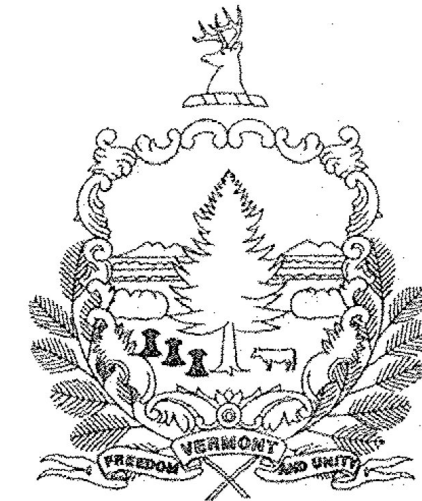


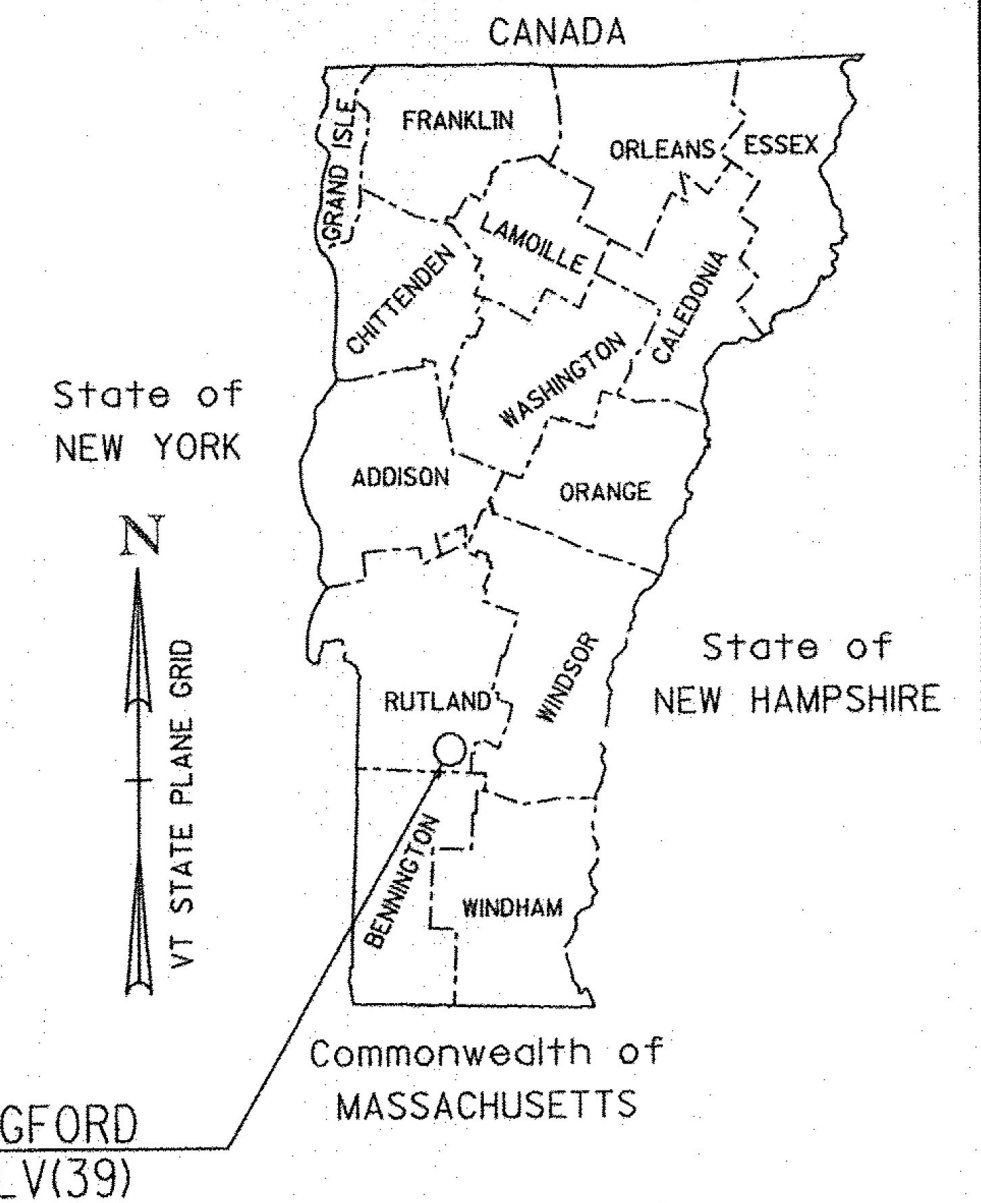
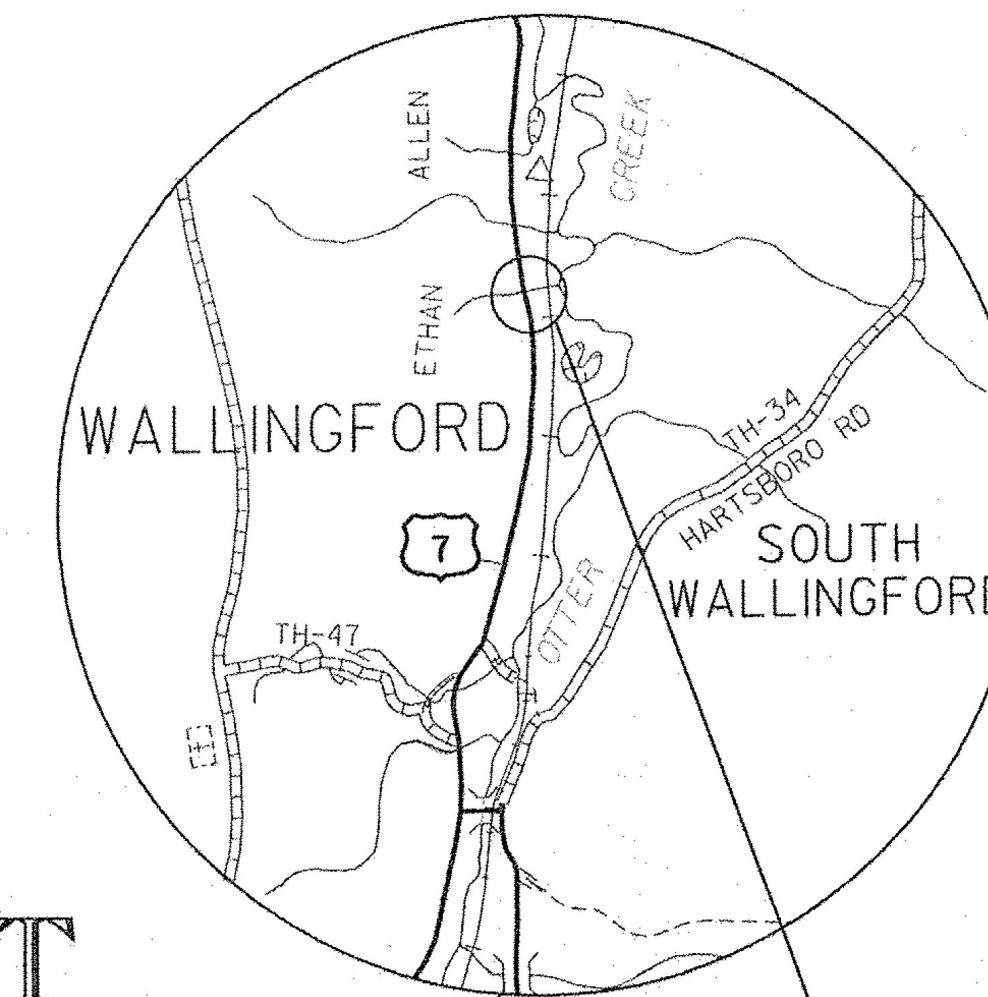
FOR INDEX AND VAOT  
STANDARD SHEETS, REFER  
TO SHEET 2

# STATE OF VERMONT AGENCY OF TRANSPORTATION



## PROPOSED IMPROVEMENT CULVERT REPLACEMENT PROJECT

### TOWN OF WALLINGFORD COUNTY OF RUTLAND BRIDGE NO.73A AND RR CULVERT C06470 WALLINGFORD ER CULV(39) U.S.ROUTE 7 (PRINCIPAL ARTERIAL)



PROJECT LOCATION: BRIDGE NO. 73A WALLINGFORD ER CULV(39) IS LOCATED AT MILE MARKER 2.12 ON U.S. ROUTE 7, 3.2 MILES SOUTH OF THE INTERSECTION OF U.S. ROUTE 7 AND VERMONT ROUTE 140. EXISTING RAILROAD CULVERT IS LOCATED DIRECTLY DOWNSTREAM FROM BRIDGE NO. 73A.

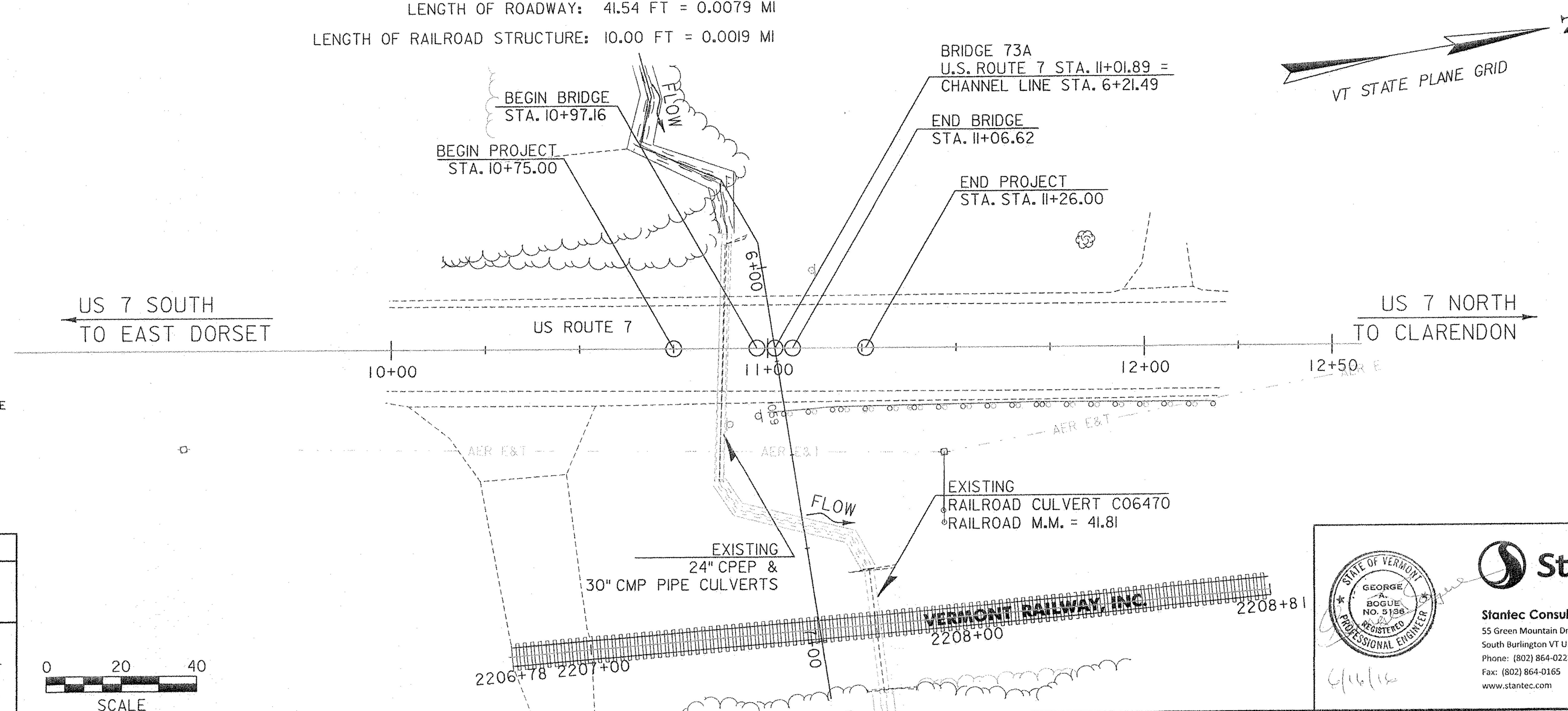
PROJECT DESCRIPTION: REPLACEMENT OF EXISTING 24" CPEP & 30" CMP PIPE CULVERTS BENEATH US ROUTE 7 WITH AN 8' x 6' PRECAST CONCRETE STRUCTURE. CONSTRUCTION OF AN 8' x 6' PRECAST BOX CULVERT JUST SOUTH OF EXISTING 3' x 4' STONE BOX CULVERT BENEATH THE RAILROAD.

LENGTH OF PROJECT: 51.00 FT = 0.0100 MI

LENGTH OF BRIDGE NO. 73A STRUCTURE: 9.46 FT = 0.0018 MI

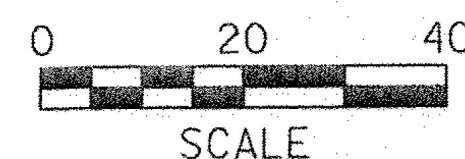
LENGTH OF ROADWAY: 41.54 FT = 0.0079 MI

LENGTH OF RAILROAD STRUCTURE: 10.00 FT = 0.0019 MI



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 : VSE	
SURVEYED DATE : AUGUST 2012	
DATUM	
VERTICAL	NAVD 88 (GEOID12) FT
HORIZONTAL	NAD 83 (2011) SPC (4400 VT) sFT



**Record Plans**  
Contractor: THE BELDEN COMPANY, INC.  
Resident Engineer: CHRISTOPHER D WILLIAMS  
Construction Began: JULY 10, 2017  
Construction Complete: OCTOBER 15, 2018  
Record Plans By: PAUL KUEHN

I hereby certify that all construction required by this set of drawings has been accomplished as indicated herein.

BY: e-Signed by Christopher Williams on 2018-10-26 14:38:48 GMT Resident Engineer

Date: October 26, 2018

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.

 <b>Stantec</b> 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  DATE 7/19/2018
	PROJECT MANAGER : KEN UPMAL, PE
	PROJECT NAME : WALLINGFORD PROJECT NUMBER : ER CULV (39)
SHEET 1 OF 36 SHEETS	

# PRELIMINARY INFORMATION SHEET (BRIDGE) - US 7 BR 73A

BRIDGE QUANTITIES

FINAL HYDRAULIC REPORT

**INDEX OF SHEETS**

SHEET NO.	SHEET TITLE
1	TITLE SHEET
2	PRELIMINARY INFORMATION SHEET - US 7 BR73A
3-4	PROJECT NOTES 1-2
5-6	QUANTITY SHEETS 1-2
7	CONVENTIONAL SYMBOLOLOGY LEGEND
8	TYPICAL SECTIONS - BR73A
9	SURVEY CONTROL AND TIES
10	LAYOUT PLAN - BRIDGE NO. 73A
11	ROADWAY PROFILE
12	STREAM PROFILE
13	STRUCTURAL PLAN & DETAILS - BR73A
14	PRELIMINARY INFORMATION SHEET - C06470
15	TYPICAL SECTIONS - RR CULV C06470
16	LAYOUT PLAN - RR CULV C06470
17	STRUCTURAL PLAN/DET. - RR CULV C06470
18	TRAFFIC CONTROL
19	BORING PLAN
20-23	BORING LOG 1-4
24-25	US ROUTE 7 CROSS SECTIONS 1-3
26	RAILROAD CROSS SECTIONS
27-28	STREAM CROSS SECTIONS 1-2
29	EPSC NARRATIVE
30	EPSC PLAN
31-32	EPSC DETAILS 1-2
33	PROJECTS IMPACTS PLAN
34	PROJECTS IMPACTS PLAN 2
35	ROW DETAIL SHEET #1
36	ROW LAYOUT PLAN #1

**VAOT STANDARD SHEETS**

NO.	TITLE	DATE
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	08/08/95
E-171A	TRAFFIC CONTROL SIGNALS GENERAL NOTES & DETAILS	08/09/95
E-172	VEHICLE DETECTOR LOOP DETAILS	08/09/95
E-191	PAVEMENT MARKING DETAILS	02/01/99
E-192	PAVEMENT MARKING DETAILS	10/12/00
E-193	PAVEMENT MARKING DETAILS	08/18/95
G-1	STEEL BEAM GUARDRAIL DETAIL (POST, DELINEATOR, TYPICALS)	11/10/15
G-19	GENERIC GRADING PLANS FOR GUARDRAIL END TERMINALS	11/15/02
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	02/10/14
T-1	TRAFFIC CONTROL GENERAL NOTES	04/25/16
T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	08/06/12
T-28	CONSTRUCTION SIGN DETAILS	08/06/12
T-30	CONSTRUCTION SIGN DETAILS	08/06/12
T-35	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS	08/06/12
T-36	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS FOR PAVING	08/06/12
T-42	BRIDGE NUMBER PLAQUE	04/09/14
T-45	SQUARE TUBE SIGN POST AND ANCHOR	01/02/13

**STRUCTURE DETAIL SHEETS**

NO.	TITLE	DATE
SD-366.00	LONGSPAN STEEL BEAM GUARDRAIL, GALVANIZED	01/03/14
SD-501.00	CONCRETE DETAILS AND NOTES	02/09/12
SD-502.00	CONCRETE DETAILS AND NOTES	10/10/12

**HIGHWAY SAFETY & DESIGN DETAIL**

NO.	TITLE	DATE
HSD-400.01	SAFETY EDGE DETAILS	03/29/16
HSD-621.06	GUARDRAIL TERMINAL LABEL DETAIL	11/03/15

**HYDROLOGIC DATA**

Date: November 2014

DRAINAGE AREA: 0.8 sq. mi.  
CHARACTER OF TERRAIN: Hilly to mountainous, mostly forested with some open areas  
STREAM CHARACTERISTICS: Small, intermittent, sinuous  
NATURE OF STREAMBED: Gravel, cobbles and sand

**PEAK FLOW DATA**

Q 2.33 =	70 cfs	Q 50 =	185 cfs
Q 10 =	130 cfs	Q 100 =	205 cfs
Q 25 =	160 cfs	Q 500 =	270 cfs

DATE OF FLOOD OF RECORD: Unknown  
ESTIMATED DISCHARGE: Unknown  
WATER SURFACE ELEV.: Unknown  
NATURAL STREAM VELOCITY: @ Q50 = 8.1 fps  
ICE CONDITIONS: Moderate  
DEBRIS: Moderate  
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Yes  
IS ORDINARY RISE RAPID? Yes  
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes  
IF YES, DESCRIBE: This site may be in the Otter Creek floodplain. Floodwaters from that river may affect this site.

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

**EXISTING STRUCTURE INFORMATION**

STRUCTURE TYPE: 24" CPEP(SL) above 30" CMP  
YEAR BUILT: Unknown  
CLEAR SPAN(NORMAL TO STREAM): 24" and 30"  
VERTICAL CLEARANCE ABOVE STREAMBED: 24" and 30"  
WATERWAY OF FULL OPENING: 3.1 sq. ft. and 4.9 sq. ft. = 8.0 sq. ft. total  
DISPOSITION OF STRUCTURE: Remove and replace with a new structure  
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

**WATER SURFACE ELEVATIONS AT:**

Q2.33 =	587.3'	VELOCITY =	10.5 fps *
Q10 =	588.1'	"	6.8 fps *
Q25 =	588.2'	"	6.5 fps *
Q50 =	588.3'	"	6.6 fps *
Q100 =	588.4'	"	6.4 fps *

\*Pipe barrel of 24" PCP

LONG TERM STREAMBED CHANGES: None noted.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes  
FREQUENCY: Below Q10  
RELIEF ELEVATION: 587.5'  
DISCHARGE OVER ROAD @Q100: 160 cfs

**UPSTREAM STRUCTURE**

TOWN: N/A - Stream divides DISTANCE: \_\_\_\_\_  
HIGHWAY #: \_\_\_\_\_ STRUCTURE #: \_\_\_\_\_  
CLEAR SPAN: \_\_\_\_\_ CLEAR HEIGHT: \_\_\_\_\_  
YEAR BUILT: \_\_\_\_\_ FULL WATERWAY: \_\_\_\_\_  
STRUCTURE TYPE: \_\_\_\_\_

**DOWNSTREAM STRUCTURE**

TOWN: Wallingford DISTANCE: 75'  
HIGHWAY #: VT Railway STRUCTURE #: C06470  
CLEAR SPAN: 3' CLEAR HEIGHT: 2'  
YEAR BUILT: N/A FULL WATERWAY: 4 sq. ft.  
STRUCTURE TYPE: Box

**LRFR LOAD RATING FACTORS**

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEM
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:	TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER						

SEE SHEET 3 FOR CULVERT DESIGN CRITERIA

**PROPOSED STRUCTURE**

STRUCTURE TYPE: Precast concrete box

CLEAR SPAN(NORMAL TO STREAM): 8.0'  
VERTICAL CLEARANCE ABOVE STREAMBED: 4.5'  
WATERWAY OF FULL OPENING: 36 sq. ft.

**WATER SURFACE ELEVATIONS AT:**

Q2.33 =	581.6'	VELOCITY =	5.4 fps *
Q10 =	582.7'	"	7.3 fps *
Q25 =	583.2'	"	7.6 fps *
Q50 =	583.7'	"	7.8 fps *
Q100 =	584.0'	"	7.9 fps *

\* Within box culvert

IS THE ROADWAY OVERTOPPED BELOW Q100: No  
FREQUENCY: Above Q100  
RELIEF ELEVATION: 587.6'  
DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 584.4' at the inlet  
VERTICAL CLEARANCE: @ Q50 = 0.6'

SCOUR: Not applicable for a box.

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

**PERMIT INFORMATION**

AVERAGE DAILY FLOW: 2 cfs DEPTH OR ELEVATION:  
ORDINARY LOW WATER: 1 cfs Depth < 0.1'  
ORDINARY HIGH WATER: 30 cfs Depth = 1'

**TEMPORARY BRIDGE REQUIREMENTS**

STRUCTURE TYPE: No temporary bridge required. Using phased construction.  
CLEAR SPAN (NORMAL TO STREAM): \_\_\_\_\_  
VERTICAL CLEARANCE ABOVE STREAMBED: \_\_\_\_\_  
WATERWAY AREA OF FULL OPENING: \_\_\_\_\_

**ADDITIONAL INFORMATION**

Hydraulics at this site may be affected by tailwater due to the Otter Creek. The unnamed stream is anticipated to peak prior to the Otter Creek, therefore this report does not consider Otter Creek tailwater in predicting water surface elevations. Water surface elevations may be higher than reported if tailwater conditions exist.

**DESIGN VALUES**

1. DESIGN LIVE LOAD	HL-93
2. FUTURE PAVEMENT	d <sub>p</sub> : 3.0 INCH
3. DESIGN SPAN	L: 8.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ: ---
5. PRESTRESSING STRAND	f <sub>y</sub> : ---
6. PRESTRESSED CONCRETE STRENGTH	f'c: ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'ci: ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'c: ---
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'c: 4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'c: ---
11. CONCRETE, CLASS C	f'c: ---
12. REINFORCING STEEL	f <sub>y</sub> : 60 KSI
13. STRUCTURAL STEEL AASHTO M270	f <sub>y</sub> : ---
14. SOIL UNIT WEIGHT	γ: 0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q <sub>n</sub> : 6.0 KSF
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: 0.45
17. NOMINAL BEARING RESISTANCE OF ROCK	q <sub>n</sub> : ---
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: ---
19. NOMINAL AXIAL PILE RESISTANCE	q <sub>p</sub> : ---
20. PILE YIELD STRENGTH ASTM A572	f <sub>y</sub> : ---
21. PILE SIZE	---
22. EST. PILE LENGTH	L <sub>p</sub> : ---
23. PILE RESISTANCE FACTOR	φ: ---
24. LATERAL PILE DEFLECTION	Δ: ---
25. BASIC WIND SPEED	V <sub>3s</sub> : ---
26. MINIMUM GROUND SNOW LOAD	p <sub>g</sub> : ---
27. SEISMIC DATA	PGA: --- S <sub>s</sub> : ---

PROJECT NAME: WALLINGFORD

PROJECT NUMBER: ER CULV(39)

FILE NAME: z\_wallingford\_pi.xlsm PLOT DATE: 2/19/2016  
PROJECT LEADER: G. BOGUE DRAWN BY: J. SOTER  
DESIGNED BY: M. CHENETTE CHECKED BY:  
PRELIMINARY INFORMATION SHEET - US 7 BR 73A SHEET 2 OF 36

**TRAFFIC DATA**

YEAR	ADT	DHV	% D	% T	ADTT	ESAL
2013	4300	480	54	11.6	510	3,331,000
2033	4600	530	54	17.3	820	7,480,000

20 year ESAL for flexible pavement from 2013 to 2033 : 3,331,000  
40 year ESAL for flexible pavement from 2103 to 2053 : 7,480,000  
Design Speed : 50 mph

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

**GENERAL NOTES**

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, US ROUTE 7, BR 73A SHALL BE DESIGNED IN ACCORDANCE WITH THE 7TH EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND ITS LATEST REVISIONS. RR CULVERT C06470 SHALL BE DESIGNED IN ACCORDANCE WITH THE AREMA 2015 MANUAL FOR RAILWAY ENGINEERING.
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. ALL PRECAUTIONS SHALL BE TAKEN TO PREVENT SILTATION OR POLLUTION INTO THE STREAM. REFER TO STANDARD SPECIFICATIONS, SECTION 105. ALL WATER PUMPED FROM EXCAVATION AREA SHALL BE CLARIFIED PRIOR TO BEING ALLOWED TO MIX WITH THE STREAM FLOW. VERMONT WATER QUALITY STANDARDS SHALL BE MAINTAINED AT ALL TIMES. PAYMENT FOR CLARIFICATION OF WATER WILL BE CONSIDERED INCIDENTAL TO EPSC ITEMS.
5. IN-STREAM CONSTRUCTION SHALL OCCUR ONLY WITHIN THE TIMEFRAME OUTLINED IN THE PROJECT PERMITS, WHICH ARE INCLUDED IN THE PROPOSAL. 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.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STAGING SCHEDULE. ALL WORK MUST BE DONE IN THE DRY AND ALL CULVERT SECTIONS AND BED MATERIAL SHALL BE COMPLETELY INSTALLED BEFORE THE STREAM IS ALLOWED TO FLOW THROUGH THEM. THE CONTRACTOR SHALL PREPARE AND SUBMIT A TEMPORARY STREAM DIVERSION PLAN TO CARRY THE STREAM DURING CONSTRUCTION. THE PLAN SHALL DEPICT MEASURES PROPOSED TO PREVENT EROSION AND SEDIMENTATION AND MAINTAIN STREAM WATER QUALITY. THE STREAM DIVERSION, INCLUDING ANY TEMPORARY PIPING OR DEWATERING, SHALL BE PAID UNDER ITEM 900.645 SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM).
7. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT CONTINUOUS COORDINATION WITH THE RAILROAD OPERATOR, VERMONT RAILWAY INC. (VTR), WILL BE REQUIRED THROUGHOUT CONSTRUCTION. VTR WILL PROVIDE THE CONTRACTOR WITH FLAGGERS FOR PROTECTION OF RAILROAD TRAFFIC WHILE WORK IS BEING PERFORMED ON THE RAILROAD RIGHT-OF-WAY (R.O.W.) THE CONTRACTOR SHALL NOT ENTER THE R.O.W. AT ANY TIME WITHOUT VTR AUTHORIZATION. ALL COSTS FOR RAILROAD FLAGGER PROTECTION AND RAILROAD COORDINATION WILL BE PAID FOR UNDER ITEM 900.650, SPECIAL PROVISION (MAINTENANCE OF RAILROAD TRAFFIC) (N.A.B.I.).
8. LAYOUT FOR THIS PROJECT SHALL BE ESTABLISHED USING THE EXISTING HORIZONTAL AND VERTICAL CONTROL POINTS DEFINED ON THE TIE SHEET AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COST OF PERFORMING THIS WORK WILL BE CONSIDERED INCIDENTAL TO ALL OTHER CONTRACT ITEMS.
9. BEGIN BRIDGE/END BRIDGE STATIONS ARE BASED ON AN ASSUMED 1'-0" WALL THICKNESS.

**PRECAST CONCRETE BOX CULVERTS AND WINGWALLS**

1. THE BOX CULVERTS FOR BRIDGE 73A AND C06470, INCLUDING THE SILLS, HEADWALLS, CUTOFF WALLS AND WINGWALLS WILL BE PAID FOR UNDER THE APPROPRIATE ITEM 540.10, PRECAST CONCRETE STRUCTURE. DESIGN OF THESE CULVERTS SHALL BE THE RESPONSIBILITY OF THE FABRICATOR. THE FABRICATOR SHALL USE THE FOLLOWING DESIGN CRITERIA:
  - BR73A DESIGN CRITERIA:
    - LIVE LOAD: AASHTO HL-93 LOAD.
    - DESIGN BACKFILL UNIT WEIGHT = 140 POUNDS PER CUBIC FOOT
    - FOUNDATIONS SHALL BE DESIGNED USING A NOMINAL BEARING RESISTANCE OF 6.0 ksf AND A FACTORED BEARING RESISTANCE OF 2.7 ksf.
    - THE COEFFICIENT OF FRICTION FOR SLIDING SHALL BE:
      - PRECAST FOOTINGS.....0.40
      - CAST-IN-PLACE FOOTINGS....0.45
    - IF LOOSE OR SOFT SOILS ARE ENCOUNTERED, THE EXISTING MATERIALS SHALL BE UNDERCUT AN ADDITIONAL 12" AND A GEOTEXILE MEETING THE REQUIREMENTS OF SECTION 649 FOR GEOTEXILE FOR ROAD BED SEPARATOR, SHALL BE PLACED ON THE EXCAVATED SURFACE AND BACKFILLED WITH CRUSHED STONE BEDDING.
      - NO UNDERCUTS REQUIRED
    - RR CULVERT C06470 DESIGN CRITERIA:
      - BOX CULVERT SHALL BE DESIGNED FOR COOPER E80 LIVE LOAD. SOILS ABOVE THE CULVERT ARE DESIGNED FOR AN AVERAGE INTERNAL FRICTION ANGLE OF 34 DEGREES.
      - THE WINGWALL DESIGN SHALL BE PERFORMED IN ACCORDANCE WITH THE AREMA MANUAL FOR RAILWAY ENGINEERING, 2015.
      - ALL FOUNDATIONS SHALL BE DESIGNED FOR A MAXIMUM ALLOWABLE BEARING STRESS OF 2.0 kips PER SQUARE FOOT.
      - COEFFICIENT OF FRICTION :
        - PRECAST FOOTINGS.....0.40
        - CAST-IN-PLACE FOOTINGS....0.45
      - LATERAL EARTH PRESSURES COEFFICIENT SHALL BE:
        - Ko = 0.44 (FOR THE SIDES OF THE BOX CULVERT)
        - Ka = 0.28 (FOR WINGWALLS WITH A LEVEL BACKFILL)
        - Kq = 0.69 (FOR WINGWALLS WITH A 1.5H TO 1V BACKFILL SLOPE)
      - DESIGN BACKFILL UNIT WEIGHT = 140 POUNDS PER CUBIC FOOT
      - FACTOR OF SAFETY FOR SLIDING SHALL BE GREATER THAN 1.5.
      - FACTOR OF SAFETY FOR OVERTURNING SHALL BE GREATER THAN 2.0.
  - 2. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND DESIGN CALCULATIONS FOR THE BOX CULVERTS AND ALL ASSOCIATED DETAILS FOR THE APPROVAL OF THE STRUCTURES ENGINEER IN ACCORDANCE WITH SUBSECTION 105.03 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.
  - 3. ALL BOX CULVERT JOINTS SHALL BE STRENGTHENED WITH PERMANENT CLOSURE HARDWARE. ALL HARDWARE COMPONENTS SHALL BE GALVANIZED IN ACCORDANCE WITH SUBSECTION 506.15 OF THE STANDARD SPECIFICATIONS.
  - 4. ALL REINFORCING STEEL TO BE LEVEL I (UNCOATED). MIN. CLEAR COVER SHALL BE TWO INCHES.
  - 5. 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 FILLED WITH AN OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL FROM THE AGENCY'S APPROVED PRODUCTS LIST. THE REPAIR MATERIAL SHALL BE CURED AS SPECIFIED BY THE MANUFACTURER. THE REPAIR MATERIAL AND ITS INSTALLATION WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE ITEM 540.10, PRECAST CONCRETE STRUCTURE.
  - 6. A TWO FOOT WIDE STRIP OF SHEET MEMBRANE WATERPROOFING PREFORMED SHEET SHALL BE APPLIED AT EACH SIDE JOINT. 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 MEMBRANE PROCEEDING FROM OUTLET TO INLET. THE MEMBRANE SHEETS SHALL OVERLAP THE EDGES OF THE CULVERT BY 1 FOOT ON EACH SIDE AS SHOWN IN THE PLANS. MEMBRANE WATERPROOFING WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE ITEM 540.10, PRECAST CONCRETE STRUCTURE.
  - 7. WATER REPELLENT IN ACCORDANCE WITH ITEM 514.10 SHALL BE APPLIED TO ALL EXPOSED SURFACES EXCEPT THE INSIDE OF THE BOX.
  - 8. REFER TO SHEET 16 FOR ADDITIONAL NOTES REGARDING THE CONSTRUCTION OF RR CULVERT C06470.

**UTILITY COORDINATION**

1. THE CONTRACTOR SHALL EXERCISE CAUTION WHILE WORKING IN AREAS OF OVERHEAD UTILITIES. OVERHEAD UTILITIES WILL NOT BE RELOCATED OR DE-ENERGIZED IN PREPARATION FOR THIS PROJECT. SEE UTILITIES SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS AND INFORMATION.
  - POWER LINES WERE TEMPORARILY RELOCATED TO ALLOW SETTING OF ROUTE 7 BOX SECTIONS.

PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME: z12b380_PROJECT_NOTES1.dgn	PLOT DATE: 7/18/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: L. BUXTON
DESIGNED BY: T. KNIGHT	CHECKED BY: T. KNIGHT
PROJECT NOTES 1	SHEET 3 OF 36



## TRAFFIC CONTROL

1. THE TRAFFIC CONTROL PLANS ARE SCHEMATIC ONLY AND SHOULD BE USED AS A REFERENCE. THE CONTRACTOR SHALL DESIGN AND SUBMIT 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 WILL BE PAID UNDER ITEM 900.645 SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE).
2. SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS OR CORNER SIGHT DISTANCE FROM HIGHWAYS OR DRIVES.
3. ALL SIGNS AND OTHER TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE 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) TYPE VII, VIII OR IX REQUIREMENTS, UNLESS OTHERWISE NOTED.
5. ROLL UP SIGNS SHALL HAVE RETROREFLECTIVE SHEETING EQUAL TO OR EXCEEDING ASTM 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 SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST SEVEN FEET ABOVE THE EDGE OF PAVEMENT. THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST SIX FEET OUTSIDE THE SHOULDER POINT OR FOUR FEET OUTSIDE THE FACE OF GUARDRAIL.
8. PORTABLE SIGNS SHALL BE PLACED ON THE EDGE OF ROADWAY AND 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 ARE TO BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR, CURVE, ETC.).
11. TRAVEL LANES SHALL BE 12 FEET, MINIMUM AND HAVE 1 FOOT SHOULDERS, MINIMUM.
12. 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.
13. ALL ITEMS REQUIRED TO PREPARE, SUBMIT AND IMPLEMENT THE CONTRACTOR'S PLAN, INCLUDING ANY NECESSARY REVISIONS TO THE PLAN WILL BE INCLUDED IN THE BID UNIT PRICE FOR ITEM 900.645 "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)". THE PAY ITEM INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
  - TRAFFIC CONTROL PLAN
  - TEMPORARY TRAFFIC BARRIERS
  - ENERGY ABSORPTION ATTENUATORS
  - BARRICADES
  - DRUMS/CONES
  - PAVEMENT MARKING MASK
  - ON PROJECT CONSTRUCTION SIGNING
  - PORTABLE ARROW BOARDS
  - SAW CUTS
  - TEMPORARY SHEET PILING
  - TEMPORARY ROADWAY WIDENING FOR INCLUDING BITUMINOUS CONCRETE PAVEMENT, SUBBASE OF CRUSHED GRAVEL AND EARTHWORK.

TRAFFIC CONTROL ITEMS NOT PAID FOR IN THE UNIT PRICE BID FOR ITEM 900.645 "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)" AND PAID FOR SEPARATELY ARE THE FOLLOWING:

ITEM 630.10 UNIFORMED TRAFFIC OFFICERS  
ITEM 630.15 FLAGGERS  
ITEM 646.600 TEMPORARY 4 INCH WHITE LINE  
ITEM 646.610 TEMPORARY 4 INCH YELLOW LINE  
ITEM 900.620 SPECIAL PROVISION (TEMPORARY TRAFFIC SIGNAL SYSTEM, PORTABLE)

## TEMPORARY TRAFFIC SIGNAL

1. TEMPORARY TRAFFIC SIGNAL SYSTEM WILL BE PAID AS ITEM 900.620 SPECIAL PROVISION (TEMPORARY TRAFFIC SIGNAL SYSTEM, PORTABLE).
2. SIGNAL PHASING/TIMING ADJUSTMENTS REQUESTED BY THE ENGINEER SHALL BE ACCOMPLISHED WITHIN A 48 HOUR PERIOD.
3. SIGNAL FACES SHALL BE LED AND CONSIST OF 12" LENSES. (RED, YELLOW, AND GREEN)
4. 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 INSURE COMPLIANCE WITH THE HEIGHT REQUIREMENTS IN THE EVENT THE NEW APPROACH GRADES DIFFER SIGNIFICANTLY FROM THE OLD ROAD GRADE.
5. SIGNAL FACES FOR ANY ONE APPROACH SHALL NOT BE LESS THAN 8 FEET APART MEASURED HORIZONTALLY BETWEEN CENTER FACES.
6. 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 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)" FOR ADDITIONAL INFORMATION CONCERNING SIGNAL PLACEMENT.
7. SIGNAL HEAD PLACEMENT IS CRITICAL. HEADS SHALL BE ADJUSTED TO REFLECT LANE LOCATION CHANGES.
8. ALL TEMPORARY SIGNAL EQUIPMENT, SIGNS, ETC., SHALL BELONG TO THE CONTRACTOR AT THE END OF THE PROJECT AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR REMOVAL INCLUDING ANY TEMPORARY PAVEMENT MARKINGS, UTILITY POLES, WIRES, ETC.
9. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY ILLUMINATE THE STOP BAR AREAS. 250 WATT HIGH PRESSURE SODIUM OR 150 WATT MERCURY OR AN EQUIVILANT WATTAGE LED LAMPS ARE ACCEPTABLE. THE MOUNTING HEIGHT OF THE LUMINAIRES SHALL BE 30 FEET ABOVE THE CENTERLINE OR AS DIRECTED BY THE ENGINEER. WHILE THE INTENT IS ILLUMINATE THE AREA AROUND THE TEMPORARY TRAFFIC SIGNAL SYSTEM, MEASURED NIGHTTIME ILLUMINANCE AT EACH STOP BAR SHALL NOT BE LESS THAN 1.0 FOOT-CANDLES. THE ENGINEER SHALL ORDER CHANGES TO THE LIGHTING COMPONENTS IF DETERMINED TO BE INSUFFICIENT.
10. SEE VAOT STD, E-121 FOR SIGN PLACEMENT. SEE VAOT STD, E-171A AND E-172 FOR ADDITIONAL INFORMATION ON SIGNALS.
11. ALL ELECTRICAL WORK SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.
12. 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.
13. 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-10, T-28, AND T-30.

