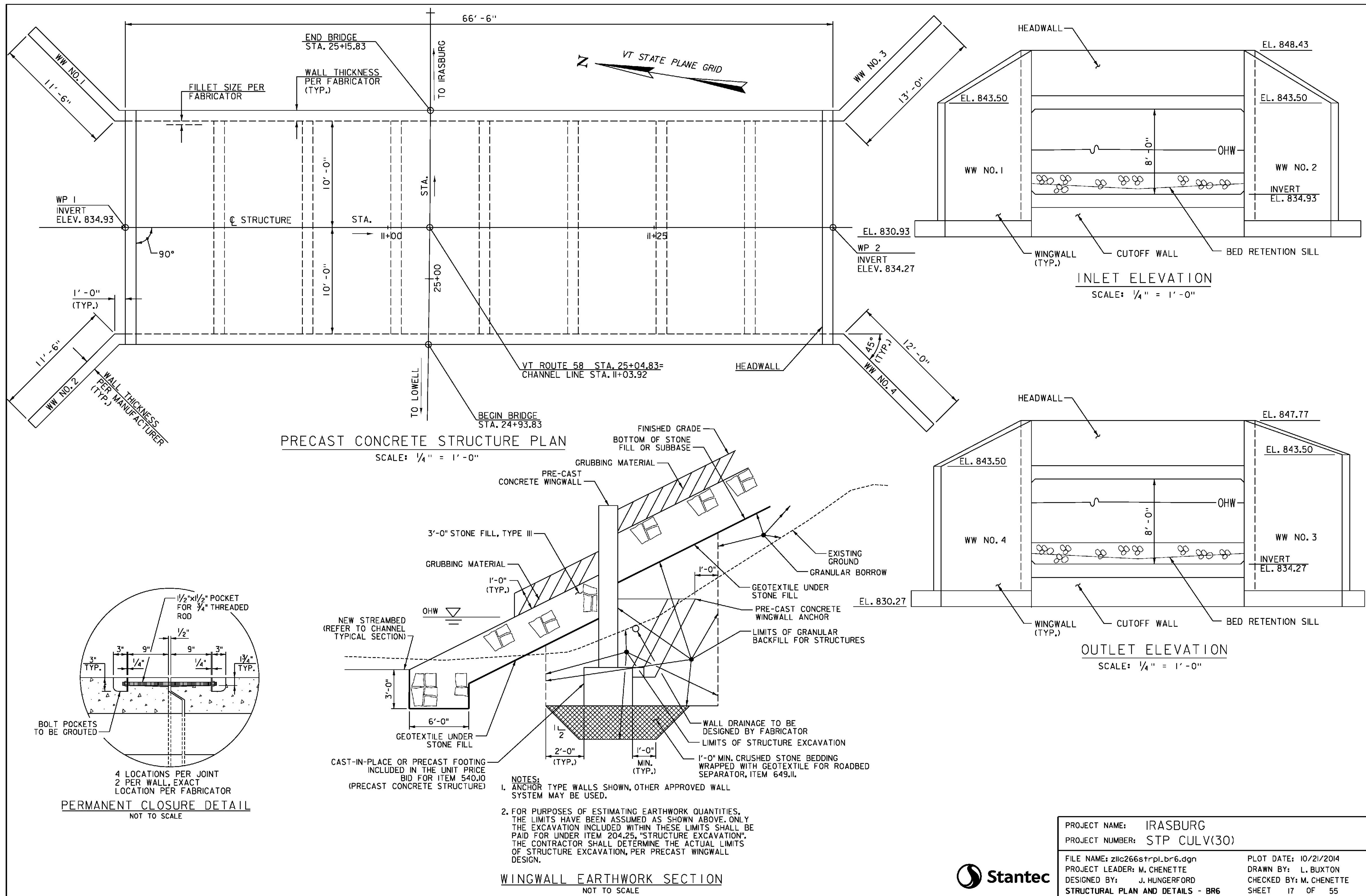
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266strm.pro.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
STREAM PROFILE - BR6

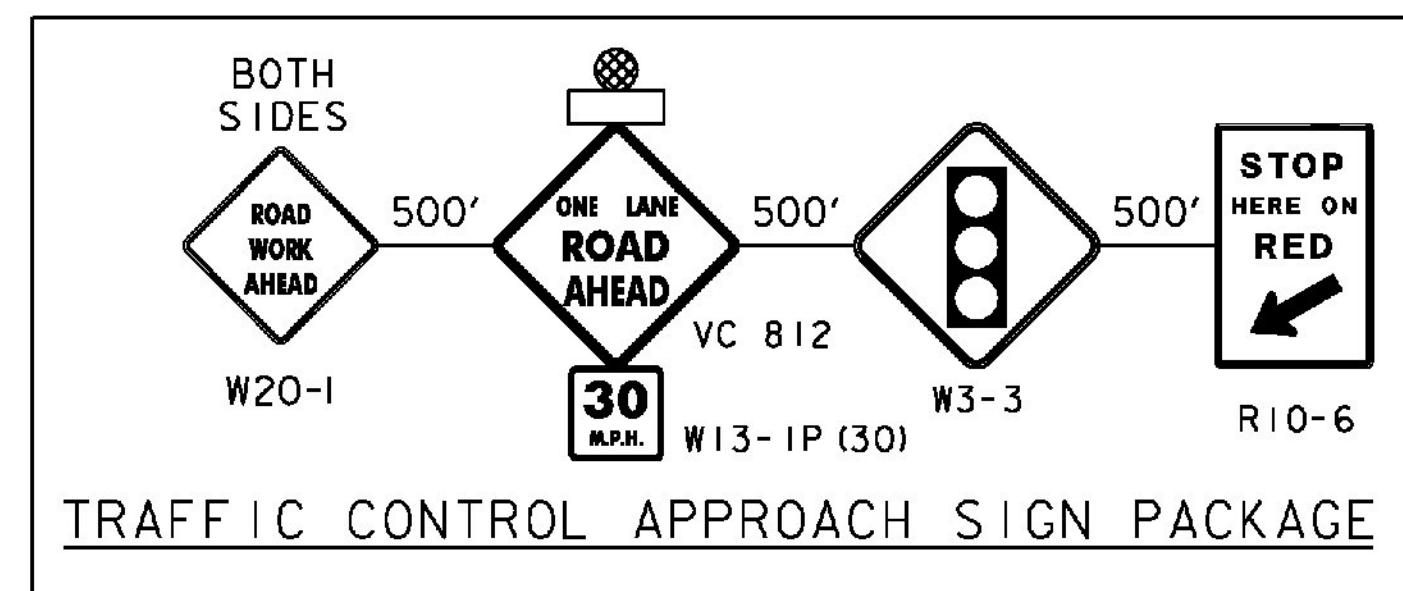
PLOT DATE: 10/21/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 16 OF 55









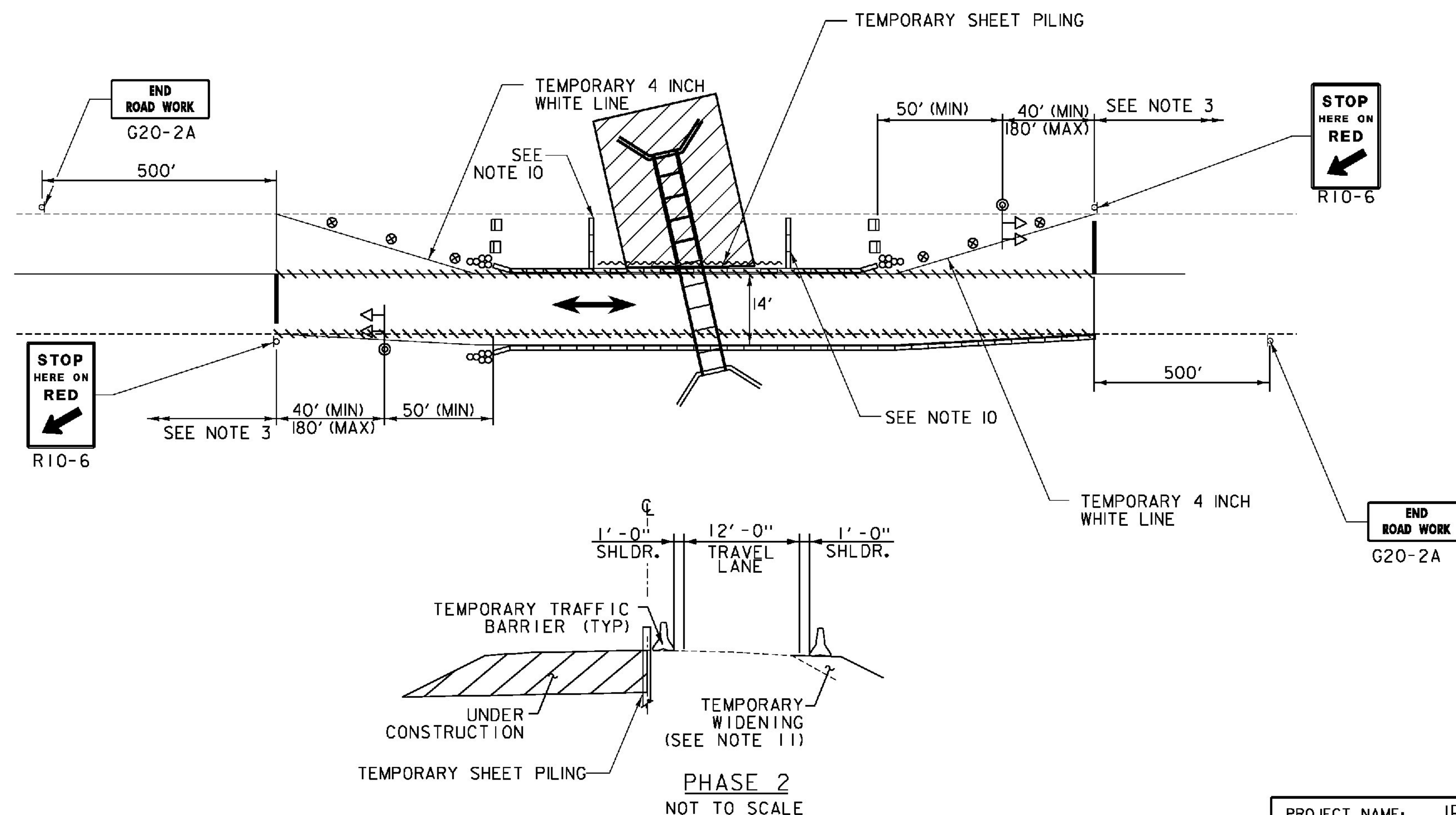
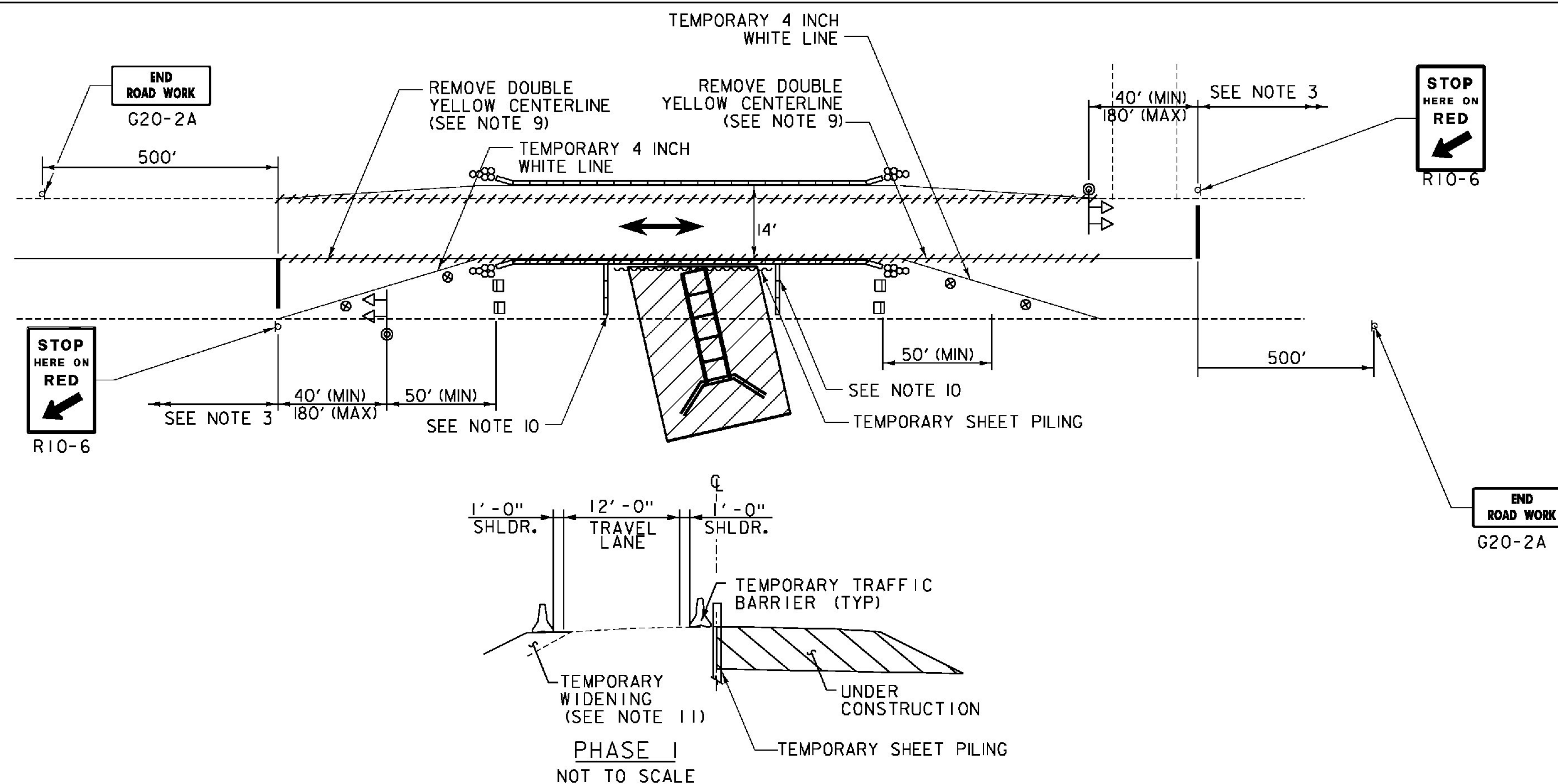


# NOTES:

- SEE SHEET 4 FOR GENERAL TRAFFIC CONTROL NOTES.
- REFER TO STANDARD T-10 FOR CONSTRUCTION APPROACH SIGNS CRITERIA.
- REFER TO "TRAFFIC CONTROL APPROACH SIGN PACKAGE" DETAIL THIS SHEET.
- CHANNELIZING DEVICE SPACING  
TANGENT SECTIONS: 60 FT. (2X DESIGN SPEED LIMIT)  
TAPER SECTIONS: 30 FT. (1X DESIGN SPEED LIMIT)  
DESIGN SPEED THROUGH CONSTRUCTION ZONE = 30MPH
- ACCESS TO ALL EXISTING SIDE ROADS, DRIVES, AND PARKING AREAS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
- TRAFFIC CONTROL SHALL ALLOW FOR A WB-67 DESIGN VEHICLE.
- ATTENUATORS SHALL MEET THE POSTED SPEED OF 50 MPH.
- CHANNELIZING DEVICES LEFT OVERNIGHT SHALL BE DRUMS.
- REMOVED CENTERLINE TO BE REPLACED WITH DURABLE 4 INCH YELLOW LINE.
- TEMPORARY TRAFFIC BARRIER TO BE IN PLACE WHILE EXCAVATION IS OPEN AND WORK IS NOT ACTIVE OR AT THE DISCRETION OF THE ENGINEER.
- TEMPORARY WIDENING TO BE PAID FOR AS PART OF ITEM 900.645 SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)

## LEGEND

	UNDER CONSTRUCTION
	ALTERNATING ONE WAY TRAFFIC
	TEMPORARY TRAFFIC BARRIER
	CHANNELIZING DEVICE
	ENERGY ABSORPTION ATTENUATOR
	TYPE III BARRIER
	CONSTRUCTION SIGN
	TEMPORARY TRAFFIC SIGNAL
	FLASHING BEACON
	REMOVE OR MASK PAVEMENT MARKINGS



PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266tc.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: I. MAYNARD  
TRAFFIC CONTROL PLAN - BR6

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 18 OF 55





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 3/8"

NX

Core Size 2 1/8"

M

Double Tube Core Barrel Used

LL

Liquid Limit

PL

Plastic Limit

PI

Plasticity Index

NP

Non Plastic

w

Moisture Content (Dry Wgt. Basis)

D

Dry

M

Moist

MTW

Moist To Wet

W

Wet

Sat

Saturated

Bo

Boulder

Gr

Gravel

Sa

Sand

Sl

Silt

Cl

Clay

HP

Hardpan

Le

Ledge

NLTD

No Ledge To Depth

CNPF

Can Not Penetrate Further

TLOB

To Ledge Or Boulder

NR

No Recovery

Rec.

Recovery

2Rec.

Percent Recovery

RQD

Rock Quality Designation

CBR

California Bearing Ratio

<

Less Than

>

Greater Than

R

Refusal (N > 100)

blk

Black

bl

Blue

brn

Brown

dk

Dark

gry

Gray

gn

Green

lt

Light

or

Orange

pnk

Pink

pu

Purple

rd

Red

tn

Tan

wh

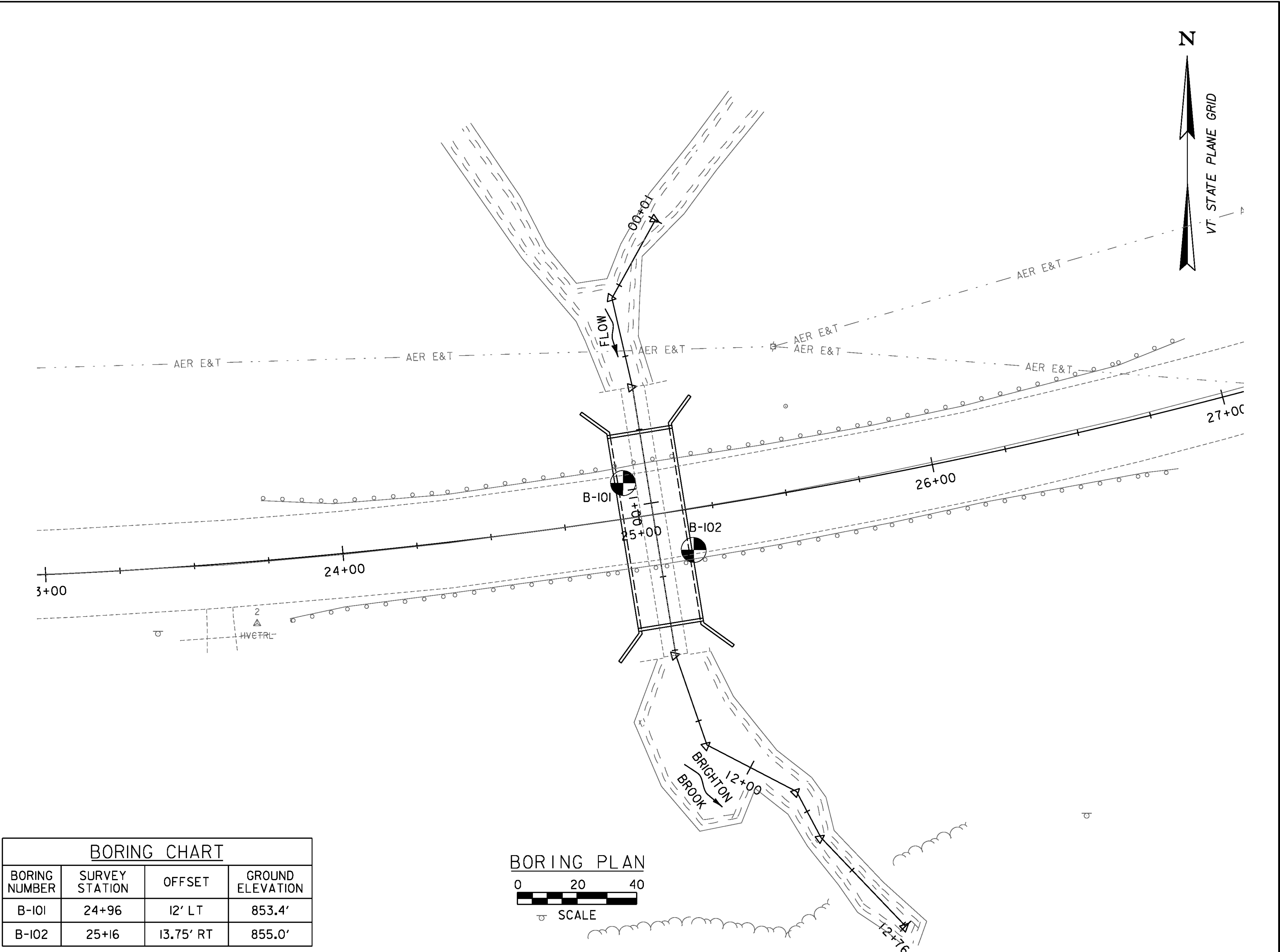
White

yel

Yellow

mltc

Multicolored



DEFINITIONS (AASHTO)

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

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

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

GRAVEL - Rounded particles of rock < 3" and > 0.075" (#10 sieve).

SAND - Particles of rock < 0.075" (#10 sieve) and > 0.0029" (#200 sieve).

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

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

VARVED - Alternate layers of silt and clay.

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

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

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

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

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

DIP - Inclination of bed with a horizontal plane.

GENERAL NOTES

1. The subsurface explorations shown herein were made on Oct. 25, 2012 by N.H. Boring.

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

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

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

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

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

LEGEND:

BRIDGE BORING

PROJECT NAME: IRASBURG

PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266bdr_bor_pl.br6.dgn

PLOT DATE: 9/26/2014

PROJECT LEADER: M. CHENETTE

DRAWN BY: L. BUXTON

DESIGNED BY: J. HUNGERFORD

CHECKED BY: J. HUNGERFORD

BORING PLAN - BR6

SHEET 19 OF 55





BOTTOM OF CULVERT  
APPROX. EL. 833.9

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION				BORING LOG		Boring No.: B-101			
				IRASBURG STP CULV(30) VT-58 BR-6&7		Page No.: 1 of 1			
						Pin No.: 11C266			
						Checked By: LAR			
Boring Crew: GARROW, JUDKINS				Casing Sampler		Groundwater Observations			
Date Started: 10/11/12 Date Finished: 10/11/12				Type: WB SS		Date	Notes		
VTSPG NAD83: N 843693.56 ft E 1691783.85 ft				I.D.: 4 in 1.5 in		Depth (ft)			
Station: 24+96 Offset: 12' LT				Hammer Wt: N.A. 140 lb.		10/11/12	Bedstream Bottom		
Ground Elevation: 853.4				Hammer Fall: N.A. 30 in.					
				Hammer/Rod Type: Auto/AWJ					
				Rig: CME 45C SKID CE = 1.33					
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
10		Asphalt Pavement, 0.0 ft - 0.8 ft							
		A-4, SiSa, brn, Moist, Rec. = 1.0 ft	7-3-3-3 (6)	15.4	12.4	44.2	43.4		
		Visual Description: SiGrSa, brn, Moist, Rec. = 0.8 ft	22-13-13-7 (26)						
		Visual Description: GrSa, brn, Moist, Rec. = 0.8 ft	3-2-5-4 (7)						
		Field Note: No Recovery, Stone in sampler.	7-6-4-2 (10)						
		A-2-4, SiSa, Dk/brn, MTW, Rec. = 0.9 ft	4-2-1-1 (3)	42.1	0.5	64.7	34.8		
		Visual Description: SiSa, Dk/brn, MTW, Rec. = 1.5 ft	1-2-1-2 (3)						
		Visual Description: SiSa, yellow, MTW, Rec. = 0.1 ft	7-5-8-8 (13)						
		Field Note: No Recovery	11-8-8-8 (16)						
		A-4, Si, gry, Wet, Rec. = 0.9 ft	7-5-3-4 (8)	26.5		17.3	82.7		
30		Visual Description: Si, gry, MTW, Rec. = 1.4 ft	2-3-2-2 (5)						
		A-4, Si, gry, MTW, Rec. = 1.4 ft	2-3-5-5 (8)	26.0		17.0	83.0		
		Visual Description: Si, gry, MTW, Rec. = 1.2 ft	2-3-4-6 (7)						
		A-4, Si, gry, MTW, Rec. = 1.5 ft	3-3-4-5 (7)	24.7		1.6	98.4	23	6
		Visual Description: Si with little clay, gry, MTW, Rec. = 1.6 ft	3-3-3-4 (6)						
		Field Note: No Recovery in Shelby Tube							
		Visual Description: SiCl, gry, Moist, Rec. = 1.8 ft	3-3-4-6 (7)						
		A-6, SiCl, gry, MTW, Rec. = 1.5 ft	4-5-7-6 (12)	26.5		0.8	99.2	29	11
		Visual Description: SiCl, gry, MTW, Rec. = 1.8 ft	3-4-6-6 (10)						
		Visual Description: SiCl, gry, MTW, Rec. = 1.6 ft	5-4-4-6 (8)						
50		Hole stopped @ 50.0 ft							
		Remarks: 15.0 feet to bed of stream.							
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. CE is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

BOTTOM OF CULVERT  
APPROX. EL. 833.6

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION				BORING LOG		Boring No.: B-102			
				IRASBURG STP CULV(30) VT-58 BR-6&7		Page No.: 1 of 1			
						Pin No.: 11C266			
						Checked By: LAR			
Boring Crew: GARROW, JUDKINS				Casing Sampler		Groundwater Observations			
Date Started: 10/12/12 Date Finished: 10/12/12				Type: WB SS		Date	Notes		
VTSPG NAD83: N 843671.01 ft E 1691807.52 ft				I.D.: 4 in 1.5 in		Depth (ft)			
Station: 25+16 Offset: 13.75' RT				Hammer Wt: N.A. 140 lb.					
Ground Elevation: 855.0				Hammer Fall: N.A. 30 in.					
				Hammer/Rod Type: Auto/AWJ					
				Rig: CME 45C SKID CE = 1.33					
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		Asphalt Pavement, 0.0 ft - 0.8 ft							
		Visual Description: SaGr, brn, Moist, Rec. = 0.6 ft	8-8-8-7 (16)						
10		Visual Description: Broken Rock pieces, gry, Moist, Rec. = 0.1 ft	14-R06.0"						
		Field Note: Boulder							
		Visual Description: GrSa, brn, MTW, Rec. = 0.4 ft	4-4-3-3 (7)						
		Field Note: No Recovery, Stone in sampler.	4-3-2-4 (5)						
20		Visual Description: One stone with little sand, gry, Moist, Rec. = 0.1 ft	3-4-3-4 (7)						
		A-2-4, GrSiSa, Dk/gry, MTW, Rec. = 0.7 ft	4-6-5-2 (11)	17.6	26.1	40.2	33.7		
		Visual Description: GrSiSa, gry, MTW, Rec. = 0.8 ft	4-4-4-3 (8)						
		A-4, SaSi, gry, Wet, Rec. = 1.1 ft	2-2-4-4 (6)	26.5	0.4	43.7	55.9		
		Visual Description: SiSa, gry, Wet, Rec. = 1.5 ft	2-4-4-4 (8)						
30		A-4, CiSi, gry, Moist, Rec. = 1.7 ft	4-5-5-5 (10)	22.9		3.2	96.8	25	8
		Visual Description: CiSi, gry, MTW, Rec. = 1.3 ft	2-5-4-6 (9)						
		A-6, SiCl, gry, MTW, Rec. = 1.8 ft	2-4-3-3 (7)	26.3		1.0	99.0	30	11
		Visual Description: CiSi, gry, MTW, Rec. = 1.4 ft	2-4-5-5 (9)						
		A-4, CiSi, gry, MTW, Rec. = 1.4 ft	3-3-6-6 (9)	24.4		16.6	83.4	23	8
40		Visual Description: CiSi, gry, MTW, Rec. = 1.4 ft	2-4-6-5 (10)						
		A-4, CiSi, gry, MTW, Rec. = 1.6 ft	4-5-6-4 (11)	23.1		13.3	86.7	24	10
		Visual Description: SiCl, gry, MTW, Rec. = 1.4 ft	3-6-9-12 (15)						
		A-6, SiCl, gry, MTW, Rec. = 1.6 ft	4-8-10-12 (18)	24.1		5.5	94.5	34	14
			4-8-12-16 (20)						
50		Hole stopped @ 50.0 ft							
		Remarks: 15.0 feet to bed of stream.							
Notes:	1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. CE is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.								

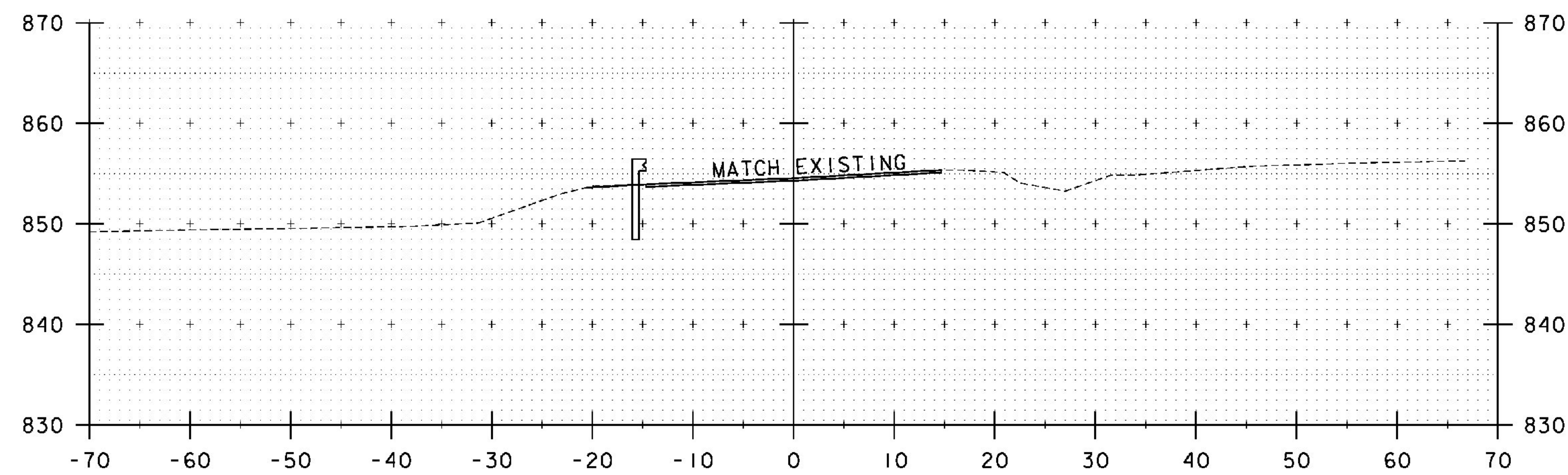


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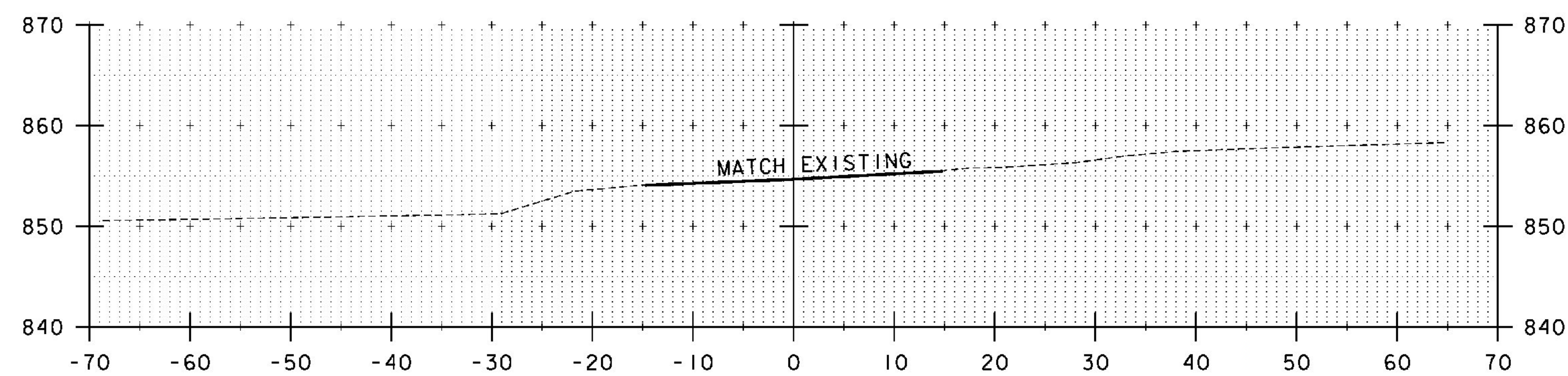
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PROJECT LEADER: M. CHENETTE  
DESIGNED BY: VTRANS  
BORING LOG - BR6

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: VTRANS  
SHEET 20 OF 55



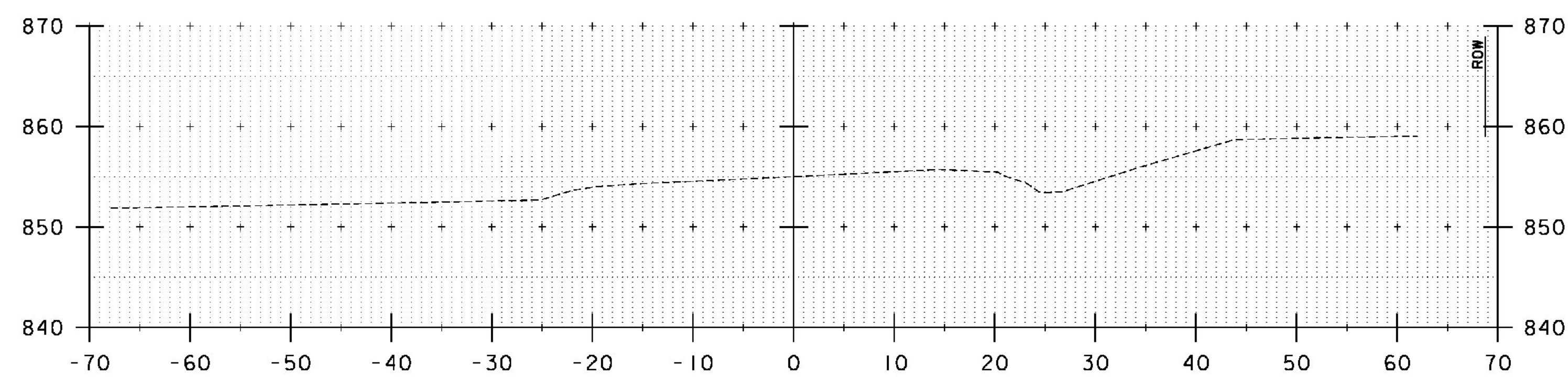


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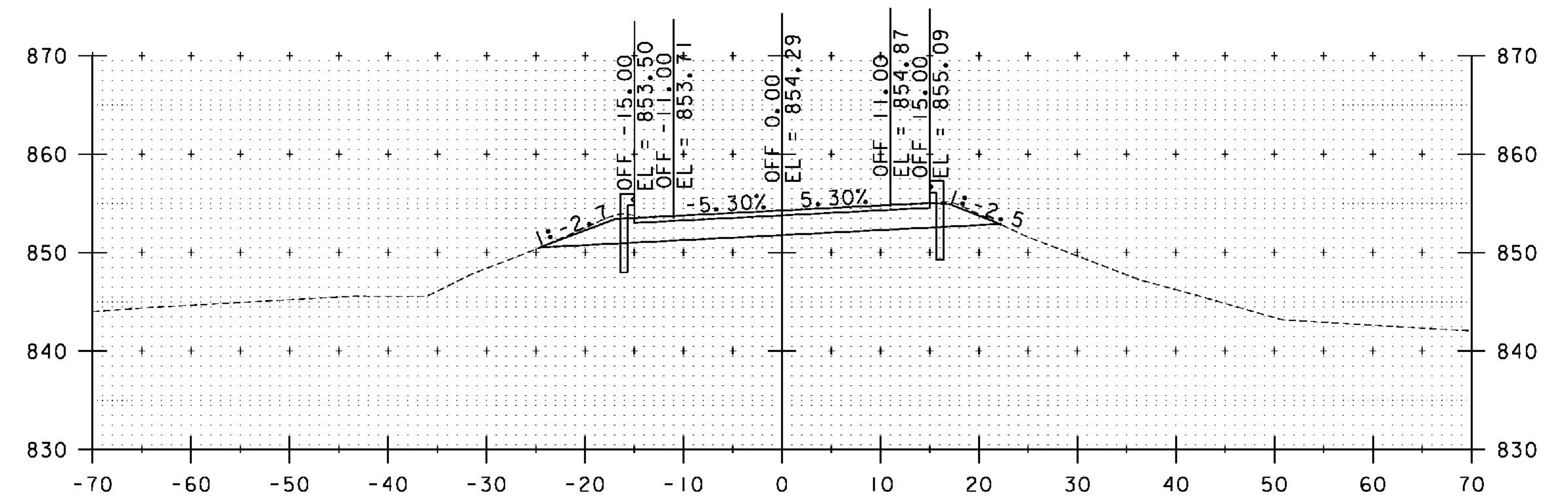


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23+50

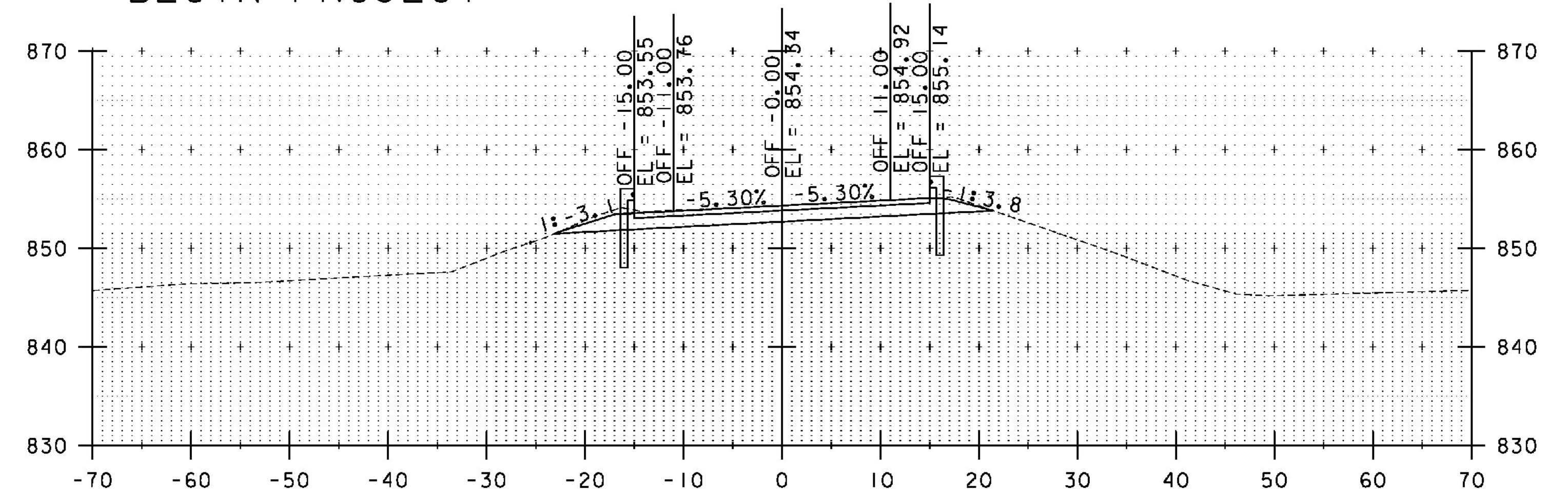


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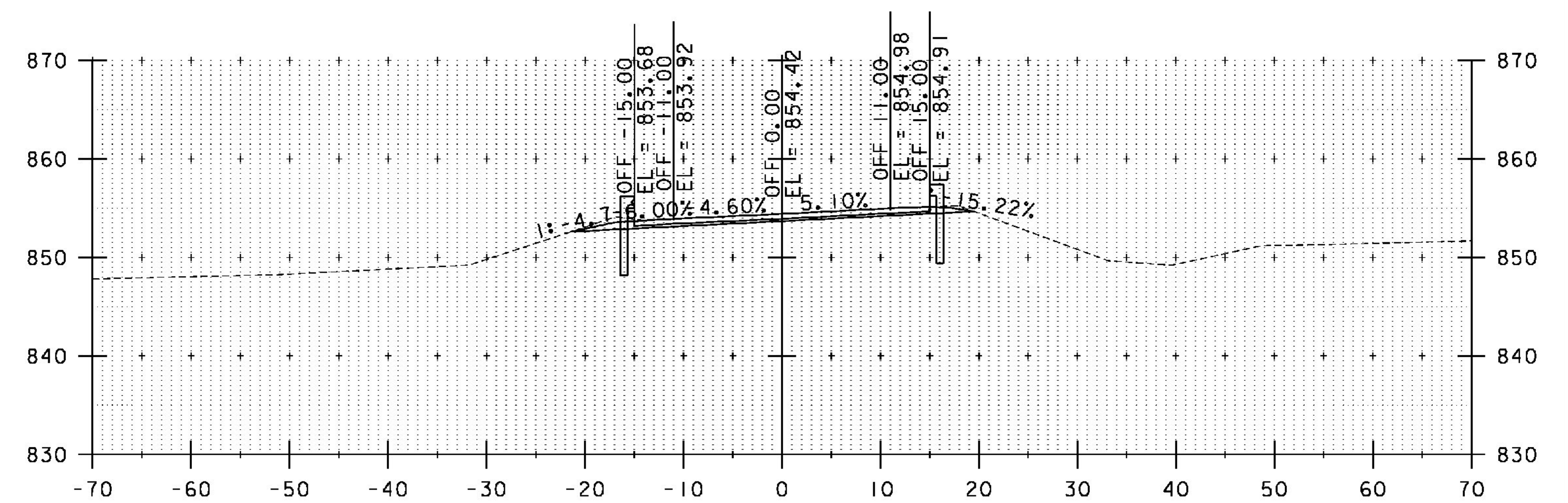


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24+50



24+25



24+00

STA. 23+25 TO STA. 24+50

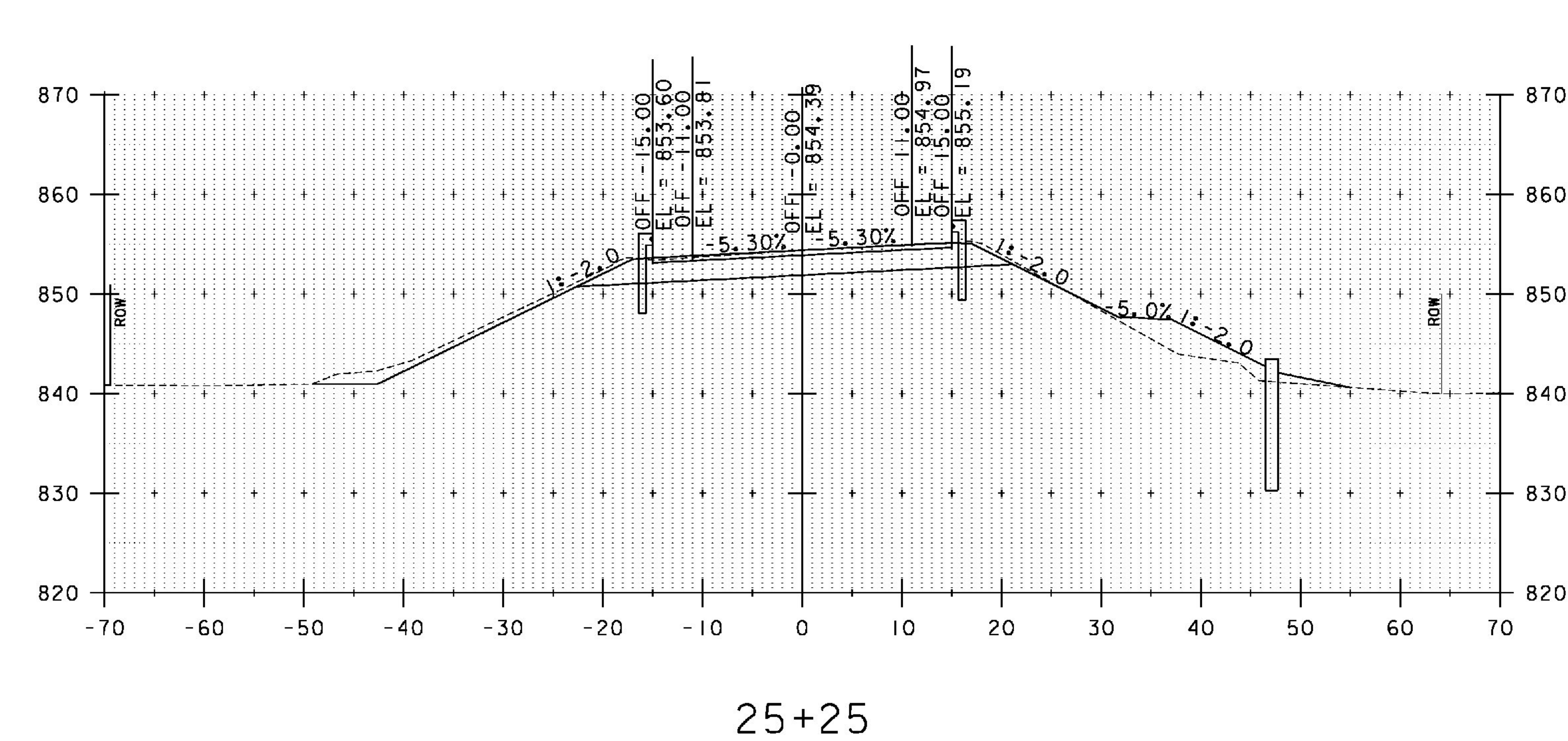
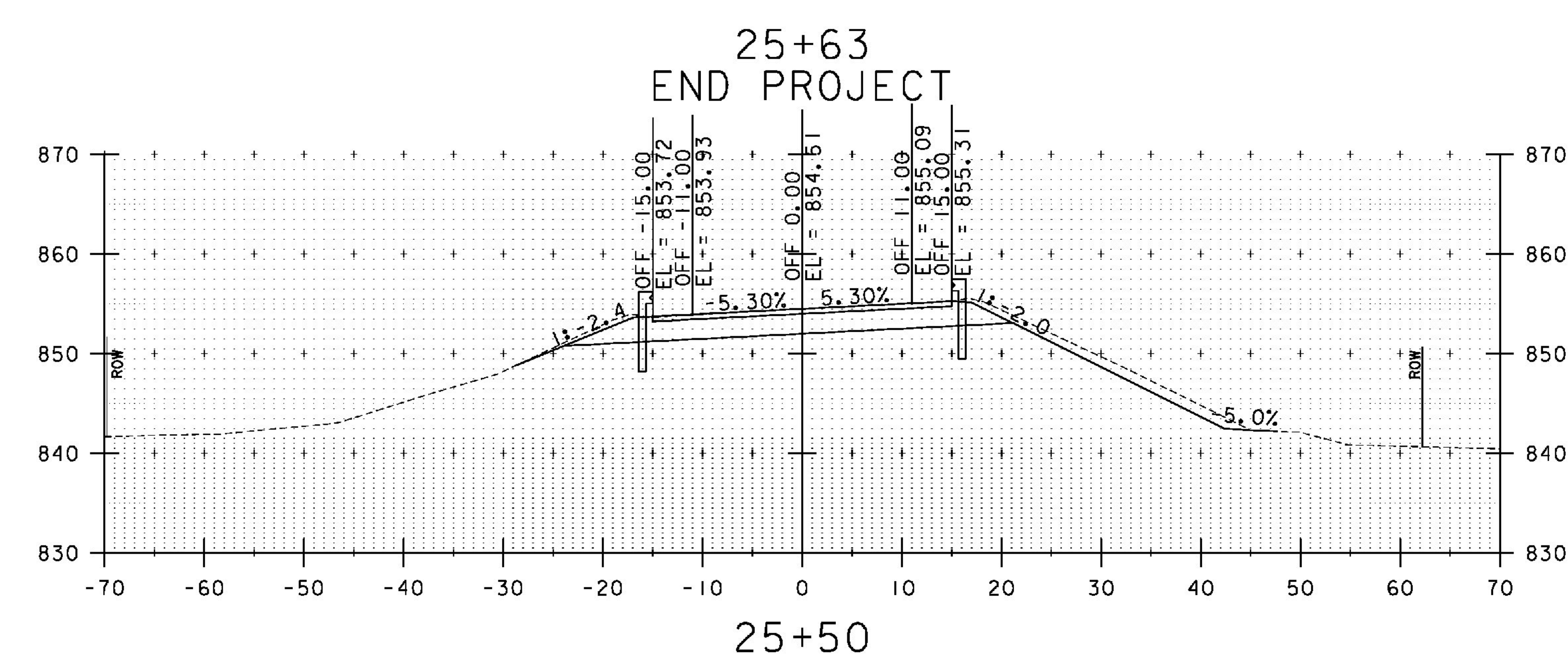
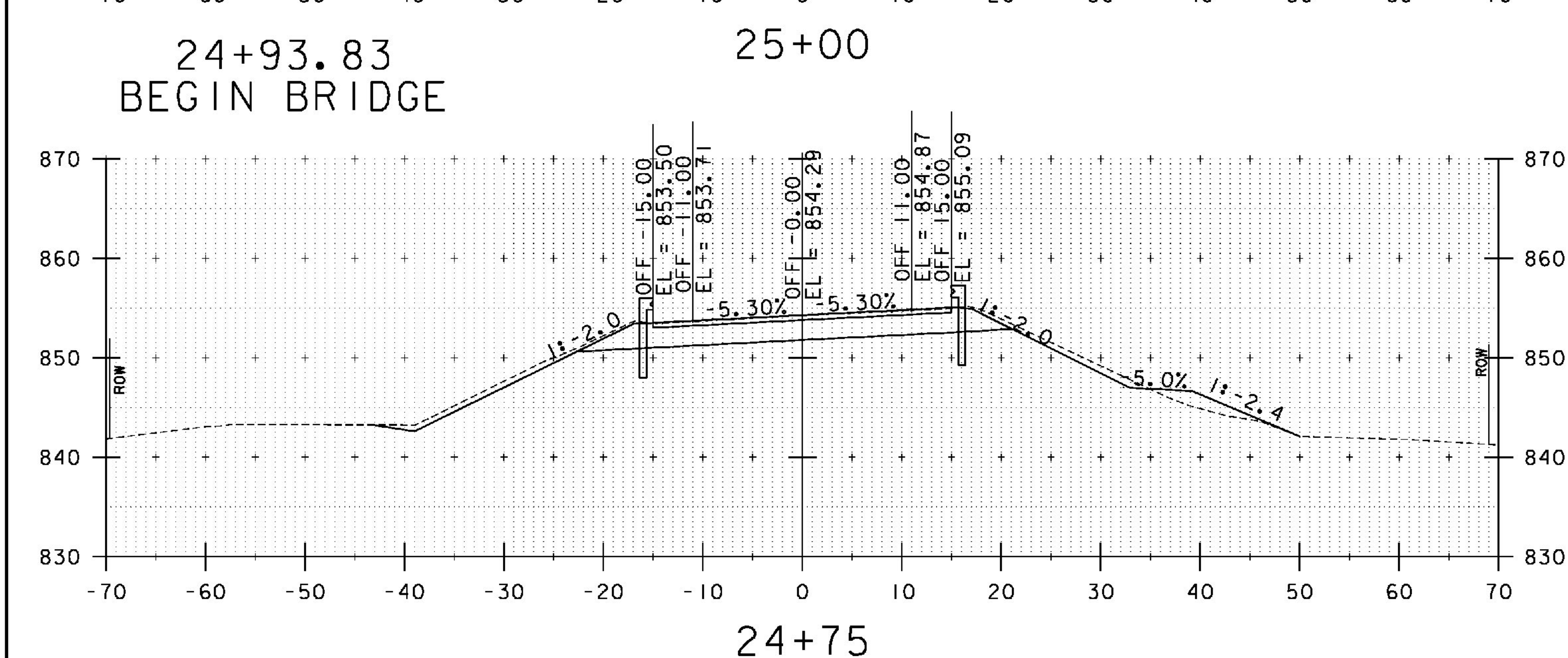
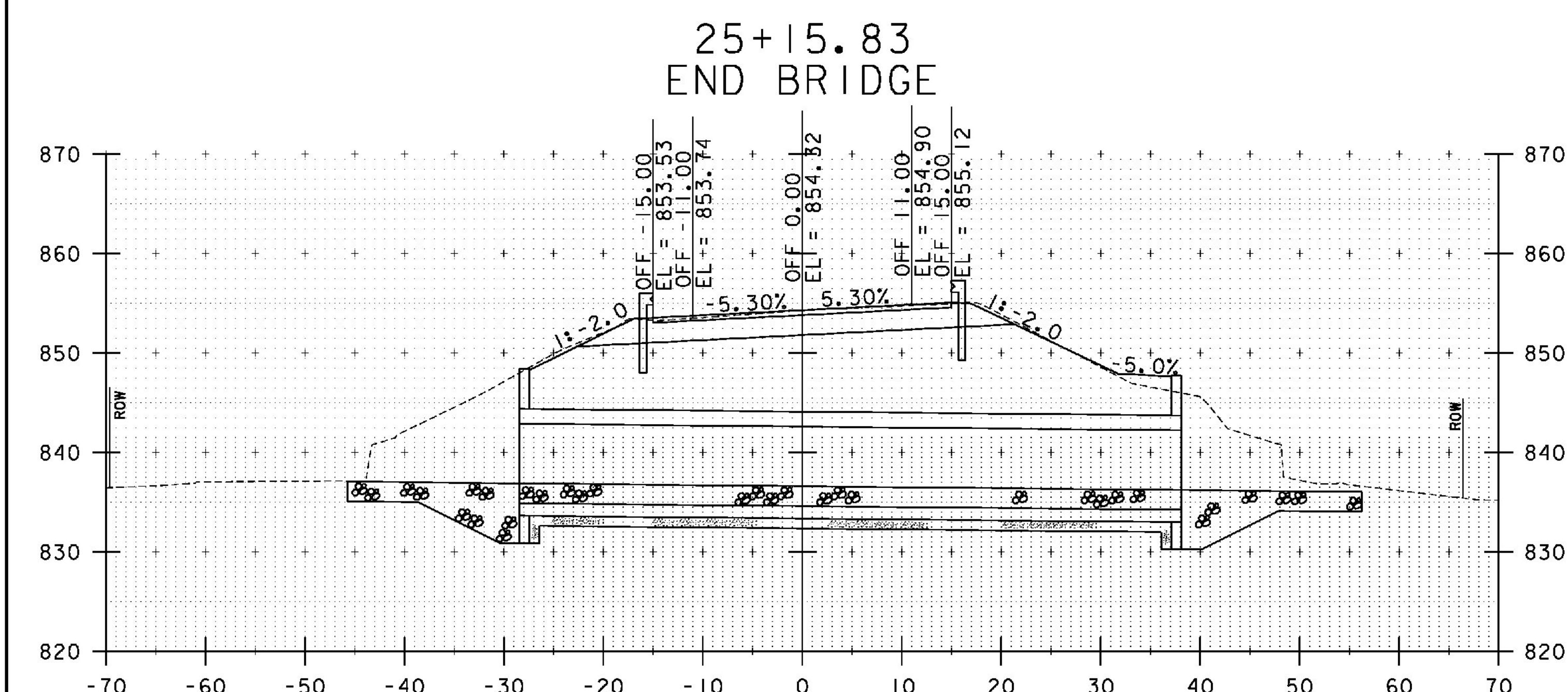
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PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266xs.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
ROADWAY CROSS SECTIONS - RXSI - BR6

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 21 OF 55





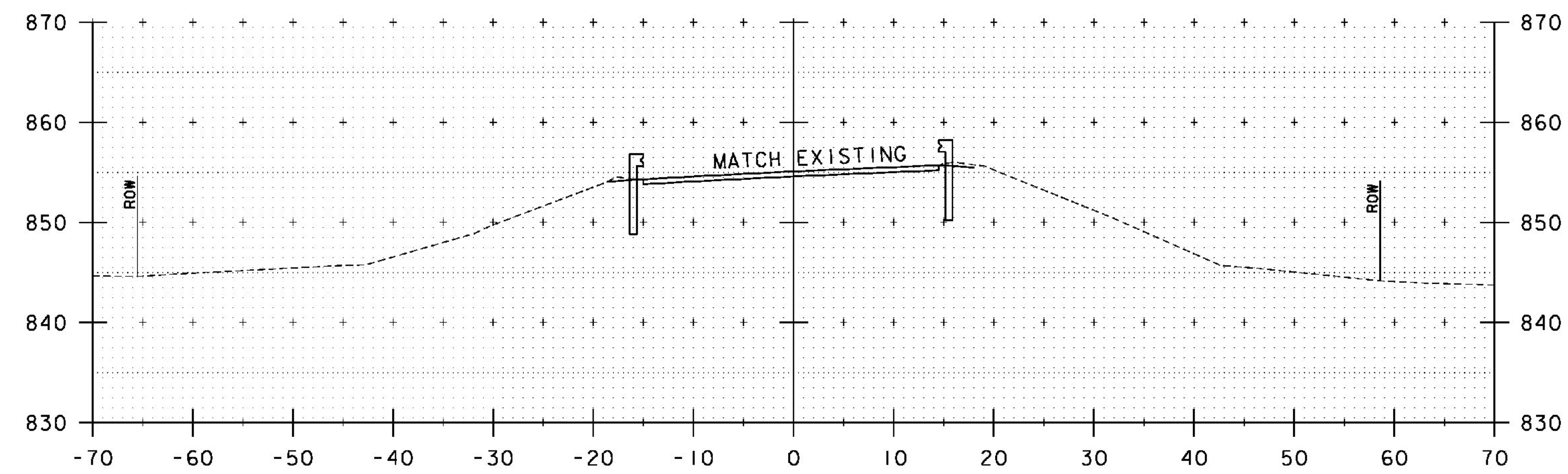


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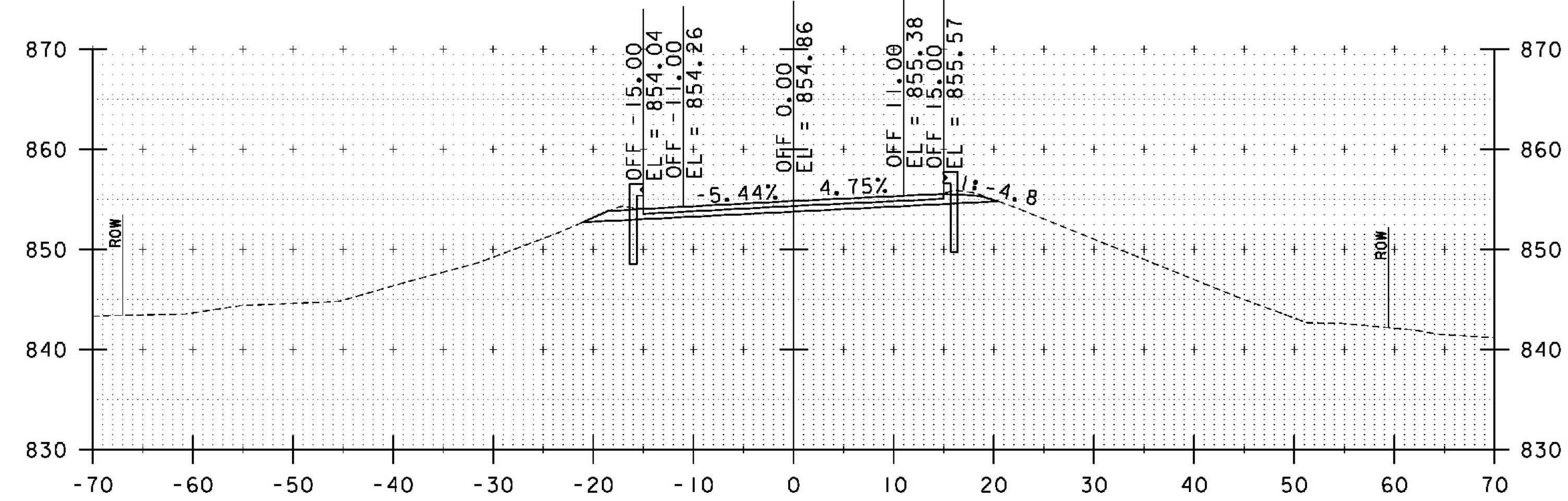
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PROJECT LEADER:	M. CHENETTE
DESIGNED BY:	J. HUNGERFORD
ROADWAY CROSS SECTIONS -	RXS2 - BR6
PLOT DATE:	9/26/2014
DRAWN BY:	L. BUXTON
CHECKED BY:	M. CHENETTE
SHEET	22 OF 55



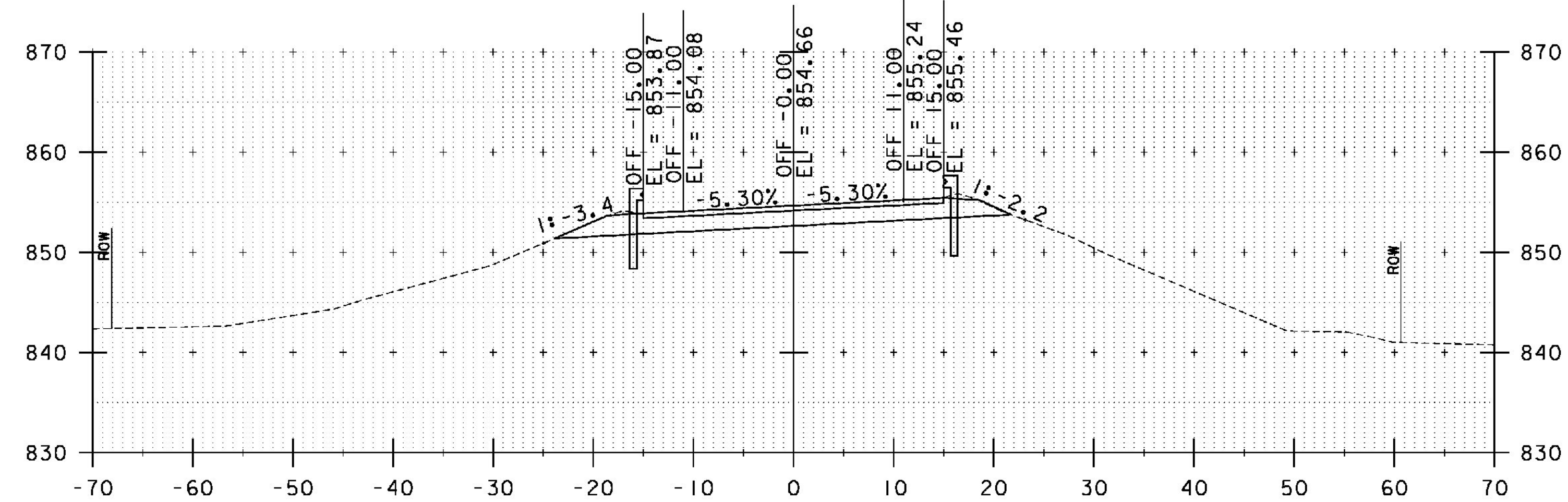




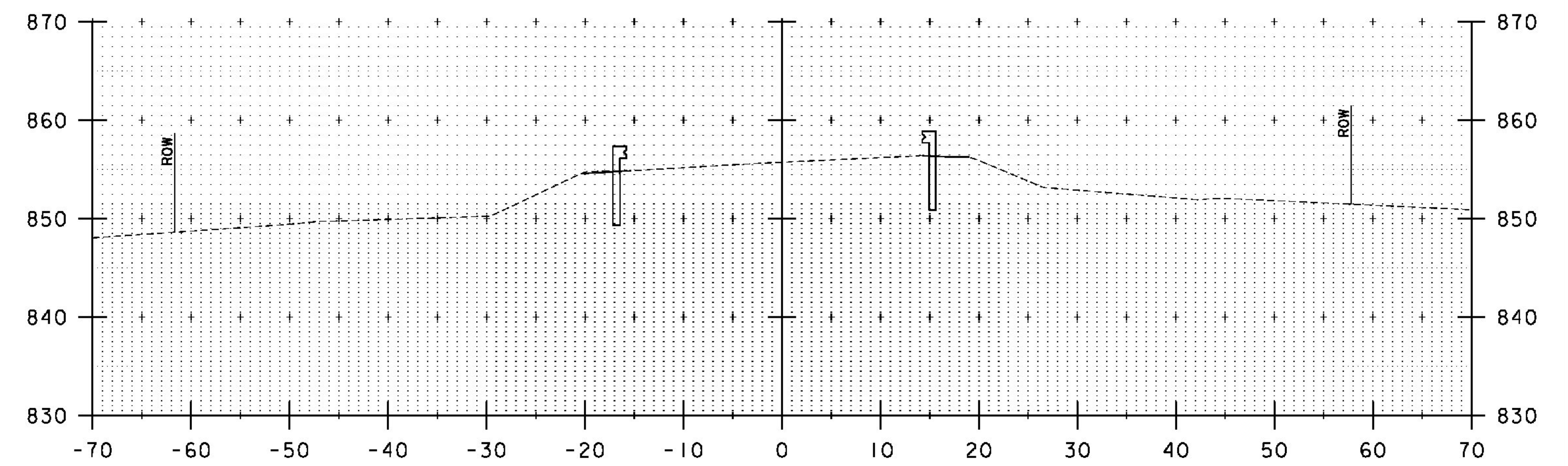
26+25



26+00

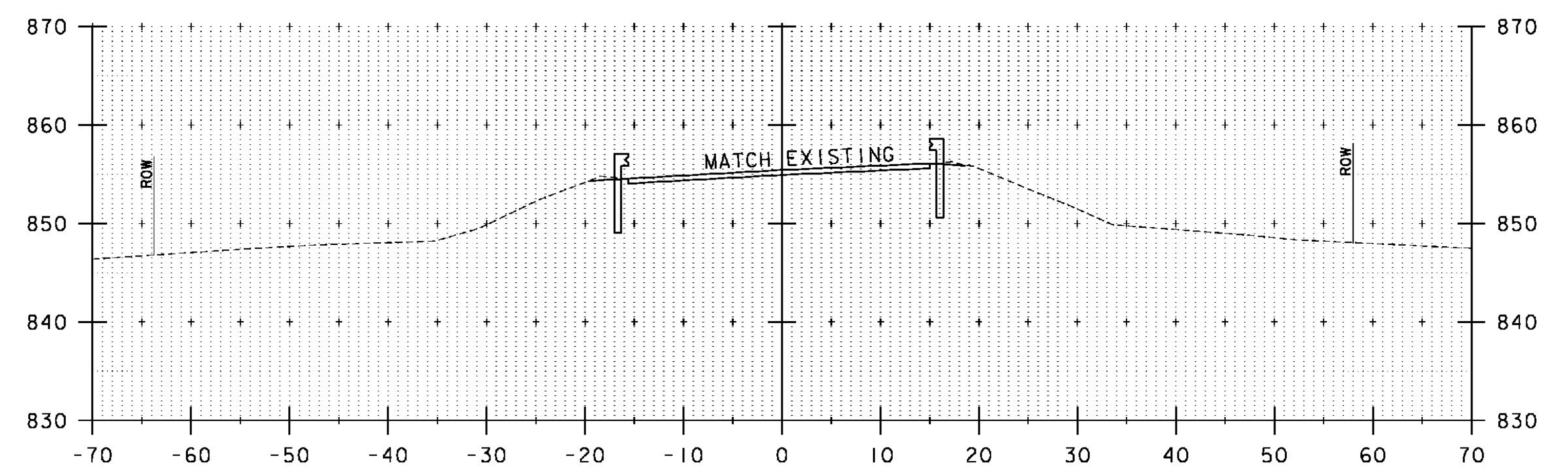


25+75



26+63  
END APPROACH

26+75



26+50

STA. 25+75 TO STA. 26+75

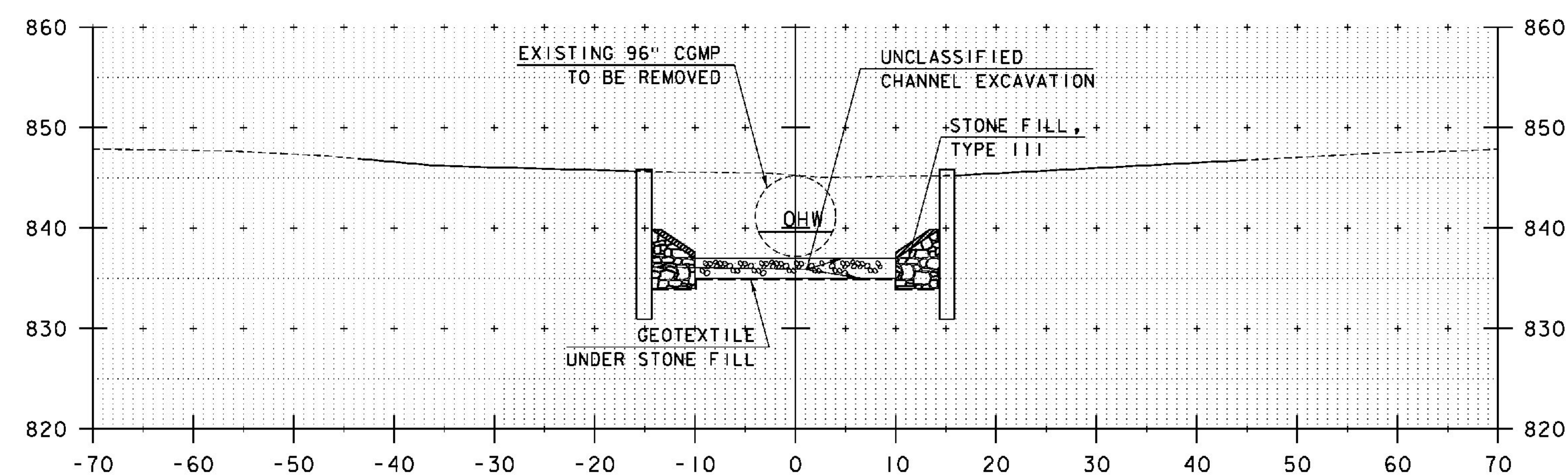
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PROJECT NUMBER: STP CULV(30)

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DESIGNED BY: J. HUNGERFORD  
ROADWAY CROSS SECTIONS - RXS3 - BR6

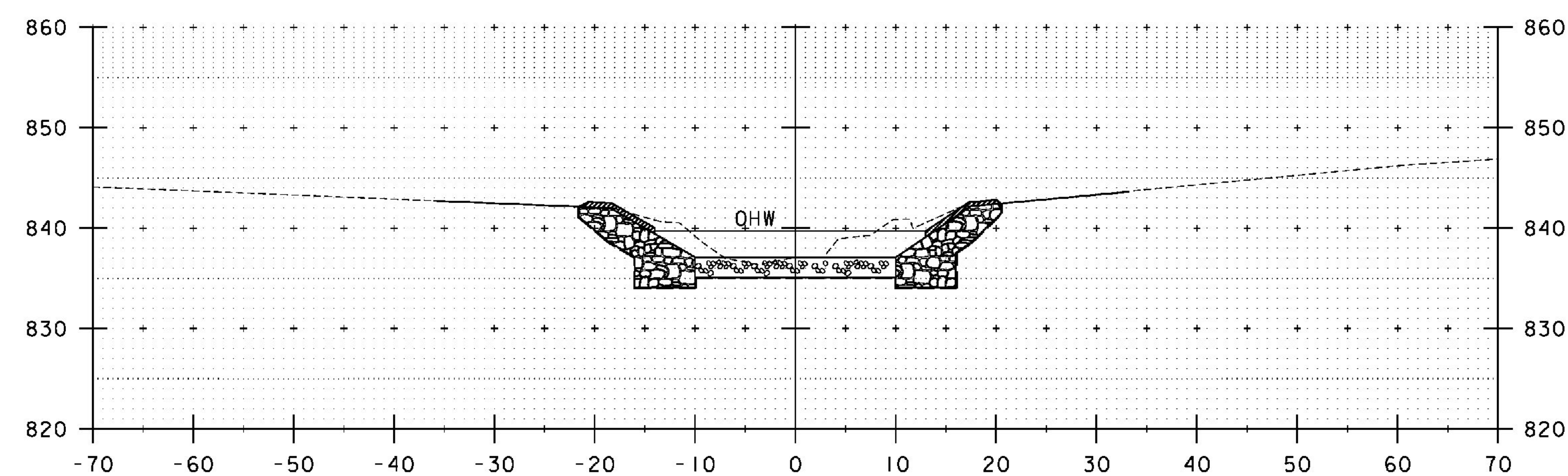
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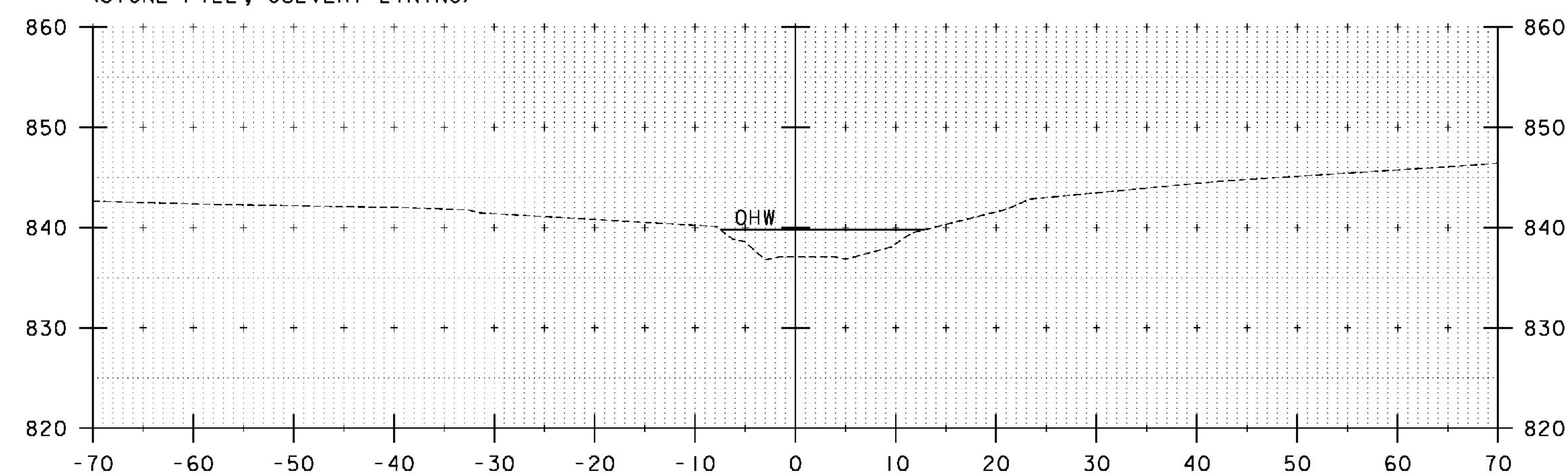




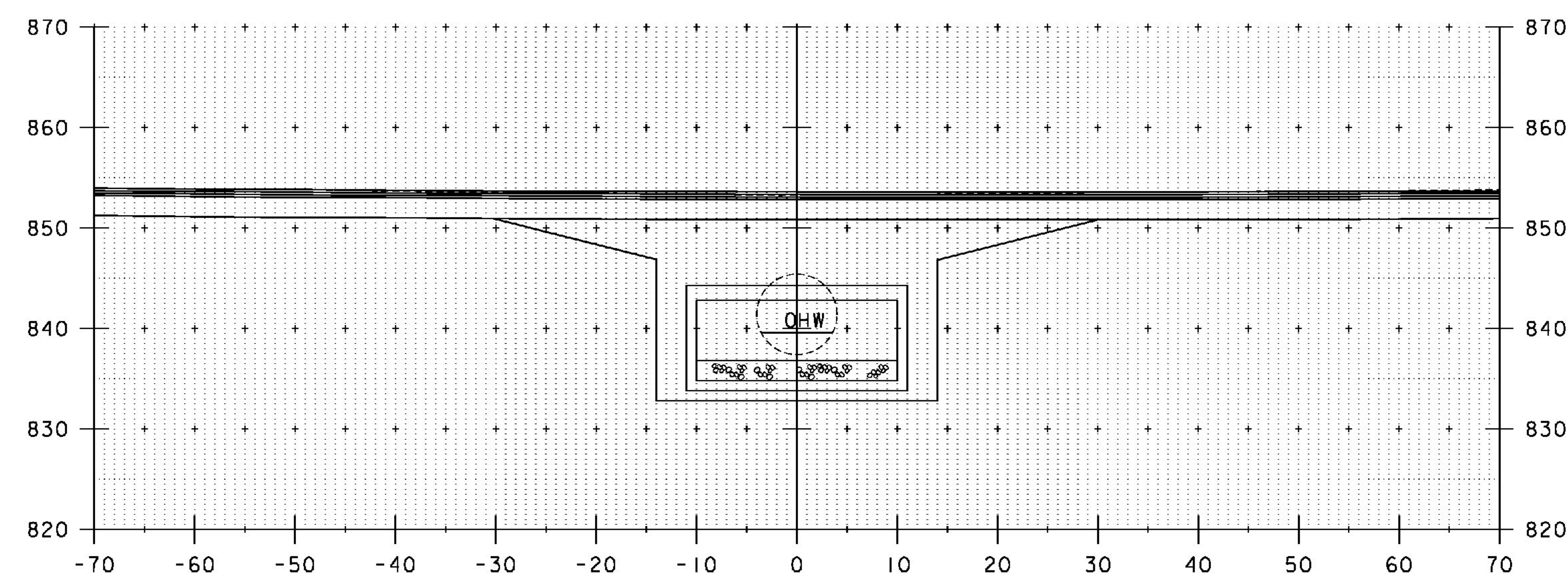
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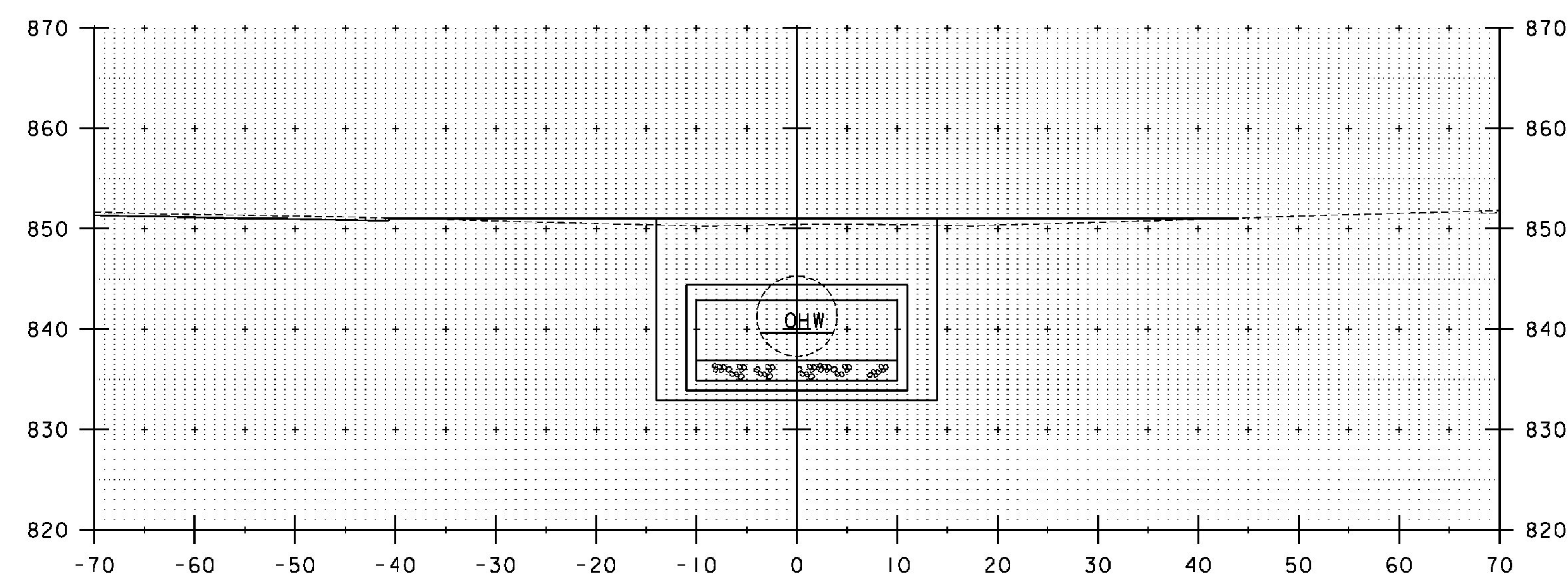
10+60



10+50



10+90



10+80

STA. 10+75.33 LT  
STOP UNCLASSIFIED CHANNEL EXCAVATION  
GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE III  
GRUBBING MATERIAL

STA. 10+75.33 RT  
STOP UNCLASSIFIED CHANNEL EXCAVATION  
GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE III  
GRUBBING MATERIAL

STA. 10+50 TO STA. 10+90

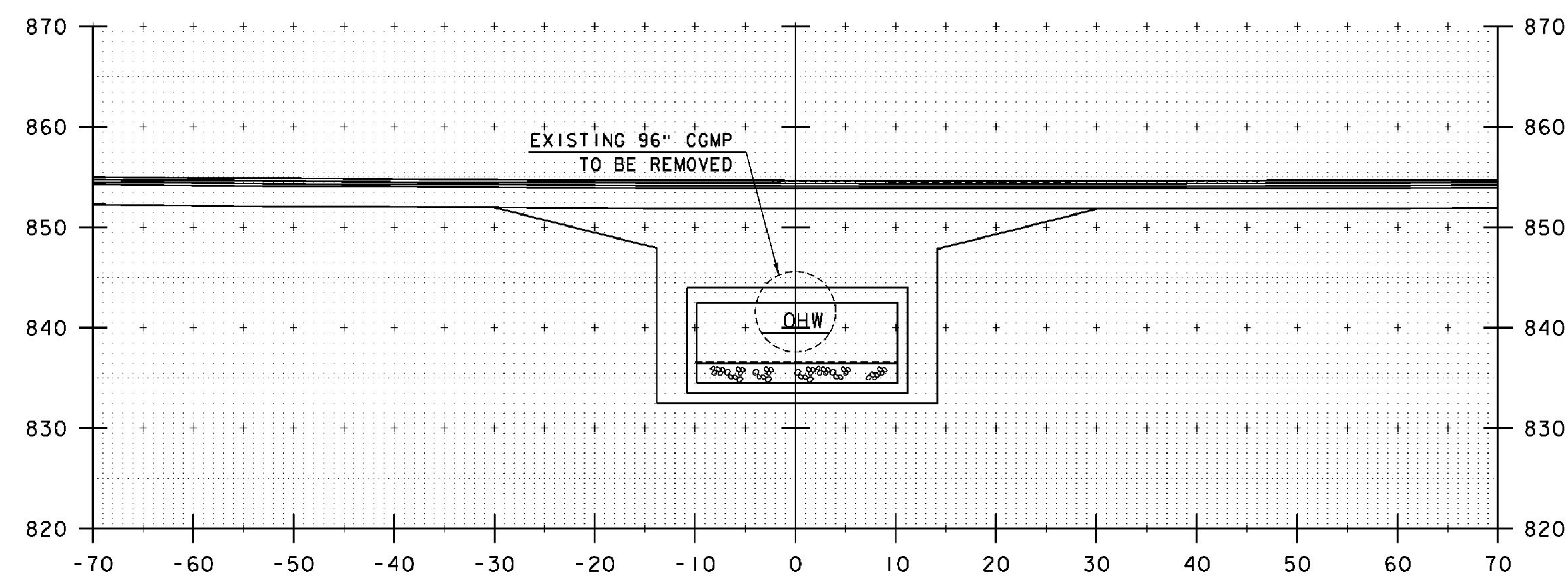
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PROJECT NUMBER: STP CULV(30)