AT THE CONTRACTOR'S REQUEST, TRAFFIC CONTROL WAS CHANGED TO A ONE-LANE DETOUR TO THE WEST OF ROUTE 7 WITH A TEMPORARY SIGNAL SYSTEM.



PROJECT NAME: WALLINGFORD  
PROJECT NUMBER: ER CULV(39)

FILE NAME: z12b380\_PROJECT\_NOTES2.dgn PLOT DATE: 7/14/2016  
PROJECT LEADER: G. BOGUE DRAWN BY: L. BUXTON  
DESIGNED BY: I. MAYNARD CHECKED BY: G. SANTY  
PROJECT NOTES 2 SHEET 4 OF 36

# QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES			
					ROADWAY	EROSION CONTROL	RAILROAD	CULVERT # 73A	CULVERT # CO6470	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
					1						1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	-			
					510		230				740		CY	COMMON EXCAVATION	203.15	-			
								140	180		320		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	-			
					110						110		CY	TRENCH EXCAVATION OF EARTH	204.20	-			
					1						1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	-			
								600	400		1000		CY	STRUCTURE EXCAVATION	204.25	-			
								400	240		640		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	-			
					320						320		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10	-			
					410						410		CY	SUBBASE OF CRUSHED GRAVEL, COARSE GRADED	301.25	-			
							90				90		CY	SUBBASE OF CRUSHED GRAVEL, FINE GRADED	301.26	-			
					8						8		CWT	EMULSIFIED ASPHALT	404.65	-			
					1						1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	-			
								2	2		4		GAL	WATER REPELLENT, SILANE	514.10	-			
									1		1		LS	PRECAST CONCRETE STRUCTURE (8' X 6' X 37' BOX)	540.10	-			
								1			1		LS	PRECAST CONCRETE STRUCTURE (8' X 6' X 60' BOX)	540.10	-			
								270	160		430		CY	STONE FILL, TYPE III	613.12	-			
					102						102		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20	-			
					174						174		LF	STEEL BEAM GUARDRAIL, GALVANIZED/NESTED	621.206	-			
					2						2		EACH	MANUFACTURED TERMINAL SECTION, FLARED	621.50	-			
					1						1		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60	-			
					81						81		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80	-			
								60	70		130		TON	CRUSHED STONE BEDDING	629.54	-			
					10						10		HR	UNIFORMED TRAFFIC OFFICERS	630.10	-			
					80						80		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	-			
					900						900		LF	DURABLE 4 INCH WHITE LINE	646.400	-			
					900						900		LF	DURABLE 4 INCH YELLOW LINE	646.410	-			
					500						500		LF	TEMPORARY 4 INCH WHITE LINE	646.600	-			
					500						500		LF	TEMPORARY 4 INCH YELLOW LINE	646.610	-			
					300		180				480		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11	-			
							260				260		SY	GEOTEXTILE UNDER RAILROAD BALLAST	649.21	-			
								510	320		830		SY	GEOTEXTILE UNDER STONE FILL	649.31	-			
						65					65		SY	GEOTEXTILE FOR SILT FENCE	649.51	-			
						16					16		LB	SEED	651.15	-			
						130					130		LB	FERTILIZER	651.18	-			
						1					1		TON	AGRICULTURAL LIMESTONE	651.20	-			
						1					1		TON	HAY MULCH	651.25	-			

PROJECT NAME: WALLINGFORD  
PROJECT NUMBER: ER CULV(39)  
FILE NAME: z12b380\_frm.dgn PLOT DATE: 7/14/2016  
PROJECT LEADER: G. BOGUE DRAWN BY: I. MAYNARD  
DESIGNED BY: I. MAYNARD CHECKED BY: T. KNIGHT  
QUANTITY SHEET 1 SHEET 5 OF 36

# QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				ROADWAY	EROSION CONTROL	RAILROAD	CULVERT # 73A	CULVERT # CO6470	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
					80					80		CY	TOPSOIL	651.35	-			
					610					610		SY	GRUBBING MATERIAL	651.40	-			
					1					1		LS	EPSC PLAN	652.10	-			
					40					40		HR	MONITORING EPSC PLAN	652.20	-			
					1					1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30	-			
					495					495		SY	TEMPORARY EROSION MATTING	653.20	-			
					20					20		CY	TEMPORARY STONE CHECK DAM, TYPE I	653.25	-			
					60					60		CY	VEHICLE TRACKING PAD	653.35	-			
					2					2		EACH	FILTER BAG	653.45	-			
					280					280		LF	BARRIER FENCE	653.50	-			
					280					280		LF	PROJECT DEMARCATION FENCE	653.55	-			
				1						1		SF	TRAFFIC SIGNS, TYPE A	675.20	0.16			
				16						16		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341	-			
						90				90		CY	SPECIAL PROVISION (RAILROAD BALLAST)	900.608	-			
							50	65		115		CY	SPECIAL PROVISION (STONE FILL, STREAM BED MATERIAL)(TYPE I)	900.608	-			
						50				50		EACH	SPECIAL PROVISION (REMOVAL AND REPLACEMENT OF CROSS TIES)	900.620	-			
				1						1		EACH	SPECIAL PROVISION (TEMPORARY TRAFFIC SIGNAL SYSTEM, PORTABLE)	900.620	-			
						100				100		LF	SPECIAL PROVISION (REMOVE AND RESET RAILROAD TRACKS)	900.640	-			
							1			1		LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)(CULVERT 73A)	900.645	-			
								1		1		LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)(CULVERT CO6470)	900.645	-			
				1						1		LS	SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)	900.645	-			
						1				1		LU	SPECIAL PROVISION (MAINTENANCE OF RAILROAD TRAFFIC)(N.A.B.I.)	900.650	-			
				1						1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY)(N.A.B.I.)	900.650	-			
				1						1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650	-			
				290						290		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680	-			

PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME: z12b380_frm.dgn	PLOT DATE: 6/16/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: I. MAYNARD
DESIGNED BY: I. MAYNARD	CHECKED BY: T. KNIGHT
QUANTITY SHEET 2	SHEET 6 OF 36

**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 BARRIER FENCE
XXXXXXXXXXXXXXXX	TREE PROTECTION ZONE (TPZ)
//// //// ////	STRIPING LINE REMOVAL
~~~~ ~~~~~	SHEET PILES

**CONVENTIONAL BOUNDARY SYMBOLGY**

**BOUNDARY LINES**

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

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLGY

**ENVIRONMENTAL RESOURCES**

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

**ARCHEOLOGICAL & HISTORIC**

— — — — —	ARCHEOLOGICAL BOUNDARY
— — — — —	HISTORIC DISTRICT BOUNDARY
— — — — —	HISTORIC AREA
(H)	HISTORIC STRUCTURE

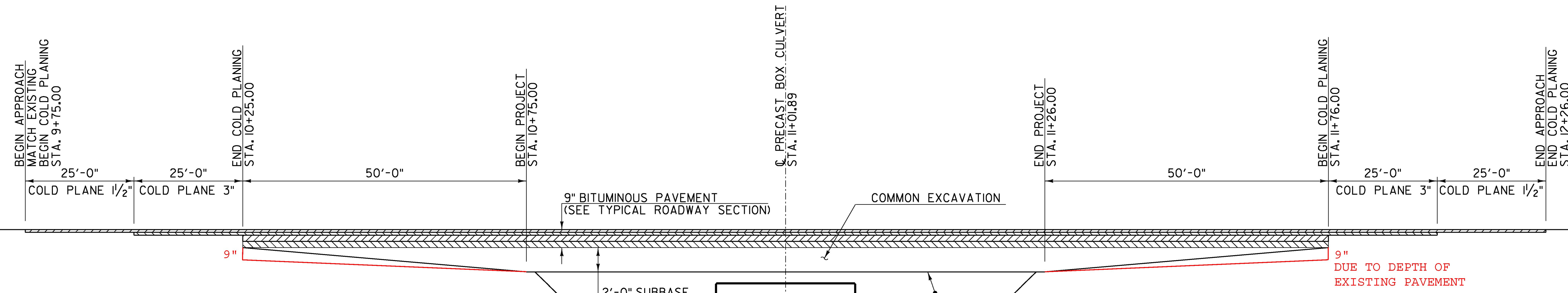
**CONVENTIONAL TOPOGRAPHIC SYMBOLGY**

**EXISTING FEATURES**

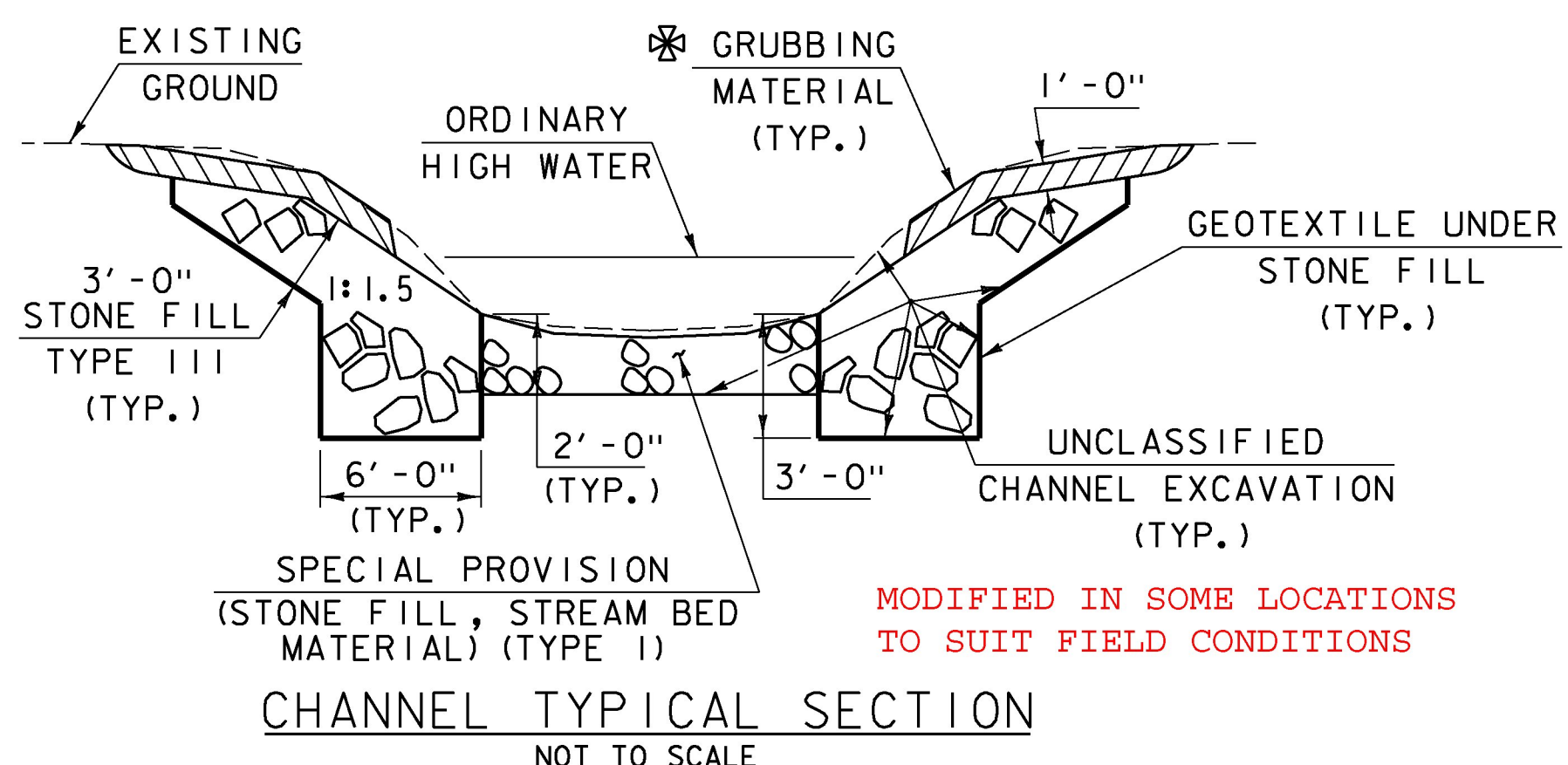
— — — — —	ROAD EDGE PAVEMENT
— — — — —	ROAD EDGE GRAVEL
— — — — —	DRIVEWAY EDGE
— — — — —	DITCH
— — — — —	FOUNDATION
— — — — —	FENCE (EXISTING)
— — — — —	FENCE WOOD POST
— — — — —	FENCE STEEL POST
— — — — —	GARDEN
— — — — —	ROAD GUARDRAIL
— — — — —	RAILROAD TRACKS
— — — — —	CULVERT (EXISTING)
— — — —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

PROJECT NAME: WALLINGFORD  
 PROJECT NUMBER: ER CULV(39)  
 FILE NAME: z12b380\_legend.dgn PLOT DATE: 6/16/2016  
 PROJECT LEADER: G. BOGUE DRAWN BY: VTRANS  
 DESIGNED BY: VTRANS CHECKED BY: VTRANS  
 CONVENTIONAL SYMBOLGY LEGEND SHEET 7 OF 36



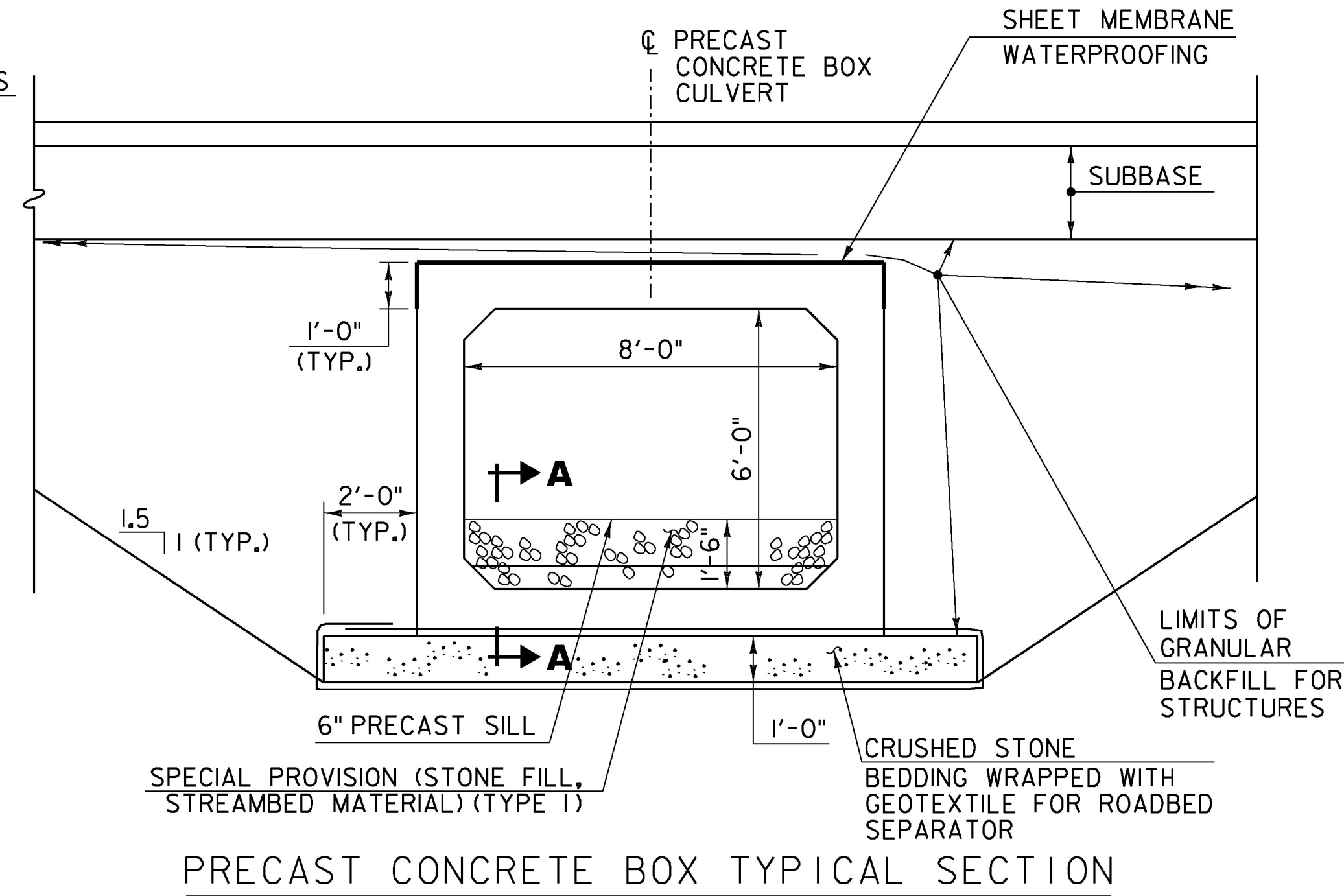


NOTE:  
EXISTING PAVEMENT CONSISTED OF 12" OF BLACKTOP AND 6" CONCRETE SLABS.  
REMOVAL PAID UNDER NEW ITEM 203.16 SOLID ROCK EXCAVATION.

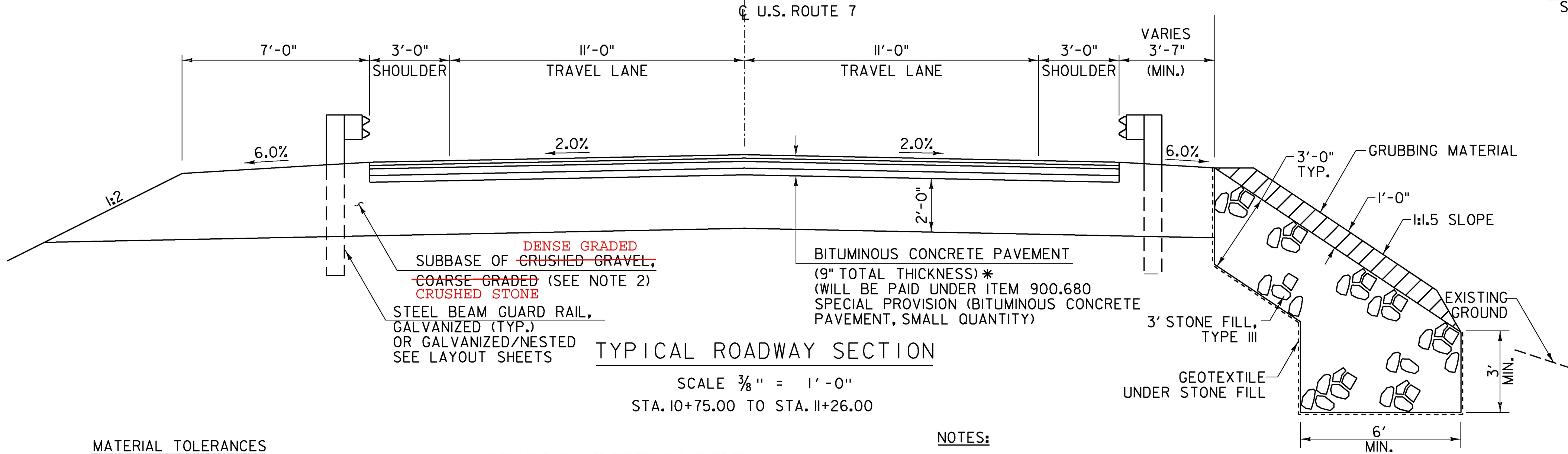


WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.

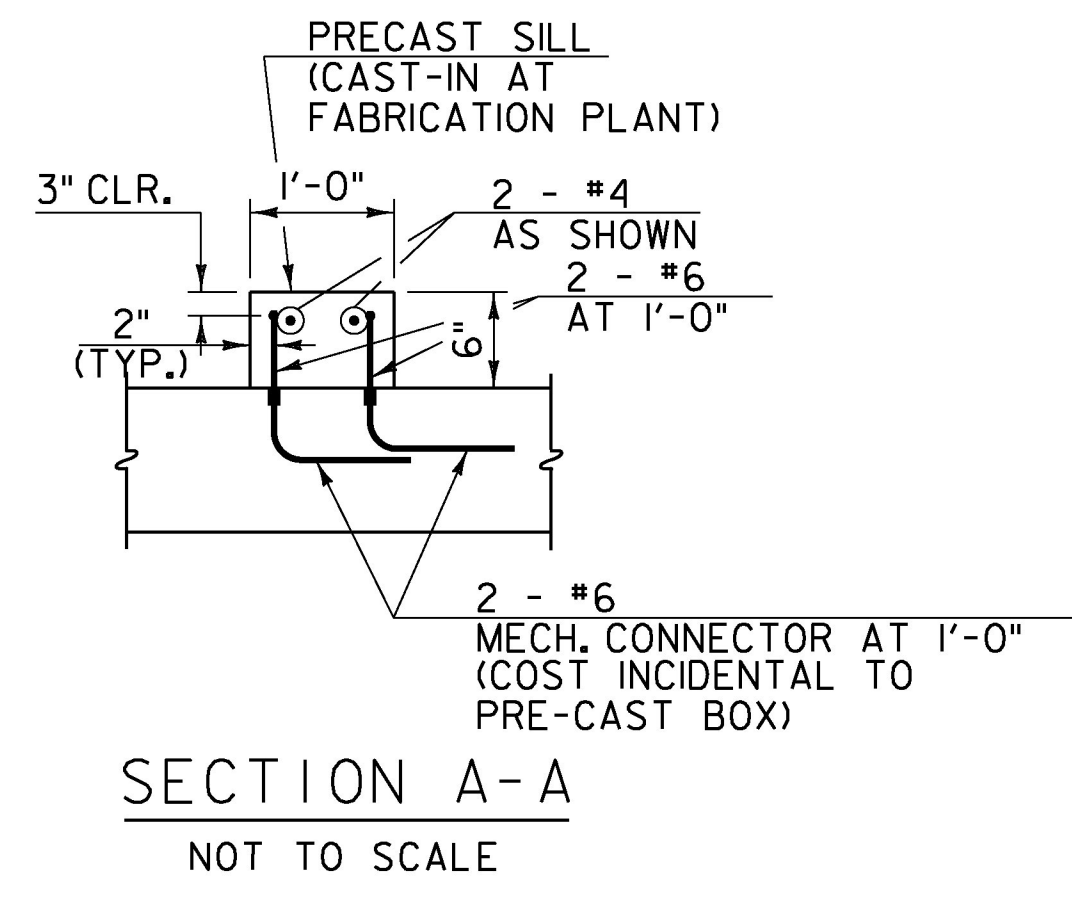
TYPICAL APPROACH SECTION  
NOT TO SCALE



PRECAST CONCRETE BOX TYPICAL SECTION  
SCALE 3/8" = 1'-0"



TYPICAL ROADWAY SECTION  
SCALE 3/8" = 1'-0"  
STA. 10+75.00 TO STA. 11+26.00



SECTION A-A  
NOT TO SCALE

MATERIAL TOLERANCES (IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
SUBBASE	+/- 1"

\* BITUMINOUS CONCRETE PAVEMENT:  
1/2" TYPE IVS OVER  
1/2" TYPE IVS OVER  
3" TYPE IIS OVER  
3" TYPE IIS  
EMULSIFIED ASPHALT BETWEEN LAYERS (SEE NOTE 1)

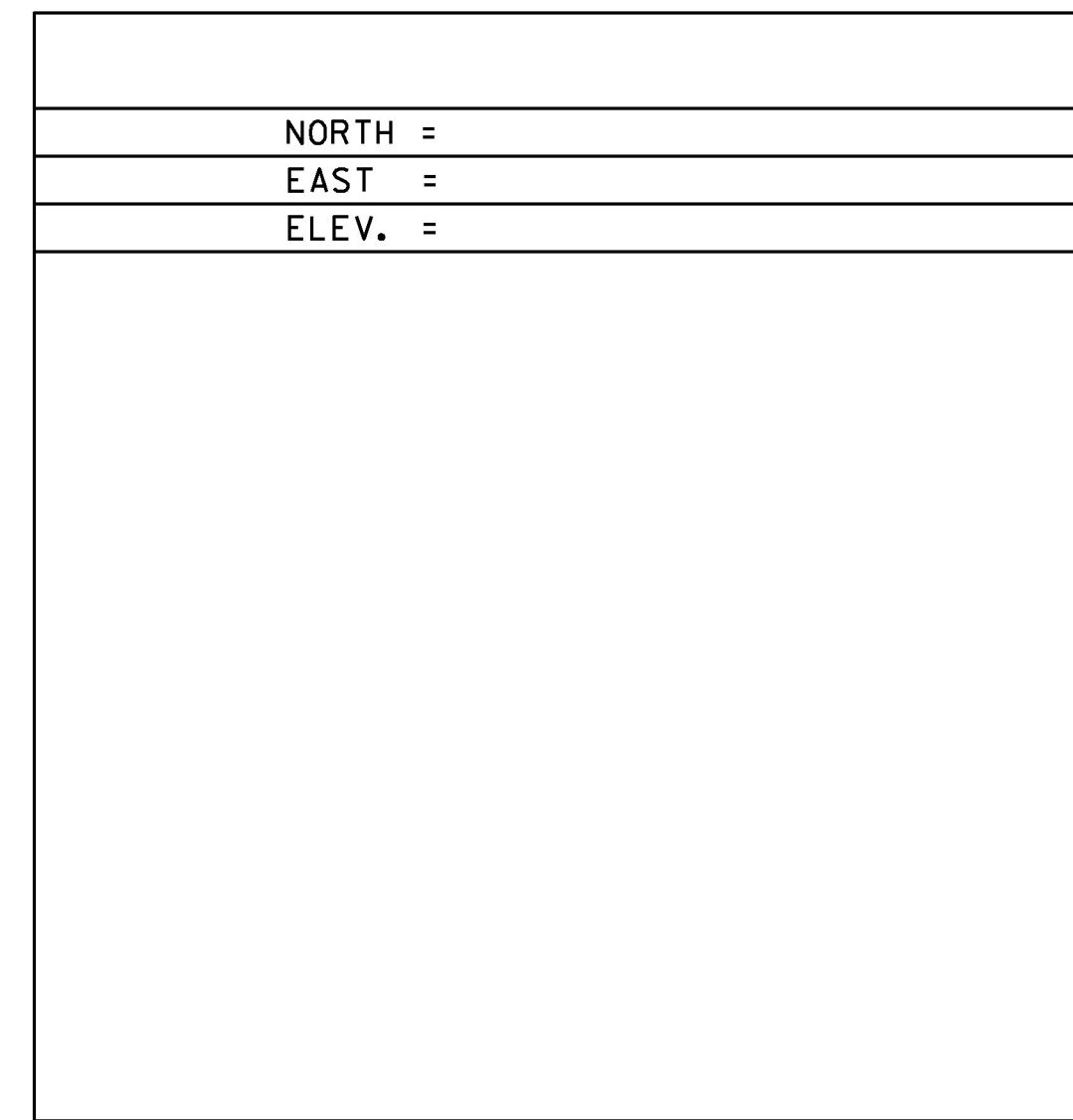
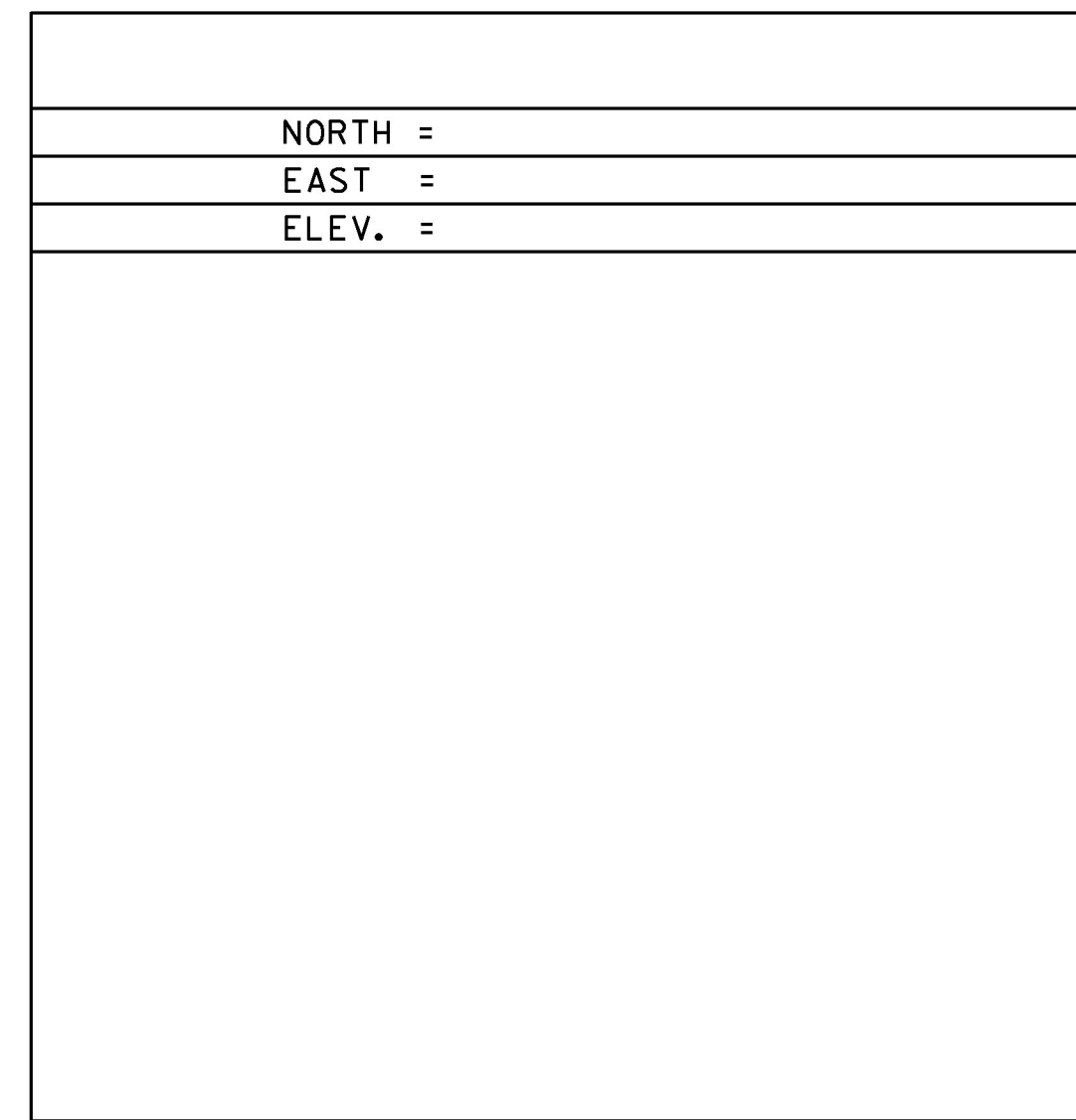
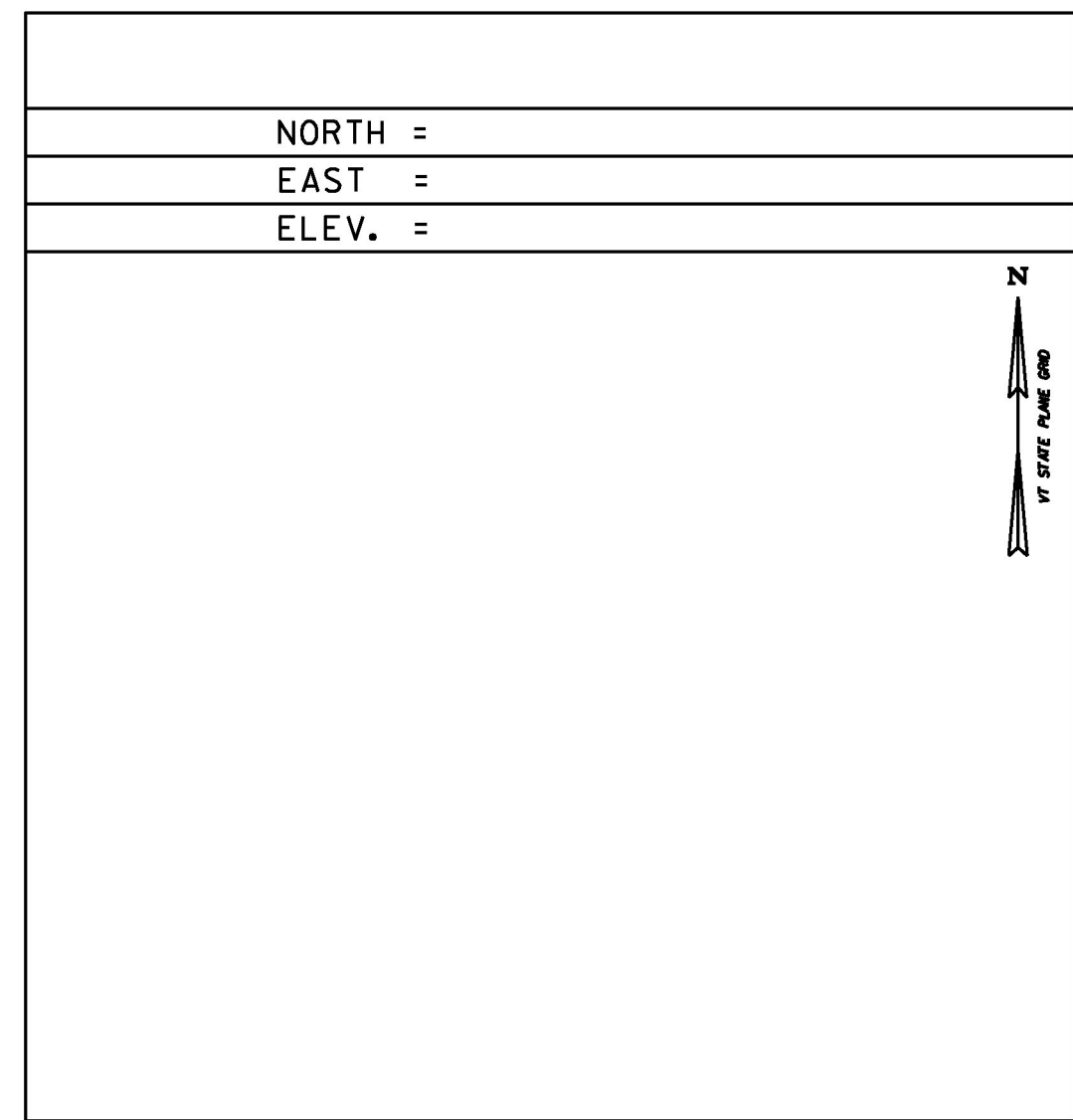
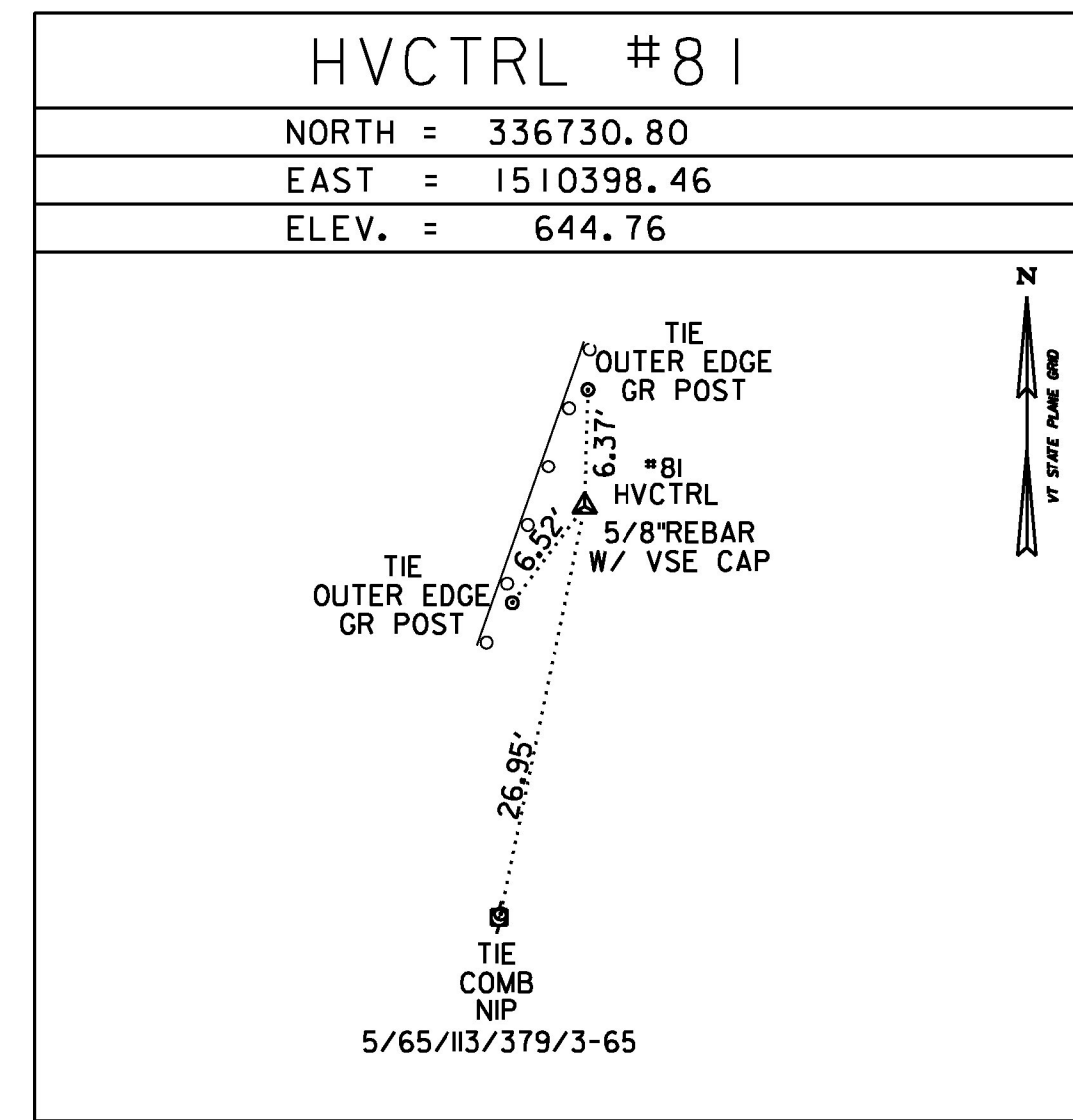
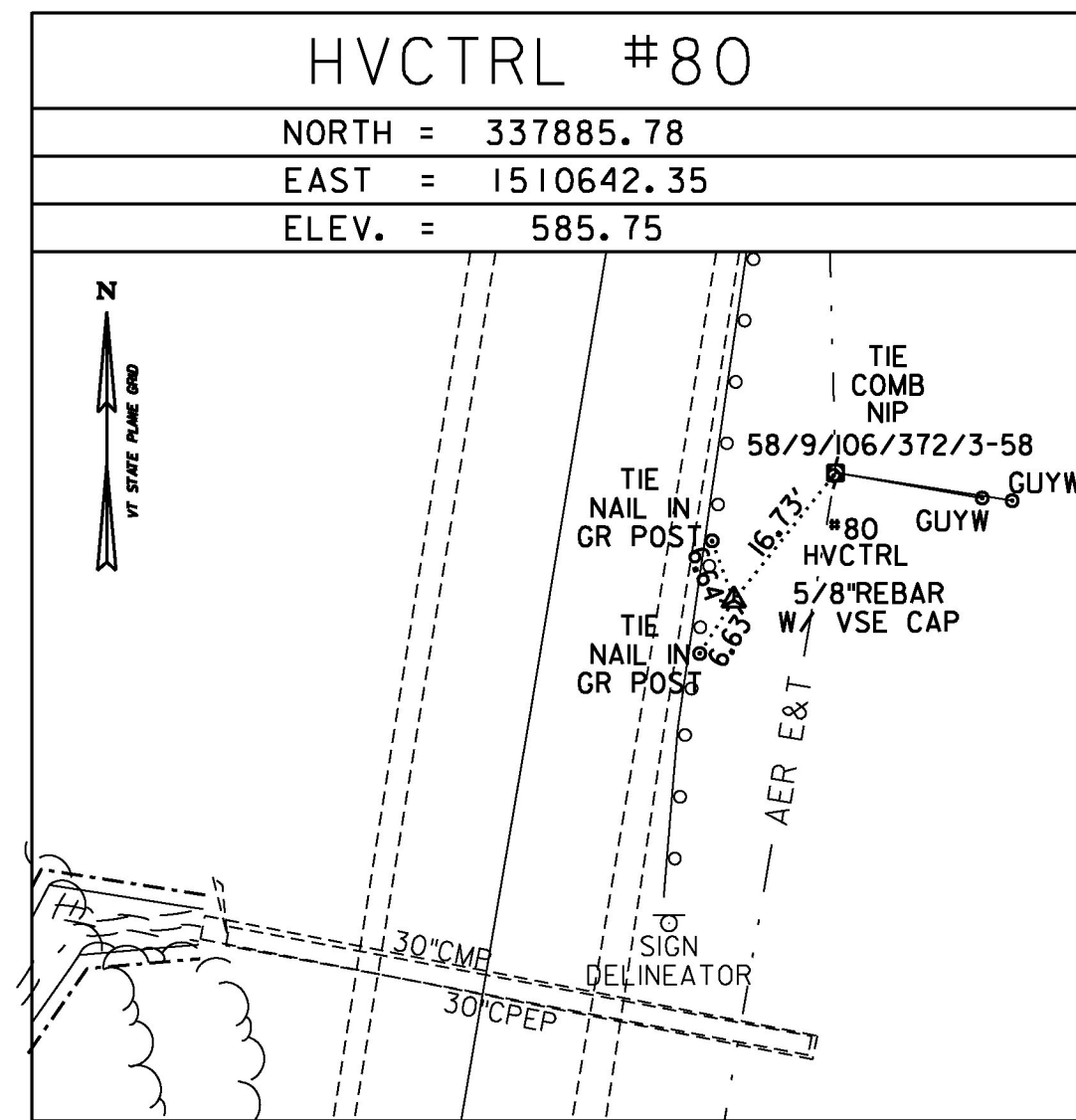
NOTES:  
1. EMULSIFIED ASPHALT SHALL BE APPLIED ON COLD PLANED SURFACES AT THE RATE OF 0.08 GAL/SY AND BETWEEN PAVED LAYERS AT THE RATE OF 0.04 GAL/SY.  
2. DENSE GRADED CRUSHED STONE MAY BE SUBSTITUTED FOR SUBBASE OF CRUSHED GRAVEL, COARSE GRADED. DENSE GRADED WAS USED.



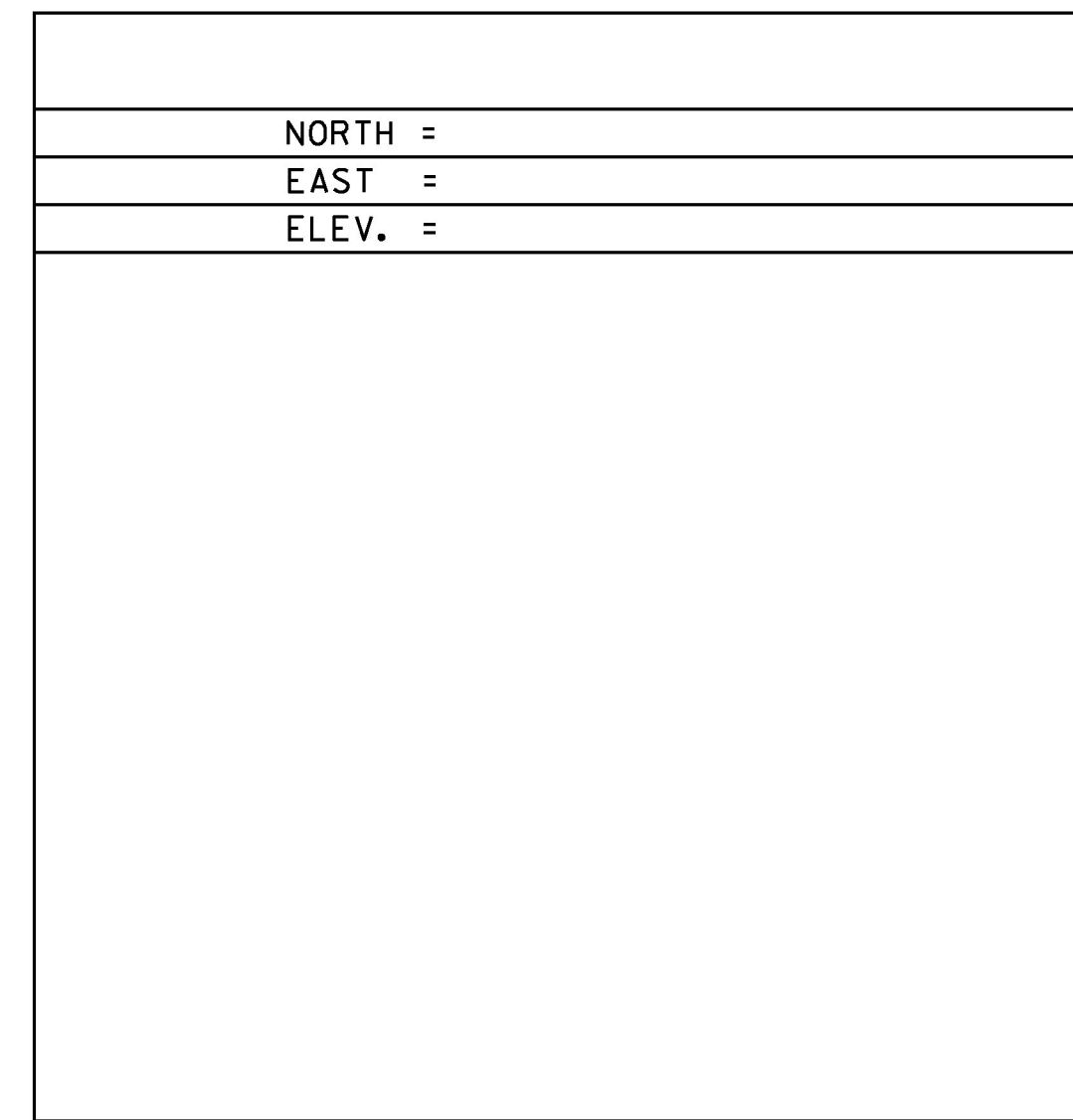
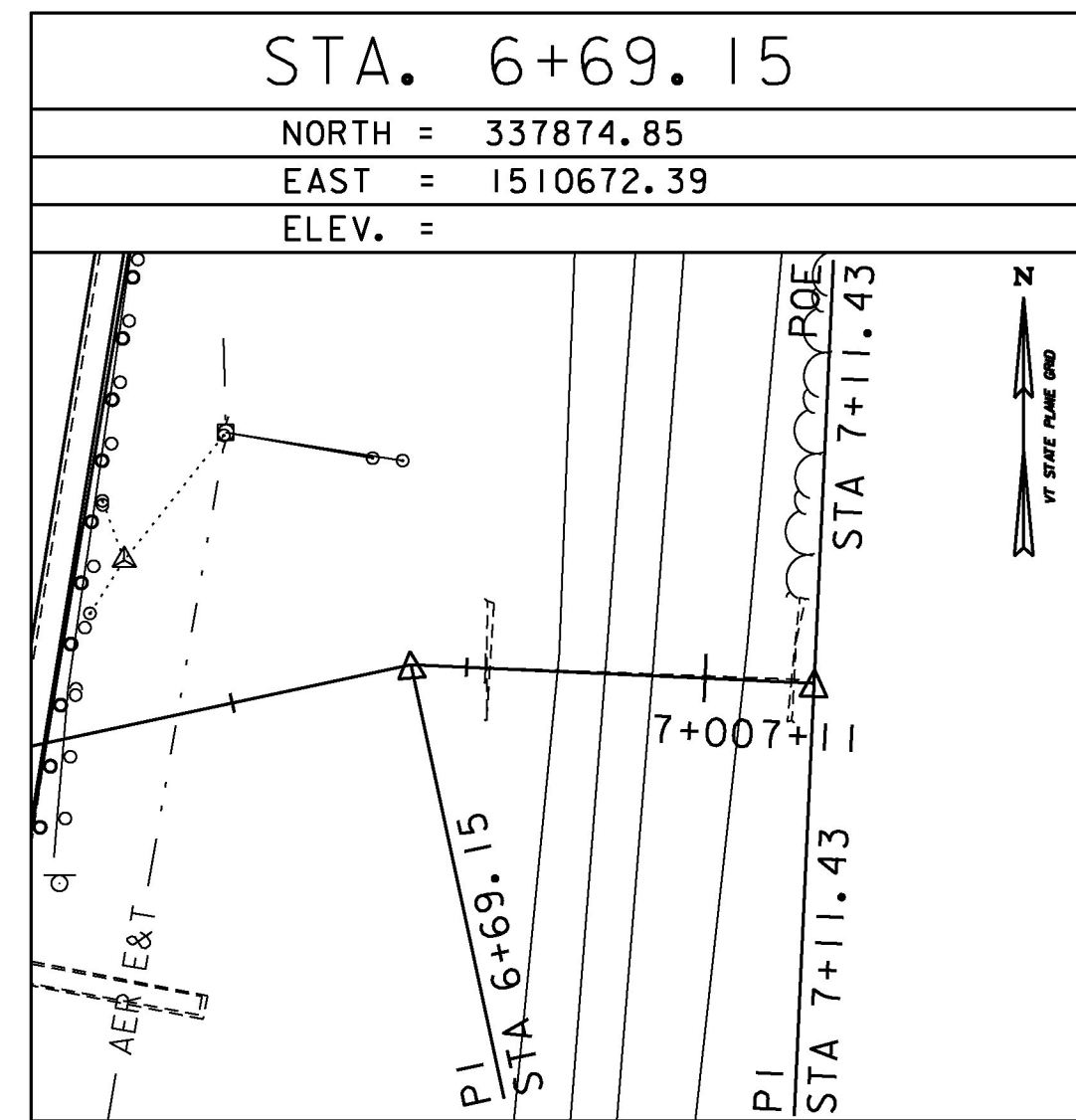
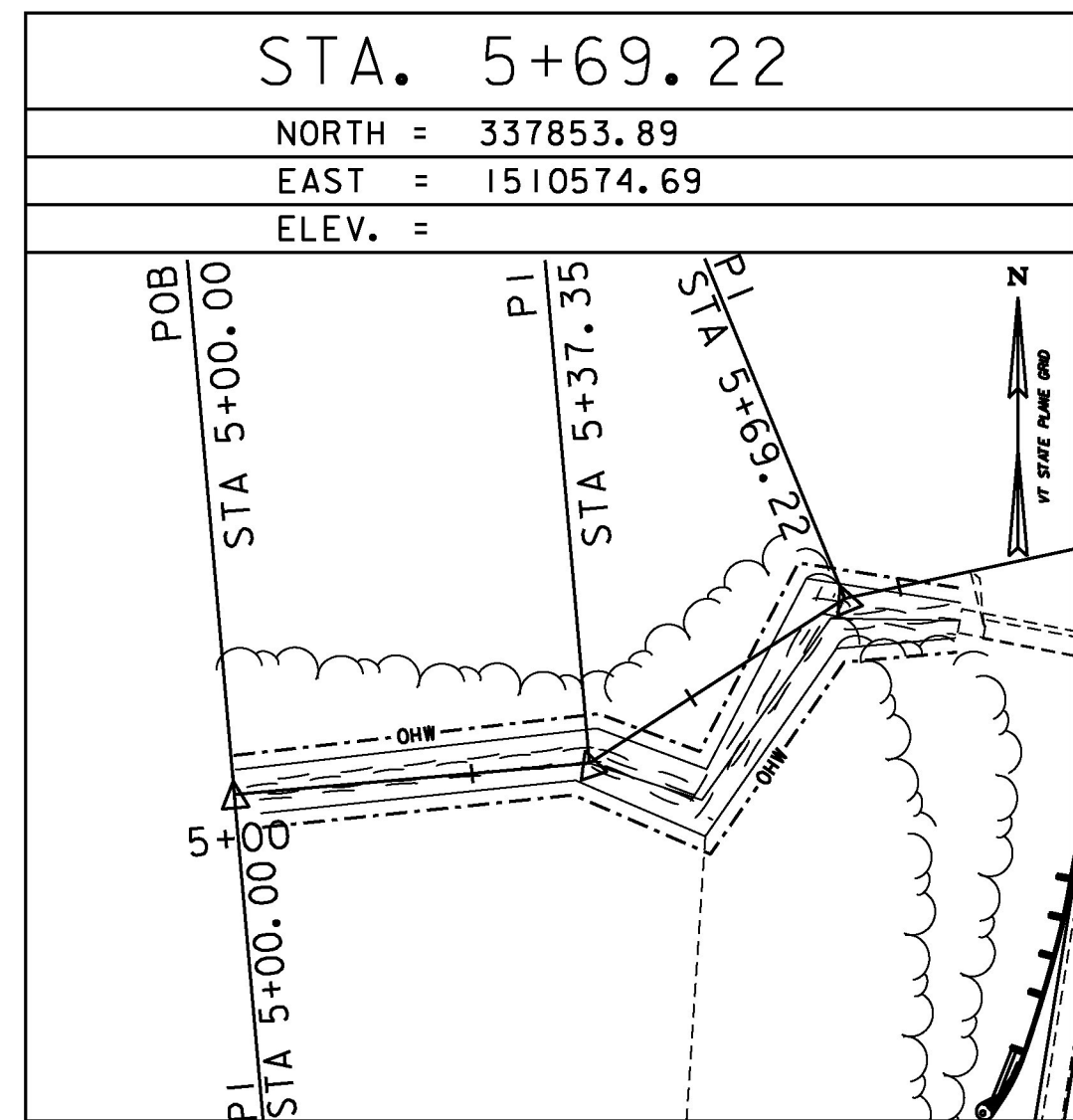
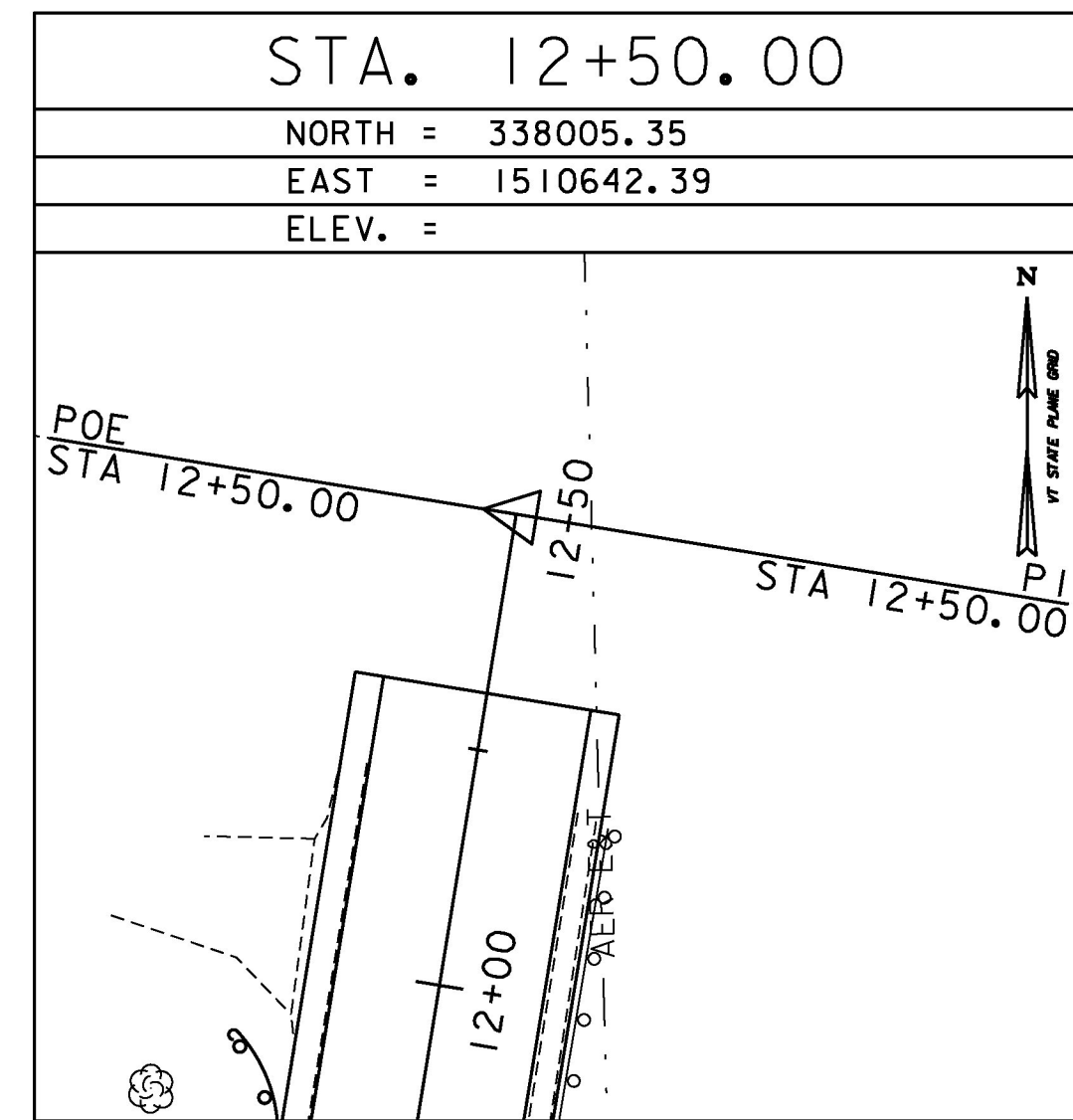
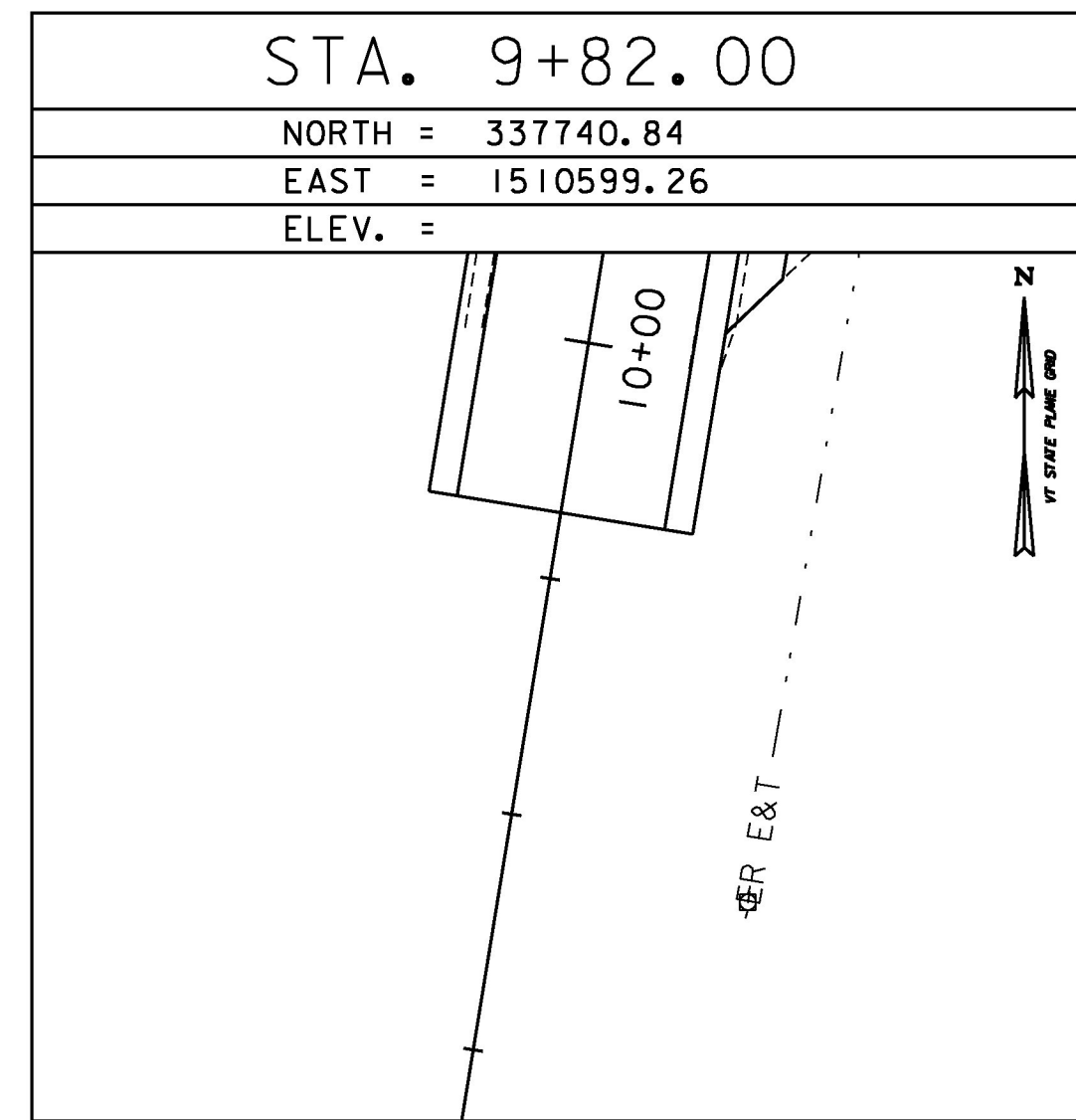
PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	z12b380_TYPICAL_SECTIONS.dgn
PROJECT LEADER:	G. BOGUE
DESIGNED BY:	J. HUNGERFORD
TYPICAL SECTIONS - BR 73A	
PLOT DATE:	6/16/2016
DRAWN BY:	L. BUXTON
CHECKED BY:	T. KNIGHT
SHEET	8 OF 36

GPS CONTROL POINTS

TRAVERSE TIES



ALIGNMENT TIES

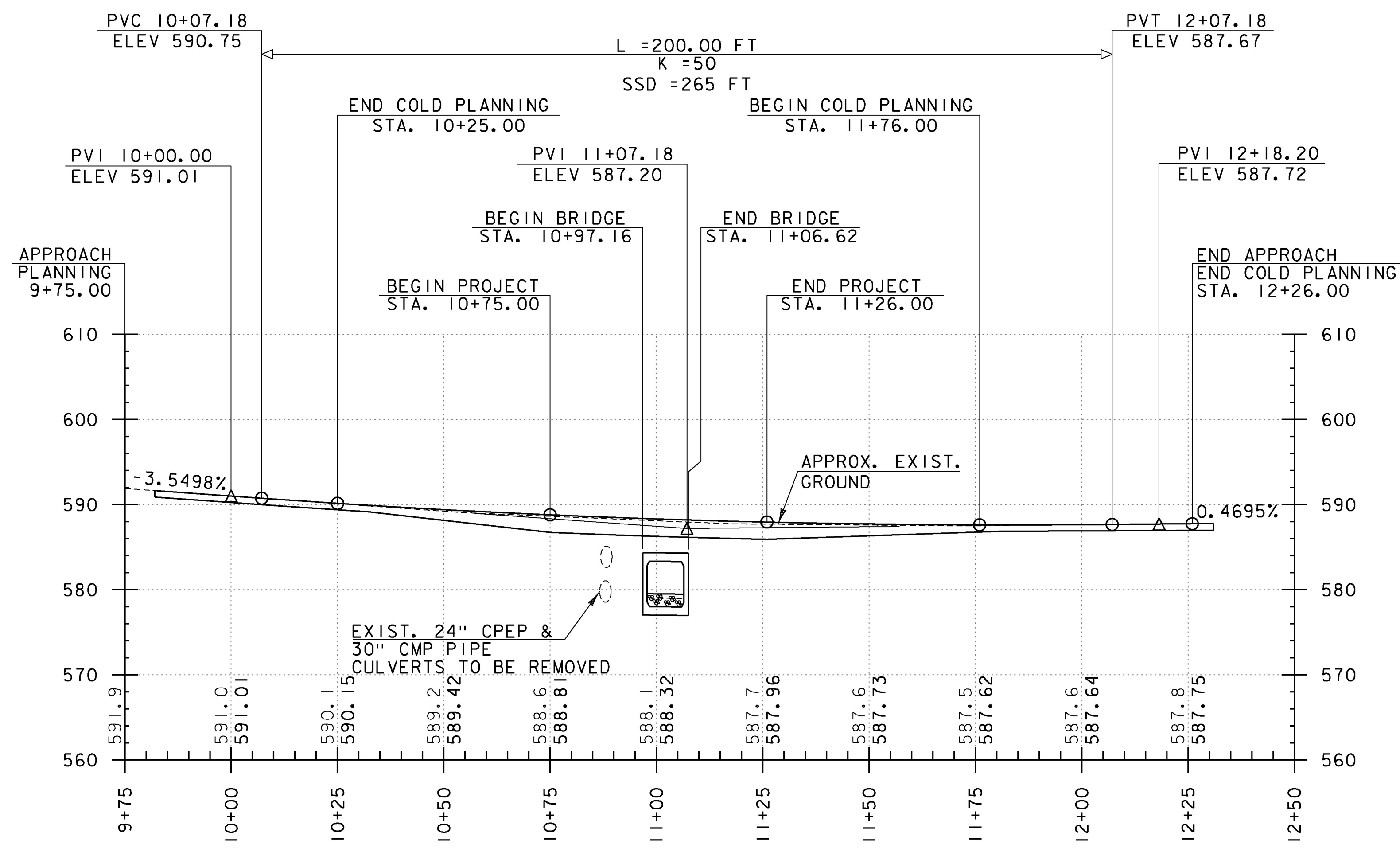


DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83 (2011)
ADJUSTMENT	NONE

PROJECT NAME: WALLINGFORD	
PROJECT NUMBER: ER CULV(39)	
FILE NAME: z12b380_TIE_SHEET.dgn	PLOT DATE: 6/16/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: J. SOTER
DESIGNED BY: I. MAYNARD	CHECKED BY: I. MAYNARD
SURVEY CONTROL AND TIES	SHEET 9 OF 36







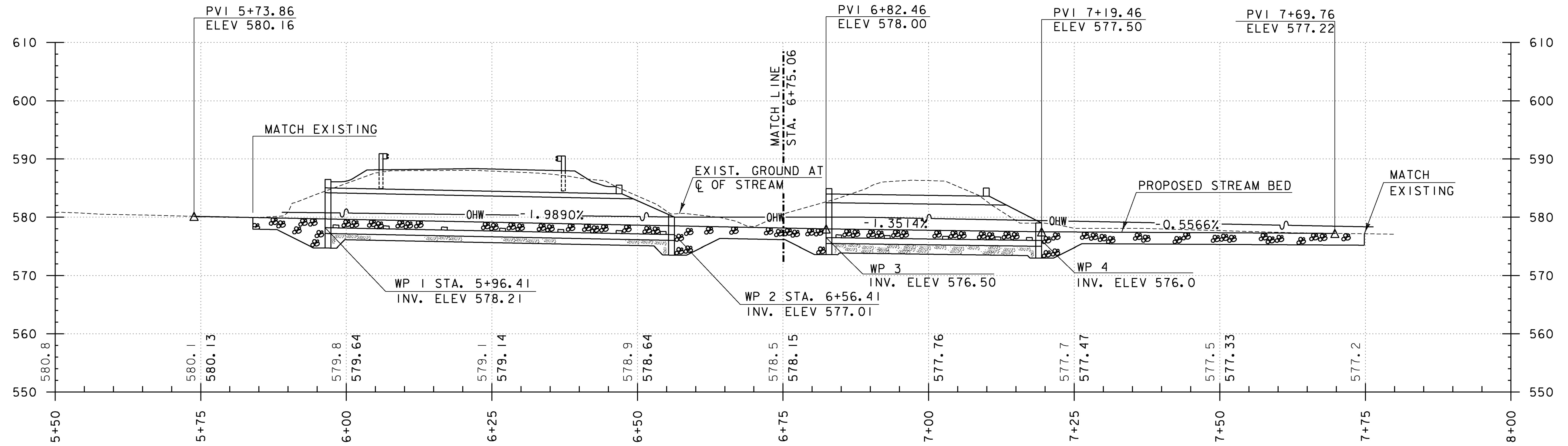
**PROFILE ALONG VT ROUTE 7**  
 HORIZONTAL SCALE: 1" = 20'      VERTICAL SCALE: 1" = 10'

**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.

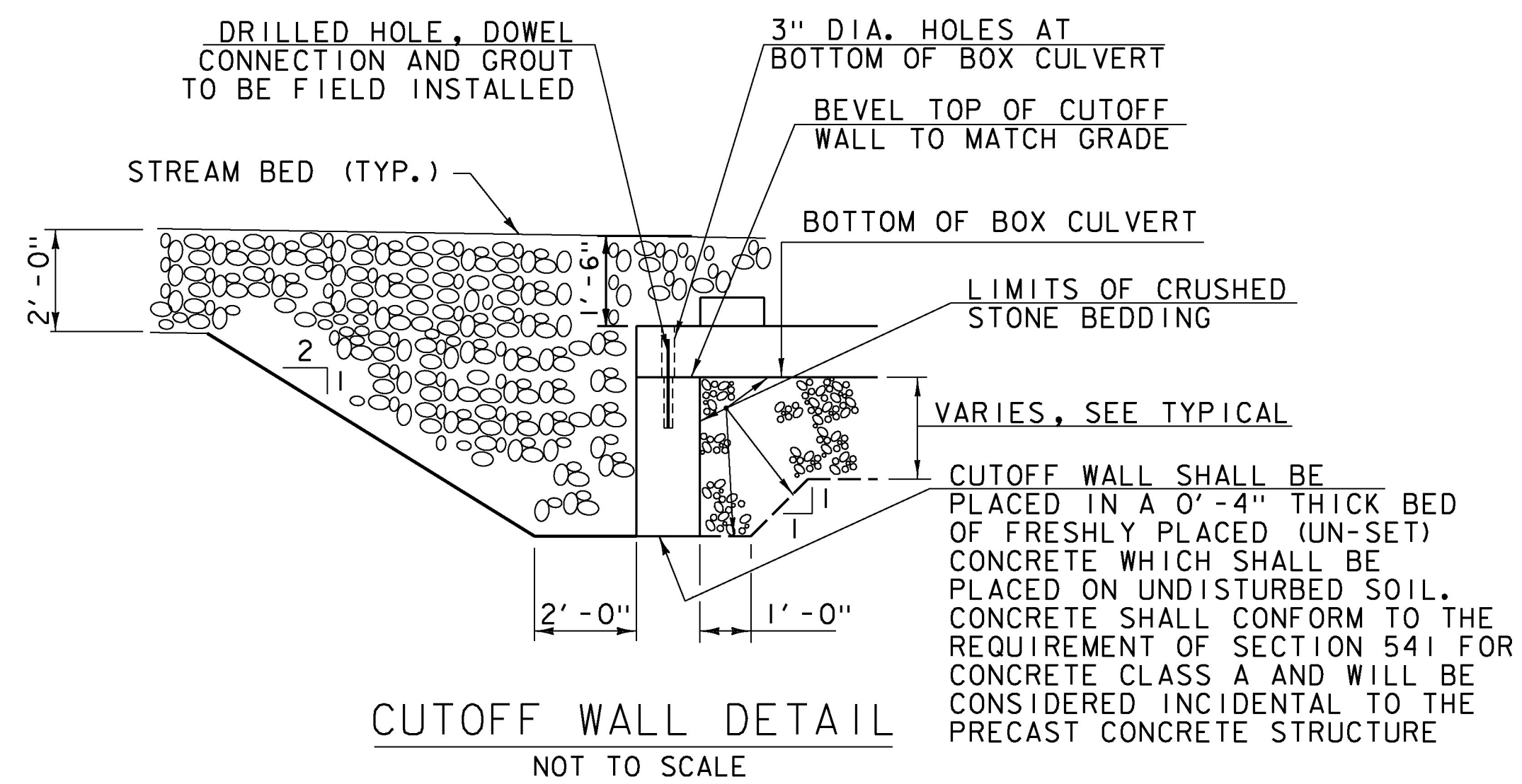
PROJECT NAME: WALLINGFORD	
PROJECT NUMBER: ER CULV(39)	
FILE NAME: z12b380_PROFILES.dgn	PLOT DATE: 6/16/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: L. BUXTON
DESIGNED BY: J. HUNGERFORD	CHECKED BY: T. KNIGHT
ROADWAY PROFILE	SHEET II OF 36





**STREAM PROFILE**

HORIZONTAL SCALE: 1" = 10'    VERTICAL SCALE: 1" = 10'



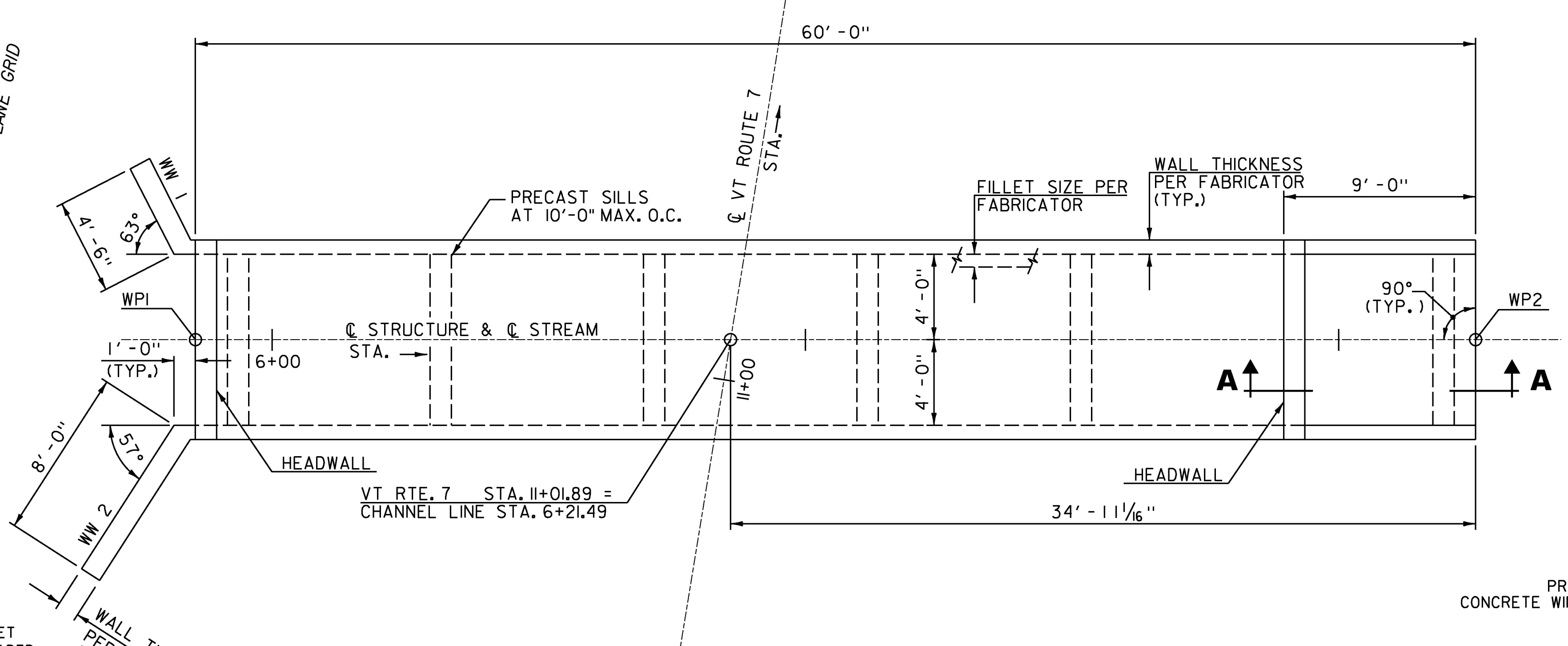
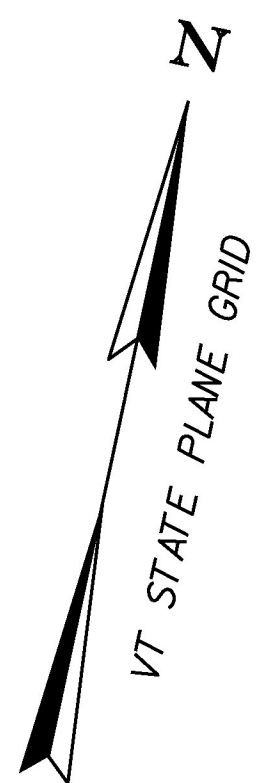
**NOTE:**  
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG PROPOSED CENTERLINE.

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

PROJECT NAME: WALLINGFORD  
PROJECT NUMBER: ER CULV(39)

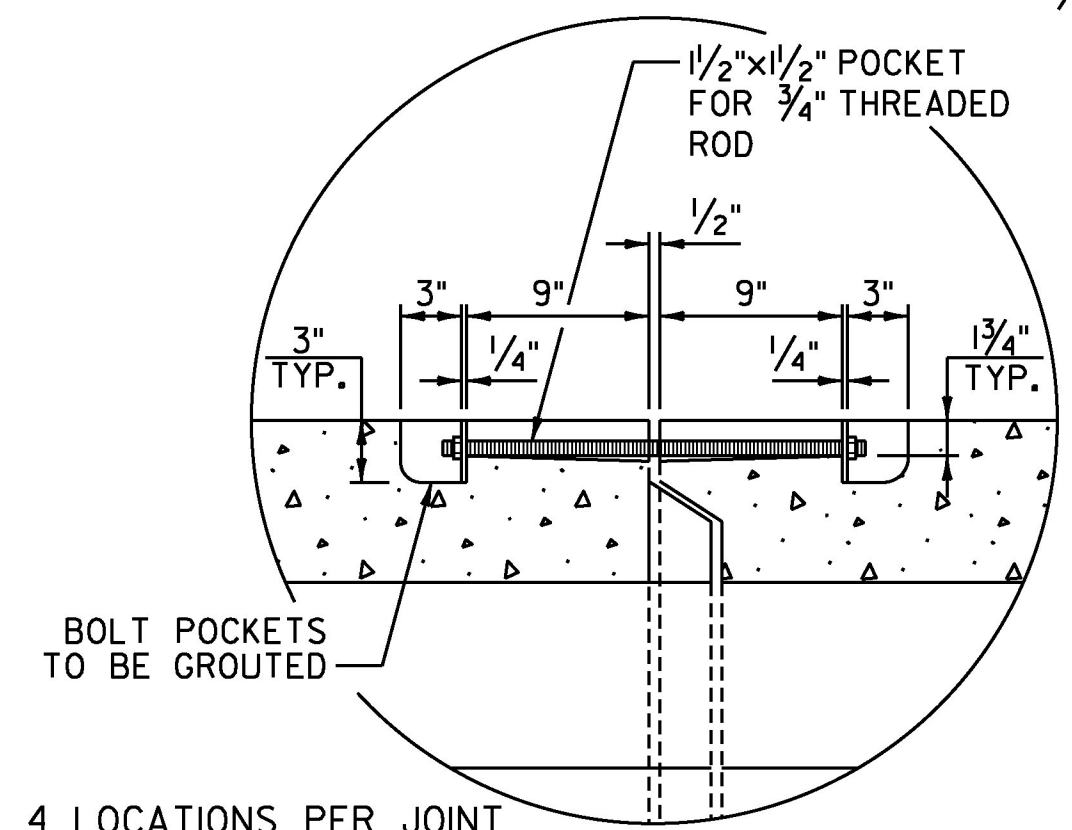
FILE NAME: z12b380\_STREAM\_PROFILE.dgn    PLOT DATE: 7/12/2016  
PROJECT LEADER: G. BOGUE    DRAWN BY: L. BUXTON  
DESIGNED BY: J. HUNGERFORD    CHECKED BY: T. KNIGHT  
STREAM PROFILE    SHEET 12 OF 36



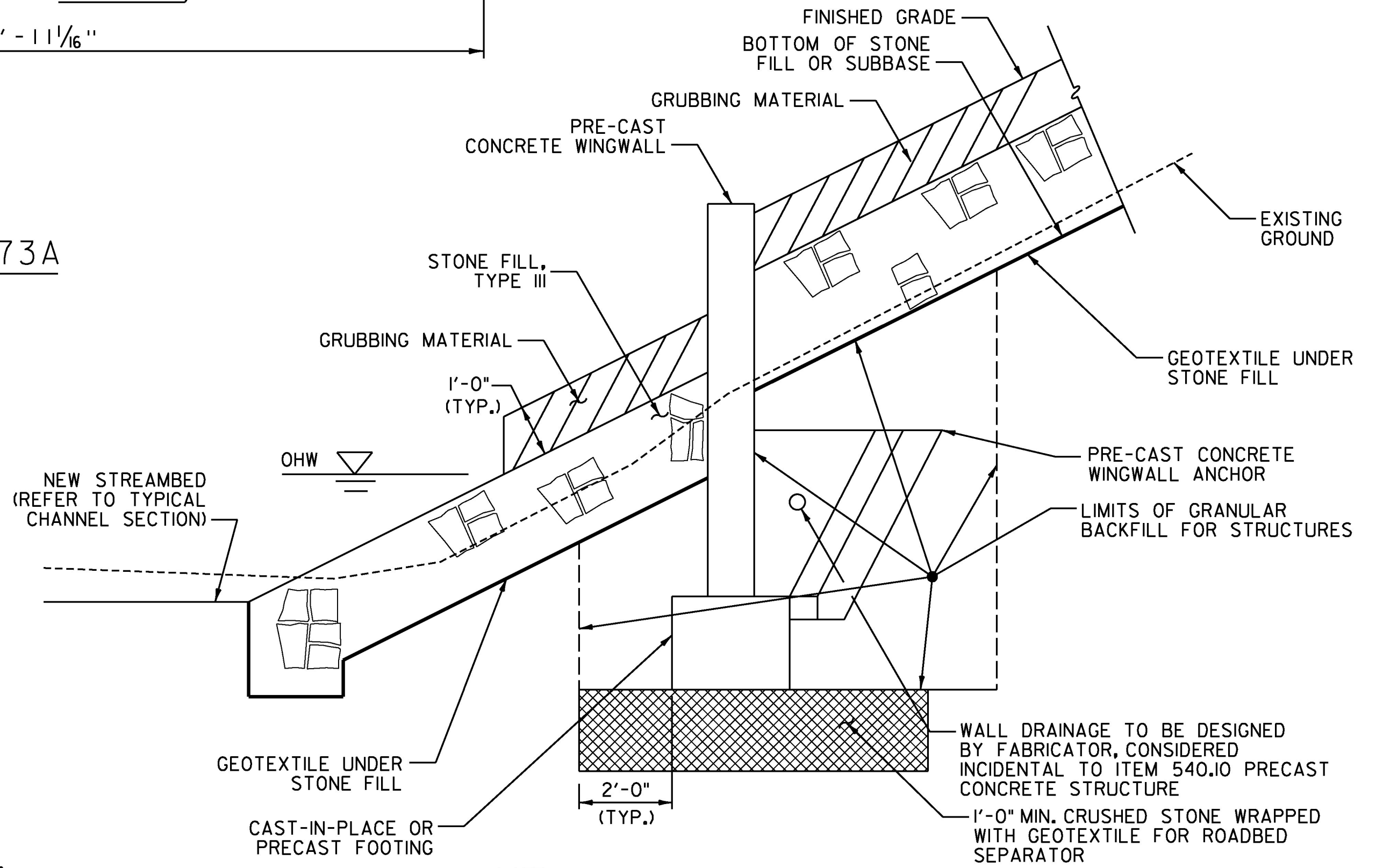


SEE SHOP DRAWINGS IN JOB RECORDS FOR DETAILS OF PRECAST BOX AND WINGWALLS.

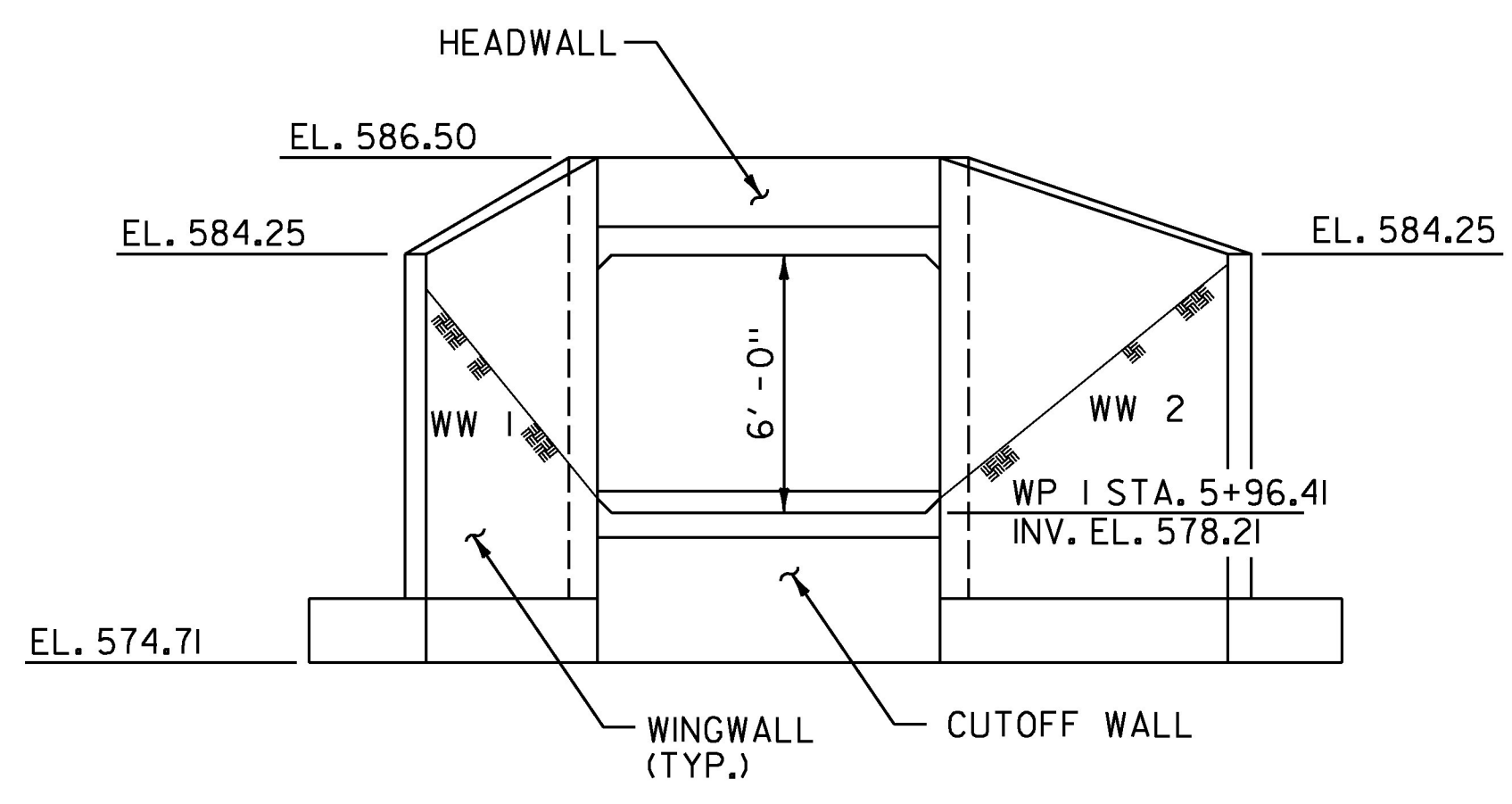
PRECAST CONCRETE STRUCTURE PLAN - BR73A  
SCALE: 1/4" = 1'-0"



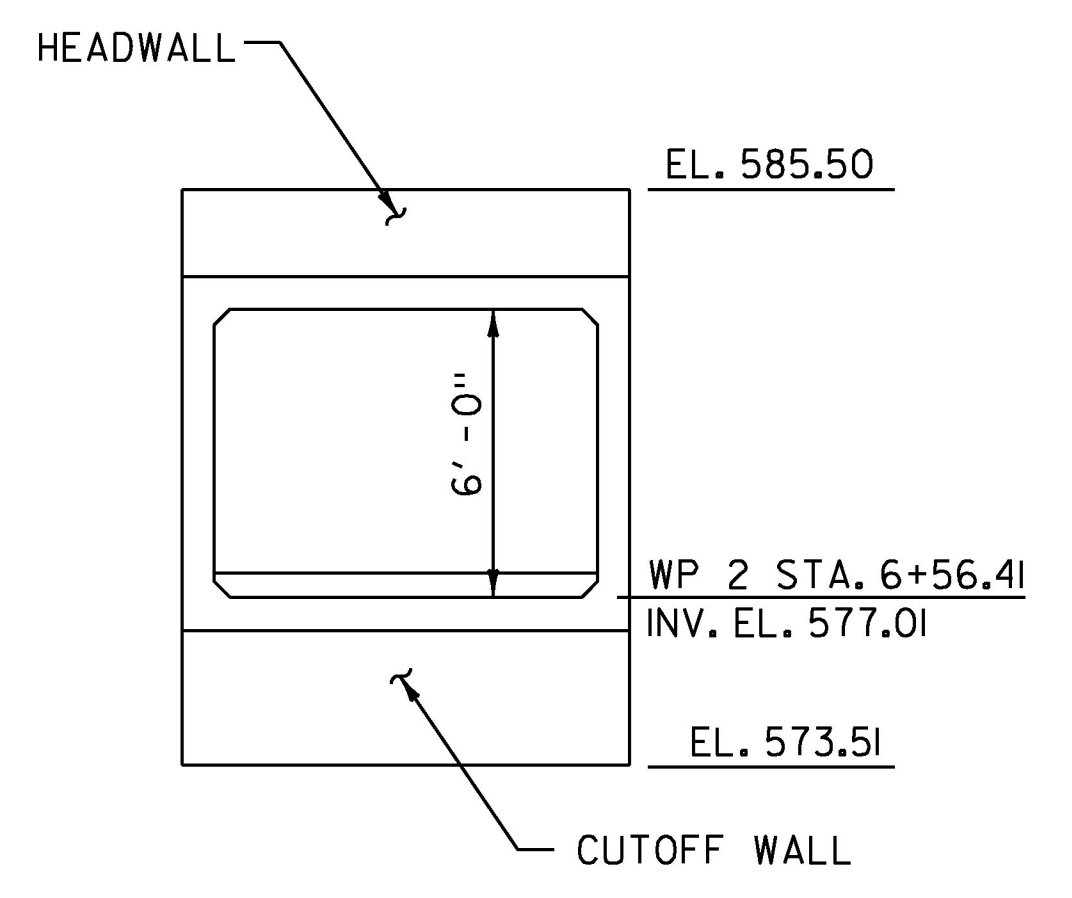
PERMANENT CLOSURE DETAIL  
NOT TO SCALE



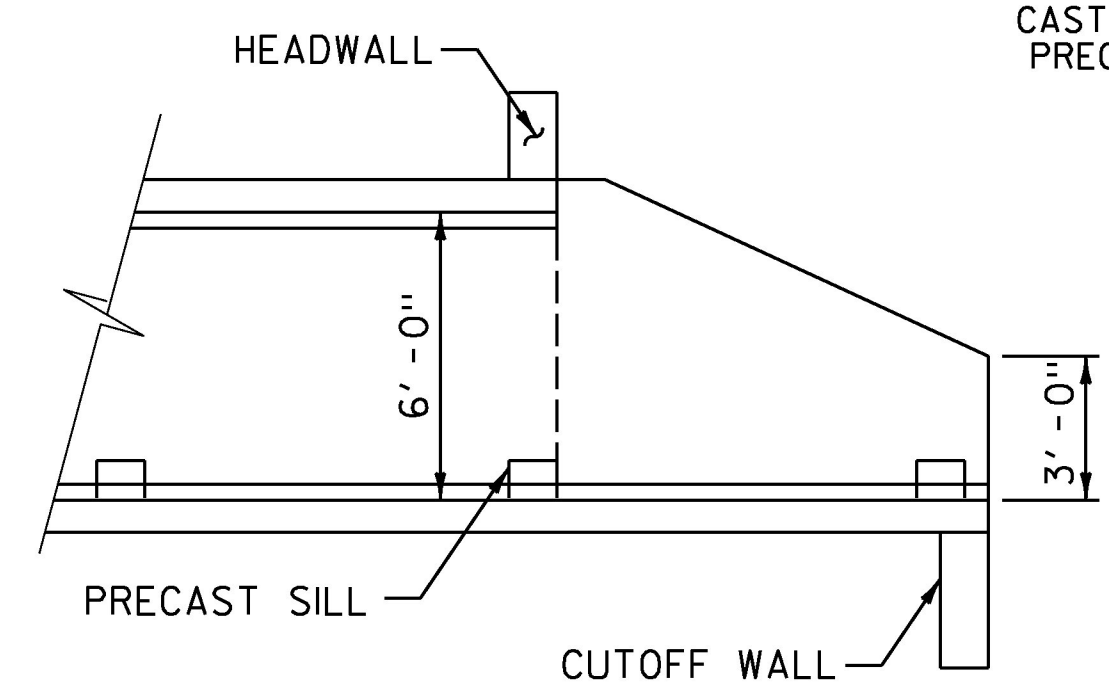
WINGWALL EARTHWORK SECTION  
NOT TO SCALE



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



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



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

NOTE:  
FOR DETAILS NOT SHOWN SEE PRECAST CONCRETE BOX TYPICAL SECTION ON SHEET 8.



PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	z12b380_STRUCT.PLAN.DET.dgn
PLOT DATE:	6/16/2016
PROJECT LEADER:	G. BOGUE
DRAWN BY:	L. BUXTON
DESIGNED BY:	J. HUNGERFORD
CHECKED BY:	T. KNIGHT
STRUCTURAL PLAN & DETAILS - BR73A	SHEET 13 OF 36

INDEX OF SHEETS

PLAN SHEETS

FOR INDEX OF SHEETS AND  
VAOT STANDARD SHEETS, SEE  
SHEET 2.

STANDARDS LIST

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: November 2014

DRAINAGE AREA : 0.8 sq. mi.  
CHARACTER OF TERRAIN : Hilly to mountainous, mostly forested with some open areas  
STREAM CHARACTERISTICS : Small, intermittent, sinuous  
NATURE OF STREAMBED : Gravel, cobbles and sand

PEAK FLOW DATA

Q 2.33 = 70 cfs                      Q 50 = 185 cfs  
Q 10 = 130 cfs                      Q 100 = 205 cfs  
Q 25 = 160 cfs                      Q 500 = 270 cfs

DATE OF FLOOD OF RECORD : Unknown  
ESTIMATED DISCHARGE : Unknown  
WATER SURFACE ELEV. : Unknown  
NATURAL STREAM VELOCITY : @ Q50 = 8.1 fps  
ICE CONDITIONS : Moderate  
DEBRIS : Moderate  
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Yes  
IS ORDINARY RISE RAPID? Yes  
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes  
IF YES, DESCRIBE: This site may be in the Otter Creek floodplain. Floodwaters from that river may affect this site.