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DESIGNED BY: J. HUNGERFORD  
CHANNEL CROSS SECTIONS - CXSI - BR6

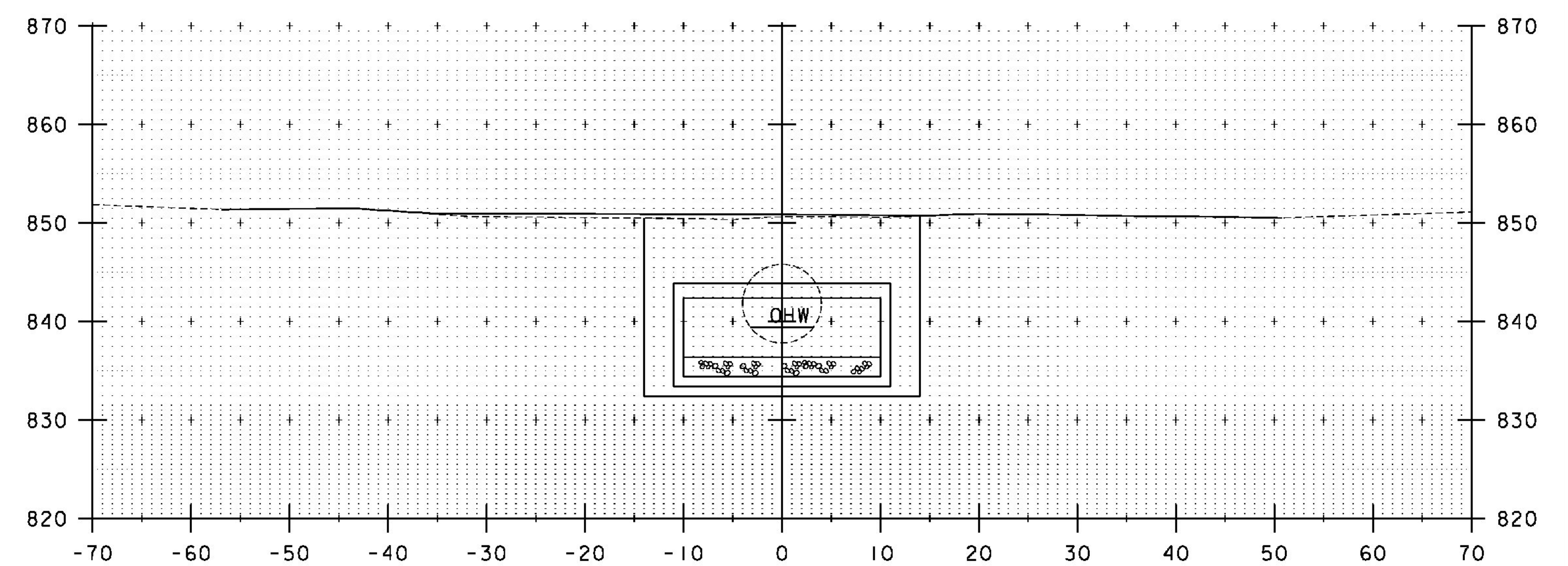
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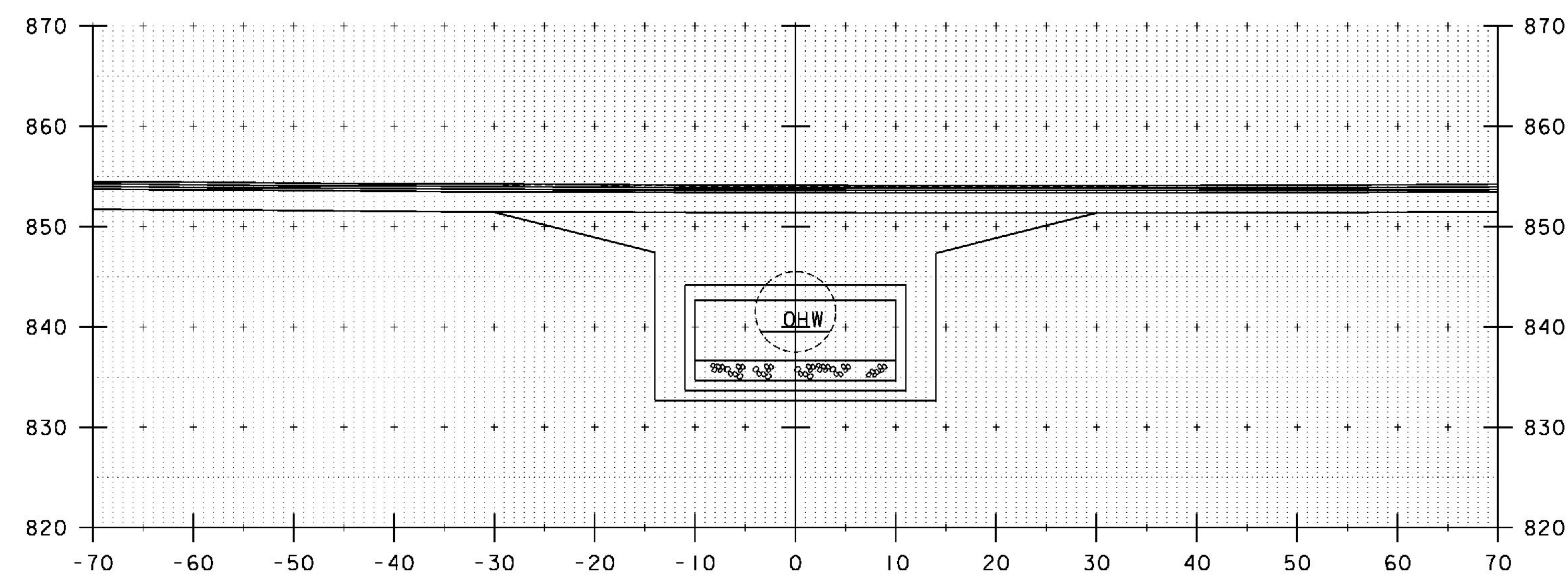




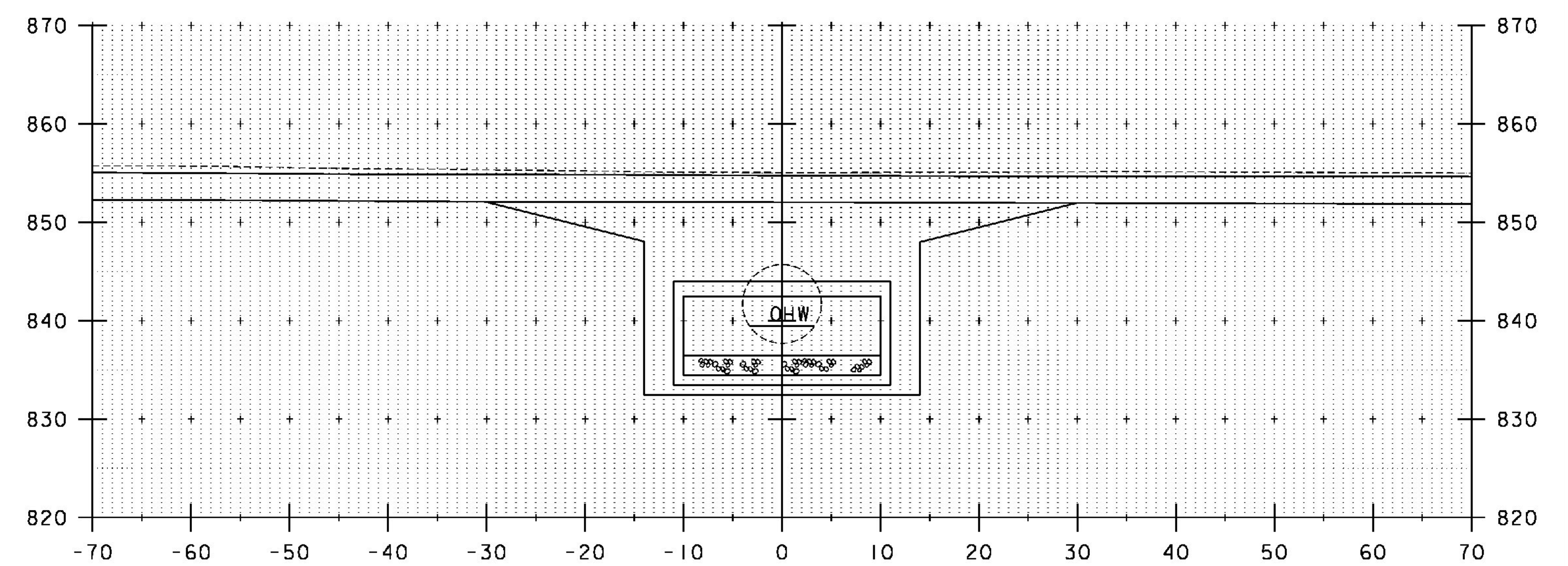
11+10



11+30



11+00



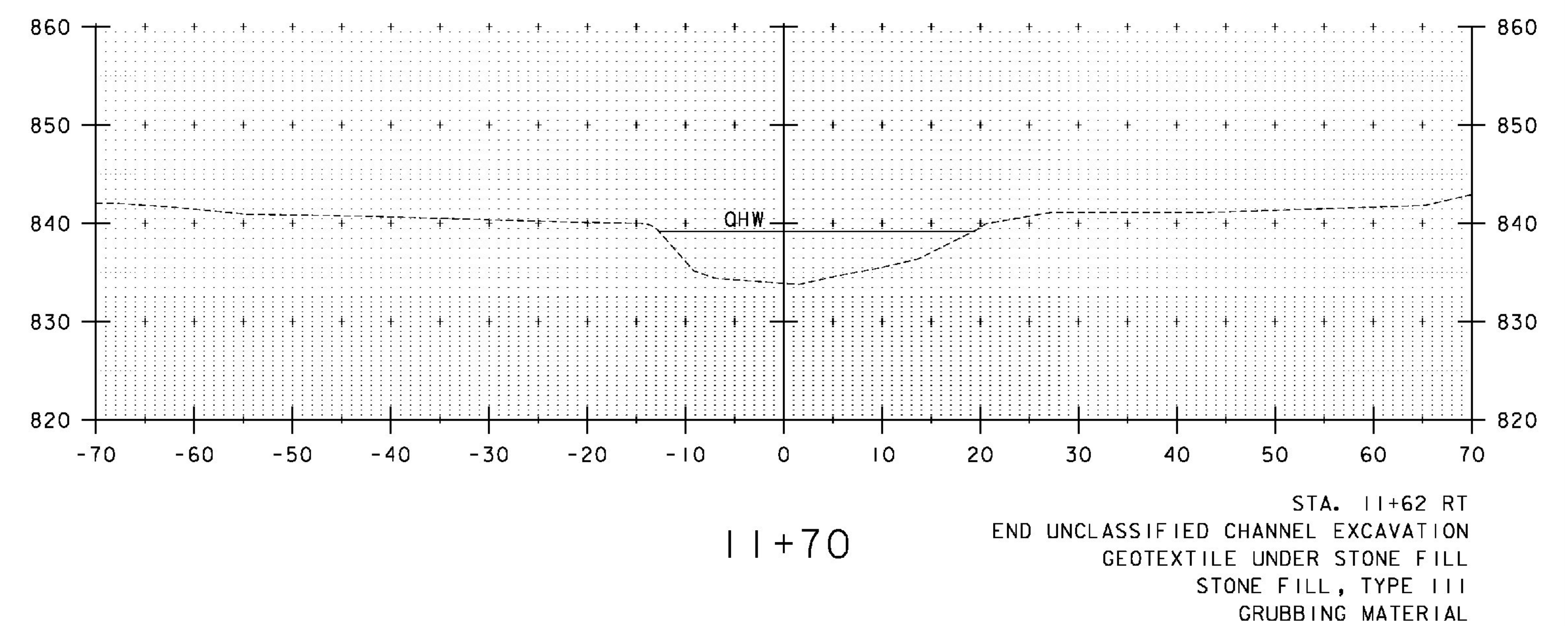
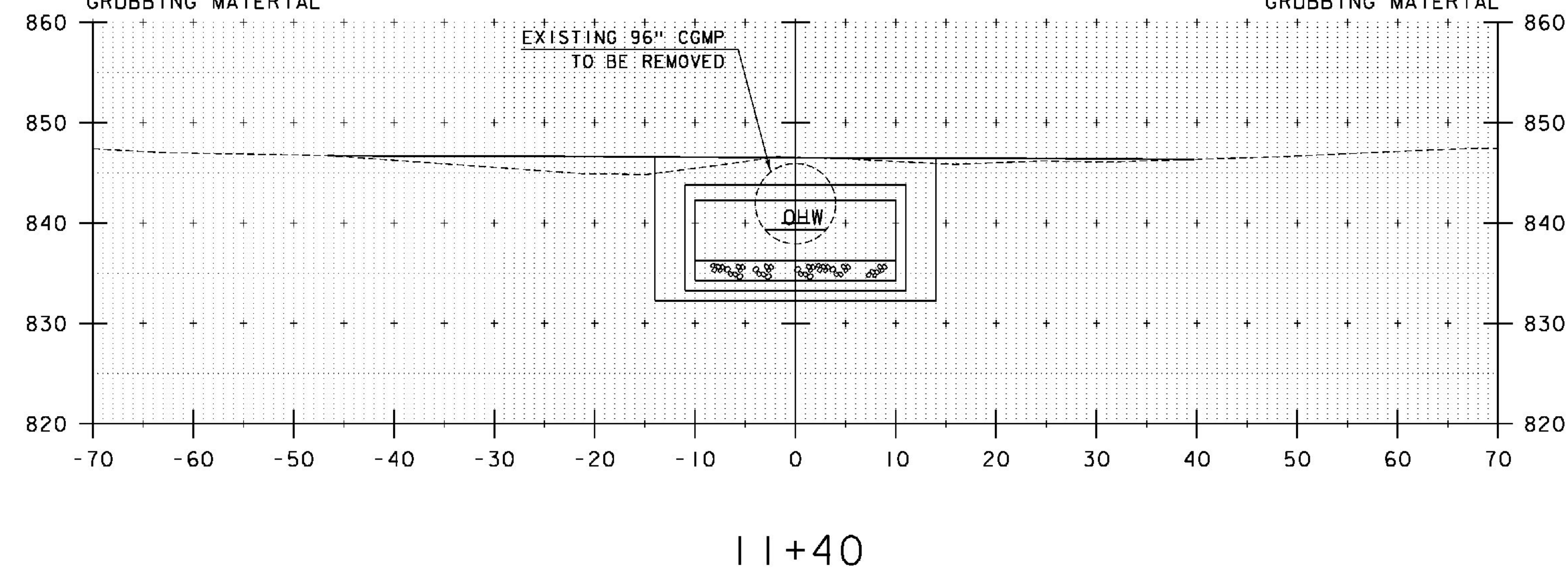
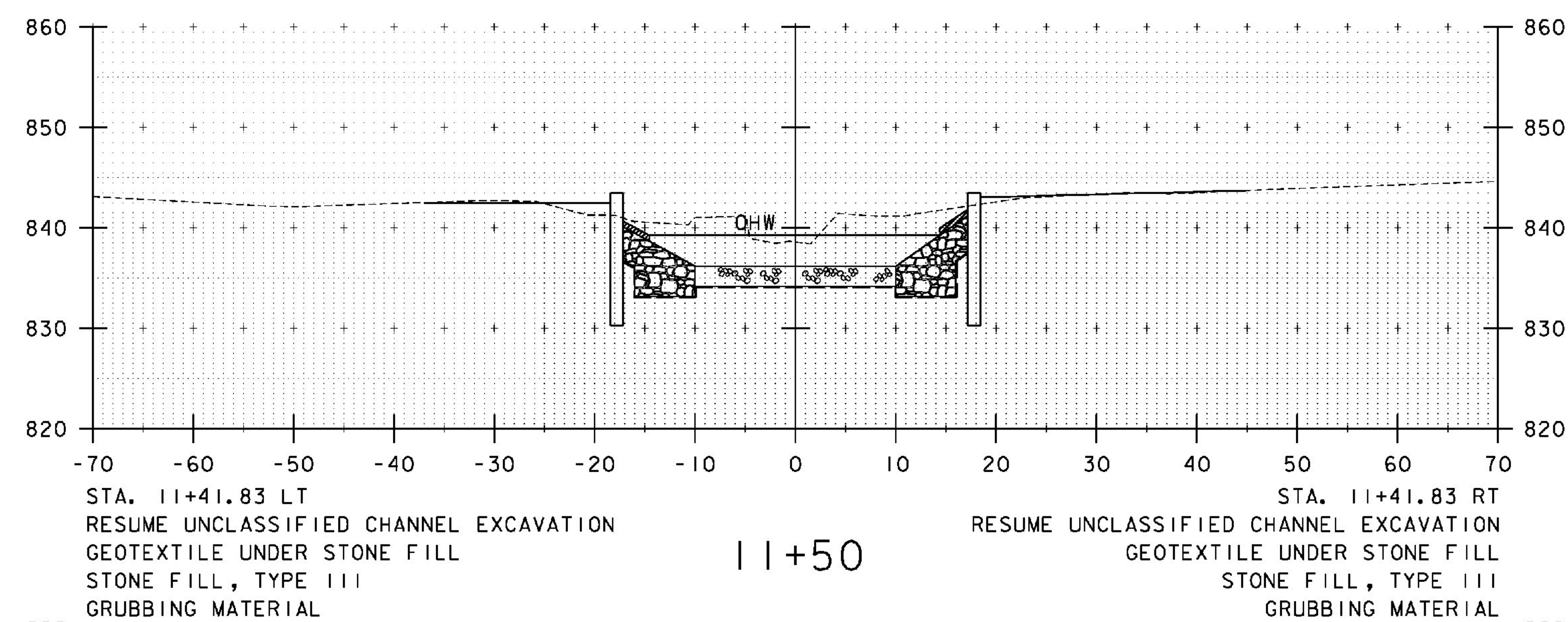
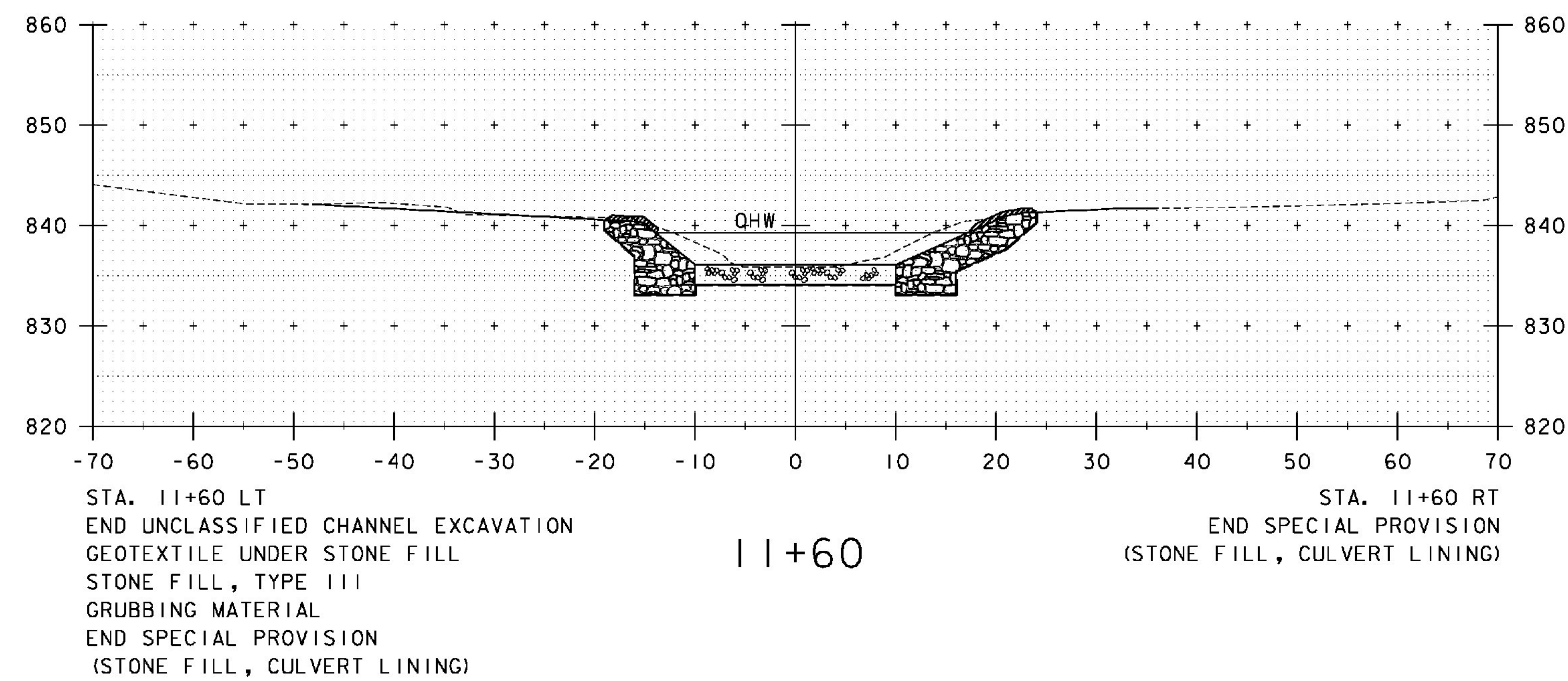
11+20

STA. 11+00 TO STA. 11+30

PROJECT NAME: IRASBURG	
PROJECT NUMBER: STP CULV(30)	
FILE NAME: z11c266xs.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
CHANNEL CROSS SECTIONS - CXS2 - BR6	SHEET 25 OF 55







STA. 11+40 TO STA. 11+70

PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266xs.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
CHANNEL CROSS SECTIONS - CXS3 - BR6

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 26 OF 55





EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REPLACEMENT OF BRIDGE #6, RELATED CHANNEL WORK AND INCIDENTALS. BRIDGE #6 IS AN EXISTING 96” CORRUGATED STEEL CULVERT, WHICH WILL BE REPLACED WITH A 20’ SPAN PRECAST CONCRETE BOX CULVERT TO CONVEY THE BRIGHTON BROOK BENEATH VT ROUTE 58. BRIDGE #6 IS LOCATED IN THE TOWN OF IRASBURG ON VT ROUTE 58, 0.3 MILES WEST OF THE JUNCTION WITH VERMONT ROUTE 14.

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

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.69 ACRES.

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

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE PROJECT SITE IS A LOW LYING WETLAND / MARSHY AREA WITH GRASSY UNDERGROWTH. VT ROUTE 58 IS WITHIN THE PROJECT SITE. THERE IS AN ADJACENT HOUSE AND FARM TO THE SITE WITH AGRICULTURAL FARMLAND. GRASS AND UNDERGROWTH BUFFERS THE AGRICULTURAL FARMLAND FROM THE PROJECT SITE. THERE ARE OVERHEAD UTILITIES THAT SHOULD NOT BE IMPACTED BY THE PROJECT. THERE IS A GUY WIRE ON THE NORTH SIDE OF THE PROJECT THAT WILL BE REPLACED WITH A PUSH BRACE PRIOR TO THE START OF THE PROJECT.

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

THE WATER SOURCE ON THE PROJECT SITE IS THE BRIGHTON BROOK. THE PROJECT IS IN THE LAKE MEMPHREMAGOG DRAINAGE BASIN. THE TOTAL CONTRIBUTING DRAINAGE AREA IS 3.55 SQ. MI. DUE TO THE NATURE OF THE SURROUNDING TERRAIN THE PROJECT SITE COULD RECEIVE RUNOFF FROM THE SURROUNDING SLOPES, ROADWAY DITCHES AND THE ROADWAY OVER TOP OF CULVERT. THERE ARE CLASS II WETLANDS ON THE NORTH AND SOUTH SIDES OF THE PROJECT AT THE INLET AND OUTLET. SEE THE PROJECT IMPACTS PLANS.

1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF OPEN GRASSED AREAS, AND UNDERGROWTH ON THE BANKS OF THE BROOK. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS RELATED TO THE EXCAVATION REQUIRED FOR THE INSTALLATION OF THE CULVERT, HEADWALLS, WINGWALLS, STONE FILL, AND TEMPORARY ACCESS. UPON PROJECT COMPLETION, THE CHANNEL AND DISTURBED AREAS WITH SLOPES GREATER THAN 2:1 WILL BE ARMORED WITH STONE FILL TYPE III AS SPECIFIED ON THE PLANS.DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES.

1.2.4 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF ORLEANS, VERMONT. SOILS ON THE PROJECT SITE ARE LAMOINE SILT LOAM, “K FACTOR” = 0.32. THE SOIL IS CONSIDERED MODERATELY ERODIBLE DUE TO K-VALUE.

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: ARCHEOLOGICALLY SENSITIVE AREAS IN ALL FOUR QUADRANTS AS SHOWN ON THE PLANS  
PRIME AGRICULTURAL LAND: NO  
THREATENED AND ENDANGERED SPECIES: NO  
WATER RESOURCE: BRIGHTON BROOK  
WETLANDS: THERE ARE WETLANDS AT THE INLET AND OUTLET OF THE STRUCTURE. SEE THE PROJECT IMPACTS PLANS.

1.3 RISK EVALUATION

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

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND SUBMITTING AN EPSC PLAN IN ACCORDANCE WITH SECTION 652 OF THE SPECIAL PROVISIONS.

IN ADDITION, THE CONTRACTOR SHALL DESIGN AND IMPLEMENT A TEMPORARY STREAM DIVERSION, INCLUDING EPSC MEASURES IN ACCORDANCE WITH ITEM 900.645, SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM).

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

1.4.1 MARK SITE BOUNDARIES

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

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

1.4.2 LIMIT DISTURBANCE AREA

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

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

1.4.3 SITE ENTRANCE/EXIT STABILIZATION

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

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

1.4.4 INSTALL SEDIMENT BARRIERS

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

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

1.4.5 DIVERT UPLAND RUNOFF

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

THE PROJECT AREA IS RELATIVELY FLAT WITH MINIMAL OFF-SITE RUNOFF FLOWING THROUGH THE SITE. THERFORE DIVERSION MEASURES WILL NOT BE NECESSARY.

1.4.6 SLOW DOWN CHANNELIZED RUNOFF

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

STONE CHECK DAMS WILL BE INSTALLED AS NEEDED AND AS DIRECTED BY THE ENGINEER.

1.4.7 CONSTRUCT PERMANENT CONTROLS

THERE ARE NO PERMANENT STORMWATER TREATMENT DEVICES TO BE INSTALLED WITH THIS PROJECT.

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

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

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

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

1.4.9 WINTER STABILIZATION

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

1.4.10 STABILIZE SOIL AT FINAL GRADE

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

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

1.4.11 DE-WATERING ACTIVITIES

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

SEDIMENT CONTAINMENT BAGS (FILTER BAGS) FOR HEADWALL WORK SHALL BE USED AS NECESSARY AND AS DIRECTED BY THE ENGINEER. SEE SHEET 30 FOR DETAIL.

1.4.12 INSPECT YOUR SITE

INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS.

1.5 SEQUENCE AND STAGING

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

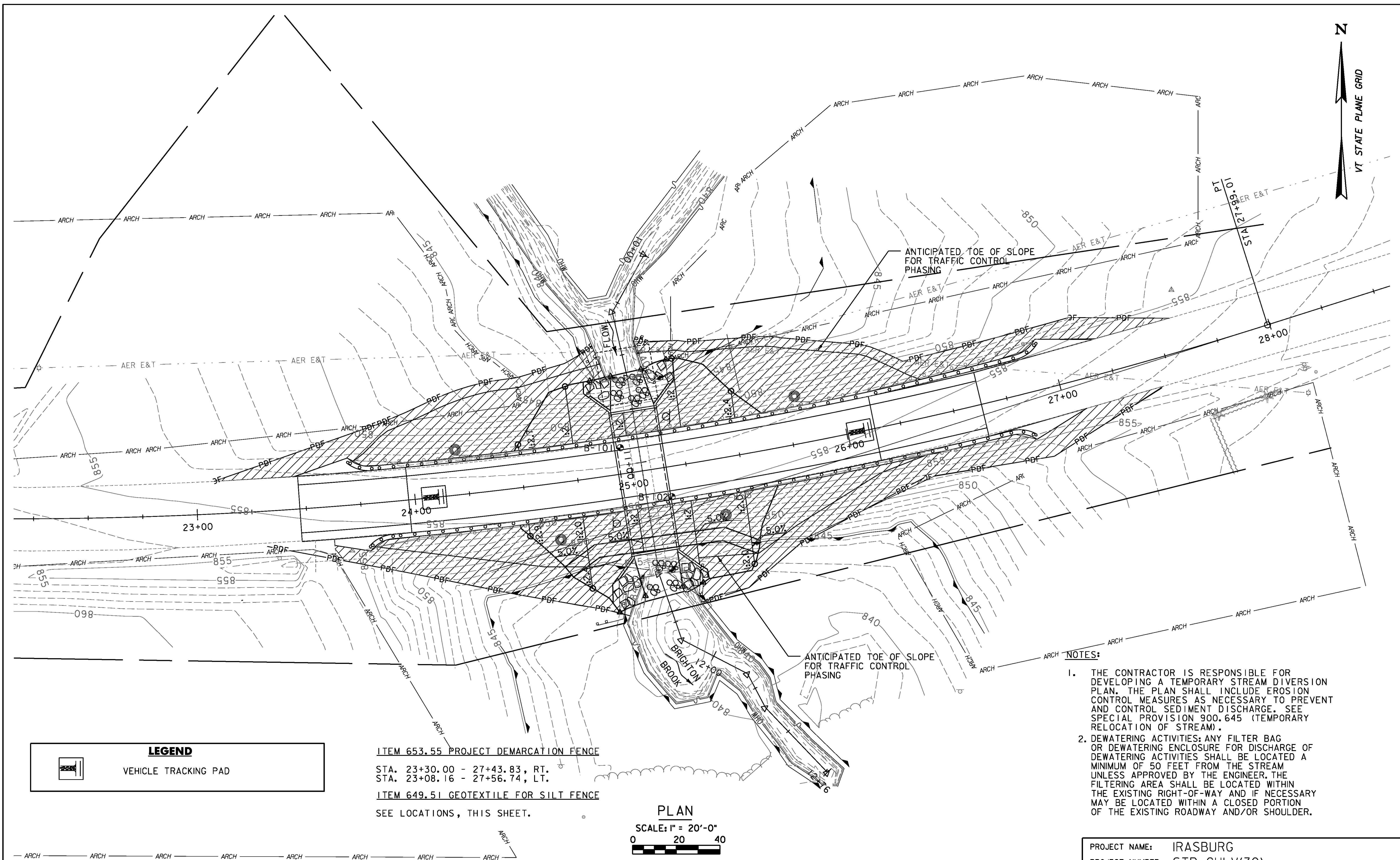
1.5.1 OFF-SITE ACTIVITIES

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



PROJECT NAME: IRASBURG	
PROJECT NUMBER: STP CULV(30)	
FILE NAME: zllc266ero_narr_BR6.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
EPSC NARRATIVE - ECN 1- BR6	SHEET 27 OF 55





**NOTES:**

1. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING A TEMPORARY STREAM DIVERSION PLAN. THE PLAN SHALL INCLUDE EROSION CONTROL MEASURES AS NECESSARY TO PREVENT AND CONTROL SEDIMENT DISCHARGE. SEE SPECIAL PROVISION 900.645 (TEMPORARY RELOCATION OF STREAM).
2. DEWATERING ACTIVITIES: ANY FILTER BAG OR DEWATERING ENCLOSURE FOR DISCHARGE OF DEWATERING ACTIVITIES SHALL BE LOCATED A MINIMUM OF 50 FEET FROM THE STREAM UNLESS APPROVED BY THE ENGINEER. THE FILTERING AREA SHALL BE LOCATED WITHIN THE EXISTING RIGHT-OF-WAY AND IF NECESSARY MAY BE LOCATED WITHIN A CLOSED PORTION OF THE EXISTING ROADWAY AND/OR SHOULDER.

PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266bdr_EPSC.br6.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
EPSC CONST. SITE PLAN - ECPI - BR6	SHEET 28 OF 55









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

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

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

#### CONSTRUCTION GUIDANCE

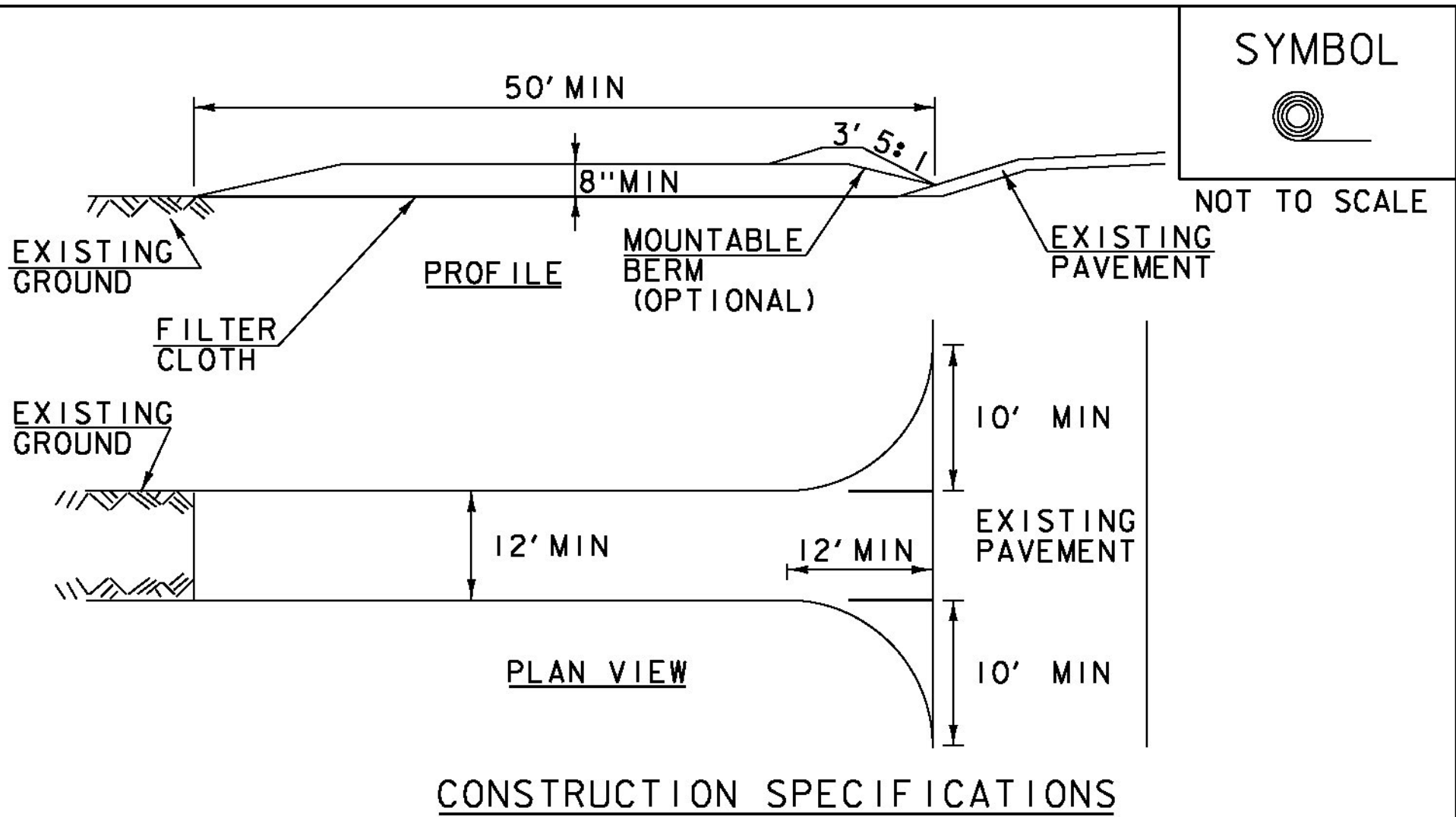
- RURAL SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
- URBAN SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED LAWN AREAS DISTURBED BY THE CONTRACTOR.
- ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 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



#### CONSTRUCTION SPECIFICATIONS

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

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

#### STABILIZED CONSTRUCTION ENTRANCE

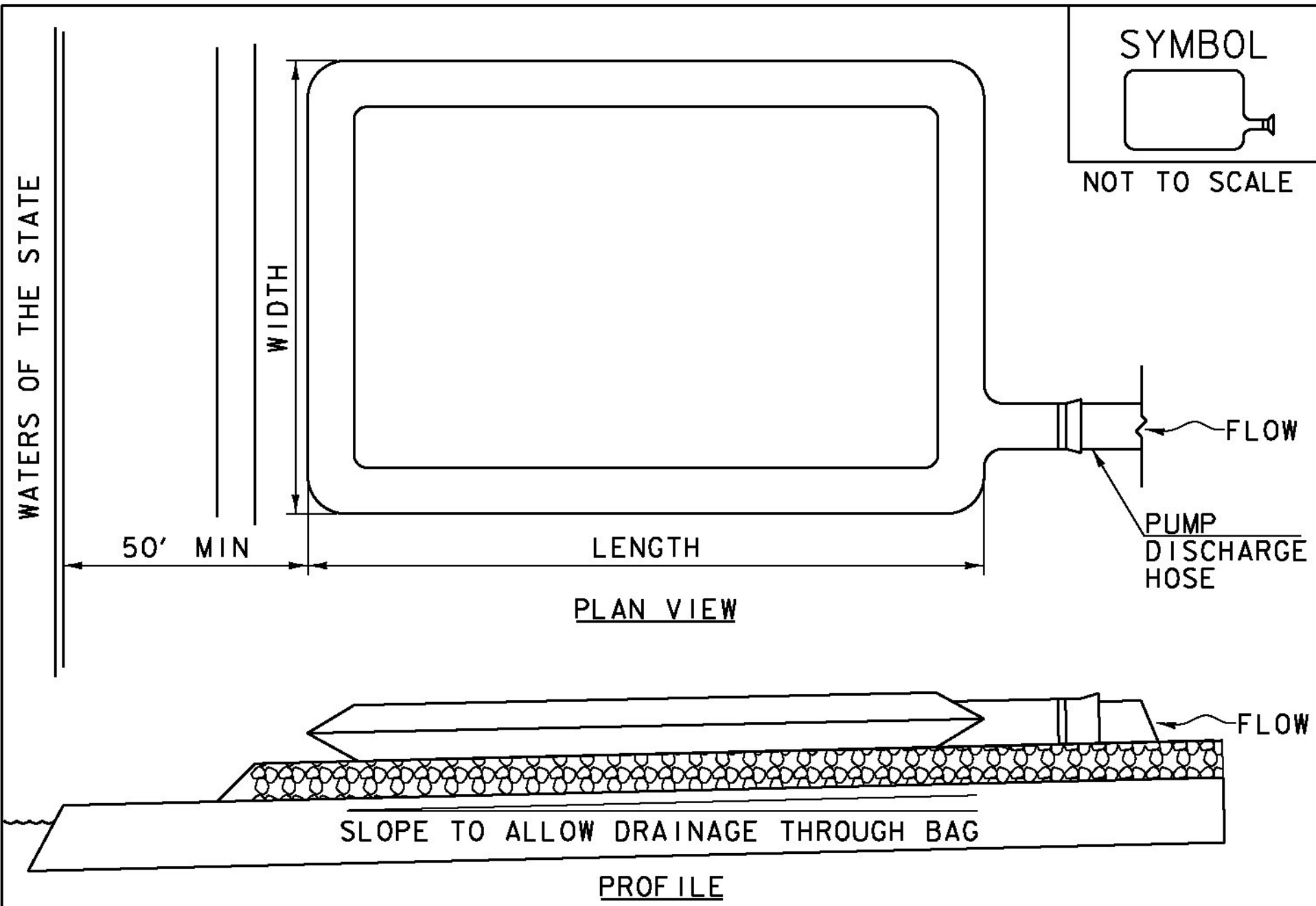
##### NOTES:

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

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

##### REVISIONS

MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



#### CONSTRUCTION SPECIFICATIONS

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

#### FILTER BAG

##### NOTES:

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

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

##### REVISIONS

MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF

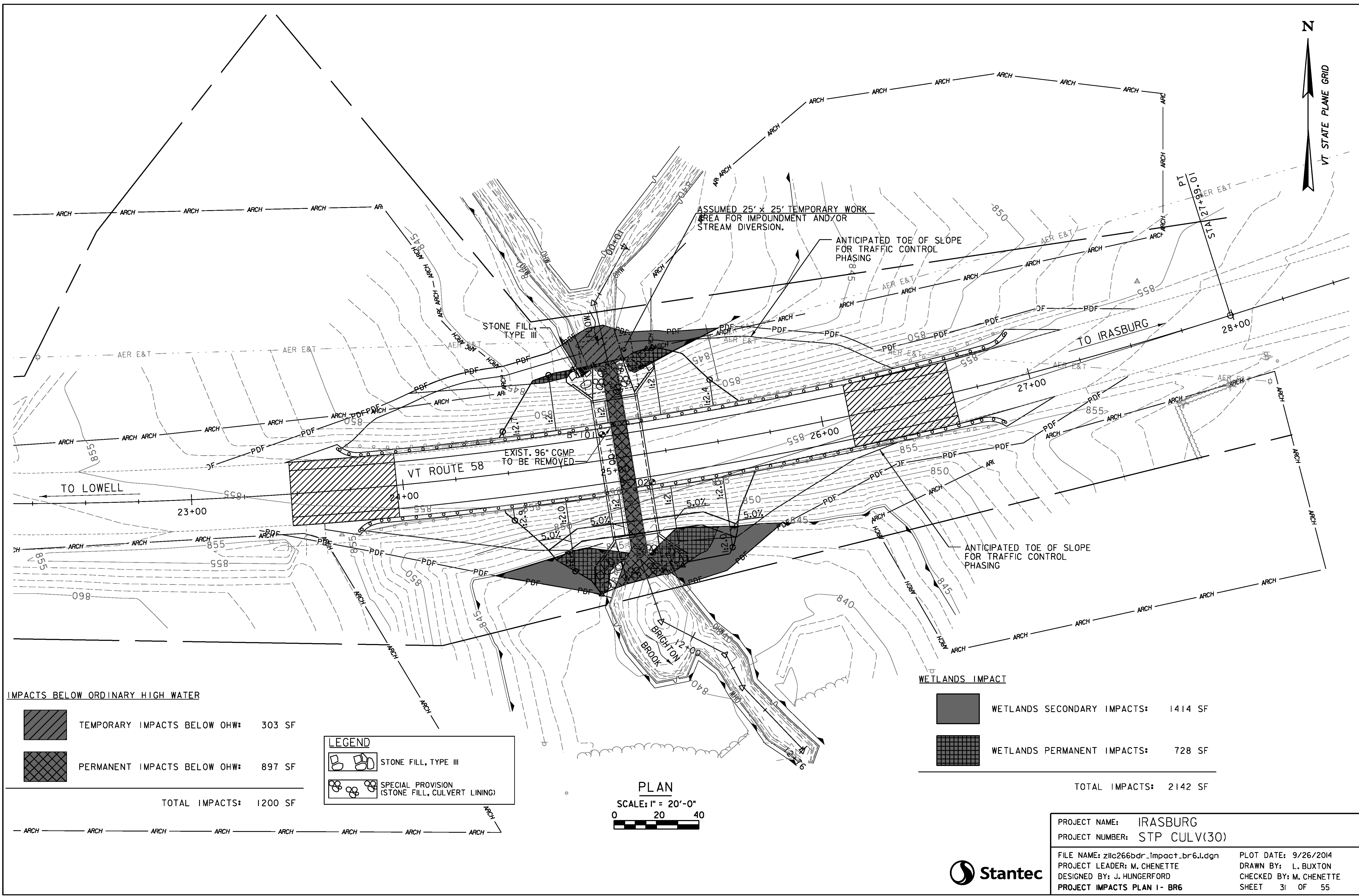
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266epsc def_br6.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
EROSION CONTROL DETAILS - ECD 2 - BR6

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 30 OF 55







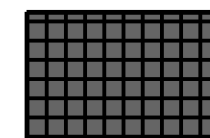
IMPACTS BELOW ORDINARY HIGH WATER

	TEMPORARY IMPACTS BELOW OHW:	303 SF
	PERMANENT IMPACTS BELOW OHW:	897 SF
TOTAL IMPACTS:		1200 SF

**LEGEND**

	STONE FILL, TYPE III
	SPECIAL PROVISION (STONE FILL, CULVERT LINING)

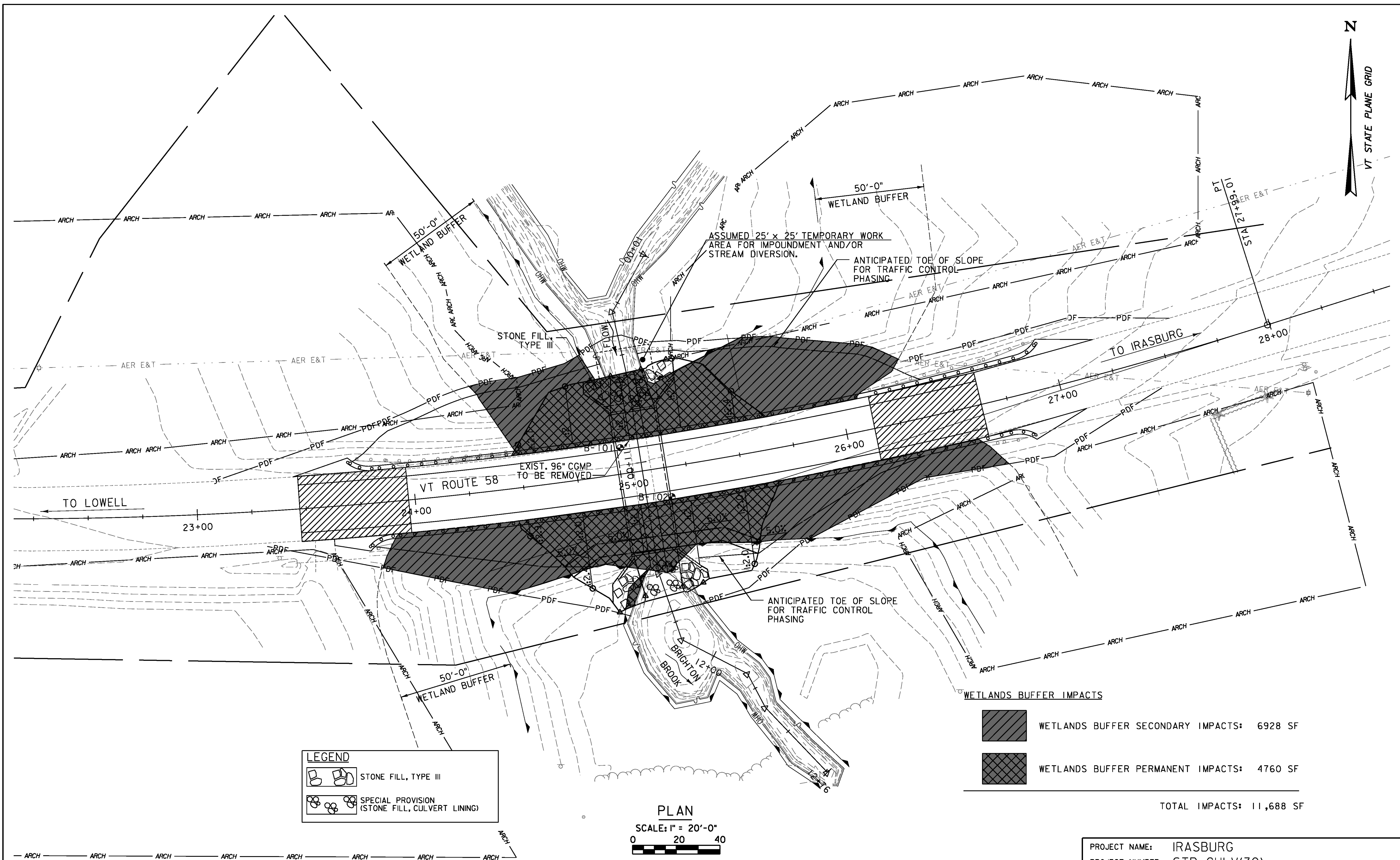
**PLAN**  
SCALE: 1" = 20'-0"  
0 20 40

WETLANDS IMPACT		
	WETLANDS SECONDARY IMPACTS:	1414 SF
	WETLANDS PERMANENT IMPACTS:	728 SF
TOTAL IMPACTS:		2142 SF

PROJECT NAME: IRASBURG	
PROJECT NUMBER: STP CULV(30)	
FILE NAME: zllc266bdr_impact_br6.lgdn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
PROJECT IMPACTS PLAN I - BR6	SHEET 31 OF 55







WETLANDS BUFFER IMPACTS	
	WETLANDS BUFFER SECONDARY IMPACTS: 6928 SF
	WETLANDS BUFFER PERMANENT IMPACTS: 4760 SF
TOTAL IMPACTS: 11,688 SF	

**LEGEND**

STONE FILL, TYPE III

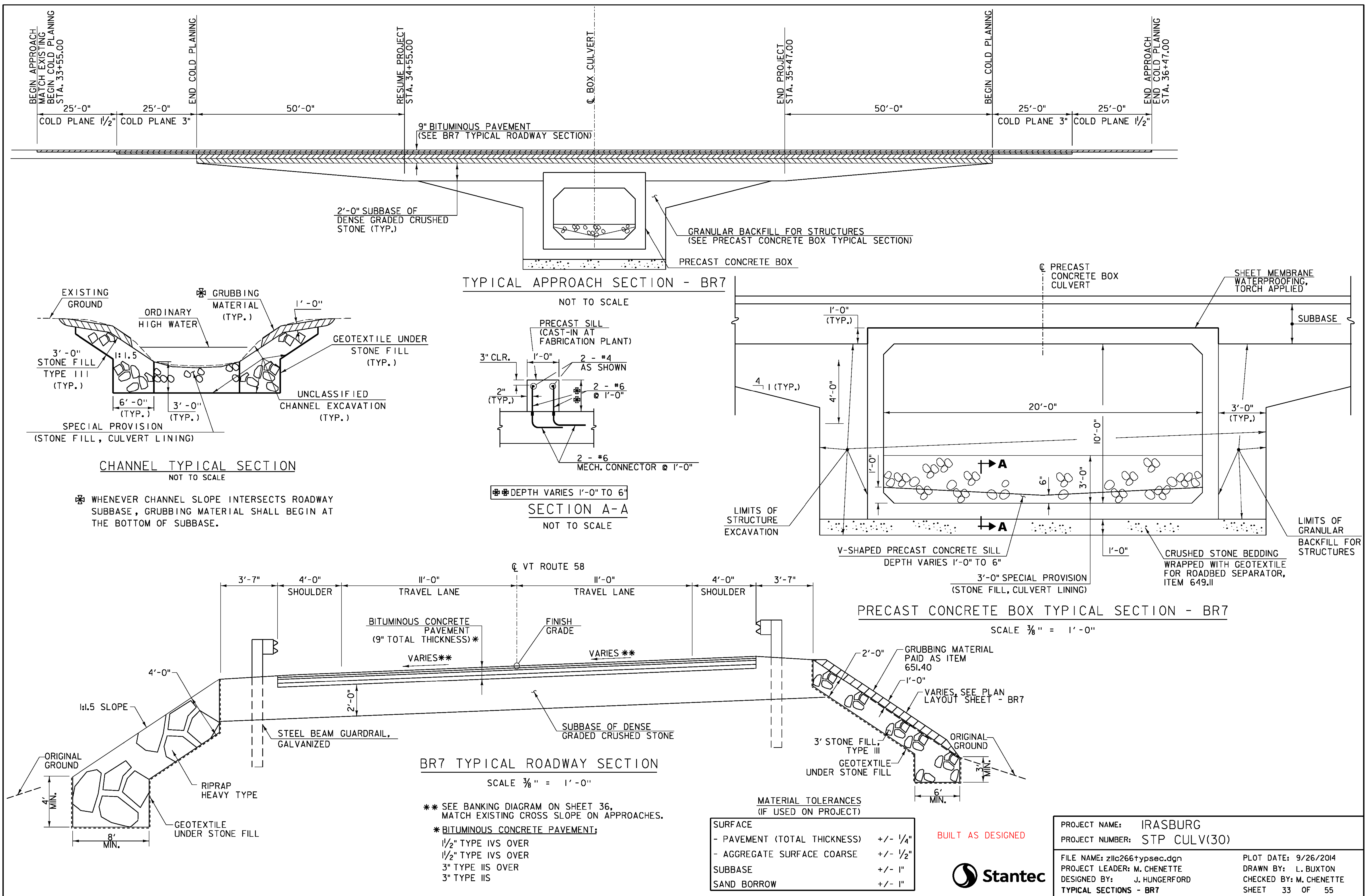
SPECIAL PROVISION (STONE FILL, CULVERT LINING)

**PLAN**  
SCALE: 1" = 20'-0"  
0 20 40



PROJECT NAME: IRASBURG	PLLOT DATE: 9/26/2014
PROJECT NUMBER: STP CULV(30)	DRAWN BY: L. BUXTON
FILE NAME: zllc266bdr_impacts_br6.2.dgn	CHECKED BY: M. CHENETTE
PROJECT LEADER: M. CHENETTE	SHEET 32 OF 55
DESIGNED BY: J. HUNGERFORD	
PROJECT IMPACTS PLAN 2 - BR6	





** SEE BANKING DIAGRAM ON SHEET 36,  
MATCH EXISTING CROSS SLOPE ON APPROACHES.

*** BITUMINOUS CONCRETE PAVEMENT:**  
1 1/2" TYPE IVS OVER  
1 1/2" TYPE IVS OVER  
3" TYPE IIS OVER  
3" TYPE IIS

MATERIAL TOLERANCES (IF USED ON PROJECT)	
SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COARSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

BUILT AS DESIGNED



PROJECT NAME: IRASBURG	
PROJECT NUMBER: STP CULV(30)	
FILE NAME: zllc266typsec.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
TYPICAL SECTIONS - BR7	
SHEET 33 OF 55	

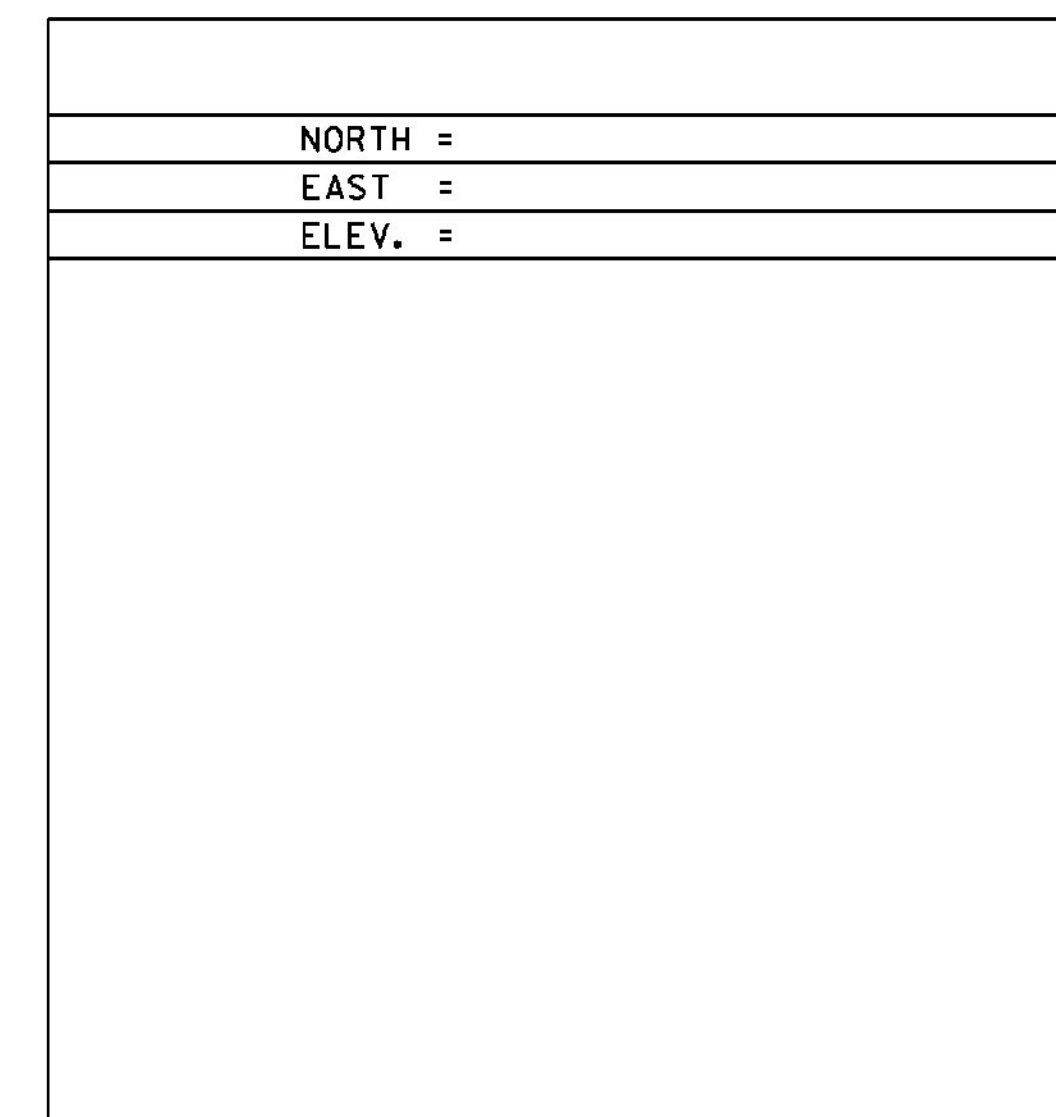
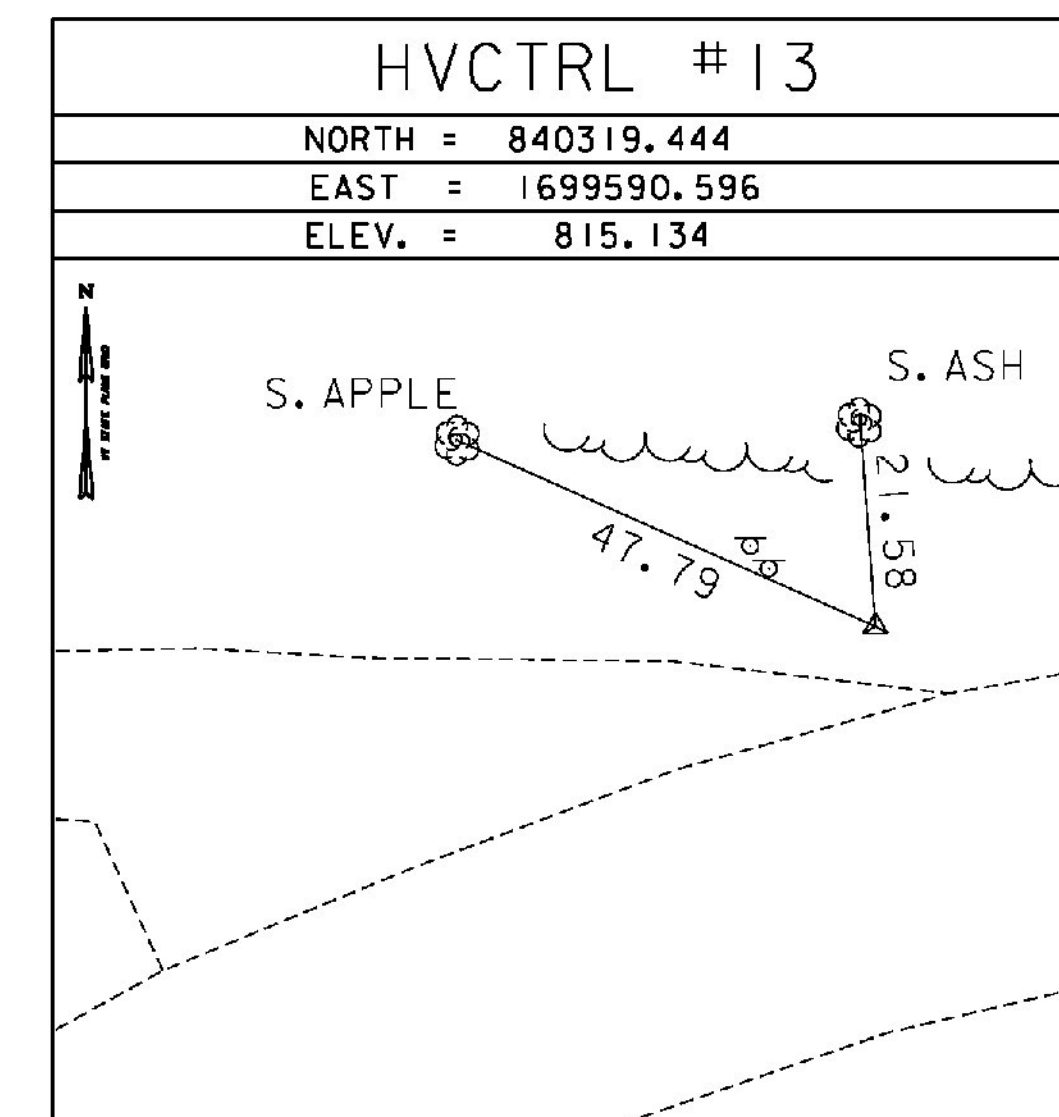
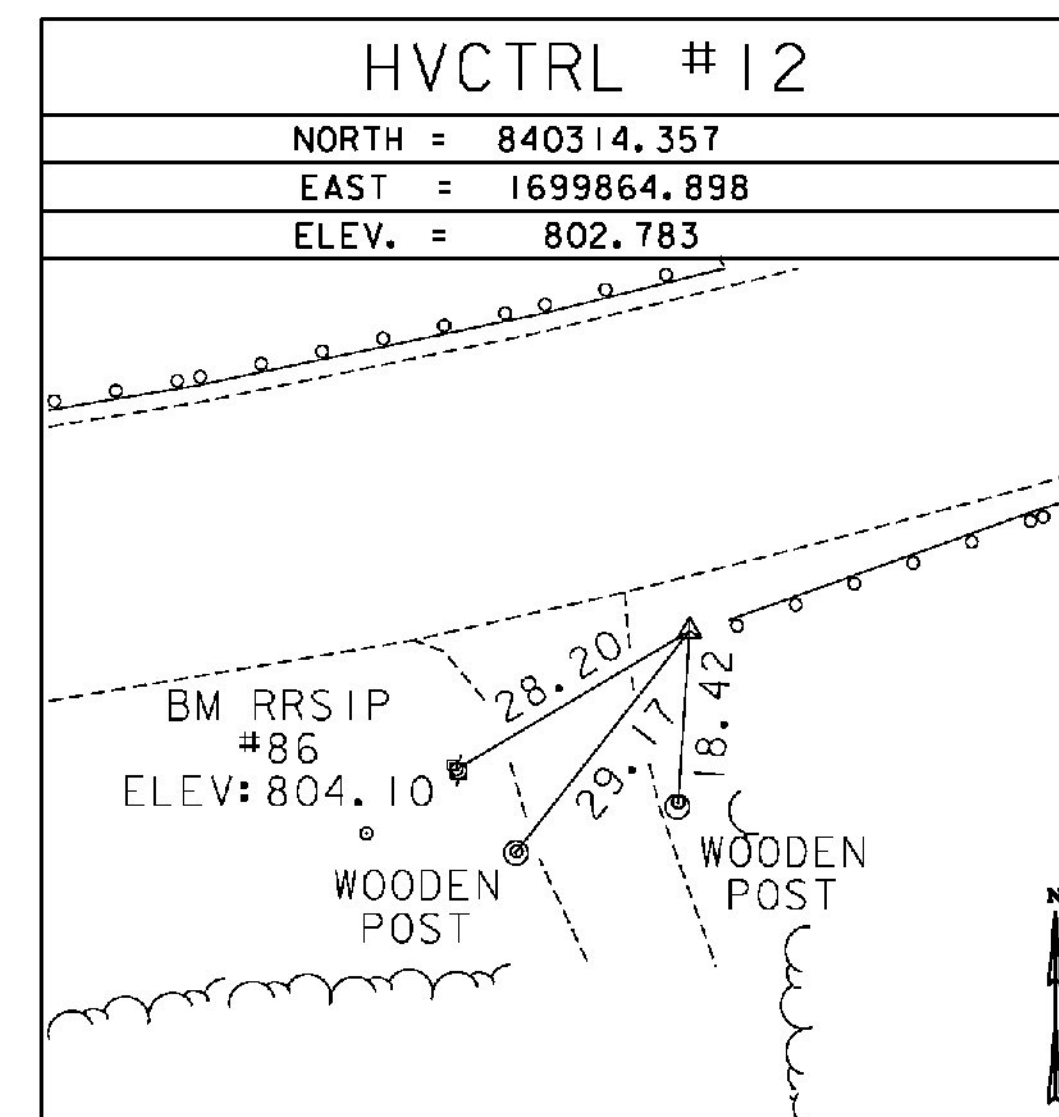
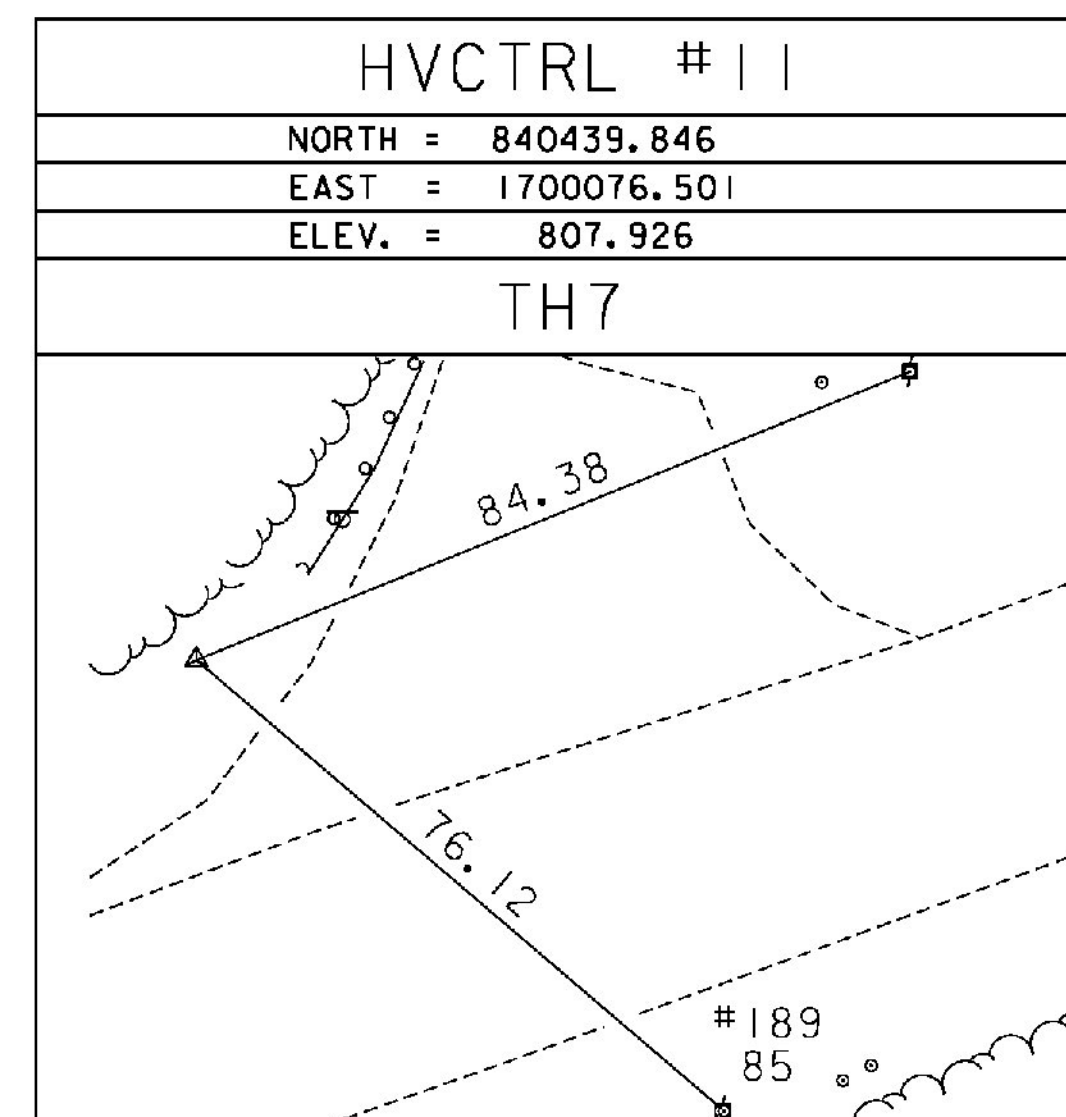
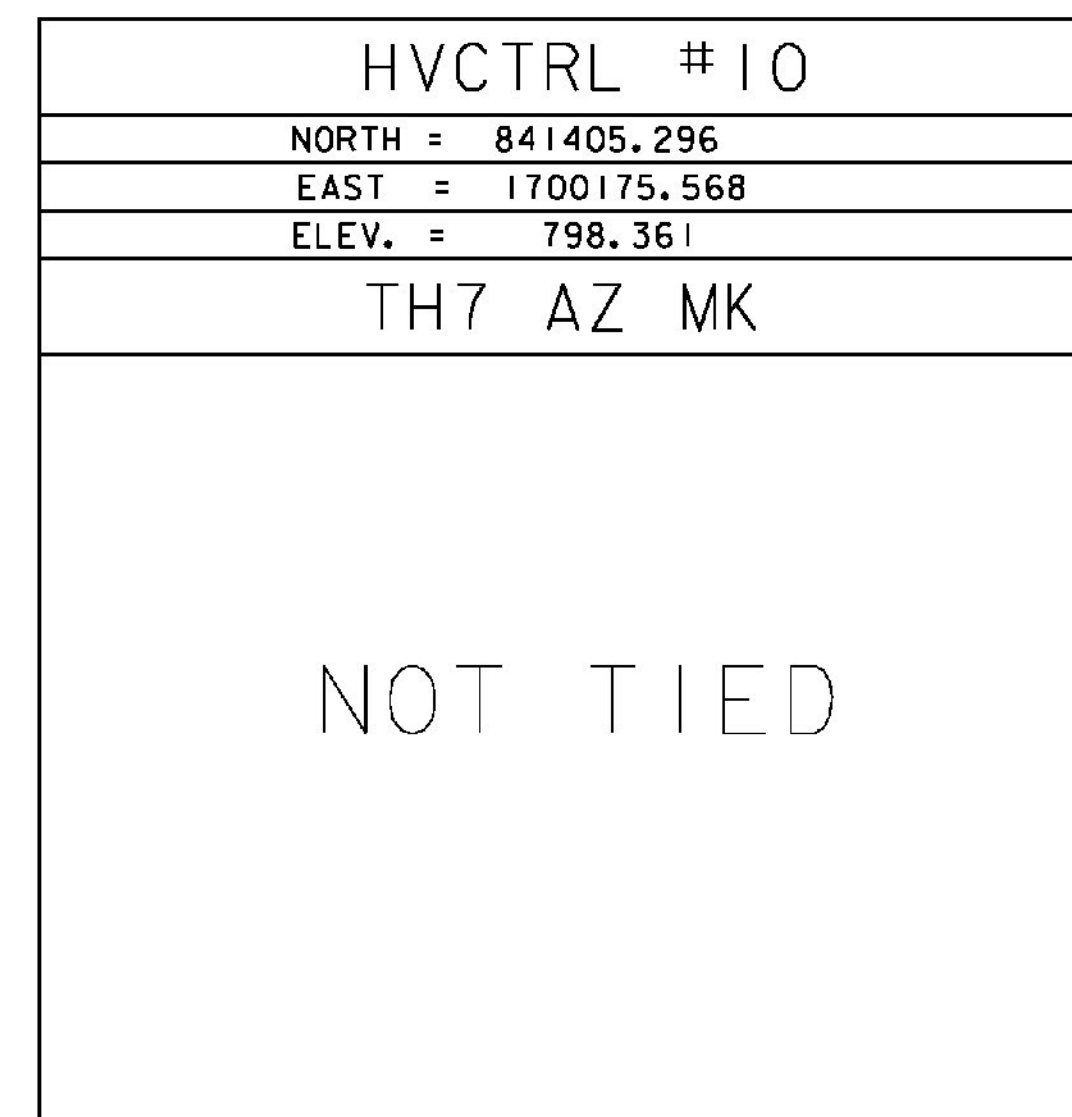


## GPS CONTROL POINTS

COORDINATES WERE DERIVED FROM STATIC NETWORK OBSERVATIONS WITH A LEAST SQUARES ADJUSTMENT. THE FOLLOWING CONTINUOUSLY OPERATING GPS REFERENCE STATIONS [CORS] WERE USED.