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

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: 3' wide X 4' high Stone Box Culvert  
YEAR BUILT: Unknown  
CLEAR SPAN(NORMAL TO STREAM): 3'  
VERTICAL CLEARANCE ABOVE STREAMBED: 4'  
WATERWAY OF FULL OPENING: 12.0 sq. ft. total  
DISPOSITION OF STRUCTURE: Remove and replace with a new structure  
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 = 582.9'                      VELOCITY = 9.1 fps \*  
Q10 = 586.4'                      "                      10.6 fps \*  
Q25 = 586.6'                      "                      10.8 fps  
Q50 = 586.7'                      "                      11.3 fps  
Q100 = 586.8'                      "                      11.7 fps

LONG TERM STREAMBED CHANGES: None noted.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes  
FREQUENCY: Below Q10  
RELIEF ELEVATION: 586.0'  
DISCHARGE OVER ROAD @Q100: 97 cfs

UPSTREAM STRUCTURE

TOWN: Wallingford                      DISTANCE:                      \_\_\_\_\_  
HIGHWAY # : US Route 7                      STRUCTURE #: 73A  
CLEAR SPAN: 8'-0"                      CLEAR HEIGHT: 4'-6"  
YEAR BUILT: New                      FULL WATERWAY: 36 sf  
STRUCTURE TYPE: Concrete Box Culvert

DOWNSTREAM STRUCTURE

TOWN: N/A                      DISTANCE:                      \_\_\_\_\_  
HIGHWAY # :                      STRUCTURE #:                      \_\_\_\_\_  
CLEAR SPAN:                      CLEAR HEIGHT:                      \_\_\_\_\_  
YEAR BUILT:                      FULL WATERWAY:                      \_\_\_\_\_  
STRUCTURE TYPE:                      \_\_\_\_\_

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	H-13	3S2	6 AXLE	3A STR.	4A STR.	5A SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:	TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER						

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

SEE SHEET 3 FOR CULVERT DESIGN CRITERIA

PROPOSED STRUCTURE

STRUCTURE TYPE: BOX CULVERT  
CLEAR SPAN(NORMAL TO STREAM): 8.0'  
VERTICAL CLEARANCE ABOVE STREAMBED: 4.5'  
WATERWAY OF FULL OPENING: 36 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 580.1'                      VELOCITY= 6.6 fps \*  
Q10 = 581.3'                      "                      8.1 fps \*  
Q25 = 581.8'                      "                      8.6 fps \*  
Q50 = 582.2'                      "                      9.0 fps \*  
Q100 = 582.5'                      "                      9.4 fps \*

IS THE ROADWAY OVERTOPPED BELOW Q100: No  
FREQUENCY: Above Q100  
RELIEF ELEVATION: 586.0'  
DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 582.9' at the inlet  
VERTICAL CLEARANCE: @ Q50 = -0.6'

SCOUR:

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: 2 cfs                      DEPTH OR ELEVATION:  
ORDINARY LOW WATER: 1 cfs                      Depth < 0.1'  
ORDINARY HIGH WATER: 24 cfs                      Depth = 1'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: No temporary bridge required. Temporary closure approved by RR.  
CLEAR SPAN (NORMAL TO STREAM):  
VERTICAL CLEARANCE ABOVE STREAMBED:  
WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

Hydraulics at this site may be affected by tailwater due to the Otter Creek. The unnamed stream is anticipated to peak prior to the Otter Creek, therefore this report does not consider Otter Creek tailwater in predicting water surface elevations. Water surface elevations may be higher than reported if tailwater conditions exist.

DESIGN VALUES

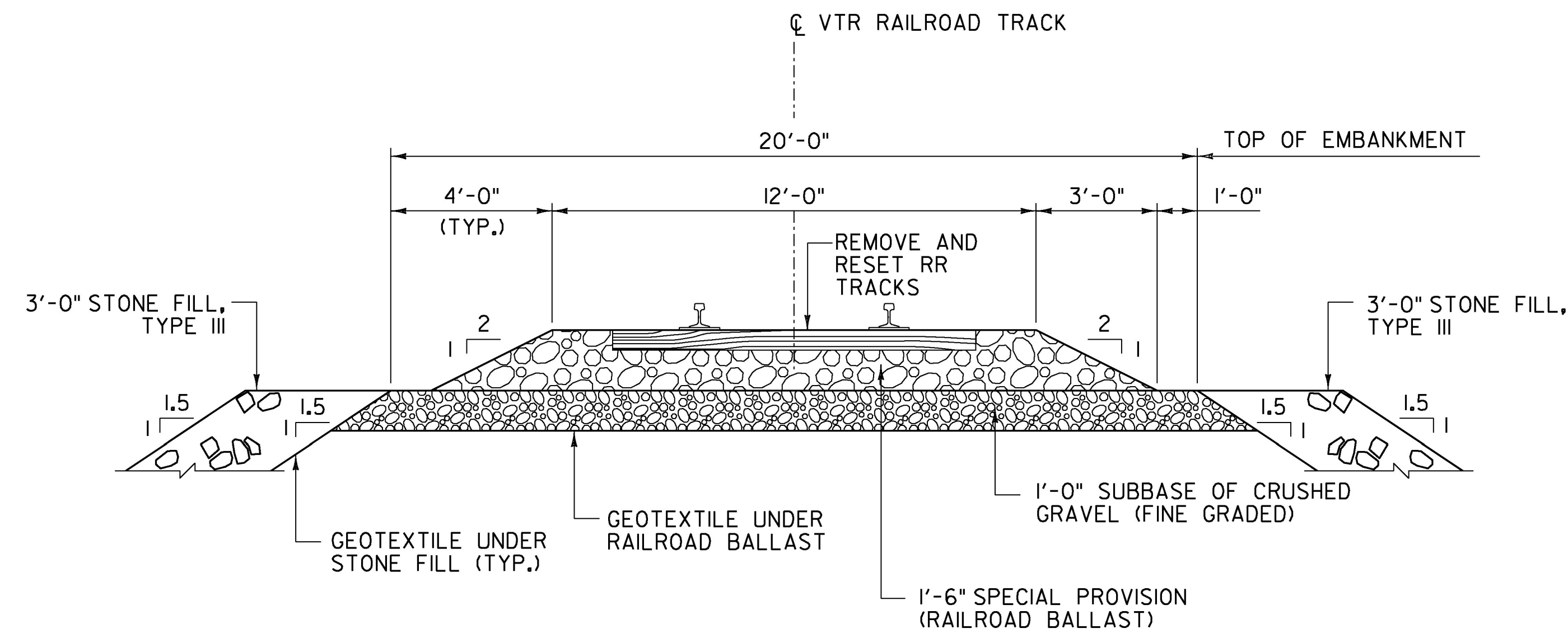
1. DESIGN LIVE LOAD	COOP. E80
2. FUTURE PAVEMENT	d <sub>p</sub> : 3.0 INCH
3. DESIGN SPAN	L: 8.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ: ---
5. PRESTRESSING STRAND	f <sub>y</sub> : ---
6. PRESTRESSED CONCRETE STRENGTH	f' <sub>c</sub> : ---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f' <sub>cr</sub> : ---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f' <sub>c</sub> : ---
9. CONCRETE, HIGH PERFORMANCE CLASS A	f' <sub>c</sub> : 4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f' <sub>c</sub> : ---
11. CONCRETE, CLASS C	f' <sub>c</sub> : ---
12. REINFORCING STEEL	f <sub>y</sub> : 60 KSI
13. STRUCTURAL STEEL AASHTO M270	f <sub>y</sub> : ---
14. NOMINAL BEARING RESISTANCE OF SOIL	q <sub>n</sub> : ---
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: ---
16. NOMINAL BEARING RESISTANCE OF ROCK	q <sub>n</sub> : ---
17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	φ: ---
18. PILE RESISTANCE FACTOR	φ: ---
19. LATERAL PILE DEFLECTION	Δ: ---
20. BASIC WIND SPEED	V <sub>3s</sub> : ---
21. MINIMUM GROUND SNOW LOAD	p <sub>g</sub> : ---
22. SEISMIC DATA	PGA: 0                      S <sub>s</sub> : --- S <sub>1</sub> : ---
23.	---
24.	---
25.	---
26.	---

PROJECT NAME: WALLINGFORD  
PROJECT NUMBER: ER CULV(39)

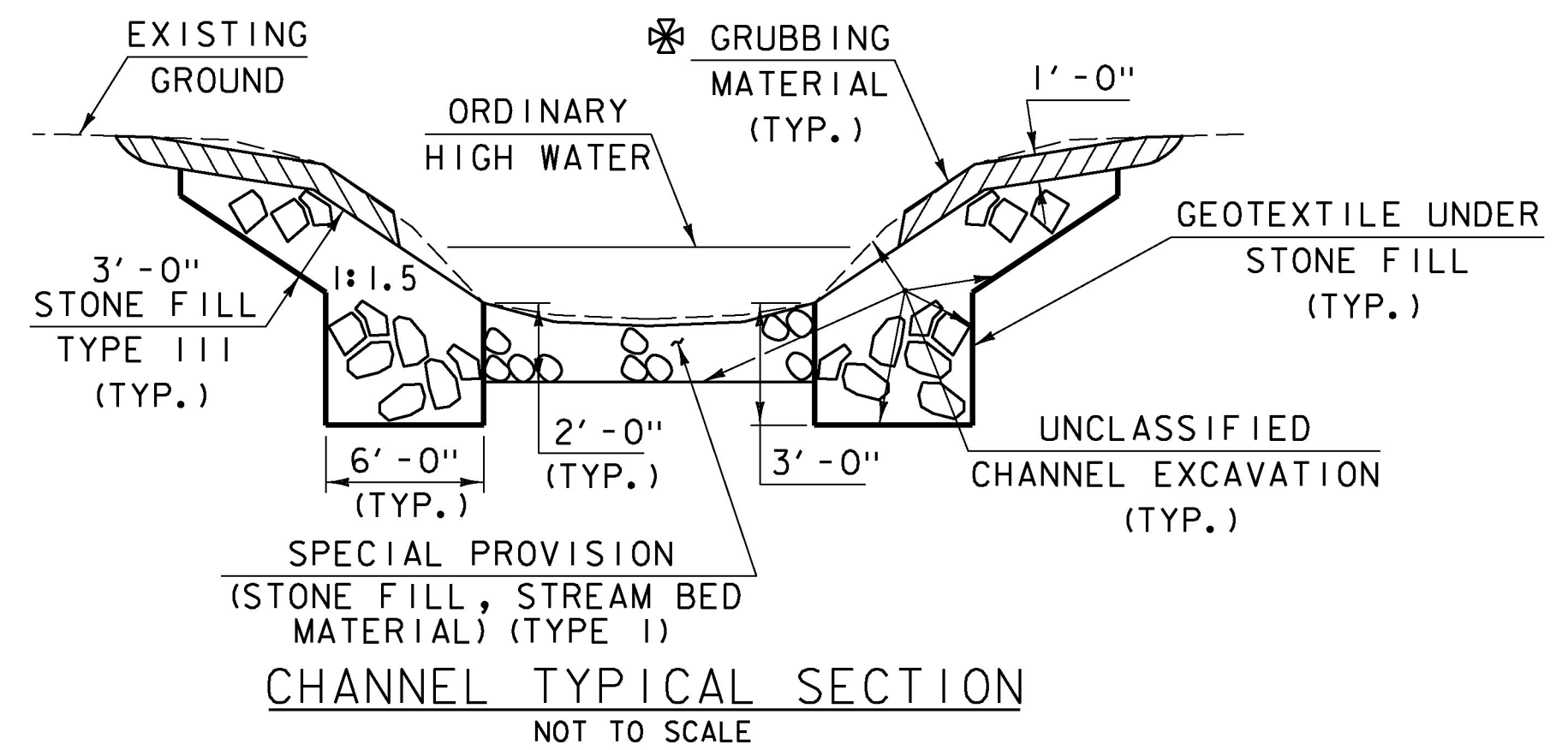
FILE NAME: z\_RR wallingford\_pi.xls                      PLOT DATE: 3/3/2016  
PROJECT LEADER: G. BOGUE                      DRAWN BY: L. BUXTON  
DESIGNED BY: T. KNIGHT                      CHECKED BY: G. BOGUE  
PRELIMINARY INFORMATION SHEET - C06470                      SHEET 14 OF 36

TRAFFIC DATA

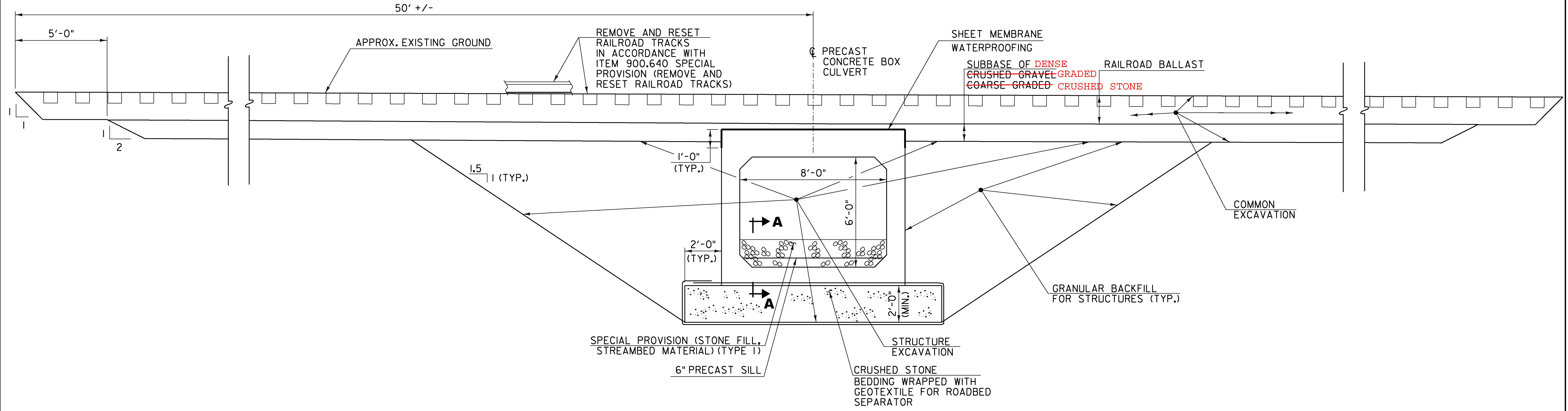
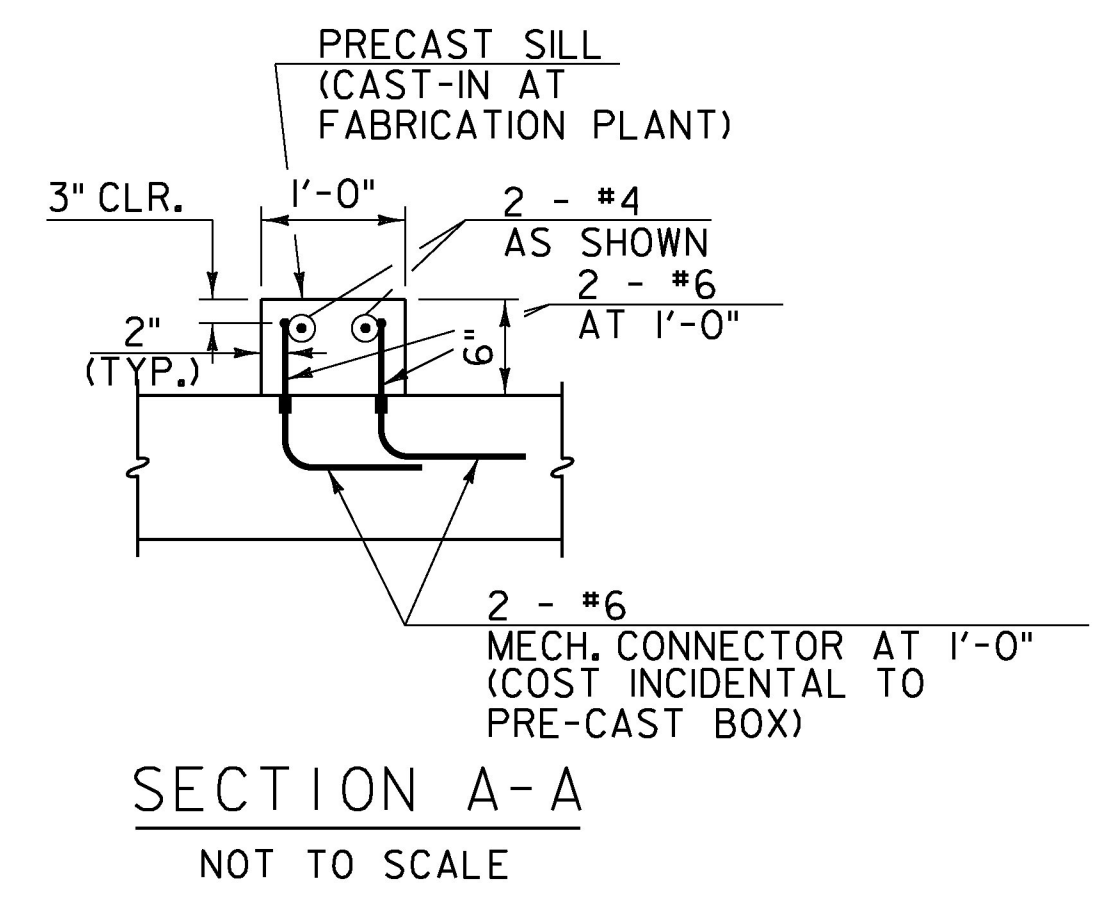
YEAR	ADT	DHV	% D	% T	ADTT	
0	0	0	0	0	0	20 year ESAL for flexible pavement from XXXX to XXXX : 0
XXXX	0	0	0	0	0	40 year ESAL for flexible pavement from XXXX to XXXX : 0
						Design Speed : 0 mph



**RAILROAD TRACK SECTION**  
 SCALE 3/8" = 1'-0"  
 STA. 2207+18 TO STA. 2208+04



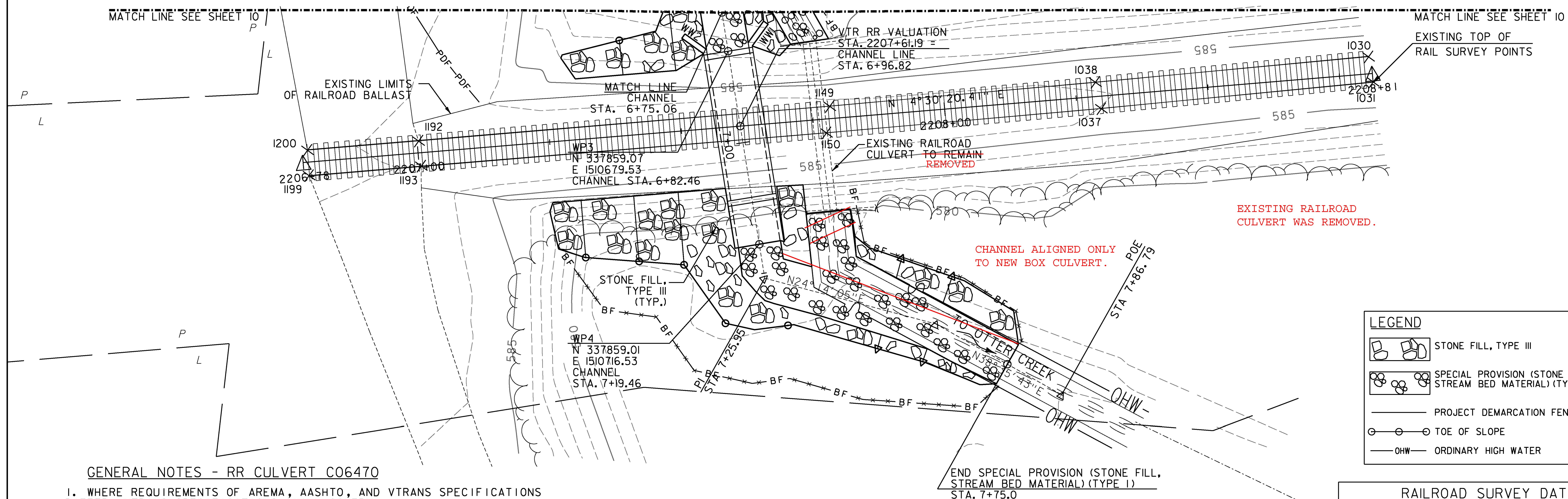
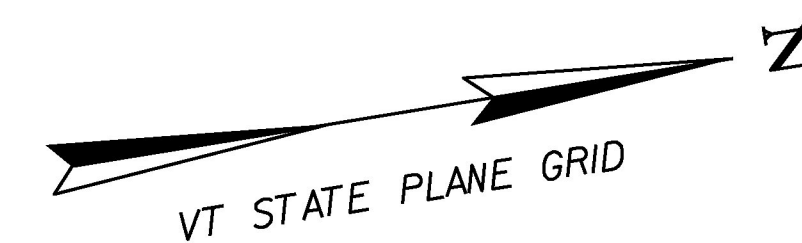
✱ WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.  
 TYPICAL SECTION MODIFIED IN SOME LOCATIONS TO SUIT FIELD CONDITIONS



**PRECAST CONCRETE BOX TYPICAL SECTION**  
 SCALE 3/8" = 1'-0"

PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	z12b380_RR TYPICAL_SECTIONS.dgn
PLOT DATE:	6/16/2016
PROJECT LEADER:	G. BOGUE
DRAWN BY:	L. BUXTON
DESIGNED BY:	J. HUNGERFORD
CHECKED BY:	T. KNIGHT
TYPICAL SECTIONS - RR CULV C06470	SHEET 15 OF 36





**GENERAL NOTES - RR CULVERT C06470**

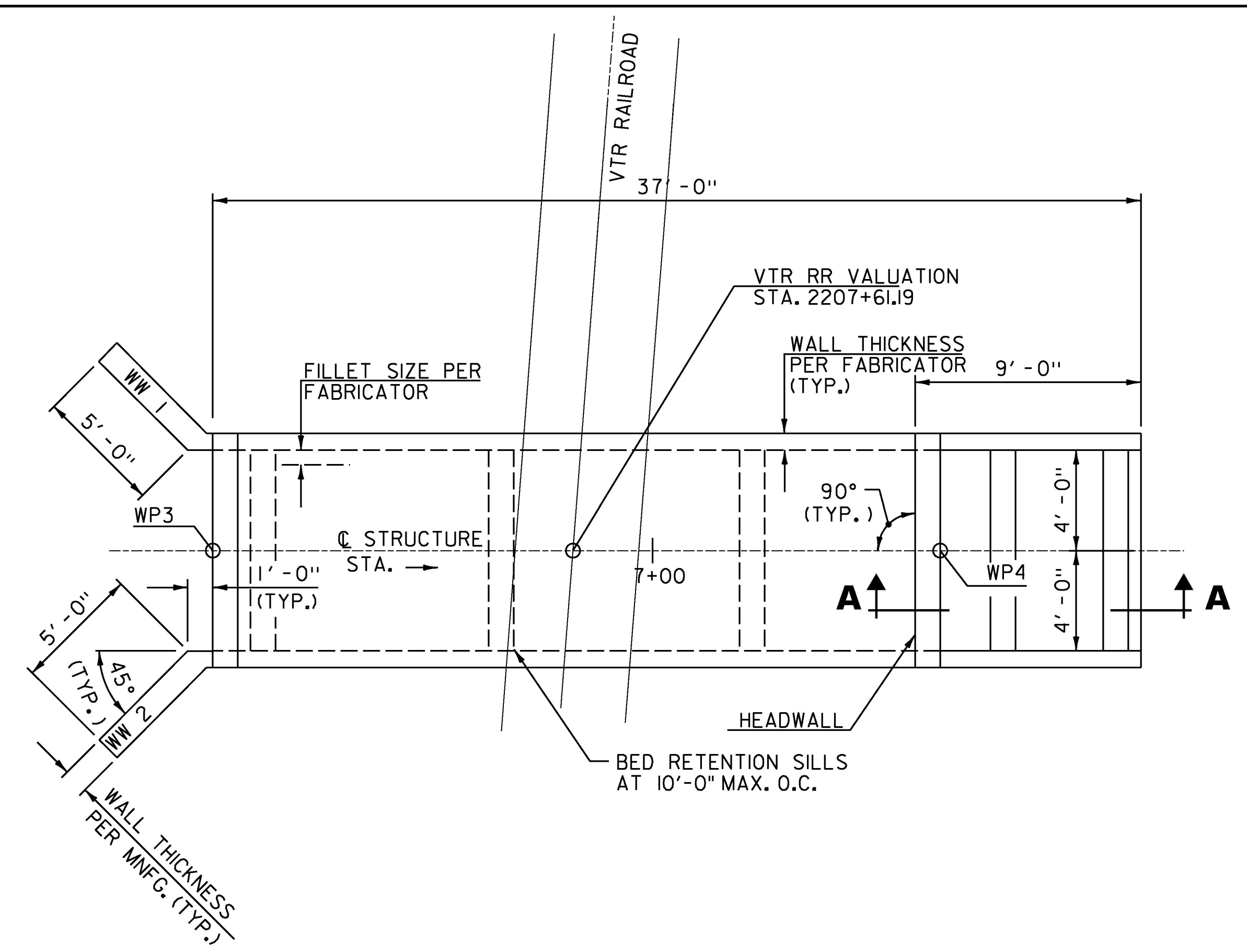
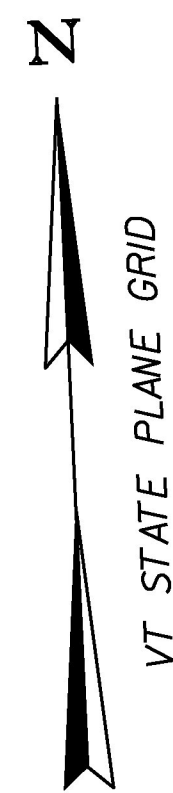
1. WHERE REQUIREMENTS OF AREMA, AASHTO, AND VTRANS SPECIFICATIONS DIFFER, VTRANS SPECIFICATIONS SHALL GOVERN.