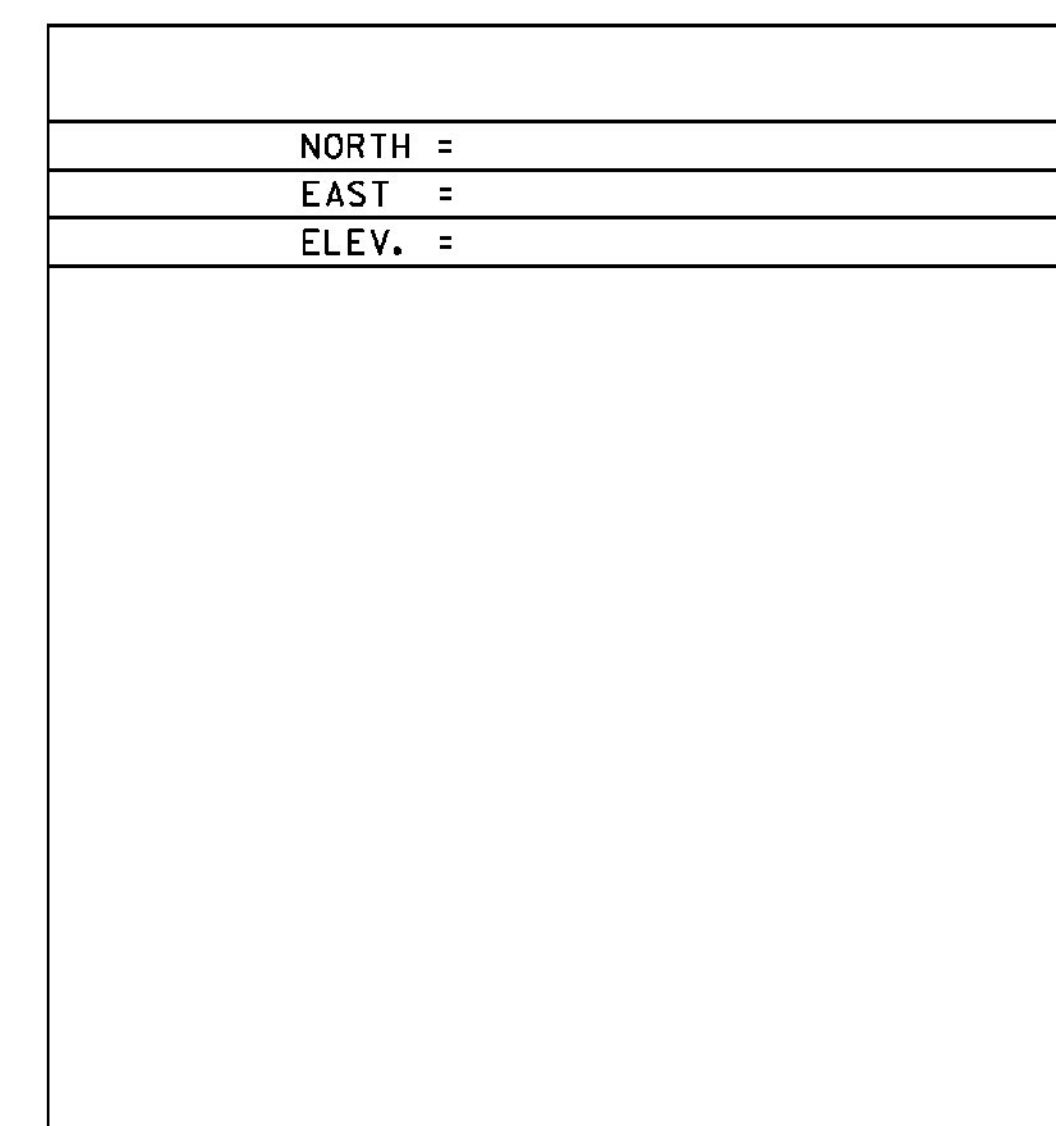
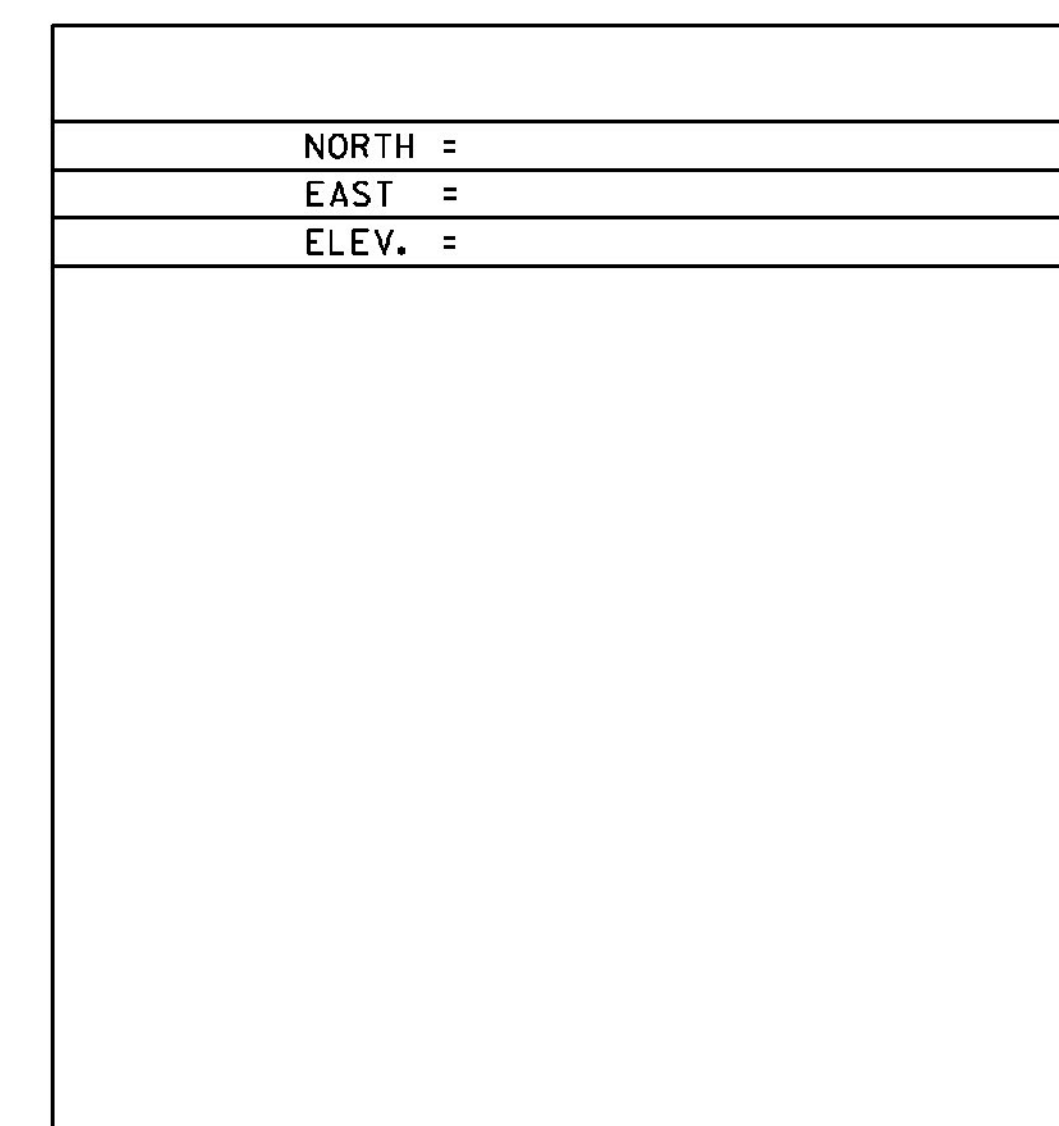
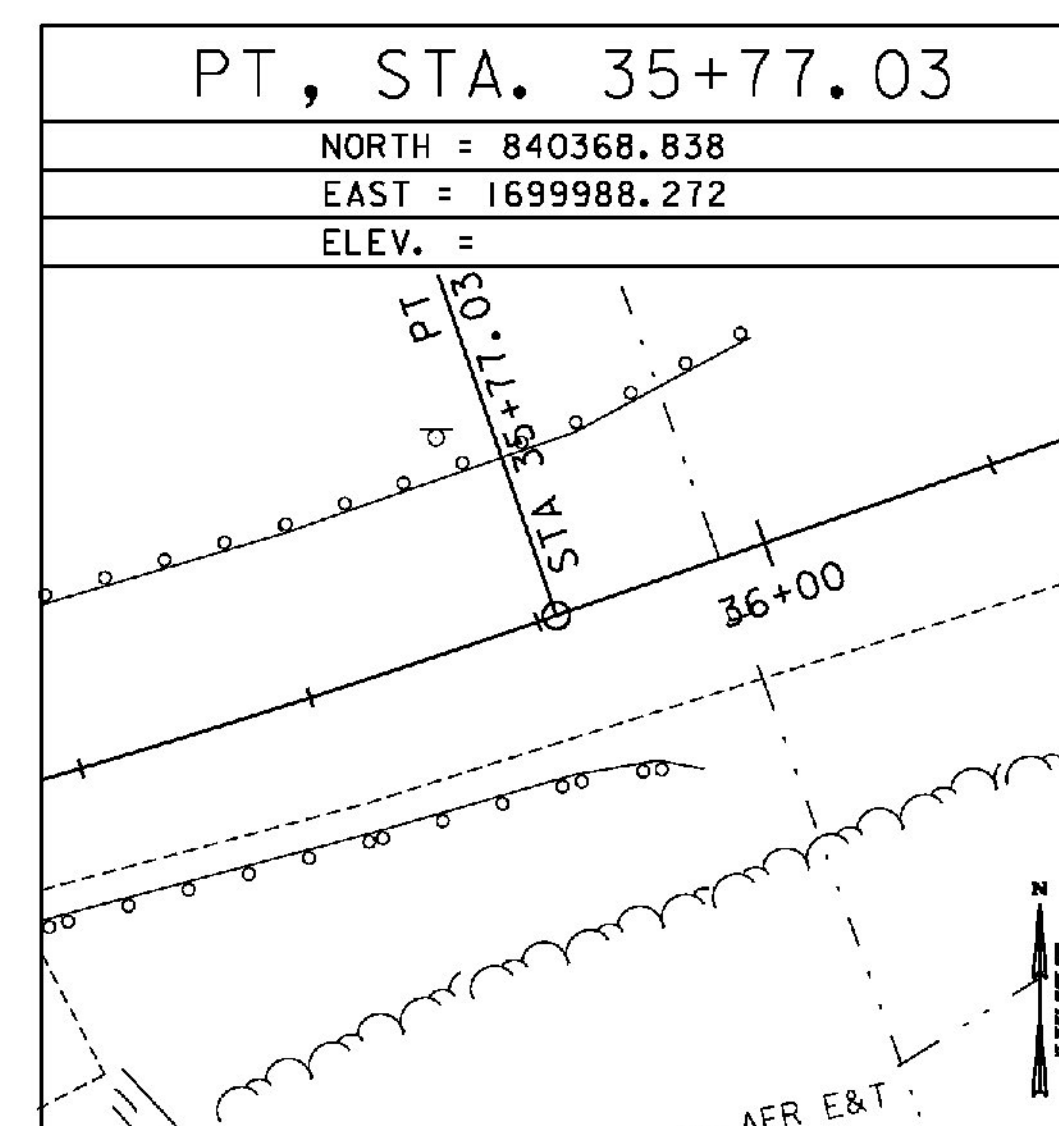
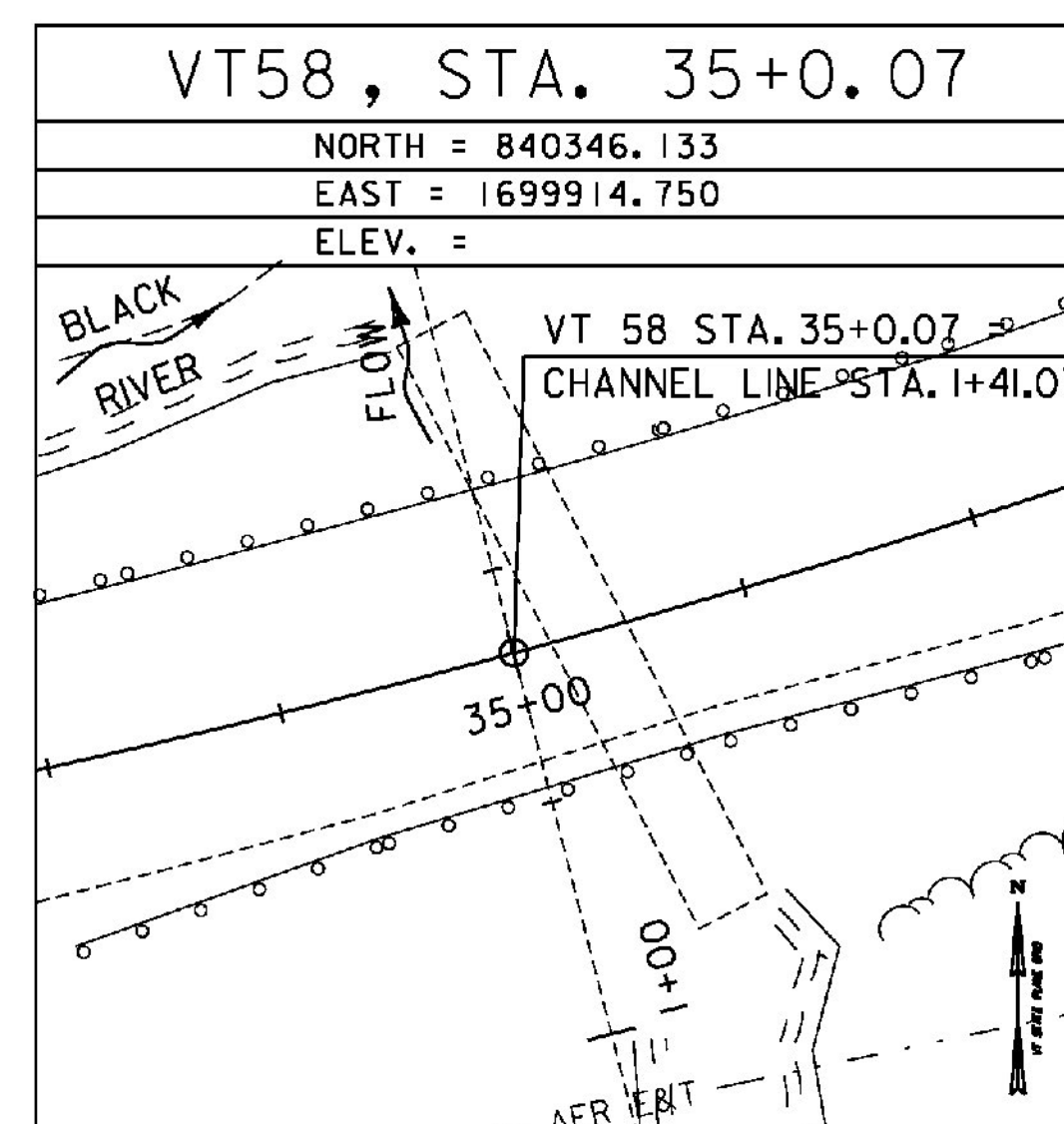
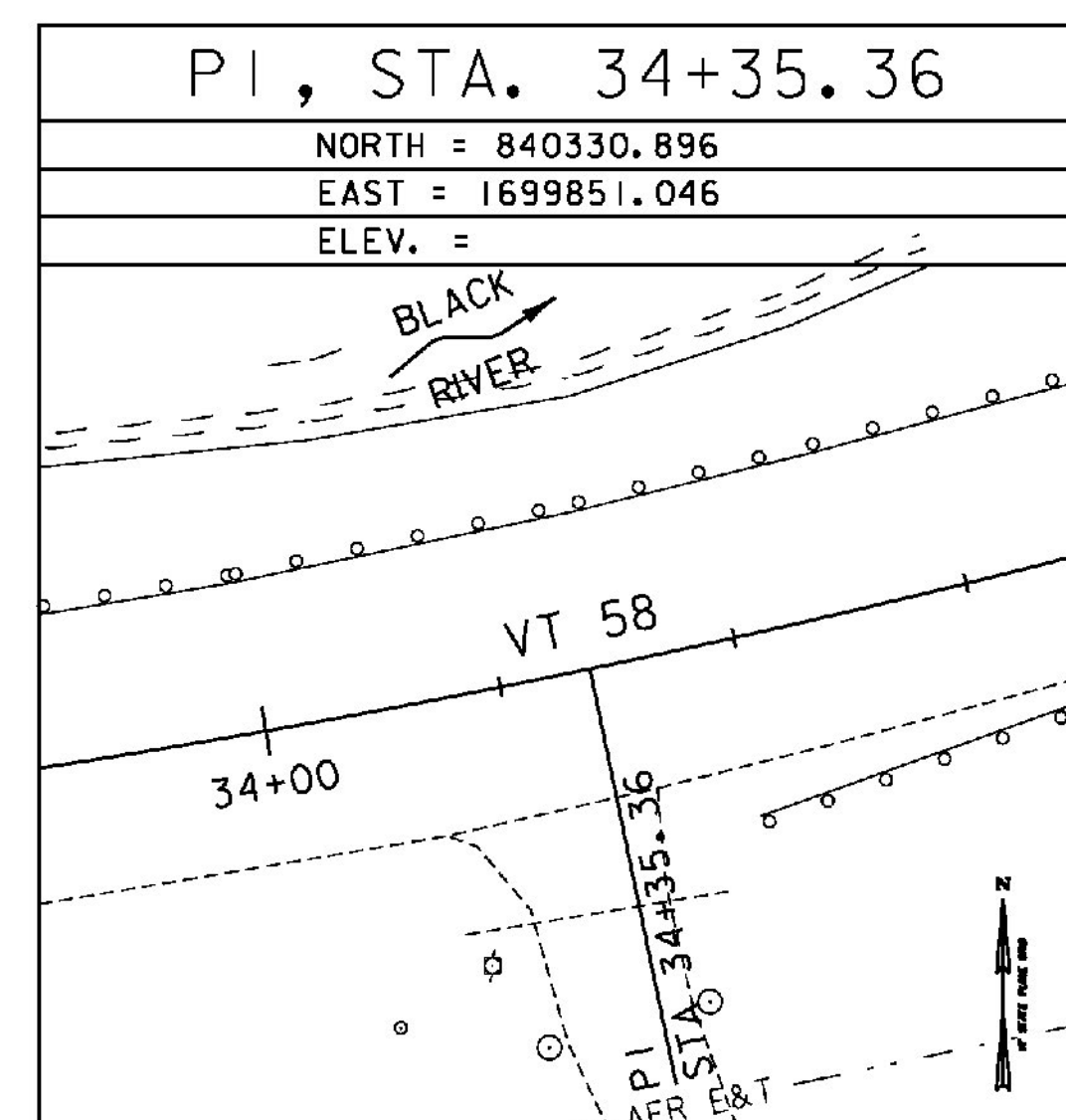
HARDWICK CORS ARP  
DERBY CORS ARP  
ISLAND POND CORS ARP

## TRAVERSE TIES



* MAIN TRAVERSE COMPLETED 2/8/2012 BY R. GILMAN P.C. & P. WINTERS

## ALIGNMENT TIES



DATUM		
VERTICAL	NAVD 88	
HORIZONTAL	NAD 83(07)	ZONE Vermont 4400
ADJUSTMENT	COMPASS	GEOID GEOID09 (Conus)



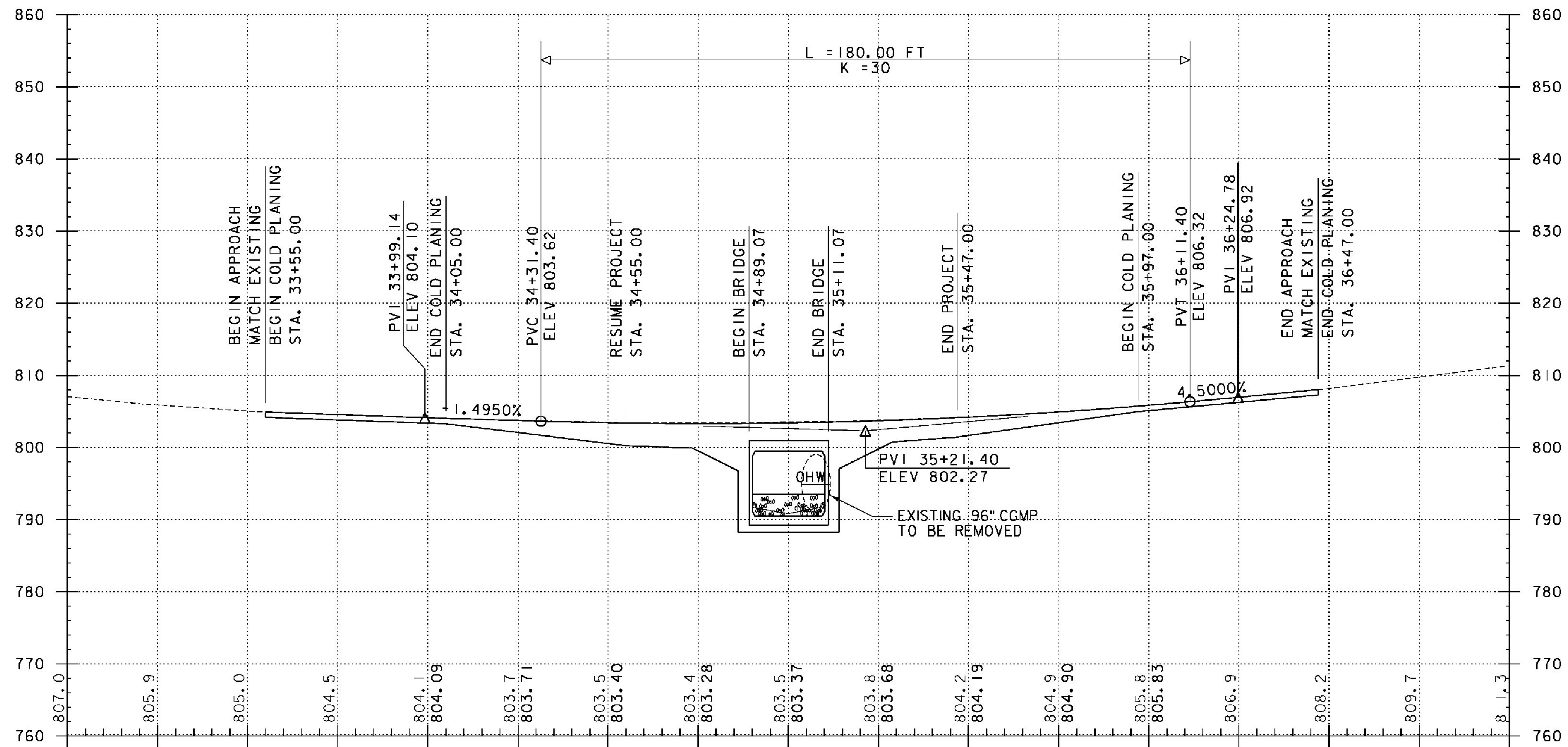
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266+1e_br7.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
SURVEY CONTROL AND TIES - BR7	SHEET 34 OF 55

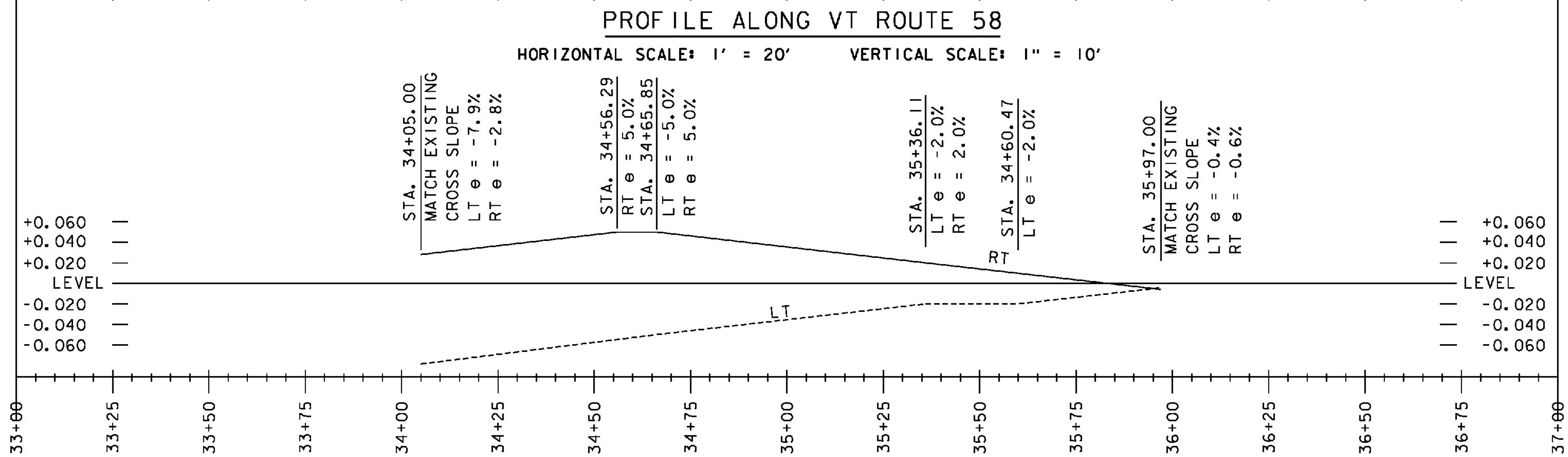








NOTE:  
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG PROPOSED CENTERLINE.  
  
ELEVATIONS SHOW TO THE NEAREST HUNDREDTH ARE FINISHED GRADE ALONG PROPOSED CENTERLINE.



### BANKING DIAGRAM

HORIZONTAL SCALE: 1' = 20' VERTICAL SCALE: N.T.S.

NOTE:  
STATIONING IN FEET AND  
SUPERELEVATIONS IN PERCENTAGES

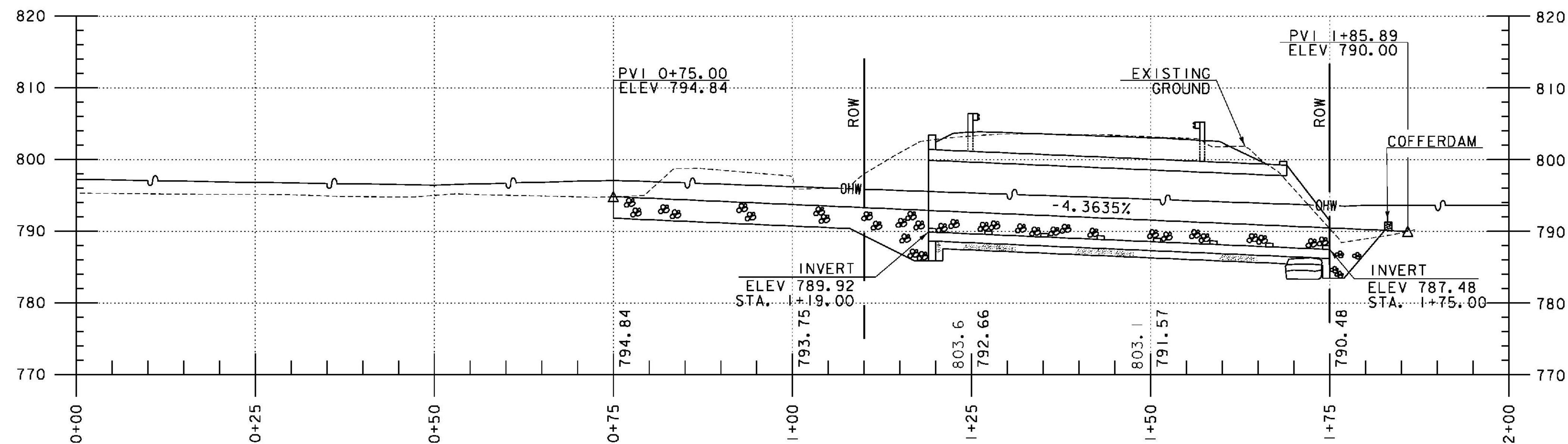
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266pro.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
ROADWAY PROFILE - BR7

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 36 OF 55



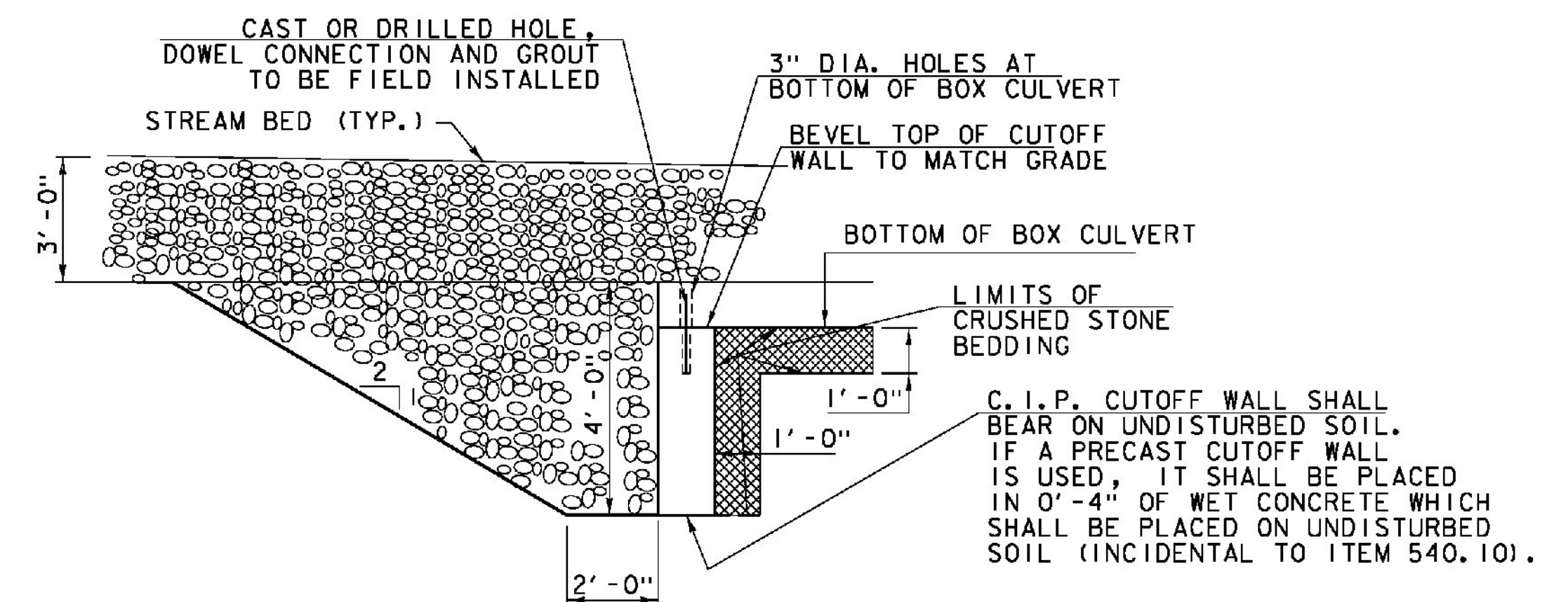
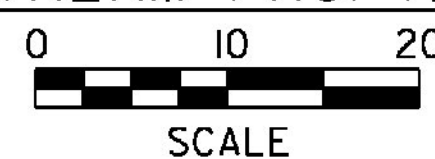




NOTE:  
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG PROPOSED CENTERLINE.

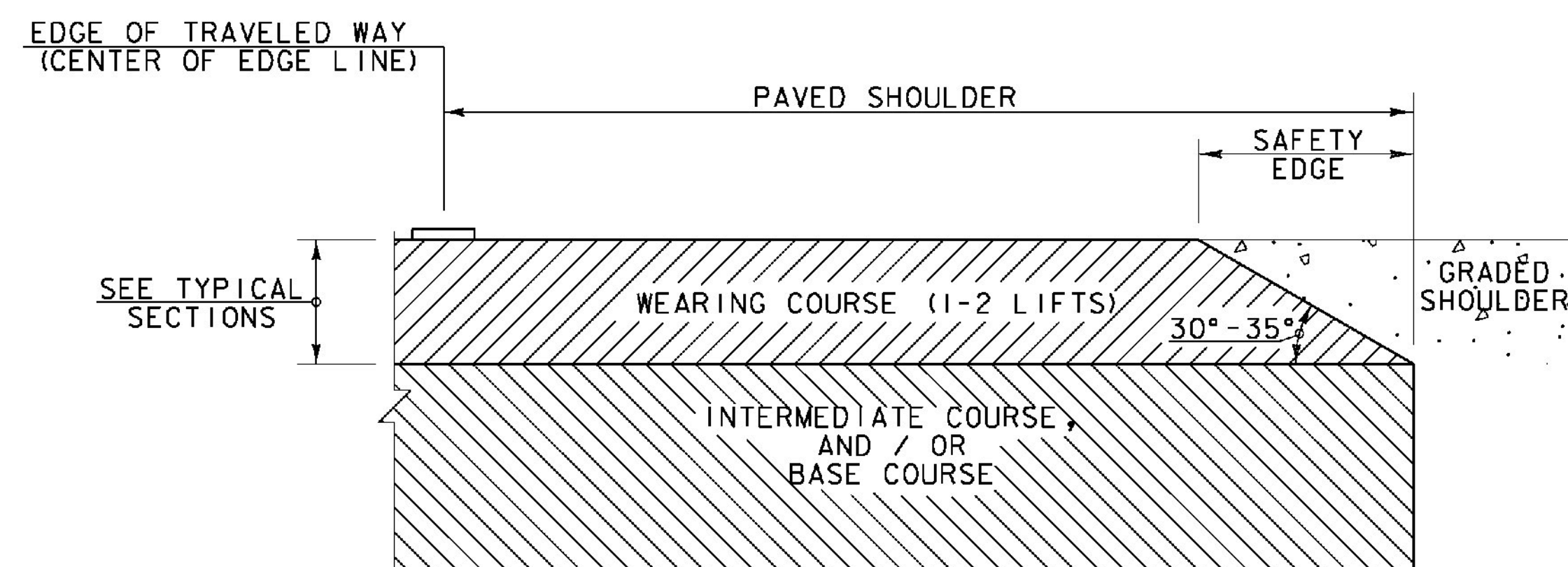
ELEVATIONS SHOW TO THE NEAREST HUNDREDTH ARE FINISHED GRADE ALONG PROPOSED CENTERLINE.

STREAM PROFILE



INLET CUTOFF WALL DETAIL

NOT TO SCALE

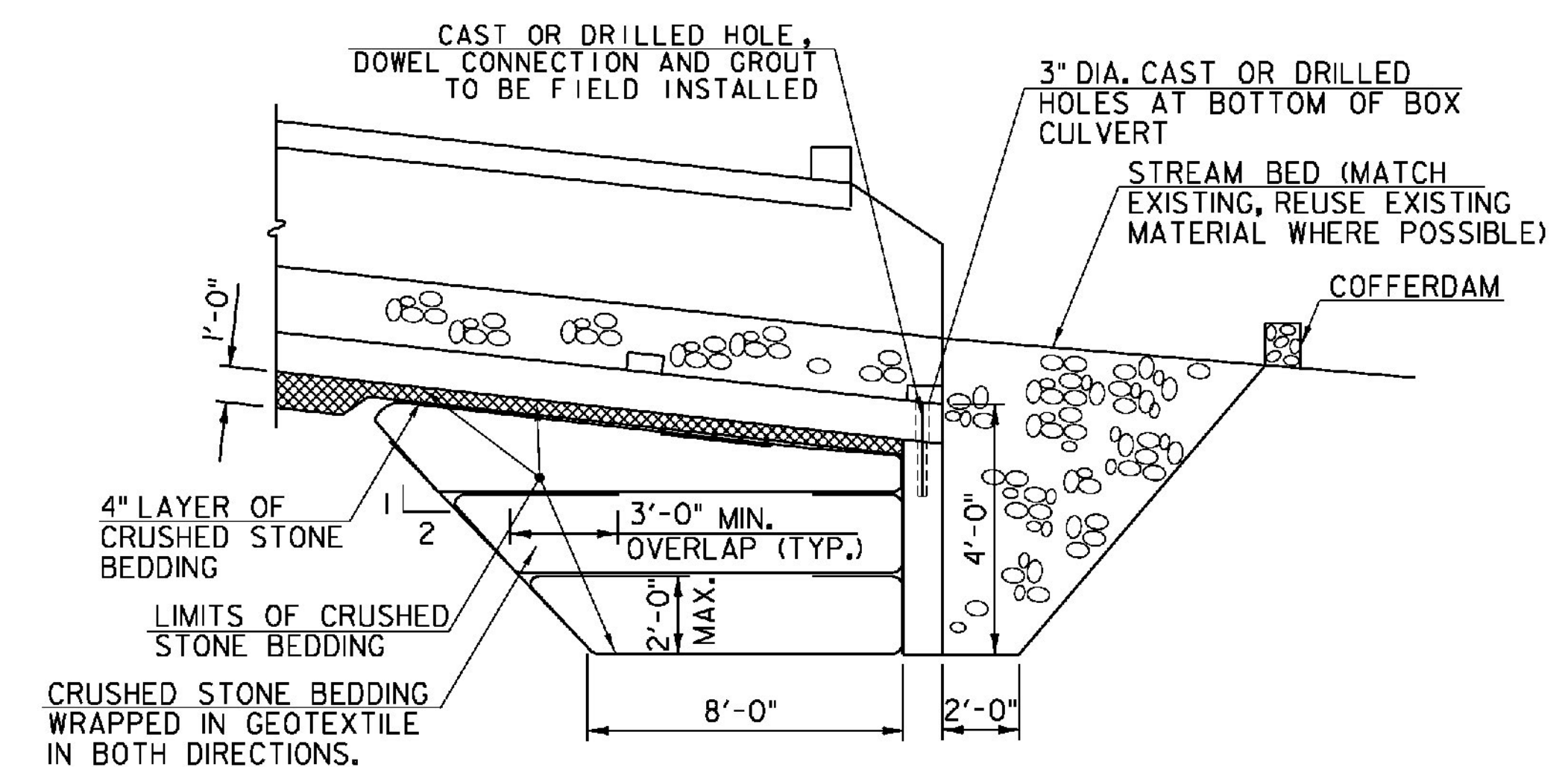


SAFETY EDGE DETAIL

NOT TO SCALE

NOTES:

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



OUTLET CUTOFF WALL DETAIL

NOT TO SCALE

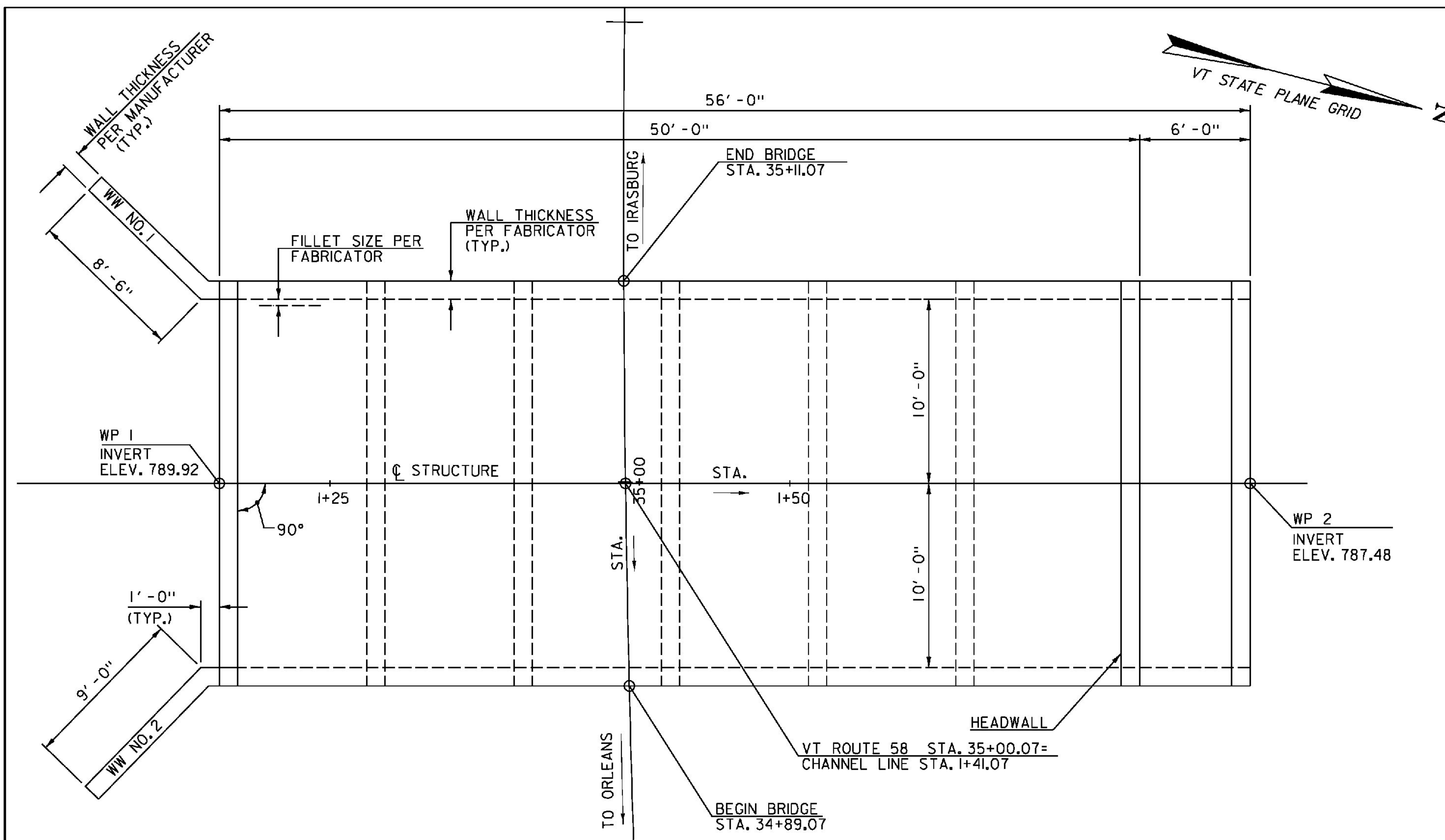


PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

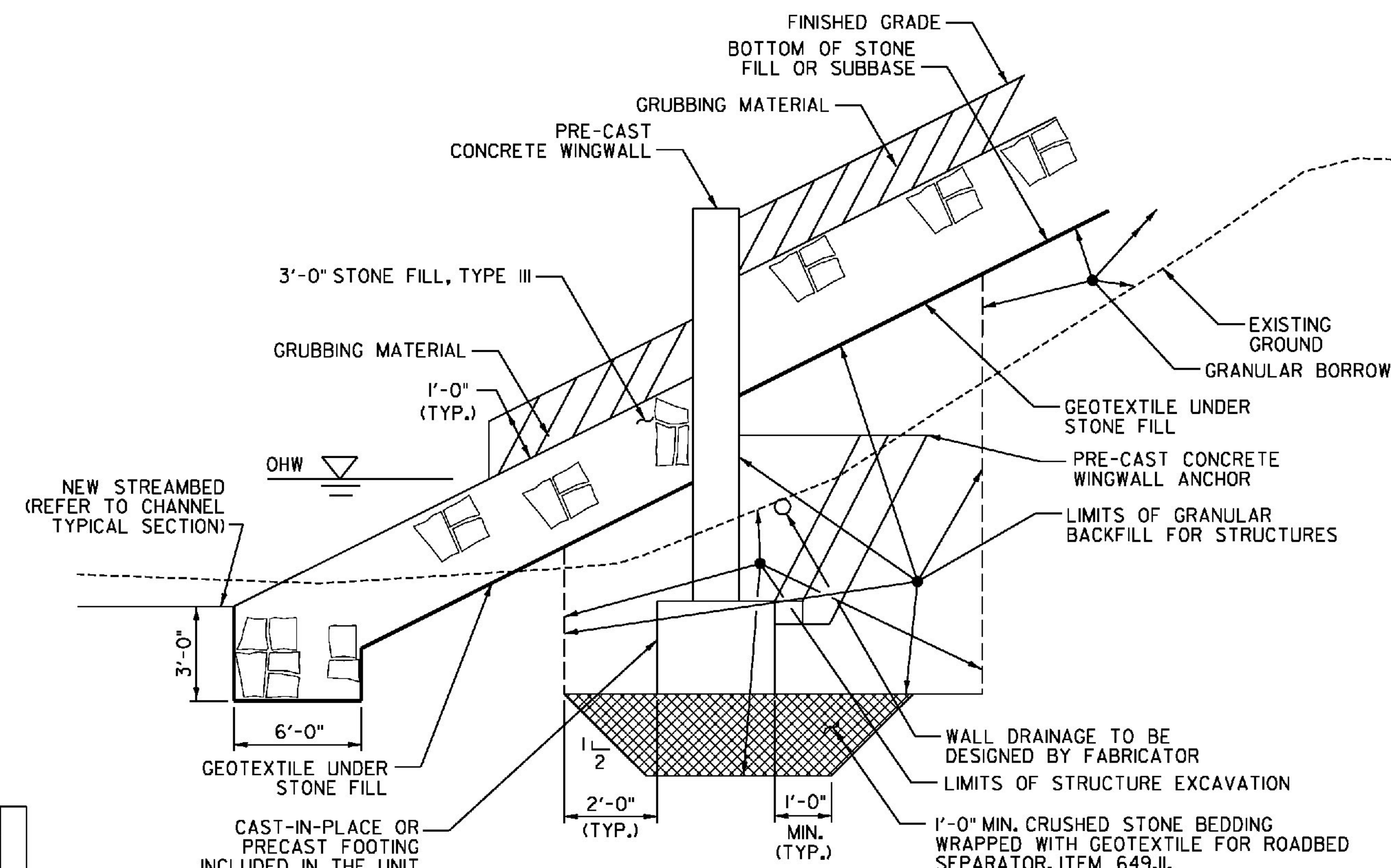
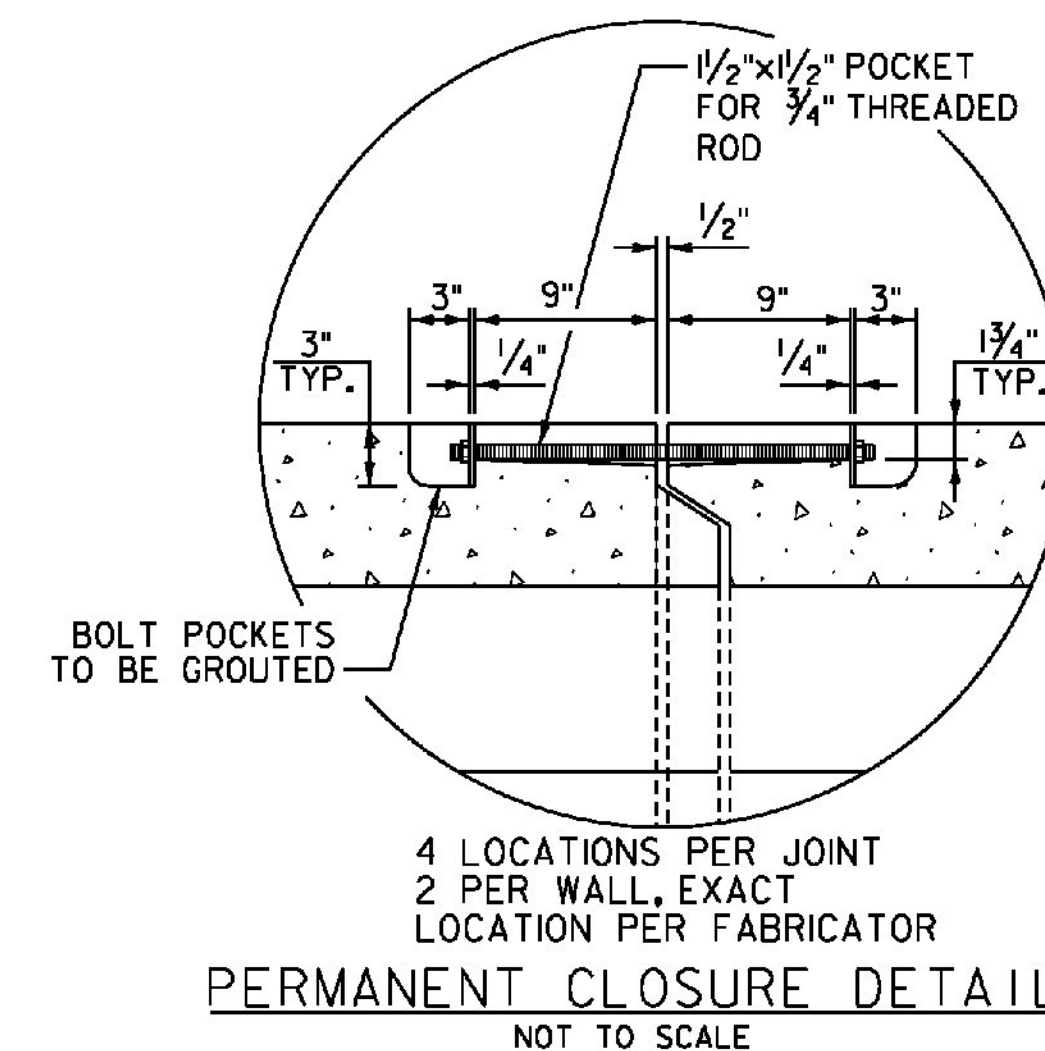
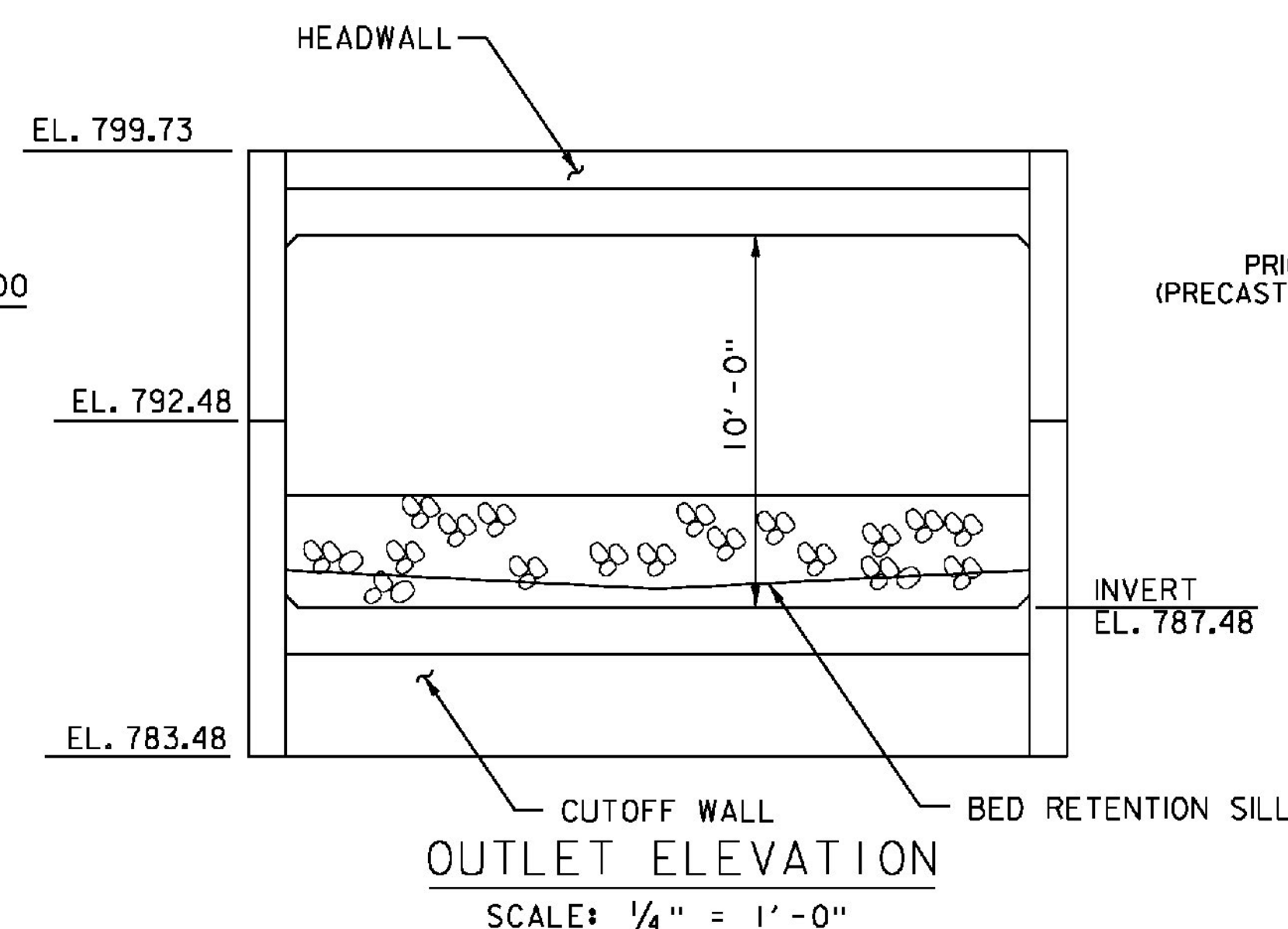
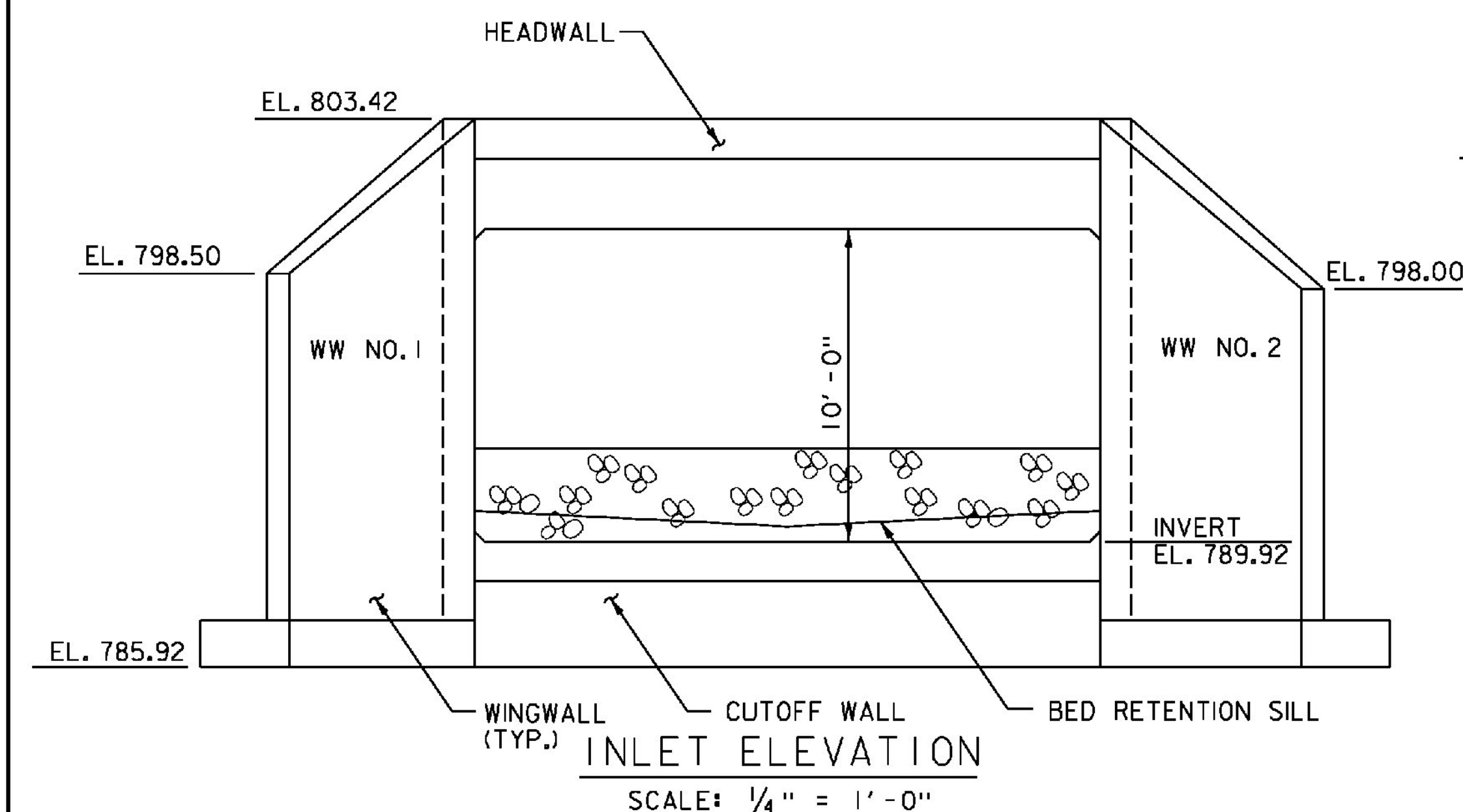
FILE NAME: zllc266strm.pro.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
STREAM PROFILE - BR7

PLOT DATE: 10/21/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 37 OF 55





PRECAST CONCRETE STRUCTURE PLAN  
SCALE: 1/4" = 1' - 0"



- NOTES:
1. ANCHOR TYPE WALLS SHOWN, OTHER APPROVED WALL SYSTEM MAY BE USED.
  2. FOR PURPOSES OF ESTIMATING EARTHWORK QUANTITIES, THE LIMITS HAVE BEEN SHOWN ABOVE. ONLY THE EXCAVATION INCLUDED WITHIN THESE LIMITS SHALL BE PAID FOR UNDER ITEM 204.25, "STRUCTURE EXCAVATION". THE CONTRACTOR SHALL DETERMINE THE ACTUAL LIMITS OF STRUCTURE EXCAVATION, PER PRECAST WINGWALL DESIGN.

WINGWALL EARTHWORK SECTION  
NOT TO SCALE

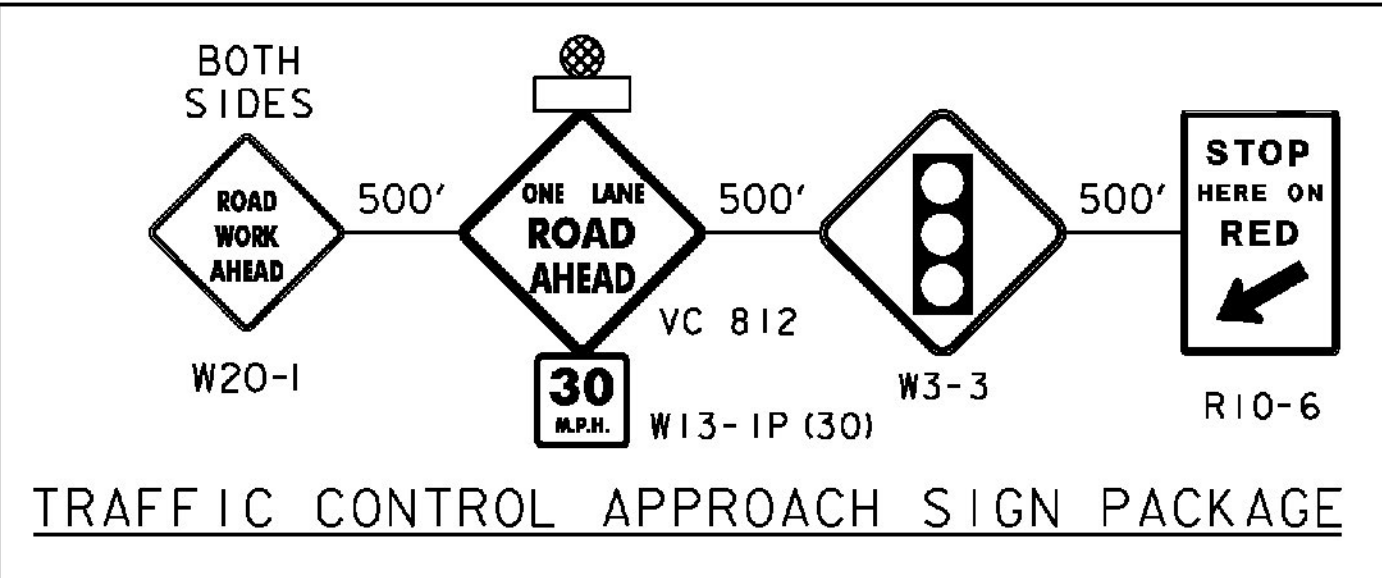
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266strpl.br7.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
STRUCTURAL PLAN AND DETAILS - BR7

PLOT DATE: 10/21/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 38 OF 55

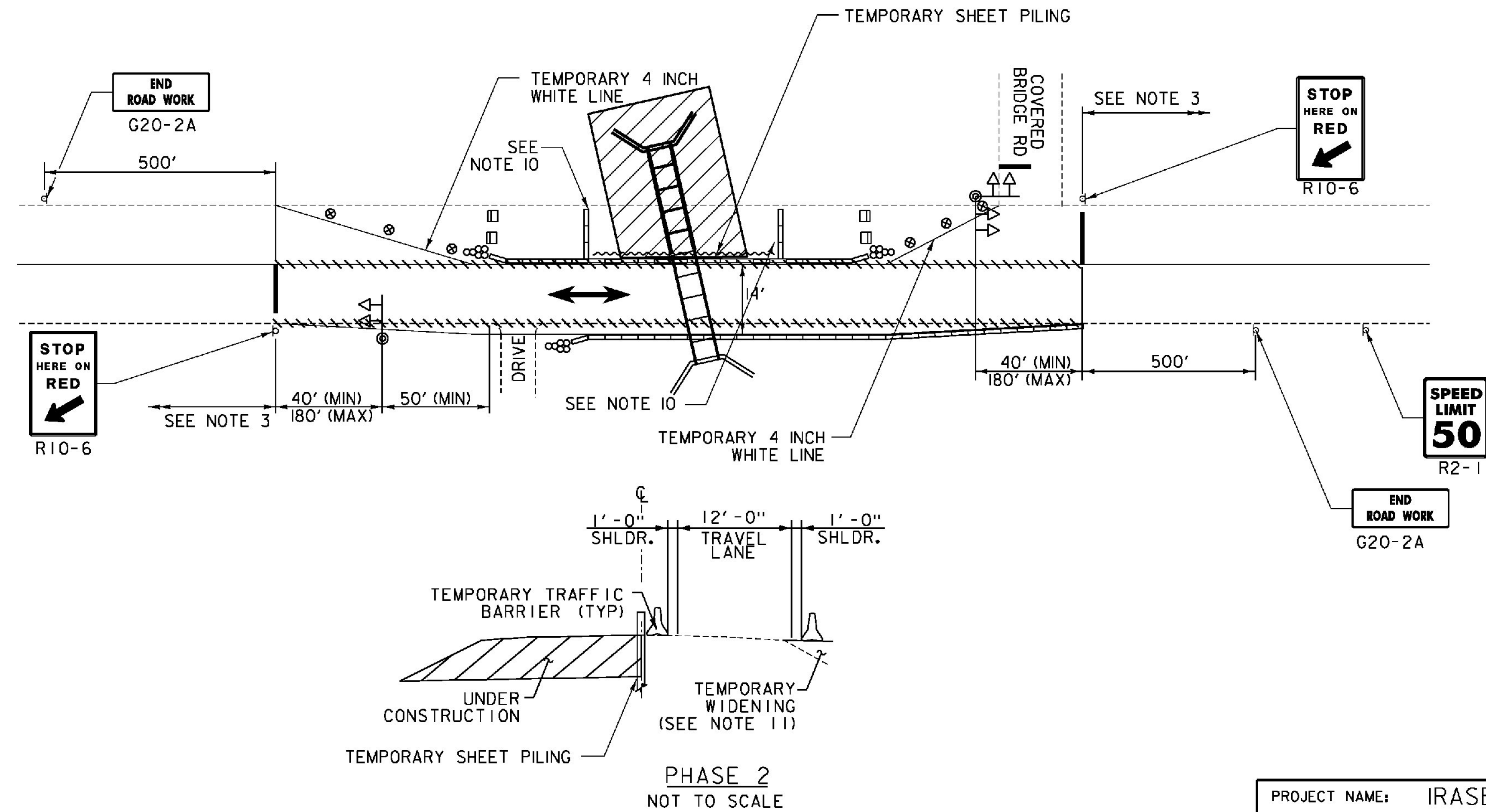
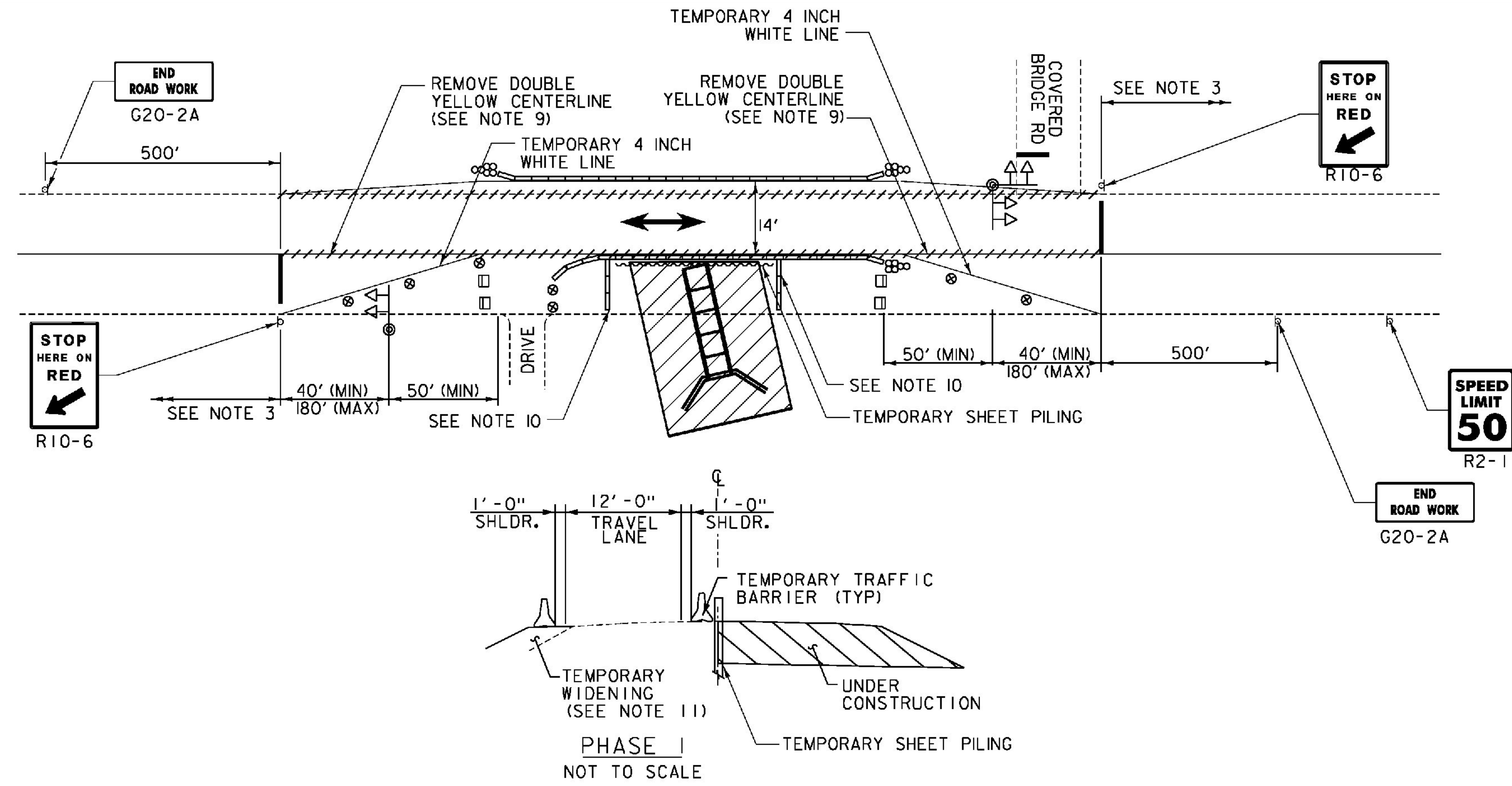






- NOTES:
1. SEE SHEET 4 FOR GENERAL TRAFFIC CONTROL NOTES.
  2. REFER TO STANDARD T-10 FOR CONSTRUCTION APPROACH SIGNS CRITERIA.
  3. REFER TO "TRAFFIC CONTROL APPROACH SIGN PACKAGE" DETAIL THIS SHEET.
  4. CHANNELIZING DEVICE SPACING  
TANGENT SECTIONS: 60 FT. (2X DESIGN SPEED LIMIT)  
TAPER SECTIONS: 30 FT. (1X DESIGN SPEED LIMIT)  
DESIGN SPEED THROUGH CONSTRUCTION ZONE = 30MPH
  5. ACCESS TO ALL EXISTING SIDE ROADS, DRIVES, AND PARKING AREAS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
  6. TRAFFIC CONTROL SHALL ALLOW FOR A WB-67 DESIGN VEHICLE.
  7. ATTENUATORS SHALL MEET THE POSTED SPEED OF 50 MPH.
  8. CHANNELIZING DEVICES LEFT OVERNIGHT SHALL BE DRUMS.
  9. REMOVED CENTERLINE TO BE REPLACED WITH DURABLE 4 INCH YELLOW LINE.
  10. TEMPORARY TRAFFIC BARRIER TO BE IN PLACE WHILE EXCAVATION IS OPEN AND WORK IS NOT ACTIVE OR AT THE DISCRETION OF THE ENGINEER.
  11. TEMPORARY WIDENING TO BE PAID FOR AS PART OF ITEM 900.645 SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)

LEGEND	
	UNDER CONSTRUCTION
	ALTERNATING ONE WAY TRAFFIC
	TEMPORARY TRAFFIC BARRIER
	CHANNELIZING DEVICE
	ENERGY ABSORPTION ATTENUATOR
	TYPE III BARRIER
	CONSTRUCTION SIGN
	TEMPORARY TRAFFIC SIGNAL
	FLASHING BEACON
	REMOVE OR MASK PAVEMENT MARKINGS



PROJECT NAME: IRASBURG	
PROJECT NUMBER: STP CULV(30)	
FILE NAME: zllc266tc.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: I. MAYNARD	CHECKED BY: M. CHENETTE
TRAFFIC CONTROL PLAN - BR7	
SHEET 39 OF 55	



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 3/8"

NX

Core Size 2 1/8"

M

Double Tube Core Barrel Used

LL

Liquid Limit

PL

Plastic Limit

PI

Plasticity Index

NP

Non Plastic

w

Moisture Content (Dry Wgt. Basis)

D

Dry

M

Moist

MTW

Moist To Wet

W

Wet

Sat

Saturated

Bo

Boulder

Gr

Gravel

Sa

Sand

Sl

Silt

Cl

Clay

HP

Hardpan

Le

Ledge

NLTD

No Ledge To Depth

CNPF

Can Not Penetrate Further

TLOB

To Ledge Or Boulder

NR

No Recovery

Rec.

Recovery

%Rec.

Percent Recovery

RQD

Rock Quality Designation

CBR

California Bearing Ratio

<

Less Than

>

Greater Than

R

Refusal (N > 100)

blk

Black

bl

Blue

brn

Brown

dk

Dark

gry

Gray

gn

Green

lt

Light

or

Orange

pnk

Pink

pu

Purple

rd

Red

tn

Tan

wh

White

yel

Yellow

mltc

Multicolored

BORING CHART

BORING NUMBER	SURVEY STATION	OFFSET	GROUND ELEVATION
B-103	34+96	12.75' LT	803.0'
B-104	35+20	10.25' RT	803.5'

BORING PLAN

0

20

40

SCALE

DEFINITIONS (AASHTO)

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

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

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

GRAVEL - Rounded particles of rock < 3" and > 0.075" (#10 sieve).

SAND - Particles of rock < 0.075" (#10 sieve) and > 0.0025" (#200 sieve).

SILT - Soil < 0.0025" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

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

VARVED - Alternate layers of silt and clay.

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

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

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

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

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

DIP - Inclination of bed with a horizontal plane.

GENERAL NOTES

1. The subsurface explorations shown herein were made on Oct. 25, 2012 by N.H. Boring.

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

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

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

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

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

LEGEND:

⊕

BRIDGE BORING

PROJECT NAME: IRASBURG

PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266bdr_bor_pl.br7.dgn

PROJECT LEADER: M. CHENETTE

DESIGNED BY: J. HUNGERFORD

BORING PLAN - BR7

PLOT DATE: 9/26/2014

DRAWN BY: L. BUXTON

CHECKED BY: J. HUNGERFORD

SHEET 40 OF 55



BOTTOM OF CULVERT  
APPROX. EL. 787.5

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION				BORING LOG		Boring No.: B-103				
				IRASBURG STP CULV(30) VT-58 BR-6&7		Page No.: 1 of 1				
						Pin No.: 11C266				
						Checked By: LAR				
Boring Crew: GARROW, JUDKINS				Casing		Sampler				
Date Started: 10/10/12 Date Finished: 10/10/12				Type: WB SS		Date				
VTSPG NAD83: N 840357.40 ft E 1699907.54 ft				I.D.: 4 in 1.5 in		Depth (ft)				
Station: 34+96 Offset: 12.75' LT				Hammer Wt: N.A. 140 lb.		Notes				
Ground Elevation: 803.0				Hammer Fall: N.A. 30 in.						
				Hammer/Rod Type: Auto/AWJ						
				Rig: CME 45C SKID CE = 1.33						
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)		Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		Asphalt Pavement, 0.0 ft – 0.6 ft								
		Visual Description: Sa with little Gravel, gry, Moist, Rec. = 0.6 ft		5-4-4-4 (8)						
10		Field Note: Boulders & Cobbles								
		Field Note: No Recovery, gry, Moist, Appears to be Silt.		2-1-2-2 (3)						
		A-6, SiCl, gry, MTW, Rec. = 1.5 ft		(WH)	35.1	0.6	3.0	96.4	33	11
20		CISi Shelby Tube, gry, MTW, Rec. = 0.8 ft, 19.0 ft – 21.0 ft								
		A-4, CISi, gry, MTW, Rec. = 1.7 ft		(6)	24.2	1.4	16.5	82.1	26	8
		A-4, Si, gry, MTW, Rec. = 1.1 ft		(2)	22.4		12.9	87.1	20	5
		Visual Description: GrSaSi, gry, Wet, Rec. = 0.2 ft		(2)						
		A-6, SiCl, gry, Wet, Rec. = 0.3 ft		(2)	19.1				34	18
30		Visual Description: CISi, gry, Wet, Rec. = 0.7 ft		(WH)						
		A-4, SaCISi, gry, Wet, Rec. = 1.7 ft		(WH)	31.5		20.0	80.0	23	9
		Visual Description: SaCISi, gry, Wet, Rec. = 0.6 ft		1-3-5-5 (8)						
		A-2-4, Sa, gry, MTW, Rec. = 1.7 ft		4-3-3-4 (6)	16.9	5.3	77.5	17.2		
		A-1-b, GrSa, gry, MTW, Rec. = 0.6 ft		8-4-5-6 (9)						
40		A-1-b, GrSa, gry, MTW, Rec. = 0.5 ft		8-7-9-11 (16)	10.1	21.8	69.7	8.5		
		Visual Description: Sa, gry, MTW, Rec. = 1.1 ft		14-11-11-11 (22)						
		A-2-4, Sa, gry, MTW, Rec. = 1.1 ft		6-6-10-10 (16)	13.5	7.9	78.3	13.8		
		Hole stopped @ 45.0 ft								
50		Remarks: Top of river bed is 16.0 feet below ground surface.								
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. CE is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										

BOTTOM OF CULVERT  
APPROX. EL. 788.5

STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION				BORING LOG			Boring No.: B-104					
				IRASBURG STP CULV(30) VT-58 BR-6&7			Page No.: 1 of 1					
							Pin No.: 11C266					
							Checked By: LAR					
Boring Crew: GARROW, WHITLOCK				Casing		Sampler		Groundwater Observations				
Date Started: 10/09/12    Date Finished: 10/09/12				Type: WB	SS			Date	Depth (ft)	Notes		
VTSPG NAD83:        N 840341.66 ft    E 1699936.75 ft				I.D.: 4 in	1.5 in							
Station:        35+20                    Offset: 10.25' RT				Hammer Wt: N.A.	140 lb.							
				Hammer Fall: N.A.	30 in.							
Ground Elevation:        803.5				Hammer/Rod Type: Auto/AWJ								
				Rig: CME 45C SKID	CE = 1.33							
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)				Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		Field Note: Asphalt Pavement										
5		Visual Description: SiSaGr, brn, Wet, Rec. = 0.5 ft				8-5-5-4 (10)						
		Field Note: Boulder										
10		Visual Description: SiGrSa, brn, Moist, Rec. = 1.2 ft				7-4-5-7 (9)						
15		Field Note: No Recovery, Appears to be Sandy Silt.				2-1-2-2 (3)						
		A-4, CISi, gry, Moist, Rec. = 1.1 ft				1-2-2-2 (4)	31.2	11.2	12.3	76.5	31	10
		A-4, CISi, gry, Moist, Rec. = 1.0 ft				1-1-2-3 (5)	26.1	4.2	8.2	87.6	29	10
		SaSi Shelby Tube, gry, Moist, Rec. = 1.1 ft, 21.0 ft - 23.0 ft, Tested Non-Plastic					15.3					
		A-4, SaCISi, gry, Moist, Rec. = 1.8 ft				(2)	22.6	11.6	21.4	67.0	22	8
25		A-4, SaGrSi with some Clay, gry, Wet, Rec. = 1.5 ft				(WH)	19.3	27.4	21.5	51.1	24	9
		A-4, CISi, gry, Wet, Rec. = 1.4 ft				(2)	21.5	2.6	11.6	85.8	20	7
		A-4, SaSi, gry, MTW, Rec. = 1.4 ft				6-5-7-11 (12)	14.1	2.4	41.1	56.5		
30		Visual Description: GrSaSi, gry, MTW, Rec. = 1.0 ft				8-7-7-10 (14)						
		Visual Description: SiSa, gry, Wet, Rec. = 1.3 ft				2-3-5-7 (6)						
35		A-4, SiSa, gry, Moist, Rec. = 1.4 ft				17-26-26-30 (52)	13.0		59.2	40.8		
		Visual Description: SiSa, gry, Moist, Rec. = 1.5 ft				18-30-39-R (69)						
40		A-4, SiSa, gry, Moist, Rec. = 0.9 ft				32-R (R)	13.3		55.0	45.0		
		A-4, SiSa, gry, Moist, Rec. = 1.7 ft				13-32-37-R (69)			60.1	39.9		
		Visual Description: SiSa, gry, Moist, Rec. = 1.3 ft				31-36-R (R)						
45		Hole stopped @ 44.4 ft										
Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual. 2. N Values have not been corrected for hammer energy. CE is the hammer energy correction factor. 3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.												

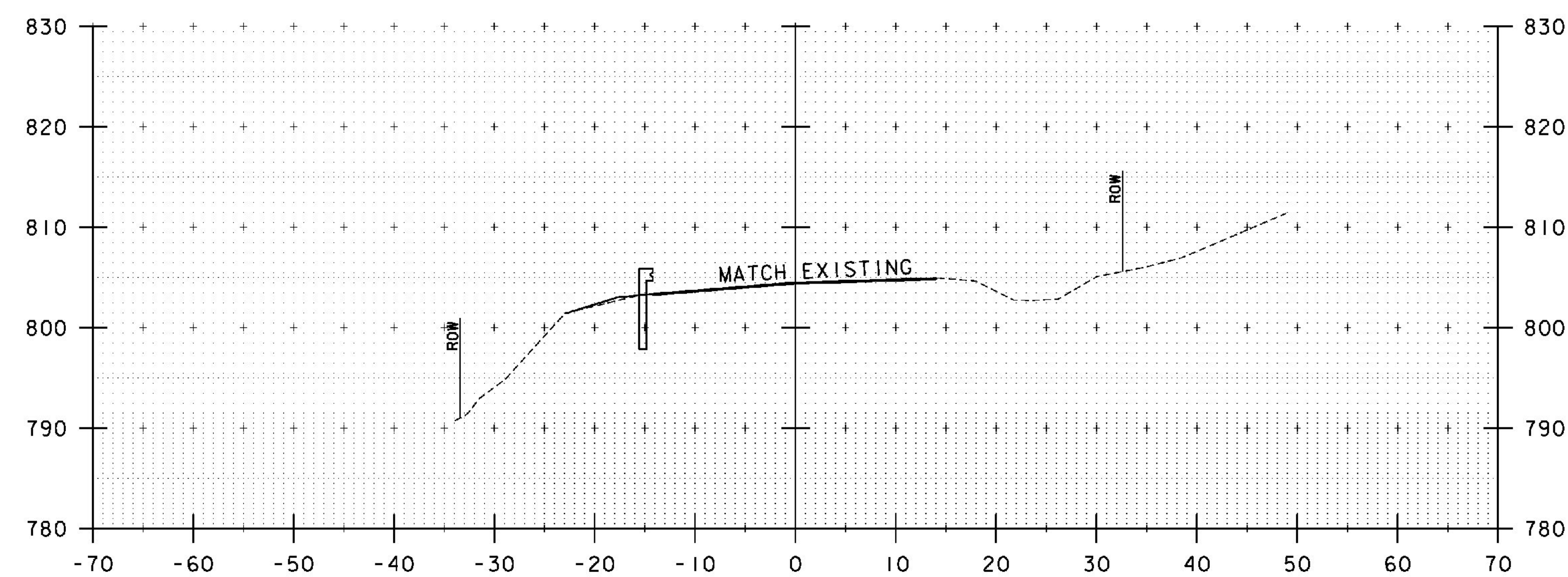


PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: z11c266bor_log.br7.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: VTRANS  
BORING LOG - BR7

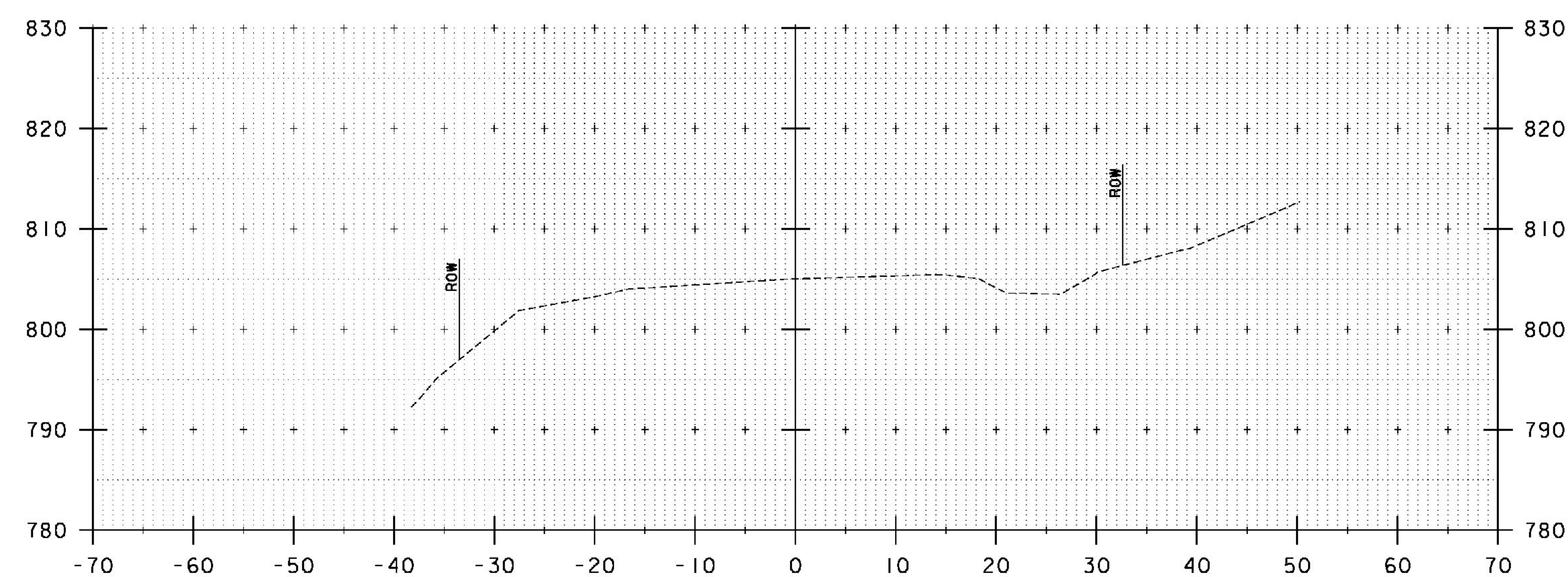
PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: VTRANS  
SHEET 41 OF 55



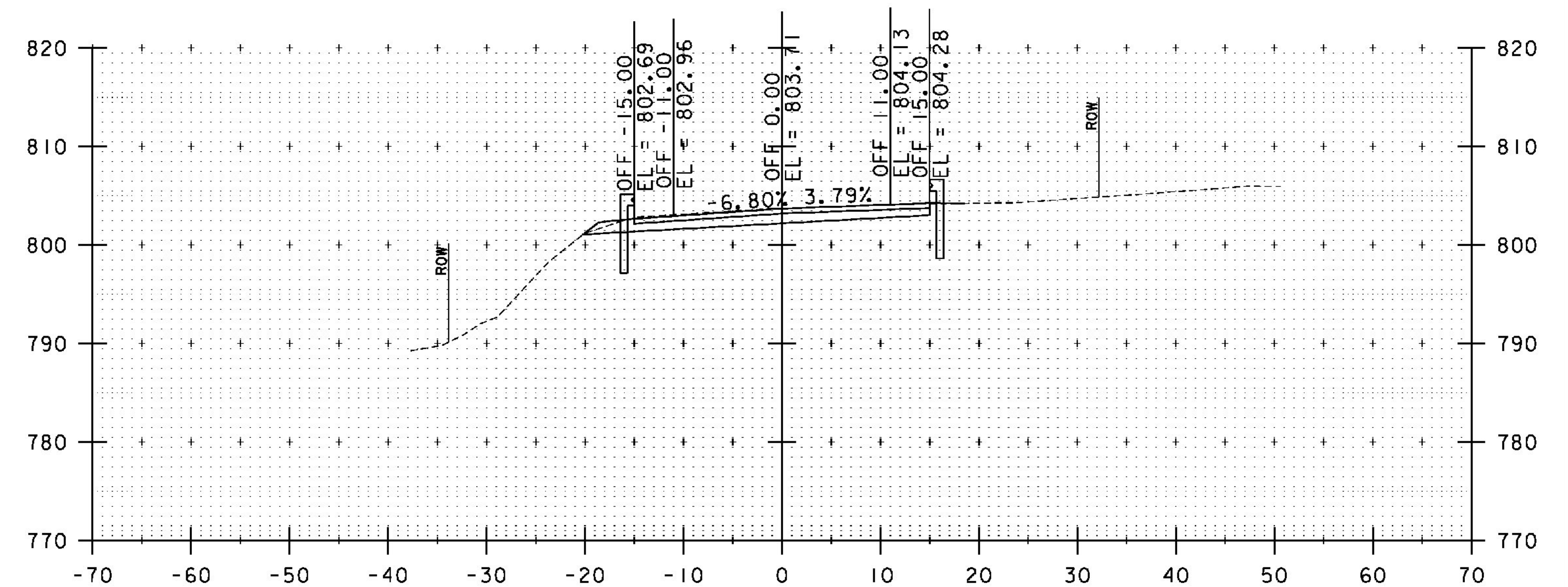


33+55  
BEGIN APPROACH

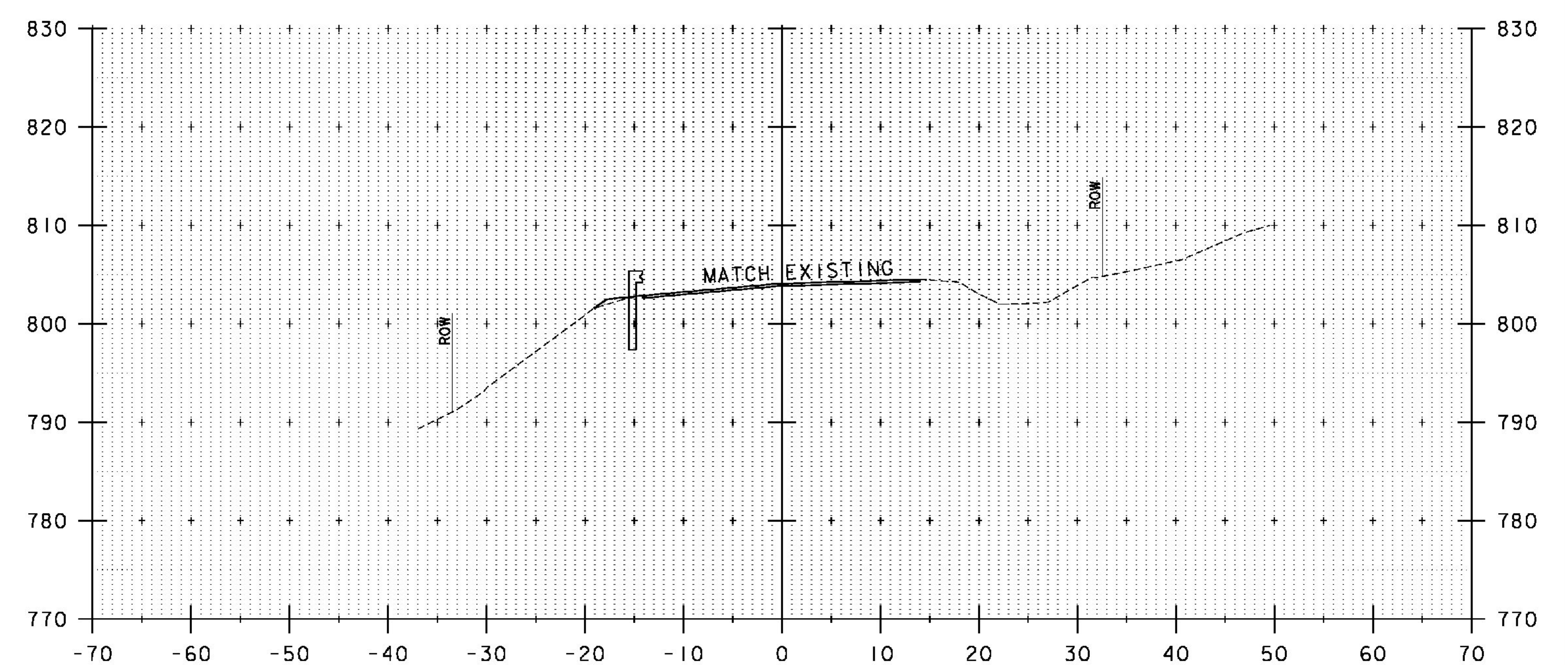
33+75



33+50



34+25



34+00

STA. 33+50 TO STA. 34+25

PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266xs.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
ROADWAY CROSS SECTIONS - RXSI - BR7

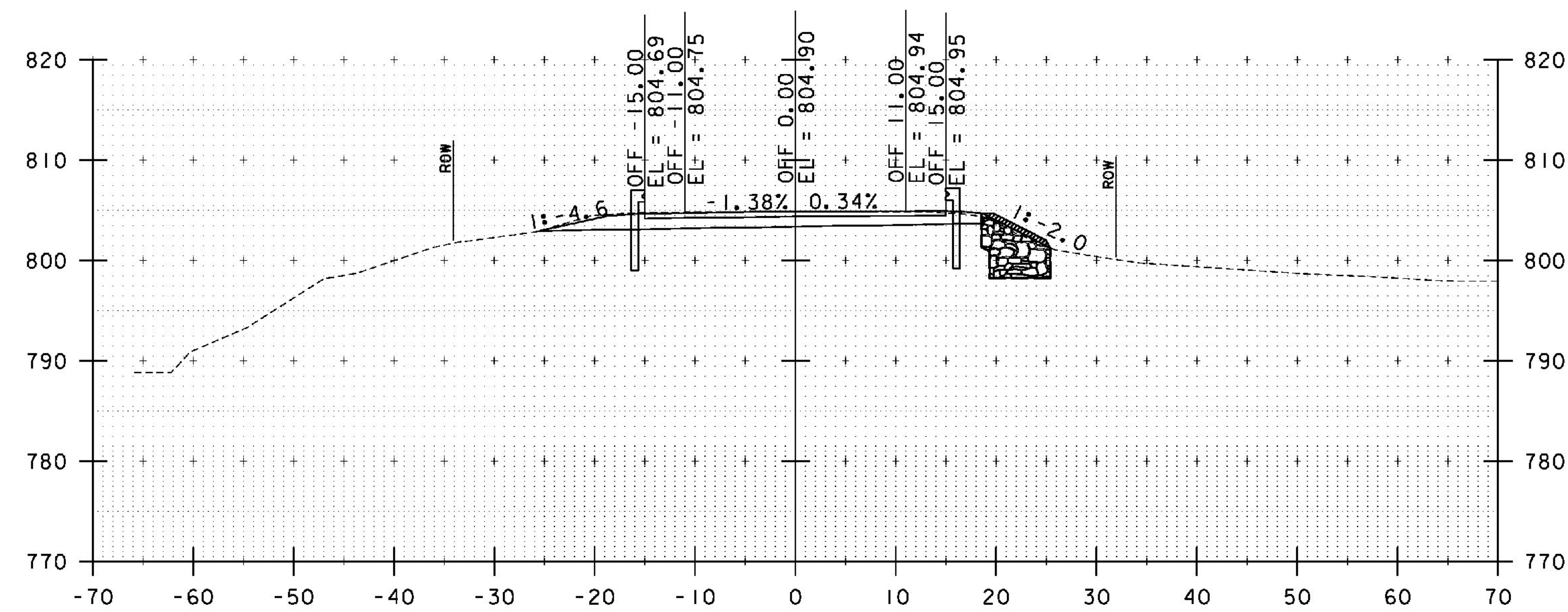
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DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 42 OF 55



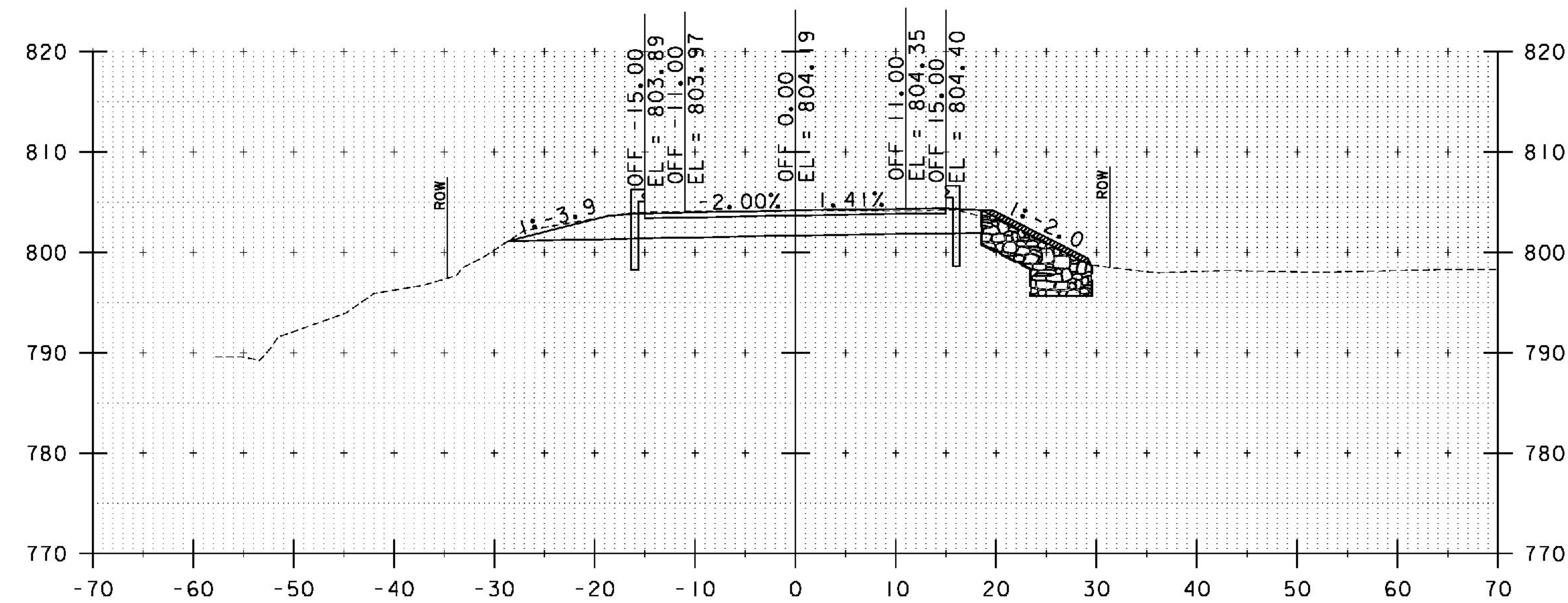




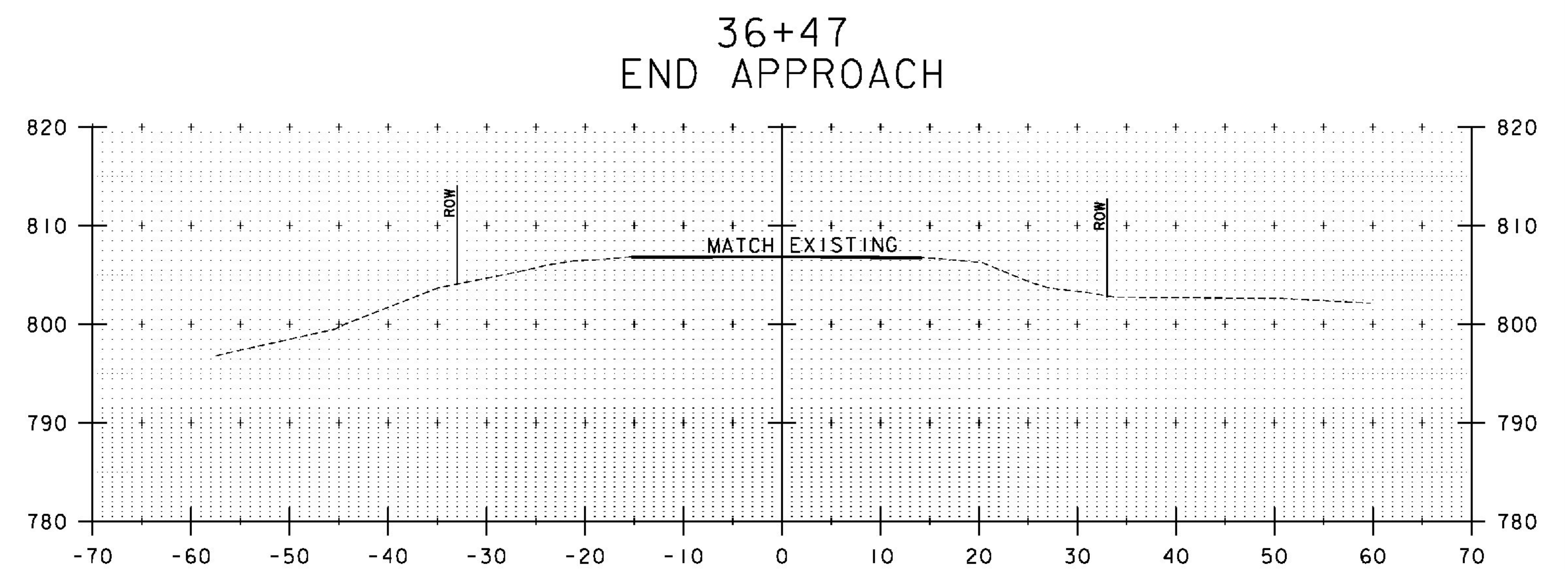




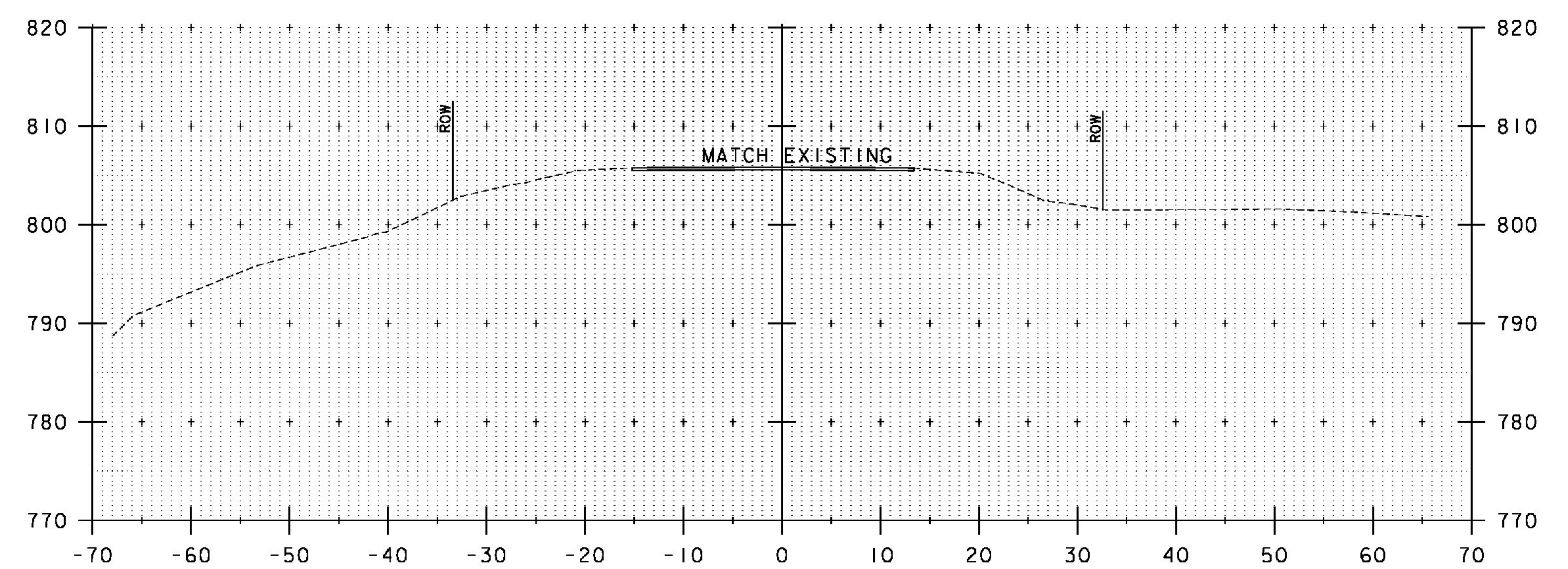
35+75



35+50



36+25



36+00

STA. 35+50 TO STA. 36+47

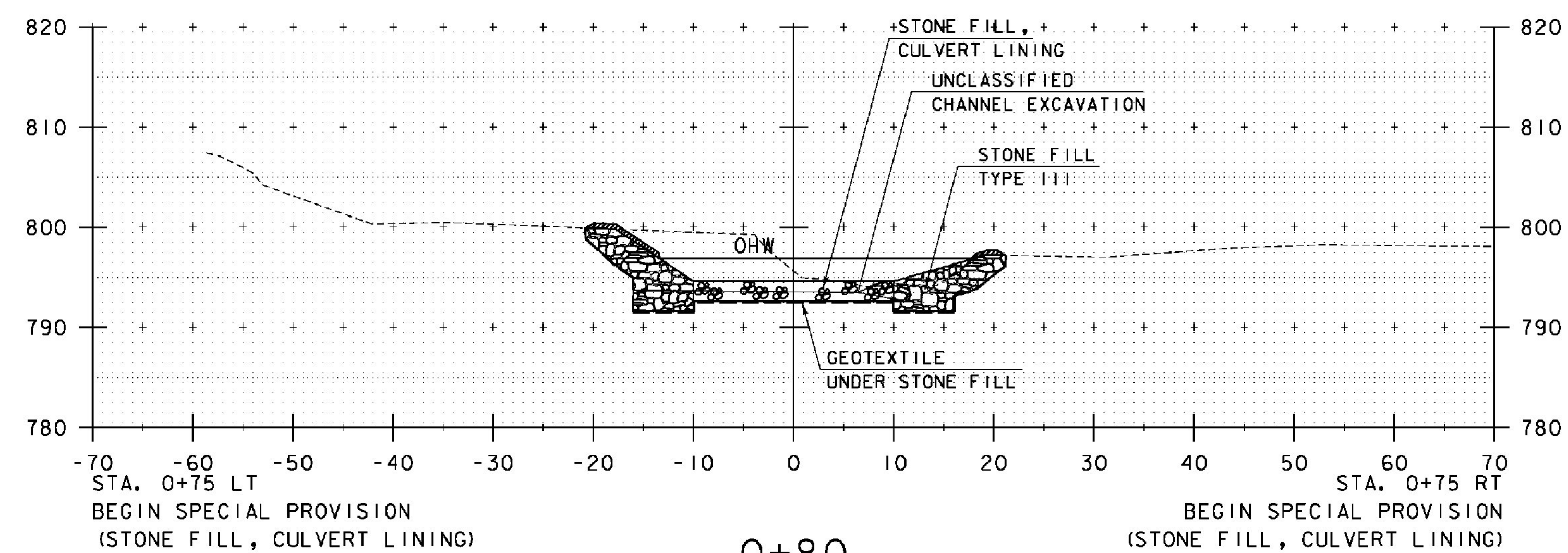
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266xs.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
ROADWAY CROSS SECTIONS - RXS3 - BR7

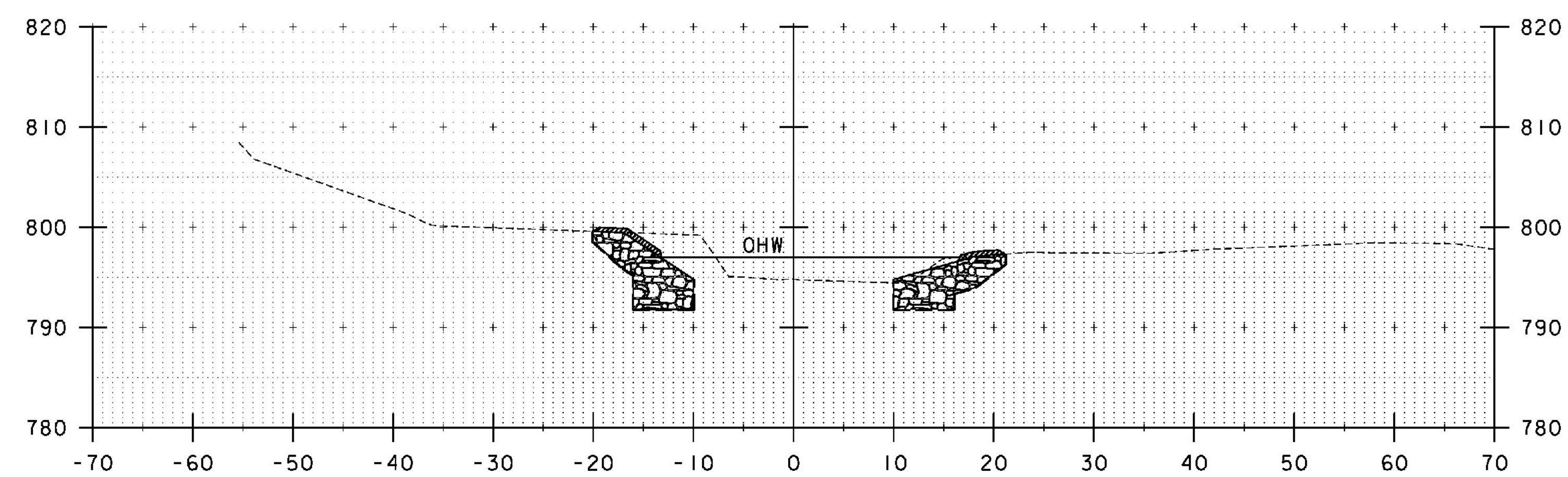
PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 44 OF 55



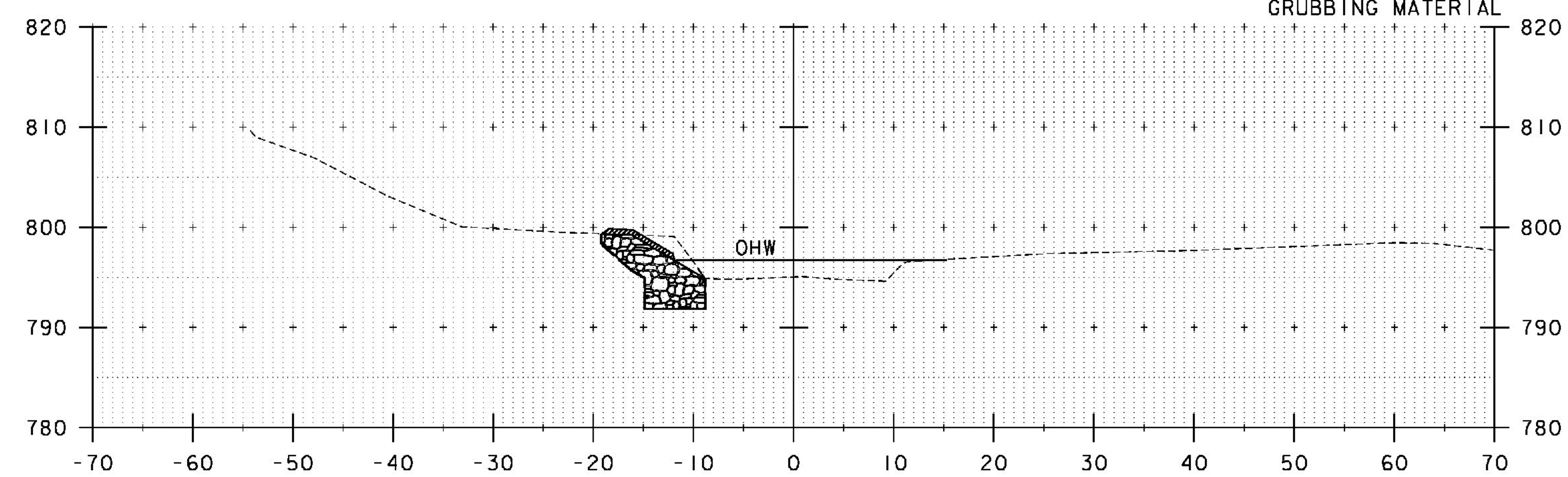




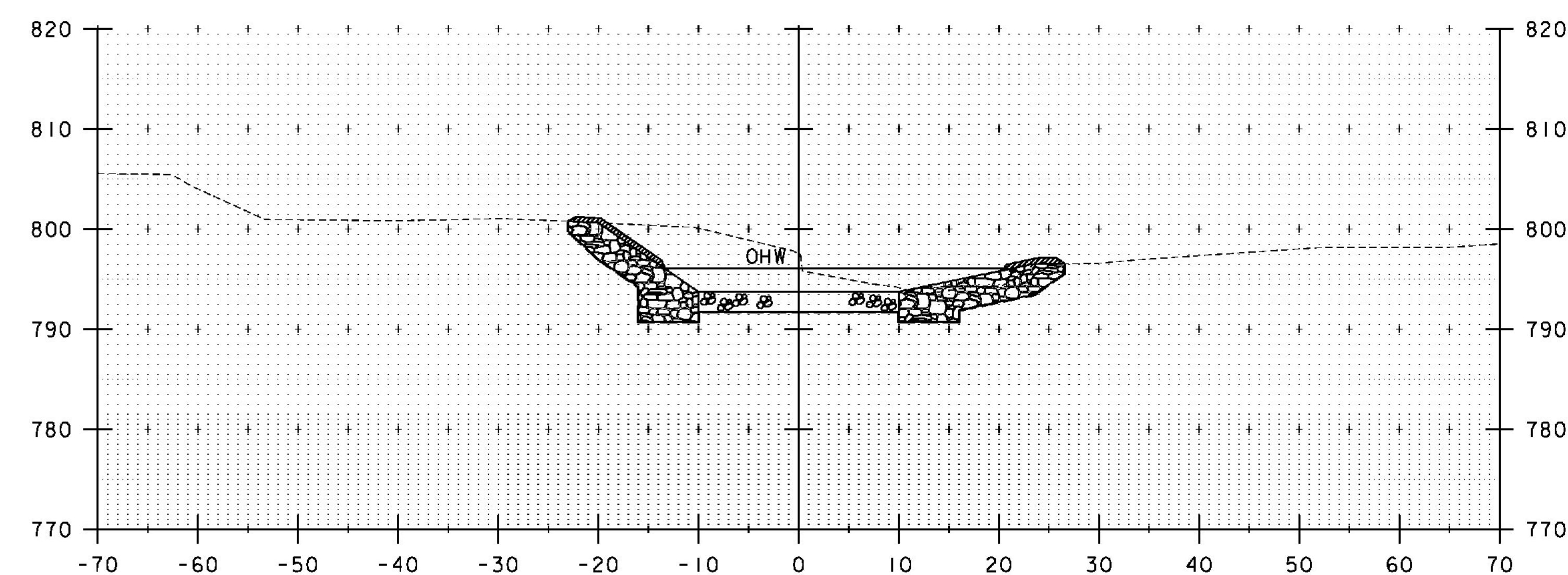
0+80



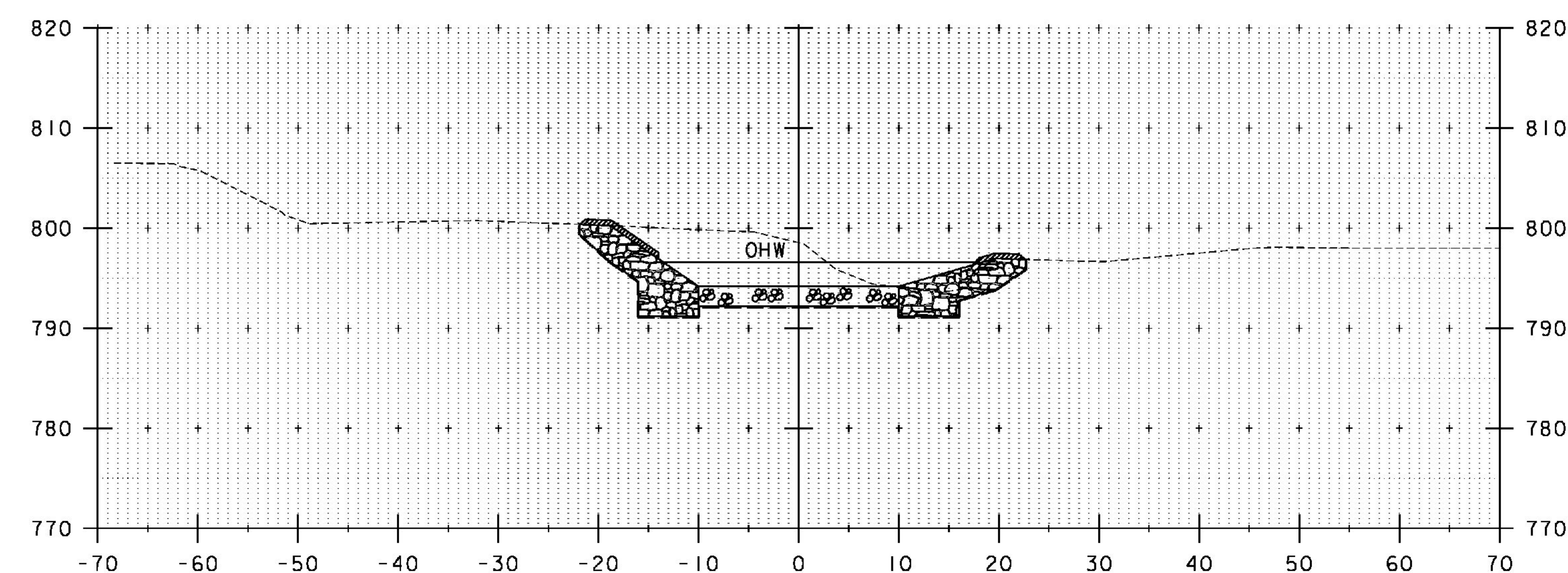
0+70



0+60



1+00



0+90

STA. 0+60 TO STA. 1+00

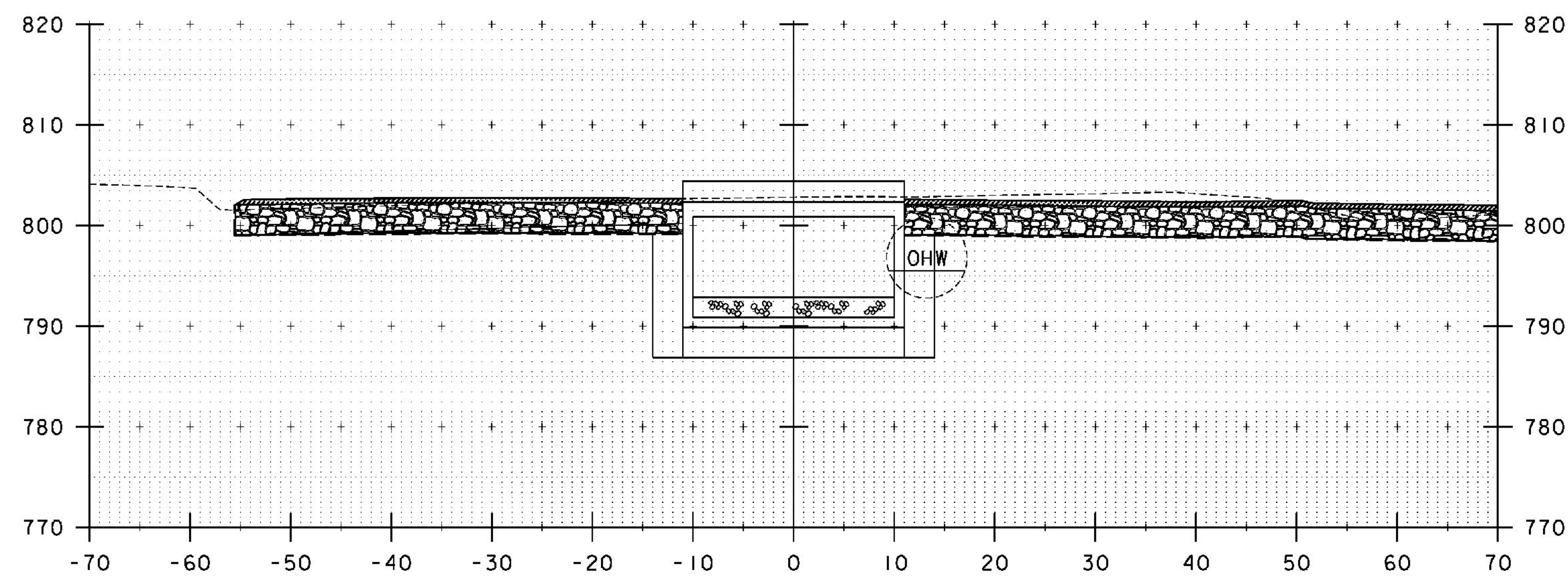


PROJECT NAME: IRASBURG	PLOT DATE: 9/26/2014
PROJECT NUMBER: STP CULV(30)	DRAWN BY: L. BUXTON
FILE NAME: zllc266xs.dgn	CHECKED BY: M. CHENETTE
PROJECT LEADER: M. CHENETTE	SHEET 45 OF 55
DESIGNED BY: J. HUNGERFORD	
CHANNEL CROSS SECTIONS - CXSI - BR7	

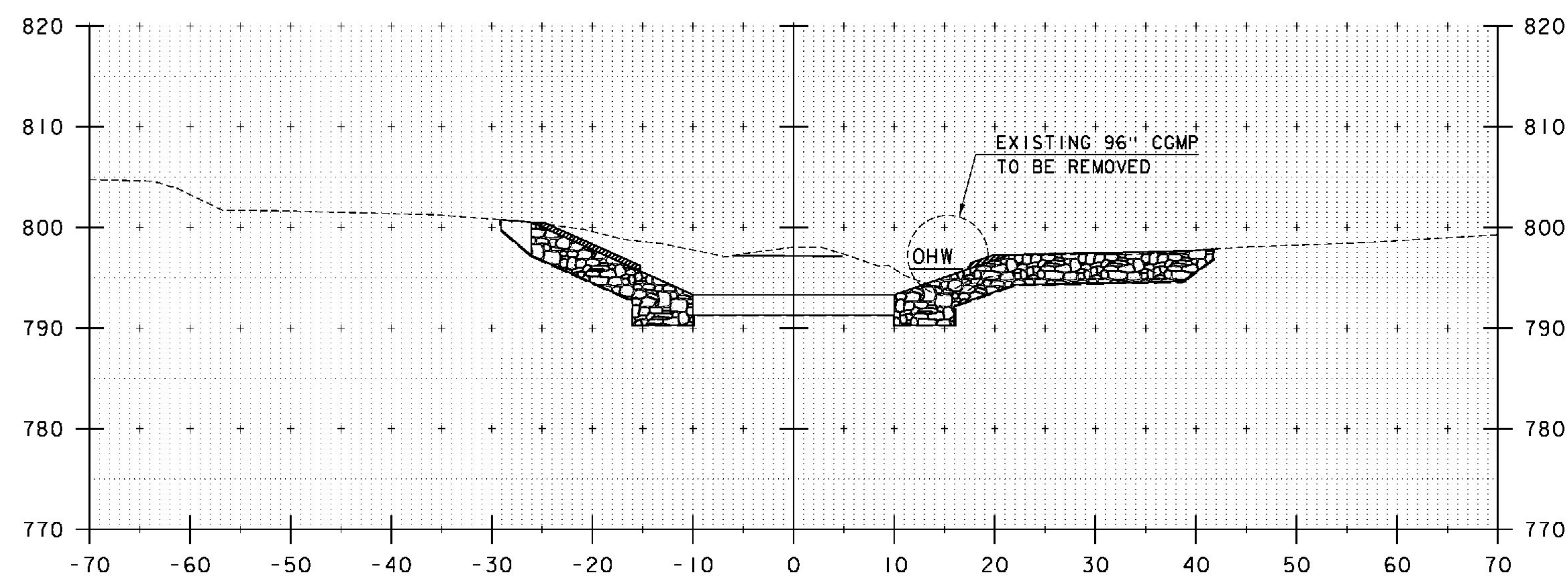


STA. 1+23.44 LT  
END UNCLASSIFIED CHANNEL EXCAVATION  
GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE III  
GRUBBING MATERIAL

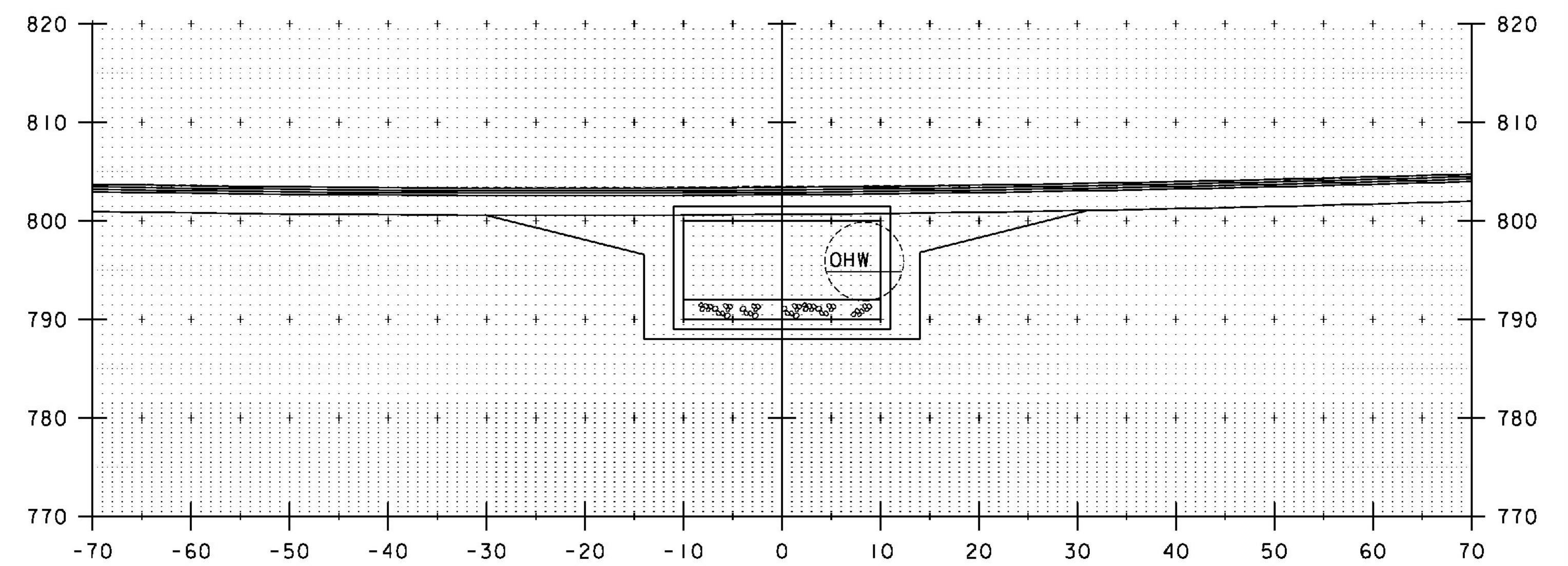
STA. 1+23.44 RT  
END UNCLASSIFIED CHANNEL EXCAVATION  
GEOTEXTILE UNDER STONE FILL  
STONE FILL, TYPE III  
GRUBBING MATERIAL



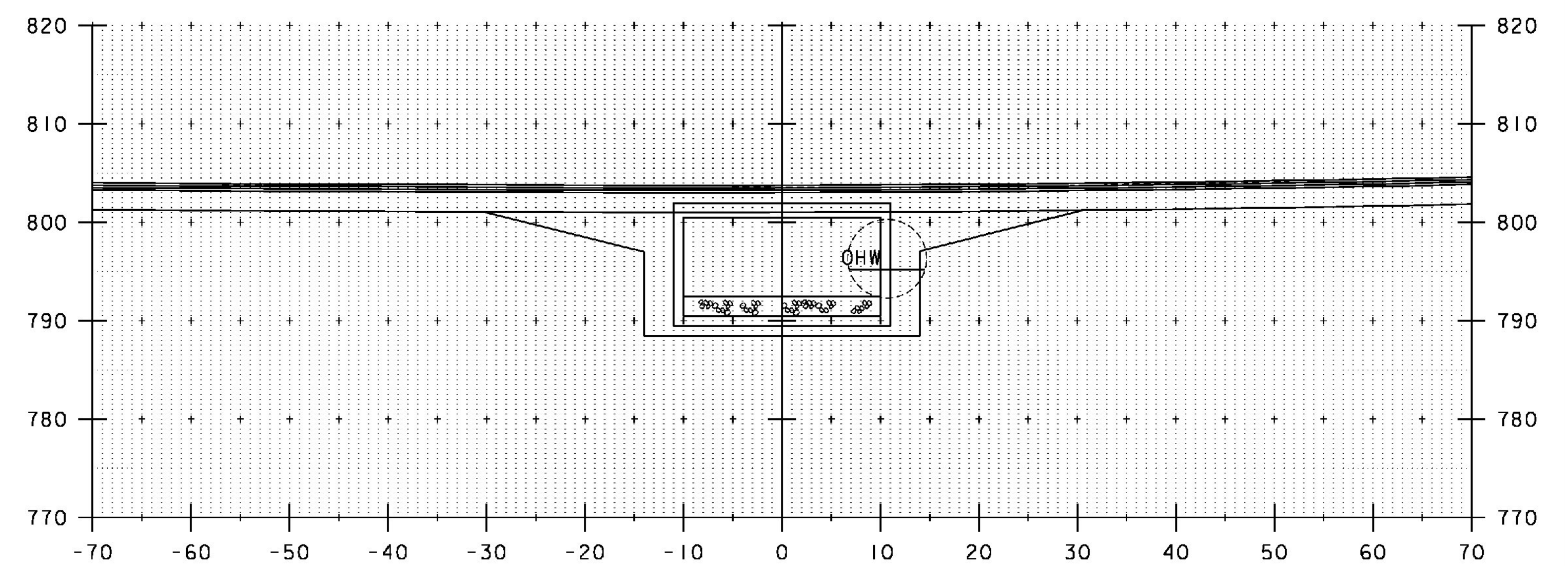
I+20



I+10



I+40



I+30

STA. 1+10 TO STA. 1+40

PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266xs.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
CHANNEL CROSS SECTIONS - CXS2 - BR7

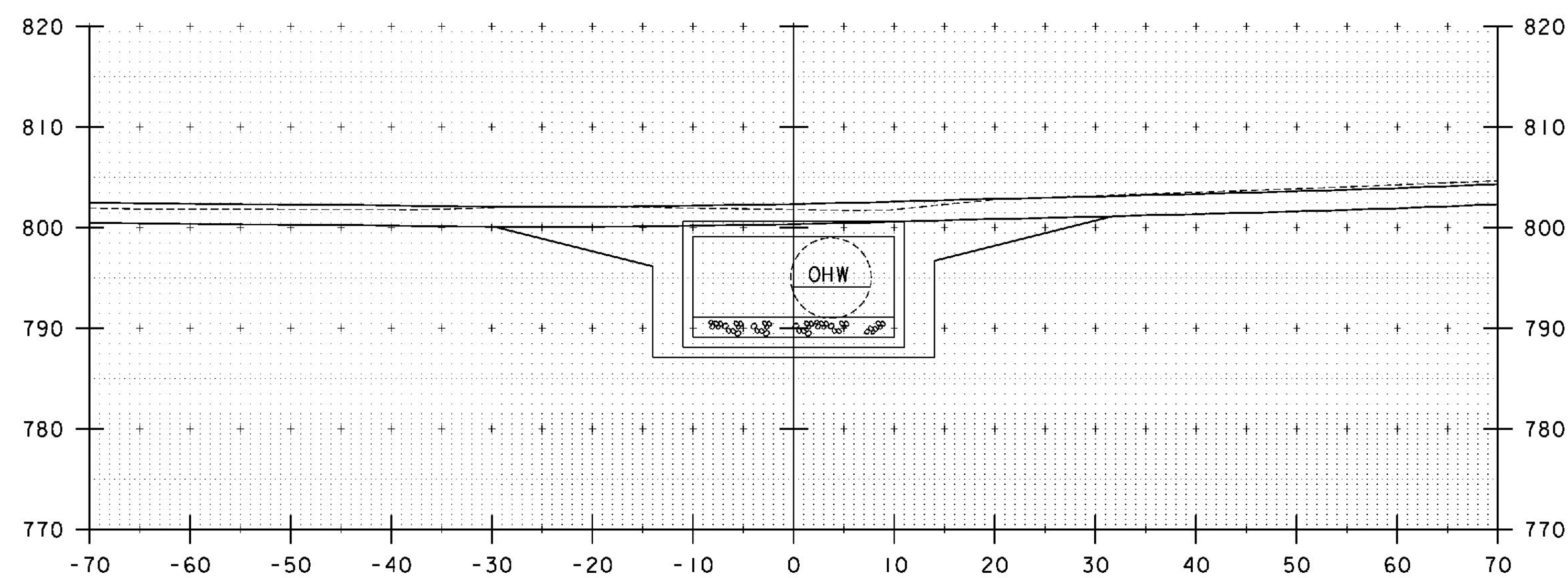
PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 46 OF 55



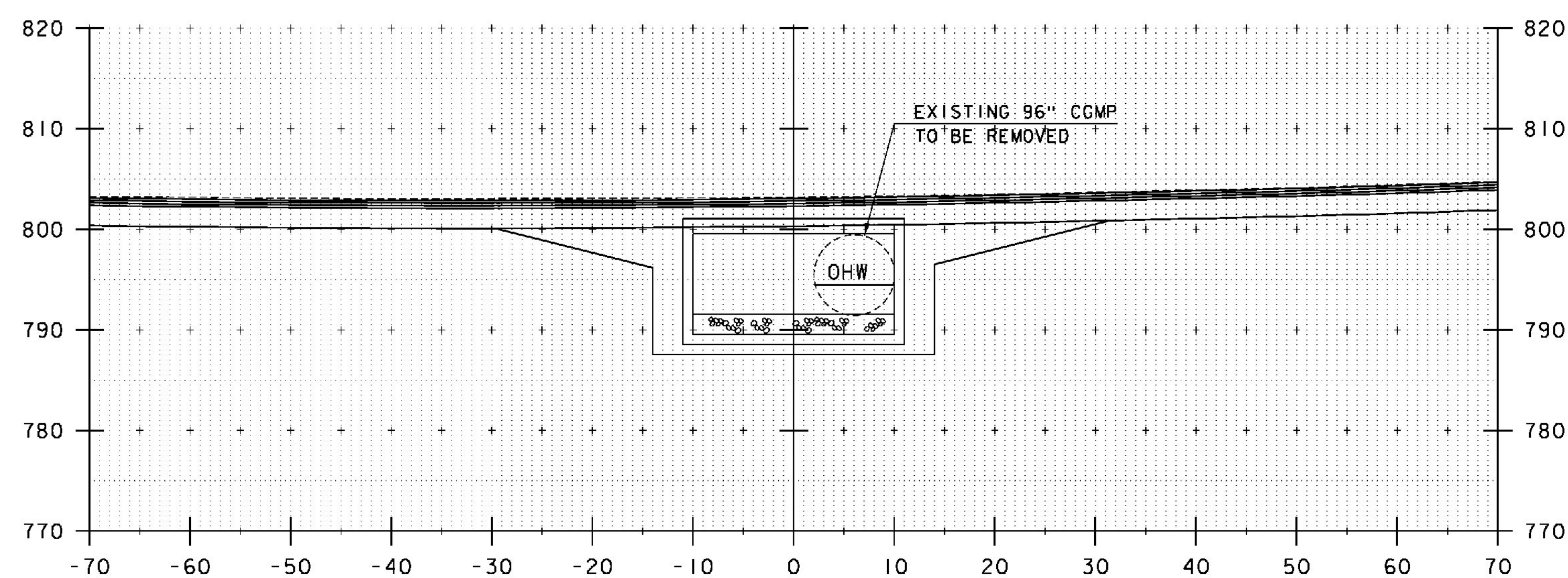


STA. 1+60.65 LT  
BEGIN UNCLASSIFIED CHANNEL EXCAVATION  
GEOTEXTILE UNDER STONE FILL  
RIP RAP, HEAVY TYPE

STA. 1+60.65 RT  
BEGIN UNCLASSIFIED CHANNEL EXCAVATION  
GEOTEXTILE UNDER STONE FILL  
RIP RAP, HEAVY TYPE



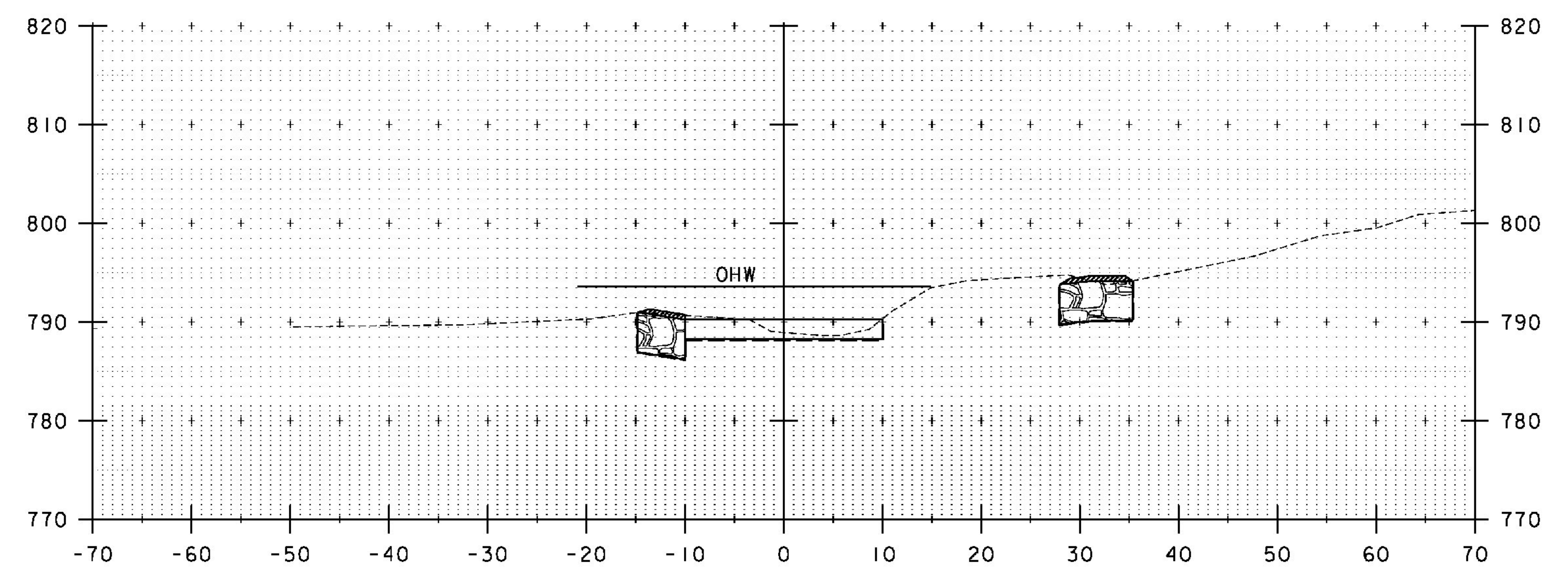
1+60



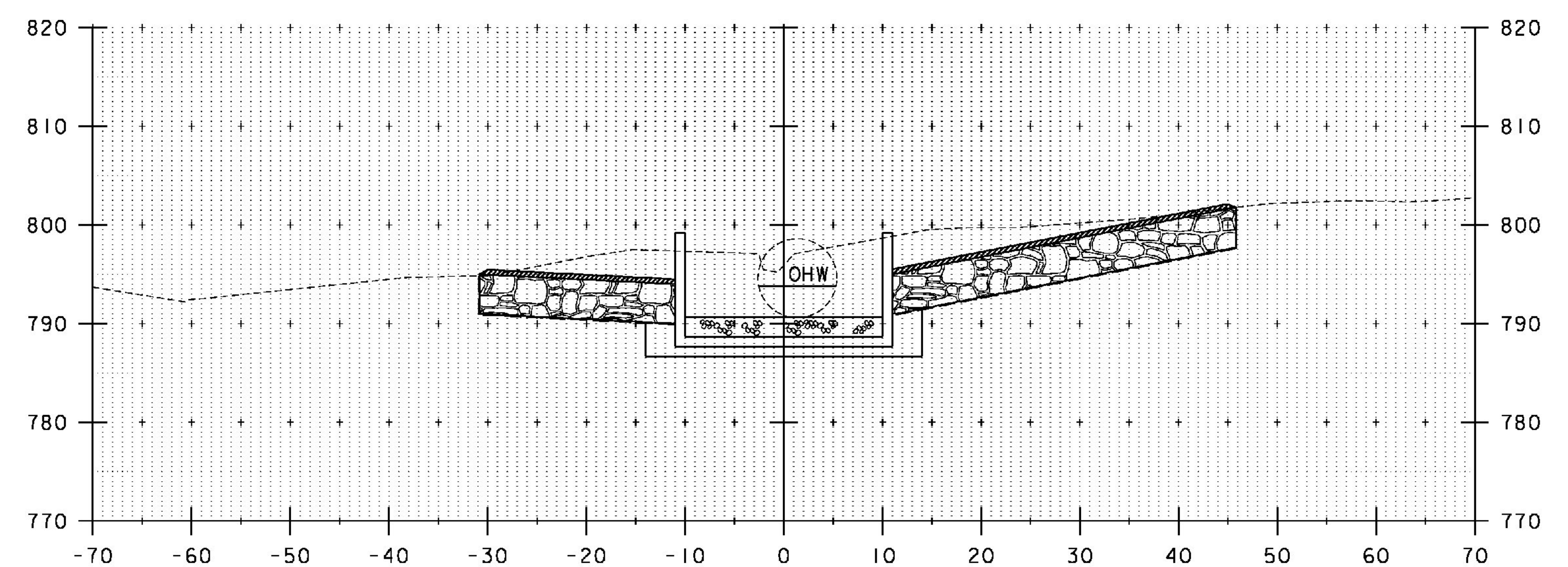
1+50

STA. 1+86 LT  
END UNCLASSIFIED CHANNEL EXCAVATION  
SPECIAL PROVISION (STONE FILL, CULVERT LINING)

STA. 1+86 RT  
END UNCLASSIFIED CHANNEL EXCAVATION  
GEOTEXTILE UNDER STONE FILL  
RIP RAP, HEAVY TYPE  
SPECIAL PROVISION (STONE FILL, CULVERT LINING)



1+80



1+70

STA. 1+50 TO STA. 1+80

PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266xs.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
CHANNEL CROSS SECTIONS - CXS3 - BR7

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 47 OF 55





EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REPLACEMENT OF BRIDGE #7, RELATED CHANNEL WORK AND INCIDENTALS. BRIDGE #7 IS AN EXISTING 96” CORRUGATED STEEL CULVERT, WHICH WILL BE REPLACED WITH A 20’ SPAN PRECAST CONCRETE BOX CULVERT TO CONVEY AN UNNAMED TRIBUTARY BENEATH VT ROUTE 58 TO THE BLACK RIVER. BRIDGE #7 IS LOCATED IN THE TOWN OF IRASBURG ON VT ROUTE 58, 0.5 MILES EAST OF THE JUNCTION WITH VERMONT ROUTE 14.

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

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.55 ACRES.

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

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS WELL ESTABLISHED FOREST WITH MODERATE SLOPES AT THE INLET AND THE BLACK RIVER DIRECTLY AT THE OUTLET. THERE ARE TREES ON THE BANKS OF THE STREAM. VT ROUTE 58 IS WITHIN THE PROJECT SITE. THERE ARE OVERHEAD UTILITIES THAT HAVE BEEN RELOCATED TO NOT IMPACT THE PROJECT.

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

THE WATER SOURCE ON THE PROJECT IS AN UNNAMED TRIBUTARY TO THE BLACK RIVER. THE PROJECT IS IN THE LAKE MEMPHREMAGOG DRAINAGE BASIN. THE TOTAL CONTRIBUTING DRAINAGE AREA IS 2.03 SQ. MI. DUE TO THE NATURE OF THE SURROUNDING TERRAIN THE PROJECT SITE COULD RECEIVE RUNOFF FROM THE SURROUNDING SLOPES, ROADWAY DITCHES, AND THE ROADWAY OVER TOP OF CULVERT.THERE ARE CLASS II WETLANDS ON THE SOUTH SIDE OF THE PROJECT AT THE INLET. SEE THE PROJECT IMPACTS PLANS.

1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF FOREST LAND WITH SMALL TREES AND BRUSH ON THE BANKS OF THE STREAM. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS RELATED TO THE EXCAVATION REQUIRED FOR THE INSTALLATION OF THE CULVERT, HEADWALLS, WINGWALLS, STONE FILL, AND TEMPORARY ACCESS. UPON PROJECT COMPLETION, THE CHANNEL AND DISTURBED AREAS WITH SLOPES GREATER THAN 2:1 WILL BE ARMORED WITH STONE FILL TYPE II AT THE INLET AND HEAVY RIP RAP AT THE OUTLET 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 ORLEANS, VERMONT. SOILS ON THE PROJECT SITE ARE MOOSILAUKE VERY FINE SANDY LOAM, “K FACTOR” = 0.32. THE SOIL IS CONSIDERED MODERATELY ERODIBLE DUE TO K-VALUE.

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

1.2.5 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: NO  
HISTORICAL OR ARCHEOLOGICAL AREAS: NO  
PRIME AGRICULTURAL LAND: NO  
THREATENED AND ENDANGERED SPECIES: NO  
WATER RESOURCE: UNNAMED TRIBUTARY TO THE BLACK RIVER  
WETLANDS: THERE ARE WETLANDS AT THE INLET OF THE STRUCTURE. SEE THE PROJECT IMPACTS PLANS.

1.3 RISK EVALUATION

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

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND SUBMITTING AN EPSC PLAN IN ACCORDANCE WITH SECTION 652 OF THE SPECIAL PROVISIONS.

IN ADDITON, THE CONTRACTOR SHALL DESIGN AND IMPLEMENT A TEMPORARY STREAM DIVERSION, INCLUDING EPSC MEASURES IN ACCORDANCE WITH ITEM 900.645, SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM).

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

1.4.1 MARK SITE BOUNDARIES

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

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

1.4.2 LIMIT DISTURBANCE AREA

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

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

1.4.3 SITE ENTRANCE/EXIT STABILIZATION

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

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

1.4.4 INSTALL SEDIMENT BARRIERS

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

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

1.4.5 DIVERT UPLAND RUNOFF

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

THE PROJECT AREA IS RELATIVELY FLAT WITH MINIMAL OFF-SITE RUNOFF FLOWING THROUGH THE SITE. THERFORE DIVERSION MEASURES WILL NOT BE NECESSARY.

1.4.6 SLOW DOWN CHANNELIZED RUNOFF

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

STONE CHECK DAMS WILL BE INSTALLED AS NEEDED AND AS DIRECTED BY THE ENGINEER.

1.4.7 CONSTRUCT PERMANENT CONTROLS

THERE ARE NO PERMANENT STORMWATER TREATMENT DEVICES TO BE INSTALLED WITH THIS PROJECT.

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

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

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

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

1.4.9 WINTER STABILIZATION

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

1.4.10 STABILIZE SOIL AT FINAL GRADE

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

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

1.4.11 DE-WATERING ACTIVITIES

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

SEDIMENT CONTAINMENT BAGS (FILTER BAGS) FOR HEADWALL WORK SHALL BE USED AS NECESSARY AND AS DIRECTED BY THE ENGINEER. SEE SHEET 51 FOR DETAIL.

1.4.12 INSPECT YOUR SITE

INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS.

1.5 SEQUENCE AND STAGING

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

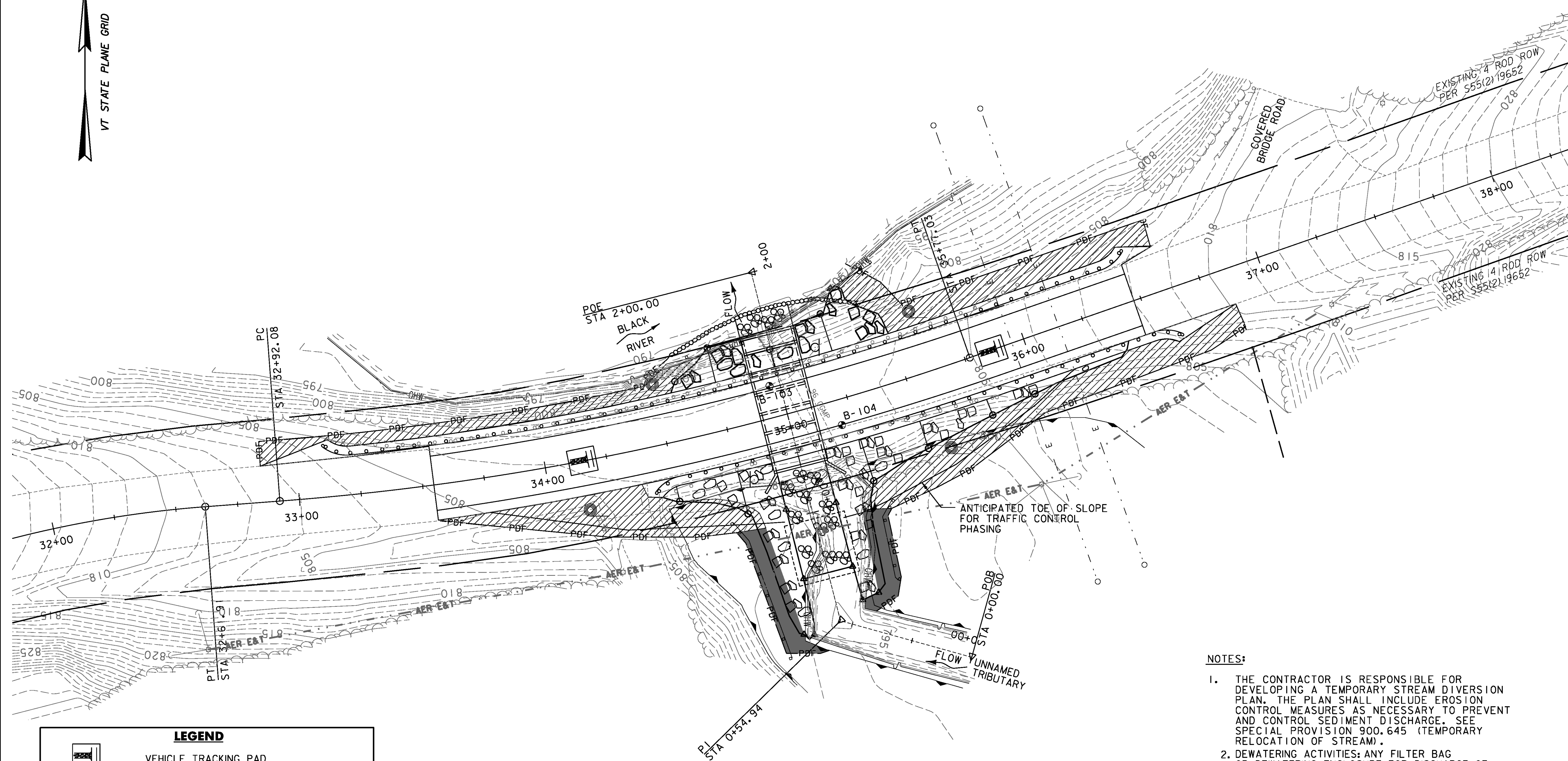
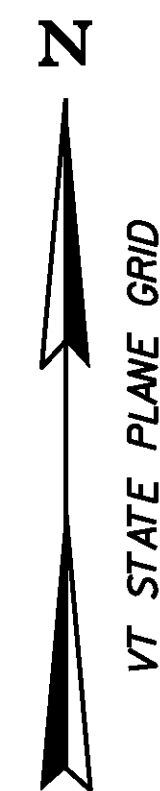
1.5.1 OFF-SITE ACTIVITIES

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



PROJECT NAME:	IRASBURG
PROJECT NUMBER:	STP_CULV(30)
FILE NAME: zllc266ero_narr_BR7.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
EPSC NARRATIVE - ECN 1- BR7	SHEET 48 OF 55





#### LEGEND



VEHICLE TRACKING PAD



DISTURBED AREAS REQUIRING VEGETATION

#### ITEM 653.55 PROJECT DEMARCATION FENCE

STA. 33+55.17 - 36+85.43, RT.  
STA. 32+85.26 - 36+60.49, LT.

#### ITEM 649.51 GEOTEXTILE FOR SILT FENCE

SEE LOCATIONS, THIS SHEET.

#### PLAN

SCALE: 1" = 20'-0"  
0 20 40

#### NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING A TEMPORARY STREAM DIVERSION PLAN. THE PLAN SHALL INCLUDE EROSION CONTROL MEASURES AS NECESSARY TO PREVENT AND CONTROL SEDIMENT DISCHARGE. SEE SPECIAL PROVISION 900.645 (TEMPORARY RELOCATION OF STREAM).
2. DEWATERING ACTIVITIES: ANY FILTER BAG OR DEWATERING ENCLOSURE FOR DISCHARGE OF DEWATERING ACTIVITIES SHALL BE LOCATED A MINIMUM OF 50 FEET FROM THE STREAM UNLESS APPROVED BY THE ENGINEER. THE FILTERING AREA SHALL BE LOCATED WITHIN THE EXISTING RIGHT-OF-WAY AND IF NECESSARY MAY BE LOCATED WITHIN A CLOSED PORTION OF THE EXISTING ROADWAY AND/OR SHOULDER.

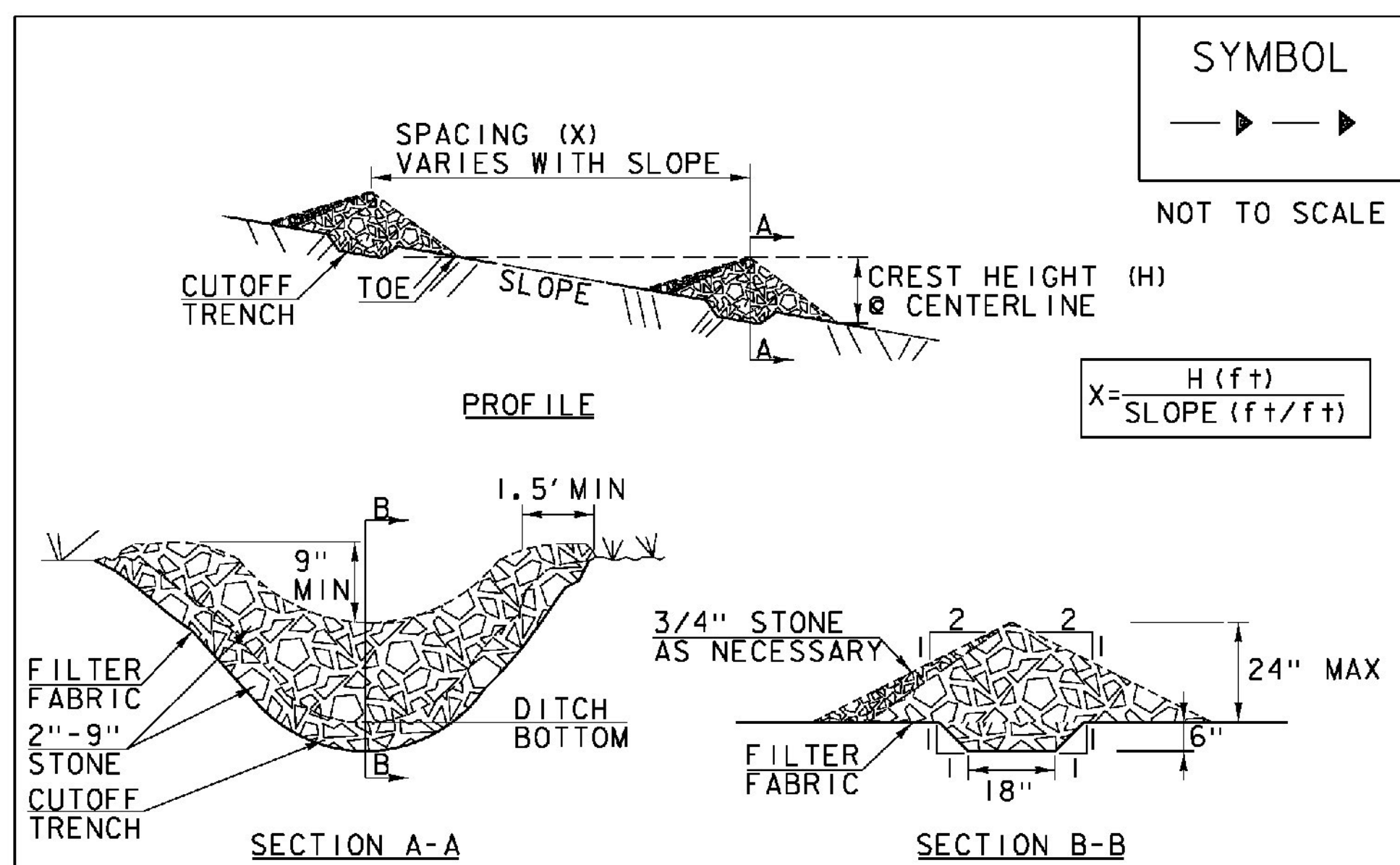
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266bdr_EPSC.br7.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
EPSC CONST. SITE PLAN - ECPI - BR7

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 49 OF 55







### CONSTRUCTION SPECIFICATIONS

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

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

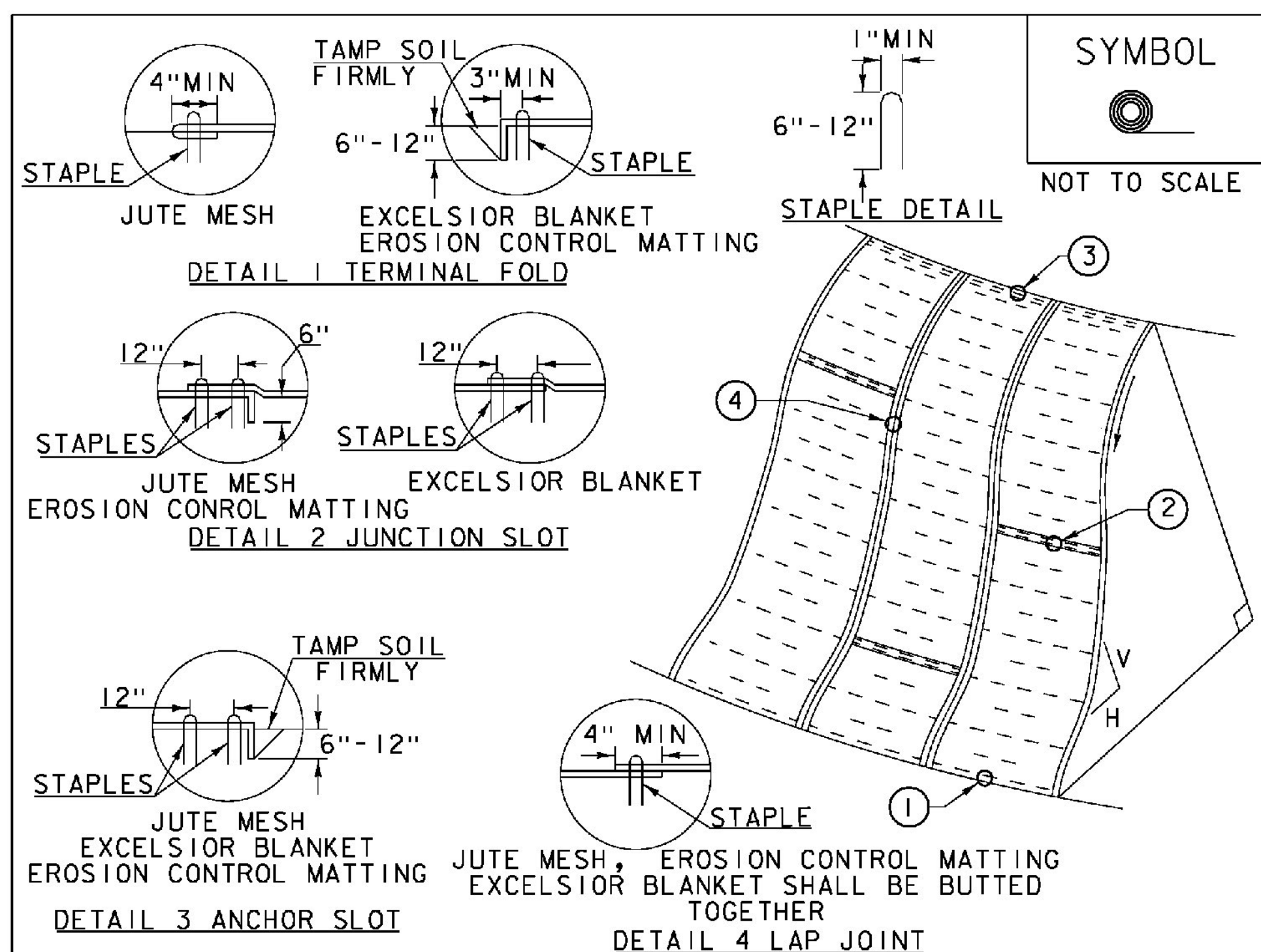
### CHECK DAM

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 1 (PAY ITEM 653.25)

#### REVISIONS

MARCH 21, 2008	WHF
JANUARY 8, 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.

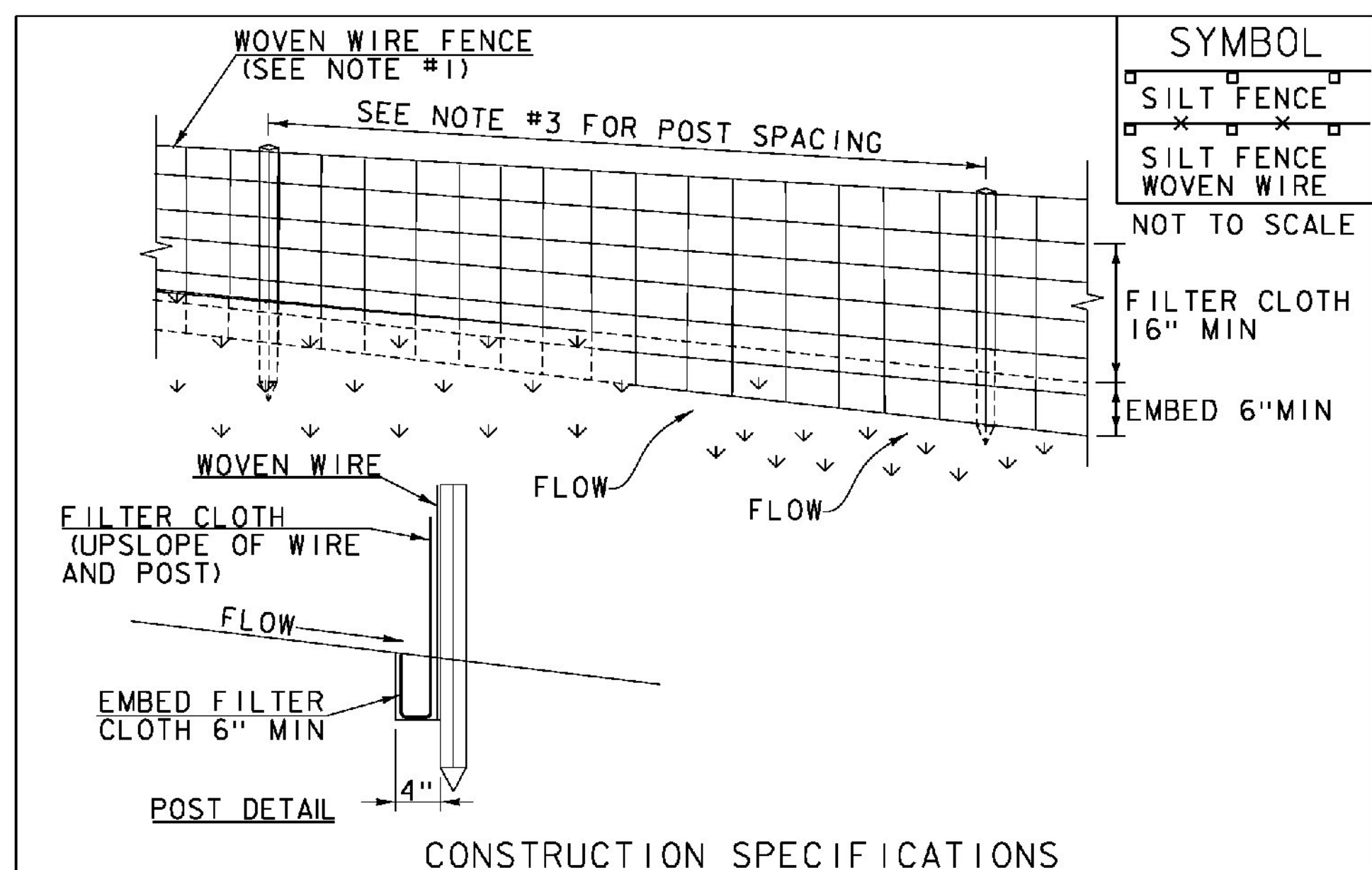
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
ORIGINALLY DEVELOPED BY USDA-NRCS  
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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

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

#### REVISIONS

APRIL 16, 2007	JMF
JANUARY 13, 2009	WHF



### CONSTRUCTION SPECIFICATIONS

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

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

### SILT FENCE

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

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

#### REVISIONS

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



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

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

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

CONSTRUCTION GUIDANCE

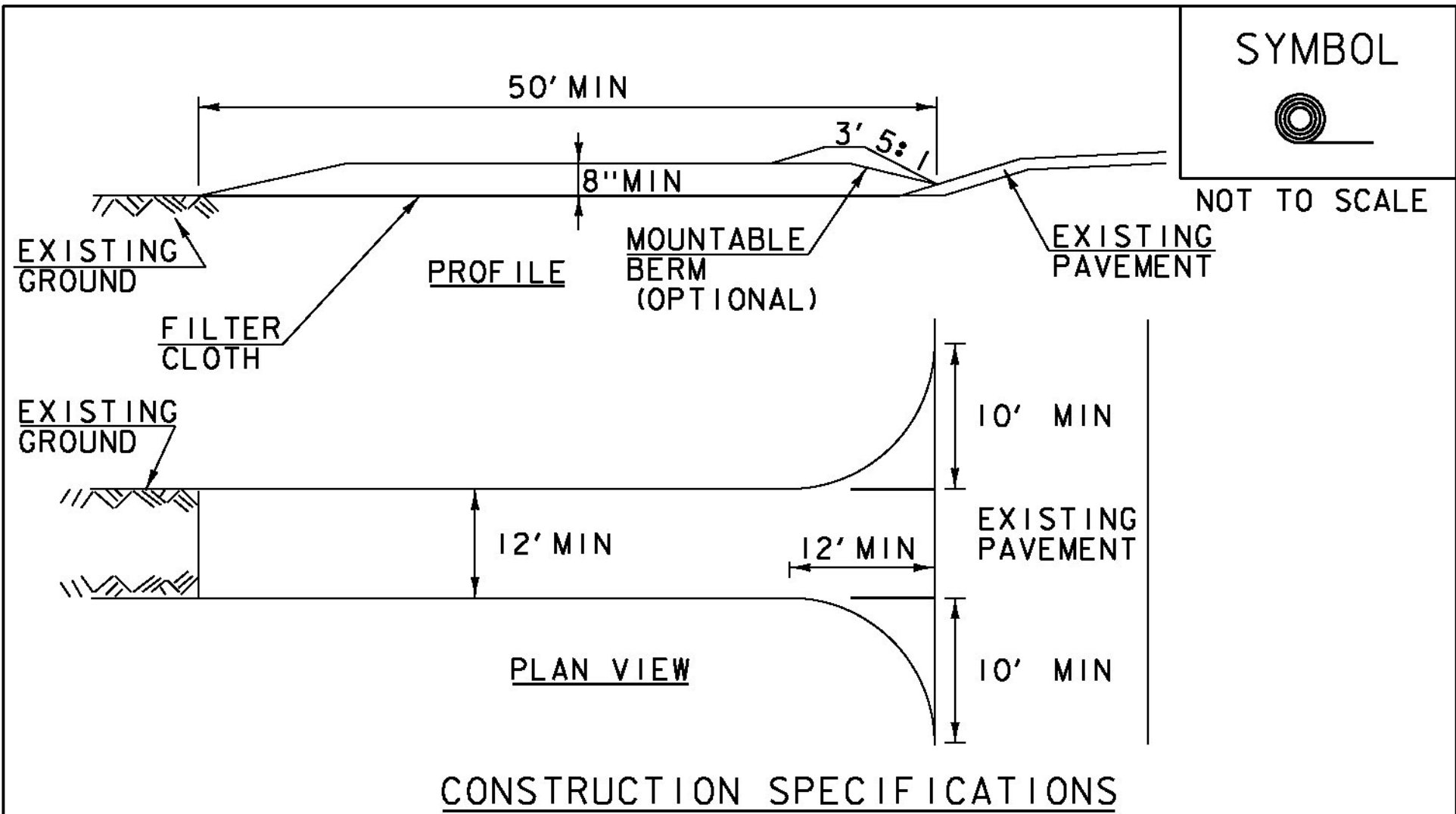
- 1.RURAL SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
- 2.URBAN SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED LAWN AREAS DISTURBED BY THE CONTRACTOR.
- 3.ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT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

ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

TURF ESTABLISHMENT

REVISIONS

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



CONSTRUCTION SPECIFICATIONS

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

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

STABILIZED  
CONSTRUCTION  
ENTRANCE

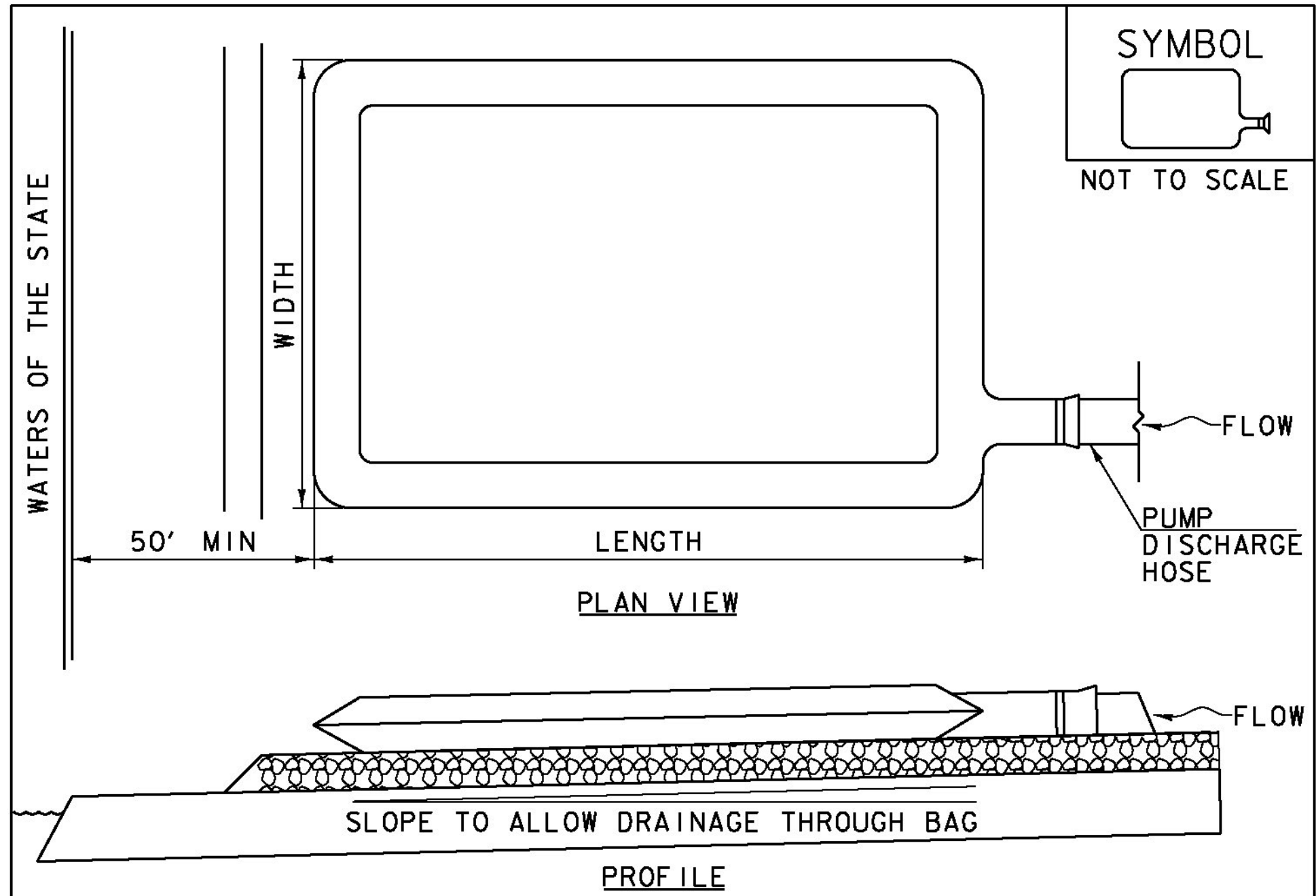
NOTES:

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

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

REVISIONS

MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



CONSTRUCTION SPECIFICATIONS

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

FILTER BAG

NOTES:

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

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

REVISIONS

MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF

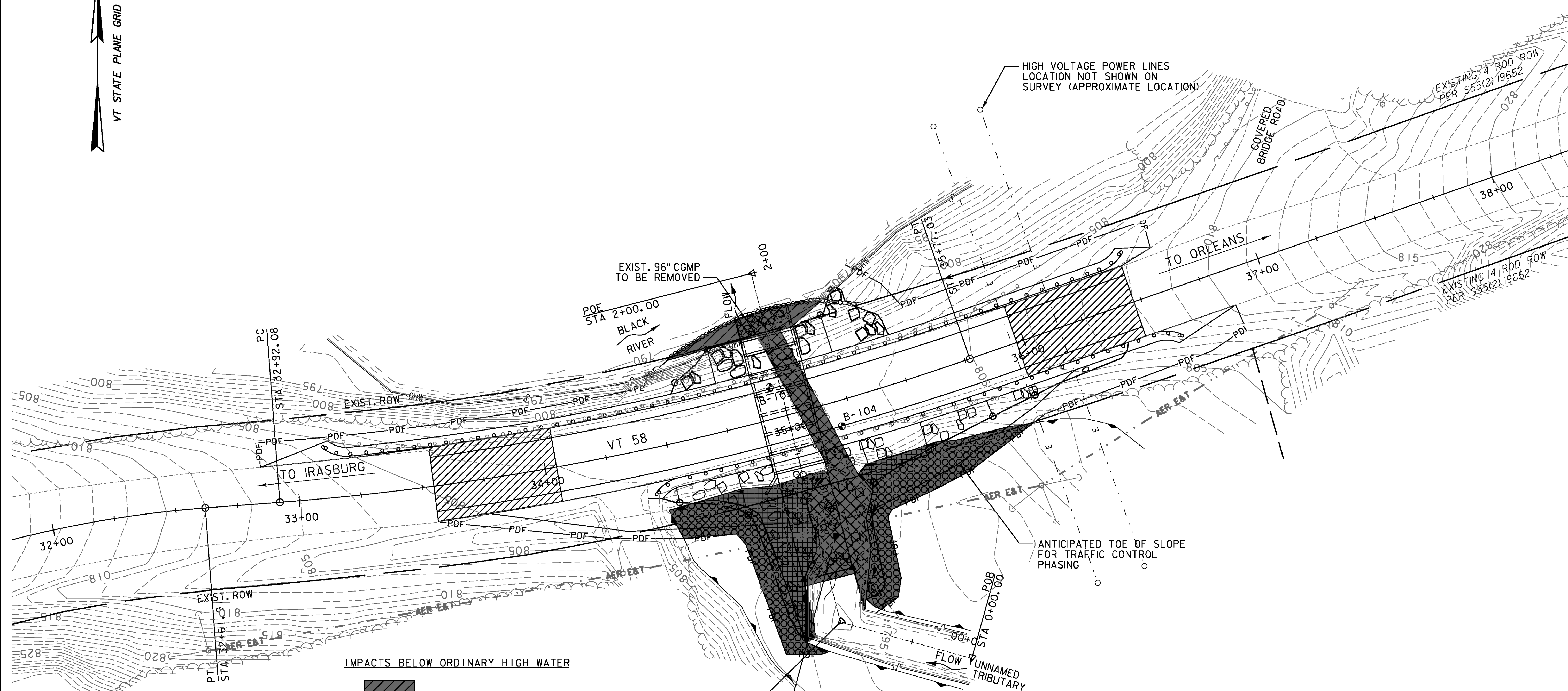
PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

FILE NAME: zllc266epsc def_br7.dgn  
PROJECT LEADER: M. CHENETTE  
DESIGNED BY: J. HUNGERFORD  
EROSION CONTROL DETAILS - ECD 2 - BR7

PLOT DATE: 9/26/2014  
DRAWN BY: L. BUXTON  
CHECKED BY: M. CHENETTE  
SHEET 51 OF 55







**LEGEND**

RIPRAP, HEAVY TYPE

STONE FILL, TYPE III

SPECIAL PROVISION (STONE FILL, CULVERT LINING)

IMPACTS BELOW ORDINARY HIGH WATER		
	TEMPORARY IMPACTS BELOW OHW:	224 SF
	PERMANENT IMPACTS BELOW OHW:	1778 SF
TOTAL IMPACTS:		2002 SF

WETLANDS IMPACT		
	WETLANDS SECONDARY IMPACTS:	2096 SF
	WETLANDS PERMANENT IMPACTS:	1087 SF
TOTAL IMPACTS:		3183 SF

**PLAN**

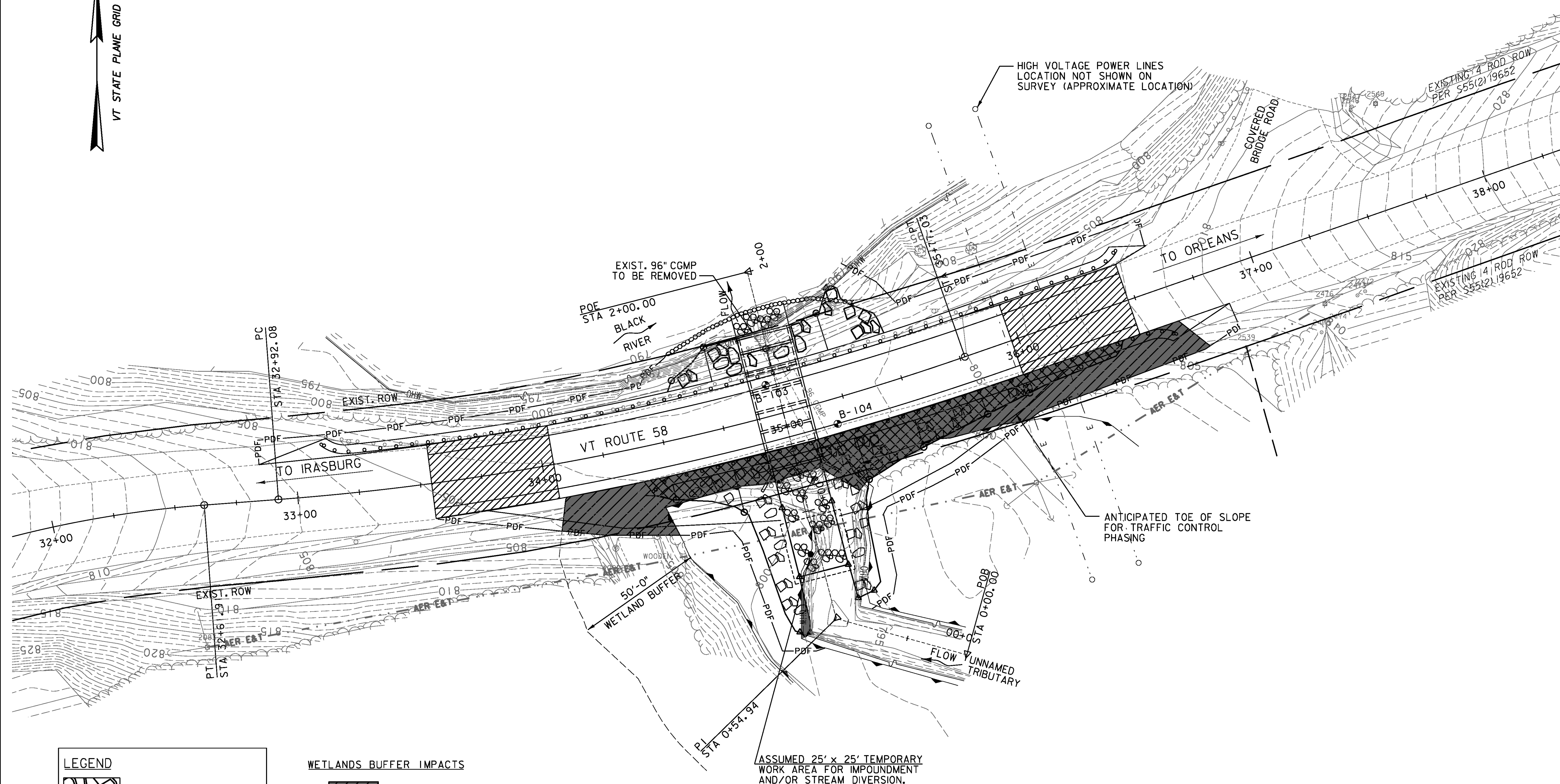
SCALE: 1" = 20'-0"

0 20 40



PROJECT NAME: IRASBURG	
PROJECT NUMBER: STP CULV(30)	
FILE NAME: zllc266bdr_Impacts_br7.l.dgn	PLOT DATE: 9/26/2014
PROJECT LEADER: M. CHENETTE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: M. CHENETTE
PROJECT IMPACTS PLAN I- BR7	SHEET 52 OF 55





LEGEND	
	RIPRAP, HEAVY TYPE
	STONE FILL, TYPE III
	SPECIAL PROVISION (STONE FILL, CULVERT LINING)

WETLANDS BUFFER IMPACTS	
	WETLANDS BUFFER SECONDARY IMPACTS: 1853 SF
	WETLANDS BUFFER PERMANENT IMPACTS: 2336 SF
TOTAL IMPACTS: 4189 SF	

PLAN  
SCALE: 1" = 20'-0"  
0 20 40

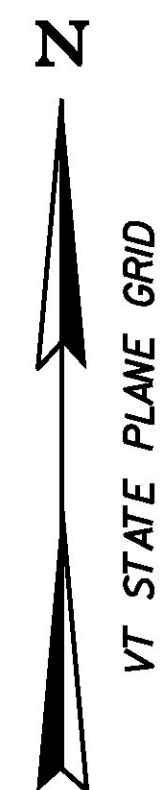


PROJECT NAME:	IRASBURG	PLOT DATE:	9/26/2014
PROJECT NUMBER:	STP CULV(30)	DRAWN BY:	L. BUXTON
FILE NAME:	zllc266bdr_impacts_br7.2.dgn	CHECKED BY:	M. CHENETTE
PROJECT LEADER:	M. CHENETTE	SHEET	53 OF 55
DESIGNED BY:	J. HUNGERFORD	PROJECT IMPACTS PLAN 2 - BR7	









621.20 - STEEL BEAM GUARDRAIL, GALVANIZED  
STA. 33+11.03, LT. TO STA. 34+50.00, LT.  
STA. 34+41.44, RT. TO STA. 34+50.00, RT.  
STA. 35+50.00, LT. TO STA. 36+49.20, LT.  
STA. 35+50.00, RT. TO STA. 36+61.45, RT.