2. THE UTILIZATION OF VERMONT RAILWAY, INC. FOR TRANSPORTATION OF MATERIALS OR SUPPLIES MAY BE AVAILABLE TO THE CONTRACTOR. A SEPARATE CONTRACT BETWEEN VERMONT RAILWAY, INC. AND THE CONTRACTOR IS REQUIRED. PROPER NOTIFICATION AND PERMISSION SHALL BE OBTAINED FROM VERMONT RAILWAY, INC. PRIOR TO ENTERING THE RIGHT-OF-WAY.
3. ALL CONTRACTOR INCURRED EXPENSES RELATING TO RAILROAD SUPPLIED FLAGGING PROTECTION WILL BE IN ACCORDANCE WITH ITEM 900.650, "SPECIAL PROVISION (MAINTENANCE OF RAILROAD TRAFFIC) (N.A.B.I.)".
4. AN ESTIMATED QUANTITY OF TIES HAS BEEN INCLUDED IN THE CONTRACT TO BE USED TO REPLACE DETERIORATED TIES WITHIN THE PROJECT LIMITS. REPLACEMENT OF TIES MUST BE APPROVED BY THE ENGINEER. REMOVING AND REPLACING THE EXISTING TIMBER CROSS TIES WILL BE IN ACCORDANCE WITH 900.620, "SPECIAL PROVISION (REMOVAL AND REPLACEMENT OF CROSS TIES)".
5. REMOVAL, RESETTING AND RE-ALIGNMENT OF RAIL WILL BE IN ACCORDANCE WITH ITEM 900.640, "SPECIAL PROVISION (REMOVE AND RESET RAILROAD TRACKS)". RAIL REMOVED, RESET AND RE-ALIGNMENT OUTSIDE THE LIMITS SHOWN WILL BE CONSIDERED INCIDENTAL TO THIS ITEM.
6. REMOVAL OF EXISTING BALLAST AND RAIL BED MATERIALS TO THE LIMITS SHOWN ON THE PLANS WITHIN THE AREAS OF REMOVAL AND RESETTING RAIL WILL BE IN ACCORDANCE WITH ITEM 203.15, "COMMON EXCAVATION", UNLESS NOTED OTHERWISE.

LEGEND	
	STONE FILL, TYPE III
	SPECIAL PROVISION (STONE FILL, STREAM BED MATERIAL) (TYPE I)
	PROJECT DEMARCATION FENCE
	TOE OF SLOPE
	OHW - ORDINARY HIGH WATER

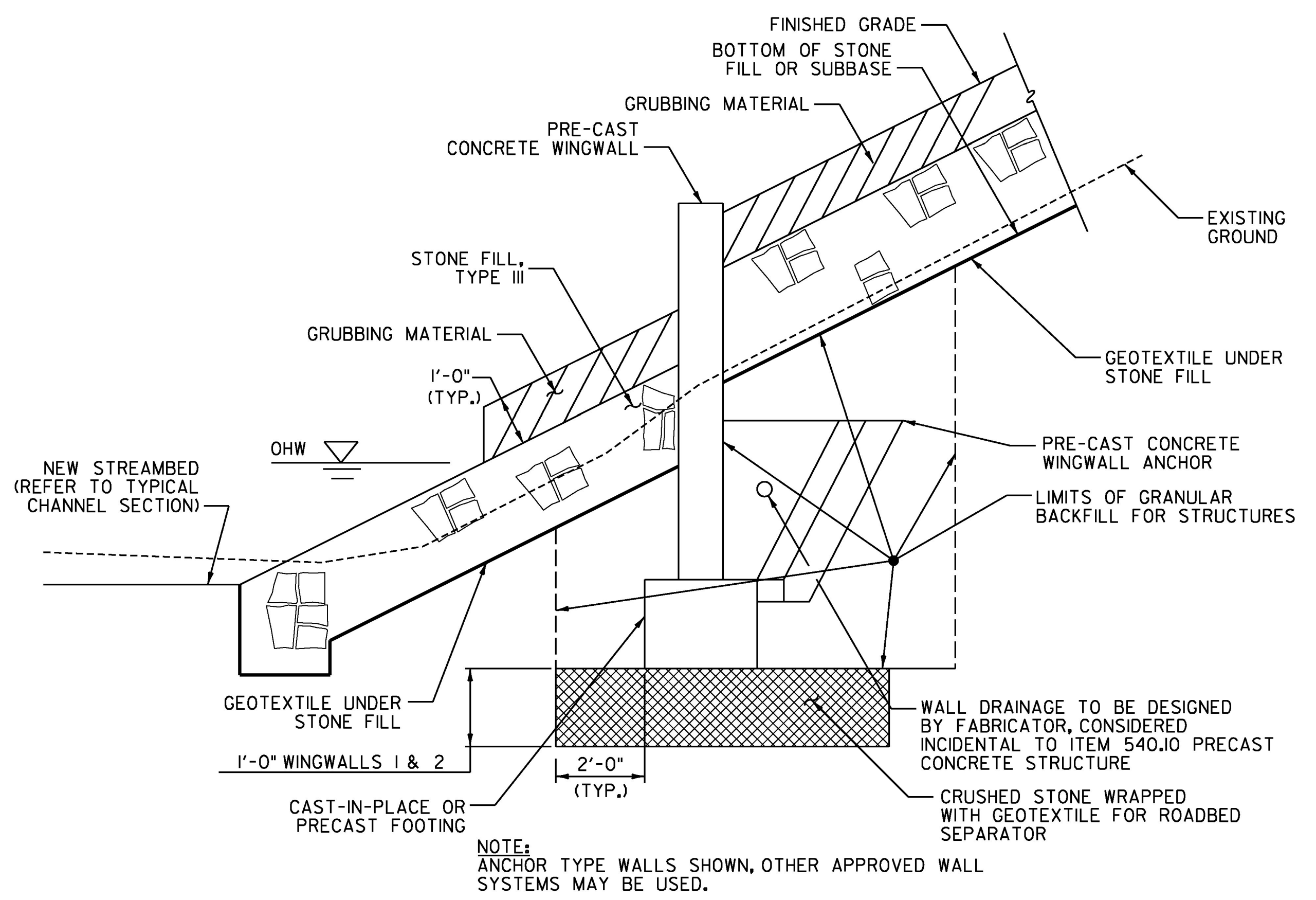
RAILROAD SURVEY DATA			
POINT	NORTHING	EASTING	ELEVATION
1199	337777.00	1510689.99	587.13
1200	337777.48	1510685.22	587.07
1193	337798.25	1510691.64	586.97
1192	337798.51	1510686.89	586.91
1150	337874.96	1510697.78	586.72
1149	337876.38	1510692.93	586.66
1037	337927.02	1510701.64	586.56
1038	337926.73	1510696.52	586.47
1031	337978.63	1510704.92	586.32
1030	337978.51	1510700.10	586.20

PROJECT NAME:	WALLINGFORD	FILE NAME:	z12b380.RR LAYOUT.dgn	PLOT DATE:	7/18/2016
PROJECT NUMBER:	ER CULV(39)	PROJECT LEADER:	G. BOGUE	DRAWN BY:	L. BUXTON
		DESIGNED BY:	J. HUNGERFORD	CHECKED BY:	T. KNIGHT
		LAYOUT PLAN - RR CULV C06470		SHEET	16 OF 36



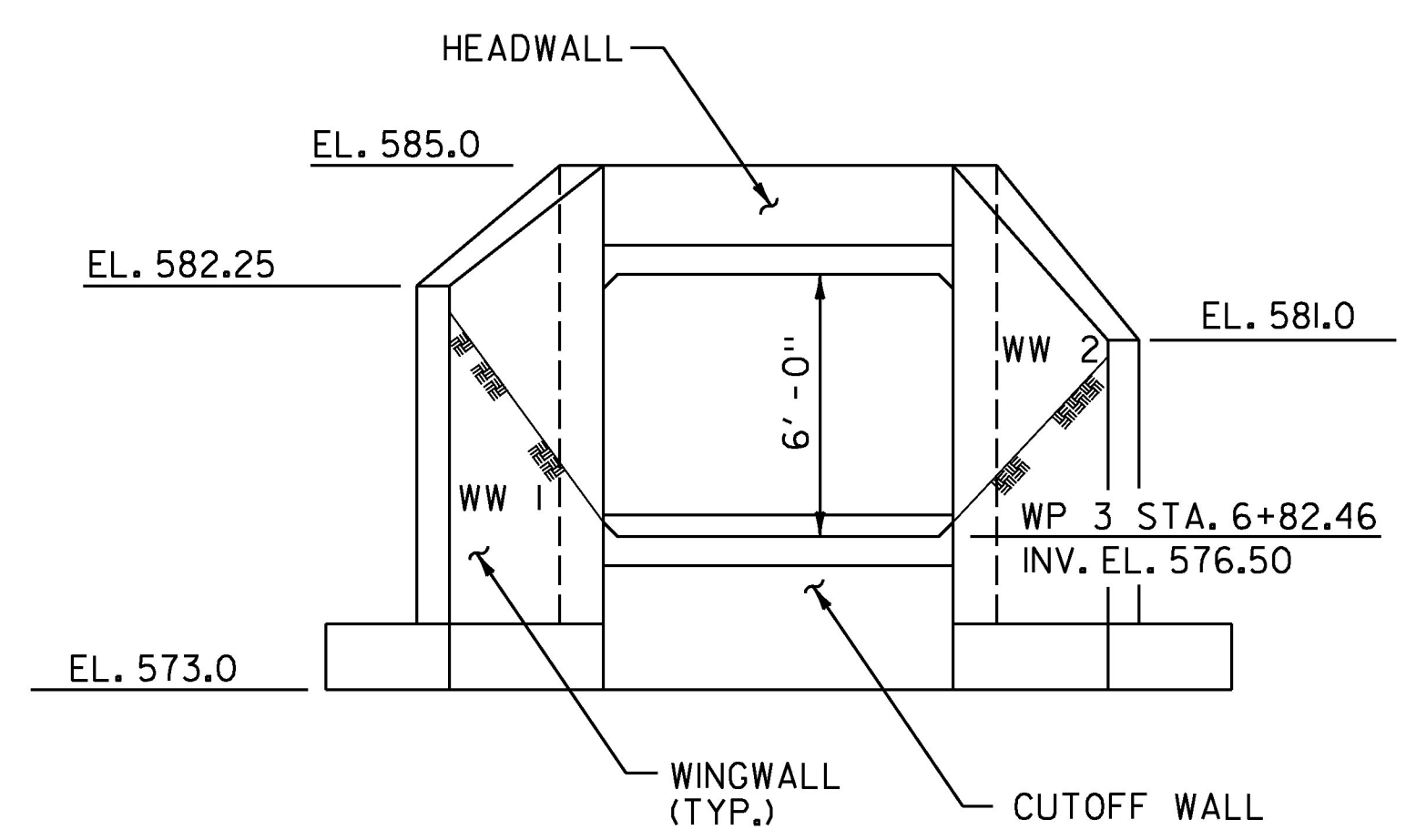


PRECAST CONCRETE STRUCTURE PLAN -RR CULV C06470  
SCALE: 1/4" = 1'-0"

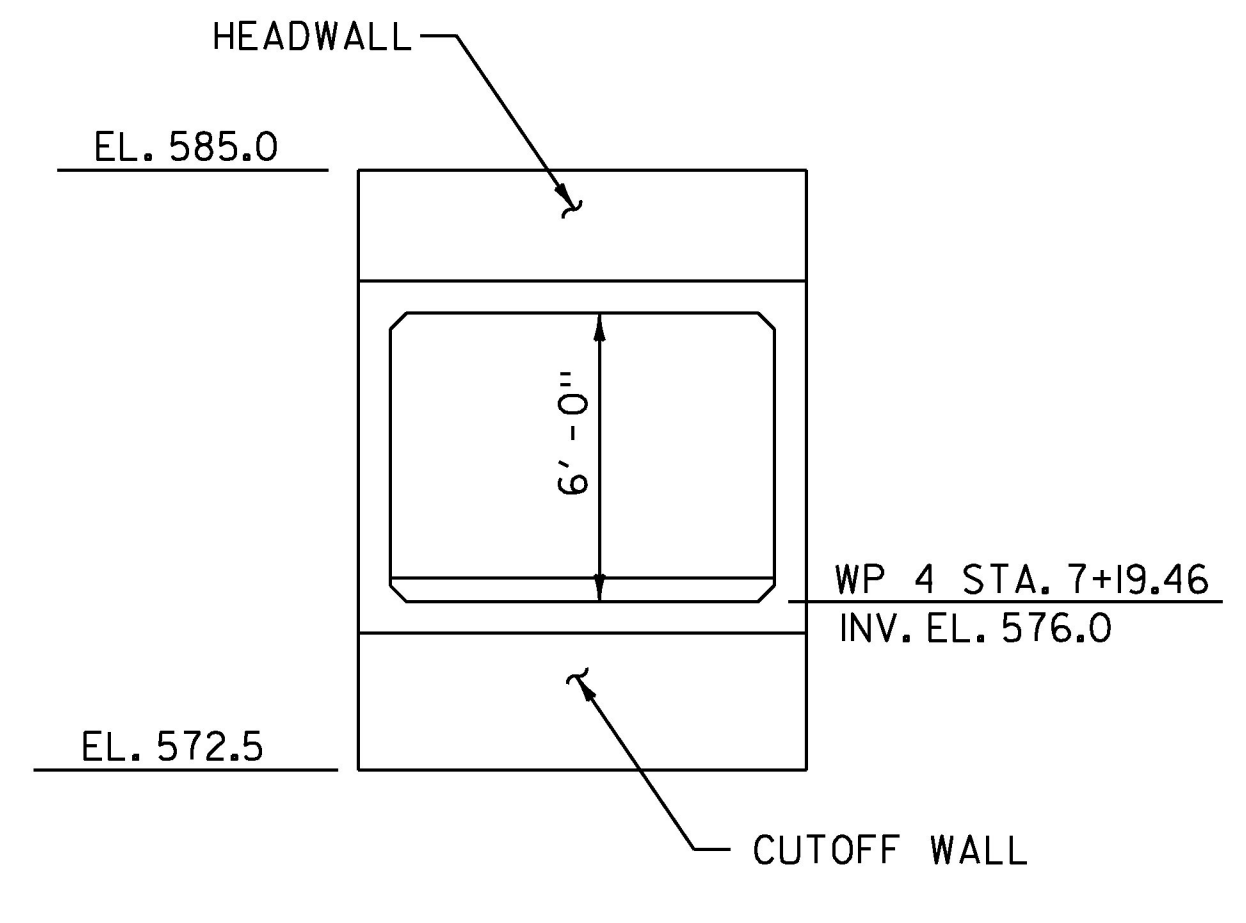


WINGWALL EARTHWORK SECTION  
NOT TO SCALE

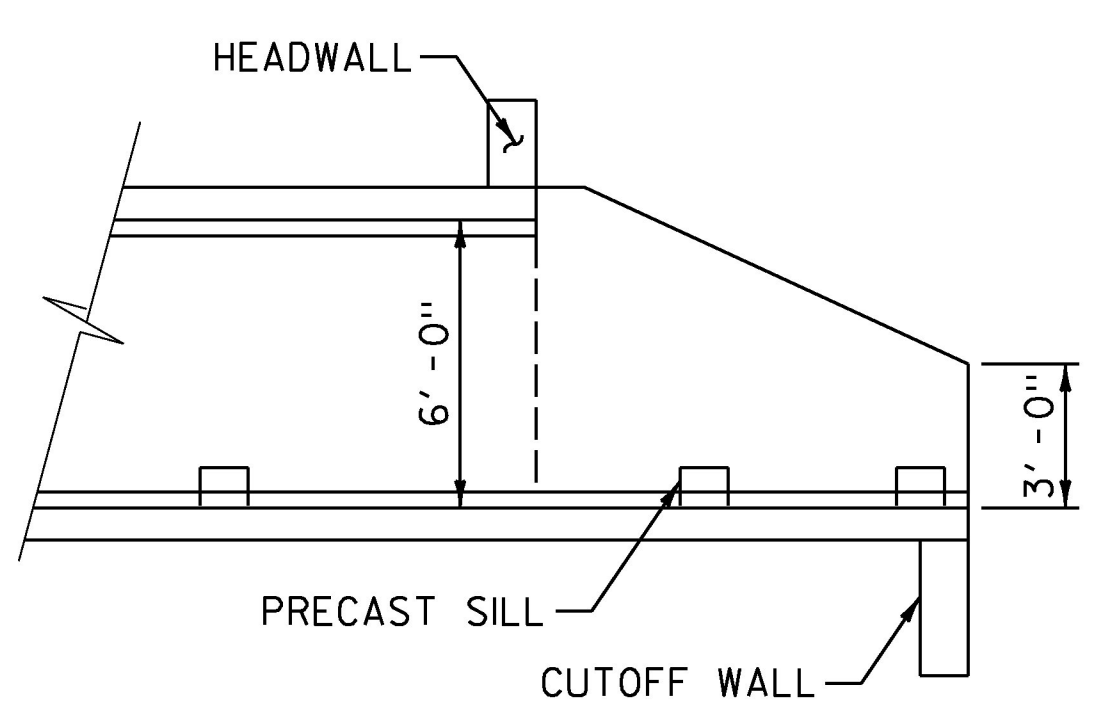
SEE SHOP DRAWINGS IN JOB RECORDS FOR DETAILS OF PRECAST AND WINGWALLS.



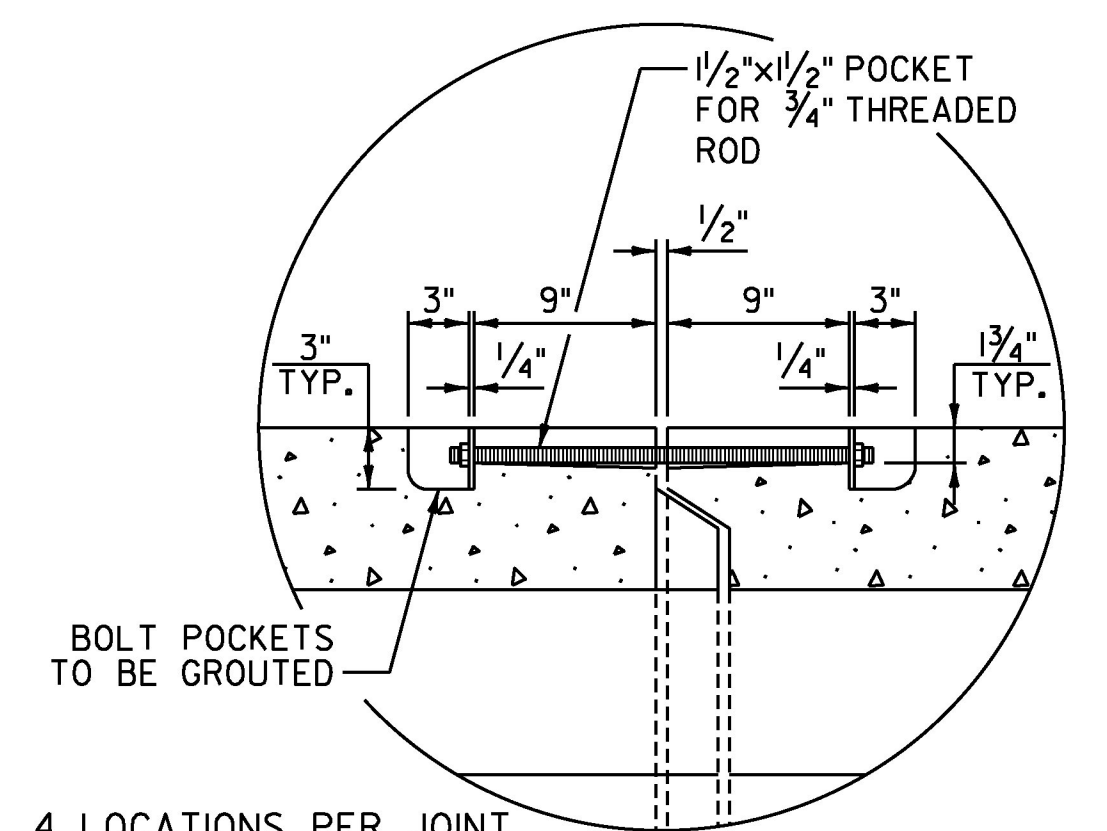
INLET ELEVATION  
SCALE: 1/4" = 1'-0"



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



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

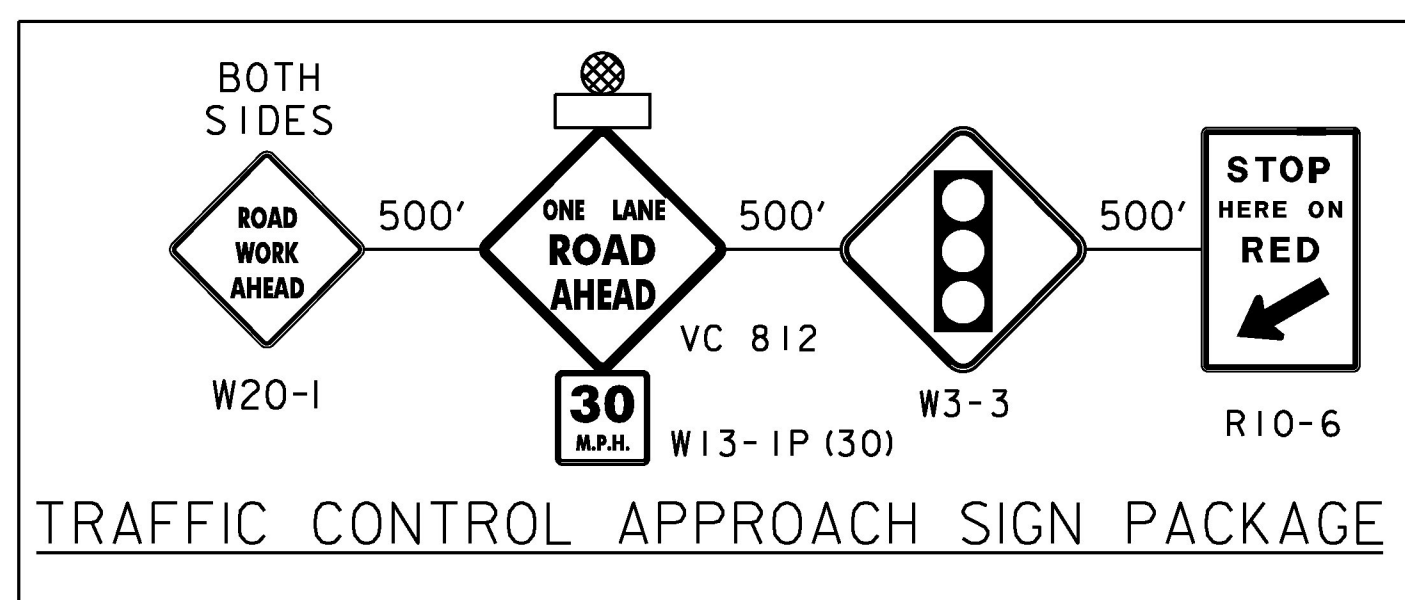


PERMANENT CLOSURE DETAIL  
NOT TO SCALE

NOTE:  
FOR DETAILS NOT SHOWN SEE PRECAST CONCRETE BOX TYPICAL SECTION ON SHEET 3.



PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	z12b380_RR_STRUCT_PLAN_DET.dgn
PLOT DATE:	6/16/2016
PROJECT LEADER:	G. BOGUE
DRAWN BY:	L. BUXTON
DESIGNED BY:	J. HUNGERFORD
CHECKED BY:	T. KNIGHT
STRUCTURAL PLAN/DET. - RR CULV C06470	SHEET 17 OF 36



NOTES:

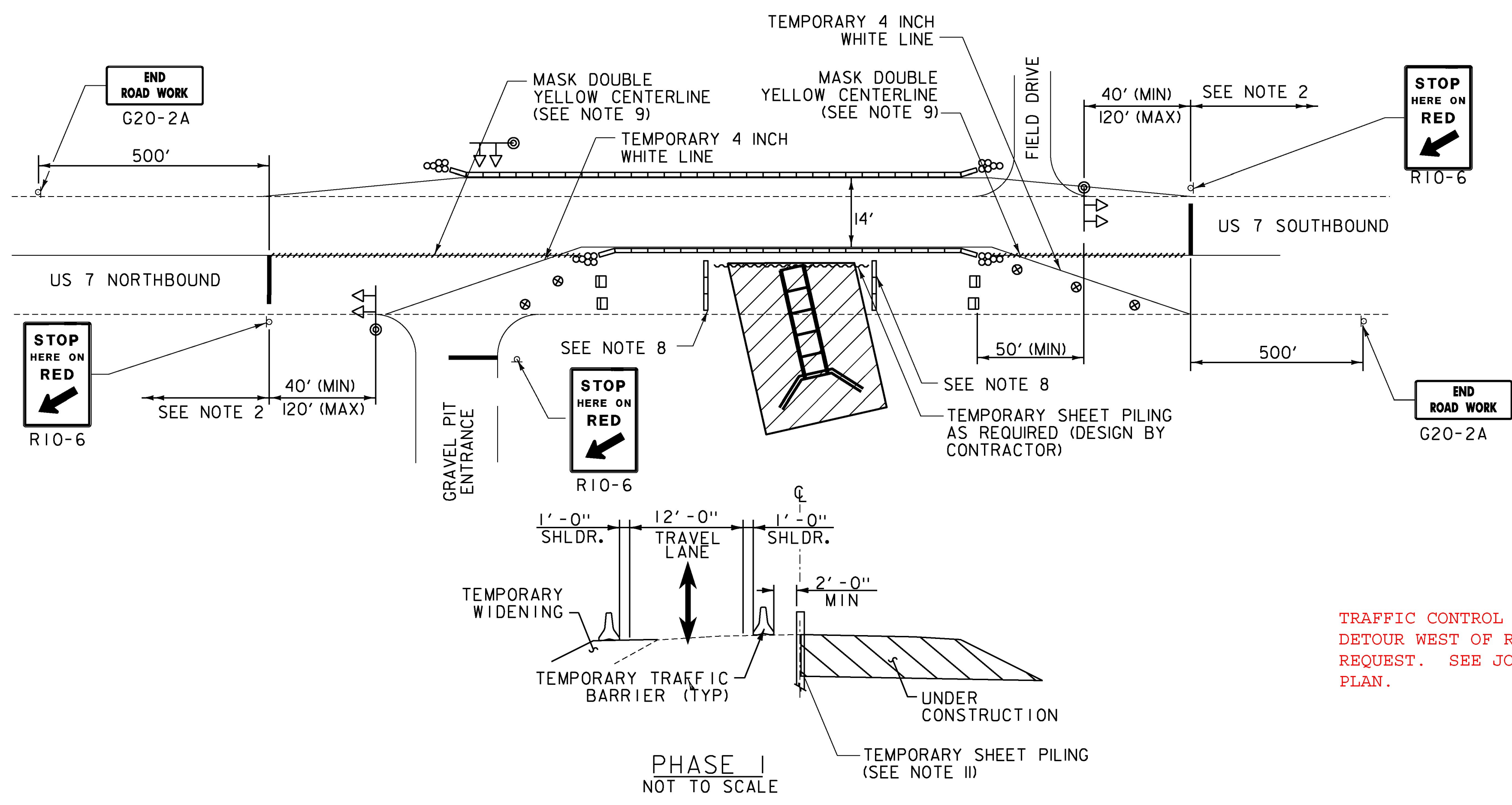
- SEE SHEET 4 FOR GENERAL TRAFFIC CONTROL NOTES.
- REFER TO STANDARD T-10 FOR CONSTRUCTION APPROACH SIGNS CRITERIA.
- CHANNELIZING DEVICE SPACING  
TANGENT SECTIONS: 60 FT. (2X DESIGN SPEED LIMIT)  
TAPER SECTIONS: 30 FT. (1X DESIGN SPEED LIMIT)  
DESIGN SPEED THROUGH CONSTRUCTION ZONE = 30MPH
- ACCESS 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.
- TEMPORARY CONCRETE BARRIER TO BE IN PLACE WHILE EXCAVATION IS OPEN AND WORK IS NOT ACTIVE OR AT THE DISCRETION OF THE ENGINEER.
- THE SIGNAL SYSTEM SHALL UTILIZE VEHICLE DETECTION AND BE PROGRAMMED TO DWELL ON RED. TIMING SHOWN IN THIS PLAN IS BASED ON ASSUMED 500' STOPLINE-STOPLINE DISTANCE AND 30MPH SPEED THROUGH WORKZONE THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ANY CHANGES TO 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. SIGNAL TIMING ADJUSTMENTS WILL BE INCIDENTAL TO ITEM 900.620 SPECIAL PROVISION (TEMPORARY TRAFFIC SIGNAL SYSTEM, PORTABLE).
- TEMPORARY SHEET PILING AS NEEDED TO BE DESIGNED BY THE CONTRACTOR AND WILL BE CONSIDERED INCIDENTAL TO ITEM 900.645 "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

**LEGEND**

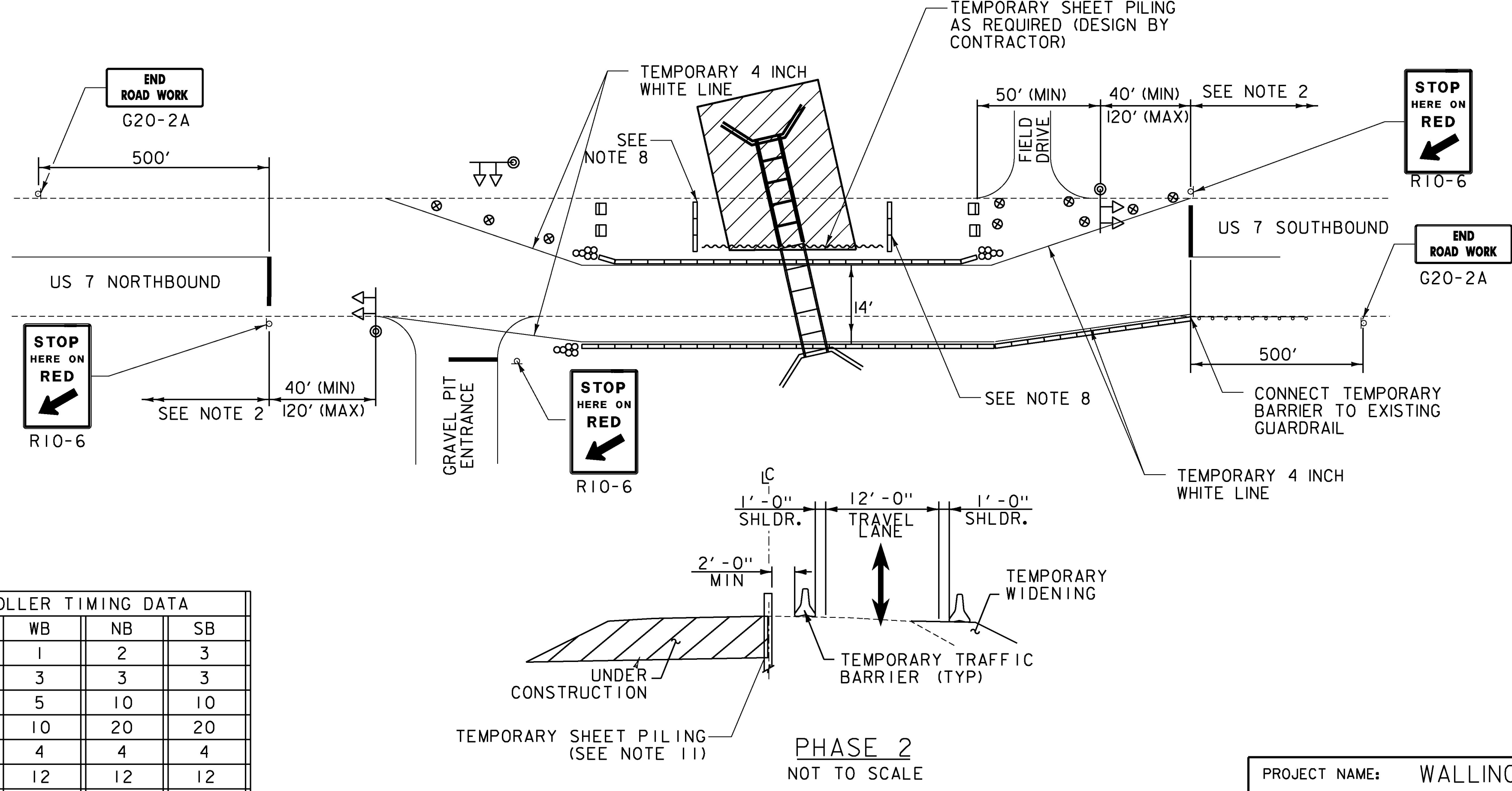
	UNDER CONSTRUCTION
	ALTERNATING ONE WAY TRAFFIC
	TEMPORARY TRAFFIC BARRIER
	CHANNELIZING DEVICE
	ENERGY ABSORPTION ATTENUATOR
	TYPE III BARRIER
	CONSTRUCTION SIGN
	TEMPORARY TRAFFIC SIGNAL
	FLASHING BEACON

**CONTROLLER TIMING DATA**

DIRECTION	WB	NB	SB
PHASE 1	1	2	3
EXTENSION	3	3	3
MIN. GREEN	5	10	10
MAX 1	10	20	20
YELLOW	4	4	4
ALL RED	12	12	12
RECALL	-	SOFT	SOFT



TRAFFIC CONTROL CHANGED TO ON-SITE DETOUR WEST OF ROUTE 7 PER CONTRACTOR REQUEST. SEE JOB RECORDS FOR APPROVED PLAN.



PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	z12b380_TRAFFIC_CONTROL.dgn
PROJECT LEADER:	G. BOGUE
DESIGNED BY:	I. MAYNARD
TRAFFIC CONTROL	
PLOT DATE:	7/14/2016
DRAWN BY:	J. SOTER
CHECKED BY:	G. SANTY
SHEET	18 OF 36

**SOIL CLASSIFICATION**

**AASHTO**

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

**ROCK QUALITY DESIGNATION**

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

**SHEAR STRENGTH**

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

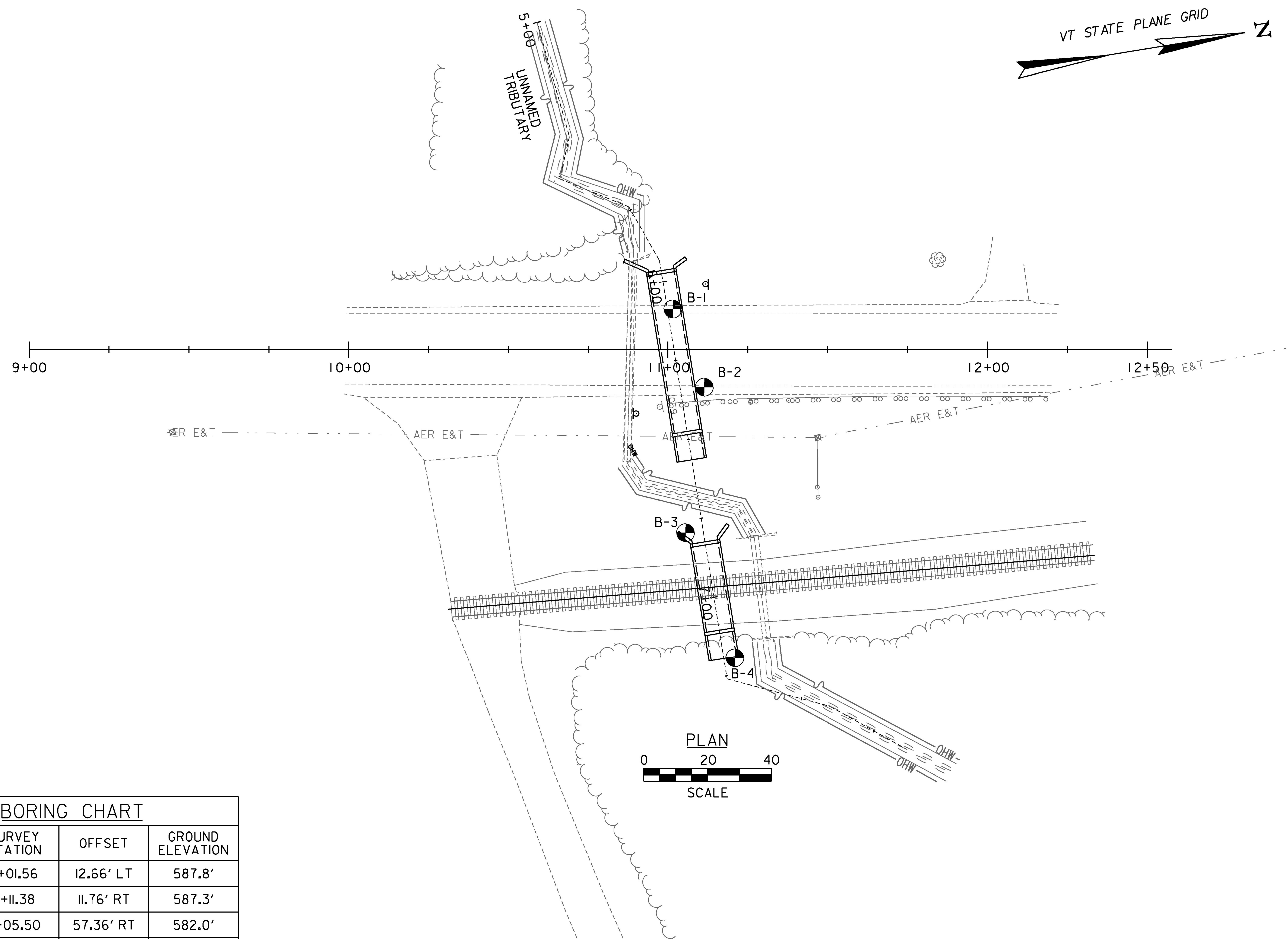
**CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY**

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

**COMMONLY USED SYMBOLS**

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

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



**BORING CHART**

BORING NUMBER	SURVEY STATION	OFFSET	GROUND ELEVATION
B-1	11+01.56	12.66' LT	587.8'
B-2	11+11.38	11.76' RT	587.3'
B-3	11+05.50	57.36' RT	582.0'
B-4	11+20.93	96.52' RT	579.0'

**DEFINITIONS (AASHTO)**

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

**GENERAL NOTES**

- The subsurface explorations shown herein were made on Oct. 25, 2012 by N.H. Boring.
- 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.
- Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
- Engineering judgement was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgement by the Contractor.
- Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
- Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

**LEGEND:**




PROJECT NAME: WALLINGFORD  
PROJECT NUMBER: ER CULV(39)

FILE NAME: z12b380\_BOR\_PLAN.dgn  
PROJECT LEADER: G. BOGUE  
DESIGNED BY: T. DYKSTRA  
BORING PLAN


PLOT DATE: 6/16/2016  
DRAWN BY: L. BUXTON  
CHECKED BY: T. DYKSTRA  