621.21 - HD STEEL BEAM GUARDRAIL, GALVANIZED  
STA. 34+50.0, LT. TO STA. 34+87.5, LT.  
STA. 34+50.0, RT. TO STA. 34+87.5, RT.  
STA. 35+12.5, LT. TO STA. 35+50.0, LT.  
STA. 35+12.5, RT. TO STA. 35+50.0, RT.

621.216 - HD STEEL BEAM GUARDRAIL, GALVANIZED/NESTED  
STA. 34+87.5, LT. TO STA. 35+12.5, LT.  
STA. 34+87.5, RT. TO STA. 35+12.5, RT.

621.60 - ANCHOR FOR STEEL BEAM GUADRAIL  
STA. 33+11.03, LT.  
STA. 34+41.44, RT.  
STA. 36+49.20, LT.  
STA. 36+61.45, RT.

621.80 - REMOVAL AND DISPOSAL OF GUARDRAIL  
STA. 33+12.71, LT. TO STA. 36+05.57, LT.  
STA. 34+48.75, RT. TO STA. 35+86.30, RT.

646.400- DURABLE 4 INCH WHITE LINE  
STA. 33+55.00, RT. TO STA. 36+47.00, RT.  
STA. 33+55.00, LT. TO STA. 36+47.00, LT.

646.410- DURABLE 4 INCH YELLOW LINE  
STA. 33+55.00, CL. TO STA. 36+47.00, CL. (DYEL)

CURVE DATA  
DELTA = 14° 50' 31.6"  
D = 5° 12' 31.4"  
R = 1100.00'  
T = 143.28'  
L = 284.95'  
E = 9.29'

**NELSON FARMS, INC.**

**STATE OF VERMONT**

STREAM BED (MATCH EXISTING, REUSE EXISTING MATERIAL WHERE POSSIBLE)

N 840372.57  
E 1699893.41  
34+85.99, 31.01' LT

SIGN TO REMAIN IN PLACE DURING CONSTRUCTION

N 840334.22  
E 1699611.32  
32+00.00, 35.19' LT

N 840340.29  
E 1699678.08  
32+62.39, 31.62' LT

EXISTING R.O.W. (4 ROD)  
L=63.68'  
R=391.10

**STATE OF VERMONT**  
APPROX. R.O.W. PROJECT S 55(2), 1949

L=50.54'  
R=325.10

N 840269.67  
E 1699625.29  
32+00.00, 30.86' RT

N 840274.29  
E 1699677.34  
32+56.26, 34.10' RT

BEGIN APPROACH  
MATCH EXISTING  
BEGIN COLD PLANING  
STA. 33+55.00

BEGIN PROJECT  
STA. 34+55.00

BEGIN BRIDGE  
STA. 34+89.07

**BEGIN R.O.W. PROJECT**  
**STP CULV (30)**  
**STA. 34+43, 36.95' RT**

**END R.O.W. PROJECT**  
**STP CULV (30)**  
**STA. 35+96, 31.87' RT**

**MAGOON, ALAN & BOBBI JO**

NOTES:  
1. GRADE IN ACCORDANCE WITH TYPICAL ROADWAY SECTION AND ROADWAY CROSS SECTIONS UNLESS NOTED OTHERWISE.

**LEGEND**

- RIPRAP, HEAVY TYPE
- STONE FILL, TYPE III
- STONE FILL, CULVERT LINING

**PLAN**

SCALE: 1" = 20'-0"  
0 20 40

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'S ACQUISITION OF LAND AND RIGHTS FOR THIS PROJECT.

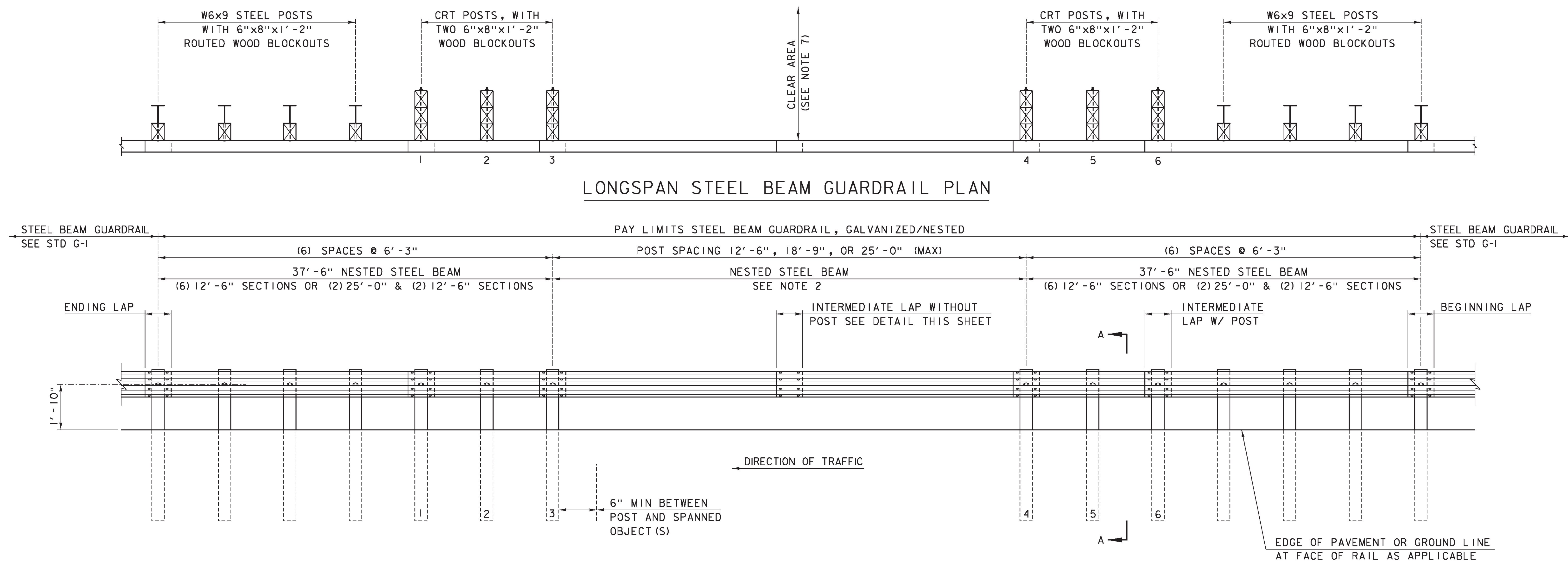
**FOR R.O.W. USE ONLY**

PROJECT NAME: IRASBURG  
PROJECT NUMBER: STP CULV(30)

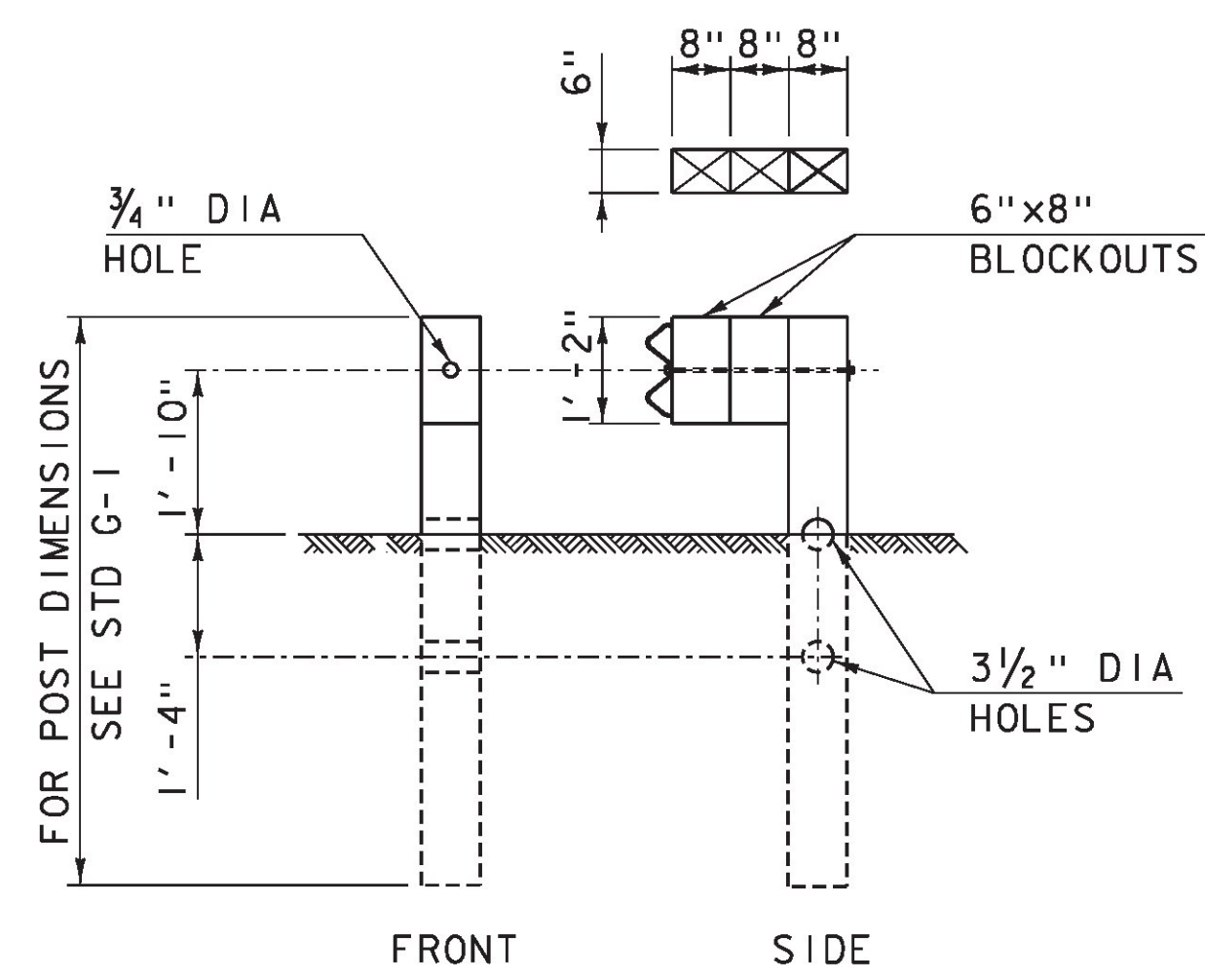
FILE NAME: r1lc266lay_br7.dgn  
PROJECT LEADER: M. SARGENT  
DESIGNED BY: STANTEC  
R.O.W. LAYOUT - BR7

PLOT DATE: 04-AUG-2014  
DRAWN BY: E. PIERCE  
CHECKED BY: R. CLOUTIER  
SHEET 55 OF 55



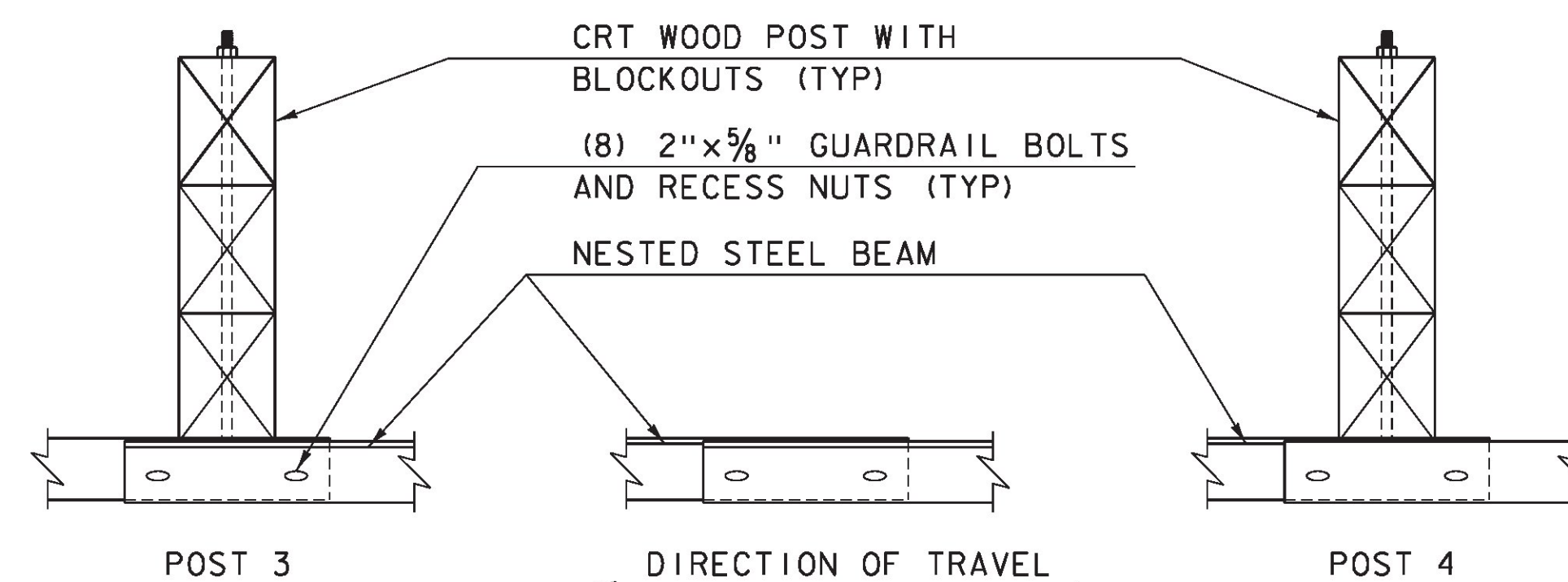


### LONGSPAN STEEL BEAM GUARDRAIL ELEVATION



#### SECTION A-A

SECTION A-A TYPICAL FOR POST 1-6.  
SEE NOTES 3 AND 4



#### INTERMEDIATE LAP WITHOUT POST

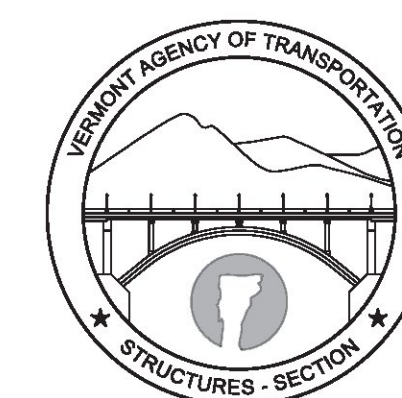
#### NOTES:

1. RAIL MEETS TEST LEVEL 3 REQUIREMENTS OF NCHRP REPORT 350.
2. THERE SHALL BE NO MORE THAN ONE SPLICE IN THE LONGSPAN LOCATION.
3. POSTS 1 THRU 6 ARE BREAKAWAY CONTROLLED RELEASING TERMINAL (CRT) POSTS.
4. POSTS 1 THRU 6 HAVE TWO 6"x8" BLOCKOUTS.
5. ON POSTS 1 THRU 6, GUARDRAIL BOLT "D", AS SHOWN ON STD G1, SHALL BE 26" LONG.
6. ON ALL POSTS WHERE THE RAIL IS NESTED GUARDRAIL BOLT "A", AS SHOWN ON STD G1, SHALL BE 2" LONG.
7. CLEAR AREA BEHIND BACK OF RAIL SHALL BE: 5'-0" MINIMUM FOR OBSTRUCTIONS LESS THAN OR EQUAL TO THE HEIGHT OF RAIL. 6'-0" FOR OBSTRUCTIONS TALLER THAN THE TOP OF RAIL.
8. W6x9 STEEL POST MAY BE REPLACED WITH CRT WOOD POST WITH THE APPROVAL OF THE ENGINEER.
9. ALL MATERIALS NECESSARY FOR THE ASSEMBLY OF THE RAIL MUST MEET THE REQUIREMENTS OF STD G-1 UNLESS OTHERWISE NOTED.
10. GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW FOR THE LANE NEAREST THE GUARDRAIL.

#### REVISIONS

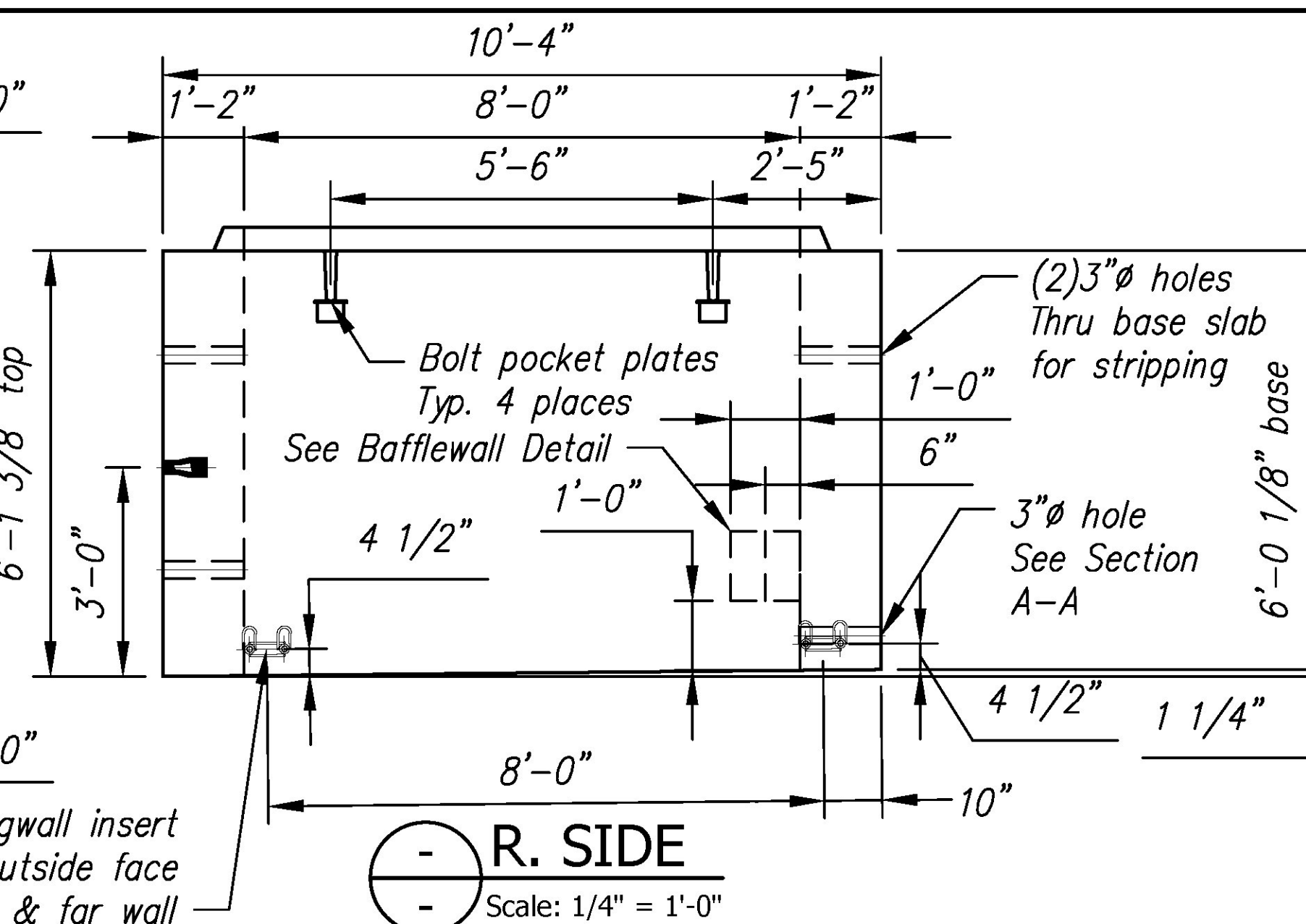
NOVEMBER 25, 2013	APPROVED FOR USE BY VAOT STRUCTURES SECTION
JANUARY 3, 2014	APPROVED FOR USE BY VAOT STRUCTURES SECTION

## LONGSPAN STEEL BEAM GUARDRAIL, GALVANIZED



STRUCTURES  
DETAIL  
SD-366.00



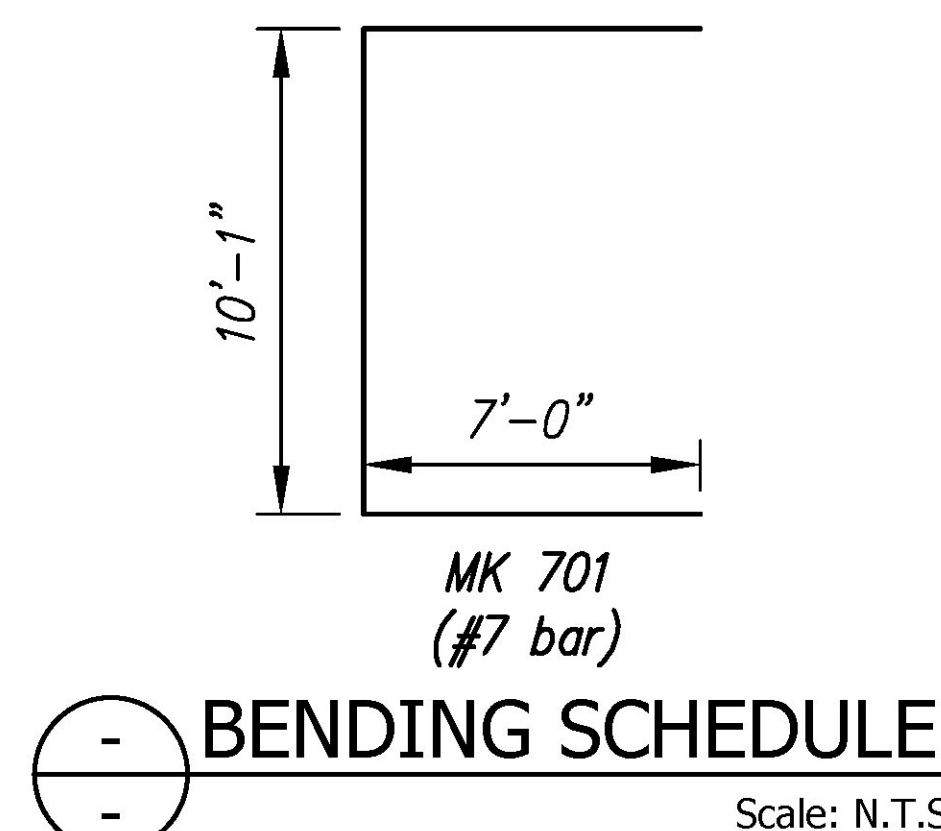


Top of base slab

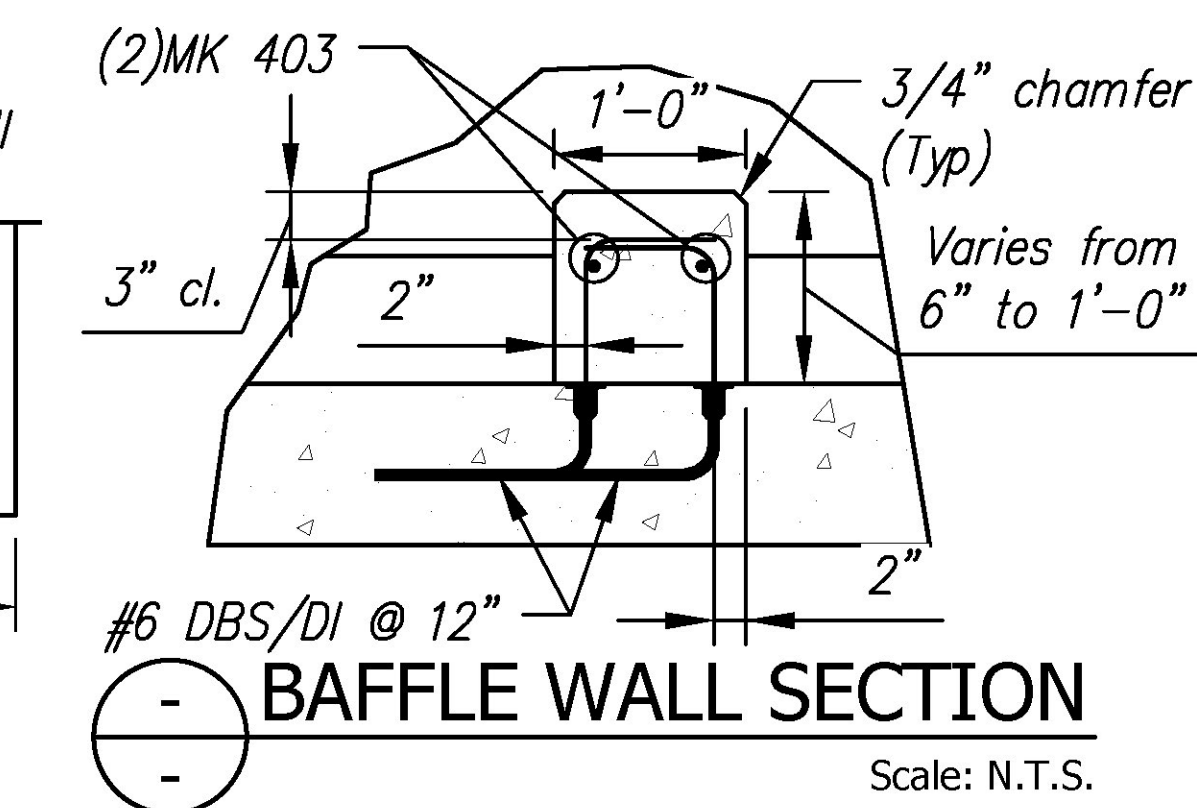
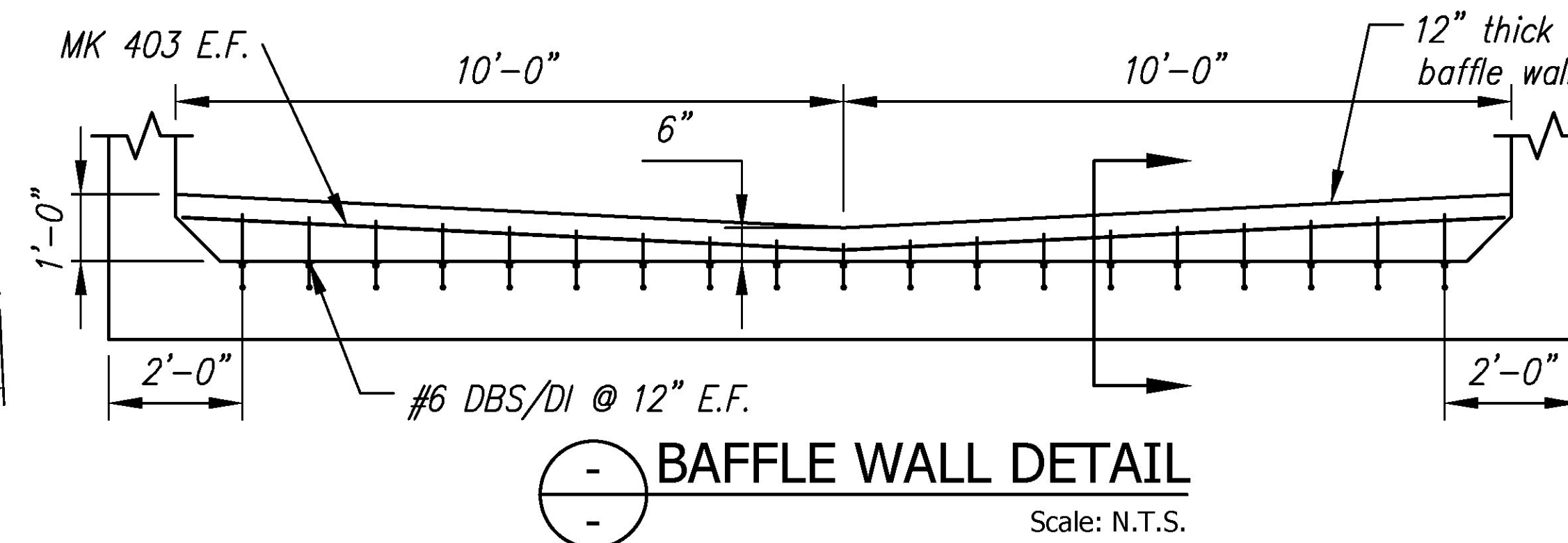
6" Typ

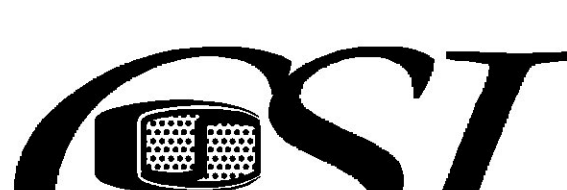
A1 Rebar Schedule				
MK		QTY	LENGTH	
401	#4	18	9 'L	6 "
402	#4	138	5 'L	9 "
501	#5	16	21 'L	6 "
701	#7	34	24 'L	1 "
702	#7	36	21 'L	6 "

A1 BW Rebar Schedule			
MK		QTY	LENGTH
403	#4	2	19' - 8"

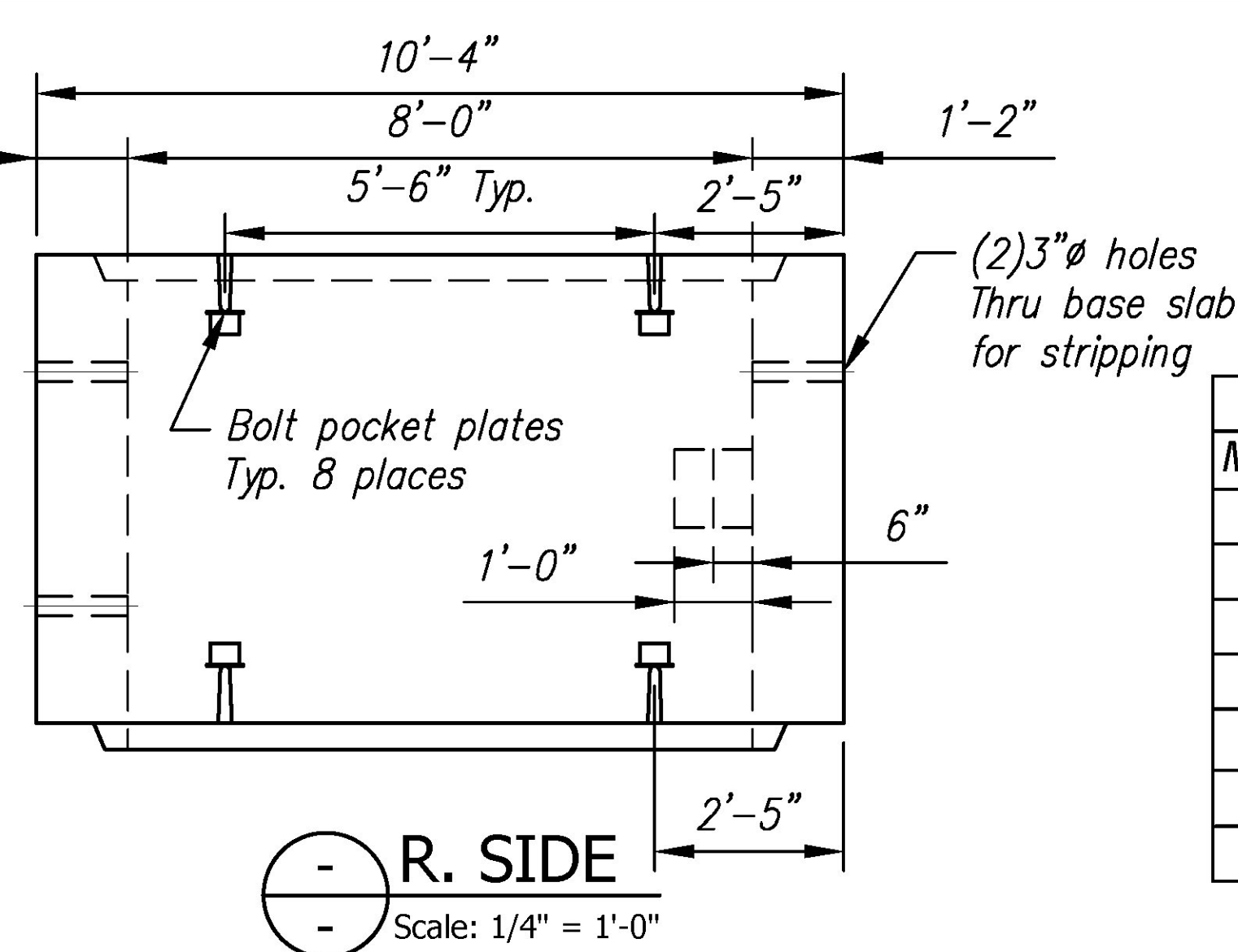


A1 - BILL OF MATERIALS / EMBEDS						
CSI ID#	DESCRIPTION			QTY	UM	COMMENTS
CT-00005	REVIEWED	X		0.34	GA	
EM-0005A	REVIEWED AS MODIFIED			4	EA	
EM-00014	REVISE AND RESUBMIT			38	EA	DOWEL BAR SPLICE
EM-00026	NOT REVIEWED			5	EA	
EM-00033	Date: 4/24/2015			18.67	FT	
EM-00125	By: Nathan Tirk			4	EA	
RM-00013	This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication process or to techniques of construction and installation and for coordination of the work of all subtrades.			644	LB	
RM-00015				359	LB	
RM-00009				3256	LB	
MX-FA5000SC.				3	15.37	CY
				/ EMBEDS		
EM-00022				38	EA	DOWEL IN
RM-00013				26	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING			0.51	CY	

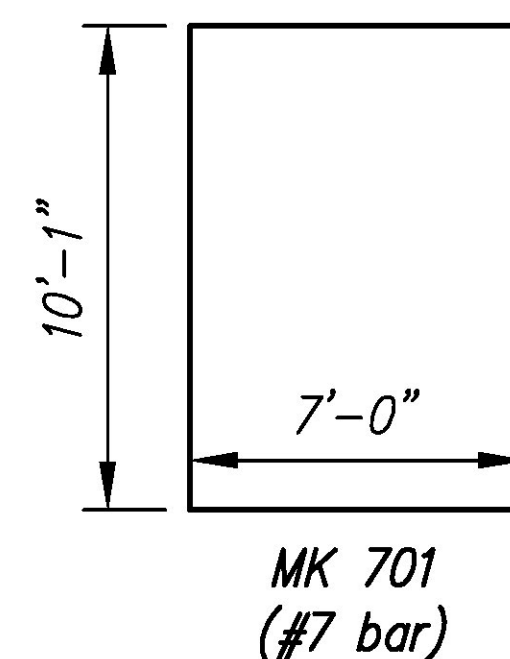


5				 <b>Concrete Systems Inc.</b> 9 Commercial St., Hudson, NH, 03051 Phone 603-889-4163 Fax 603-889-2417	STATE AGENCY   		J A MCDONALD, INC. VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT			
4					Drawn By R. YEAGER	Date 12MAR2015	B	SHOP DRAWING – A1		REV 0
3					Concrete Cu. Yd. 16.08	Weight in Tons 32.56		Drawing No. C22283-L01-A1		
2					Approved By	Date	Quantity: 1	Project No: STPCULV30	SHEET 1 OF 13	
1										
Rev.	Date	DESCRIPTION	By							
REVISIONS										

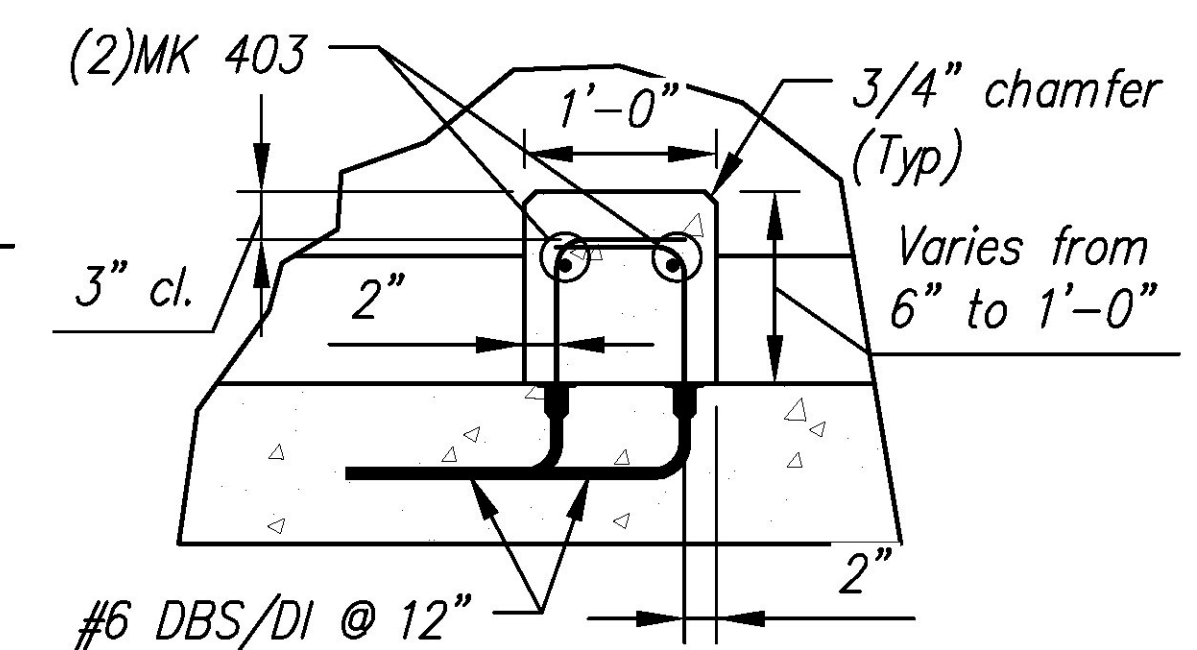
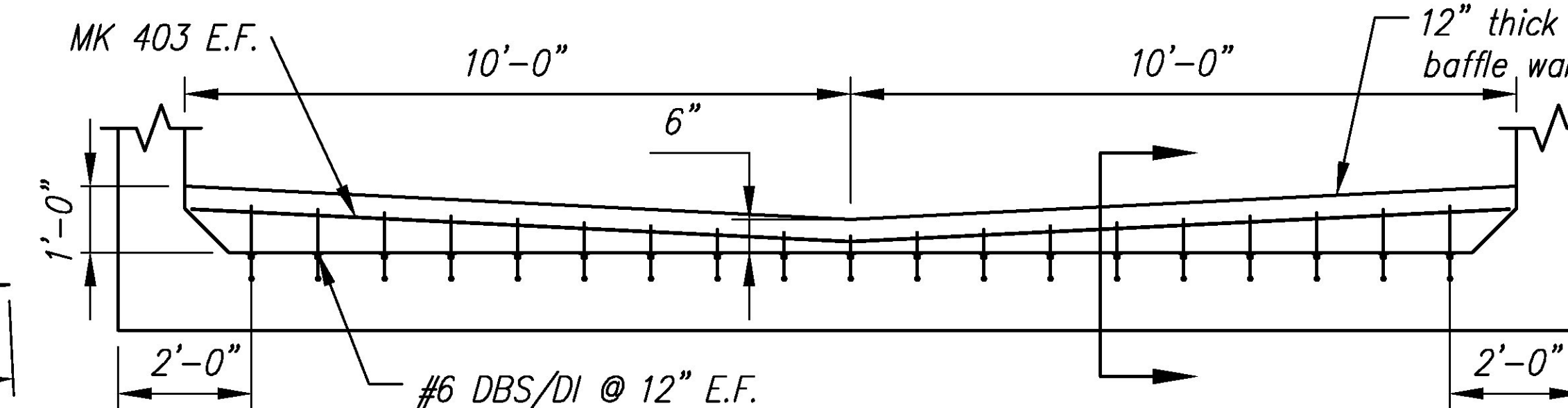




A2 BW Rebar Schedule			
MK		QTY	LENGTH
403	#4	2	19' - 8"



42. BILL OF MATERIALS / EMBEDS							
CSI ID#	REVIEWED	X		QTY	UM	COMMENTS	
EM-00014	REVIEWED AS MODIFIED			38	EA	DOWEL BAR SPLICER	
EM-00033	REVISE AND RESUBMIT			7	FT		
EM-00125	NOT REVIEWED			8	EA		
JS-00002	Date: 4/24/2015			62	FT	AROUND BELL	
RM-00013	By: Nathan Tirk		644	LB			
RM-00015	This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.			359	LB		
RM-00009				3256	LB		
MX-FA5000SC				3	15.19	CY	
EM-00022				/ EMBEDS			
RM-00013				38	EA	DOWEL IN	
MX-FA5000SC				26	LB		
				3	0.51	CY	



5			
4			
3			
2			
1			
Rev.	Date	DESCRIPTION	By
REVISIONS			

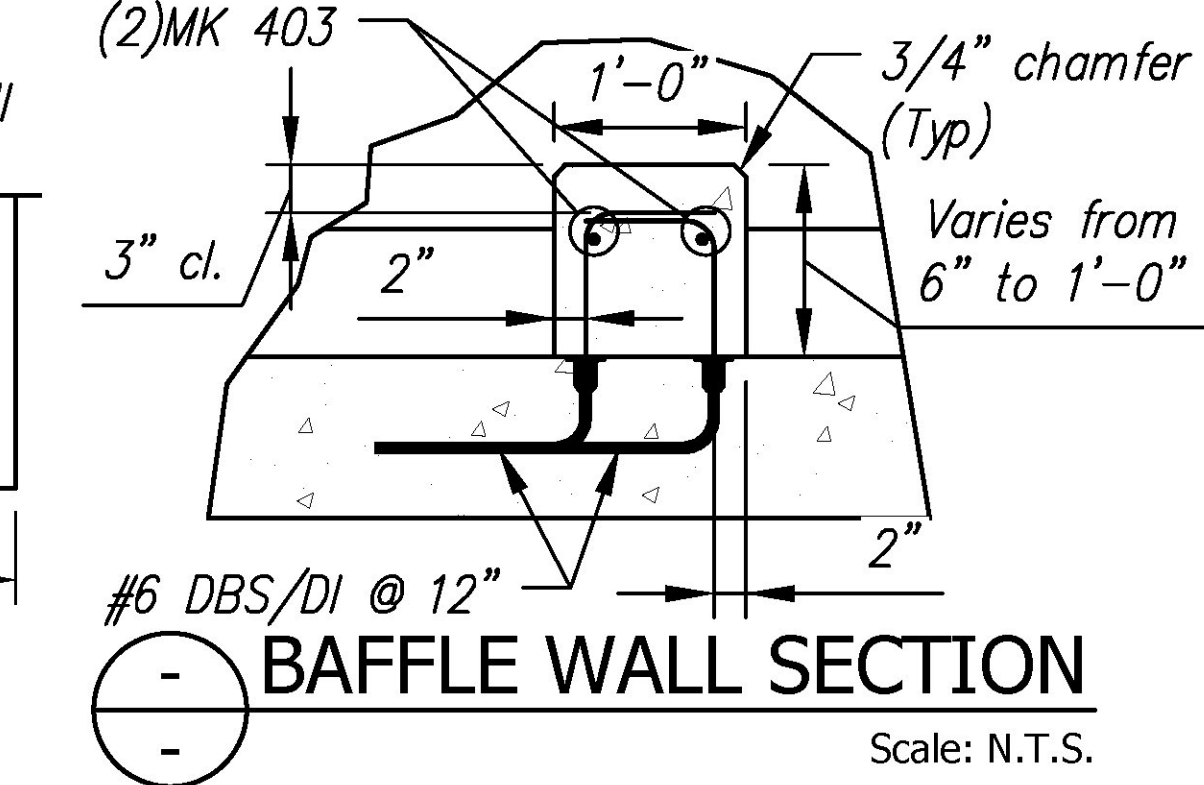
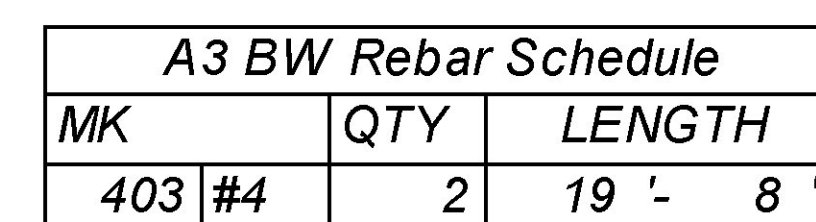
**CSI**  
Concrete Systems Inc.  
9 Commercial St., Hudson, NH, 03051  
Phone 603-889-4163  
Fax 603-889-2417

Drawn By R. YEAGER	Date 12MAR2015
Concrete Cu. Yd. 15.70	Weight in Tons 31.79
Approved By	Date

J A MCDONALD, INC.  
VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT  
BRIDGE #6, VT ROUTE 58, IRASBURG, VT

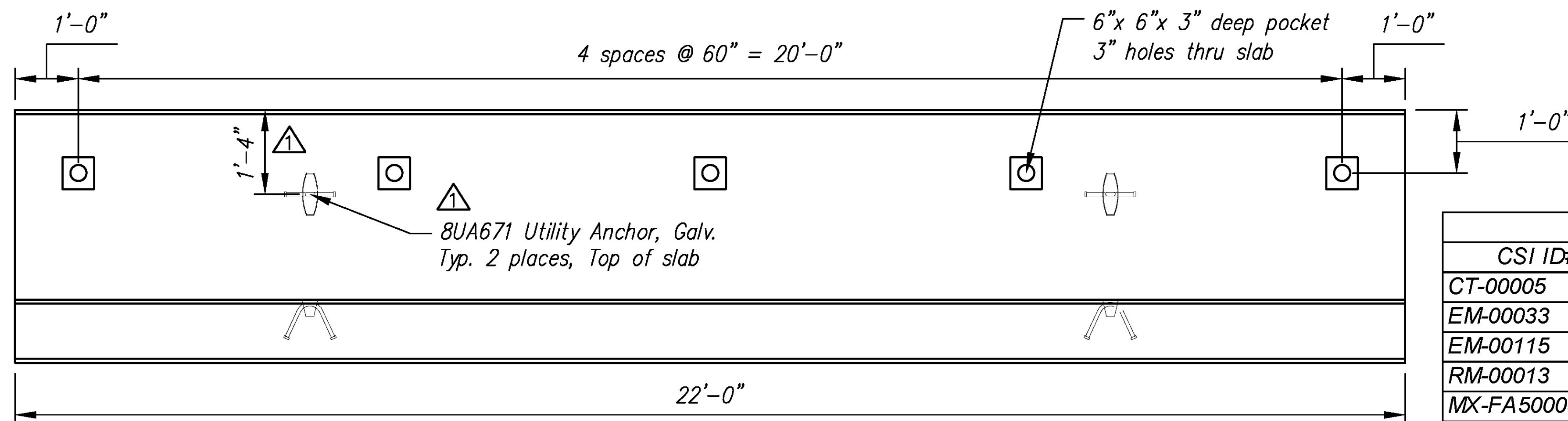
B	SHOP DRAWING - A2	REV
	Drawing No. C22283-L01-A2	0



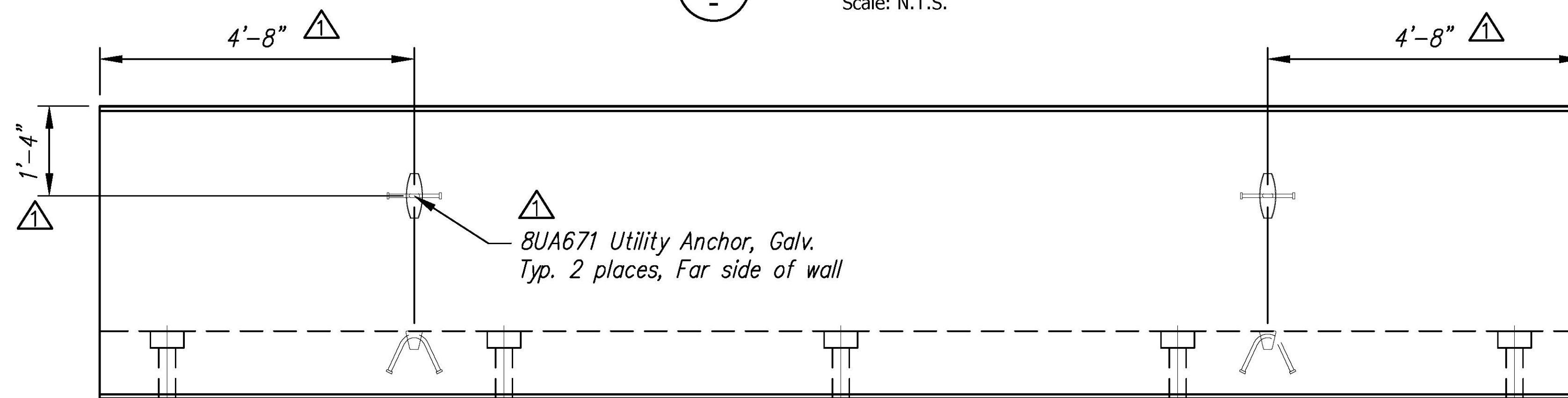


5				 Concrete Systems Inc. 9 Commercial St., Hudson, NH,03051 Phone 603-889-4163 Fax 603-889-2417	STATE AGENCY   		J A MCDONALD, INC. VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT			
4					Drawn By R. YEAGER	Date 12MAR2015	B	SHOP DRAWING – A3		REV 0
3					Concrete Cu. Yd. 15.62	Weight in Tons 31.63		Drawing No. C22283–L01–A3		
2					Approved By	Date	Quantity: 1	Project No: STPCULV30	SHEET 3 OF 13	
1										
Rev.	Date	DESCRIPTION	By							
REVISIONS										





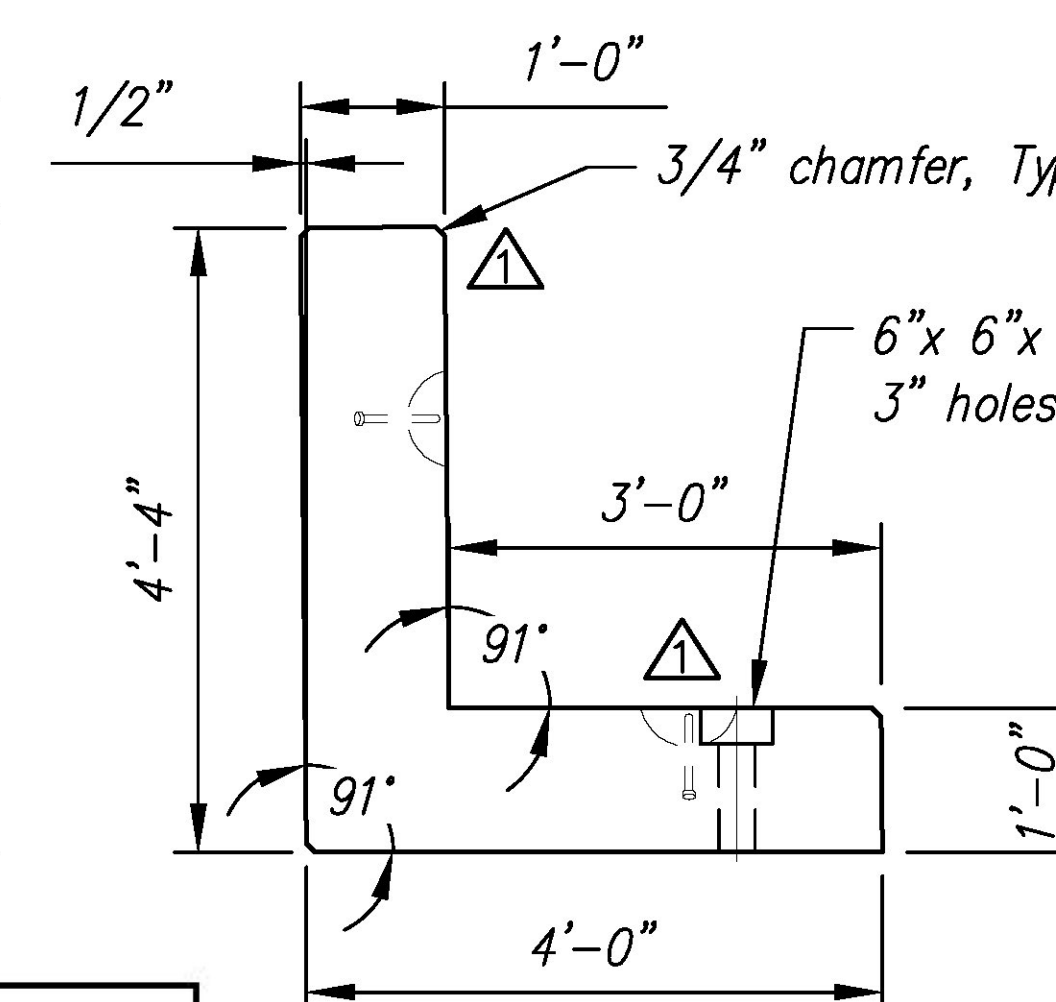
PLAN VIEW  
Scale: N.T.S.



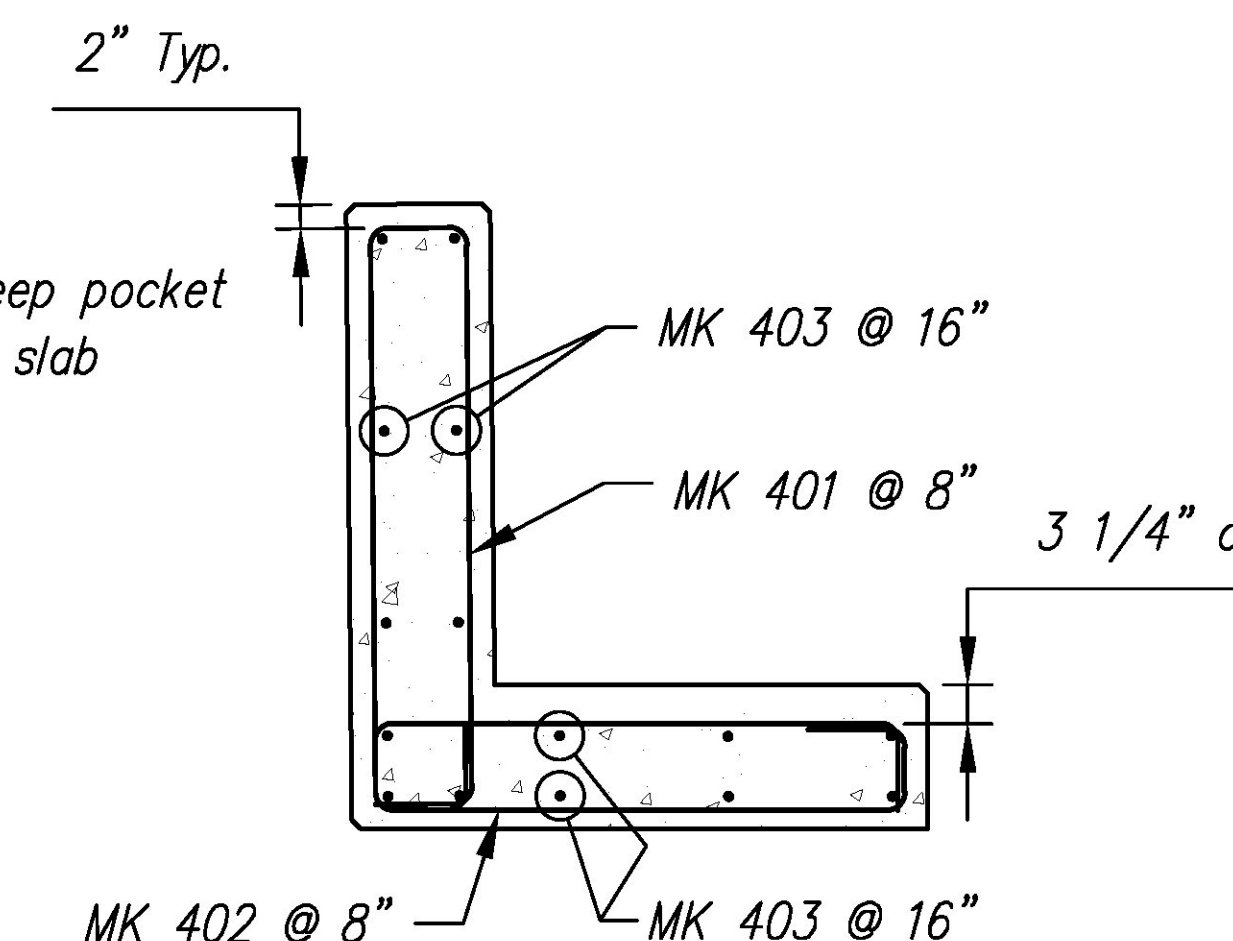
ELEVATION  
Scale: N.T.S.

HW1A Rebar Schedule			
MK	#	QTY	LENGTH
401	#4	33	10' - 8"
402	#4	33	9' - 8"
403	#4	15	21' - 9"

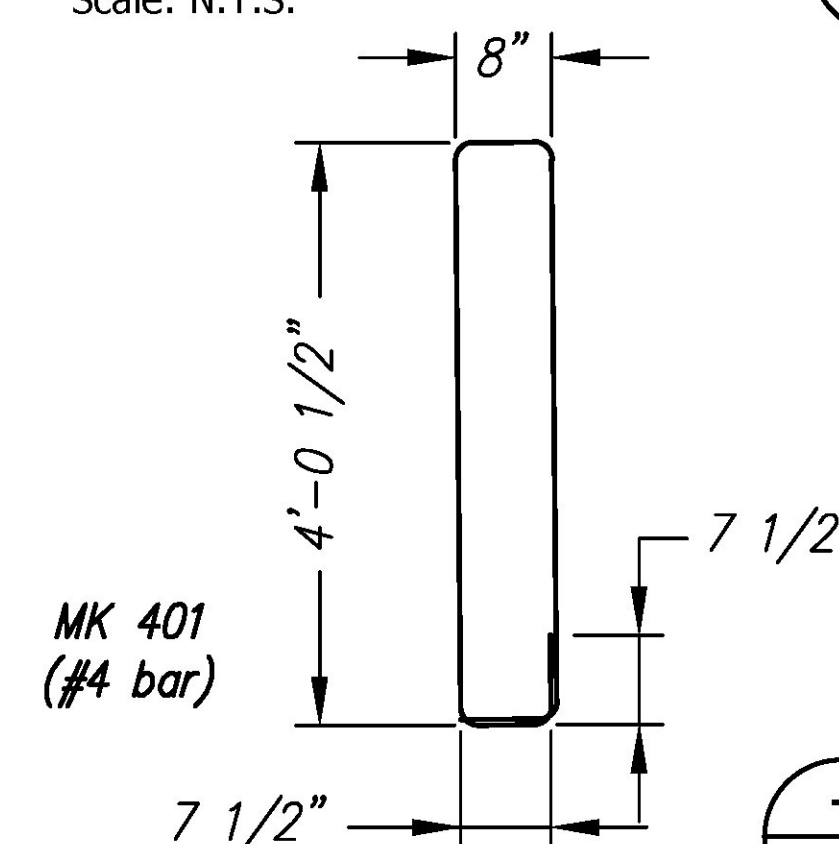
HW1A HEADWALL - BILL OF MATERIALS / EMBEDS				
CSI ID#	DESCRIPTION	QTY	UM	COMMENTS
CT-00005	CONSOLIDECK SALTGUARD (SILANE SILOXANE)	0.70	GA	
EM-00033	3" FOAM CORE PVC	3.75	FT	
EM-00115	UTILITY ANCHOR #8UA671-GALVANIZED	4	EA	
RM-00013	REBAR #4 BLACK- GR 60	666	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING	5.98	CY	



R. SIDE  
Scale: N.T.S.



REINFORCING DETAIL  
Scale: N.T.S.



BENDING SCHEDULE  
Scale: N.T.S.

Vermont Agency of Transportation

RECEIVED

ON: April 30, 2015

and Checked for

CONFORMANCE

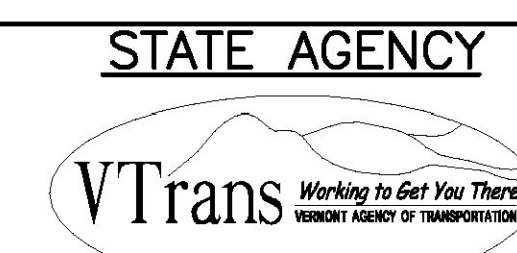
BY: Mark Sargent DATE: 5/7/2015

REVIEWED	X
REVIEWED AS MODIFIED	
REVISE AND RESUBMIT	
NOT REVIEWED	
Date: 4/24/2015	
By: Nathan Tirk	
This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.	



5			
4			
3			
2			
1	28APR2015	REVISED LOCATION OF UTILITY ANCHORS, QTY WAS 6	RY
Rev.	Date	DESCRIPTION	By
REVISIONS			

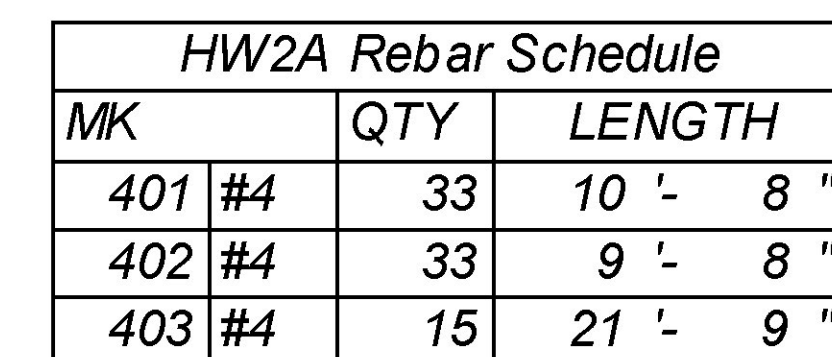
**CSI**  
Concrete Systems Inc.  
9 Commercial St., Hudson, NH, 03051  
Phone 603-889-4163  
Fax 603-889-2417



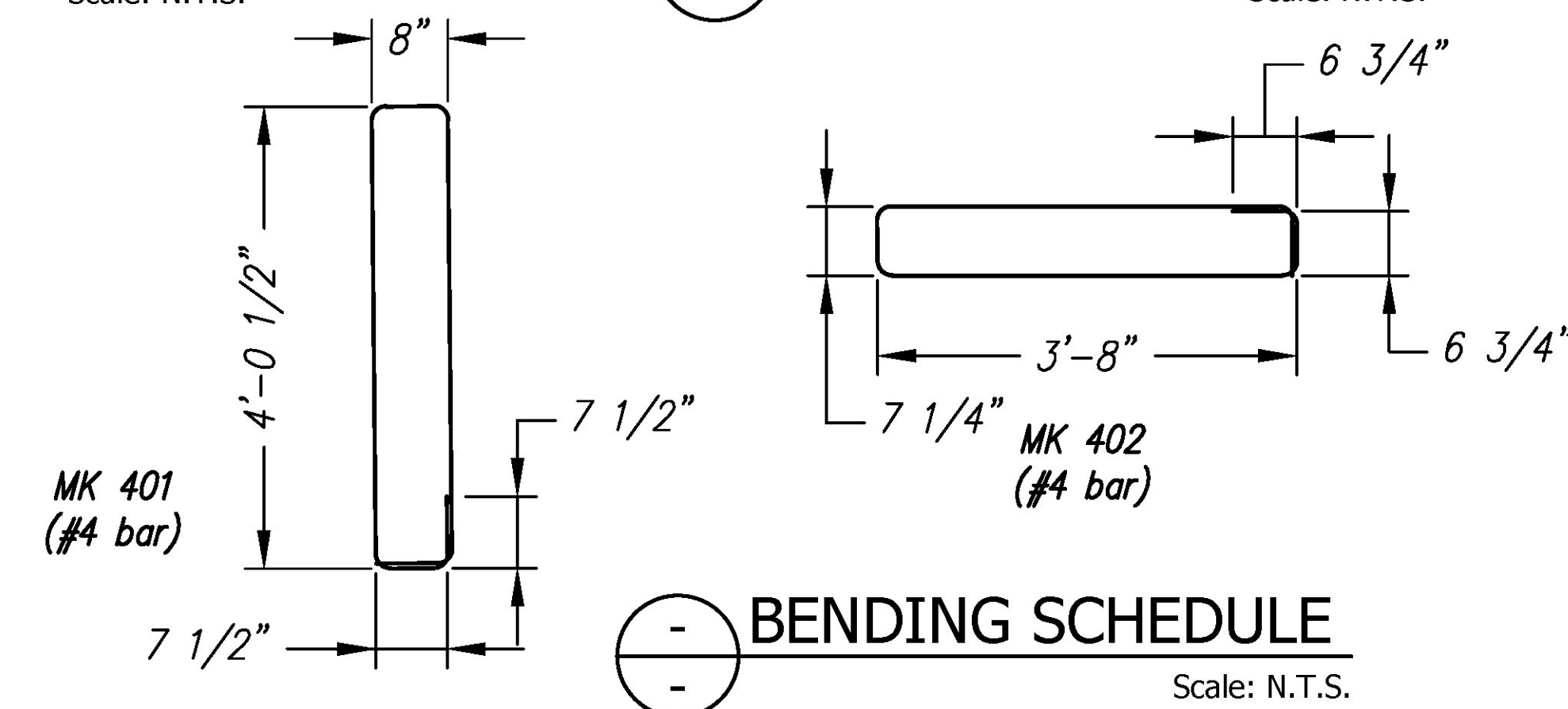
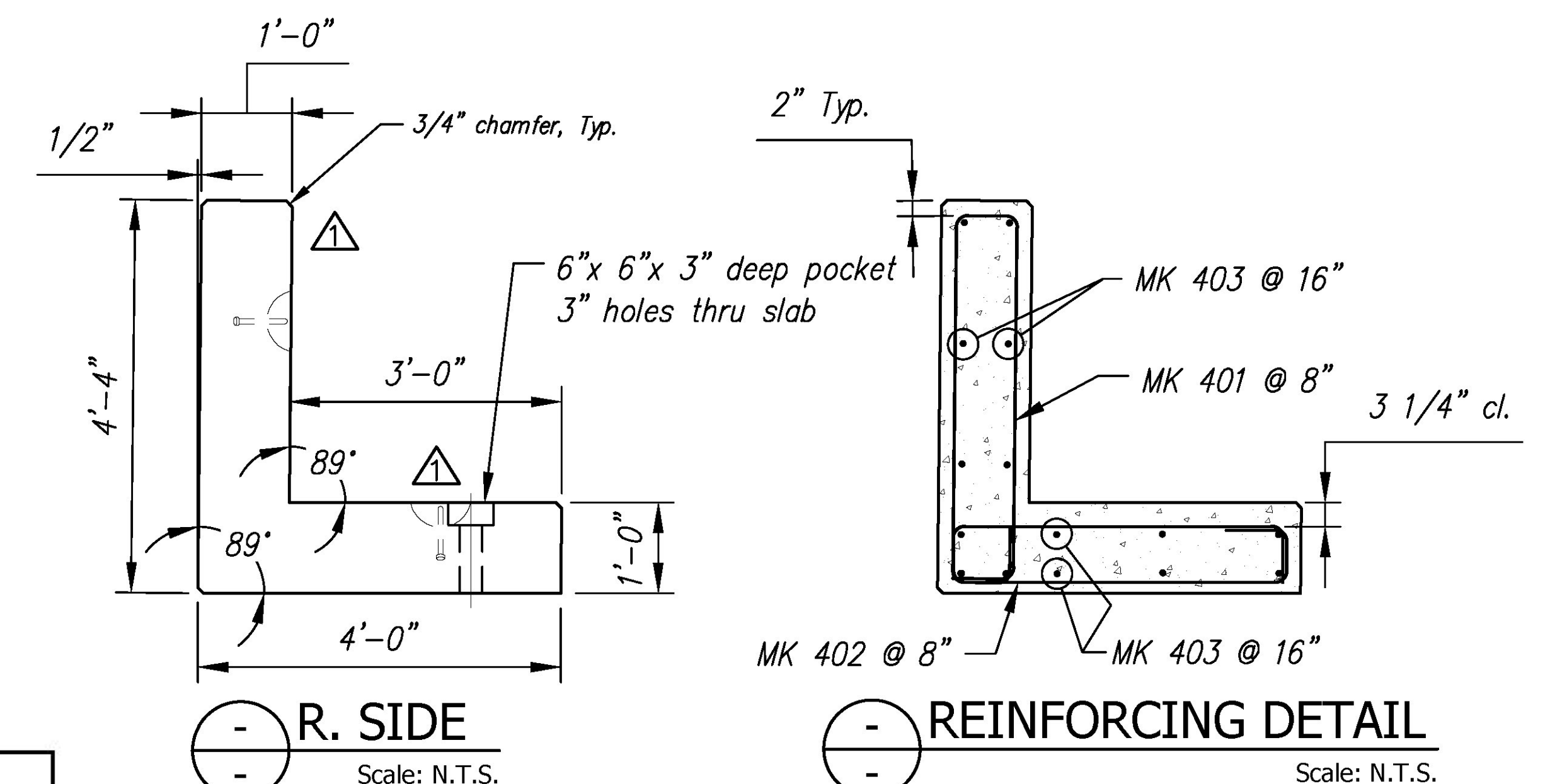
Drawn By R. YEAGER	Date 12MAR2015
Concrete Cu. Yd. 5.98	Weight in Tons 12.11
Approved By	Date

J A MCDONALD, INC.			
VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT			
B	SHOP DRAWING – HW1A		REV 1
	Drawing No. C22283–LO1–HW1A		
Quantity: 1	Project No: STPCULV30	SHEET 4 OF 13	





HW2A HEADWALL - BILL OF MATERIALS / EMBEDS				
CSI ID#	DESCRIPTION	QTY	UM	COMMENTS
CT-00005	CONSOLIDECK SALTGUARD (SILANE SILOXANE)	0.70	GA	
EM-00033	3" FOAM CORE PVC	3.75	FT	
EM-00115	UTILITY ANCHOR #8UA671-GALVANIZED	4	EA	
RM-00013	REBAR #4 BLACK- GR 60	666	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING	5.98	CY	



RECEIVED

and Checked for

# CONFORMANCE

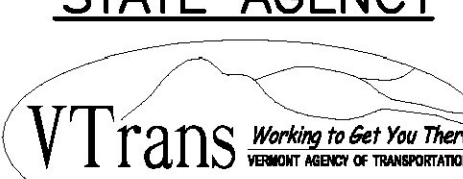
BY: Mark Sargent DATE: 5/7/2015

REVIEWED	X	 <b>Stantec</b>
REVIEWED AS MODIFIED		
REVISE AND RESUBMIT		
NOT REVIEWED		

Date: 4/24/2015

By: Nathan Tirk

This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design in hereat in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.

5				 <b>Concrete Systems Inc.</b> 9 Commercial St., Hudson, NH,03051 Phone 603-889-4163 Fax 603-889-2417	STATE AGENCY  		J A MCDONALD, INC. VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT			
4					Drawn By R. YEAGER	Date 12MAR2015	B	SHOP DRAWING – HW2A		REV 1
3					Concrete Cu. Yd. 5.98	Weight in Tons 12.11		Drawing No. C22283-L01-HW2A		
2					Approved By	Date	Quantity: 1	Project No: STPCULV30	SHEET 5 OF 13	
1	28APR2015	REVISED LOCATIONS OF UTILITY ANCHORS, QTY WAS 6	RY							
Rev.	Date	DESCRIPTION	By							
REVISIONS										

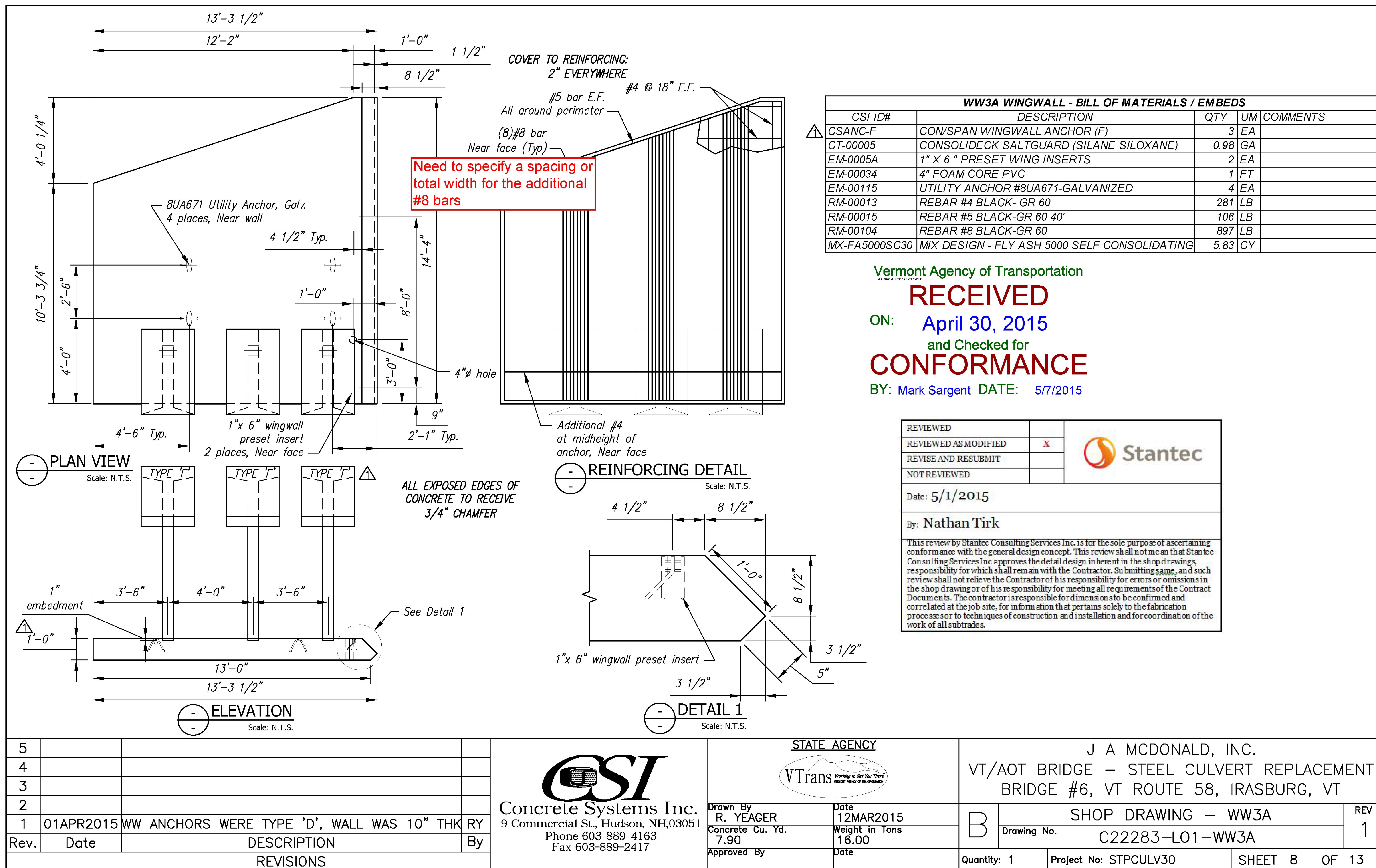








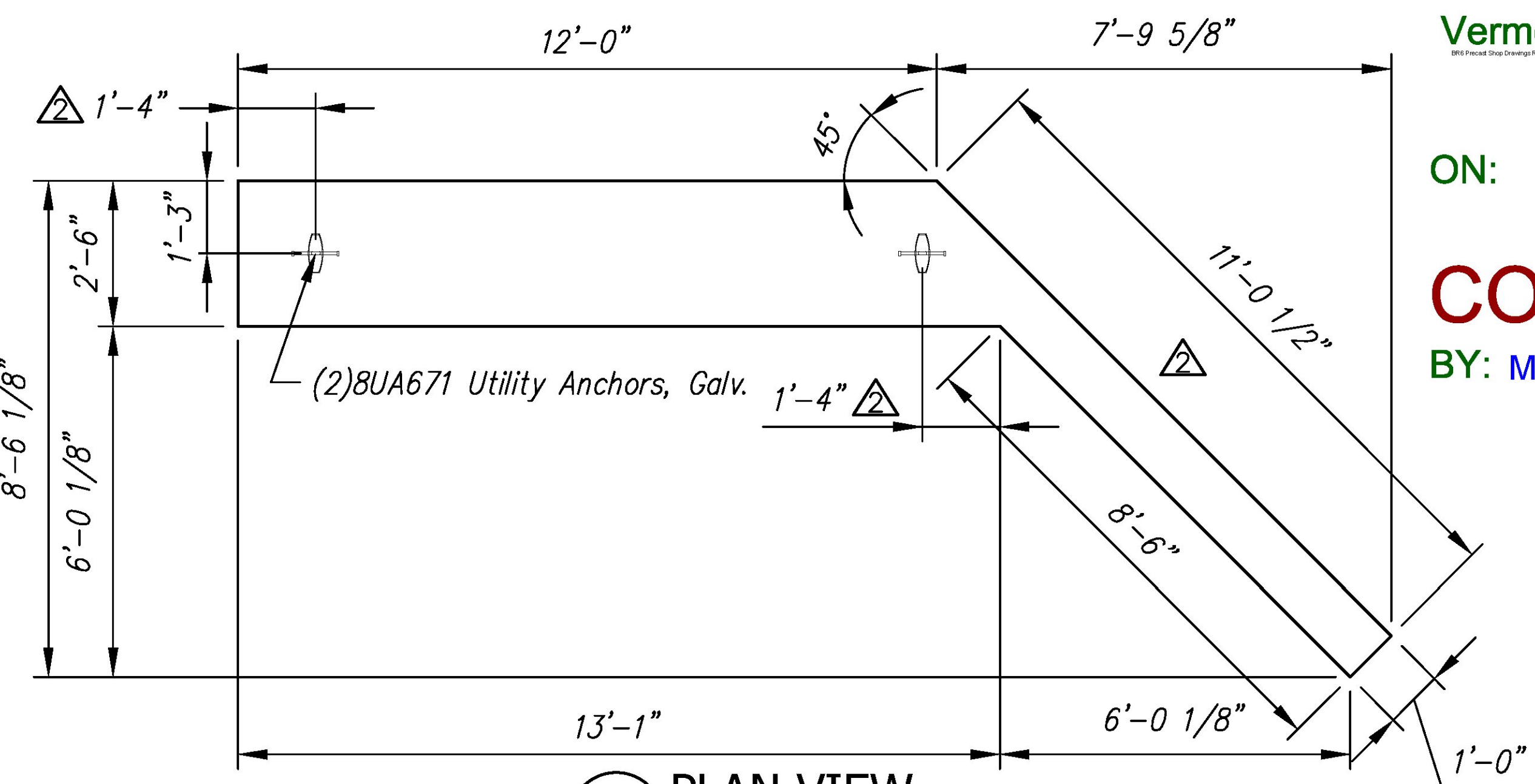




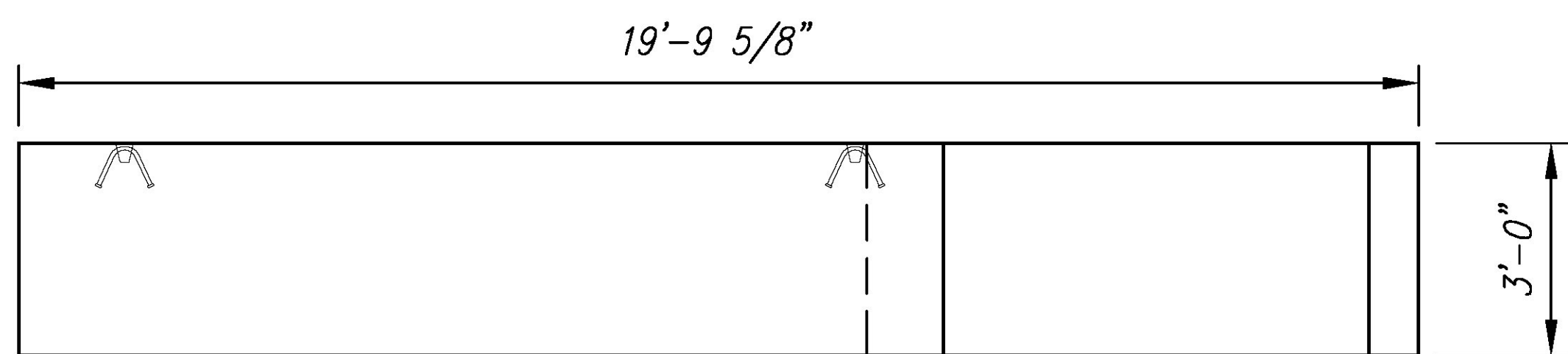




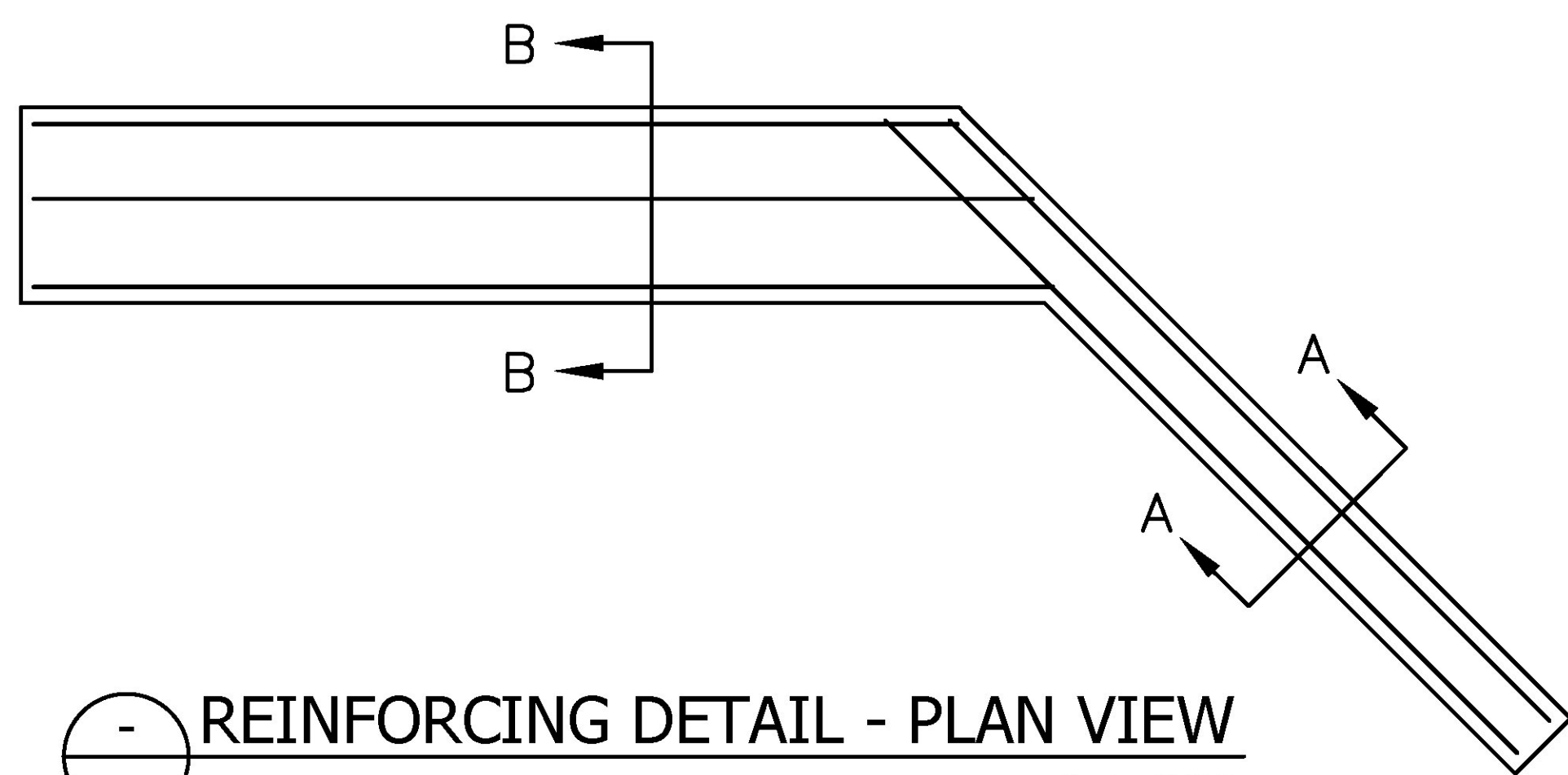




PLAN VIEW  
Scale: N.T.S.



ELEVATION  
Scale: N.T.S.



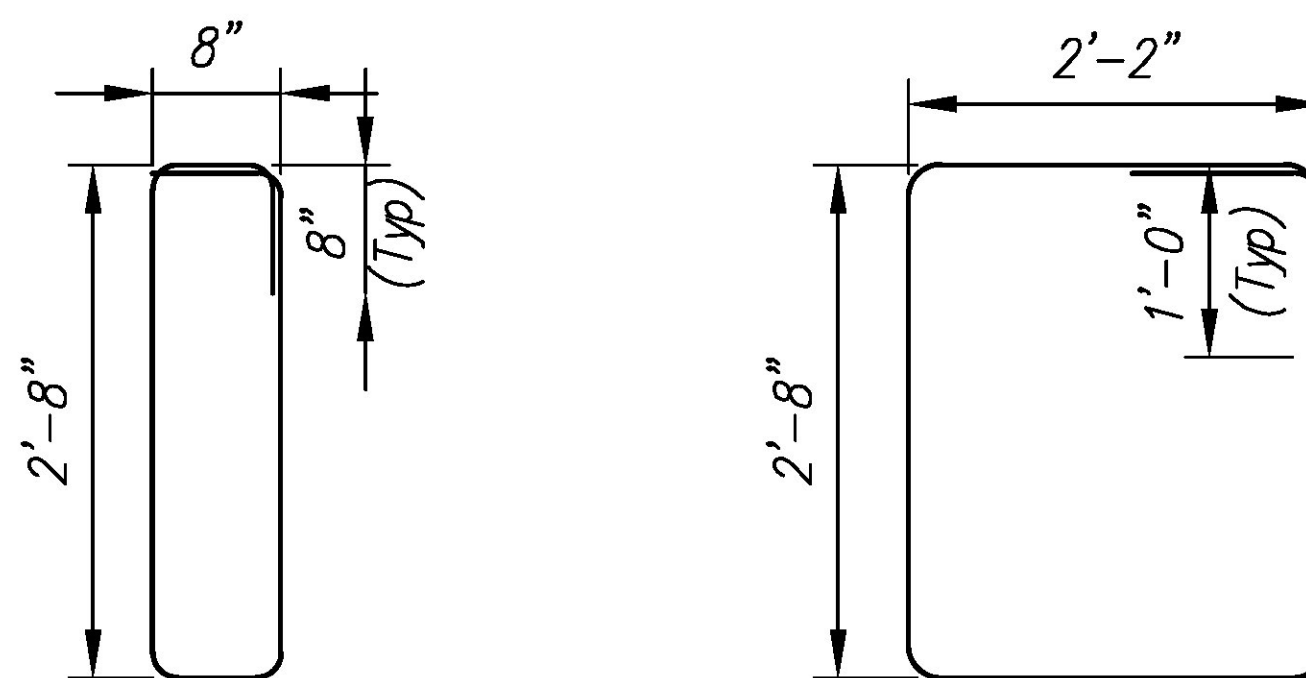
REINFORCING DETAIL - PLAN VIEW  
Scale: N.T.S.

Vermont Agency of Transportation

**RECEIVED**  
ON: April 30, 2015  
and Checked for  
**CONFORMANCE**  
BY: Mark Sargent DATE: 5/7/2015

F1A FOOTING - BILL OF MATERIALS / EMBEDS				
CSI ID#	DESCRIPTION	QTY	UM	COMMENTS
EM-00115	UTILITY ANCHOR #8UA671-GALVANIZED	2	EA	
RM-00013	REBAR #4 BLACK- GR 60	63	LB	
RM-00017	REBAR #6 BLACK-GR 60 40'	186	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING	4.57	CY	

F1A Rebar Schedule			
MK		QTY	LENGTH
401	#4	6	8' - 0"
402	#4	4	11' - 8"
601	#6	4	11' - 6"
602	#6	6	13' - 0" MAX

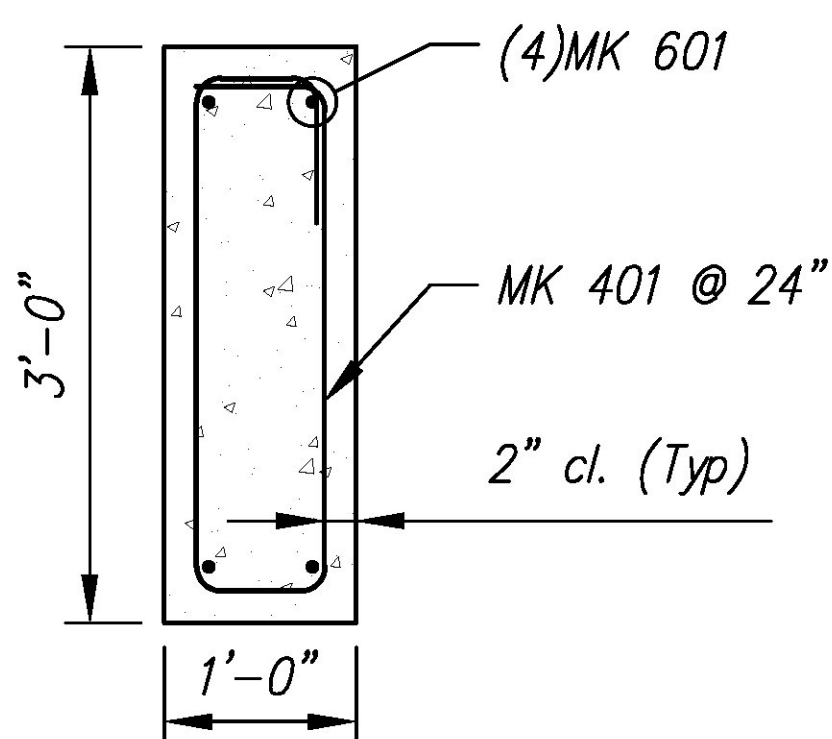


MK 401  
#4 bar  
MK 402  
#4 bar

BENDING SCHEDULE  
Scale: N.T.S.

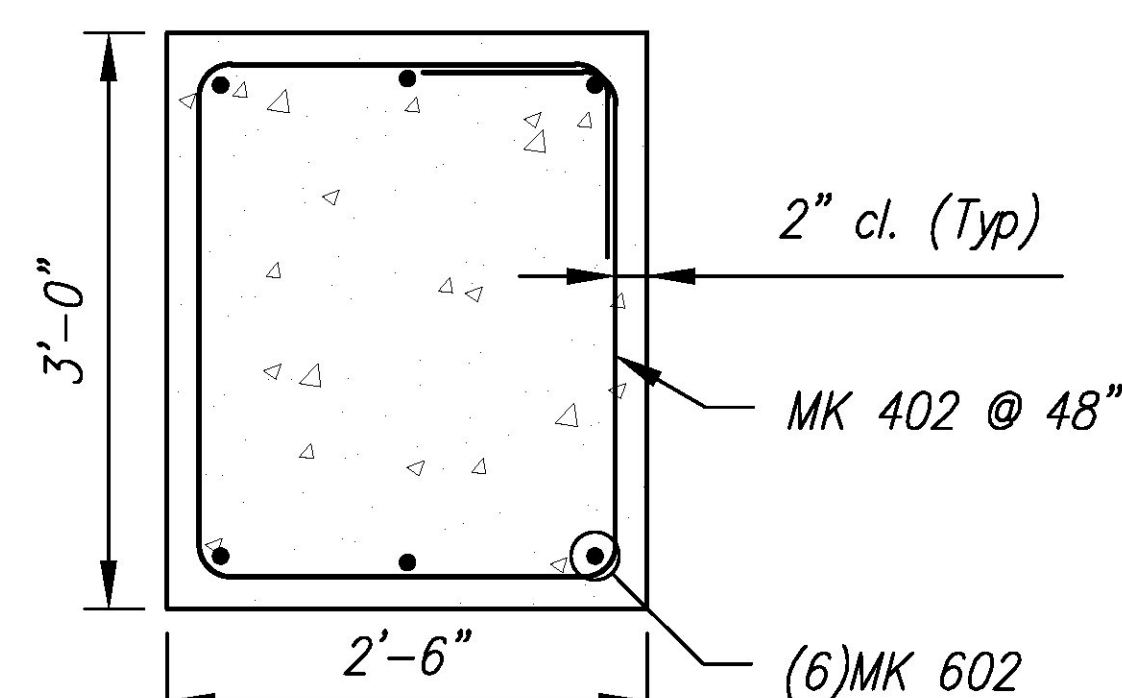
Cover to reinforcing: 2" u.n.o.

REVIEWED	X	 Stantec
REVIEWED AS MODIFIED		
REVISE AND RESUBMIT		
NOT REVIEWED		
Date: 4/24/2015		
By: Nathan Tirk		
This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omission in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.		



SECTION A-A

REINFORCING DETAIL  
Scale: N.T.S.



SECTION B-B

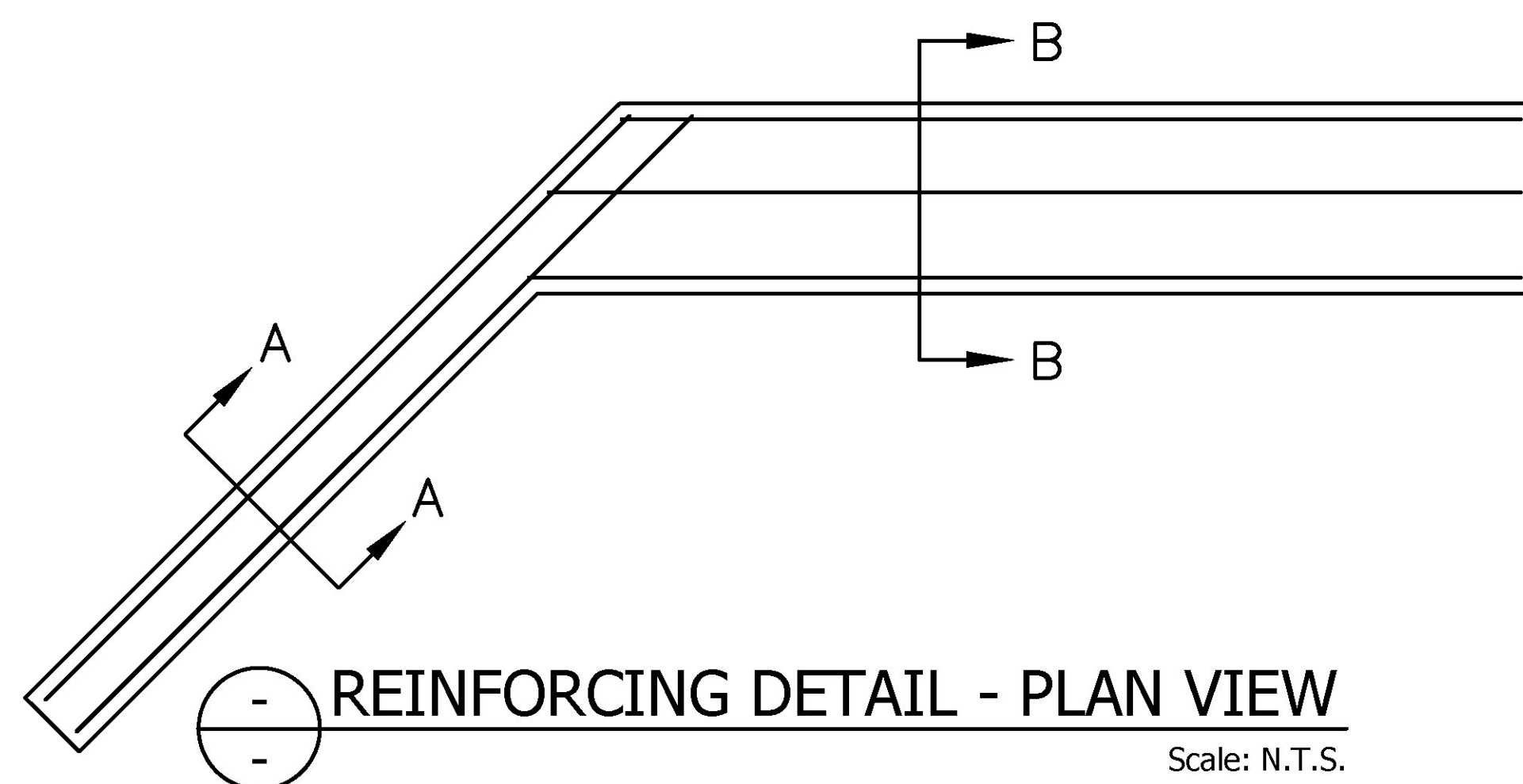
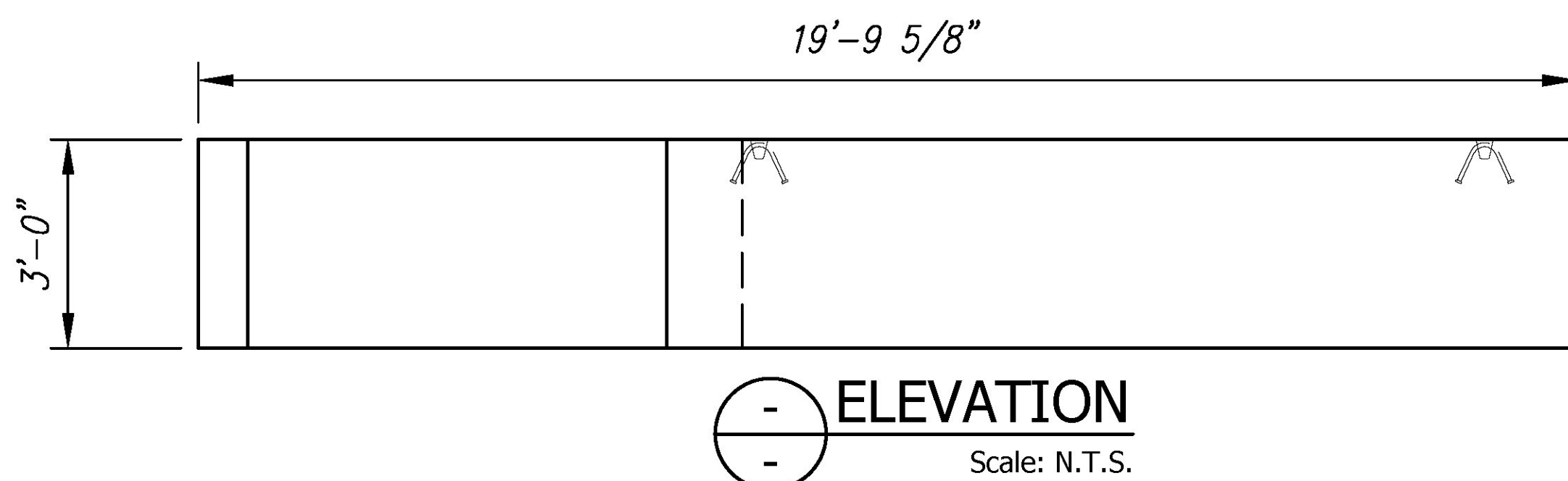
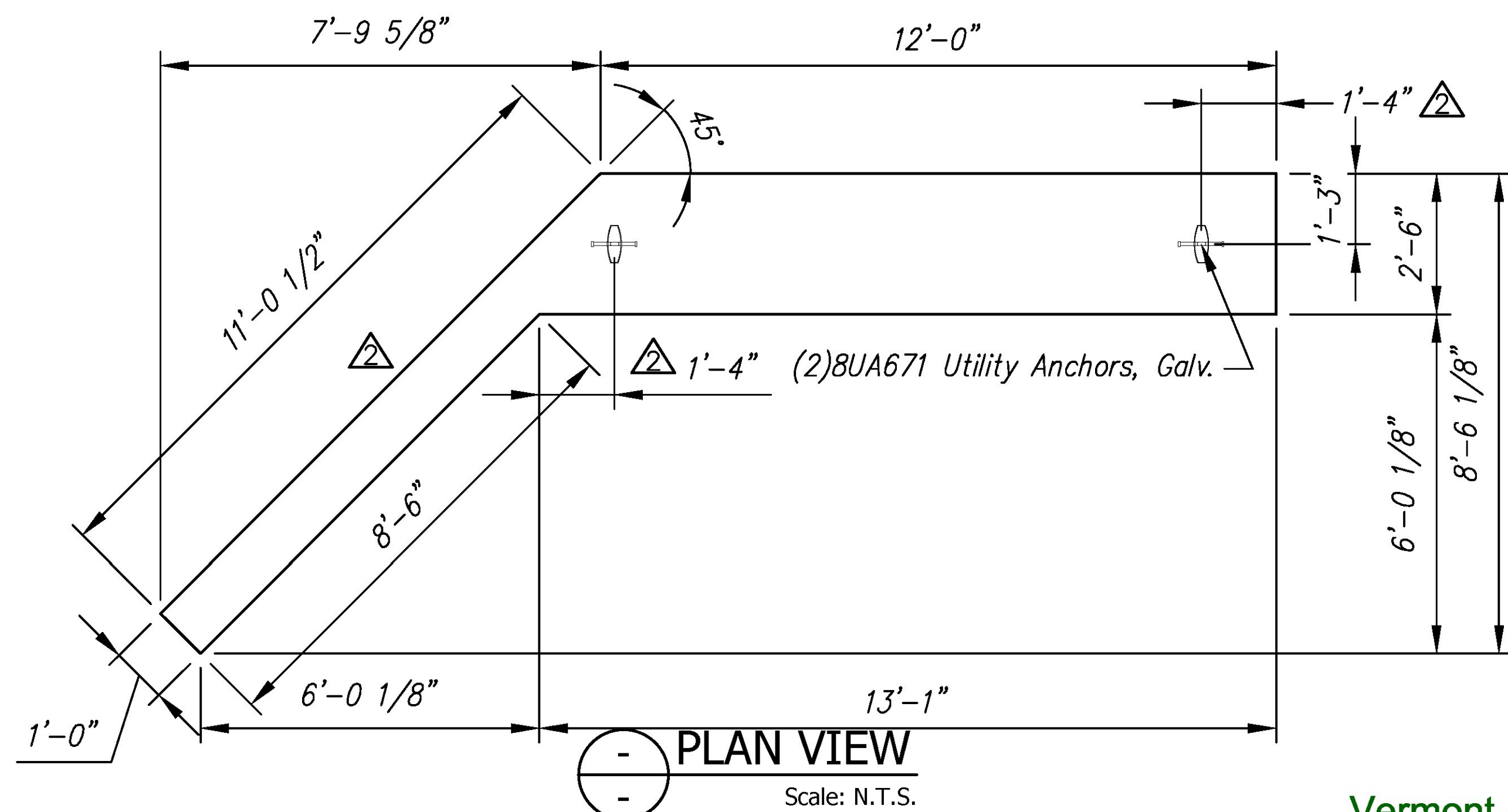
5			
4			
3			
2	28APR2015	REVISED UTILITY ANCHOR LOCATIONS	RY
1	01APR2015	DIMENSIONAL CHANGES DUE TO 12" THK WW	RY
Rev.	Date	DESCRIPTION	By
REVISIONS			

**Concrete Systems Inc.**  
9 Commercial St., Hudson, NH, 03051  
Phone 603-889-4163  
Fax 603-889-2417

STATE AGENCY	
Drawn By R. YEAGER	Date 12MAR2015
Concrete Cu. Yd. 4.57	Weight in Tons 9.25
Approved By	Date

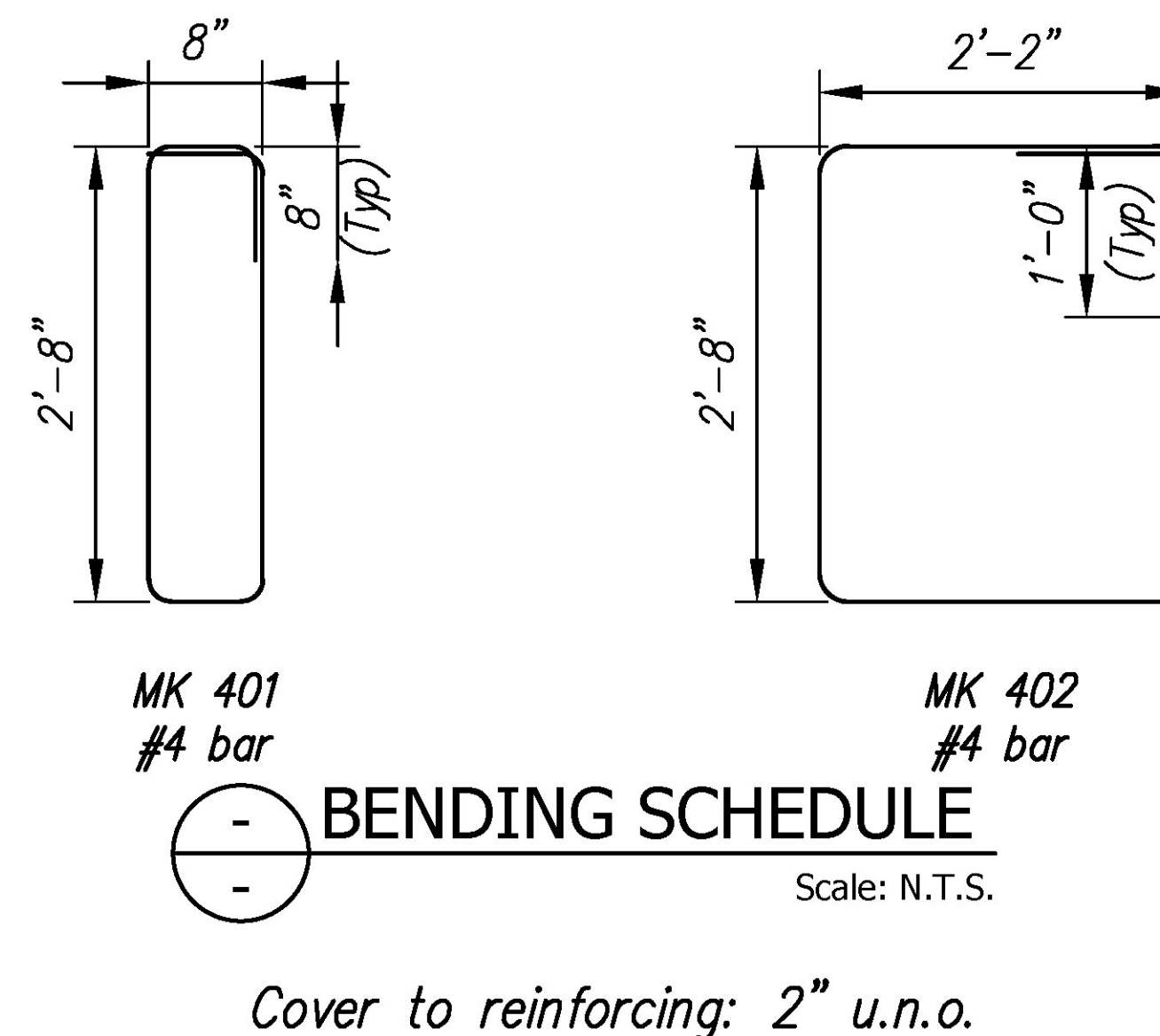
J A MCDONALD, INC. VT/AOT BRIDGE - STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT		
B	SHOP DRAWING - F1A	REV 2
	Drawing No. C22283-L01-F1A	
Quantity: 1	Project No: STPCULV30	SHEET 10 OF 13



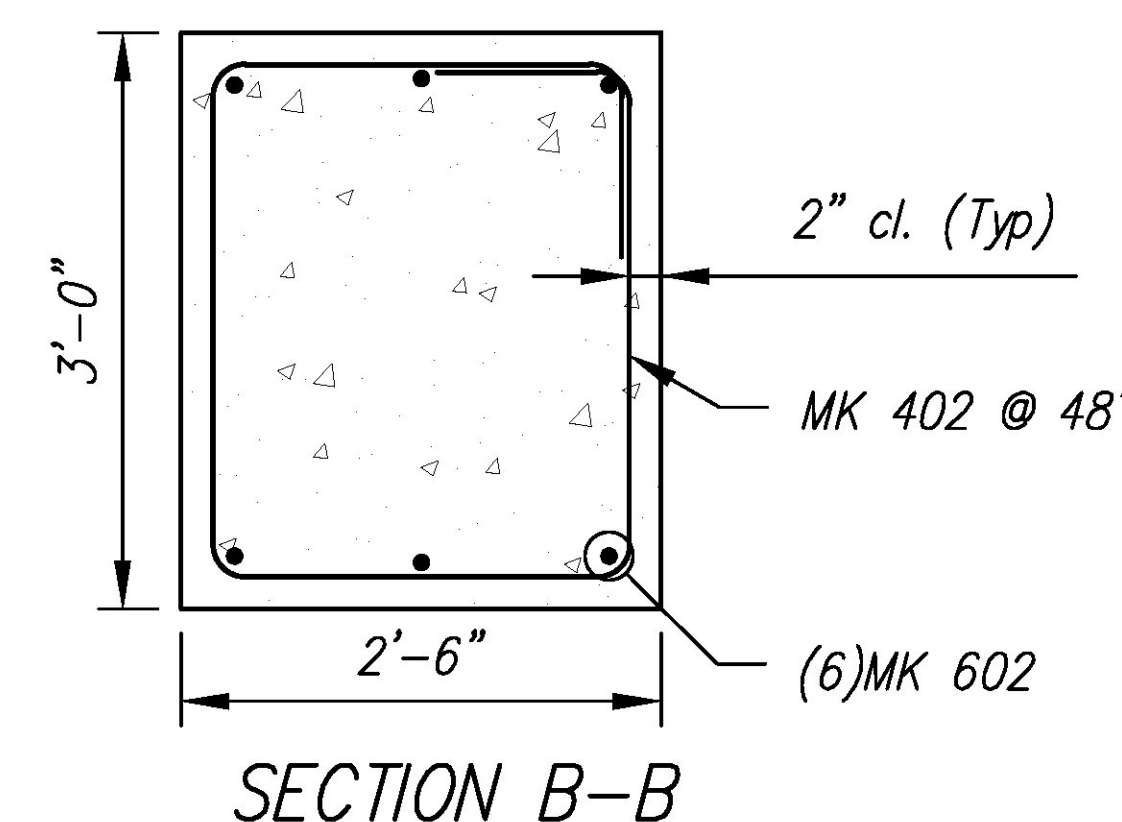
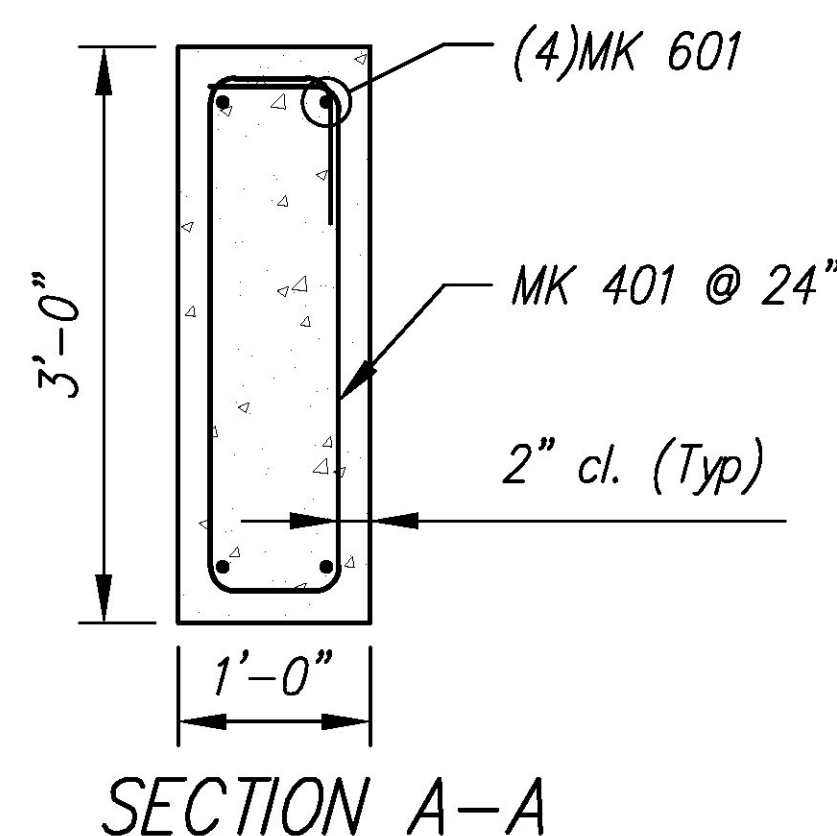


F2A FOOTING - BILL OF MATERIALS / EMBEDS				
CSI ID#	DESCRIPTION	QTY	UM	COMMENTS
EM-00115	UTILITY ANCHOR #8UA671-GALVANIZED	2	EA	
RM-00013	REBAR #4 BLACK- GR 60	63	LB	
RM-00017	REBAR #6 BLACK-GR 60 40'	186	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING	4.57	CY	

F2A Rebar Schedule			
MK	QTY	LENGTH	
401 #4	6	8 ' - 0 "	
402 #4	4	11 ' - 8 "	
601 #6	4	11 ' - 6 "	
602 #6	6	13 ' - 0 "	MAX

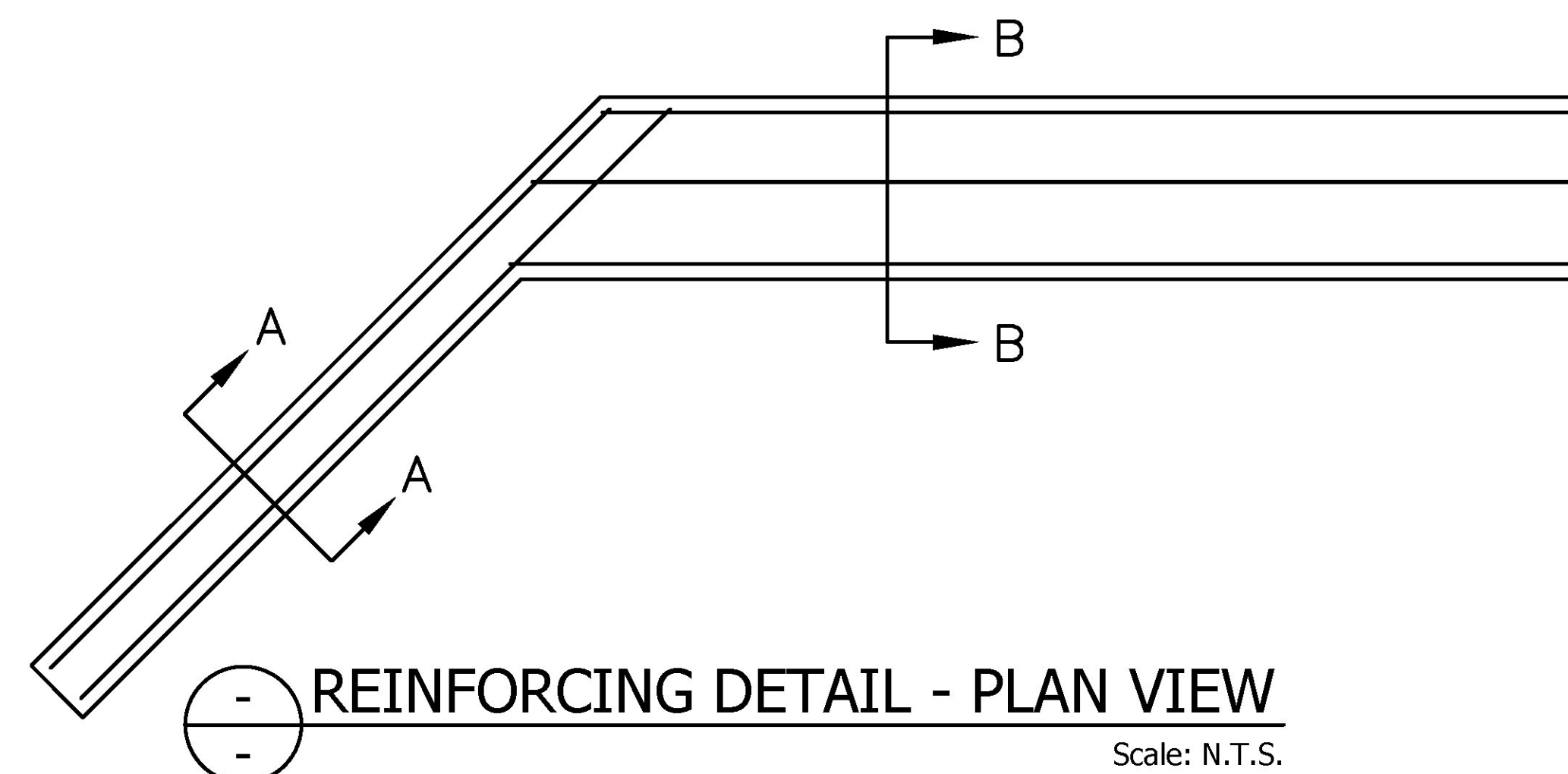
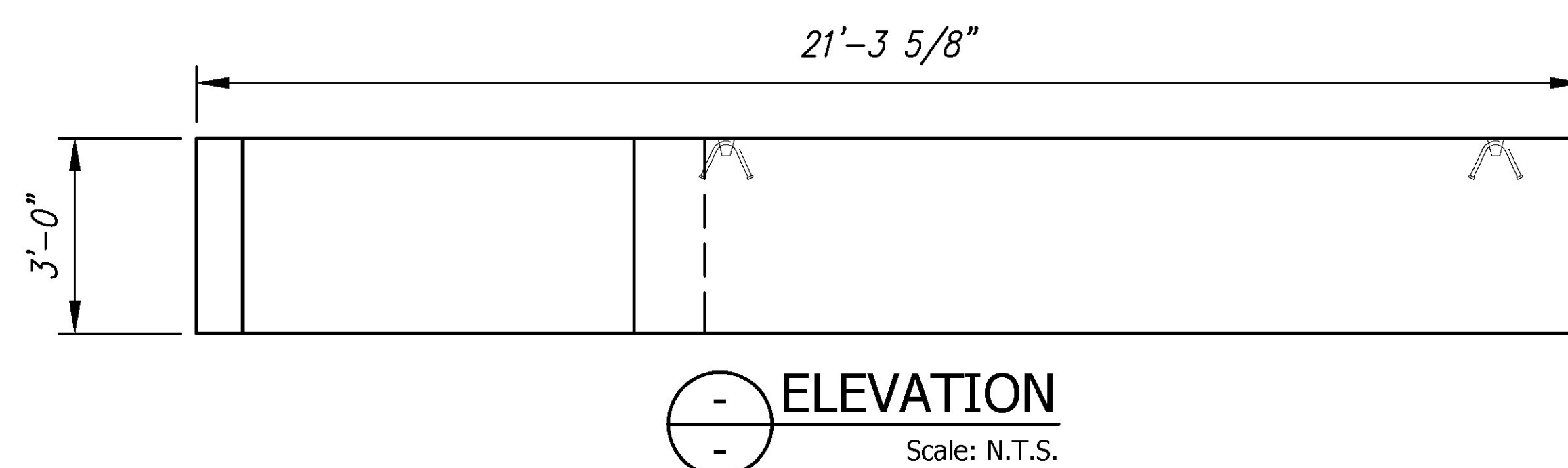


REVIEWED	X	 Stantec
REVIEWED AS MODIFIED		
REVISE AND RESUBMIT		
NOT REVIEWED		
Date: 4/24/2015		
By: Nathan Tirk		
This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.		

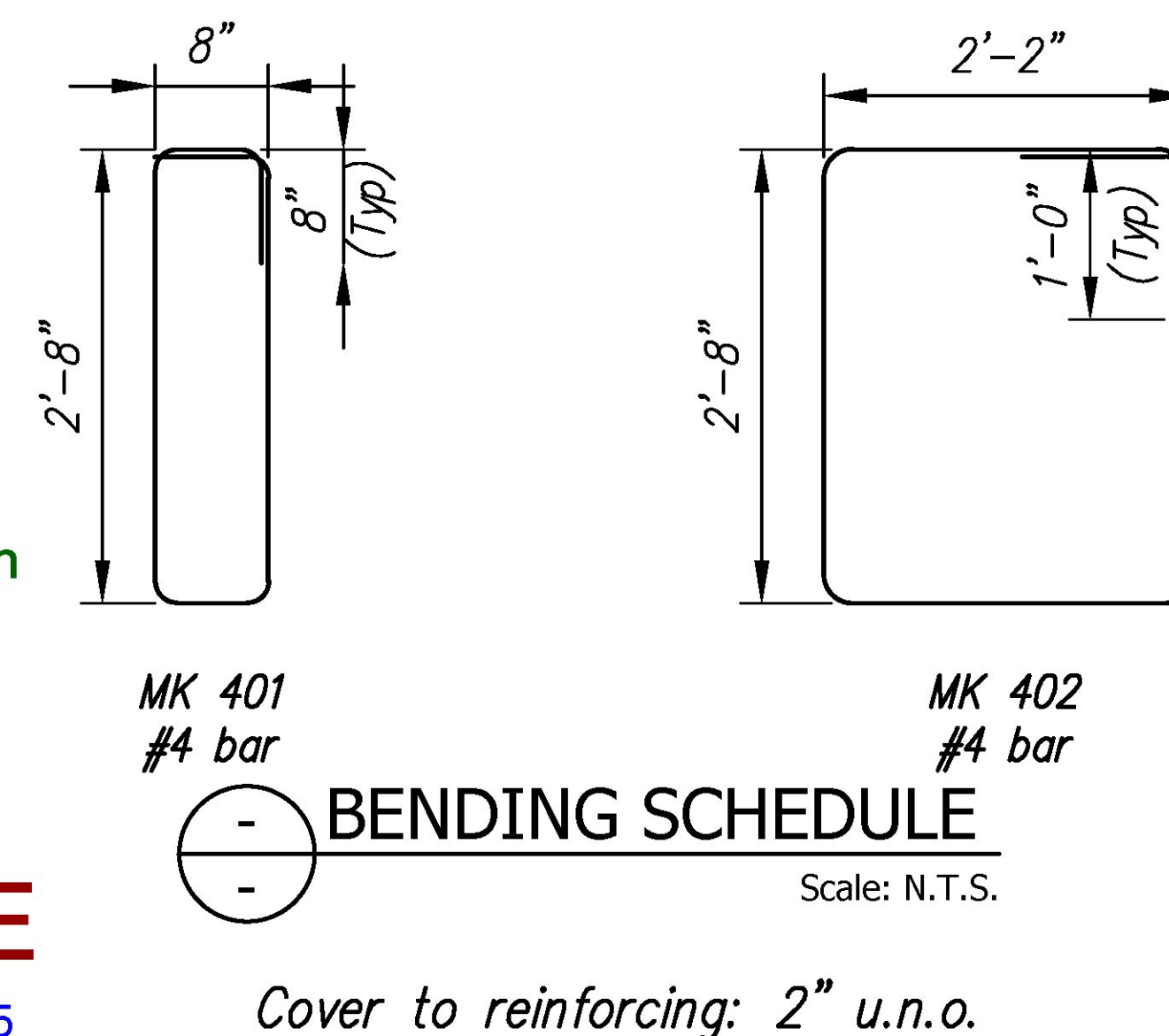


5				 <b>Concrete Systems Inc.</b> 9 Commercial St., Hudson, NH,03051 Phone 603-889-4163 Fax 603-889-2417	<u>STATE AGENCY</u> 		J A MCDONALD, INC. VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT			
4					Drawn By R. YEAGER	Date 12MAR2015	B	SHOP DRAWING – F2A		REV 2
3					Concrete Cu. Yd. 4.57	Weight in Tons 9.25		Drawing No. C22283–L01–F2A		
2	28APR2015	REVISED UTILITY ANCHOR LOCATIONS	RY		Approved By	Date	Quantity: 1		Project No: STPCULV30	SHEET 11 OF 13
1	01APR2015	DIMENSIONAL CHANGES DUE TO 12" THK WW	RY							
Rev.	Date	DESCRIPTION	By							
REVISIONS										





F3A Rebar Schedule			
MK		QTY	LENGTH
401	#4	6	8' - 0"
402	#4	4	11' - 7"
601	#6	4	11' - 6"
602	#6	6	14' - 7"

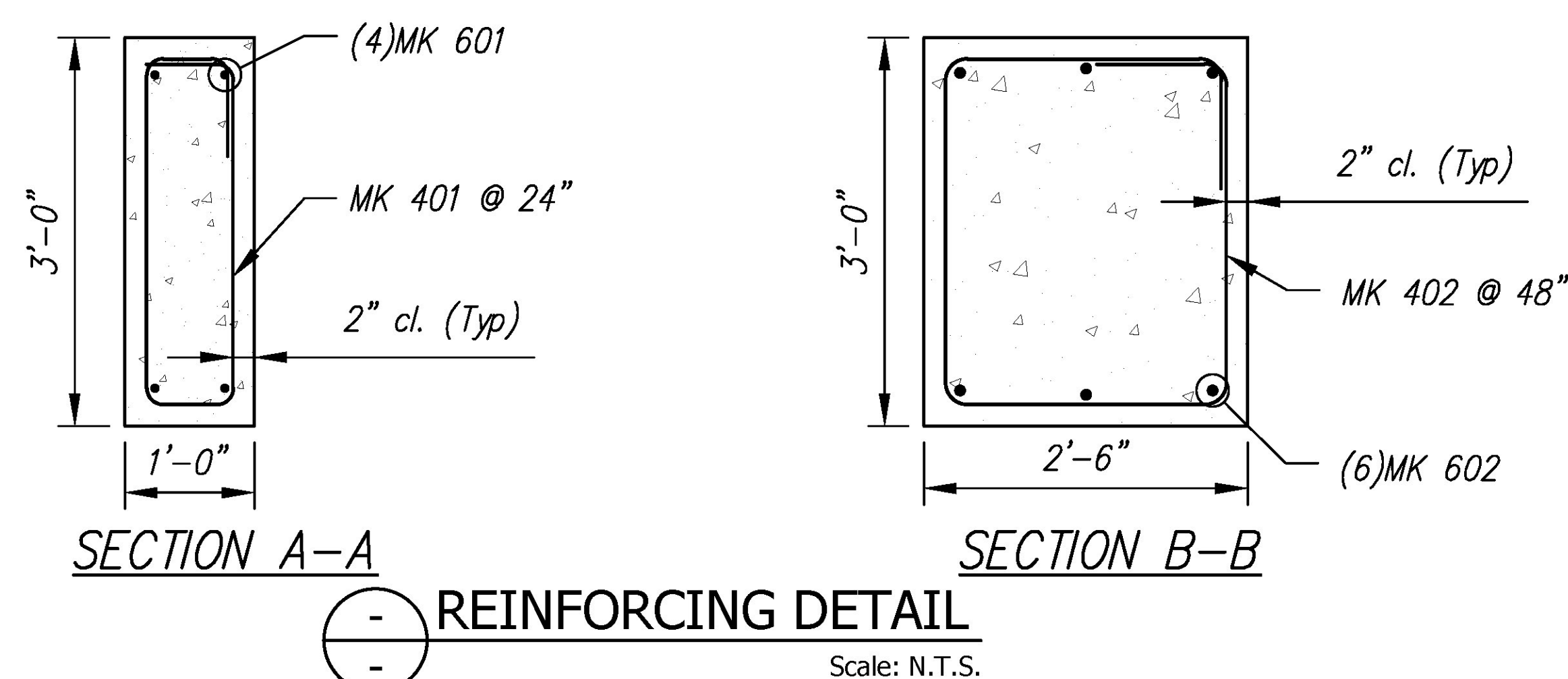


REVIEWED	X	 <b>Stantec</b>
REVIEWED AS MODIFIED		
REVISE AND RESUBMIT		
NOT REVIEWED		

Date: 4/24/2015

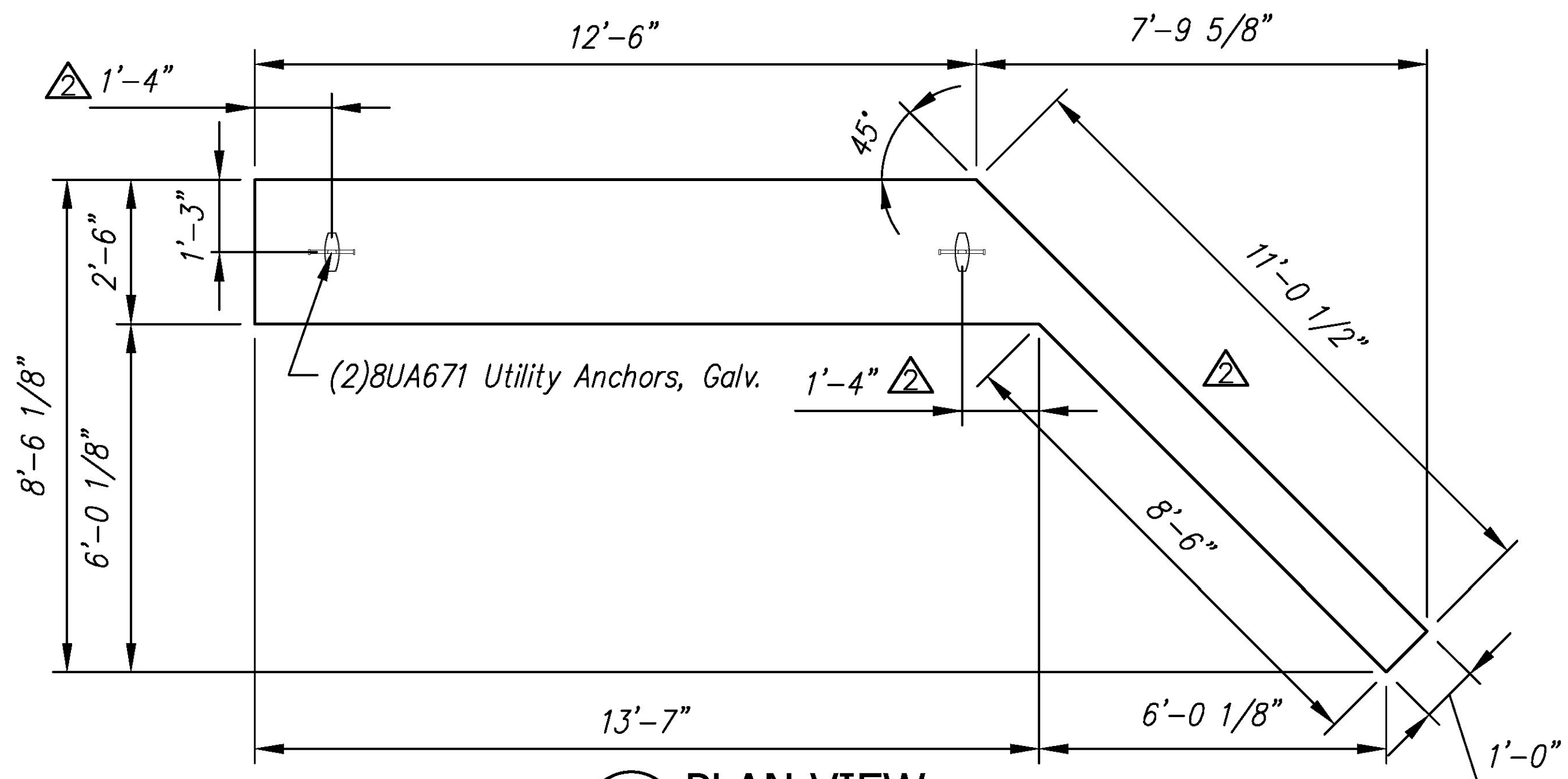
By: Nathan Tirk

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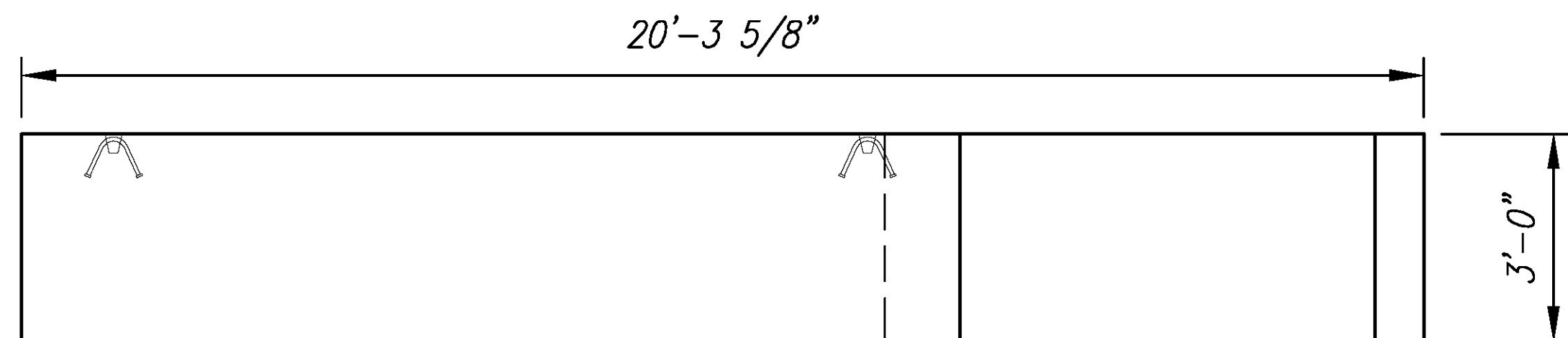


5				 <b>Concrete Systems Inc.</b> 9 Commercial St., Hudson, NH, 03051 Phone 603-889-4163 Fax 603-889-2417	STATE AGENCY  		J A MCDONALD, INC. VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT			
4					Drawn By R. YEAGER	Date 12MAR2015	B	SHOP DRAWING – F3A		REV
3					Concrete Cu. Yd. 4.99	Weight in Tons 10.10		Drawing No. C22283-L01-F3A		2
2	28APR2015	REVISED UTILITY ANCHOR LOCATIONS	RY							
1	01APR2015	DIMENSIONAL CHANGES DUE TO 12" THK WW	RY							
Rev.	Date	DESCRIPTION	By							
REVISIONS										

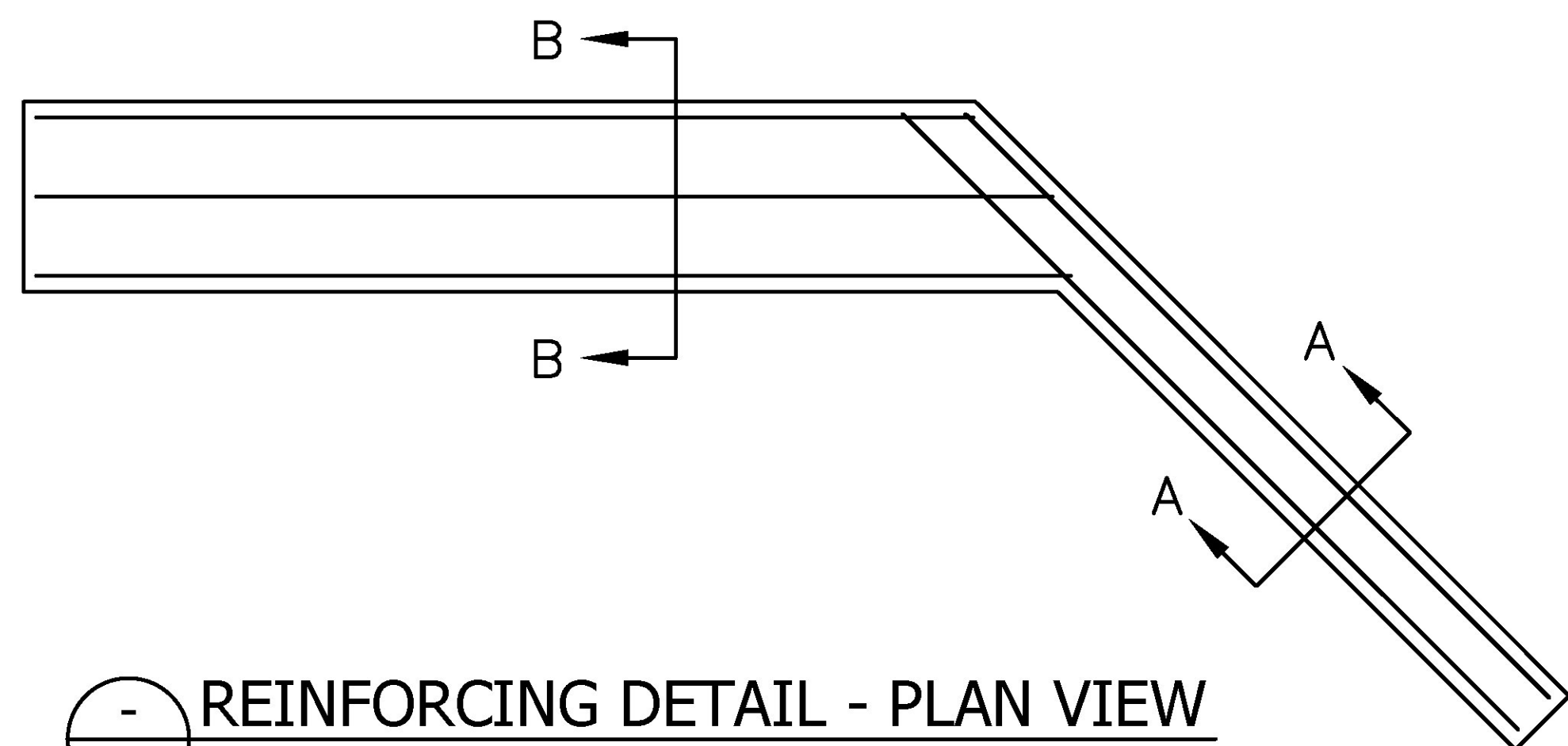




PLAN VIEW  
Scale: N.T.S.



ELEVATION  
Scale: N.T.S.

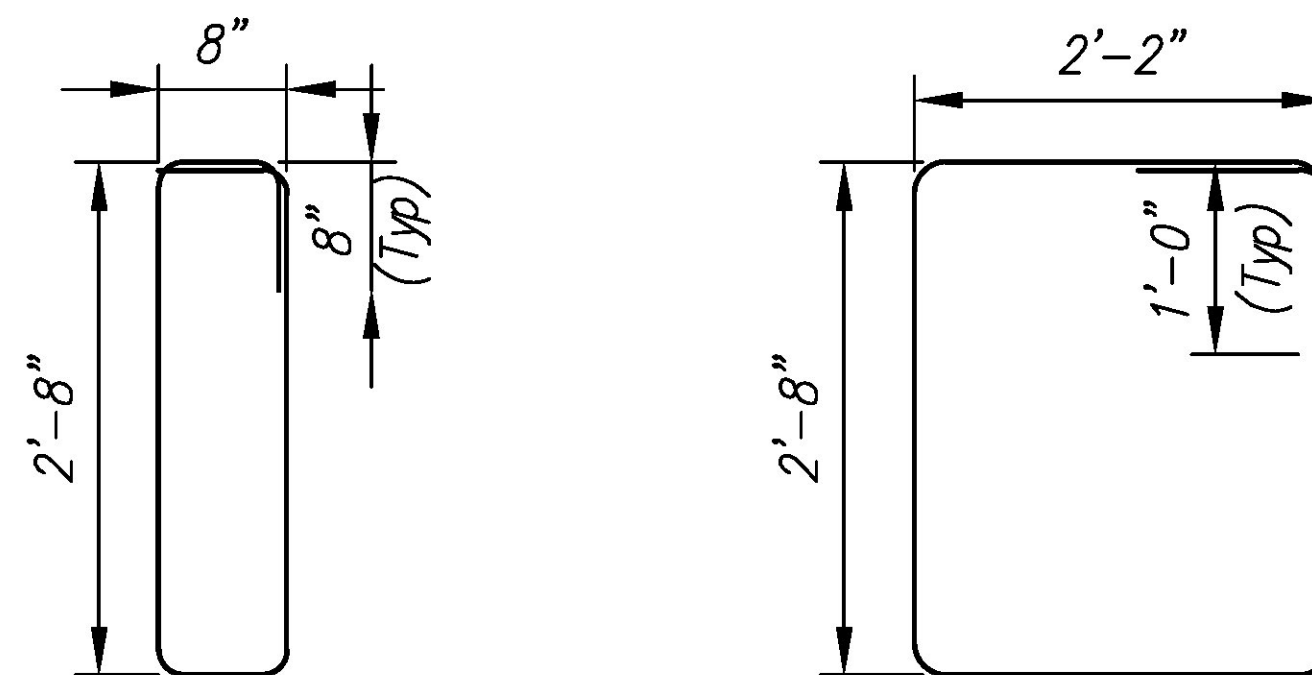


REINFORCING DETAIL - PLAN VIEW  
Scale: N.T.S.

Vermont Agency of Transportation  
**RECEIVED**  
ON: April 30, 2015  
and Checked for  
**CONFORMANCE**  
BY: Mark Sargent DATE: 5/7/2015

F4A FOOTING - BILL OF MATERIALS / EMBEDS				
CSI ID#	DESCRIPTION	QTY	UM	COMMENTS
EM-00115	UTILITY ANCHOR #8UA671-GALVANIZED	2	EA	
RM-00013	REBAR #4 BLACK- GR 60	63	LB	
RM-00017	REBAR #6 BLACK-GR 60 40'	192	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING	4.71	CY	

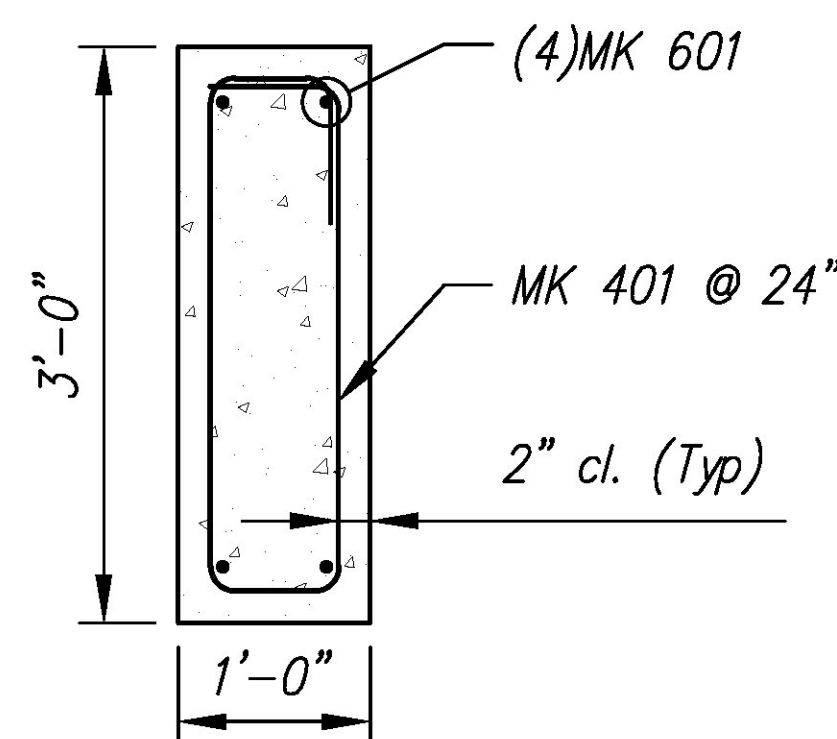
F4A Rebar Schedule			
MK	QTY	LENGTH	
401 #4	6	8' - 0"	
402 #4	4	11' - 7"	
601 #6	4	11' - 6"	
602 #6	6	13' - 7"	MAX



MK 401 #4 bar  
MK 402 #4 bar

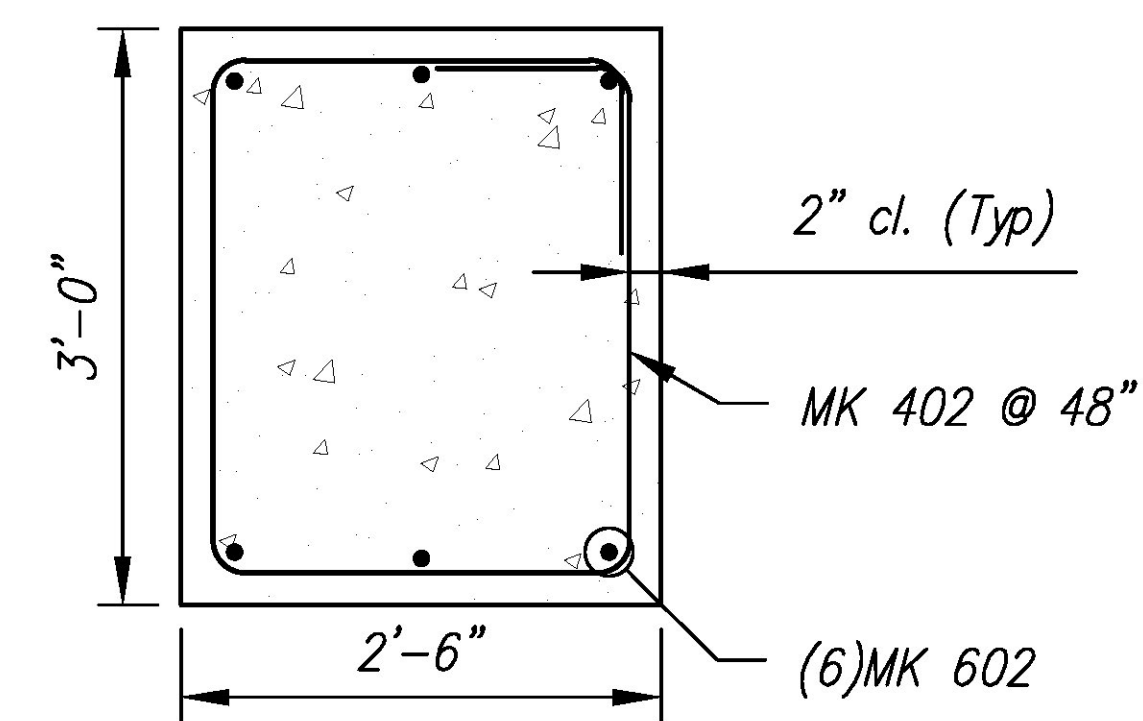
BENDING SCHEDULE  
Scale: N.T.S.

Cover to reinforcing: 2" u.n.o.



SECTION A-A

REINFORCING DETAIL  
Scale: N.T.S.



SECTION B-B

REVIEWED		 <b>Stantec</b>
REVIEWED AS MODIFIED		
REVISE AND RESUBMIT		
NOT REVIEWED		
Date: 4/24/2015		
By: Nathan Tirk		
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5			
4			
3			
2	28APR2015	REVISED UTILITY ANCHOR LOCATIONS	RY
1	01APR2015	DIMENSIONAL CHANGES DUE TO 12" THK WW	RY
Rev.	Date	DESCRIPTION	By
REVISIONS			

**Concrete Systems Inc.**  
9 Commercial St., Hudson, NH, 03051  
Phone 603-889-4163  
Fax 603-889-2417

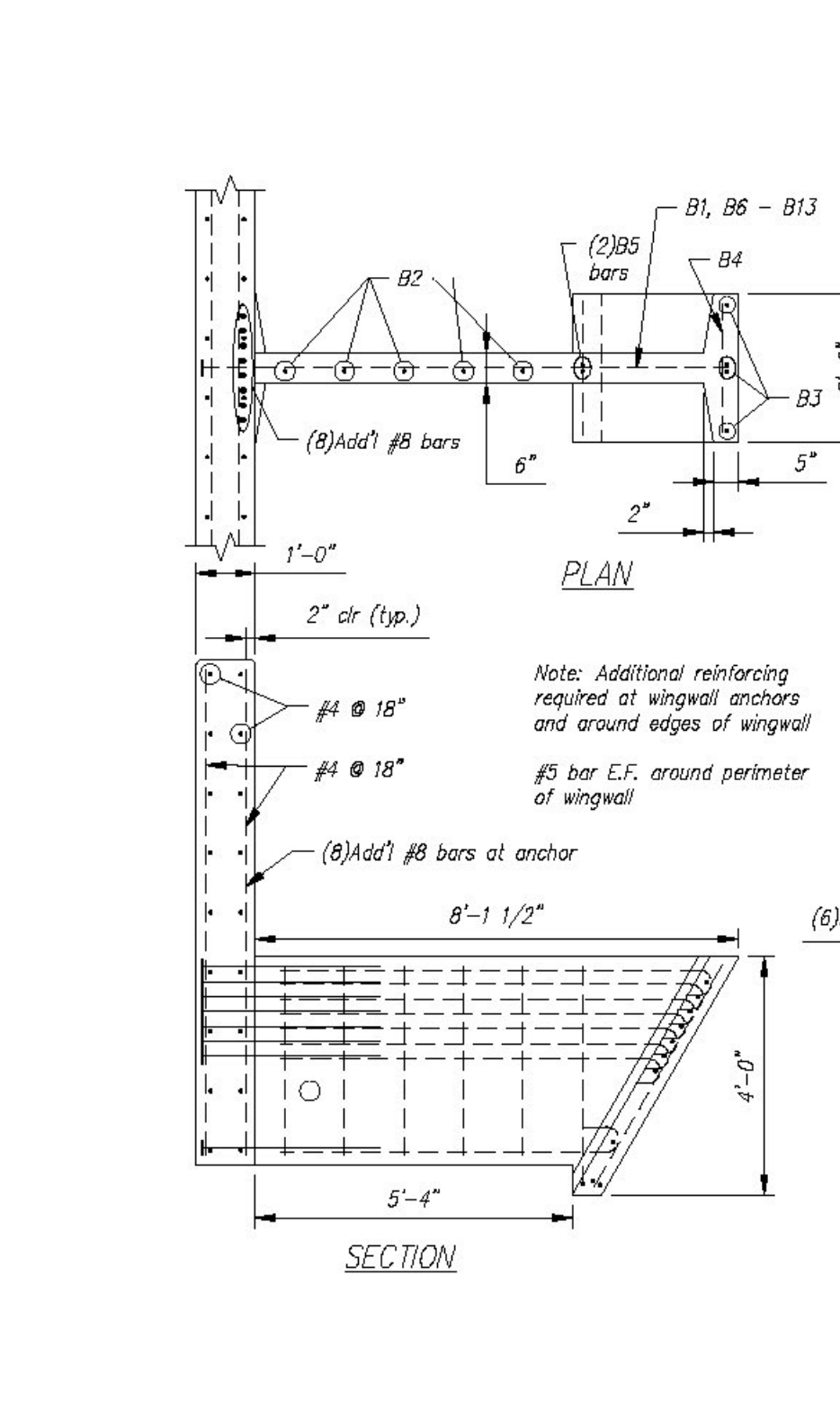
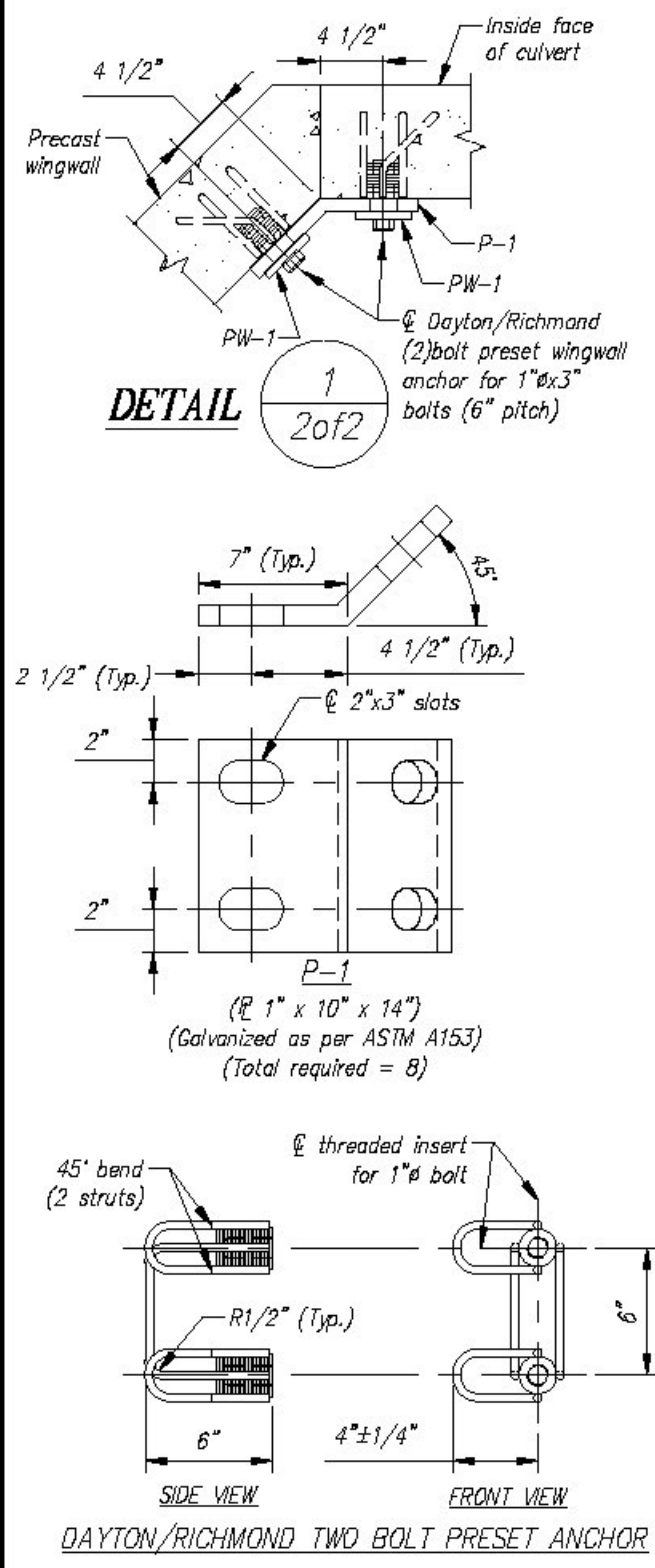
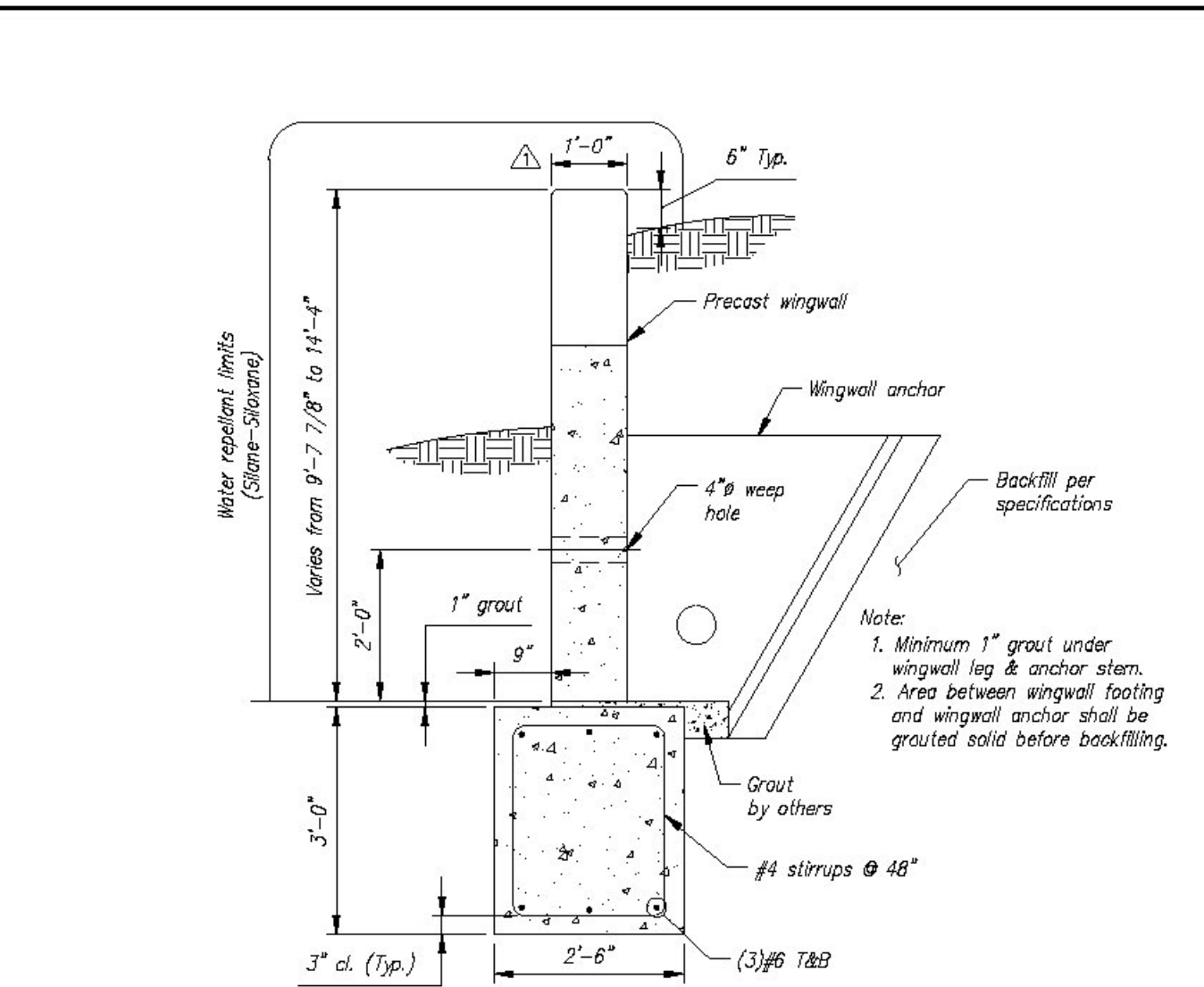
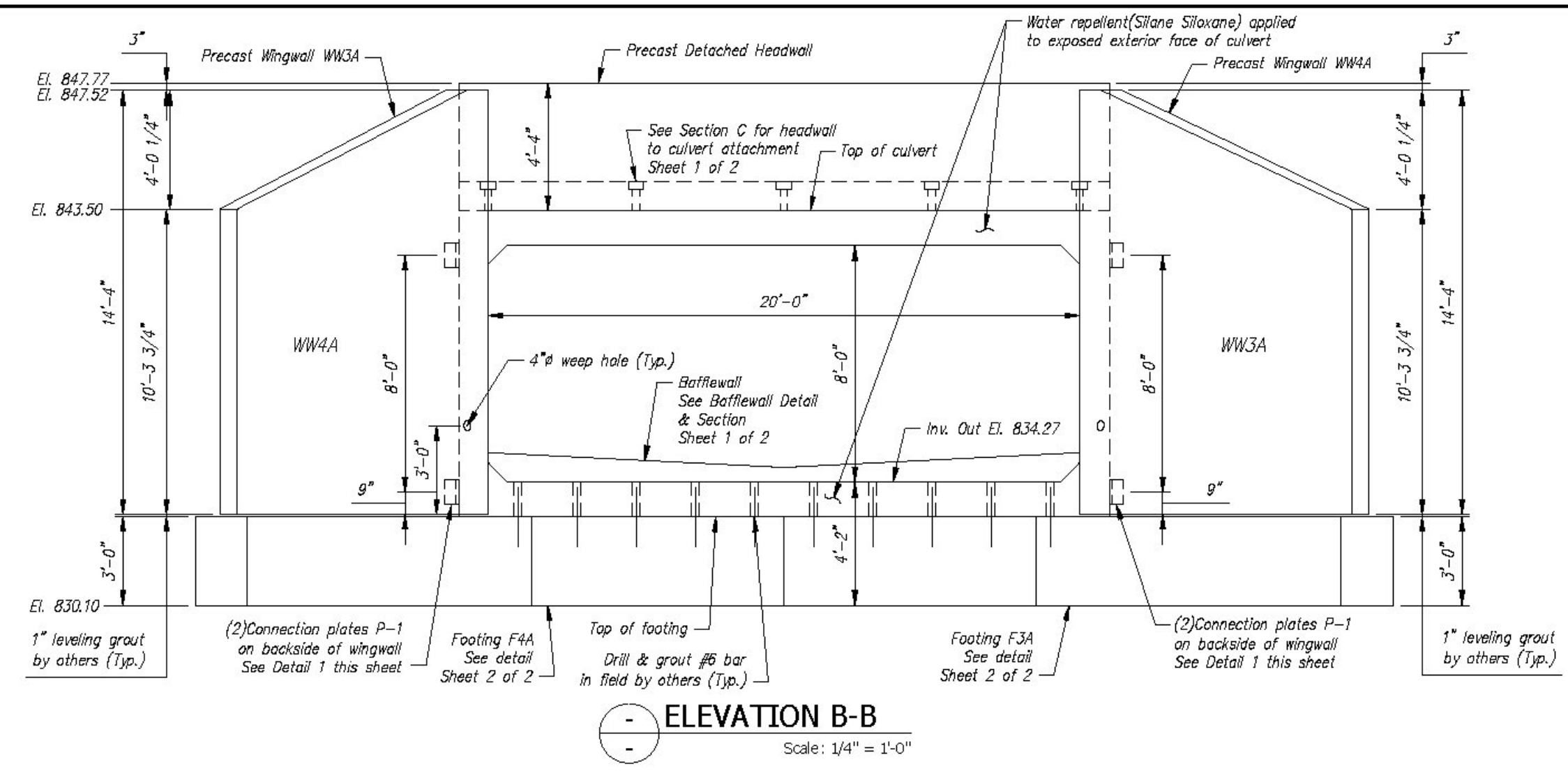
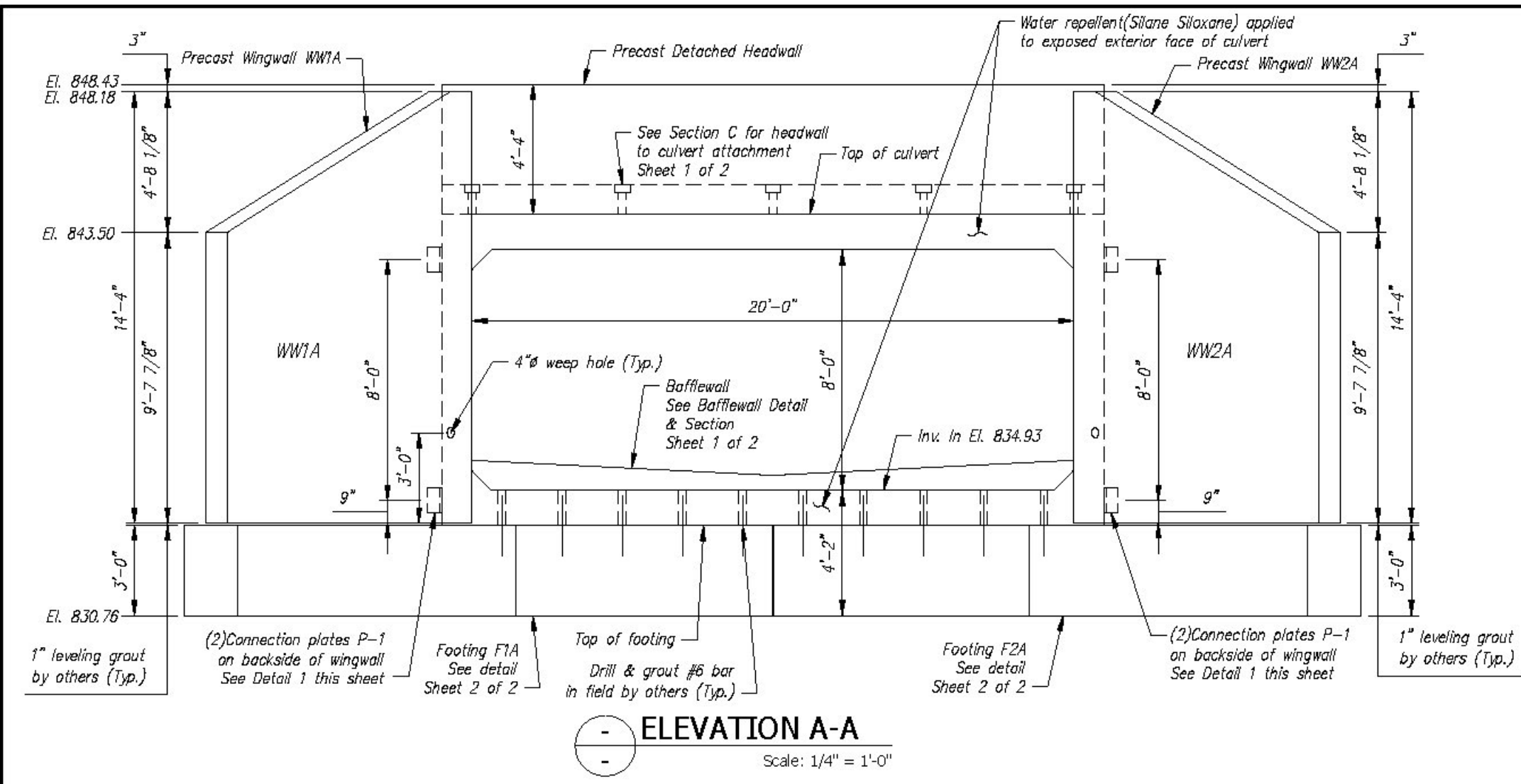
STATE AGENCY	
Drawn By R. YEAGER	Date 12MAR2015
Concrete Cu. Yd. 4.71	Weight in Tons 9.54
Approved By	Date

J A MCDONALD, INC.			
VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #6, VT ROUTE 58, IRASBURG, VT			
B	SHOP DRAWING – F4A		REV 2
	Drawing No. C22283–L01–F4A		
Quantity: 1		Project No: STPCULV30	SHEET 13 OF 13

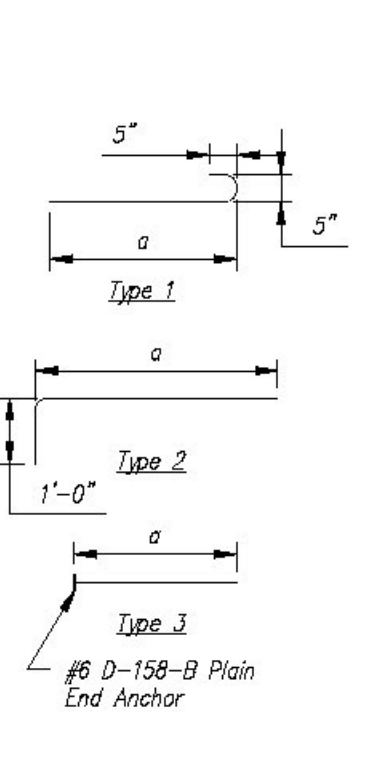




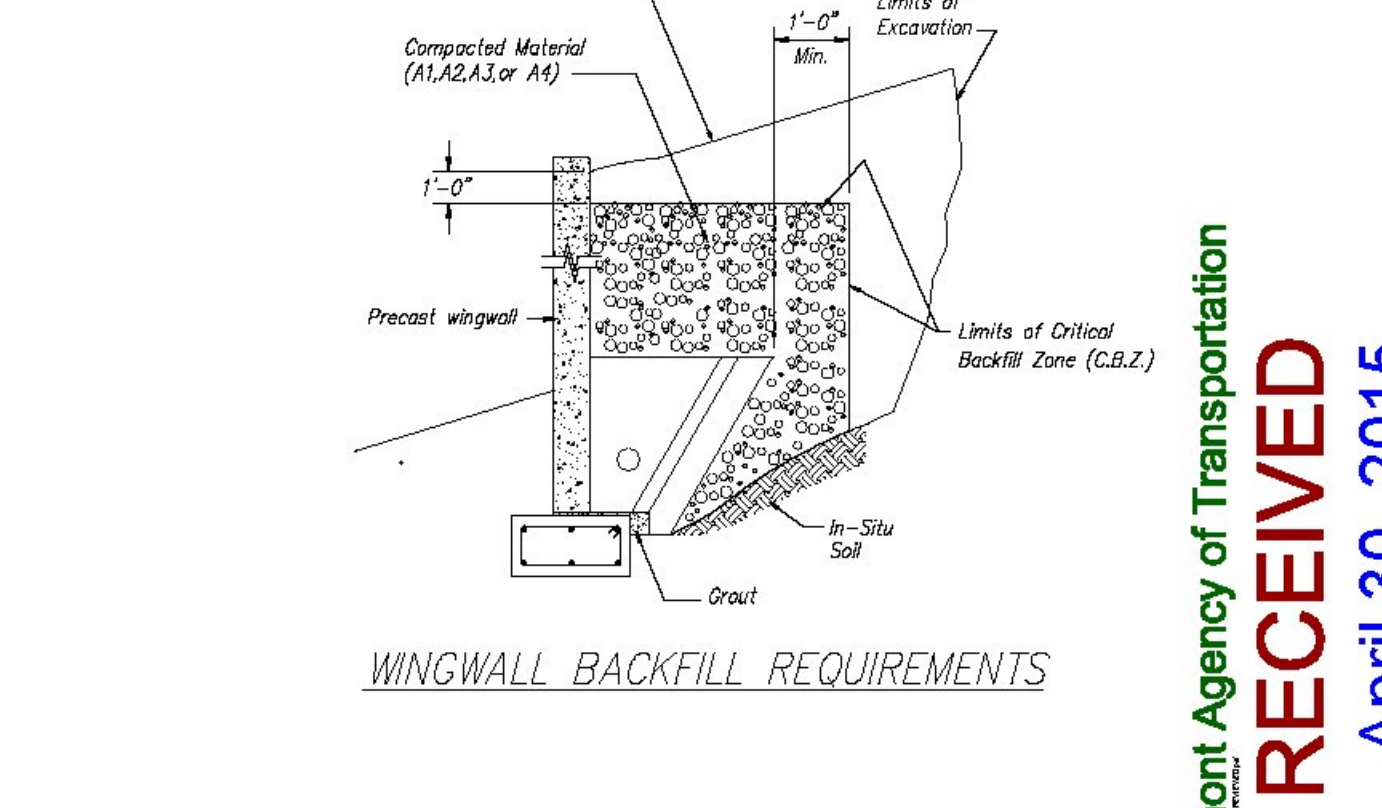




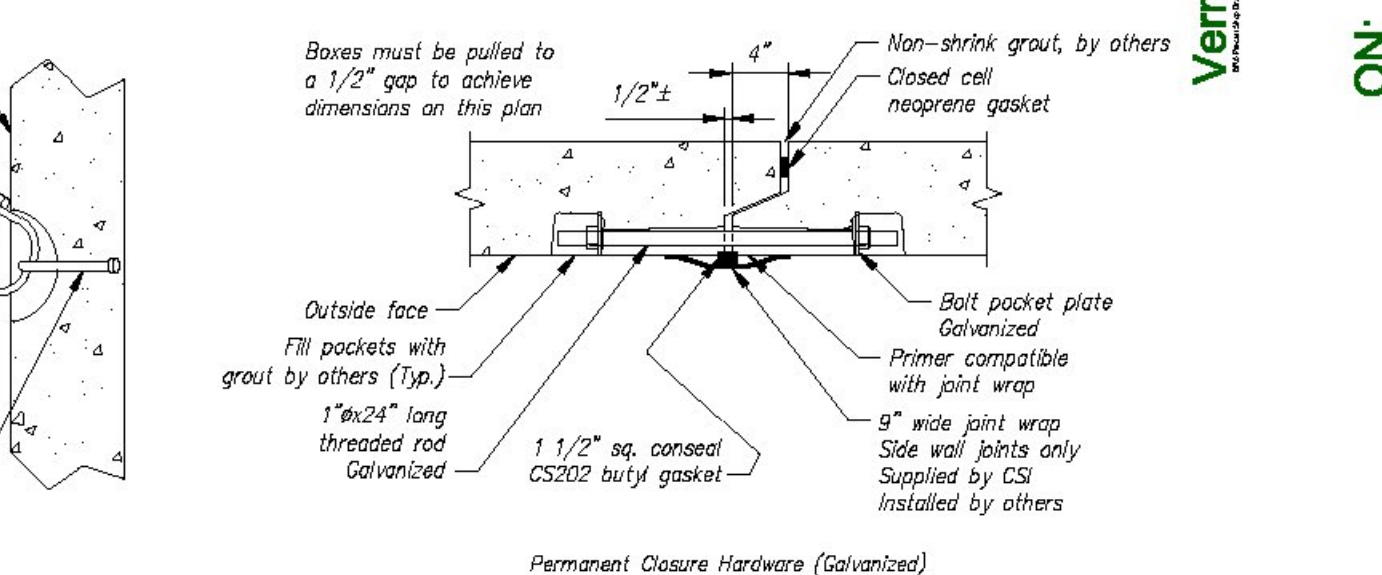
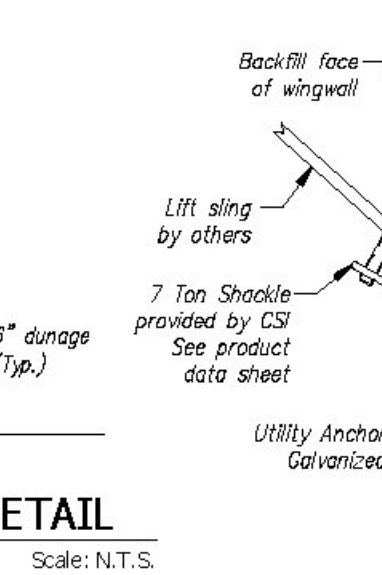
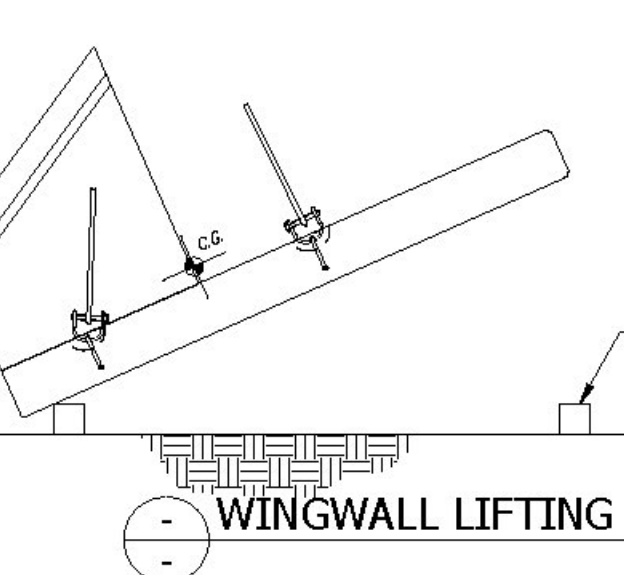
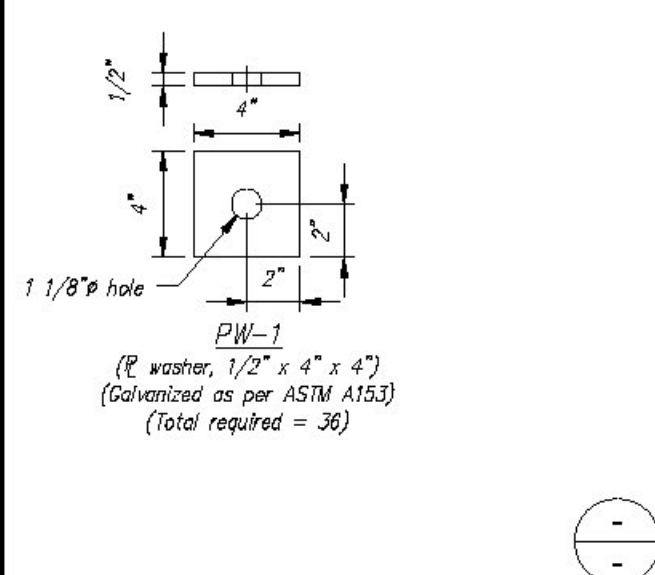
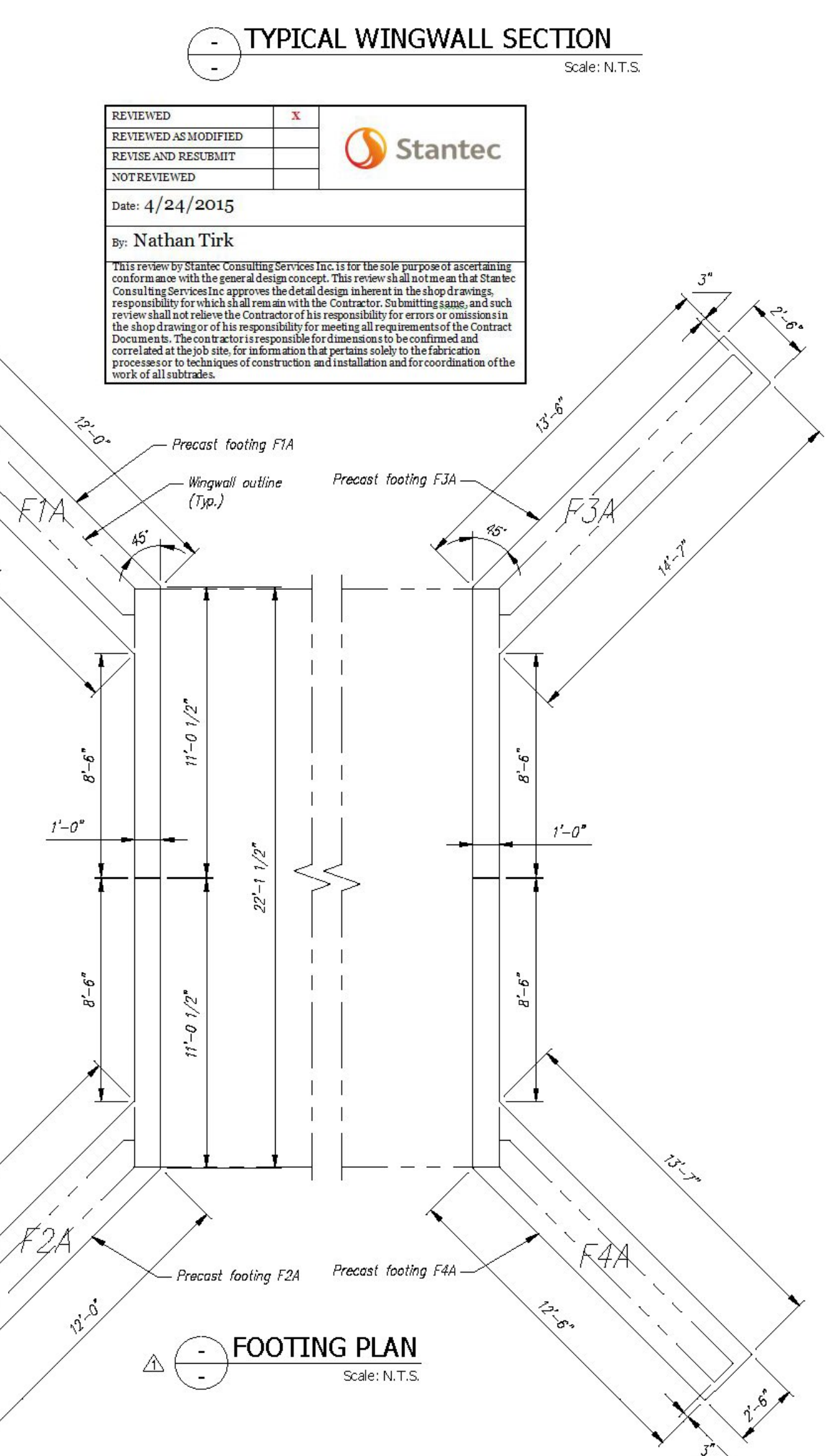
BAR LIST						
MARK	QTY.	SIZE	a	TYPE	LENGTH	
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B2	4	#5	—	Str.	3'-2"	
B3	4	#5	—	Str.	4'-3"	
B4	11	#5	—	Str.	2'-2"	
B5	2	#5	3'-8"	2	—	
B6	1	#5	6'-2"	1	—	
B7	1	#5	6'-9"	1	—	
B8	1	#5	6'-11"	1	—	
B9	1	#5	7'-1"	1	—	
B10	1	#5	7'-3"	1	—	
B11	1	#5	7'-5"	1	—	
B12	1	#5	7'-6"	1	—	
B13	1	#5	7'-8"	1	—	



BACKFILL DESCRIPTION						
Group Classification	A-1-a	A-1-b	A-2	A-2-4	A-2-5	A-2-6
Sieve Analysis, Percent Passing						
No. 10	50 max.	—	51 min.	—	—	—
No. 40	30 max.	50 max.	10 max.	35 max.	35 max.	35 max.
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.
Characteristics of Fraction Passing						
No. 40	—	—	40 max.	41 min.	40 max.	41 min.
Liquid Limit	—	—	—	10 max.	11 min.	11 min.
Plasticity Index	6 max.	N.P.	—	—	—	—
Usual Types of Significant Constituent Materials	Stane Fragments, Gravel & Sand	—	Silty or Clayey Gravel and Sand	—	—	—
General Rating as Subgrade	—	—	Excellent to Good	—	—	—



Vermont Agency of Transportation  
**RECEIVED**  
ON: **April 30, 2015**  
**CONFORMANCE**  
BY: Mark Sargent DATE: 5/12/2015



Contractor is to verify that all information shown on drawings has been thoroughly checked, complies with the contract documents and is adequate to meet the field conditions. Some dimensions and details may differ slightly from contract drawings to accommodate the manufacturing or design process. Approval of this drawing indicates that any deviation from the contract documents has been reviewed and found to be acceptable. Production will not commence until receipt of signed, approved shop drawings.