SHEET 19 OF 36



 <b>STATE OF VERMONT</b> AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	<b>BORING LOG</b>		Boring No.: <b>B-1</b>
	<b>Wallingford</b> <b>Bridge No. 73A, ER Culv(39)</b> <b>US Route 7</b>		Page No.: <b>1 of 2</b>
Boring Crew: <u>NH Boring, Derry, NH, Burke (Stantec)</u> Date Started: <u>4/30/14</u> Date Finished: <u>5/01/14</u> VTSPG NAD83: <u>N 337860.88 ft E 1510606.01 ft</u> Station: <u>11+01.56</u> Offset: <u>12.66 LT</u> Ground Elevation: <u>587.8 ft</u>		Casing: <u>Wash Bore</u> Sampler: <u>SS</u> I.D.: <u>4 in</u> <u>1.38 in</u> Hammer Wt: <u>300</u> <u>140</u> Hammer Fall: <u>24</u> <u>30</u> Hammer/Rod Type: <u>Safety/N</u> Rig: <u>Diedrich D-50</u> <u>C<sub>s</sub> = 1</u>	Pin No.: _____ Checked By: <u>TAD</u>
		Groundwater Observations	
		Date	Depth (ft)
		05/01/14	9.0
		Notes	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0.0 - 0.5		6 inches of Asphalt, 0.0 ft - 0.5 ft Visual Classification, GrSa, Moist, Rec. = 0.3 ft	100-100-25-22 (125)				
0.5 - 5.0		Visual Classification, SaGr, gry, Wet, Rec. = 0.2 ft	11-7-4-8 (11)				
5.0 - 10.0		A-1-b, SaGr, gry, Wet, Rec. = 0.5 ft	11-9-36-22 (45)	15.1	50.0	34.0	16.0
10.0 - 12.5		Visual Classification, Si, gry, Wet, Rec. = 0.2 ft	12-15-17-16 (32)				
12.5 - 15.0		Visual Classification, Sample too small for accurate description, gry, Wet, Rec. = 0.1 ft	89-22-21-20 (43)				
15.0 - 17.5		A-2-4, GrSiSa, grn-brn, Wet, Rec. = 0.5 ft	12-19-24-22 (43)	19.0	26.0	42.0	32.0
17.5 - 20.0		Visual Classification, GrSiSa, grn-brn, Wet, Rec. = 0.2 ft	36-48-31-40 (79)				
20.0 - 22.5		Visual Classification, Si, red-brn, Wet, Rec. = 1.2 ft	8-10-9-16 (19)				

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.  
 2. N Values have not been corrected for hammer energy. C 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.

 <b>STATE OF VERMONT</b> AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION	<b>BORING LOG</b>		Boring No.: <b>B-1</b>
	<b>Wallingford</b> <b>Bridge No. 73A, ER Culv(39)</b> <b>US Route 7</b>		Page No.: <b>2 of 2</b>
Boring Crew: <u>NH Boring, Derry, NH, Burke (Stantec)</u> Date Started: <u>4/30/14</u> Date Finished: <u>5/01/14</u> VTSPG NAD83: <u>N 337860.88 ft E 1510606.01 ft</u> Station: <u>11+01.56</u> Offset: <u>12.66 LT</u> Ground Elevation: <u>587.8 ft</u>		Casing: <u>Wash Bore</u> Sampler: <u>SS</u> I.D.: <u>4 in</u> <u>1.38 in</u> Hammer Wt: <u>300</u> <u>140</u> Hammer Fall: <u>24</u> <u>30</u> Hammer/Rod Type: <u>Safety/N</u> Rig: <u>Diedrich D-50</u> <u>C<sub>s</sub> = 1</u>	Pin No.: _____ Checked By: <u>TAD</u>
		Groundwater Observations	
		Date	Depth (ft)
		05/01/14	9.0
		Notes	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0.0 - 27.5		A-4, Si, red-brn, Wet, Rec. = 1.5 ft	8-9-12-13 (21)	27.1		16.0	84.0
27.5 - 30.0		Visual Classification, Si, Lt/brn, Wet, Rec. = 1.7 ft	9-13-10-5 (23)				
30.0 - 35.0		Visual Classification, Si, brn, Wet, Rec. = 0.3 ft	51-100/3" (R)				
35.0 - 37.5		Hole stopped @ 36.5 ft Top of Bedrock @ 36.5 ft					
37.5 - 47.5		Remarks: Roller bit refusal at 36.5 feet below ground surface. Probable bedrock.					

Notes: 1. Stratification lines represent approximate boundary between material types. Transition may be gradual.  
 2. N Values have not been corrected for hammer energy. C 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:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME: z12b380_BOR_LOG l.dgn	PLOT DATE: 6/16/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: L. BUXTON
DESIGNED BY: T. DYKSTRA	CHECKED BY: T. DYKSTRA
BORING LOG 1	SHEET 20 OF 36





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

**BORING LOG**

**Wallingford**  
**Bridge No. 73A, ER Culv(39)**  
**US Route 7**

Boring No.: **B-2**  
Page No.: **1 of 2**  
Pin No.:  
Checked By: **TAD**

Boring Crew: **NH Boring, Derry, NH, Burke (Stantec)**  
Date Started: **4/30/14** Date Finished: **4/30/14**  
VTSPG NAD83: **N 337866.64 ft E 1510631.68 ft**  
Station: **11+11.38** Offset: **11.76 RT**  
Ground Elevation: **587.3 ft**

Casing Sampler  
Type: **Wash Bore SS**  
I.D.: **4 in 1.38 in**  
Hammer Wt: **300 140**  
Hammer Fall: **24 30**  
Hammer/Rod Type: **Safety/N**  
Rig: **Diedrich D-50 C<sub>s</sub> = 1**

**Groundwater Observations**

Date	Depth (ft)	Notes
04/30/14	9.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		10 inches of Asphalt, 0.0 ft - 0.8 ft					
2.5		Visual Classification, SiGrSa, blk-gry, Moist, Rec. = 0.2 ft	45-19-17-11 (36)				
5.0		A-4, SaSi, brn, Wet, Rec. = 0.3 ft	5-4-3-2 (7)	25.6	1.0	33.0	66.0
7.5		Visual Classification, SaSi, brn, Wet, Rec. = 0.7 ft	5-9-11-19 (20)				
10.0		Visual Classification, SiSa, Dk/gry, Wet, Rec. = 0.7 ft	10-11-11-11 (22)				
12.5		Visual Classification, SiSa, blk-brn, Wet, Rec. = 0.8 ft	11-10-8-9 (18)				
15.0		A-4, SaSi, brn, Wet, Rec. = 1.7 ft	8-17-15-15 (32)	22.5	2.0	27.0	71.0
20.0		Visual Classification, SaSi, gry, Wet, Rec. = 0.2 ft	31-22-21-26 (43)				
22.5		A-4, SaSi, tan, Wet, Rec. = 0.5 ft	8-8-13-20	26.5		28.0	72.0

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

BORING LOG VTRANS\_TEMPLATE\_WALLINGFORD.VT.GPJ VERMONT AOT.GDT 6/24/14



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

**BORING LOG**

**Wallingford**  
**Bridge No. 73A, ER Culv(39)**  
**US Route 7**

Boring No.: **B-2**  
Page No.: **2 of 2**  
Pin No.:  
Checked By: **TAD**

Boring Crew: **NH Boring, Derry, NH, Burke (Stantec)**  
Date Started: **4/30/14** Date Finished: **4/30/14**  
VTSPG NAD83: **N 337866.64 ft E 1510631.68 ft**  
Station: **11+11.38** Offset: **11.76 RT**  
Ground Elevation: **587.3 ft**

Casing Sampler  
Type: **Wash Bore SS**  
I.D.: **4 in 1.38 in**  
Hammer Wt: **300 140**  
Hammer Fall: **24 30**  
Hammer/Rod Type: **Safety/N**  
Rig: **Diedrich D-50 C<sub>s</sub> = 1**

**Groundwater Observations**

Date	Depth (ft)	Notes
04/30/14	9.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Hole stopped @ 26.0 ft	(21)				

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

BORING LOG VTRANS\_TEMPLATE\_WALLINGFORD.VT.GPJ VERMONT AOT.GDT 6/24/14

PROJECT NAME: **WALLINGFORD**  
PROJECT NUMBER: **ER CULV(39)**

FILE NAME: **z12b380\_BOR\_LOG 2.dgn** PLOT DATE: **6/16/2016**  
PROJECT LEADER: **G. BOGUE** DRAWN BY: **L. BUXTON**  
DESIGNED BY: **T. DYKSTRA** CHECKED BY: **T. DYKSTRA**  
BORING LOG 2 SHEET **21** OF **36**





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