Rev.	Date	DESCRIPTION	By
1	01APR2015	CONSPAN WW ANCHORS WERE TYPE 'D', Wws WERE 10" THK, WW & FTG WEIGHTS UPDATED	RY
REVISIONS			

This drawing is based upon information provided from the following documents and/or sources:  
Engineer: STATE OF VT ADT PROGRAM DEVELOPMENT  
Project No: STPCULV30  
Drawings: VT/AOT PROPOSED IMPROVEMENT BRIDGE PROJECT SHEETS 1 THRU 24 & 32 OF 55  
Specifications: ----  
Other Sources: ----

**CSI**  
Concrete Systems Inc.  
9 Commercial St., Hudson, NH 03051  
Phone 603-889-4168  
Fax 603-889-2417

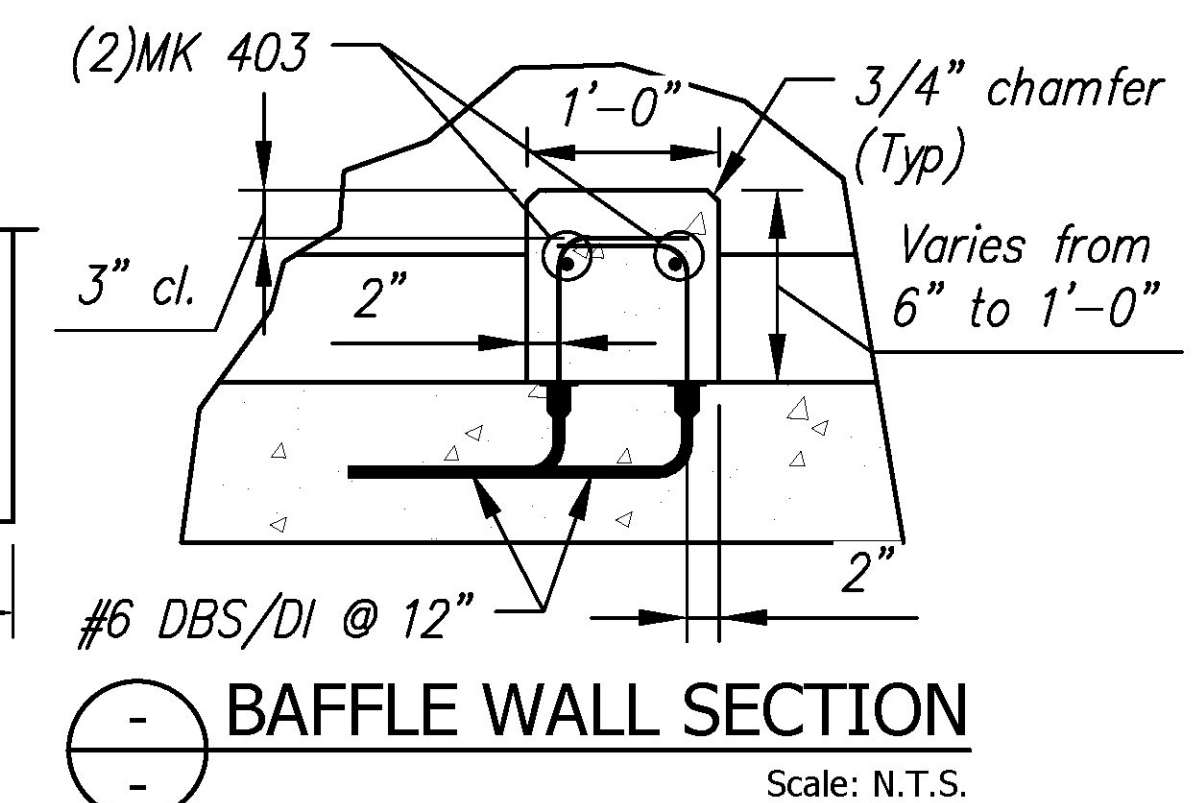
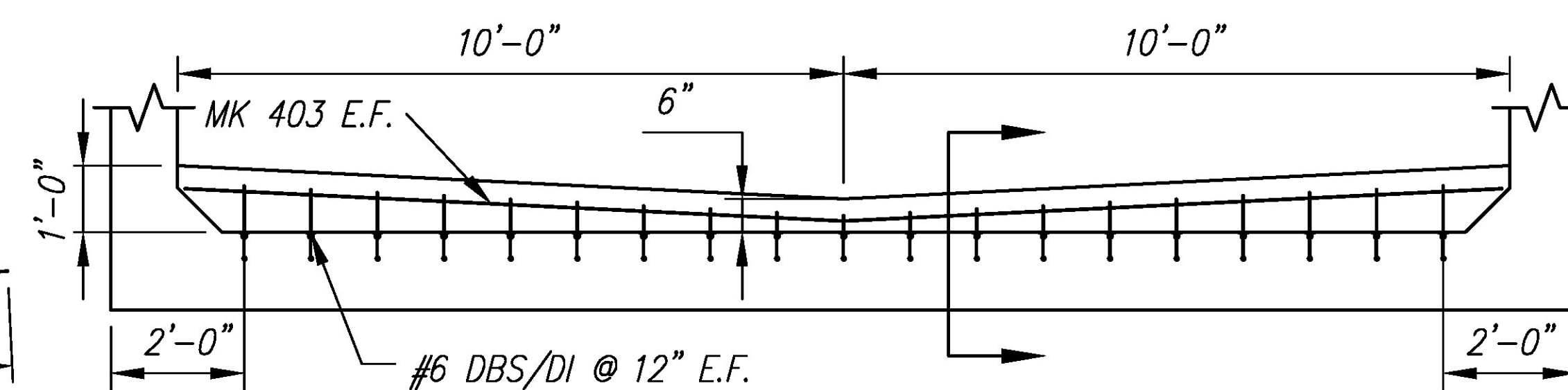
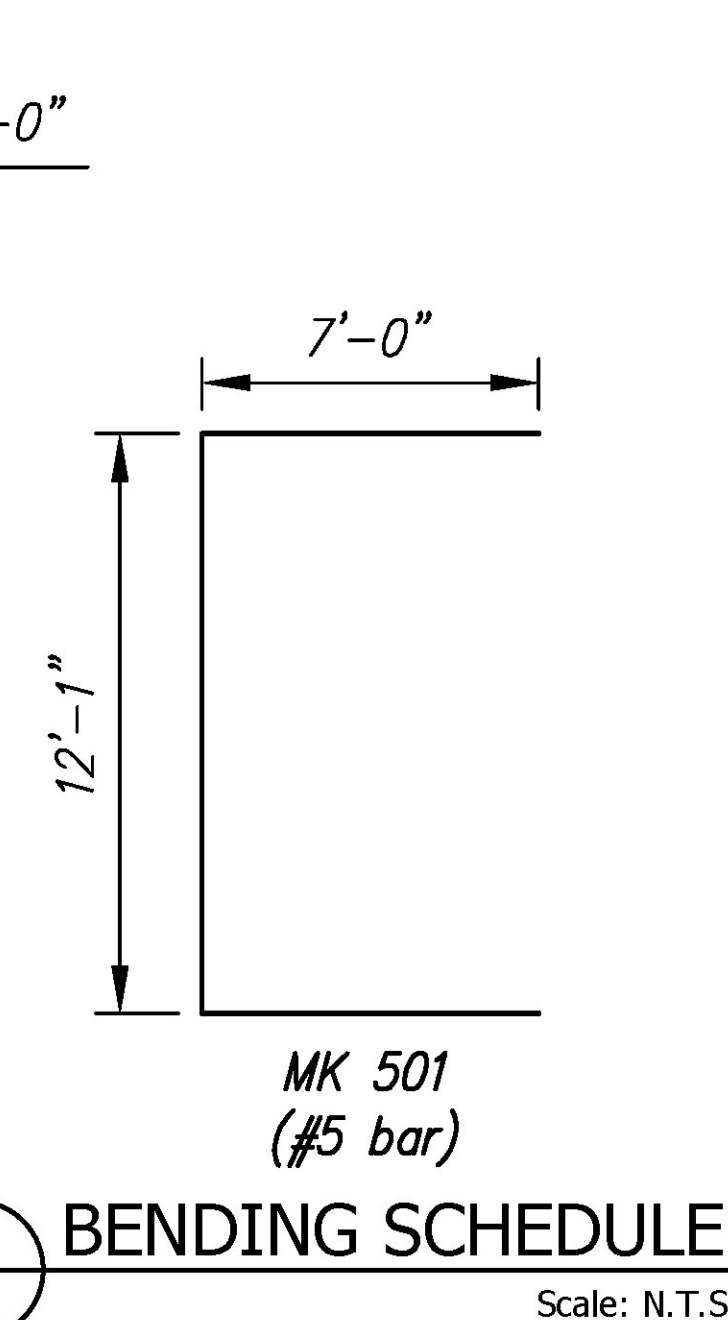
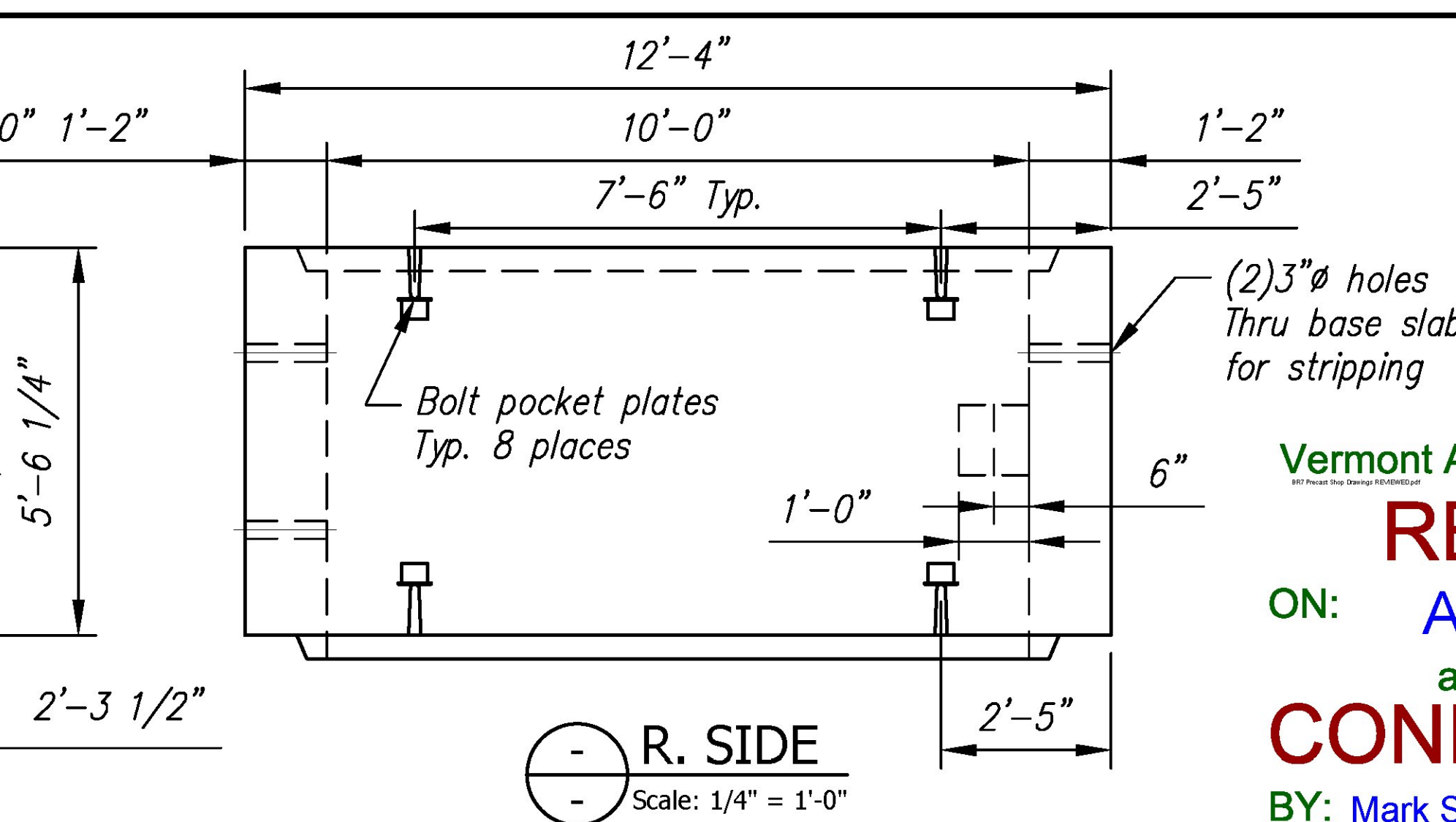
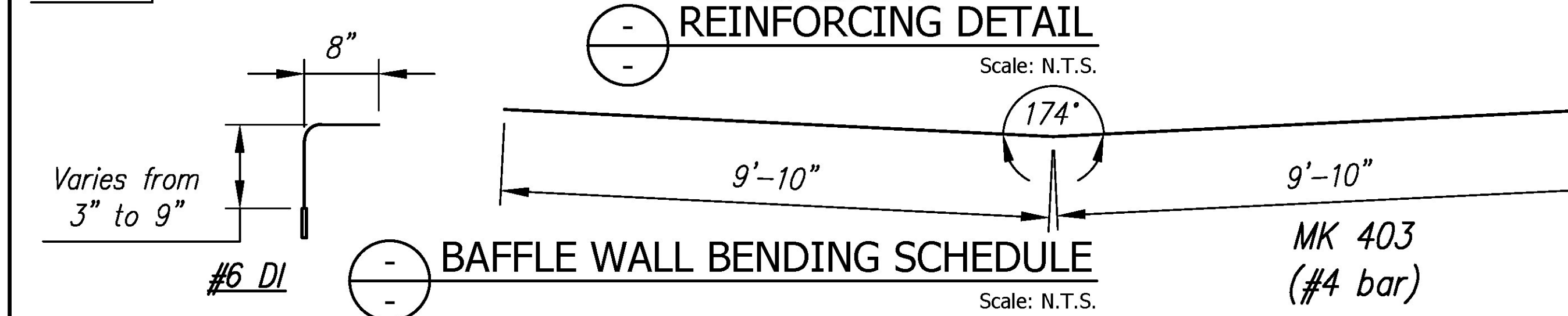
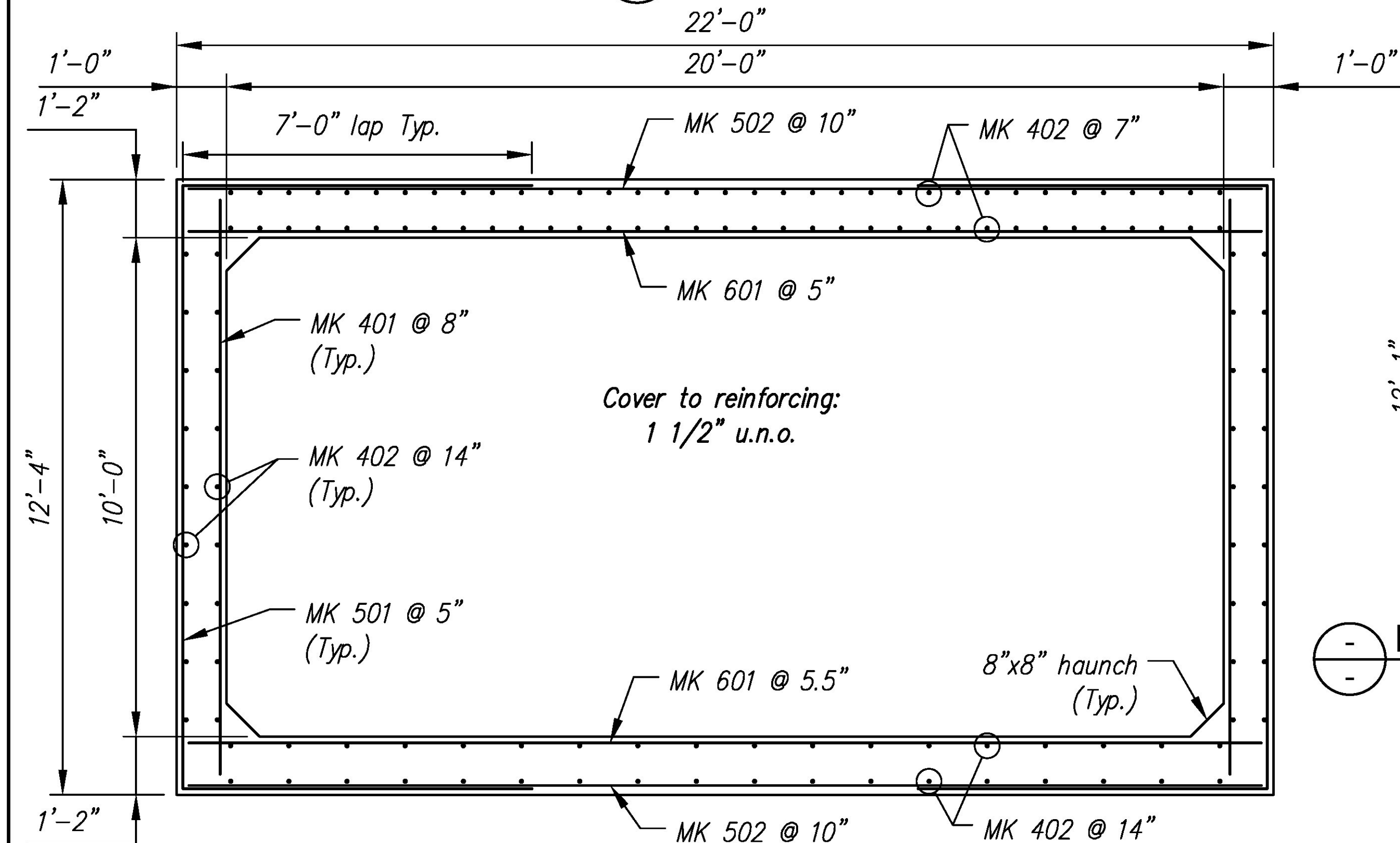
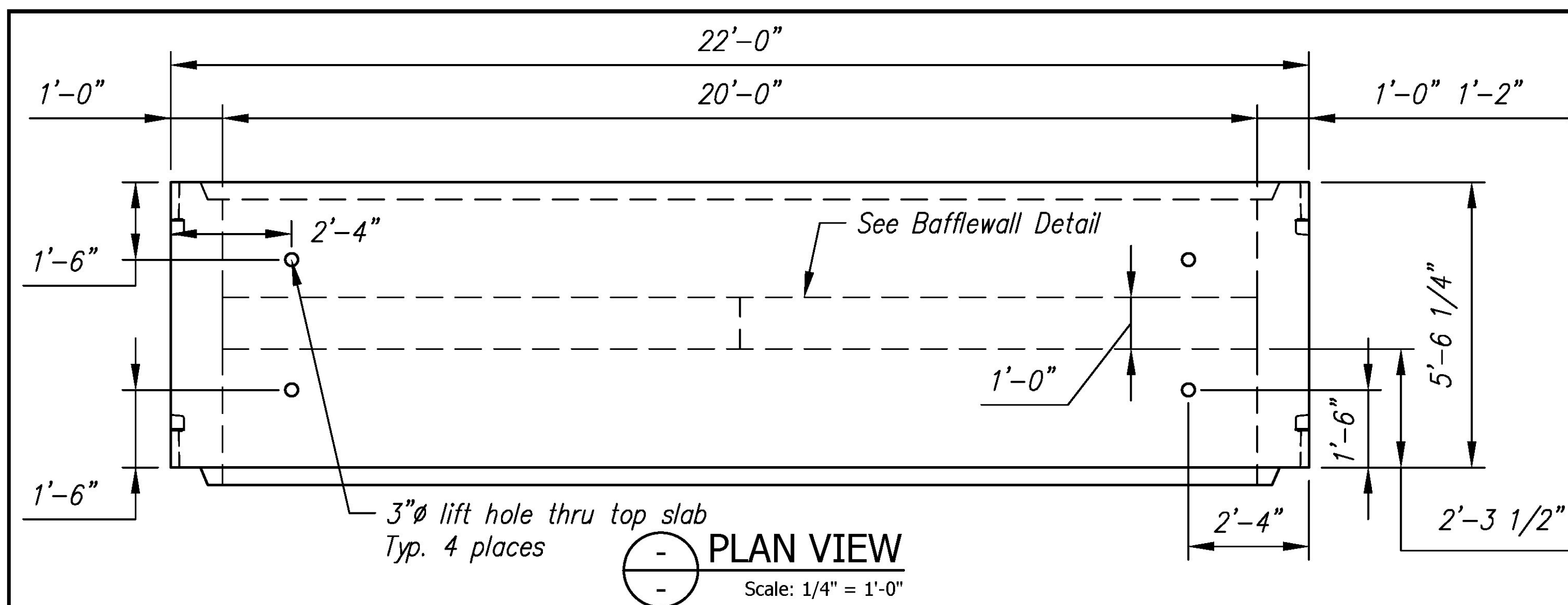
STATE AGENCY  
**VTrans**  
Drawn By: R. YEAGER  
Reviewed By: B. KOLAWOLE  
Approved By:   
Date: 09MAR2015  
Date: 02APR2015  
Date:   
Project No: STPCULV30

J A McDONALD, INC.  
VT/AOT BRIDGE - STEEL CULVERT REPLACEMENT  
BRIDGE #6, VT ROUTE 58, IRASBURG, VT  
20' SPAN X 8' RISE BOX CULVERT LAYOUT  
C22283-LO1B  
REV 1  
SHEET 2A OF 2A









Vermont Agency of Transportation  
**RECEIVED**  
ON: April 30, 2015  
and Checked for  
**CONFORMANCE**  
BY: Mark Sargent DATE: 5/7/2015

B2 Rebar Schedule			
MK	#	QTY	LENGTH
401	#4	18	11' - 6"
402	#4	142	5' - 3"
501	#5	27	26' - 1"
502	#5	14	21' - 6"
601	#6	27	21' - 6"

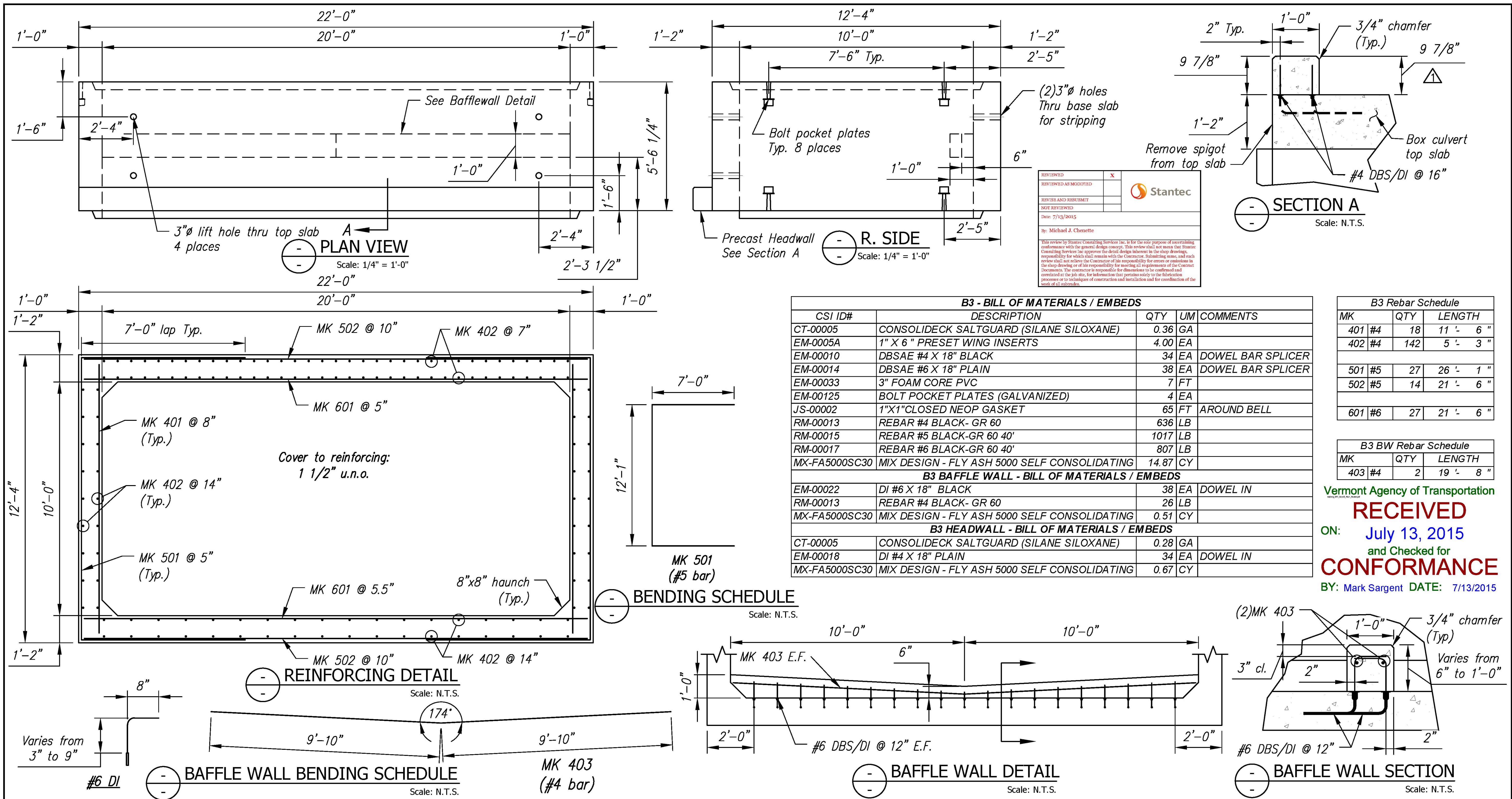
B2 BW Rebar Schedule			
MK	#	QTY	LENGTH
403	#4	2	19' - 8"

B2 - BILL OF MATERIALS / EMBEDS			
CSI ITEM	DESCRIPTION	QTY	UM COMMENTS
EM-00014	REVIEWED	38	EA DOWEL BAR SPLICER
EM-00033	REVIEWED AS MODIFIED	7	FT
EM-00125	REVISE AND RESUBMIT	8	EA
JS-00002	NOT REVIEWED	65	FT AROUND BELL
RM-00013	Date: 4/24/2015	636	LB
RM-00015	By: Nathan Tirk	1048	LB
RM-00017	This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.	872	LB
MX-FA500		14.87	CY
EM-00022		38	EA DOWEL IN
RM-00013		26	LB
MX-FA500		0.51	CY

5			
4			
3			
2			
1			
Rev.	Date	DESCRIPTION	By
REVISIONS			

 <b>Concrete Systems Inc.</b> 9 Commercial St., Hudson, NH,03051 Phone 603-889-4163 Fax 603-889-2417	<u>STATE AGENCY</u> 		J A MCDONALD, INC. VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #7, VT ROUTE 58, IRASBURG, VT			
	Drawn By R. YEAGER	Date 16MAR2015	B	SHOP DRAWING – B2		REV 0
	Concrete Cu. Yd. 15.39	Weight in Tons 31.16		Drawing No. C22283–L02–B2		
	Approved By	Date	Quantity: 7		Project No: STPCULV30	SHEET 2 OF 9







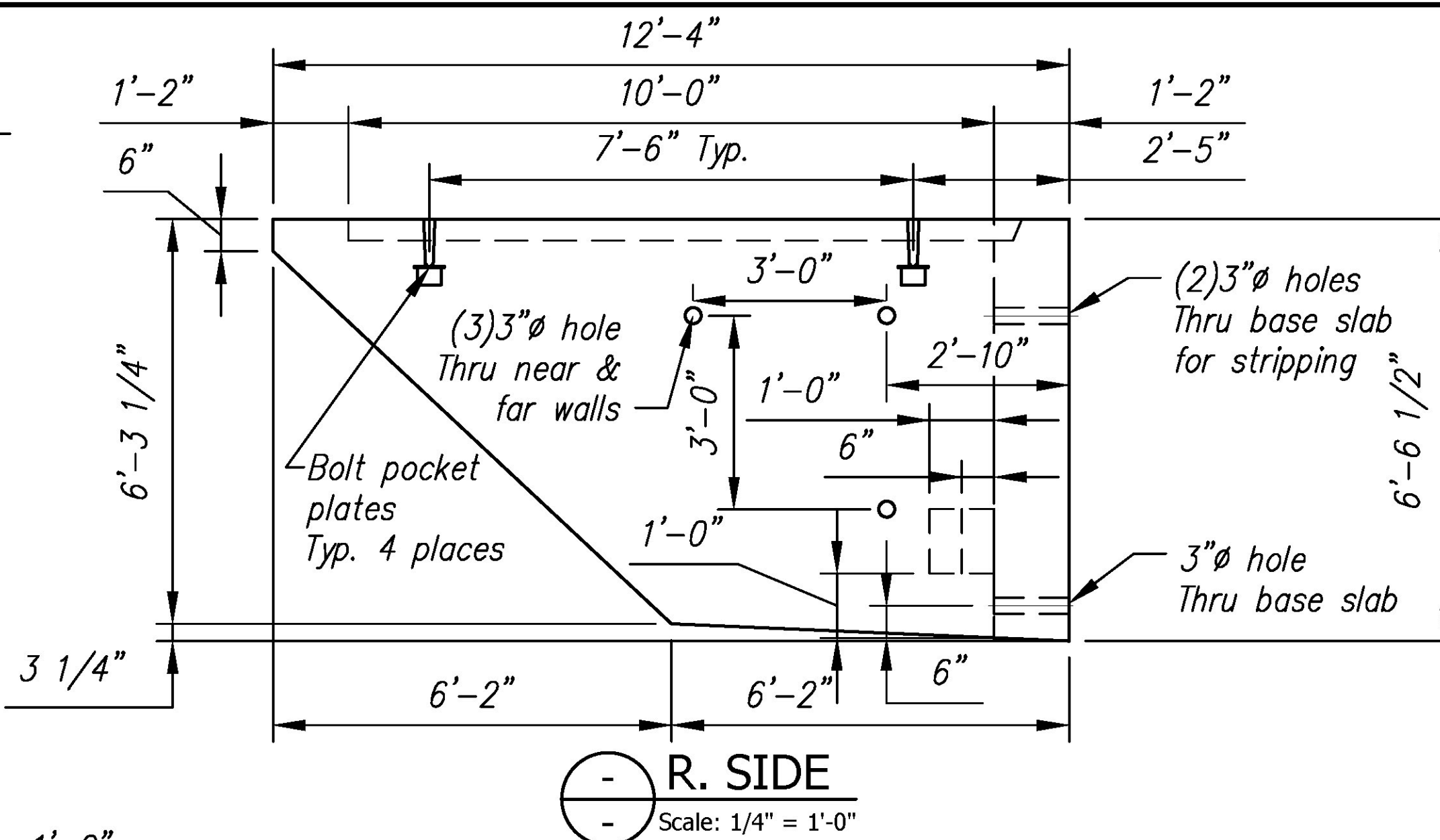
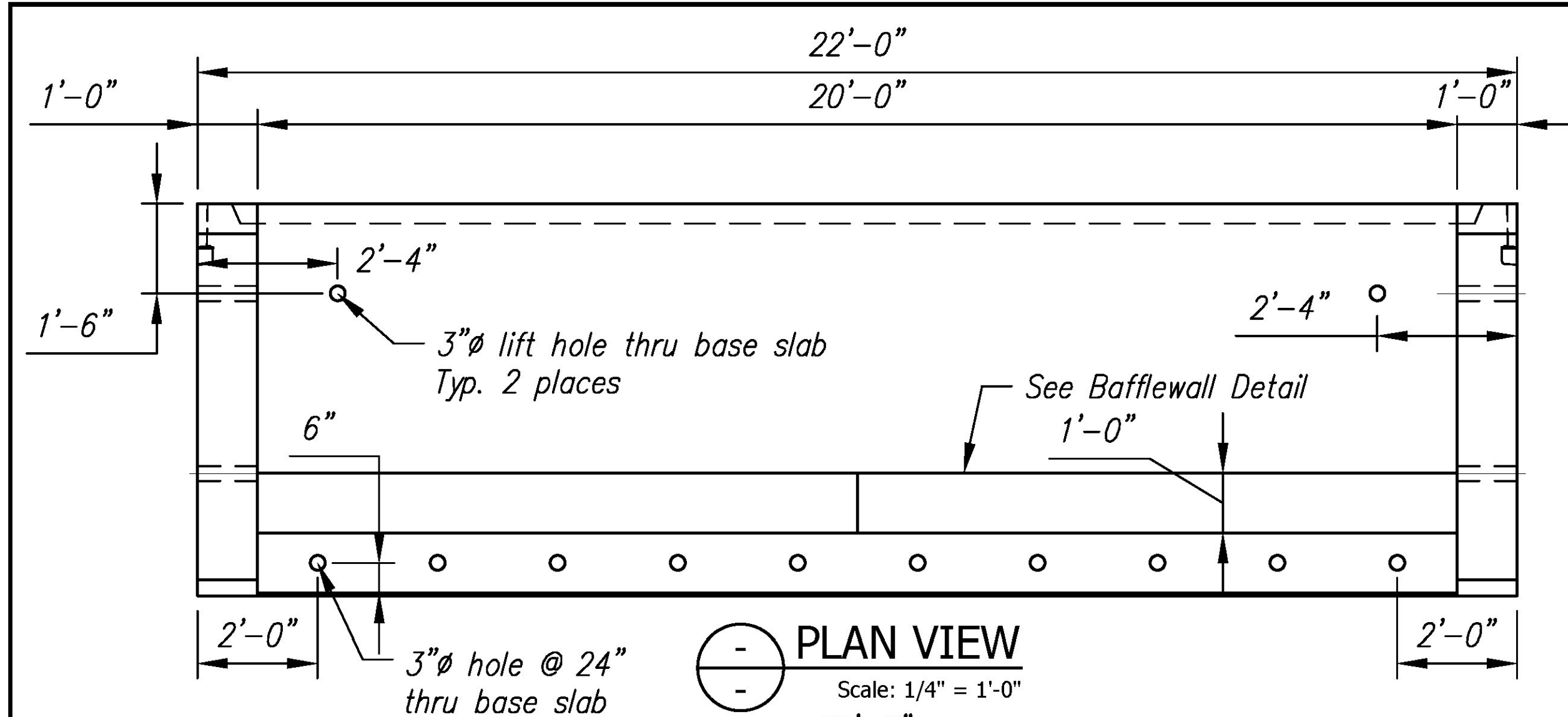
RECEIVED

ON: April 30, 2015

and Checked for

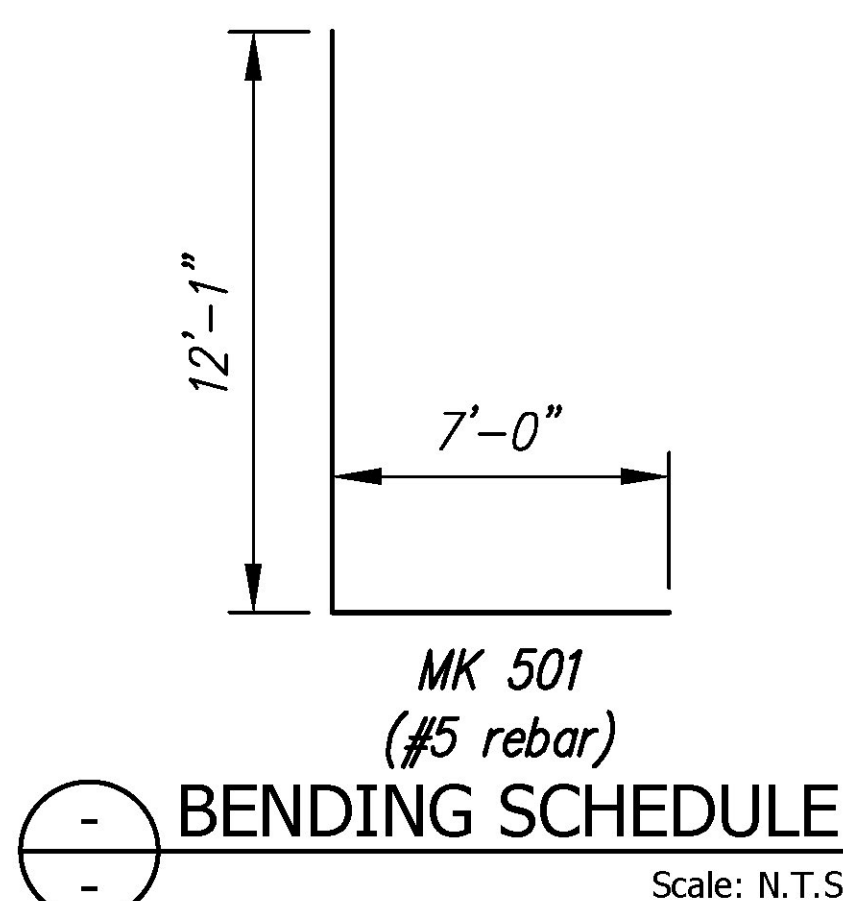
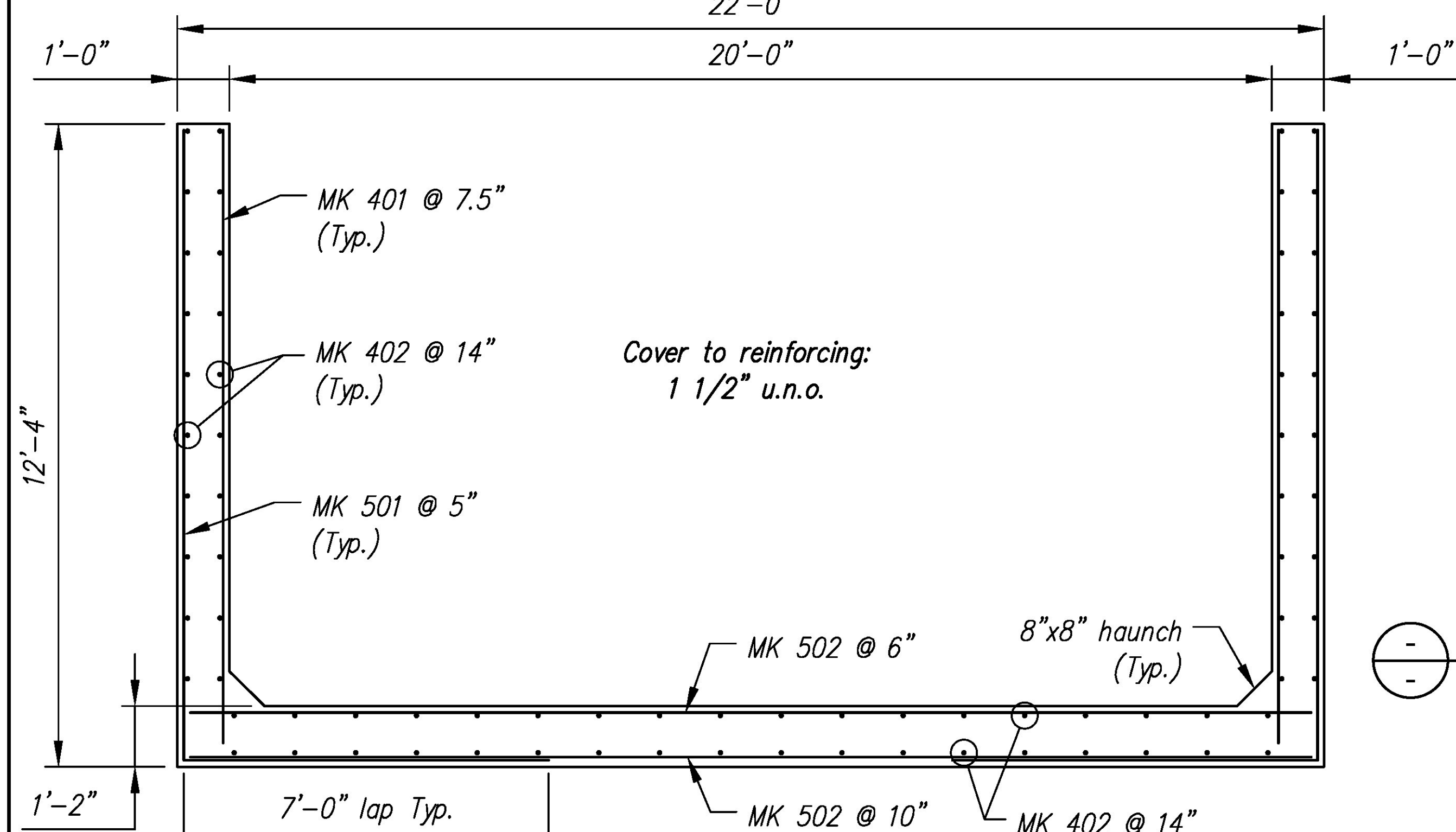
## CONFORMANCE

BY: Mark Sargent DATE: 5/7/2015

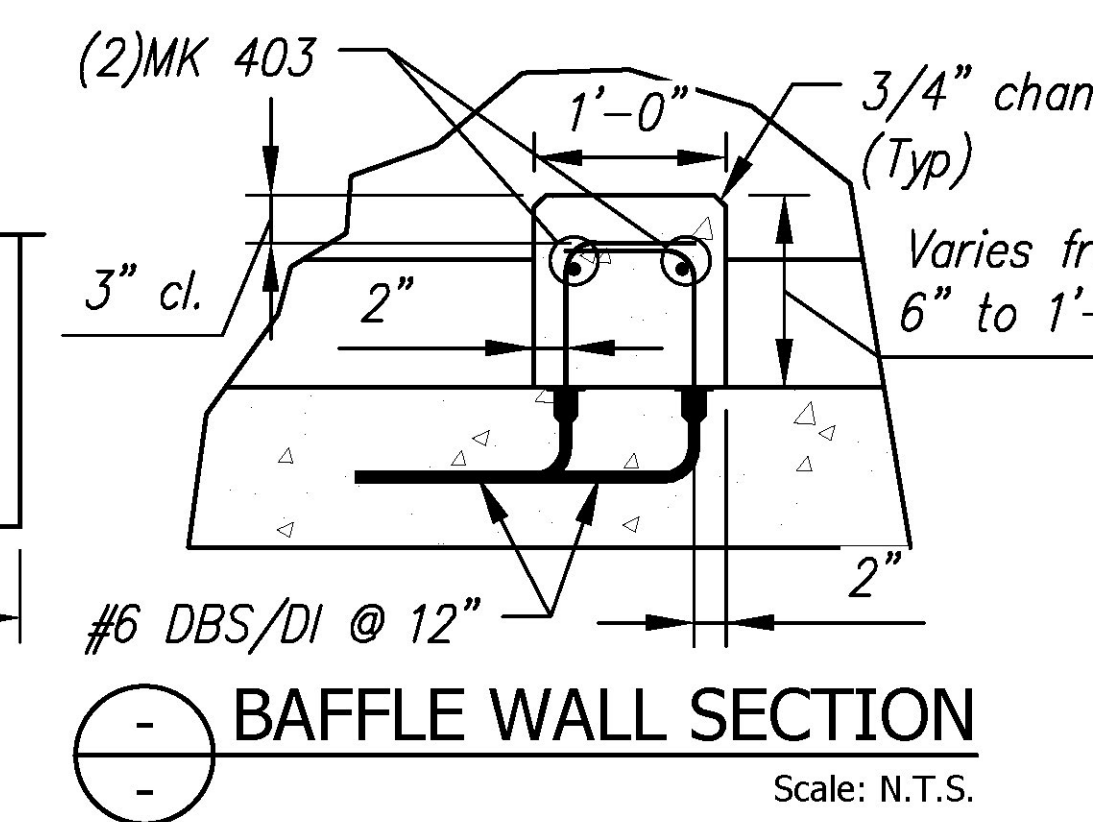
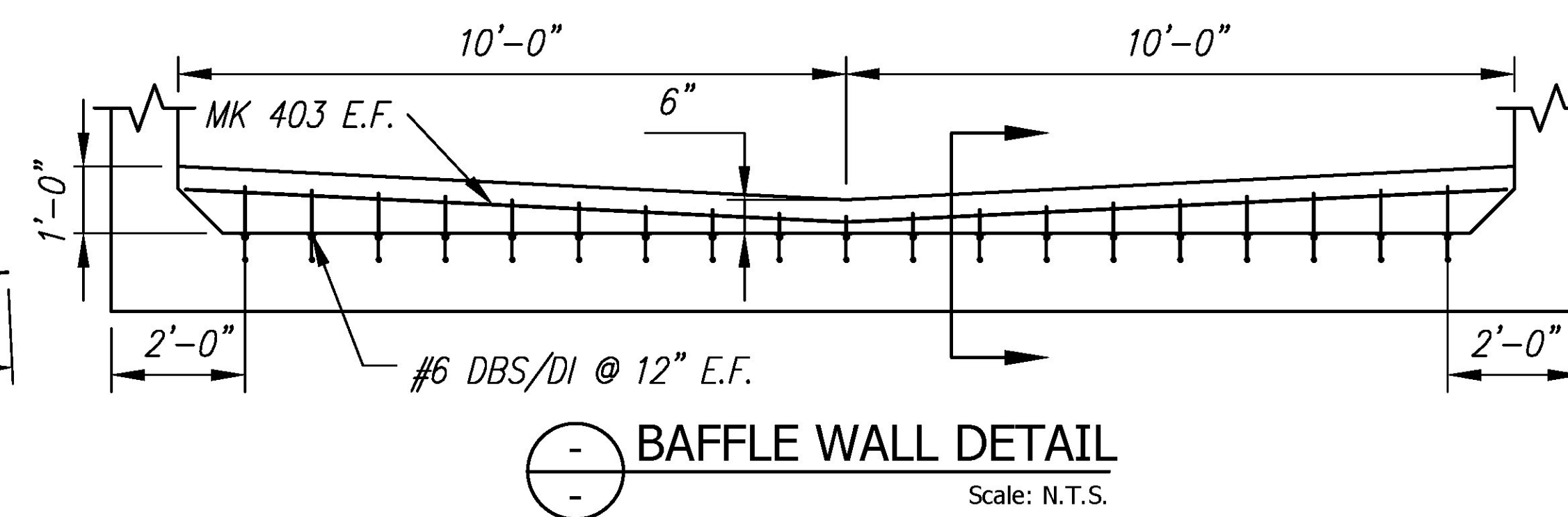
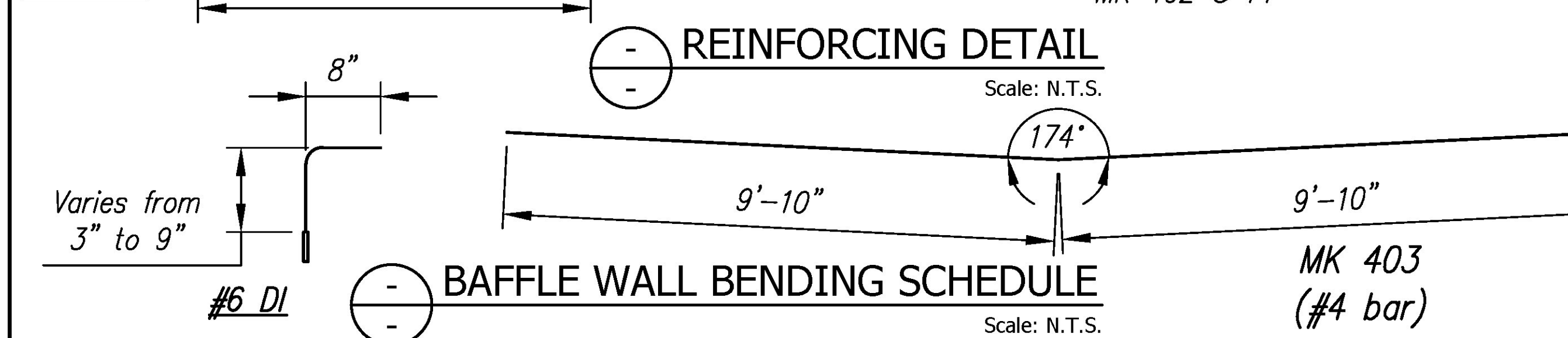


B4 Rebar Schedule				
MK		QTY	LENGTH	
401	#4	20	11 '-	7
402	#4	76	6 '-	3
501	#5	30	19 '-	1
502	#5	21	21 '-	6

B4 BW Rebar Schedule			
MK		QTY	LENGTH
403	#4	2	19' - 8"



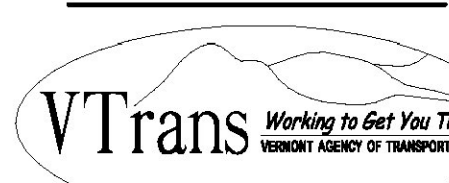
B4 - BILL OF MATERIALS / EMBEDS							
CSI ID#		DESCRIPTION		QTY	UM	COMMENTS	
CT-00005		CONSOLIDECK SALTGUARD (SILANE SILOXANE)		1.53	GA		
EM-00014		DBSAE #6 X 18" PLAIN		38	EA	DOWEL BAR SPLICE	
EM-C	REVIEWED	X		20	FT		
EM-C	REVIEWED AS MODIFIED			4	EA		
JS-O	REVISE AND RESUBMIT			44	FT	AROUND BELL	
RM-C	NOT REVIEWED			472	LB		
RM-C	Date: 4/24/2015			1068	LB		
MX-F	By: Nathan Tirk		SLIDATING	14.87	CY		
TERIALS / EMBEDS							
CT-O	This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract			SLIDATING	0.20	GA	
EM-C					38	EA	DOWEL IN
RM-C					26	LB	
MX-F				SLIDATING	0.51	CY	



5			
4			
3			
2			
1			
Rev.	Date	DESCRIPTION	By
REVISIONS			

**CSI**  
Concrete Systems Inc.  
9 Commercial St., Hudson, NH, 03051  
Phone 603-889-4163  
Fax 603-889-2417

STATE AGENCY



J A MCDONALD, INC.  
VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT  
BRIDGE #7, VT ROUTE 58, IRASBURG, VT

Drawn By R. YEAGER	Date 16MAR2015
Concrete Cu. Yd. 11.91	Weight in Tons 24.12
Approved By	Date

B	SHOP DRAWING – B4	REV
	Drawing No. C22283–L02–B4	0

Quantity: 1	Project No: STPCULV30	SHEET 4 OF 9
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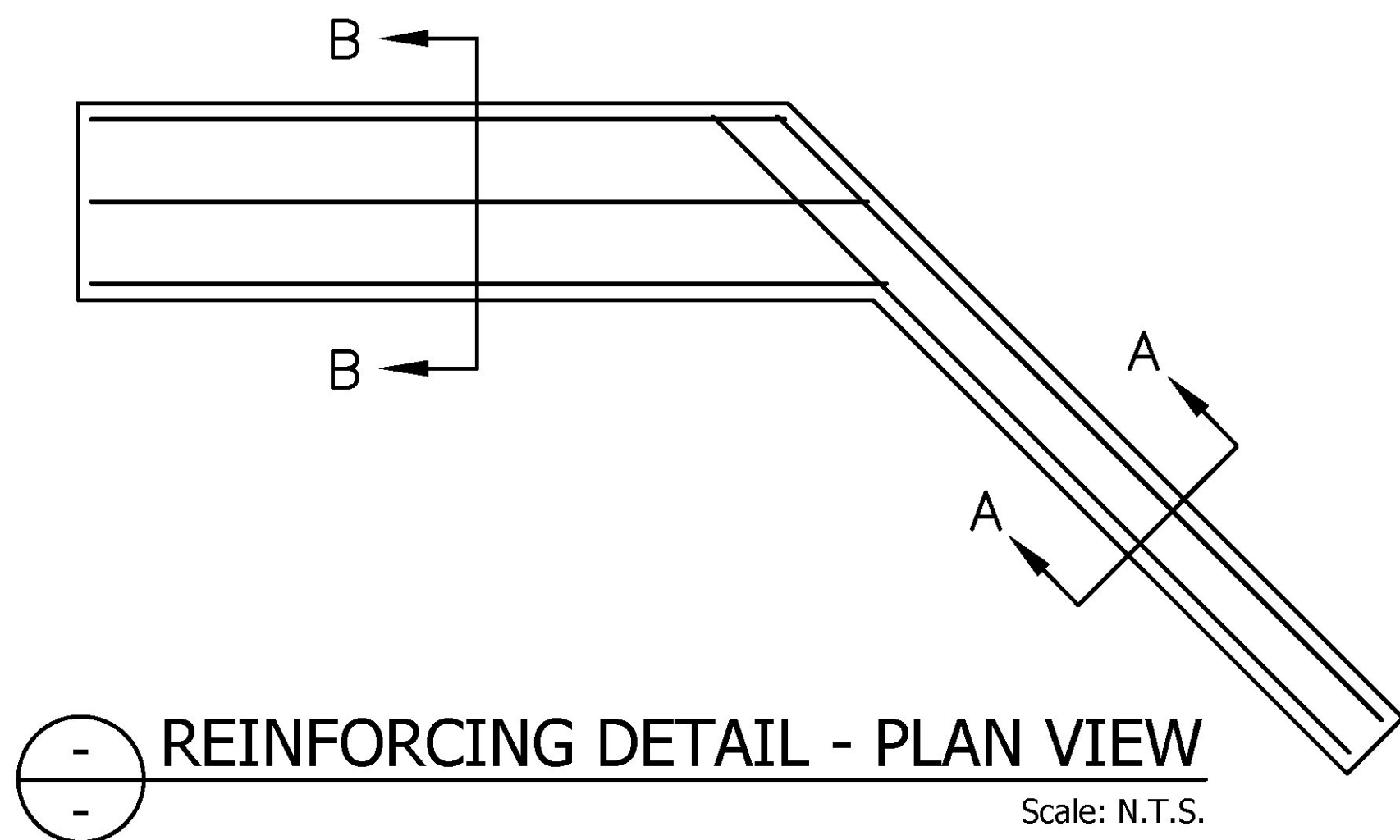
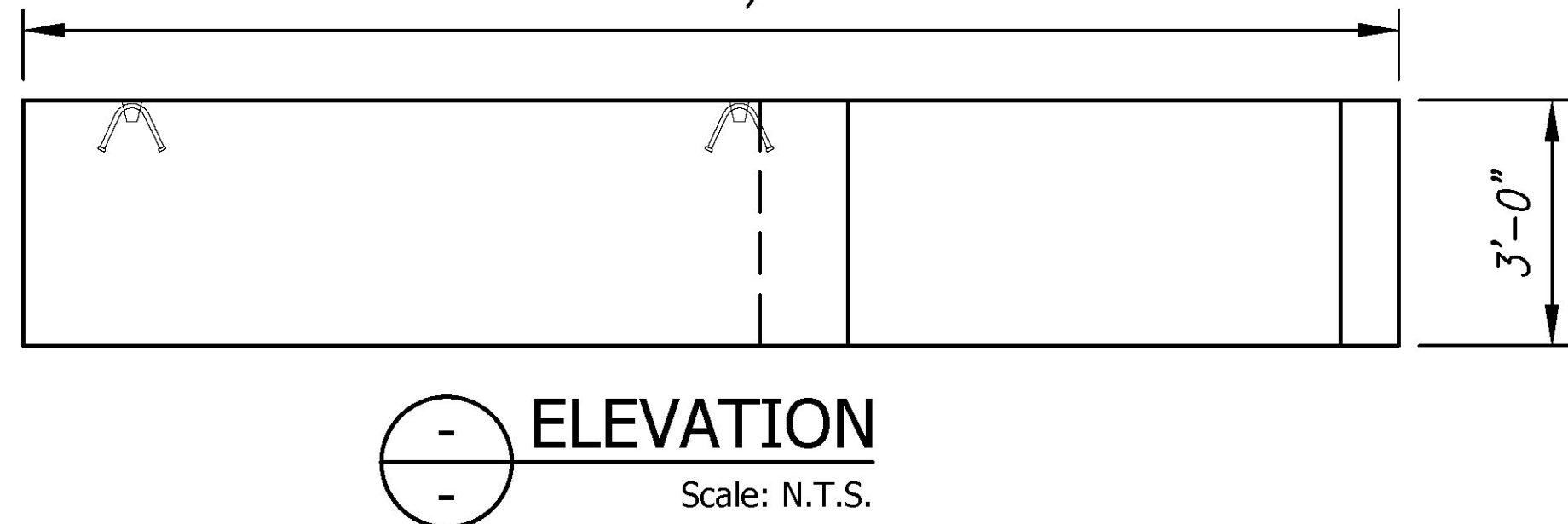
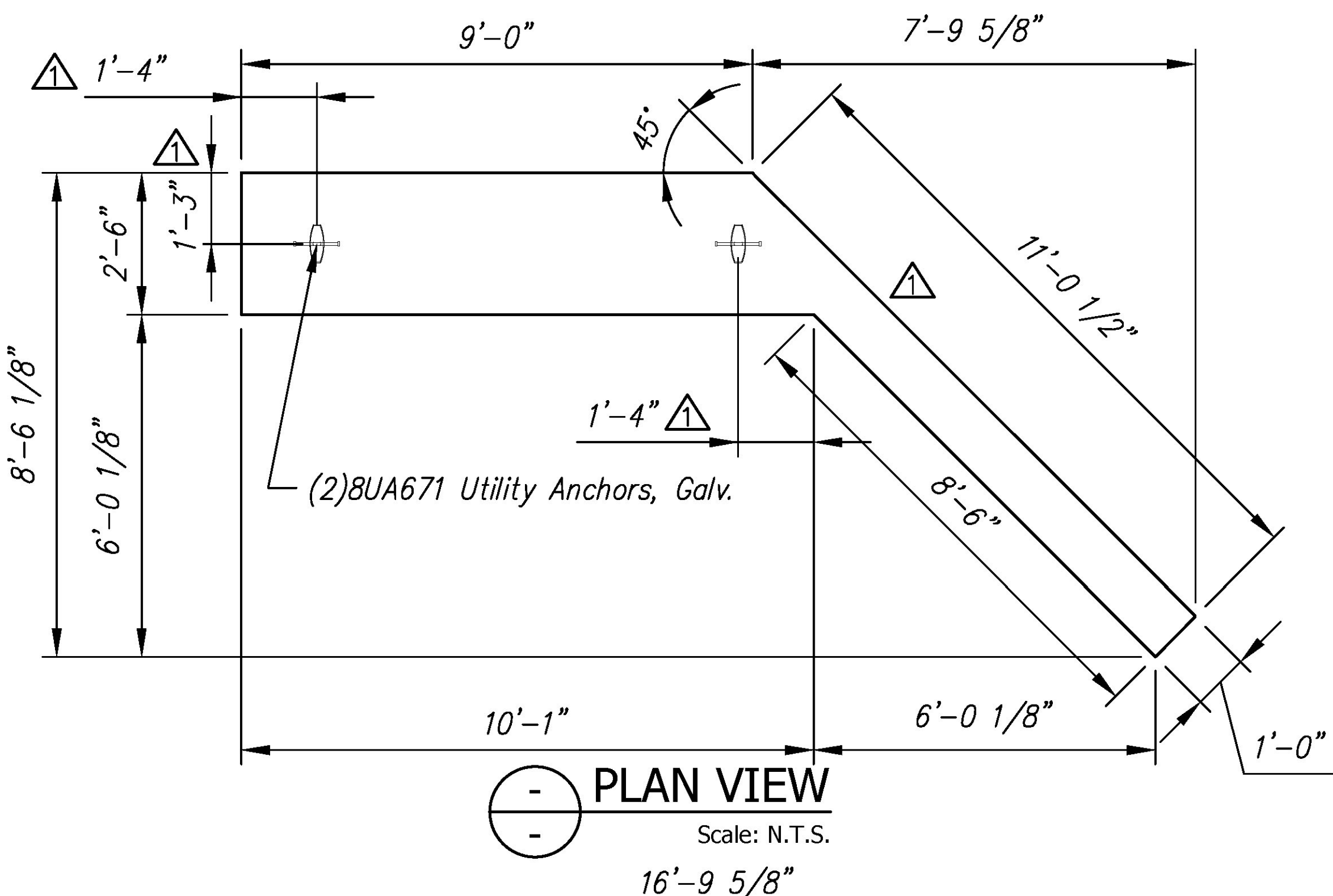


 <b>Concrete Systems Inc.</b> 9 Commercial St., Hudson, NH,03051 Phone 603-889-4163 Fax 603-889-2417	<u>STATE AGENCY</u> 		J A MCDONALD, INC. VT/AOT BRIDGE – STEEL CULVERT REPLACEMENT BRIDGE #7, VT ROUTE 58, IRASBURG, VT				
	Drawn By R. YEAGER	Date 16MAR2015	B	SHOP DRAWING – WW1B			REV 1
	Concrete Cu. Yd. 5.24	Weight in Tons 10.61		Drawing No. C22283-L02-WW1B			
	Approved By	Date	Quantity: 1	Project No: STPCULV30	SHEET 5 OF 9		







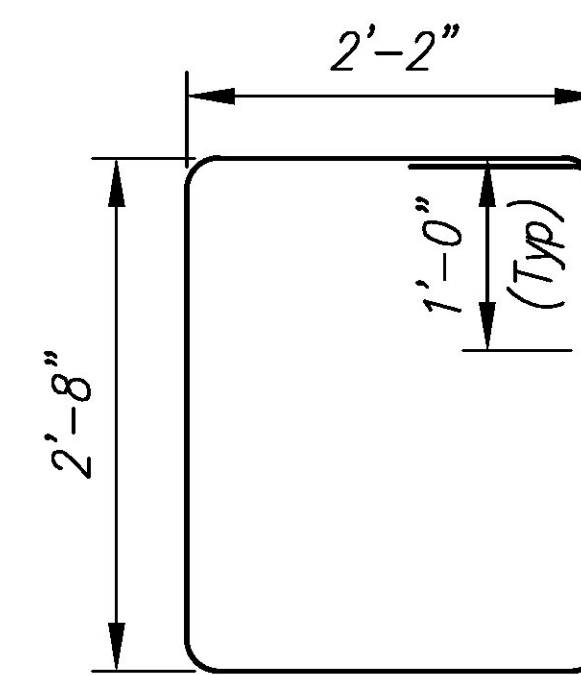
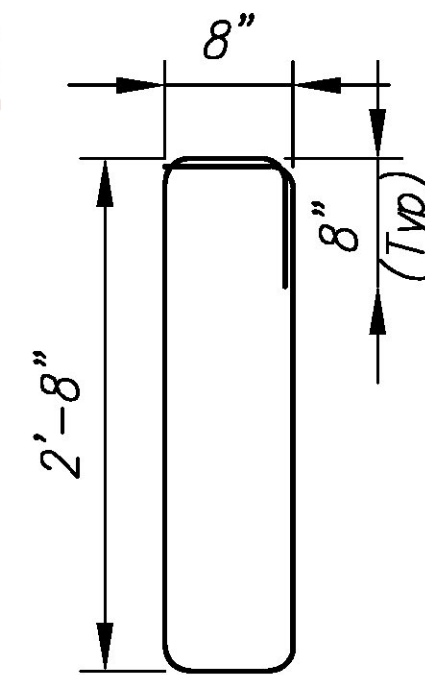


Vermont Agency of Transportation

**RECEIVED**  
ON: April 30, 2015  
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**CONFORMANCE**  
BY: Mark Sargent DATE: 5/7/2015

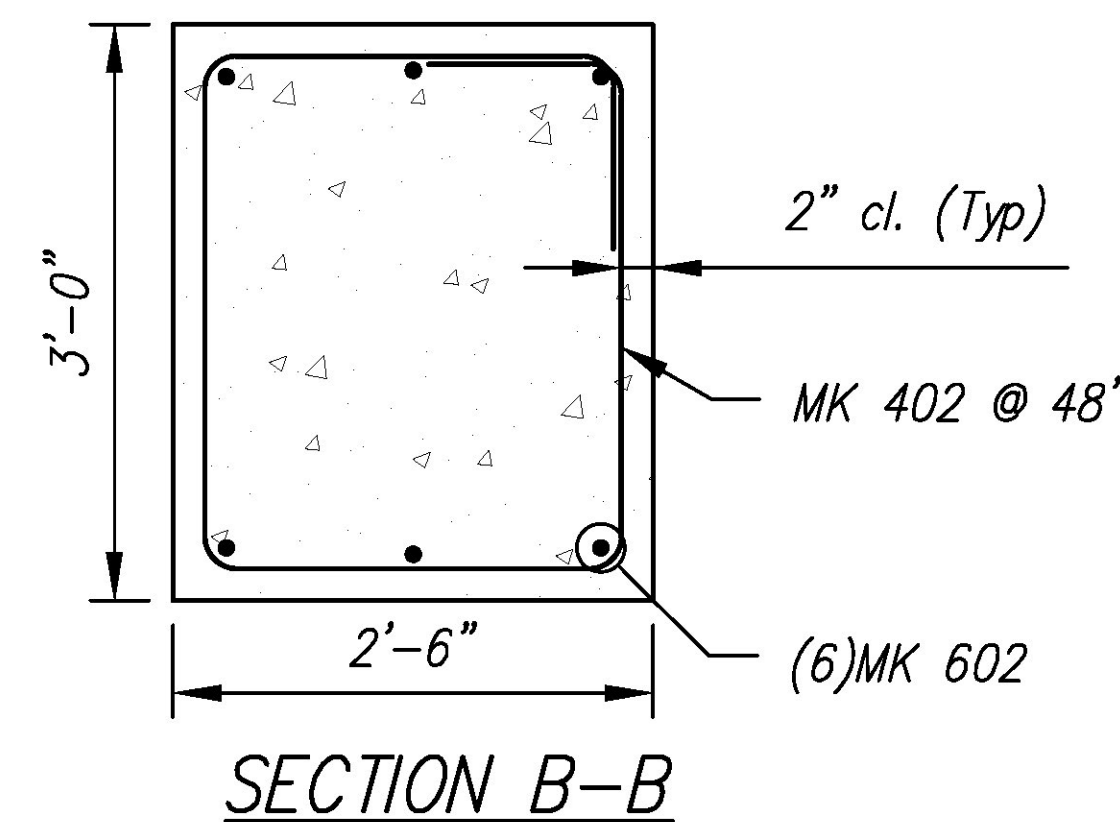
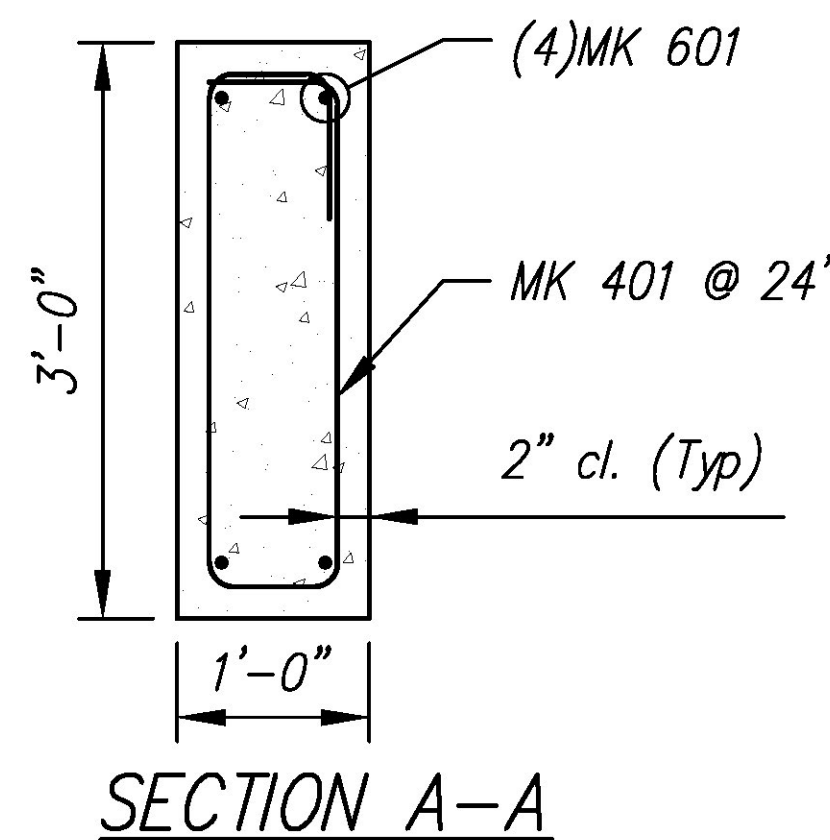
F1B - BILL OF MATERIALS / EMBEDS				
CSI ID#	DESCRIPTION	QTY	UM	COMMENTS
EM-00115	UTILITY ANCHOR #8UA671-GALVANIZED	2	EA	
RM-00013	REBAR #4 BLACK- GR 60	50	LB	
RM-00017	REBAR #6 BLACK-GR 60 40'	160	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING	3.74	CY	

F1B Rebar Schedule				
MK		QTY	LENGTH	
401	#4	5	8	0"
402	#4	3	11	8"
601	#6	4	11	6"
602	#6	6	10	1" MAX



BENDING SCHEDULE  
Scale: N.T.S.  
Cover to reinforcing: 2" u.n.o.

REVIEWED	X
REVIEWED AS MODIFIED	
REVISE AND RESUBMIT	
NOT REVIEWED	
Date: 4/24/2015	
By: Nathan Tirk	
This review by Stantec Consulting Services Inc. is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Stantec Consulting Services Inc. approves the detail design in here in the shop drawings, responsibility for which shall remain with the Contractor. Submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawing or of his responsibility for meeting all requirements of the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction and installation and for coordination of the work of all subtrades.	



REINFORCING DETAIL  
Scale: N.T.S.