**BORING LOG**

**Wallingford**  
**Bridge No. 73A, ER Culv(39)**  
**US Route 7**

Boring No.: **B-3**  
Page No.: **1 of 2**  
Pin No.:  
Checked By: **TAD**

Boring Crew: **NH Boring, Derry, NH, Burke (Stantec)**  
Date Started: **4/29/14** Date Finished: **4/29/14**  
VTSPG NAD83: **N 337853.50 ft E 1510675.75 ft**  
Station: **11+05.50** Offset: **57.36 RT**  
Ground Elevation: **582.0 ft**

Casing Type: **Wash Bore** Sampler **SS**  
I.D.: **4 in** **1.38 in**  
Hammer Wt: **300** **140**  
Hammer Fall: **24** **30**  
Hammer/Rod Type: **Safety/N**  
Rig: **Diedrich D-50** **C<sub>s</sub> = 1**

Groundwater Observations		
Date	Depth (ft)	Notes
04/29/14	4.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/(N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Visual Classification, GrSiSa, Dk/brn, Moist, Rec. = 0.8 ft	2-3-2-6 (5)				
2.5		Visual Classification, SiSa, Dk/brn, Moist, Rec. = 0.3 ft	5-14-22-29 (36)				
5.0		A-4, SaSi, gry, Wet, Rec. = 0.7 ft	90-80-11-10 (91)	31.0	2.0	45.0	53.0
7.5		No recovery, Wet, Rec. = 0.0 ft, 6.0 ft - 8.0 ft	14-7-11-12 (18)				
10.0		Visual Classification, GrSa, gry, Wet, Rec. = 1.2 ft	17-15-10-5 (25)				
12.5		A-1-b, GrSa, gry-brn, Wet, Rec. = 0.8 ft	10-2-5-8 (7)	20.1	38.0	42.0	20.0
15.0		Visual Classification, GrSa, gry, Wet, Rec. = 1.3 ft	19-37-36-36 (73)				
17.5		Visual Classification, GrSa, brn, Wet, Rec. = 1.2 ft	16-34-26-9 (60)				
20.0		Visual Classification, SiSa, brn, Wet, Rec. = 1.7 ft	12-13-12-23 (25)				
22.5		Visual Classification, SiSa, brn, Wet, Rec. = 1.2 ft	11-3-10-13 (13)				
		Sample too small for accurate description, Wet, Rec. = 0.1 ft, 20.0 ft - 22.0 ft	21-19-11-12 (30)				
		A-4, SaSi, brn, Wet, Rec. = 0.2 ft	11-12-11-3 (23)	21.7		45.0	55.0
		No recovery, Wet, Rec. = 0.0 ft, 24.0 ft - 26.0 ft	14-12-15-8				

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

BORING LOG VTRANS\_TEMPLATE\_WALLINGFORD\_VT.GPJ VERMONT AOT.GDT 6/24/14



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

**BORING LOG**

**Wallingford**  
**Bridge No. 73A, ER Culv(39)**  
**US Route 7**

Boring No.: **B-3**  
Page No.: **2 of 2**  
Pin No.:  
Checked By: **TAD**

Boring Crew: **NH Boring, Derry, NH, Burke (Stantec)**  
Date Started: **4/29/14** Date Finished: **4/29/14**  
VTSPG NAD83: **N 337853.50 ft E 1510675.75 ft**  
Station: **11+05.50** Offset: **57.36 RT**  
Ground Elevation: **582.0 ft**

Casing Type: **Wash Bore** Sampler **SS**  
I.D.: **4 in** **1.38 in**  
Hammer Wt: **300** **140**  
Hammer Fall: **24** **30**  
Hammer/Rod Type: **Safety/N**  
Rig: **Diedrich D-50** **C<sub>s</sub> = 1**

Groundwater Observations		
Date	Depth (ft)	Notes
04/29/14	4.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/(N Value)	Moisture Content %	Gravel %	Sand %	Fines %
			(27)				
30.0		Visual Classification, SaSi, brn, Wet, Rec. = 0.2 ft	6-5-6-8 (11)				
35.0		Visual Classification, SiSa, tan, Wet, Rec. = 0.1 ft	17-12-11-14 (23)				
40.0		Visual Classification, SiSa, tan, Wet, Rec. = 0.8 ft	17-35-100/2' (R)				
41.2		Hole stopped @ 41.2 ft					
41.2		Top of Bedrock @ 41.2 ft					
42.5		Remarks: Roller bit refusal at 41.2 feet below ground surface. Probable bedrock.					

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

BORING LOG VTRANS\_TEMPLATE\_WALLINGFORD\_VT.GPJ VERMONT AOT.GDT 6/24/14

PROJECT NAME: **WALLINGFORD**  
PROJECT NUMBER: **ER CULV(39)**

FILE NAME: z12b380\_BOR\_LOG 3.dgn PLOT DATE: 6/16/2016  
PROJECT LEADER: G. BOGUE DRAWN BY: L. BUXTON  
DESIGNED BY: T. DYKSTRA CHECKED BY: T. DYKSTRA  
BORING LOG 3 SHEET 22 OF 36





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

**BORING LOG**

**Wallingford**  
**Bridge No. 73A, ER Culv(39)**  
**US Route 7**

Boring No.: **B-4**  
 Page No.: **1 of 1**  
 Pin No.:  
 Checked By: **TAD**

Boring Crew: **NH Boring, Derry, NH, Burke (Stantec)**  
 Date Started: **5/20/14** Date Finished: **5/20/14**  
 VTSPG NAD83: **N 337862.43 ft E 1510716.88 ft**  
 Station: **11+20.93** Offset: **96.52 RT**  
 Ground Elevation: **579.0 ft**

Casing Sampler  
 Type: **Open Hole SS**  
 I.D.: **1.38 in**  
 Hammer Wt: **NA 140**  
 Hammer Fall: **NA 30**  
 Hammer/Rod Type: **Donut/N**  
 Rig: **Tripod C<sub>r</sub> = 0.75**

Groundwater Observations		
Date	Depth (ft)	Notes
05/20/14	0.2	

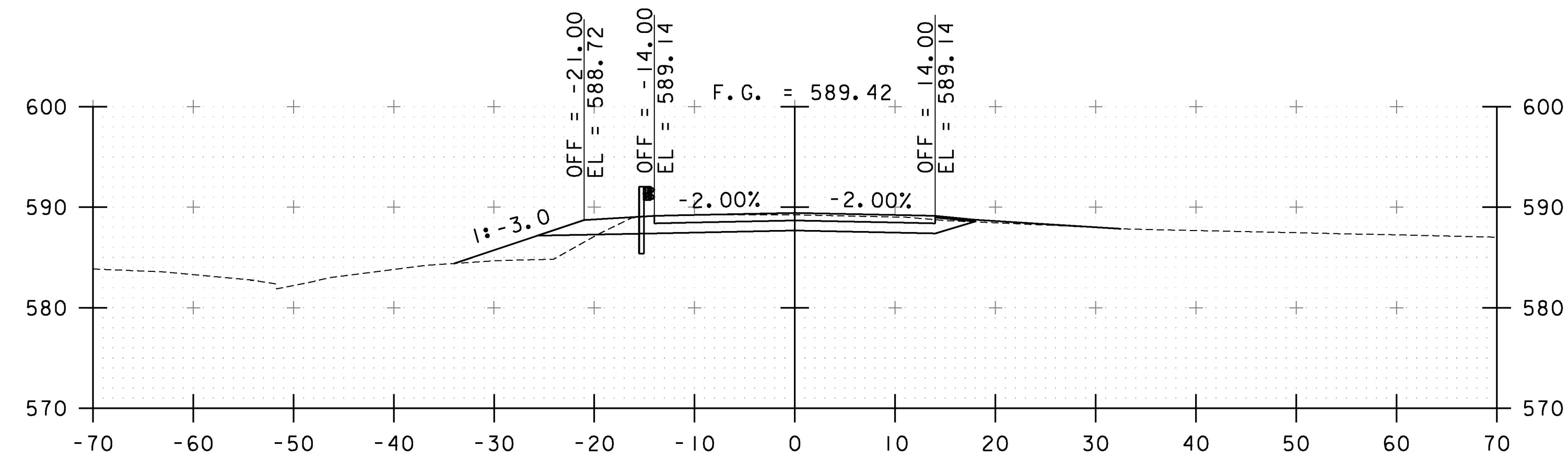
Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
0.0 - 0.2		Visual Classification, Organic Silt, Dk/brn, Wet, Rec. = 0.2 ft	0-0-1-19 (1)				
0.5 - 2.5		Visual Classification, Organic Silt (3.2% organic based in lab test), Dk/brn, Wet, Rec. = 0.5 ft	3-11-4-8 (15)	39.9			
1.5 - 5.0		Visual Classification, Organic Silt (3.5% organic based in lab test), Dk/brn, Wet, Rec. = 1.5 ft	4-8-11-19 (19)	41.0			
5.0 - 7.5		Visual Classification, Organic Silt with angular gravel, brn, Wet, Rec. = 1.0 ft	20-27-27-18 (54)				
7.5 - 10.0		Visual Classification, Si, brn, Wet, Rec. = 1.0 ft	11-10-9-12 (19)				
10.0 - 12.5		Visual Classification, SaSi, brn, Wet					
12.5 - 15.0		Visual Classification, SiSa, brn, Wet, Rec. = 1.2 ft	13-12-13-10 (25)				
15.0 - 17.5		Visual Classification, GrSiSa, brn, Wet, Rec. = 0.7 ft	11-14-15-12 (29)				
17.5 - 20.0		Visual Classification, Si, brn, Wet, Rec. = 1.3 ft	12-14-15-14 (29)				
20.0 - 22.5		Visual Classification, Si, brn, Wet, Rec. = 0.8 ft	21-23-33-40 (55)				
Hole stopped @ 18.0 ft							

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

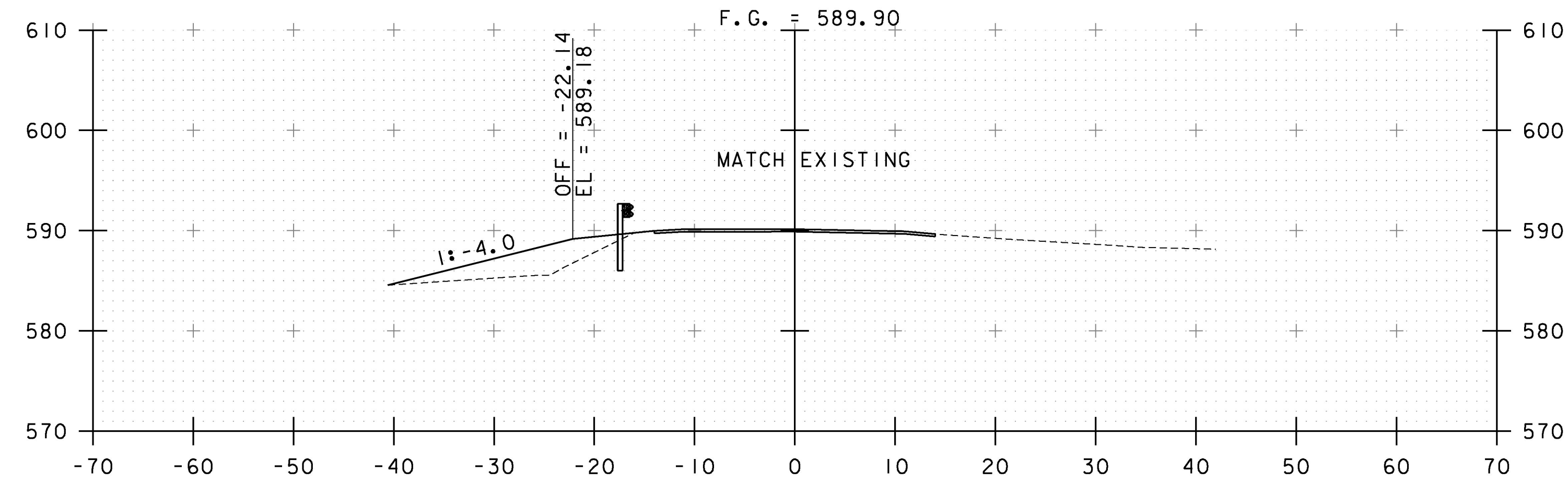
BORING LOG VTRANS\_TEMPLATE\_WALLINGFORD.VT.GPJ VERMONT AOT.GDT 6/24/14

PROJECT NAME: <b>WALLINGFORD</b>	PLOT DATE: <b>6/16/2016</b>
PROJECT NUMBER: <b>ER CULV(39)</b>	DRAWN BY: <b>L. BUXTON</b>
FILE NAME: <b>z12b380_BOR_LOG 4.dgn</b>	DESIGNED BY: <b>T. DYKSTRA</b>
PROJECT LEADER: <b>G. BOGUE</b>	CHECKED BY: <b>T. DYKSTRA</b>
BORING LOG <b>4</b>	SHEET <b>23</b> OF <b>36</b>



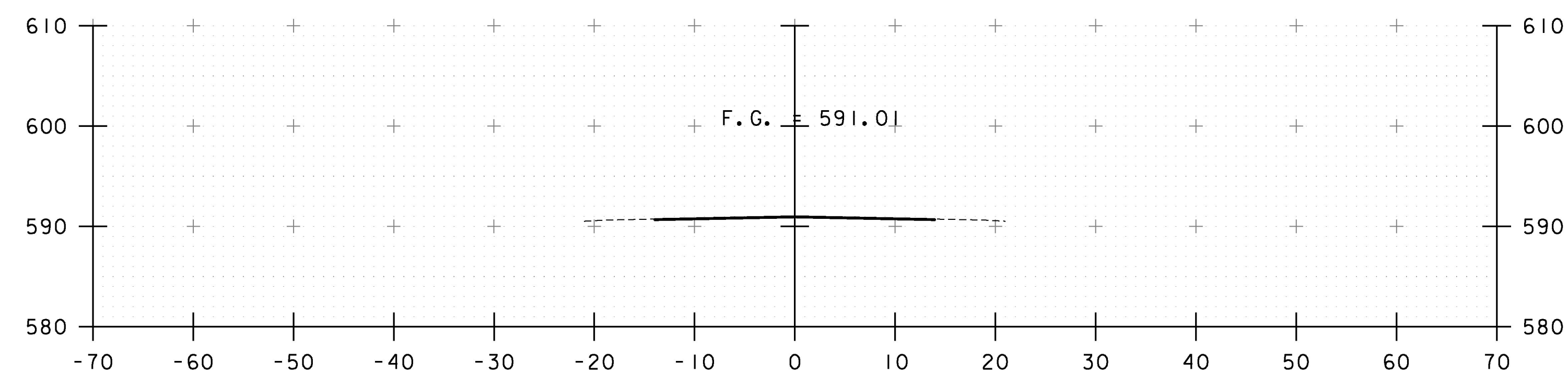


10+50



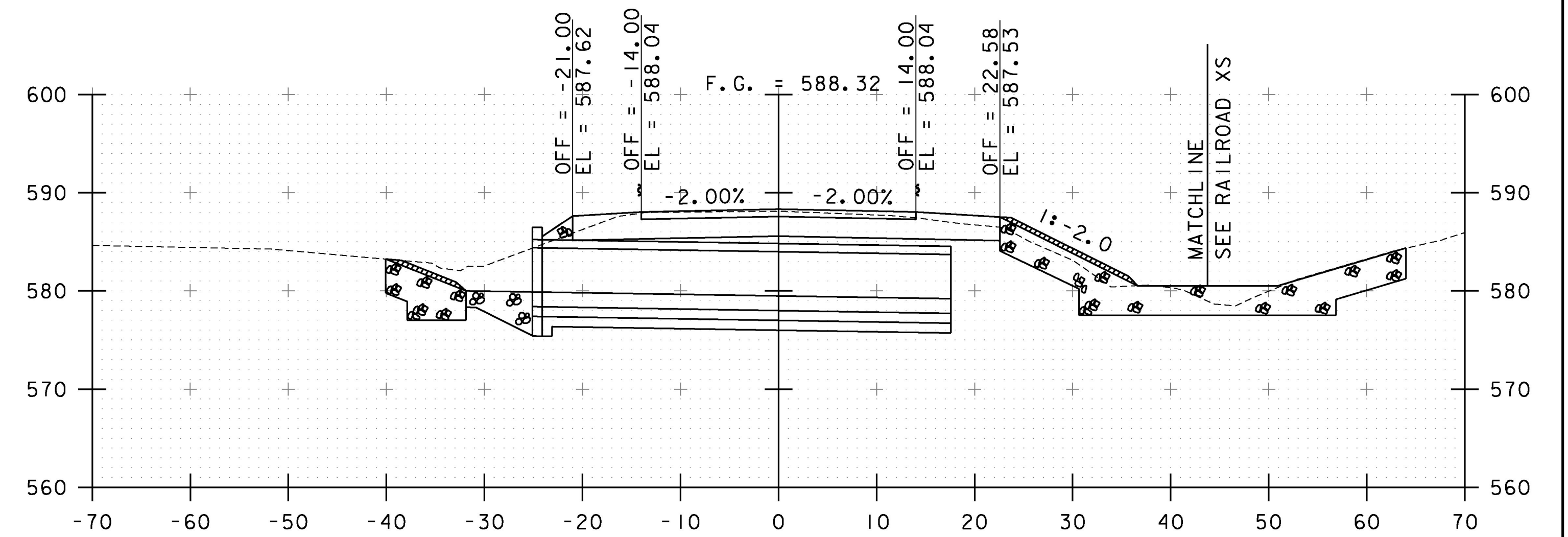
10+25

END COLD PLANING  
BEGIN SUBBASE TRANSITION

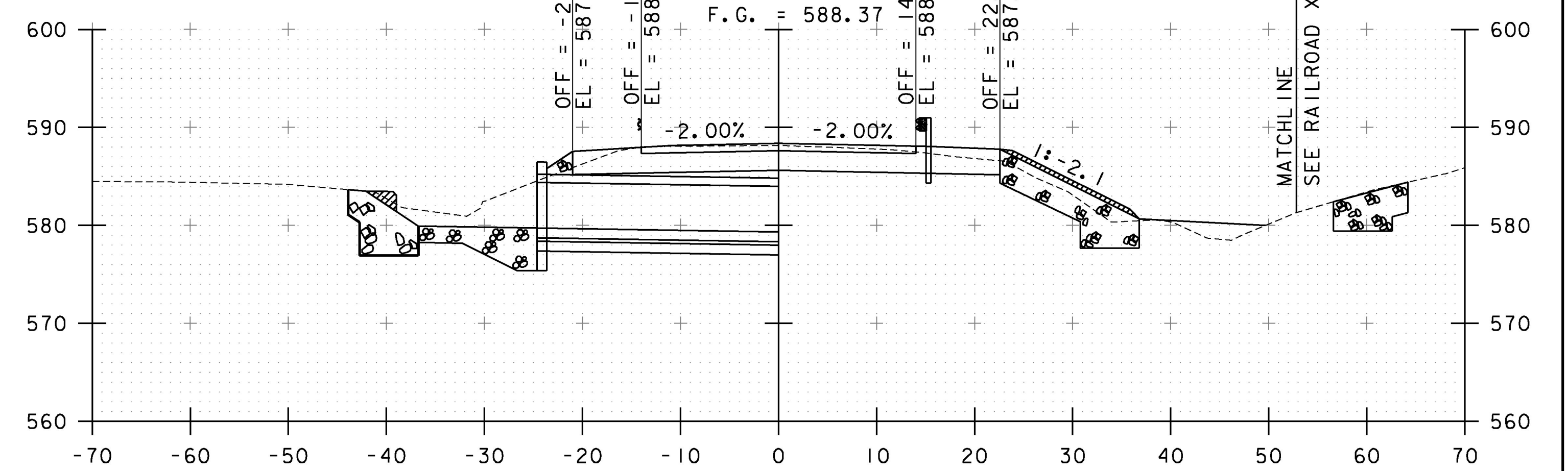


10+00

STA. 9+75.00  
BEGIN COLD PLANING  
BEGIN APPROACH  
MATCH EXISTING

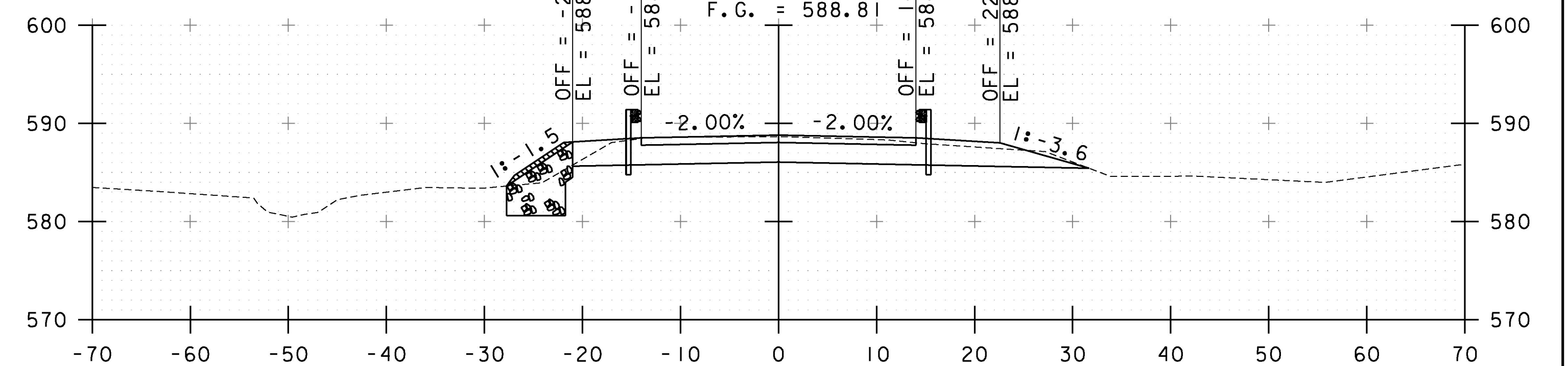


11+00



10+97.16

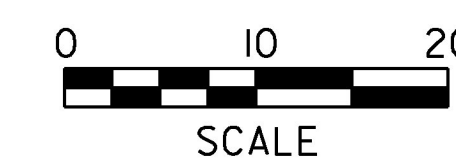
BEGIN BRIDGE



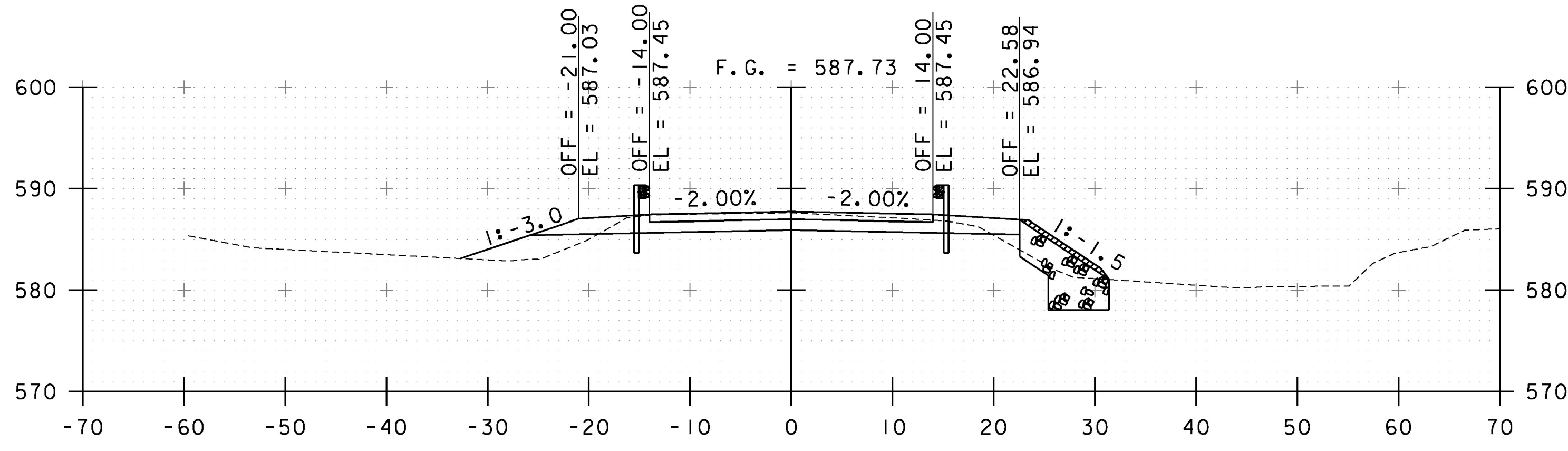
10+75

BEGIN PROJECT

STA. 10+00 TO STA. 11+00

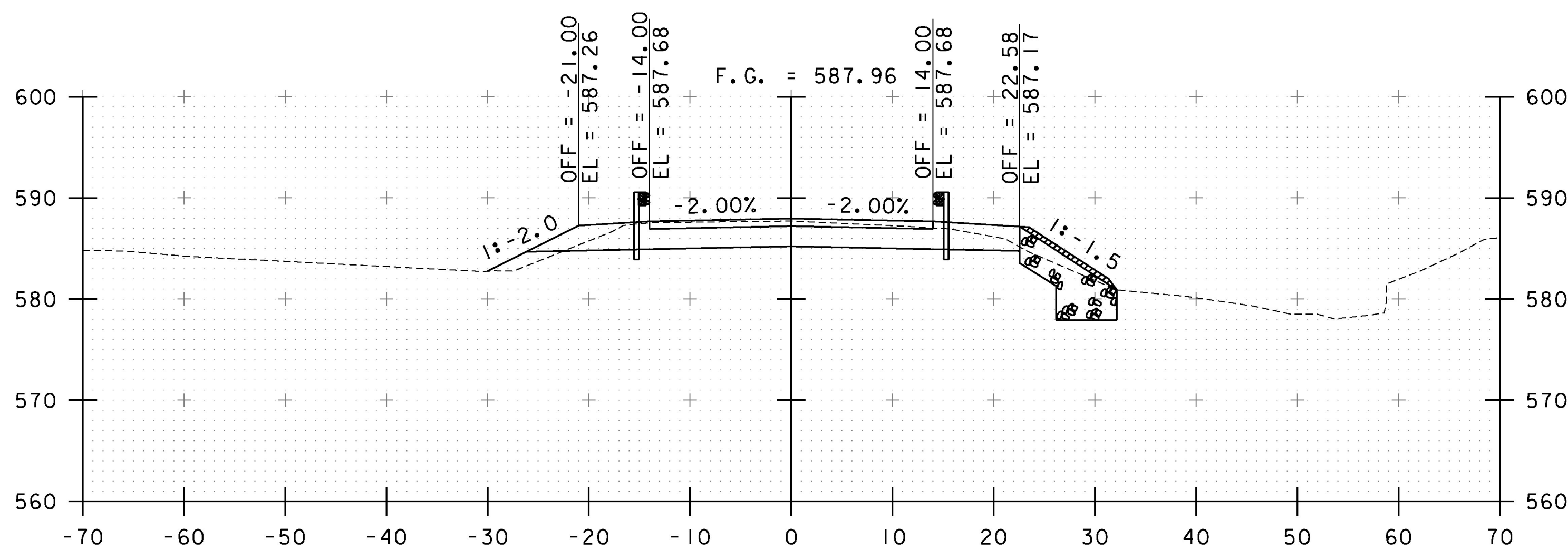


PROJECT NAME: WALLINGFORD	PLOT DATE: 6/16/2016
PROJECT NUMBER: ER CULV(39)	DRAWN BY: I. MAYNARD
FILE NAME: ...drawing\z12b380_xs.dgn	CHECKED BY: G. SANTY