5			
4			
3			
2	28APR2015	REVISED UTILITY ANCHOR LOCATIONS	RY
1	01APR2015	DIMENSIONAL CHANGES DUE TO 12" THK WW	RY
Rev.	Date	DESCRIPTION	By
REVISIONS			

**CSI**  
Concrete Systems Inc.  
9 Commercial St., Hudson, NH, 03051  
Phone 603-889-4163  
Fax 603-889-2417

STATE AGENCY  
VTrans  
Working to Get You There  
VERMONT AGENCY OF TRANSPORTATION

Drawn By  
R. YEAGER  
Concrete Cu. Yd.  
3.74  
Approved By

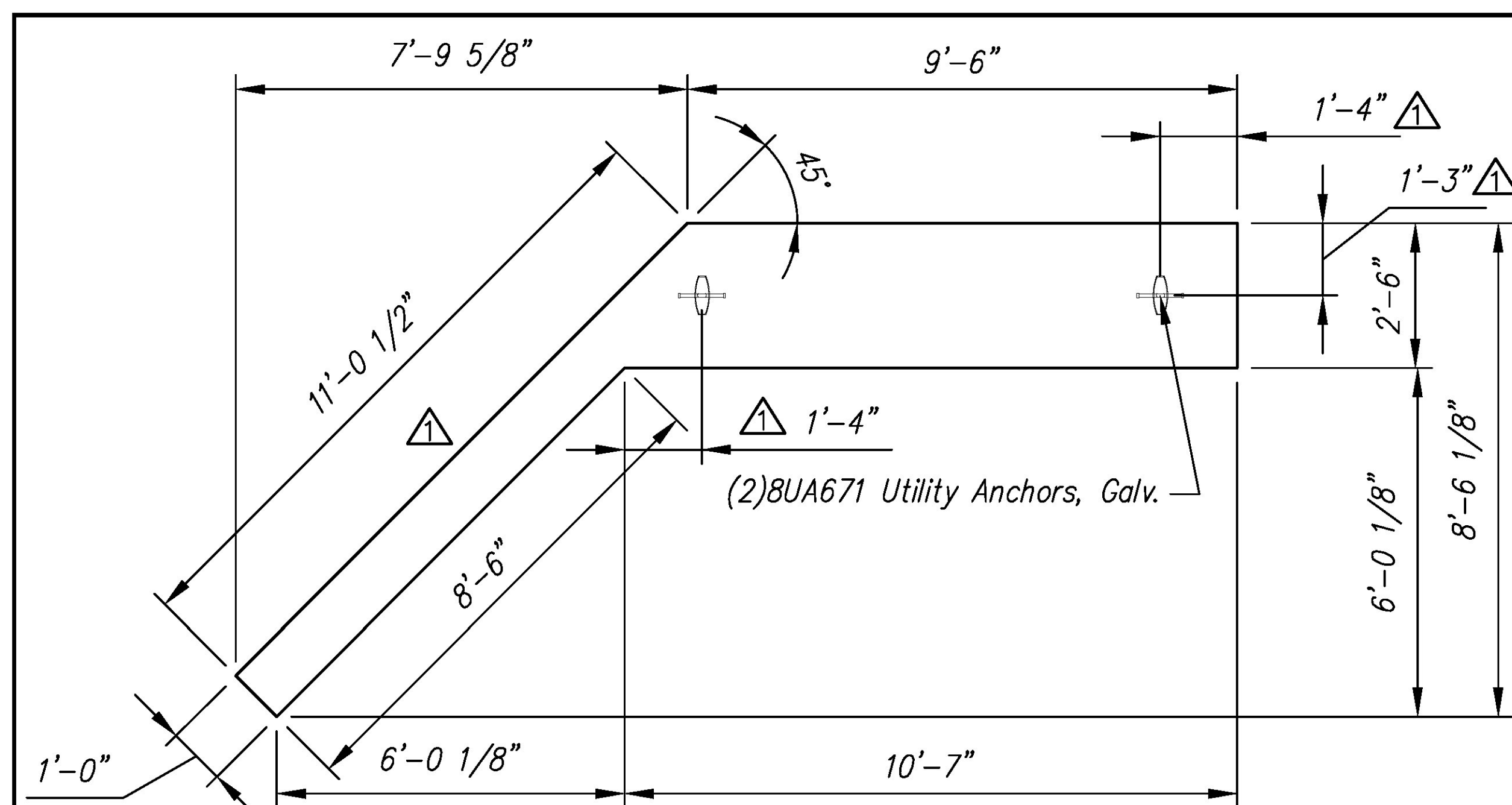
Date  
16MAR2015  
Weight in Tons  
7.57  
Date

J A MCDONALD, INC.  
VT/AOT BRIDGE - STEEL CULVERT REPLACEMENT  
BRIDGE #7, VT ROUTE 58, IRASBURG, VT

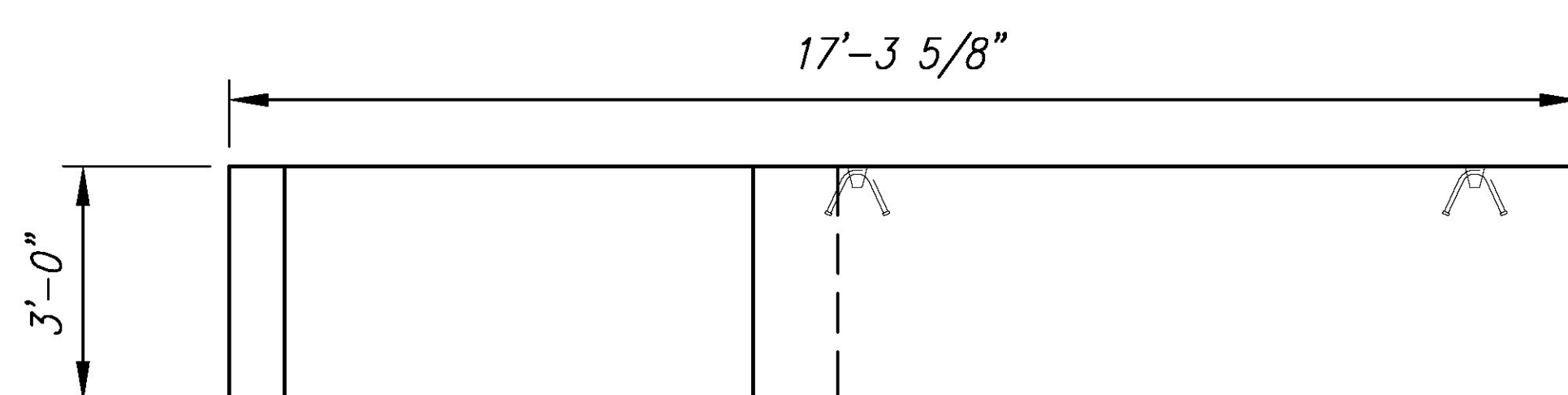
SHOP DRAWING - F1B  
Drawing No. C22283-L02-F1B  
REV 2

Quantity: 1 Project No: STPCULV30 SHEET 7 OF 9

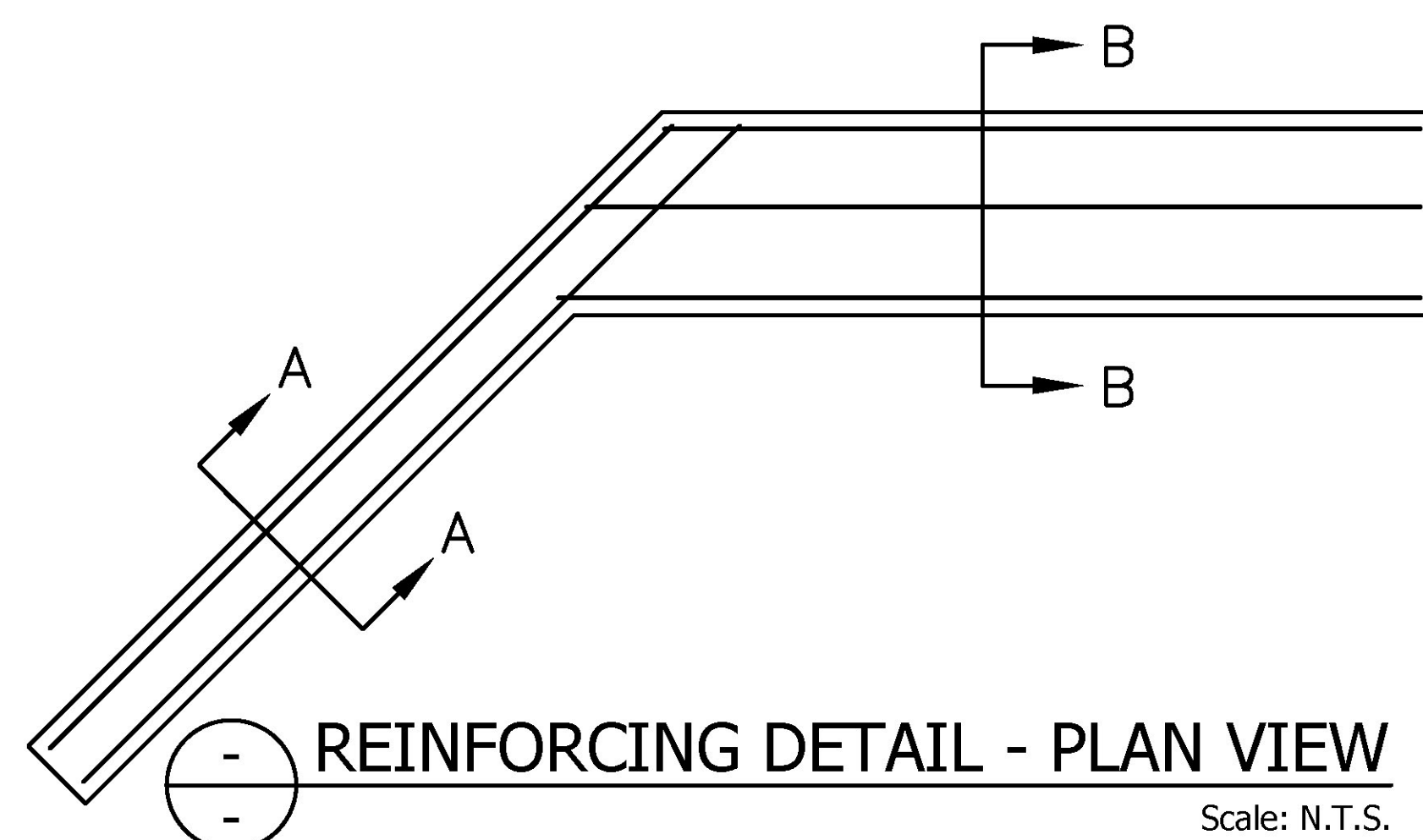




PLAN VIEW  
Scale: N.T.S.



ELEVATION  
Scale: N.T.S.



REINFORCING DETAIL - PLAN VIEW  
Scale: N.T.S.

Vermont Agency of Transportation

**RECEIVED**

ON: **April 30, 2015**

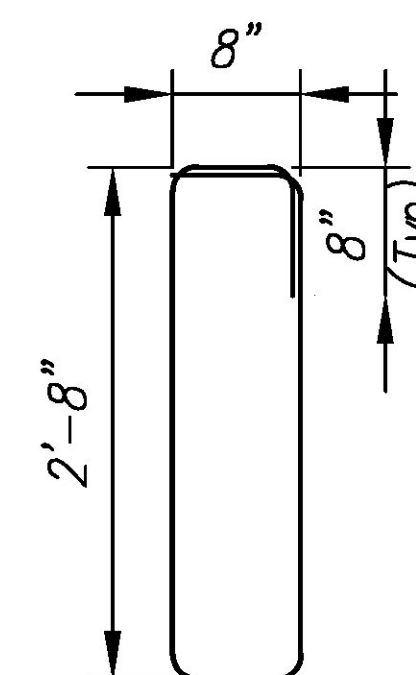
and Checked for

**CONFORMANCE**

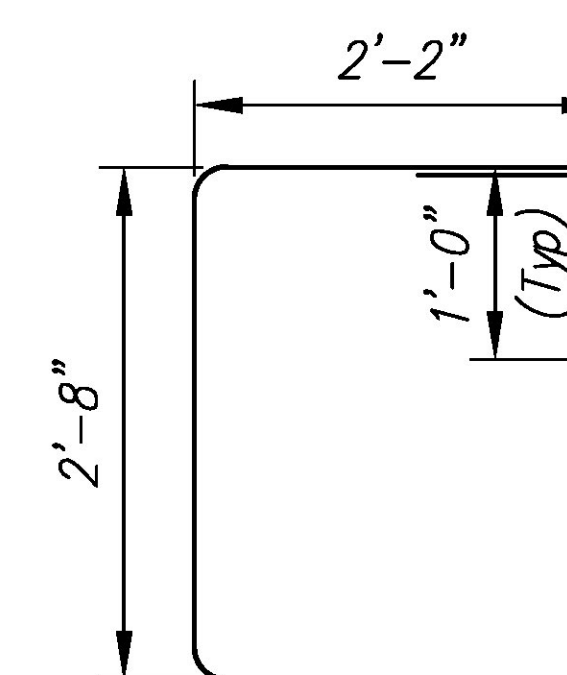
BY: Mark Sargent DATE: 5/7/2015

F2B - BILL OF MATERIALS / EMBEDS				
CSI ID#	DESCRIPTION	QTY	UM	COMMENTS
EM-00115	UTILITY ANCHOR #8UA671-GALVANIZED	2	EA	
RM-00013	REBAR #4 BLACK- GR 60	50	LB	
RM-00017	REBAR #6 BLACK-GR 60 40'	164	LB	
MX-FA5000SC30	MIX DESIGN - FLY ASH 5000 SELF CONSOLIDATING	3.88	CY	

F2B Rebar Schedule			
MK	QTY	LENGTH	
401 #4	5	8 ' - 0 "	
402 #4	3	11 ' - 8 "	
601 #6	4	11 ' - 6 "	
602 #6	6	10 ' - 7 "	MAX



MK 401  
#4 bar

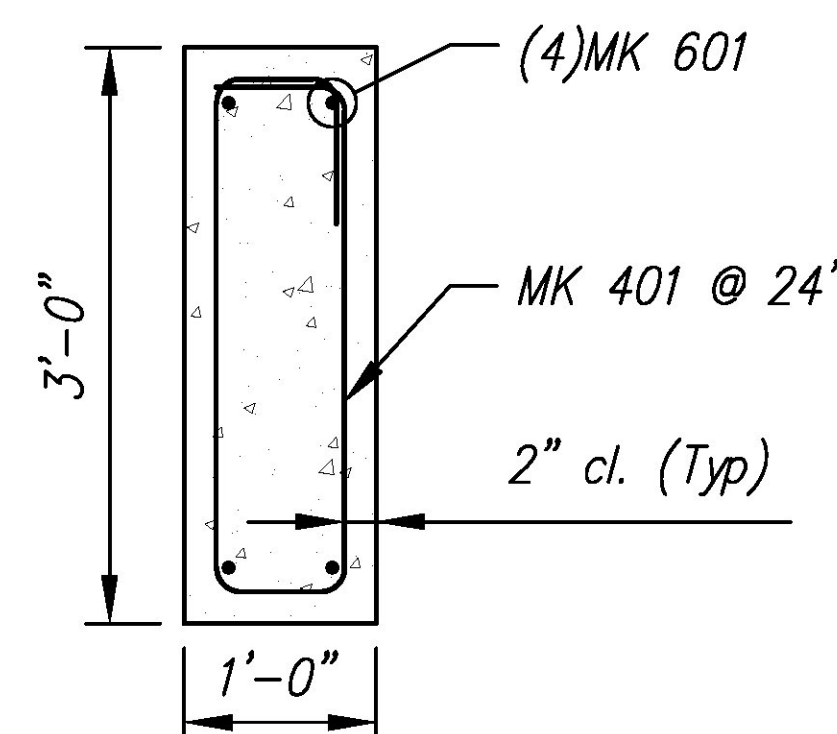


MK 402  
#4 bar

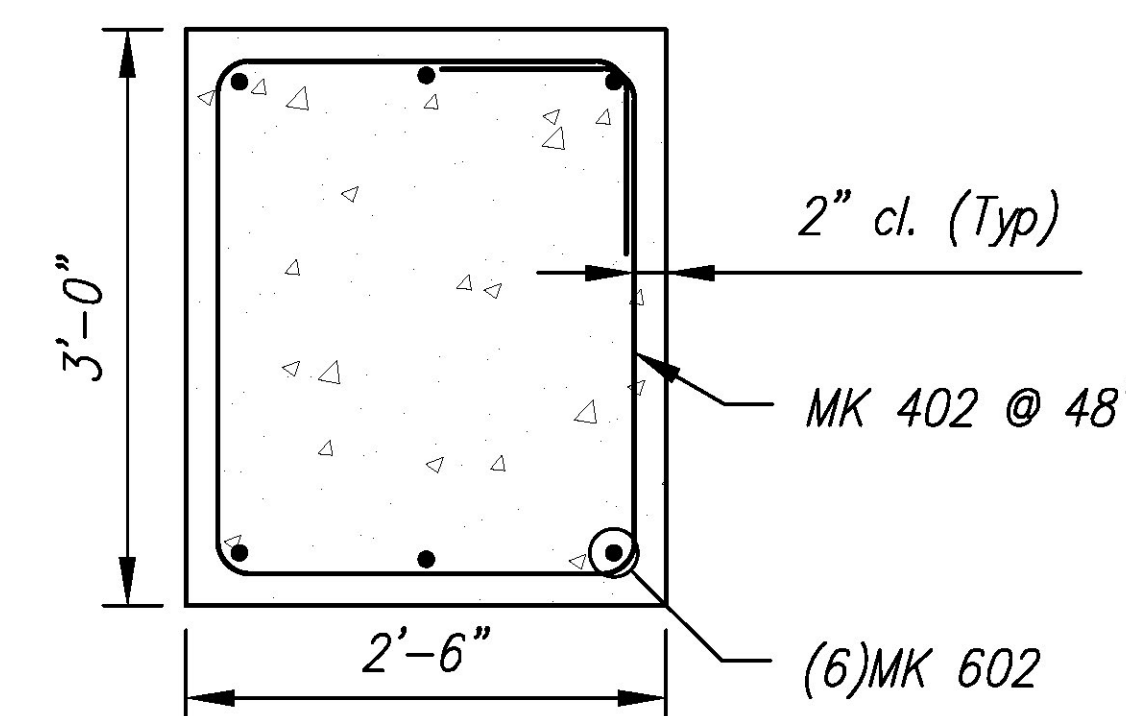
BENDING SCHEDULE  
Scale: N.T.S.

Cover to reinforcing: 2" u.n.o.

REVIEWED	X	 Stantec
REVIEWED AS MODIFIED		
REVISE AND RESUBMIT		
NOT REVIEWED		
Date: 4/24/2015		
By: Nathan Tirk		
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SECTION A-A



SECTION B-B

REINFORCING DETAIL  
Scale: N.T.S.

5			
4			
3			
2	28APR2015	REVISED UTILITY ANCHOR LOCATIONS	RY
1	01APR2015	DIMENSIONAL CHANGES DUE TO 12" THK WW	RY
Rev.	Date	DESCRIPTION	By
REVISIONS			

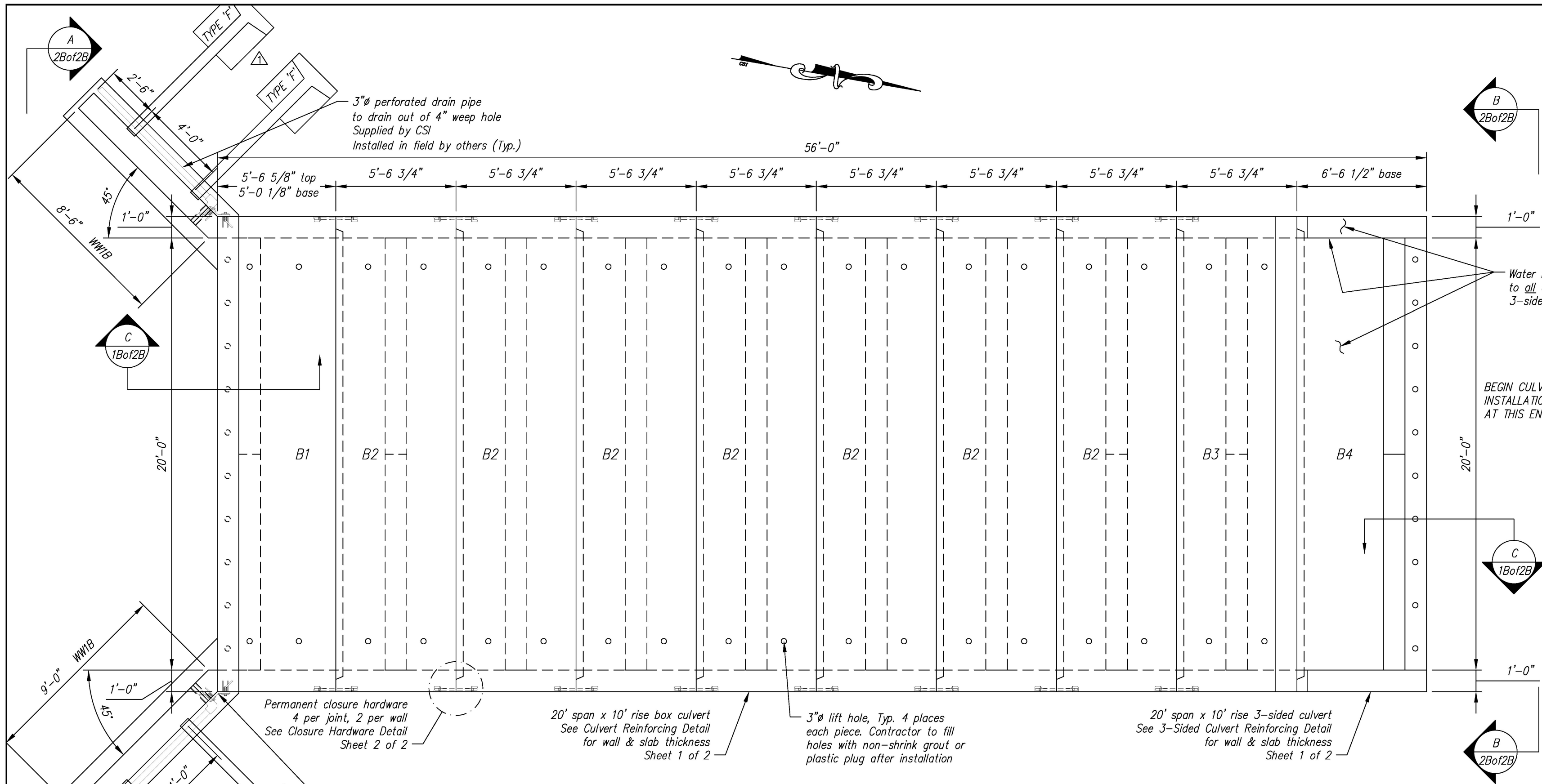
**Concrete Systems Inc.**  
9 Commercial St., Hudson, NH, 03051  
Phone 603-889-4163  
Fax 603-889-2417

STATE AGENCY		J A MCDONALD, INC.		
		VT/AOT BRIDGE - STEEL CULVERT REPLACEMENT BRIDGE #7, VT ROUTE 58, IRASBURG, VT		
Drawn By R. YEAGER	Date 16MAR2015	B	SHOP DRAWING - F2B	REV 2
Concrete Cu. Yd. 3.88	Weight in Tons 7.86		Drawing No. C22283-L02-F2B	
Approved By	Date	Quantity: 1	Project No: STPCULV30	SHEET 8 OF 9

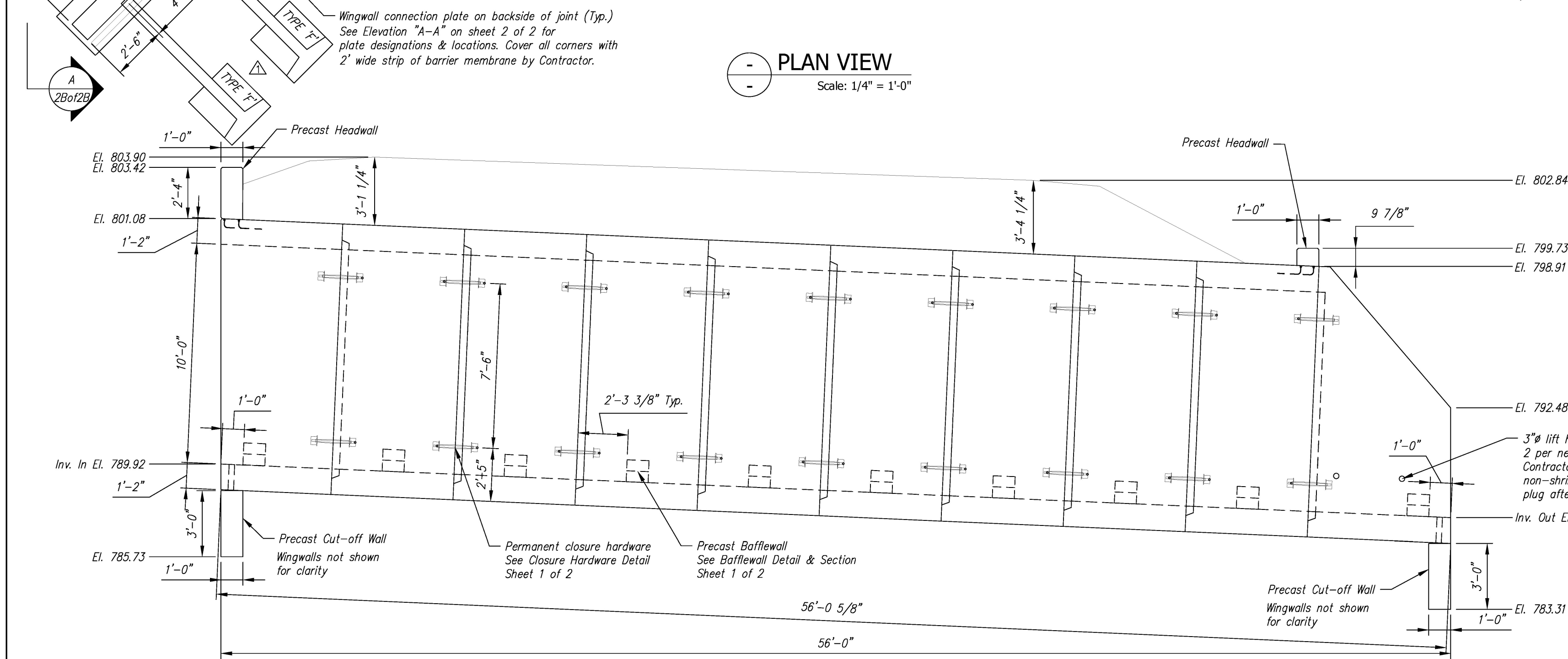




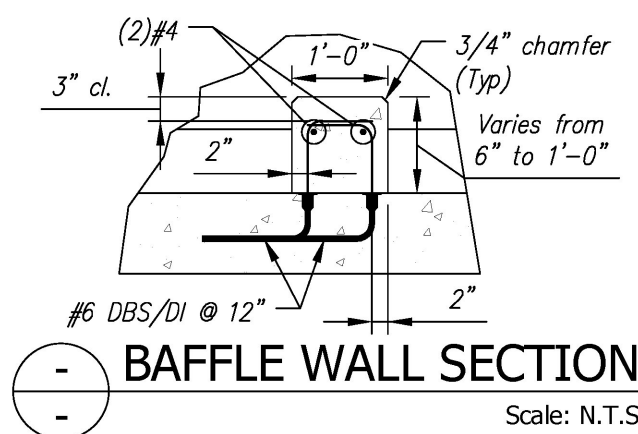




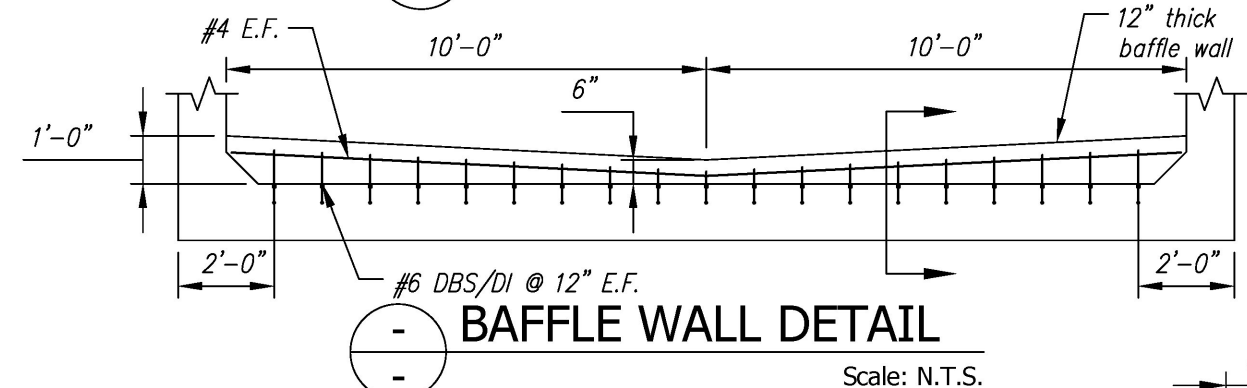
PLAN VIEW  
Scale: 1/4" = 1'-0"



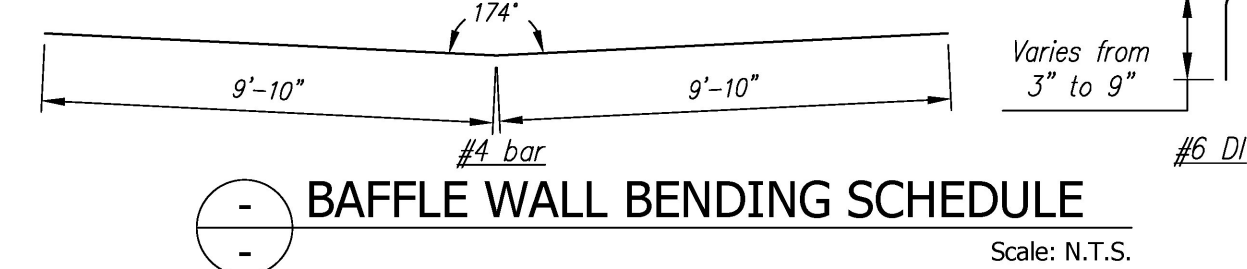
ELEVATION  
Scale: 1/4" = 1'-0"



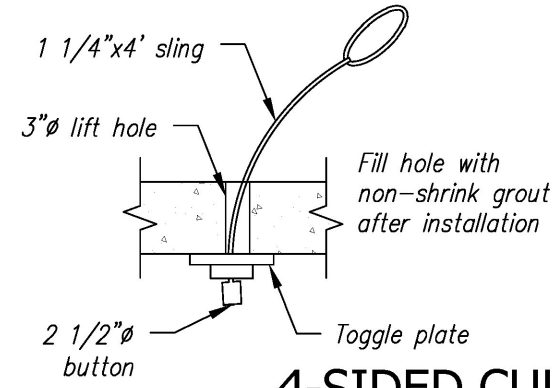
BAFFLE WALL SECTION  
Scale: N.T.S.



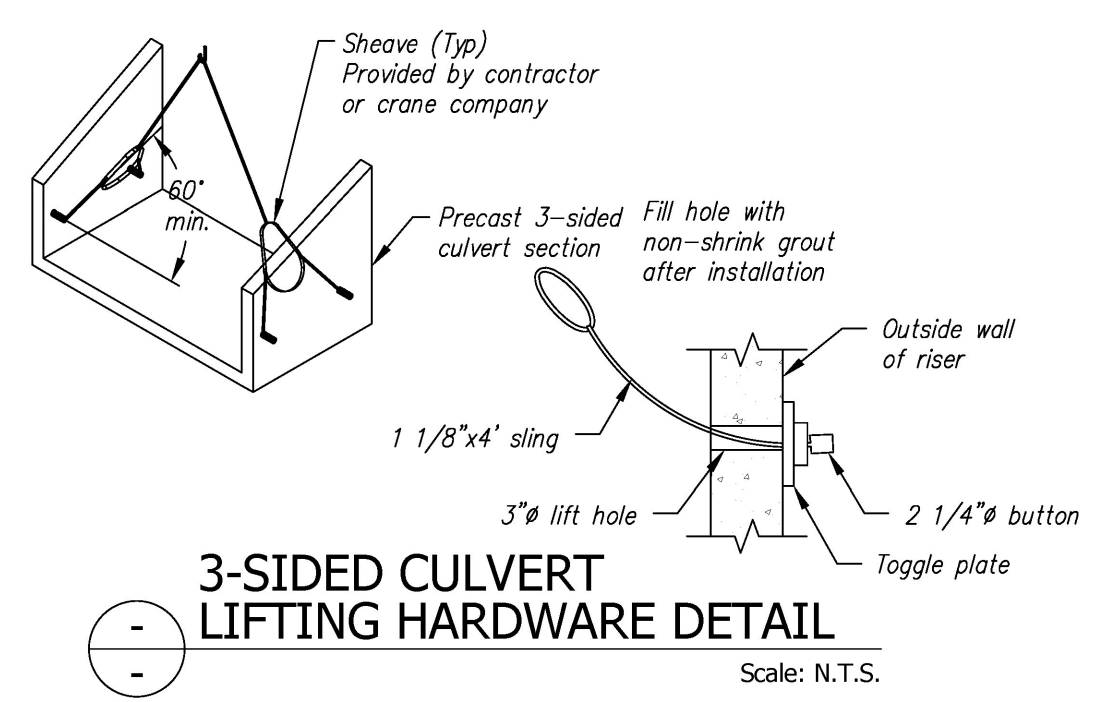
BAFFLE WALL DETAIL  
Scale: N.T.S.



BAFFLE WALL BENDING SCHEDULE  
Scale: N.T.S.



4-SIDED CULVERT LIFTING HARDWARE DETAIL  
Scale: N.T.S.

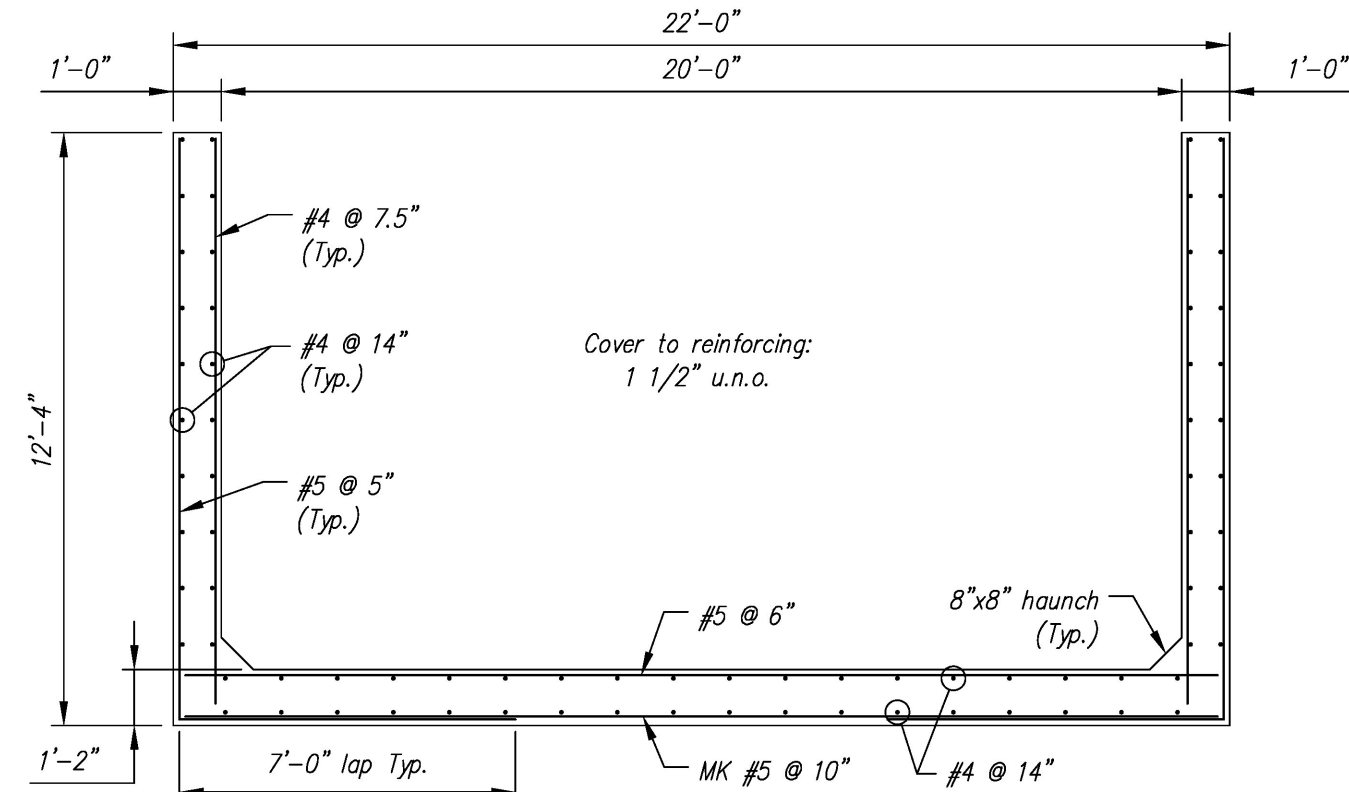


3-SIDED CULVERT LIFTING HARDWARE DETAIL  
Scale: N.T.S.

PIECE SCHEDULE (MK-FA5000SC30)					
MARK	QTY	LENGTH	YDS	WEIGHT	
B1	1	5.28	16.78	33.99	TONS
B2	7	5.56	15.39	31.16	TONS
B3	1	5.56	16.06	32.52	TONS
B4	1	6.27	11.91	24.12	TONS
WW1B	1	8.50	5.24	10.61	TONS
WW2B	1	9.00	5.39	10.91	TONS
F1B	1	19.18	3.74	7.57	TONS
F2B	1	19.86	3.88	7.86	TONS
F3B	1	22.00	2.44	4.94	TONS

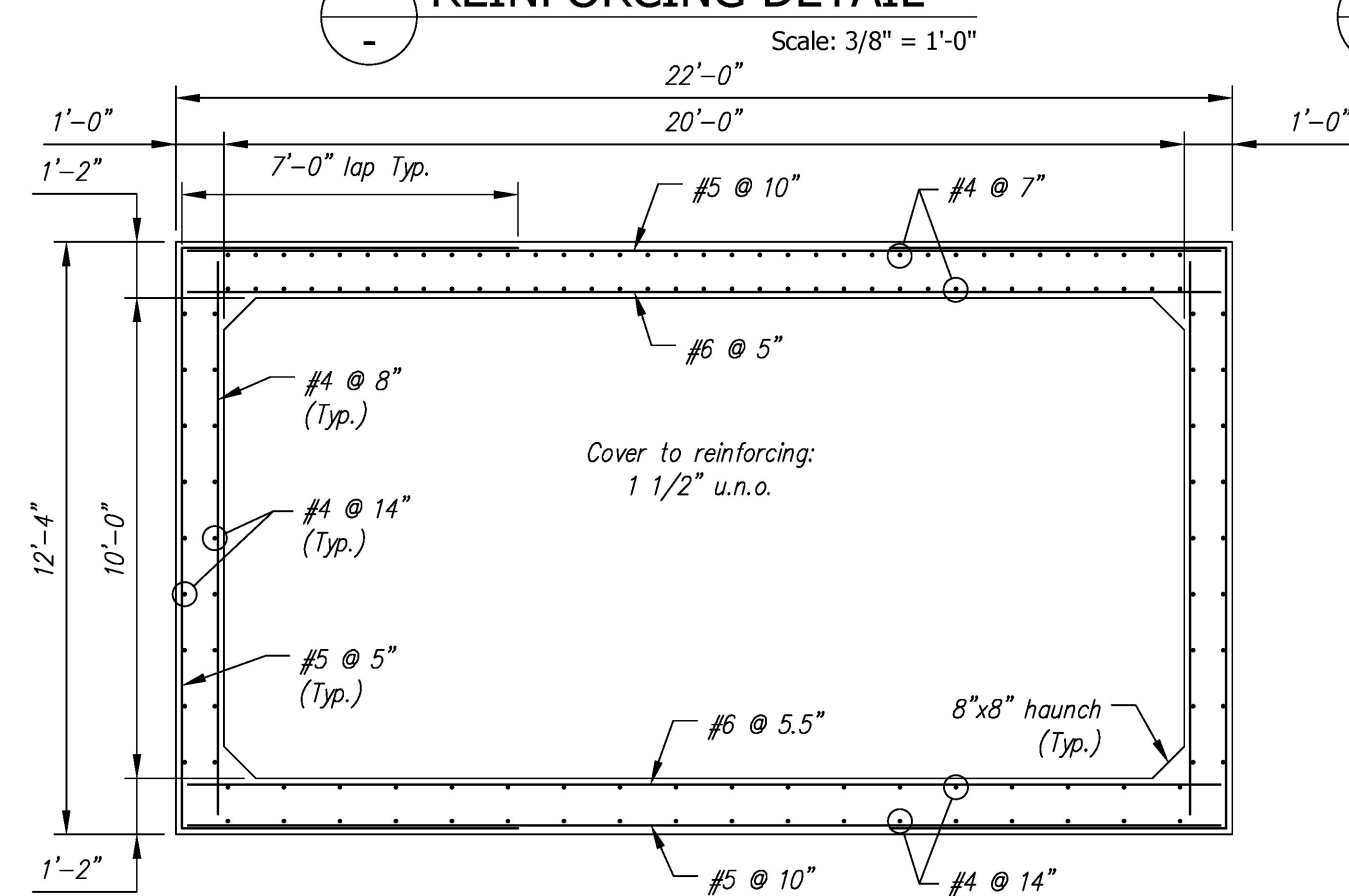
- WINGWALL GENERAL NOTES:
- Reference standard: AASHTO LRFD Specifications
  - Design Parameters:
    - Soil Bearing: 3300 psf
    - Earth Cover: 1.00 ft max.
    - Concrete: Design strength  $f'_c = 5000$  psi
    - Reinforcing: ASTM A615 (rebar), grade 60, Black
    - Soil: Unit weight = 140 pcf
    - Minimum lateral pressure coefficient .25
    - Maximum lateral pressure coefficient .50
  - Cover to reinforcing: 2" u.n.o.
  - The wingwalls have been designed for general site conditions. The project engineer shall be responsible for the structure's suitability to the existing site conditions and for the hydraulic evaluation, including scour and confirmation of soil conditions.
  - Prior to construction, contractor must verify all elevations shown through the engineer.

- GENERAL NOTES:
- Reference Standards: AASHTO "LRFD Bridge Design Specifications" ASTM C1577
  - Design Parameters:
    - Live load: HL-93
    - Earth Cover: 3' to 4'
    - Concrete: Design strength  $f'_c = 5000$  psi
    - Unit weight = 150 pcf
    - Reinforcing: ASTM A615 (rebar) GR 60, Black
    - Soil: Unit weight = 140 pcf
    - Minimum lateral pressure coefficient .25
    - Maximum lateral pressure coefficient .50
  - Cover to reinforcing: 2" headwalls
  - 1 1/2" culvert walls
  - 1 1/2" elsewhere u.n.o.
  - Dimensions include a joint gap. Actual culvert piece length is 1/8" shorter (i.e. B2 = 5'-6 1/4").
  - No dampproofing or waterproofing supplied by CSI.
  - DBS are Dowel Bar Splicers and DI are Dowel Ins. Both are supplied by CSI. DI's are to be installed and cut/bent in the field by others as required.
  - Headwalls are not designed for impact load.
  - Water repellent (Silane Siloxane) by CSI on all exposed faces of culvert, headwalls, and wingwalls.
  - Provide engineer a minimum fourteen (14) days notice prior to the start of fabrication and a detailed casting schedule.



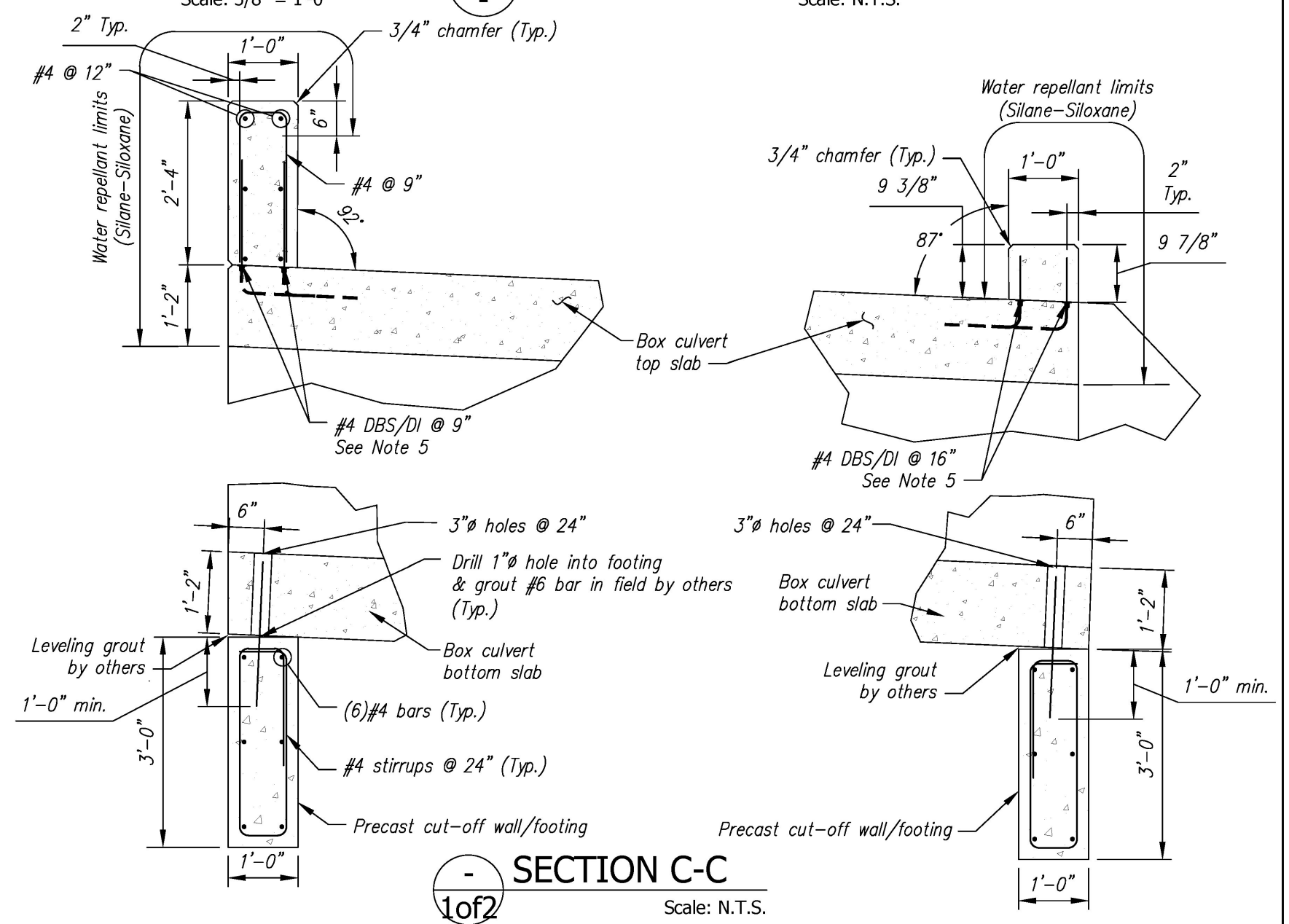
3-SIDED CULVERT REINFORCING DETAIL  
Scale: 3/8" = 1'-0"

3-SIDED CULVERT BENDING SCHEDULE  
Scale: N.T.S.



CULVERT REINFORCING DETAIL  
Scale: 3/8" = 1'-0"

BENDING SCHEDULE  
Scale: N.T.S.



SECTION C-C  
Scale: N.T.S.

Contractor is to verify that all information shown on drawings has been thoroughly checked, complies with the contract documents and is adequate to meet the field conditions. Some dimensions and details may differ slightly from contract drawings to accommodate the manufacturing or design process. Approval of this drawing indicates that any deviation from the contract documents has been reviewed and found to be acceptable. Production will not commence until receipt of signed, approved shop drawings.

This drawing contains information proprietary to CONCRETE SYSTEMS, INC. This drawing is disclosed with the understanding that it will be retained in confidence and its use limited solely to the purpose for which it is disclosed. It is understood that no reproduction of this drawing is authorized without permission from CONCRETE SYSTEMS, INC. and that it will be returned to CONCRETE SYSTEMS, INC. upon request.

Stamp for structural design only

Rev.	Date	DESCRIPTION	REVISIONS
5			
4			
3			
2			
1	01apr2015	WINGWALL ANCHORS WERE TYPE 'D', WINGWALLS WERE 10" THK	RY

This drawing is based upon information provided from the following documents and/or sources:

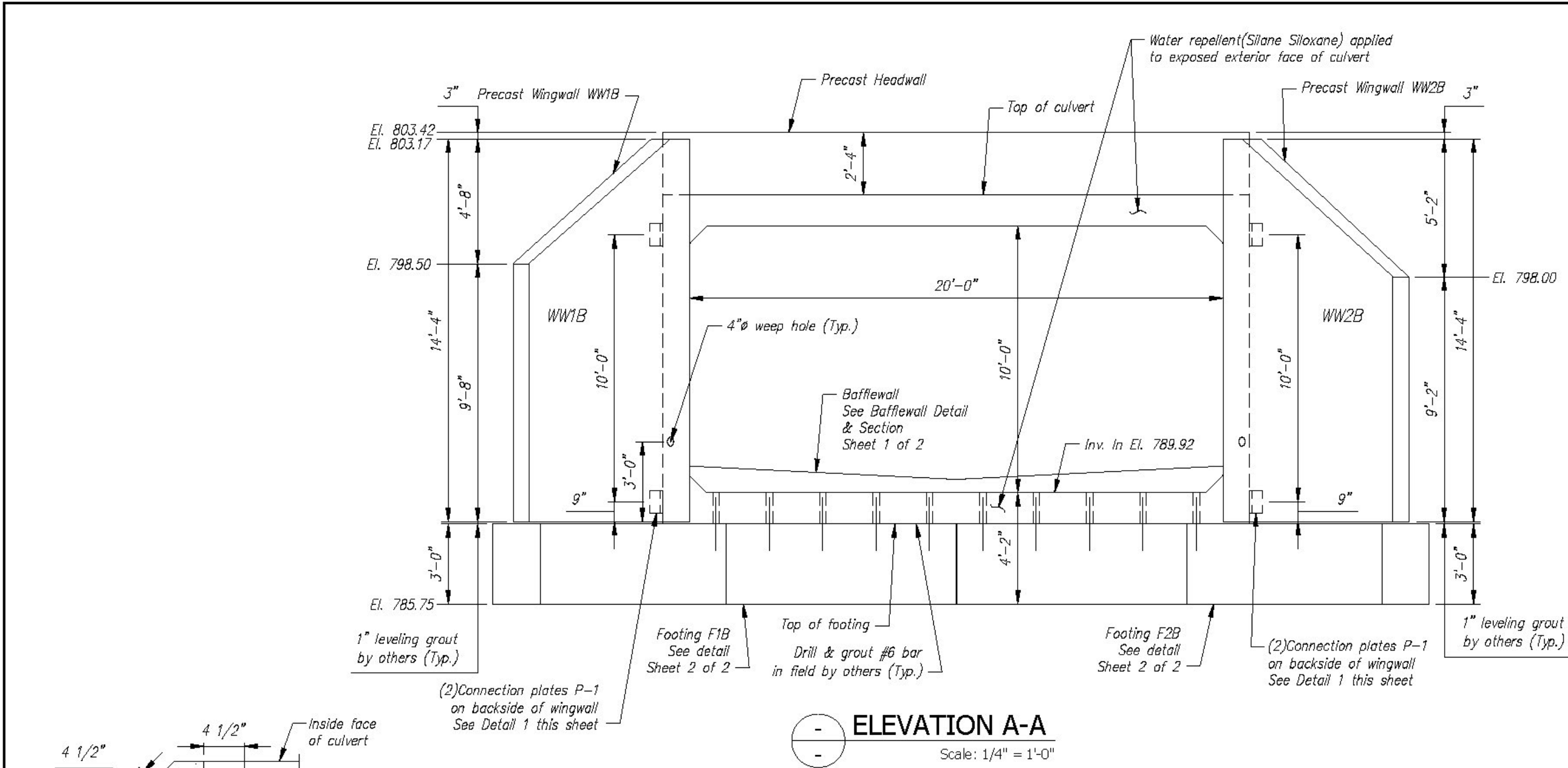
Engineer: STATE OF VT AOT PROGRAM DEVELOPMENT  
Project No: STPCULV30  
Drawings: VT/AOT PROPOSED IMPROVEMENT BRIDGE PROJECT SHEETS 1 THRU 24 & 32 OF 55  
Specifications: ----  
Other Sources: ----

Concrete Systems Inc.  
9 Commercial St., Hudson, NH 03051  
Phone 603-889-4163  
Fax 603-889-2417

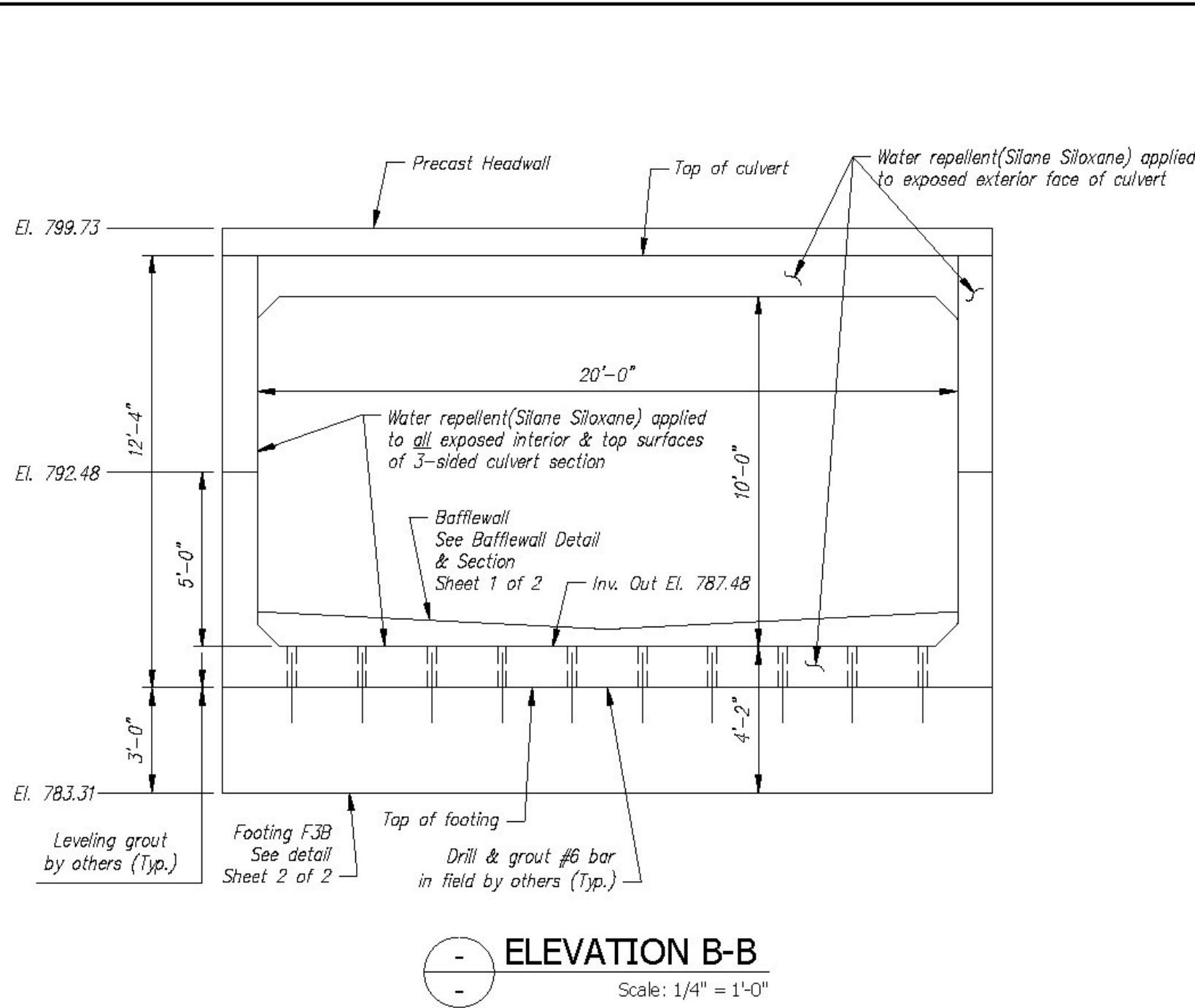
STATE AGENCY  
VTrans  
Drawn By: R. YEAGER  
Reviewed By:   
Date: 09MAR2015  
Approved By:   
Date:

J A McDONALD, INC.  
VT/AOT BRIDGE - STEEL CULVERT REPLACEMENT  
BRIDGE #7, VT ROUTE 58, IRASBURG, VT  
20' SPAN x 10' RISE BOX CULVERT LAYOUT  
C22283-L02A  
Quantity: 1  
Project No: STPCULV30  
SHEET 1B OF 2B

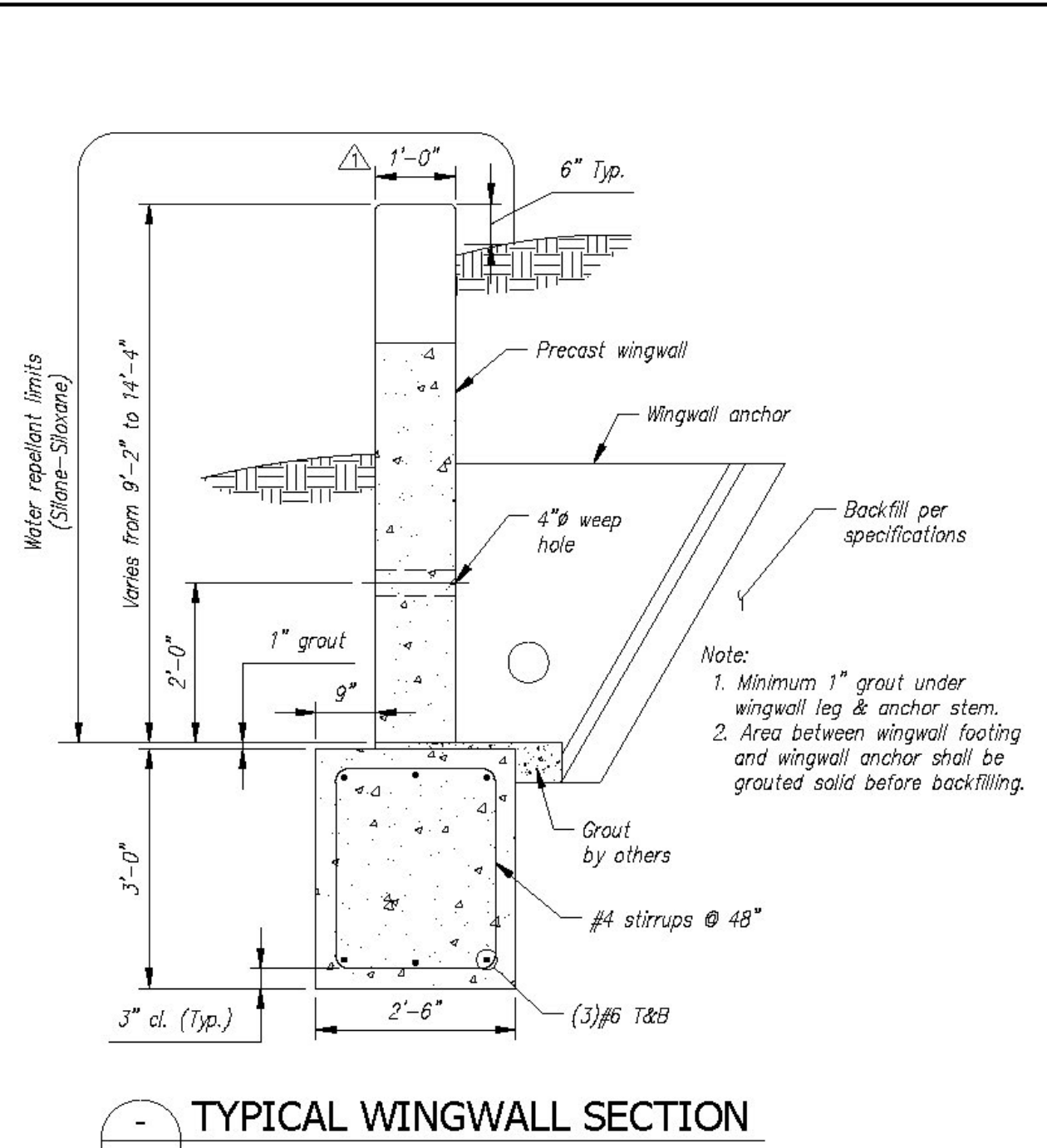




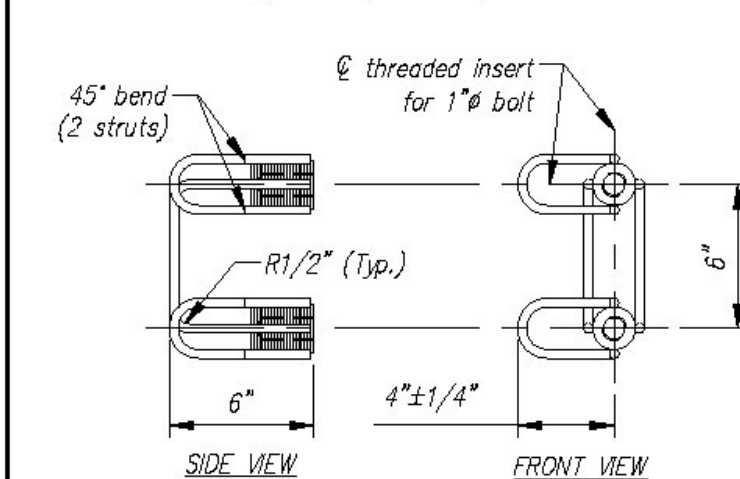
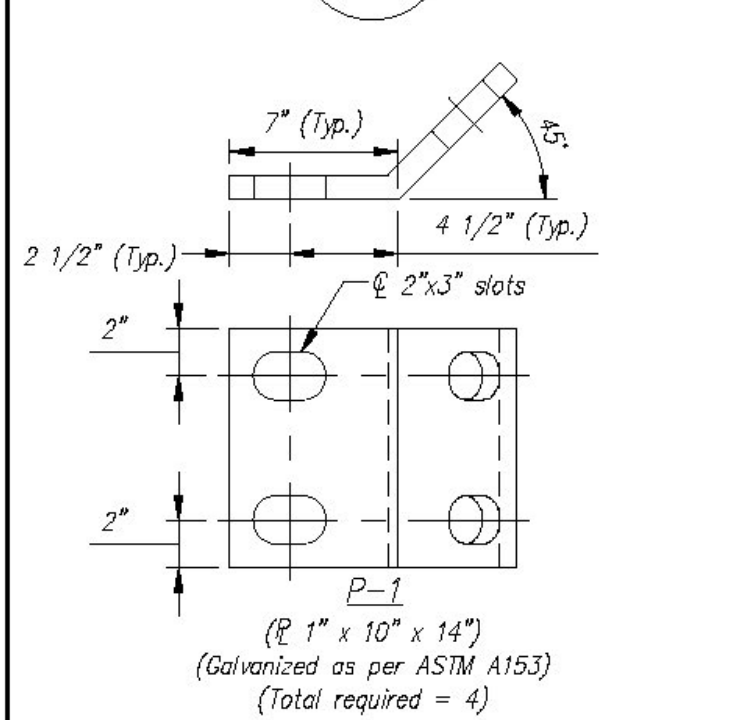
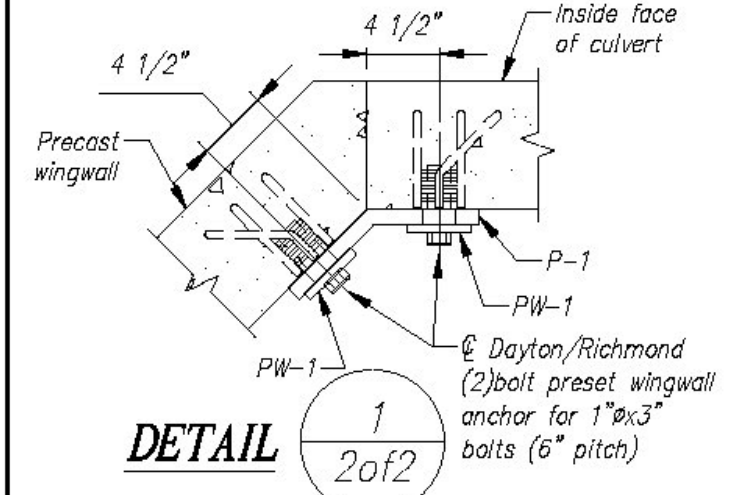
**ELEVATION A-A**  
Scale: 1/4" = 1'-0"



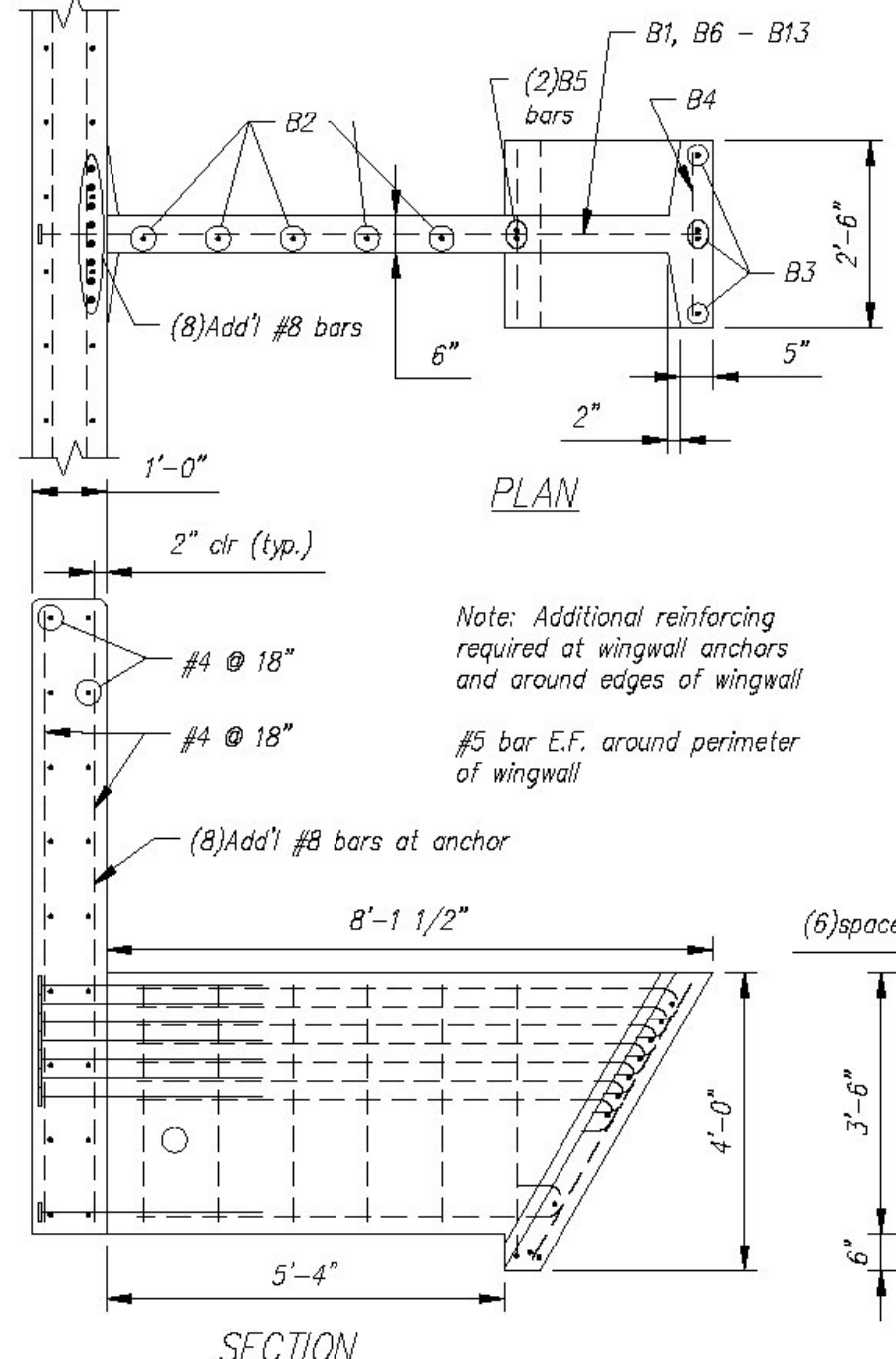
**ELEVATION B-B**  
Scale: 1/4" = 1'-0"



**TYPICAL WINGWALL SECTION**  
Scale: N.T.S.



**DAYTON/RICHMOND TWO BOLT PRESET ANCHOR**

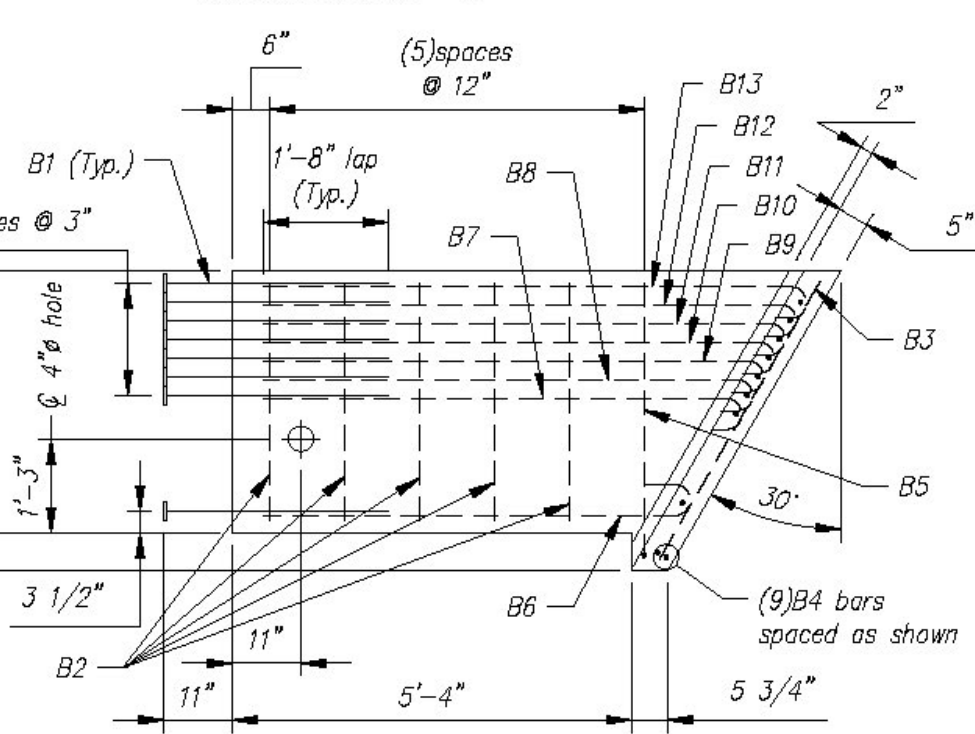


**PLAN**

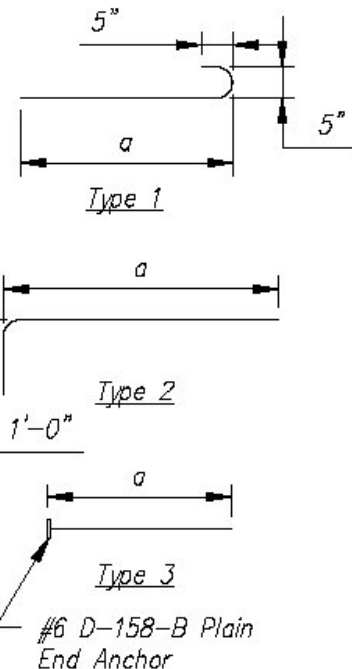
Note: Additional reinforcing required at wingwall anchors and around edges of wingwall  
#5 bar E.F. around perimeter of wingwall

BAR LIST					
MARK	QTY.	SIZE	a	TYPE	LENGTH
B1	8	#6	3'-0"	3	---
B2	4	#5	---	Str.	3'-2"
B3	4	#5	---	Str.	4'-3"
B4	11	#5	---	Str.	2'-2"
B5	2	#5	3'-8"	2	---
B6	1	#5	6'-2"	1	---
B7	1	#5	6'-9"	1	---
B8	1	#5	6'-11"	1	---
B9	1	#5	7'-1"	1	---
B10	1	#5	7'-3"	1	---
B11	1	#5	7'-5"	1	---
B12	1	#5	7'-6"	1	---
B13	1	#5	7'-8"	1	---

Note: "Str." denotes straight bar. Standard clearance = 2"



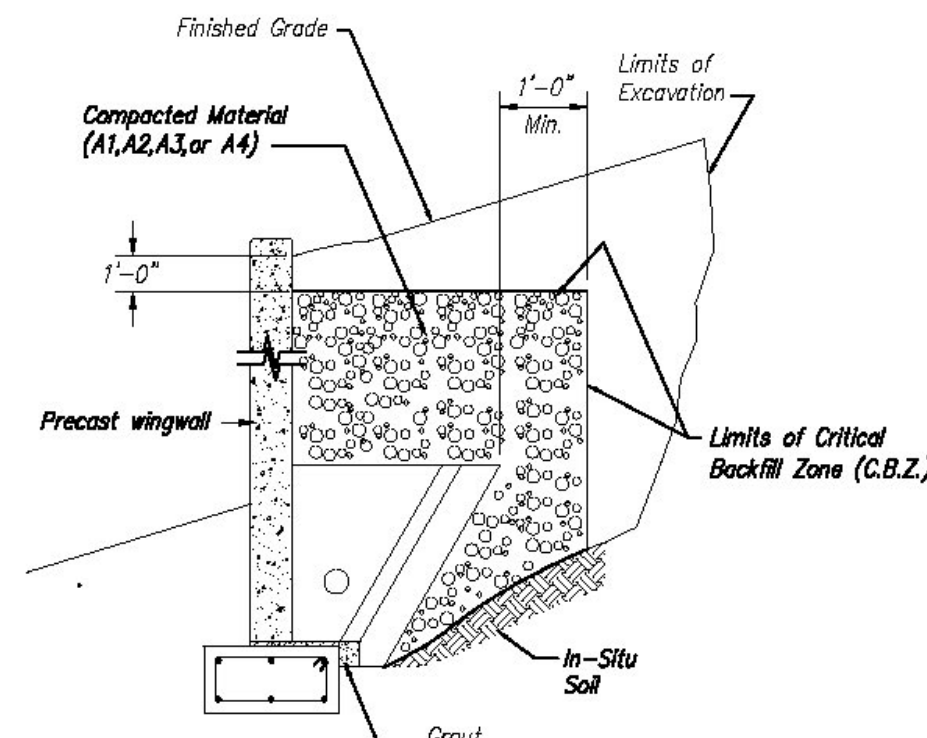
**PRECAST ANCHOR TYPE F**



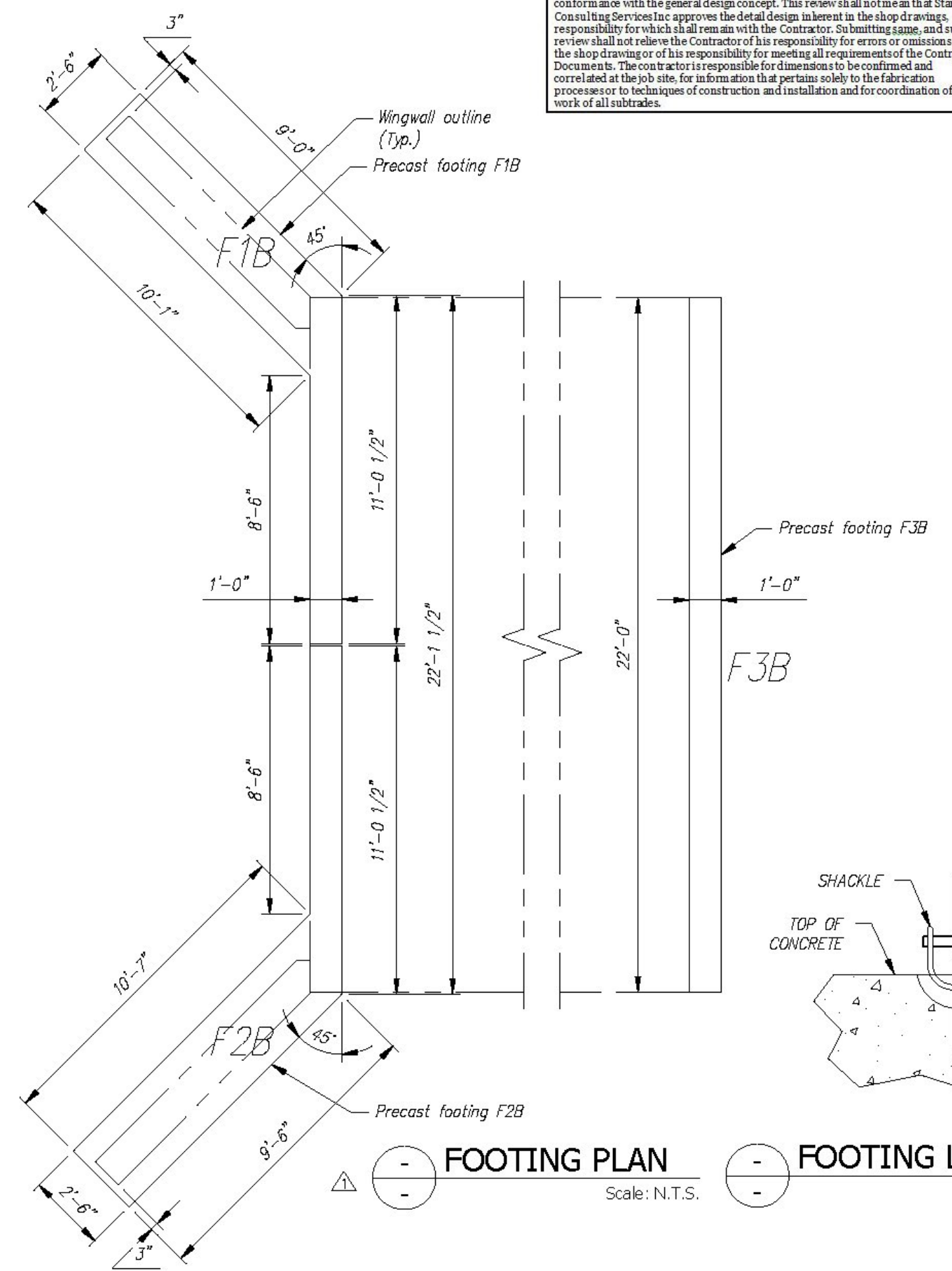
Vermont Agency of Transportation  
**RECEIVED**  
ON: April 30, 2015  
and Checked for CONFORMANCE  
BY: Mark Sargent DATE: 5/7/2015

BACKFILL DESCRIPTION						
Group Classification	A-1	A-3	A-2	A-2	A-2	A-2
	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7
Sieve Analysis, Percent Passing						
No. 10	50 max.					
No. 40	30 max.	50 max.	51 min.			
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.
Characteristics of Fraction Passing						
No. 40			40 max.	41 min.	40 max.	41 min.
Liquid Limit						
Plasticity Index	6 max.	N.P.	10 max.	10 max.	11 min.	11 min.
Usual Types of Significant Constituent Materials	Stone Fragments, Gravel & Sand	Fine Sand	Silty or Clayey Gravel and Sand			
General Rating as Subgrade		Excellent to Good				

- NOTES  
1. BACKFILLING OPERATIONS WITHIN THE C.B.Z. SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH).  
2. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS.  
3. BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY.

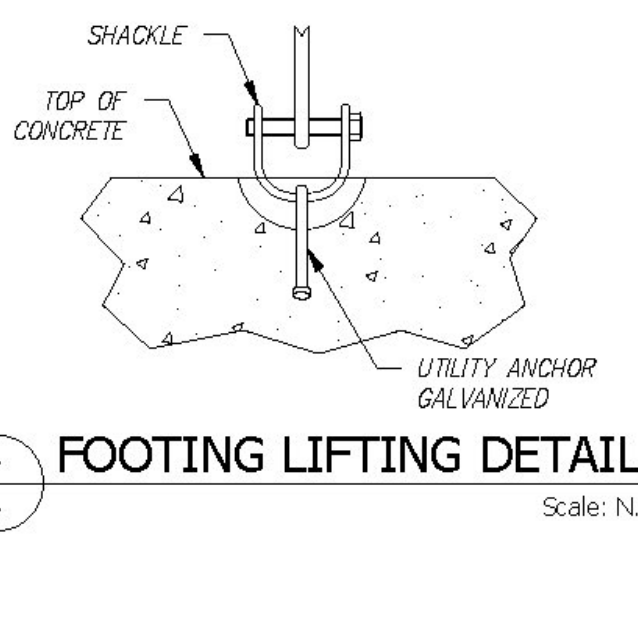


**WINGWALL BACKFILL REQUIREMENTS**



**FOOTING PLAN**

Scale: N.T.S.

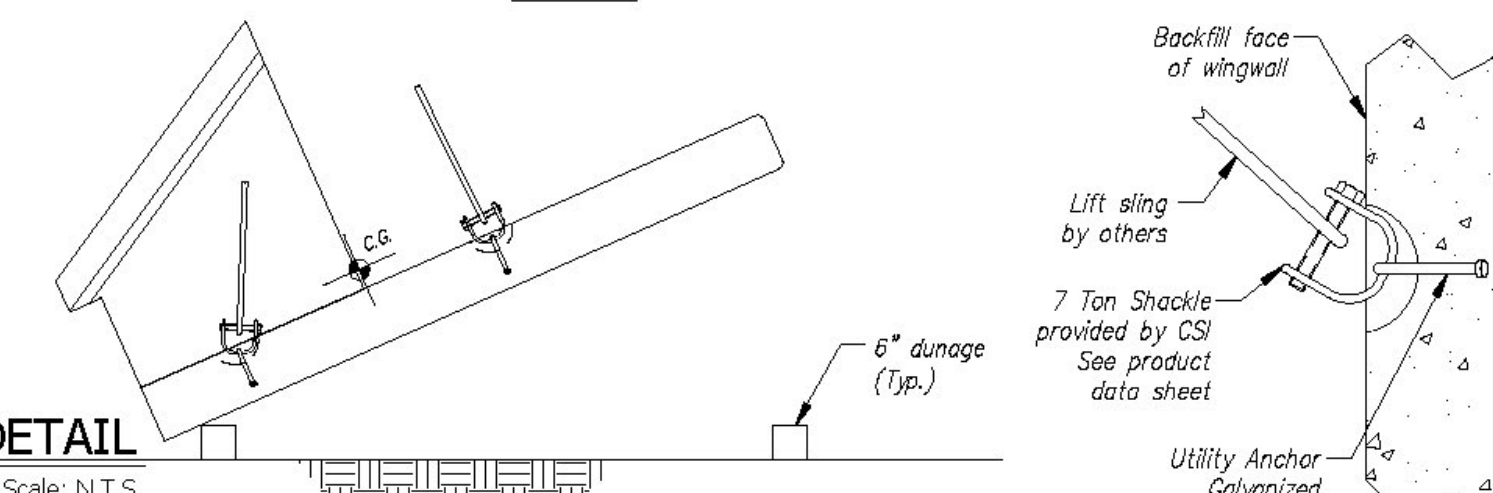


**FOOTING LIFTING DETAIL**

Scale: N.T.S.

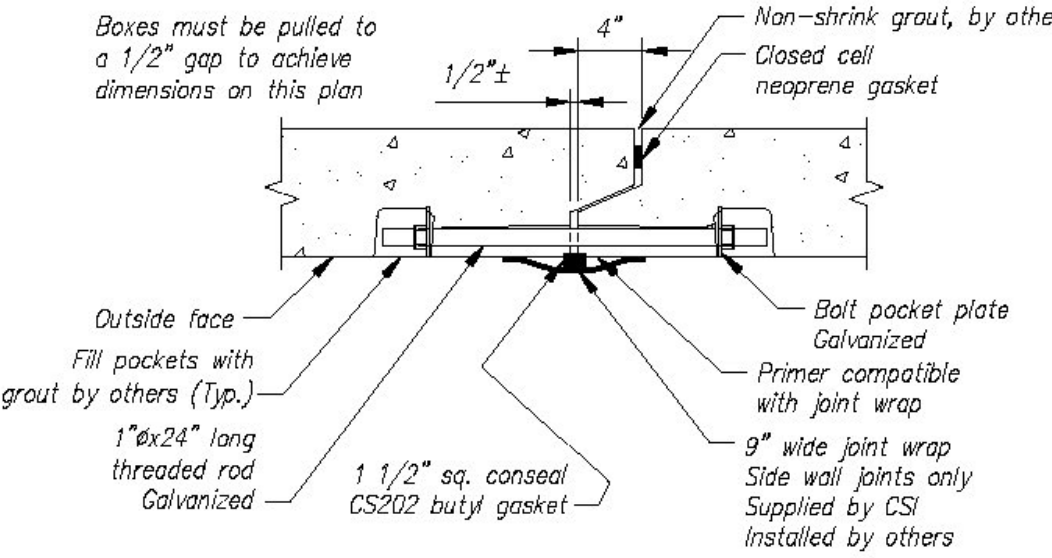


**WINGWALL OFFLOADING & TRIPPING DETAIL**



**WINGWALL LIFTING DETAIL**

Scale: N.T.S.



**CLOSURE HARDWARE DETAIL**

Scale: N.T.S.

Contractor is to verify that all information shown on drawings has been thoroughly checked, complies with the contract documents and is adequate to meet the field conditions. Some dimensions and details may differ slightly from contract drawings to accommodate the manufacturing or design process. Approval of this drawing indicates that any deviation from the contract documents has been reviewed and found to be acceptable. Production will not commence until receipt of signed, approved shop drawings.

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Stamp for structural design only

Rev.	Date	DESCRIPTION	By
5			
4			
3			
2			
1	01APR2015	WINGWALL ANCHORS WERE TYPE "D", WINGWALLS WERE 10" THK	RY
REVISIONS			

This drawing is based upon information provided from the following documents and/or sources:

Engineer: STATE OF VT AOT PROGRAM DEVELOPMENT  
Project No: STPCULV30  
Drawings: VT/AOT PROPOSED IMPROVEMENT BRIDGE PROJECT  
SHEETS 1 THRU 24 & 32 OF 55

Specifications: ----  
Other Sources: ----

**CSI**  
Concrete Systems Inc.  
9 Commercial St., Hudson, NH 03051  
Phone 603-889-4169  
Fax 603-889-2417

STATE AGENCY  
**VTrans**  
Reviewed By: R. YEAGER  
Date: 09MAR2015  
Approved by: _____  
Date: _____

J A MCDONALD, INC.  
VT/AOT BRIDGE - STEEL CULVERT REPLACEMENT  
BRIDGE #7, VT ROUTE 58, IRASBURG, VT

20' SPAN x 10' RISE BOX CULVERT LAYOUT  
C22283-L02B

Quantity: 1 Project: No. STPCULV30 SHEET 2B OF 2B