DESIGNED BY: I. MAYNARD	SHEET 24 OF 36
US ROUTE 7 CROSS SECTIONS I	



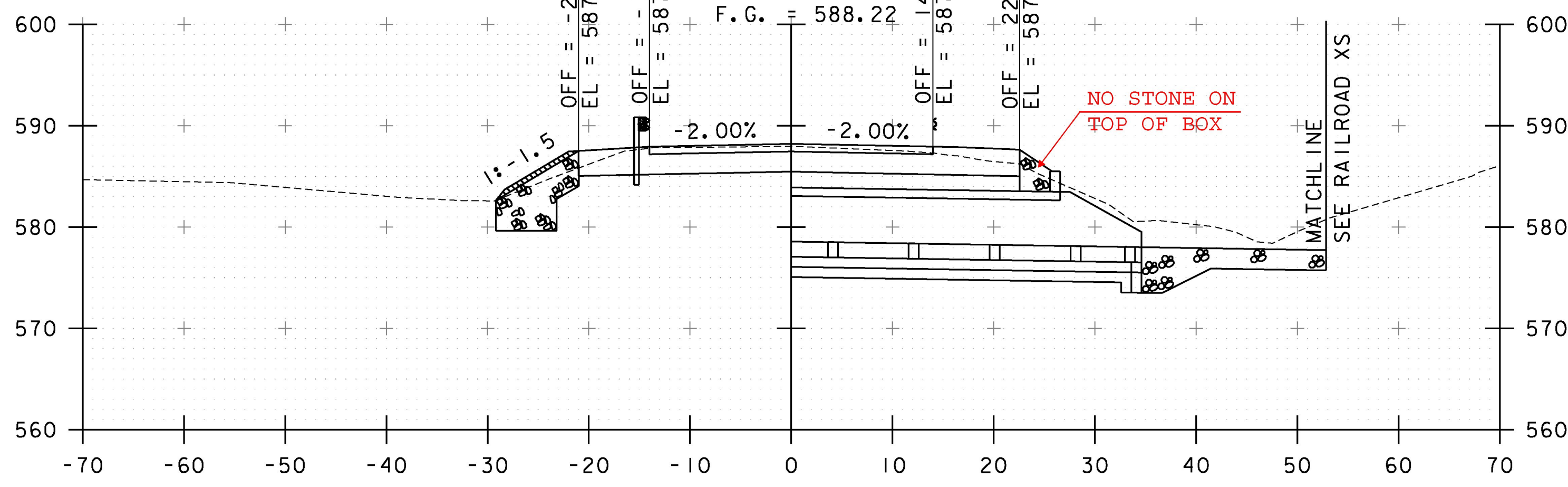
11+50

STA. 11+26.00  
END PROJECT



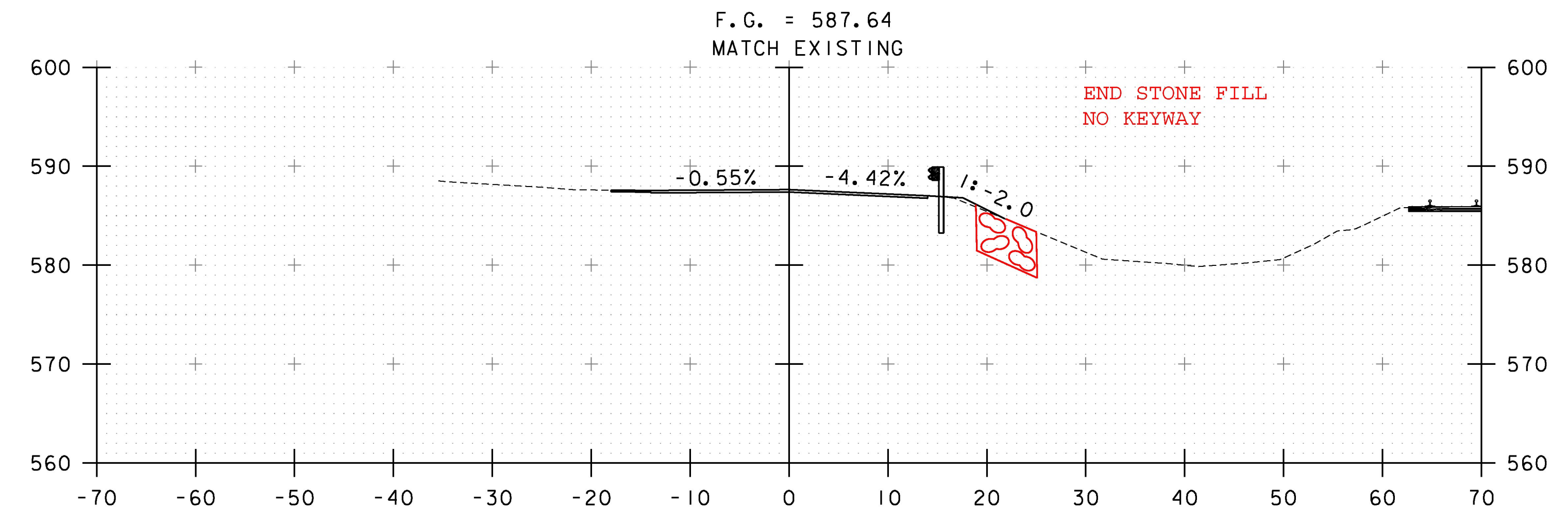
11+25

STA. 11+26.00  
END PROJECT



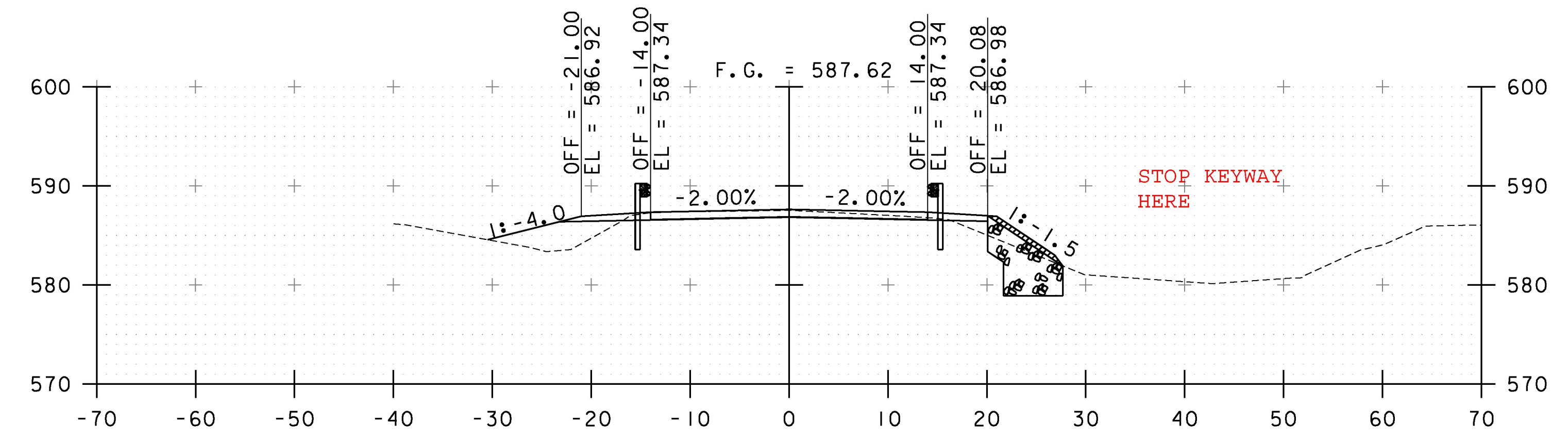
11+06.62  
END BRIDGE

STA. 12+26.00  
END COLD PLANING  
END APPROACH



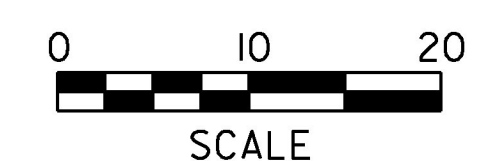
12+00

STA. 11+76.00  
BEGIN COLD PLANING

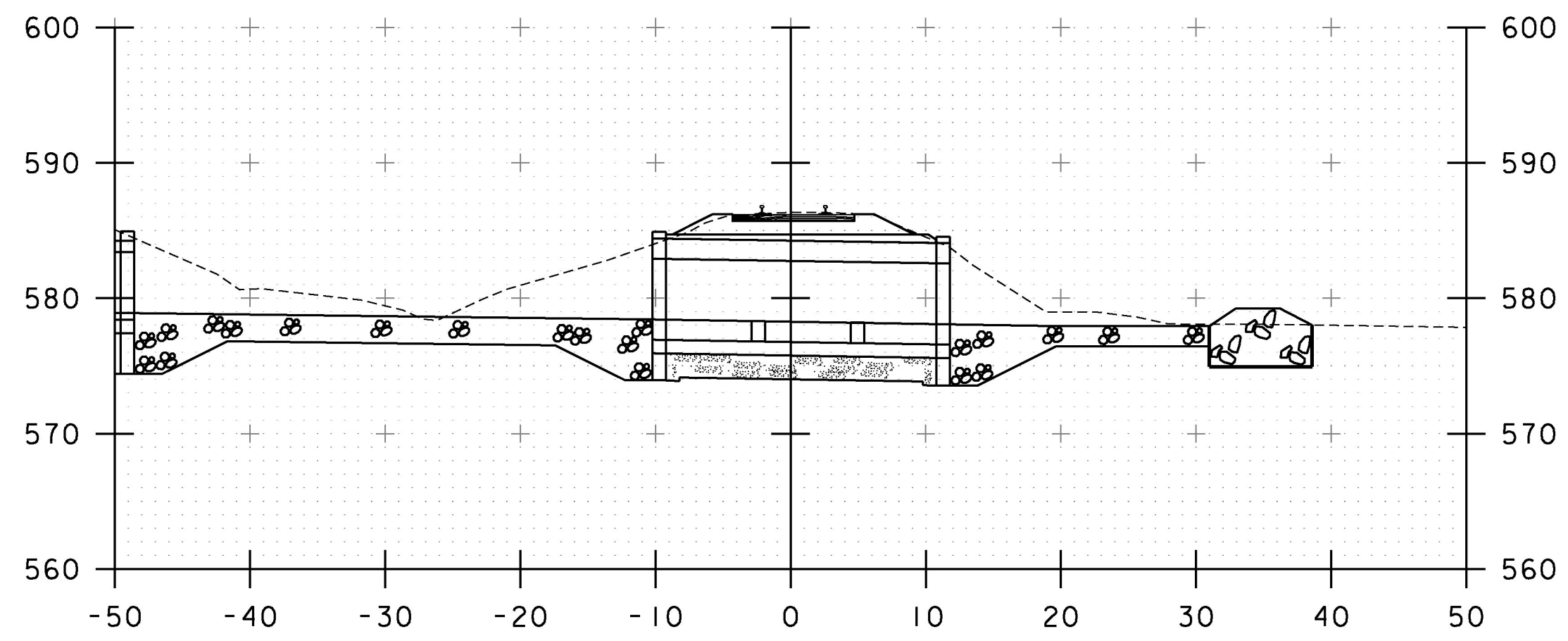


11+75

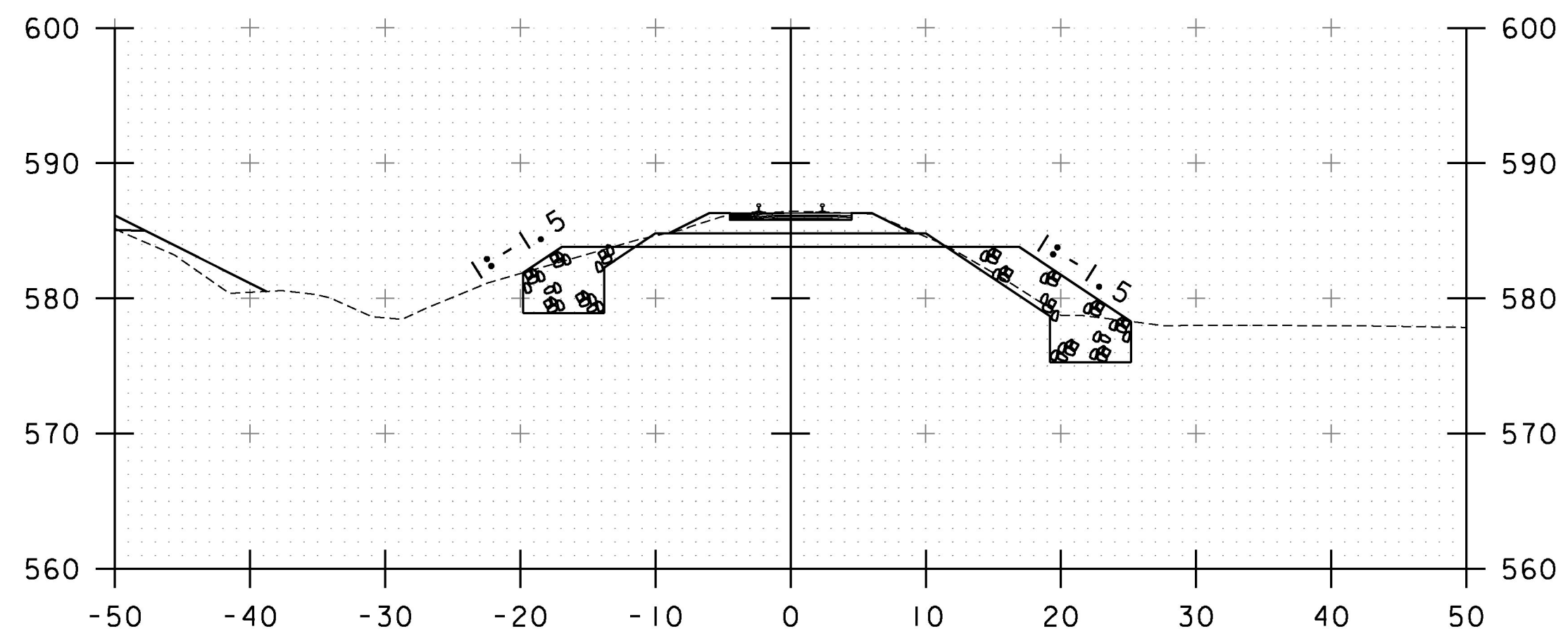
STA. 11+07 TO STA. 12+00



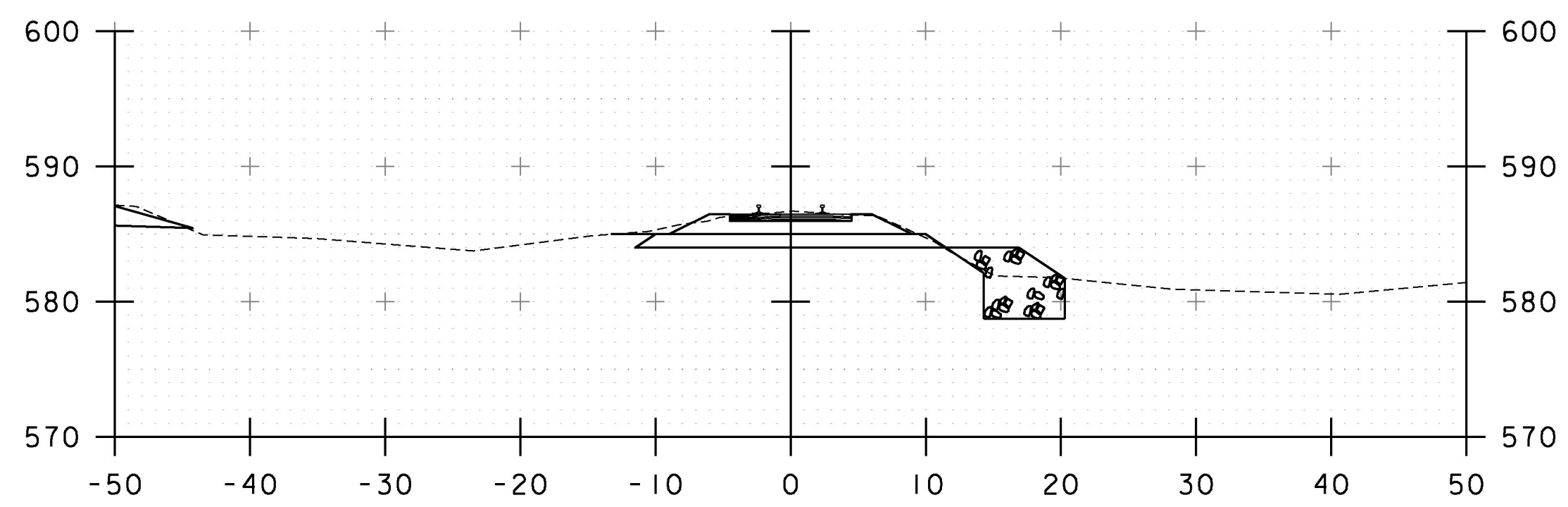
PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME: ...drawing\z12b380_xs.dgn	PLOT DATE: 6/16/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: I. MAYNARD
DESIGNED BY: I. MAYNARD	CHECKED BY: G. SANTY
US ROUTE 7 CROSS SECTIONS 2	SHEET 25 OF 36



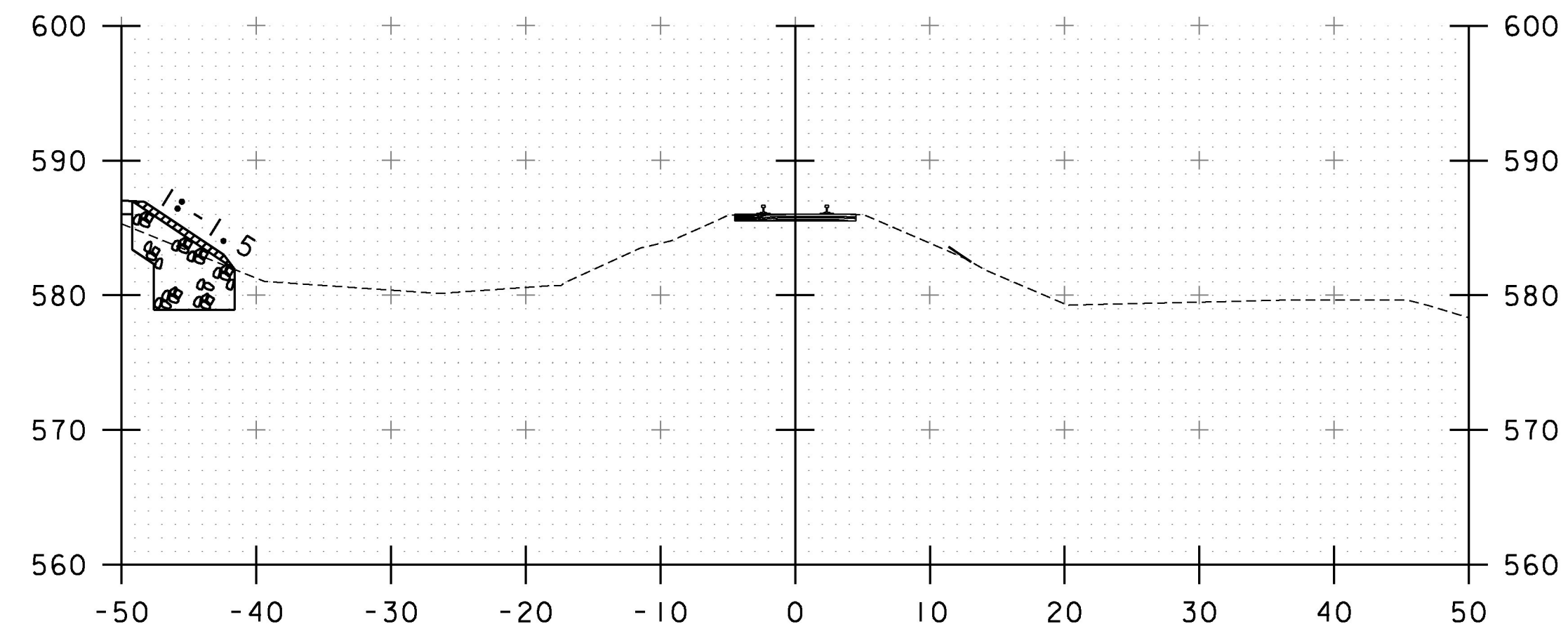
2207+61



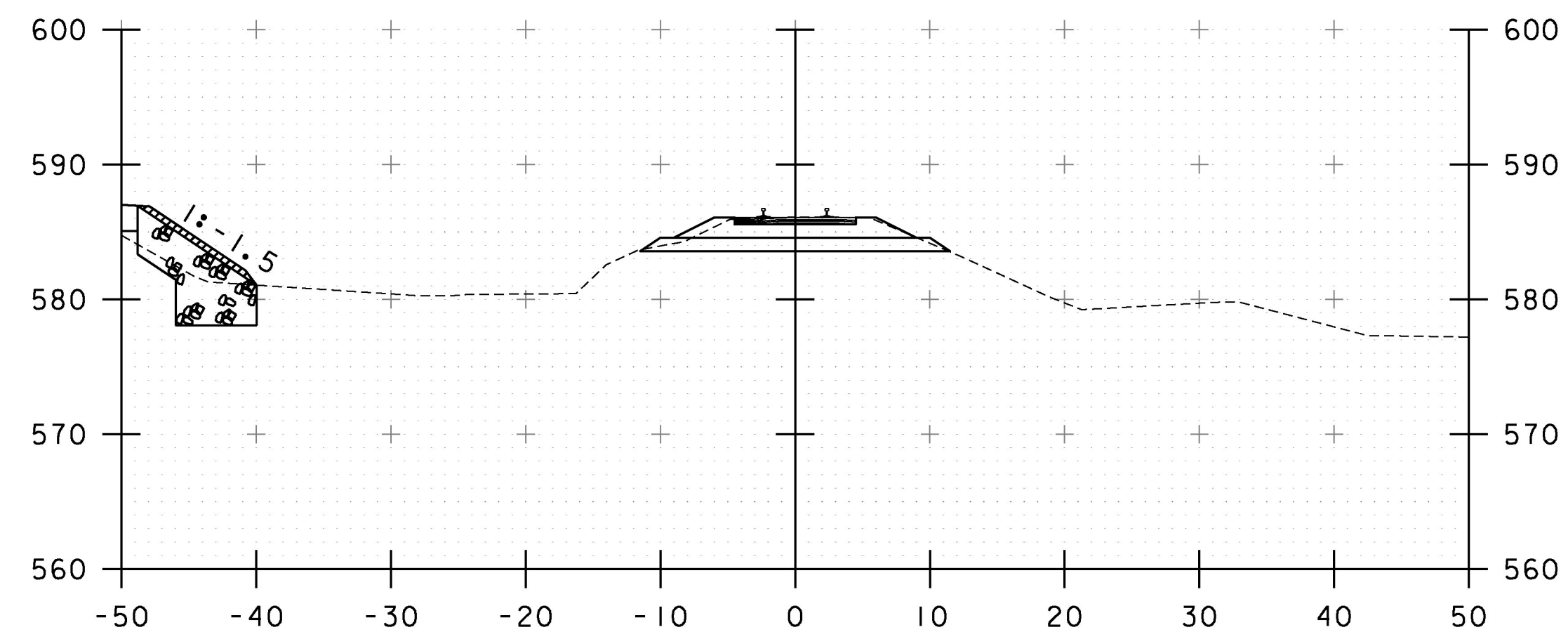
2207+50



2207+25

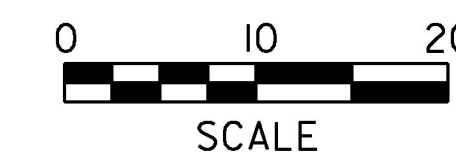


2208+25

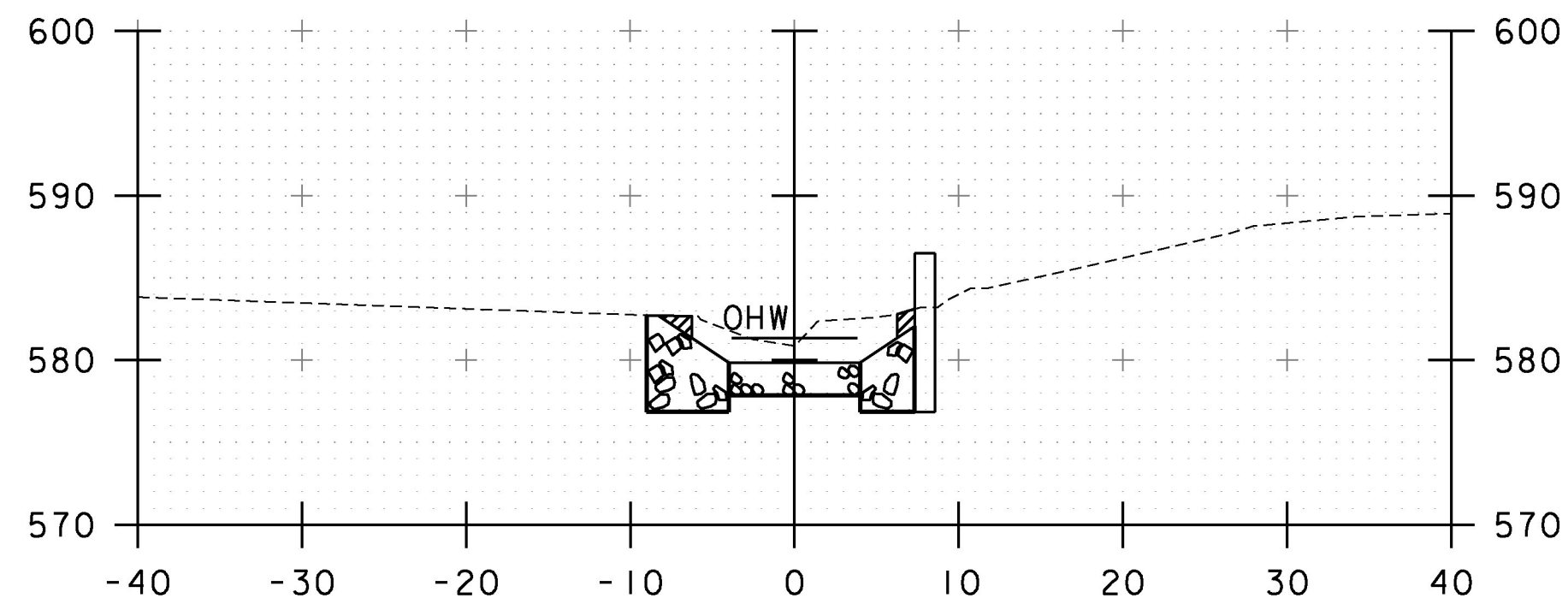


2208+00

STA. 2207+25 TO STA. 2208+50

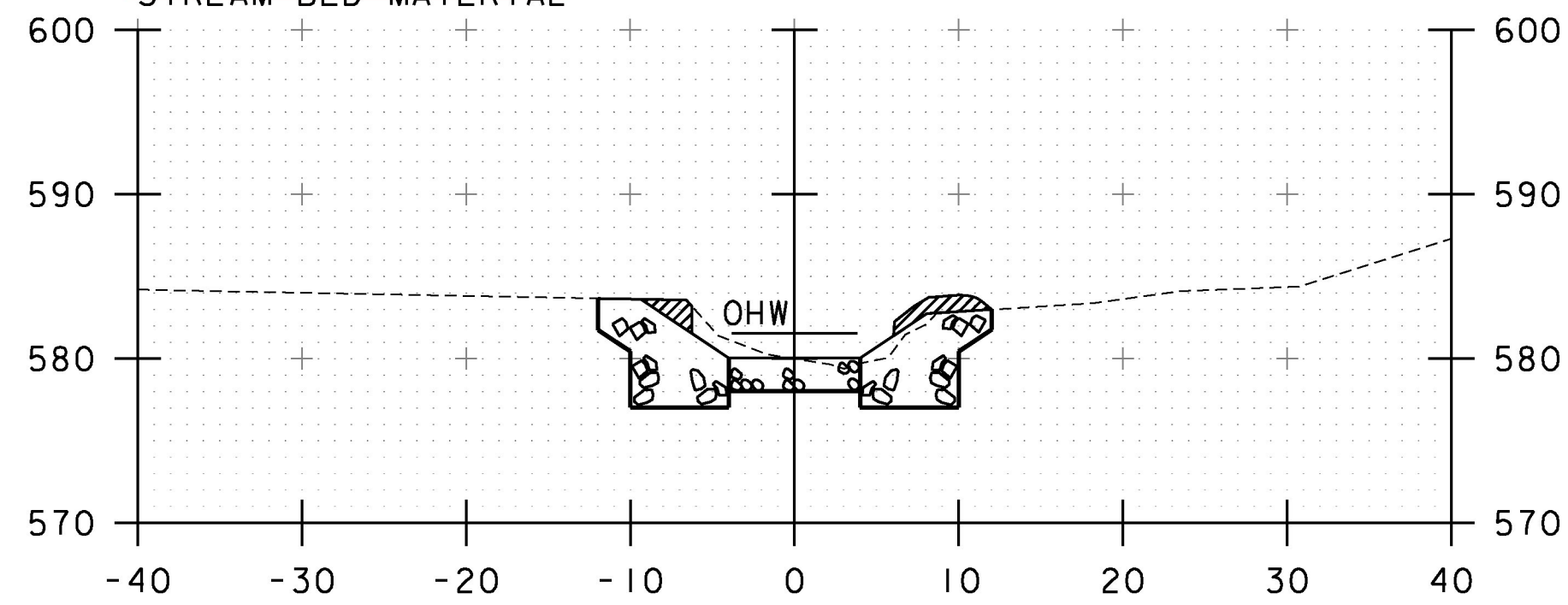


PROJECT NAME: WALLINGFORD	PLOT DATE: 6/16/2016
PROJECT NUMBER: ER CULV(39)	DRAWN BY: I. MAYNARD
FILE NAME: ...drawing\z12b380_xs.dgn	DESIGNED BY: T. KNIGHT
PROJECT LEADER: G. BOGUE	CHECKED BY: G. SANTY
RAILROAD CROSS SECTIONS	SHEET 26 OF 36

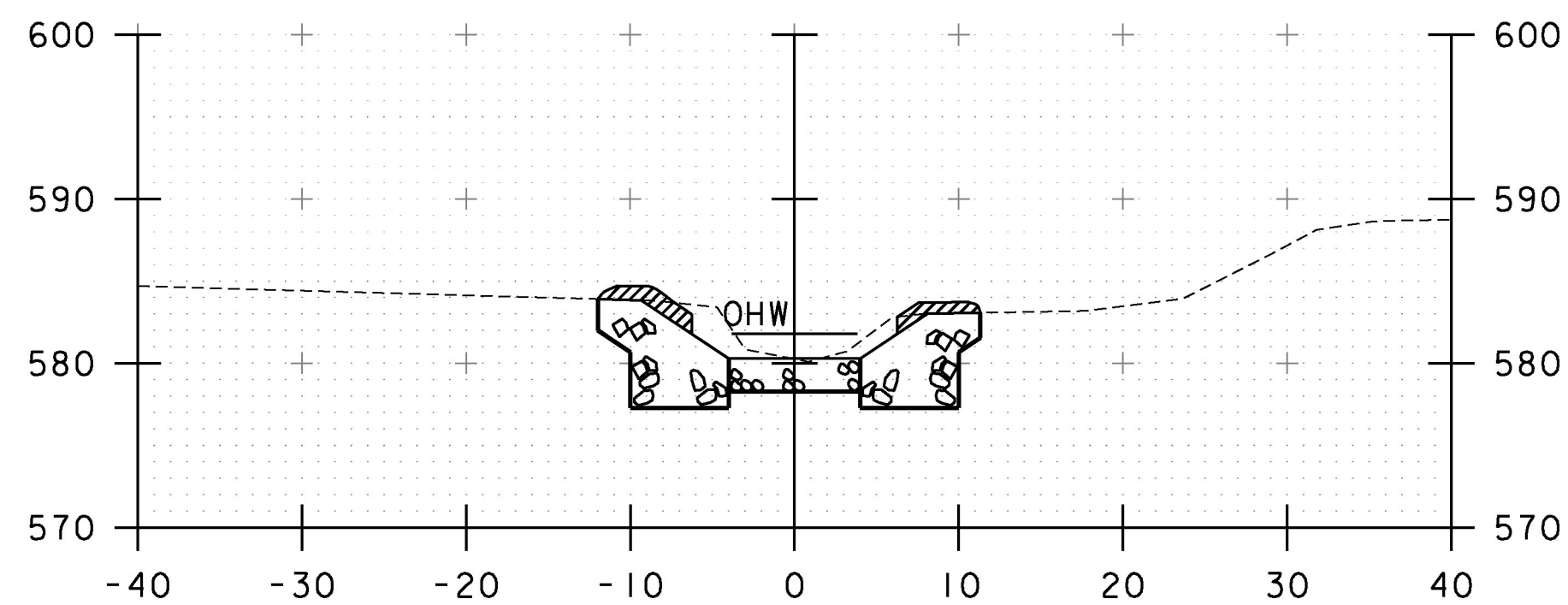


STA. 5+96.41  
 BEGIN BRIDGE  
 STOP STONE FILL STREAM  
 BED MATERIAL  
 UNCLASSIFIED CHANNEL EXCAVATION

~~STA. 5+86.35~~  
~~BEGIN STONE FILL~~  
~~STREAM BED MATERIAL~~

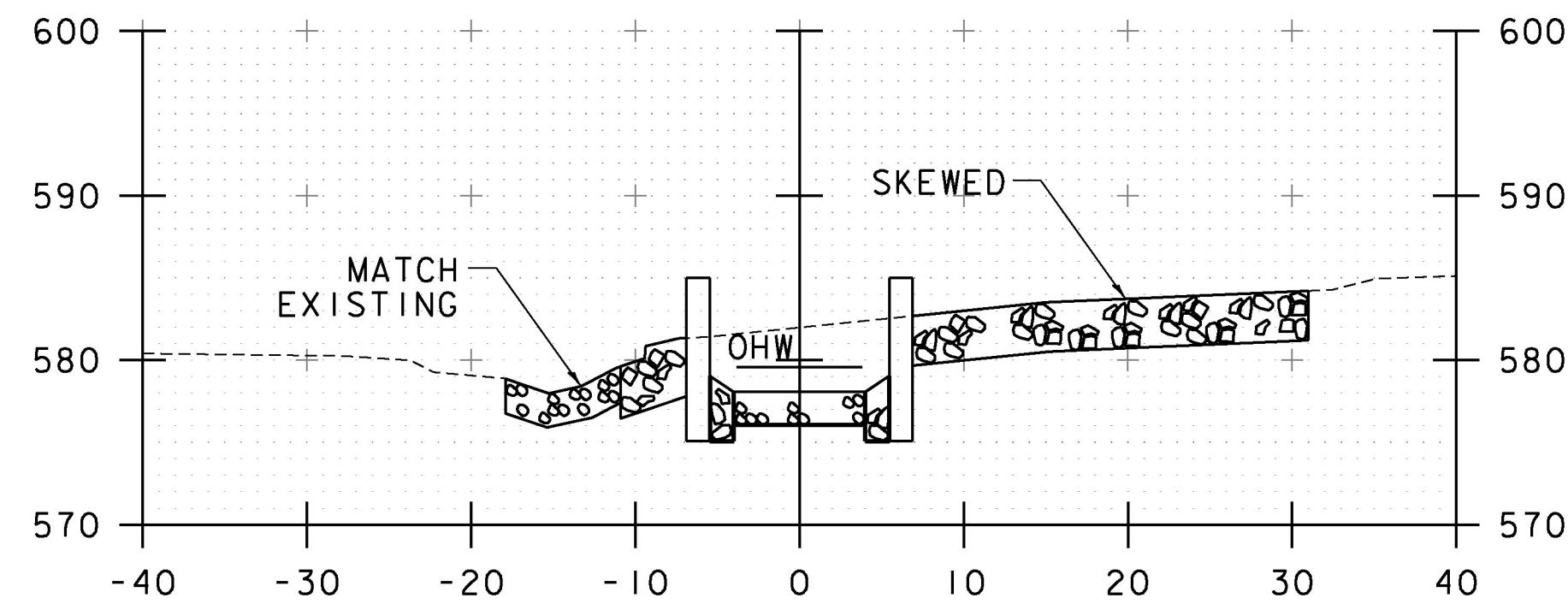


5+80



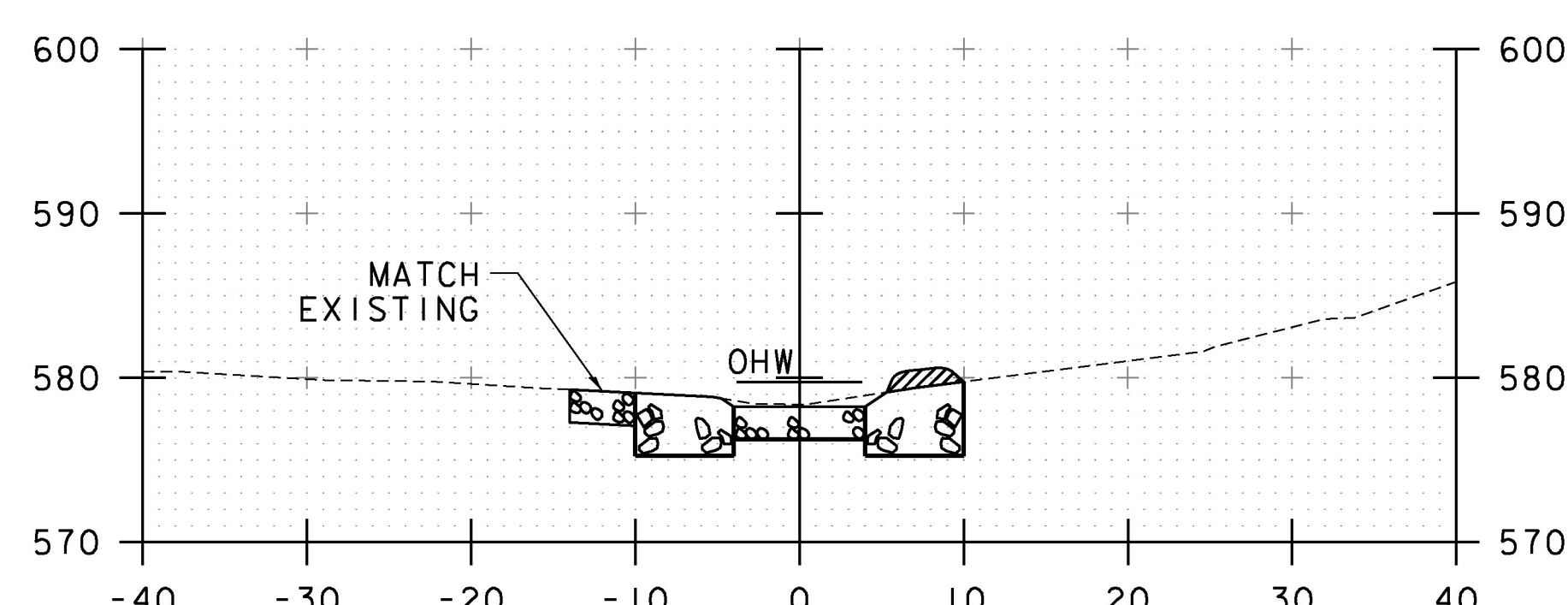
STA. 5+73.86 LT & RT  
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION  
 GEOTEXTILE UNDER STONE FILL  
 STONE FILL, TYPE III  
 GRUBBING MATERIAL  
 BEGIN STONE FILL STREAM BED MATERIAL

5+74

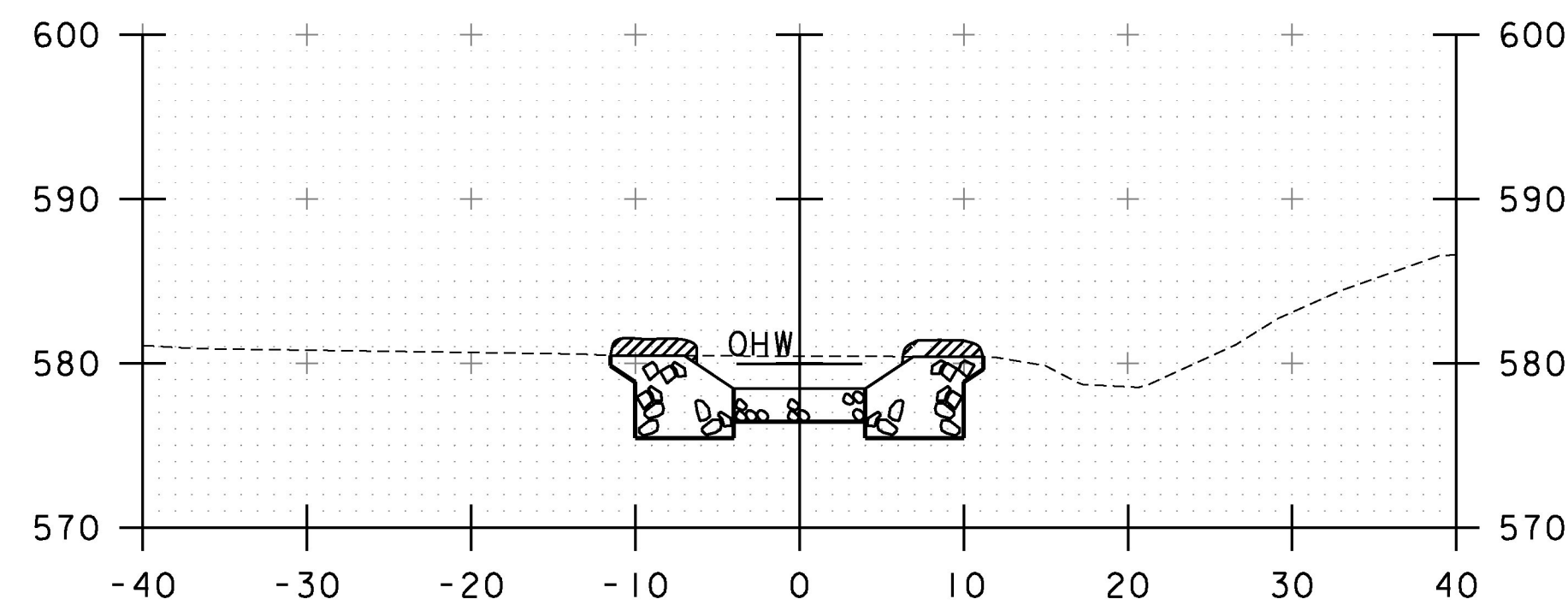


6+80

STA. 6+82.46  
 BEGIN BRIDGE  
 STOP STONE FILL STREAM  
 UNCLASSIFIED CHANNEL EXCAVATION

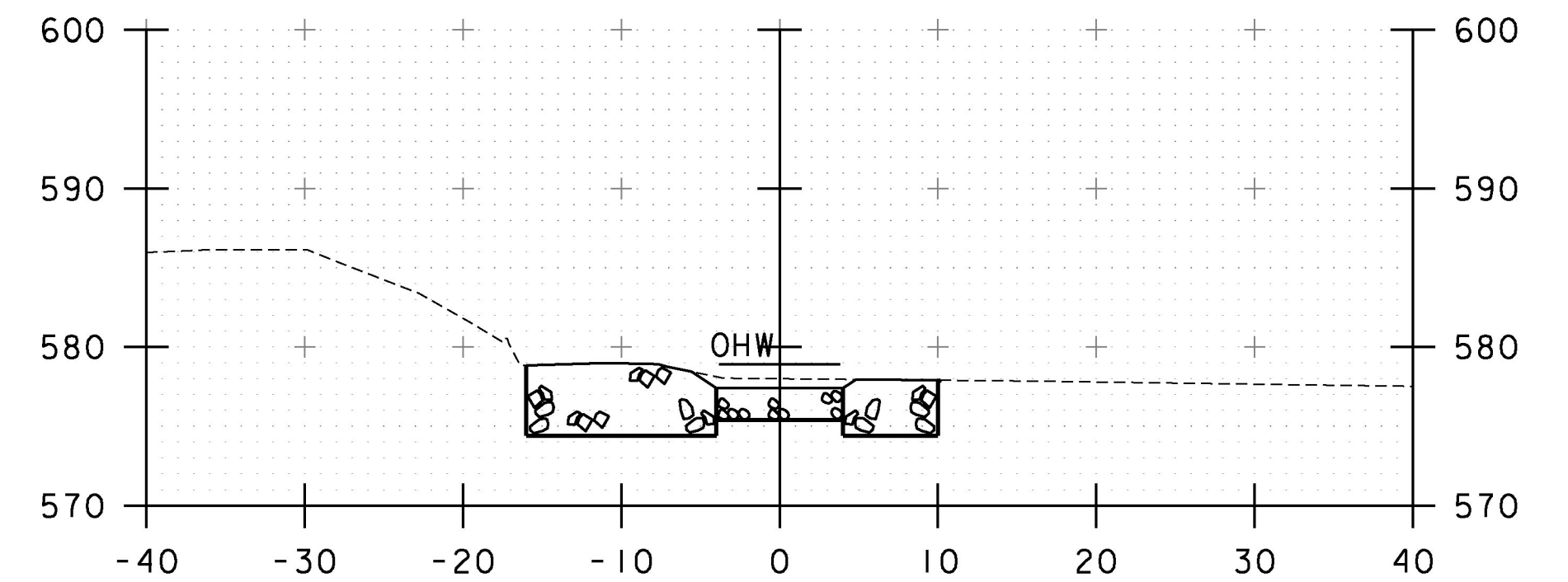


6+70

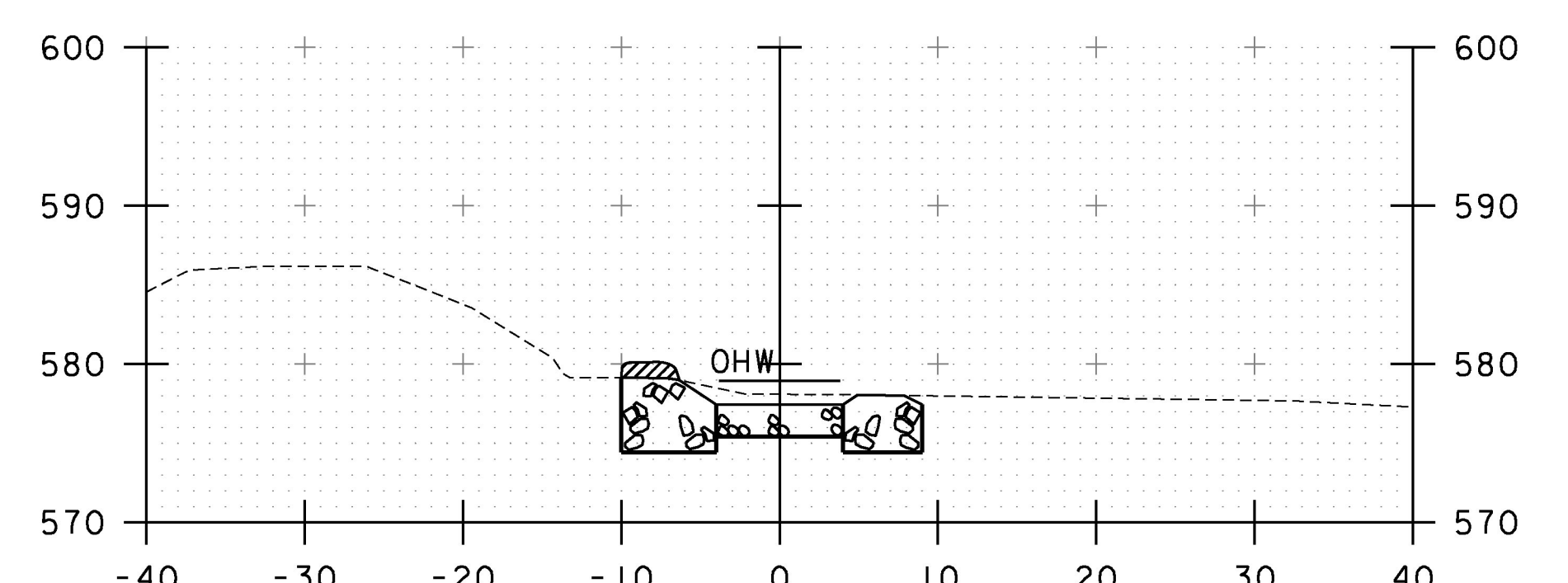


STA. 6+56.41  
 END BRIDGE  
 RESUME STONE FILL STREAM  
 BED MATERIAL  
 UNCLASSIFIED CHANNEL EXCAVATION

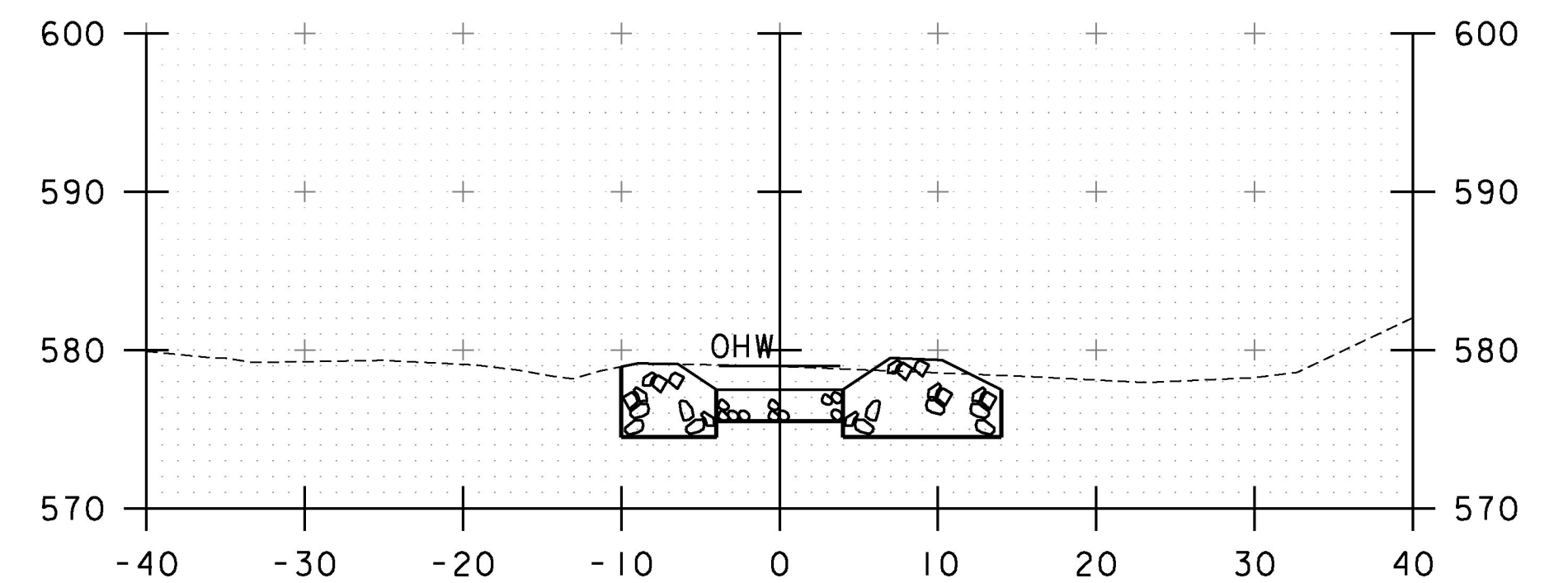
6+60



7+40

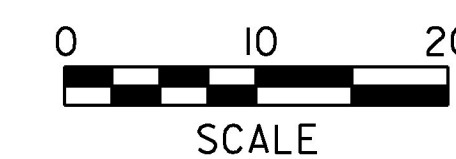


7+30



7+20

STA. 7+19.46  
 END BRIDGE  
 RESUME STONE FILL STREAM  
 UNCLASSIFIED CHANNEL EXCAVATION



SCALE

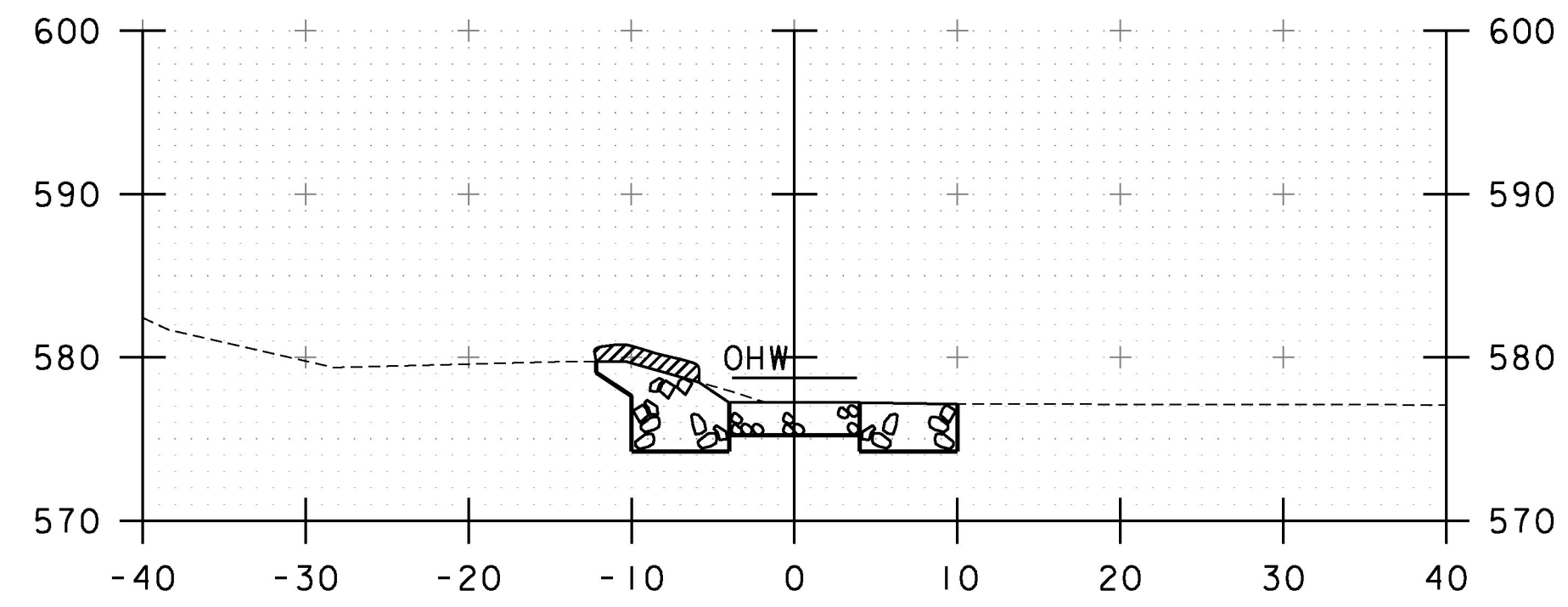
REFER TO TYPICAL FOR  
 SECTIONS WITHIN CULVERT



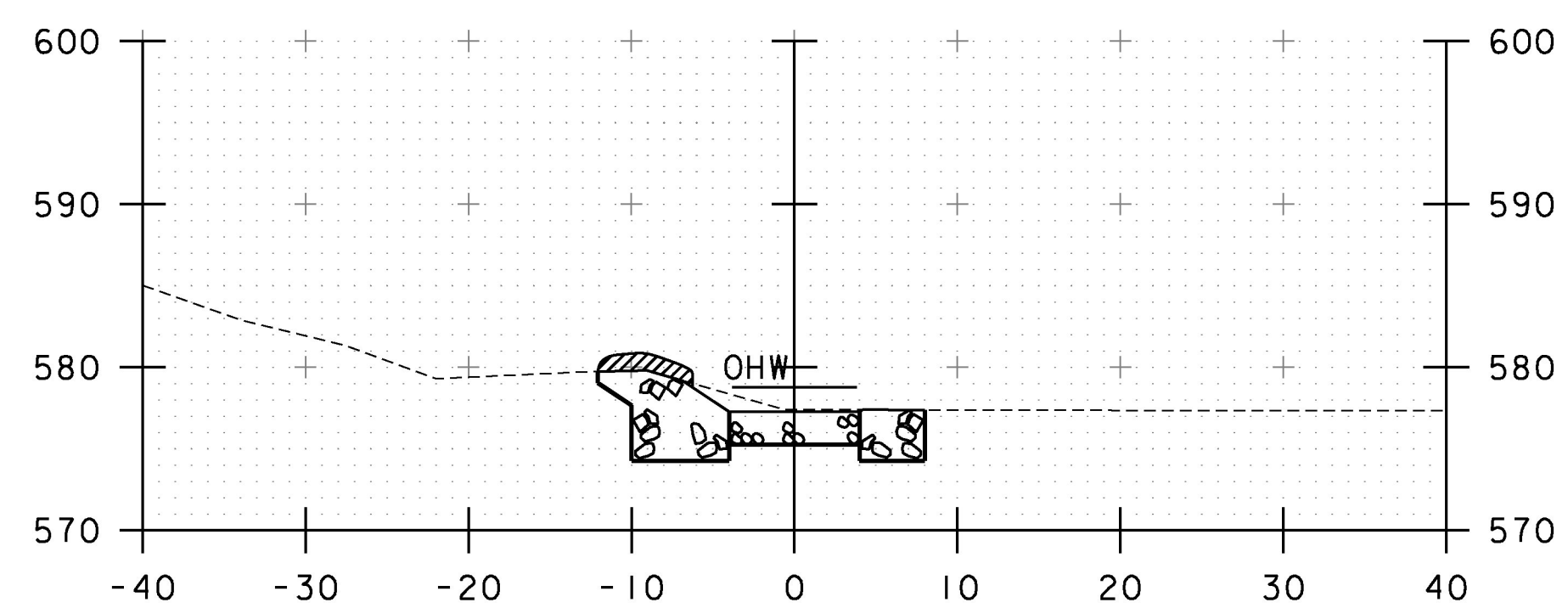
PROJECT NAME: WALLINGFORD  
 PROJECT NUMBER: ER CULV(39)

FILE NAME: ...drawing\z12b380\_xs.dgn  
 PROJECT LEADER: G. BOGUE  
 DESIGNED BY: T. KNIGHT  
 STREAM CROSS SECTIONS I

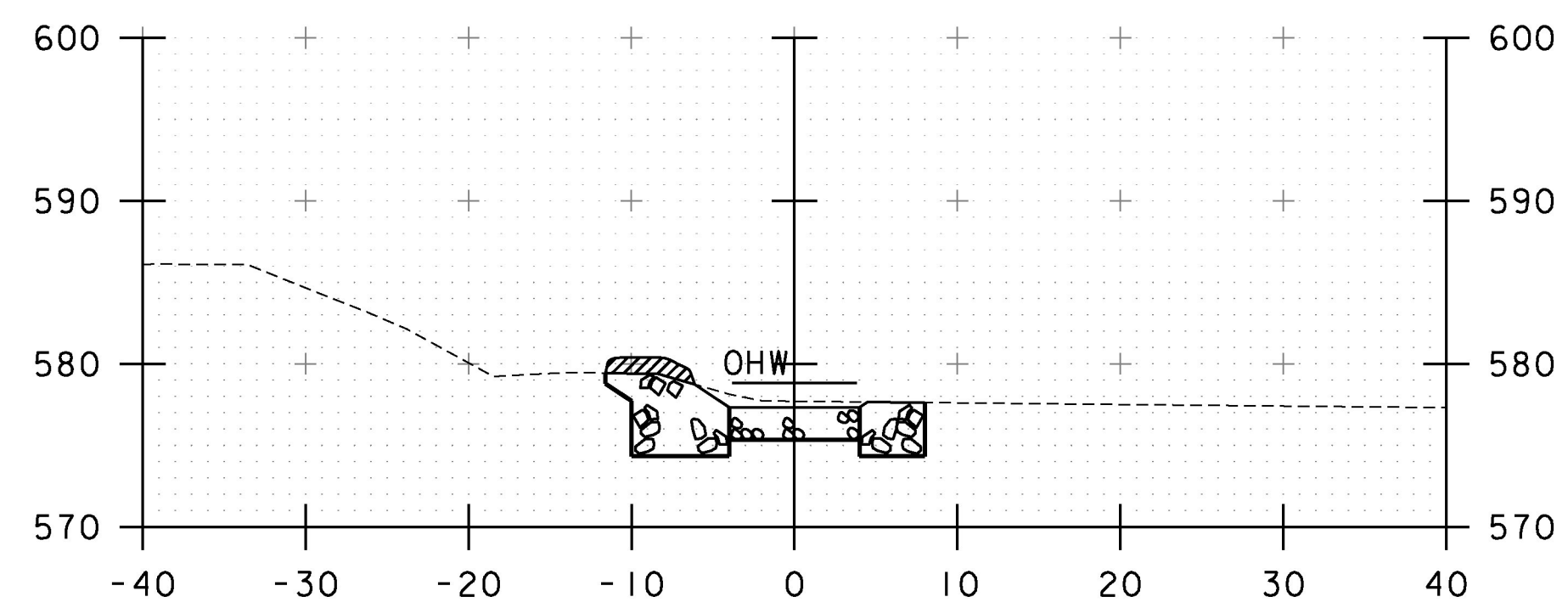
PLOT DATE: 6/16/2016  
 DRAWN BY: J. SOTER  
 CHECKED BY: N. TIRK  
 SHEET 27 OF 36



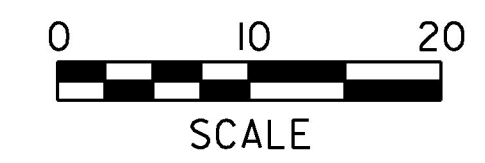
STA. 7+75.00  
 END UNCLASSIFIED CHANNEL EXCAVATION  
 7+70 GEOTEXTILE UNDER STONE FILL  
 STONE FILL, TYPE III  
 GRUBBING MATERIAL  
 STONE FILL STREAM BED MATERIAL



7+60



7+50



REFER TO TYPICAL FOR  
 SECTIONS WITHIN CULVERT



PROJECT NAME: WALLINGFORD	PLOT DATE: 6/16/2016
PROJECT NUMBER: ER CULV(39)	DRAWN BY: J. SOTER
FILE NAME: ...drawing\z12b380_xs.dgn	DESIGNED BY: T. KNIGHT
DESIGNED BY: T. KNIGHT	CHECKED BY: N. TIRK
STREAM CROSS SECTIONS 2	SHEET 28 OF 36

## EPSC PLAN NARRATIVE

### 1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REPLACEMENT OF CULVERT UNDER U.S. ROUTE 7 AND THE VTR RAILROAD WITH CONCRETE BOX CULVERTS, RELATED CHANNEL WORK AND INCIDENTALS. THE CROSSING UNDER ROUTE 7 IS A DOUBLE CULVERT WITH A 24" CPEP AND A 20" CMP, WHICH WILL BE REPLACED WITH AN 8' x 6' PRECAST CONCRETE BOX CULVERT. THE EXISTING HISTORIC STONE CULVERT UNDER THE VTR IS BEING BYPASSED BY AN 8' x 6' BOX CULVERT. THE NEW CULVERTS WILL CONVEY THE UNNAMED TRIBUTARY TO OTTER CREEK UNDER U.S. ROUTE 7 AND THE RAILROAD TO OTTER CREEK APPROXIMATELY 300' DOWNSTREAM.

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 0.65 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 WITH GRASSY UNDERGROWTH. US ROUTE 7 AND THE VTR RAILROAD ARE WITHIN THE PROJECT SITE. THERE IS ADJACENT 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.

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

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.

#### 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 RUTLAND, VERMONT. SOILS ON THE PROJECT SITE ARE PAWLING SILT LOAM, "K FACTOR" = 0.37. THE SOIL IS CONSIDERED HIGHLY 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: YES, POSSIBLY NLEB (NORTHERN LONG-EARED BAT)  
WATER RESOURCE: UNNAMED TRIBUTARY TO OTTER CREEK  
WETLANDS: YES

### 1.3 RISK EVALUATION

SINCE THIS PROJECT DOES NOT DISTURB MORE THAN 1 ACRE 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 CONSTRUCTION SITE.

THE PROJECT AREA IS RELATIVELY FLAT WITH MINIMAL OFF-SITE RUNOFF FLOWING THROUGH THE SITE. THEREFORE 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 EROSION 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.

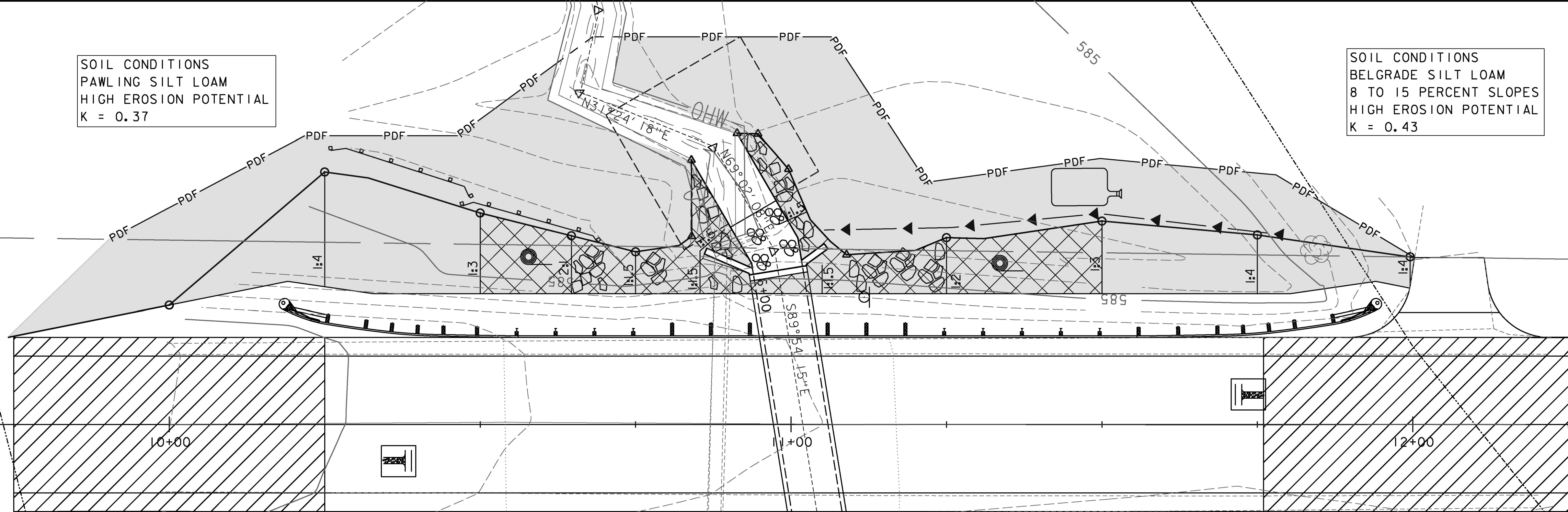
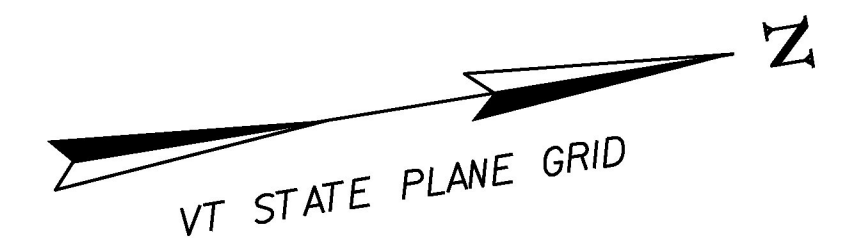
#### 1.5.1 OFF-SITE ACTIVITIES

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.

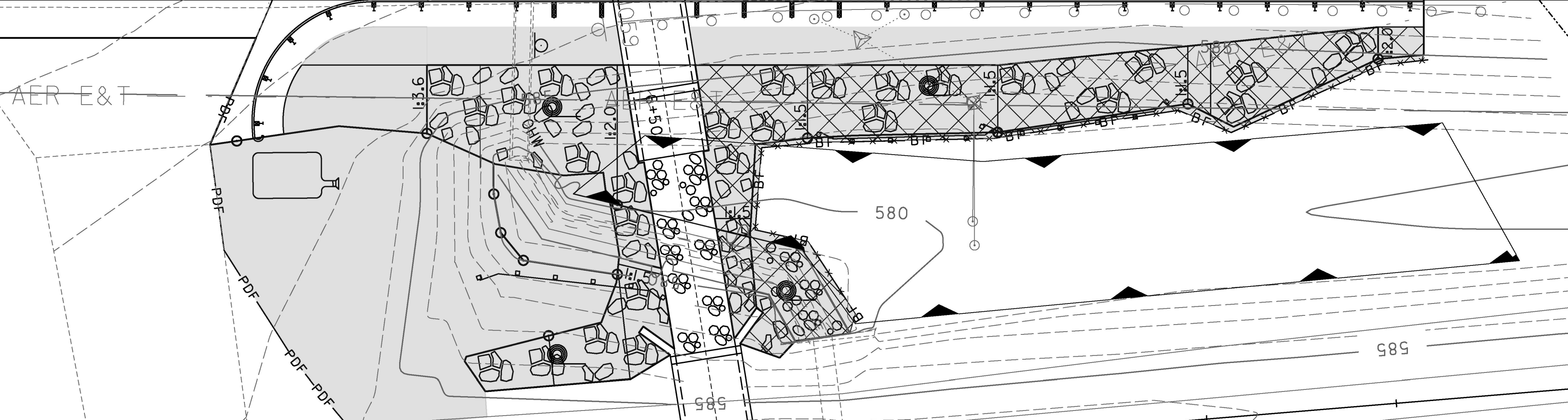
PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME: z12b380_ero_det.dgn	PLOT DATE: 6/16/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: I. MAYNARD
DESIGNED BY: I. MAYNARD	CHECKED BY: G. SANTY
EPSC NARRATIVE	SHEET 29 OF 36

SOIL CONDITIONS  
PAWLING SILT LOAM  
HIGH EROSION POTENTIAL  
K = 0.37

SOIL CONDITIONS  
BELGRADE SILT LOAM  
8 TO 15 PERCENT SLOPES  
HIGH EROSION POTENTIAL  
K = 0.43



SEE CONTRACTOR'S APPROVED EPSC PLAN INCLUDING CHANGES WEST OF ROUTE 7 DUE TO DETOUR.

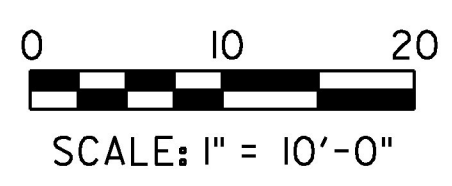


SOIL CONDITIONS  
GALWAY-NELLIS-FARMINGTON COMPLEX  
8 TO 15 PERCENT SLOPES, ROCKY  
HIGH EROSION POTENTIAL  
K = 0.37

SOIL CONDITIONS  
MIDDLEBURY LOAM  
MODERATE EROSION POTENTIAL  
K = 0.32

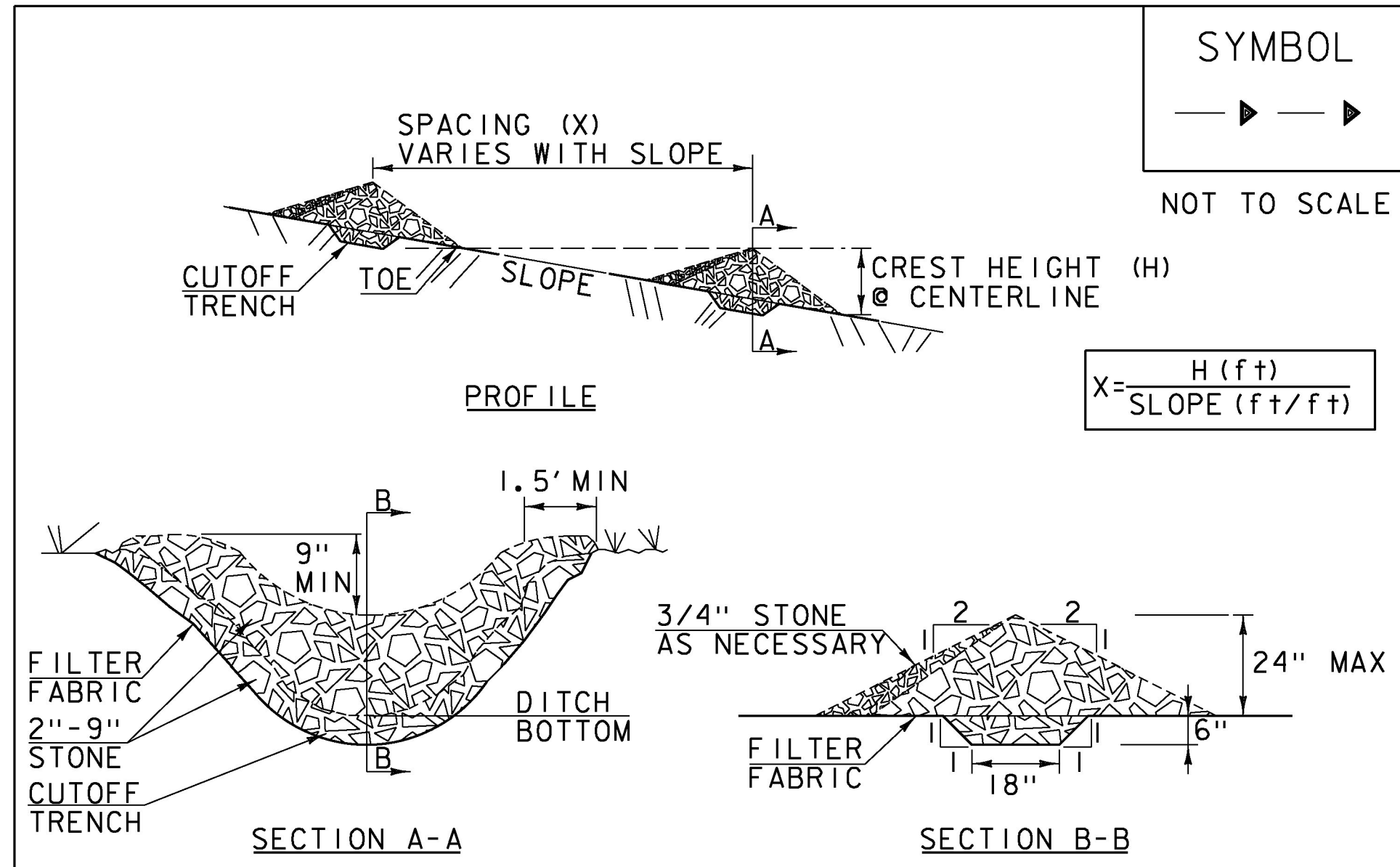
**LEGEND**

VEHICLE TRACKING PAD



PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	...drawing\z12b380_bdr_ero.dgn
PLOT DATE:	7/18/2016
PROJECT LEADER:	G. BOGUE
DRAWN BY:	I. MAYNARD
DESIGNED BY:	I. MAYNARD
CHECKED BY:	G. SANTY
EPSC PLAN	SHEET 30 OF 36





SYMBOL  
  
 NOT TO SCALE

**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.

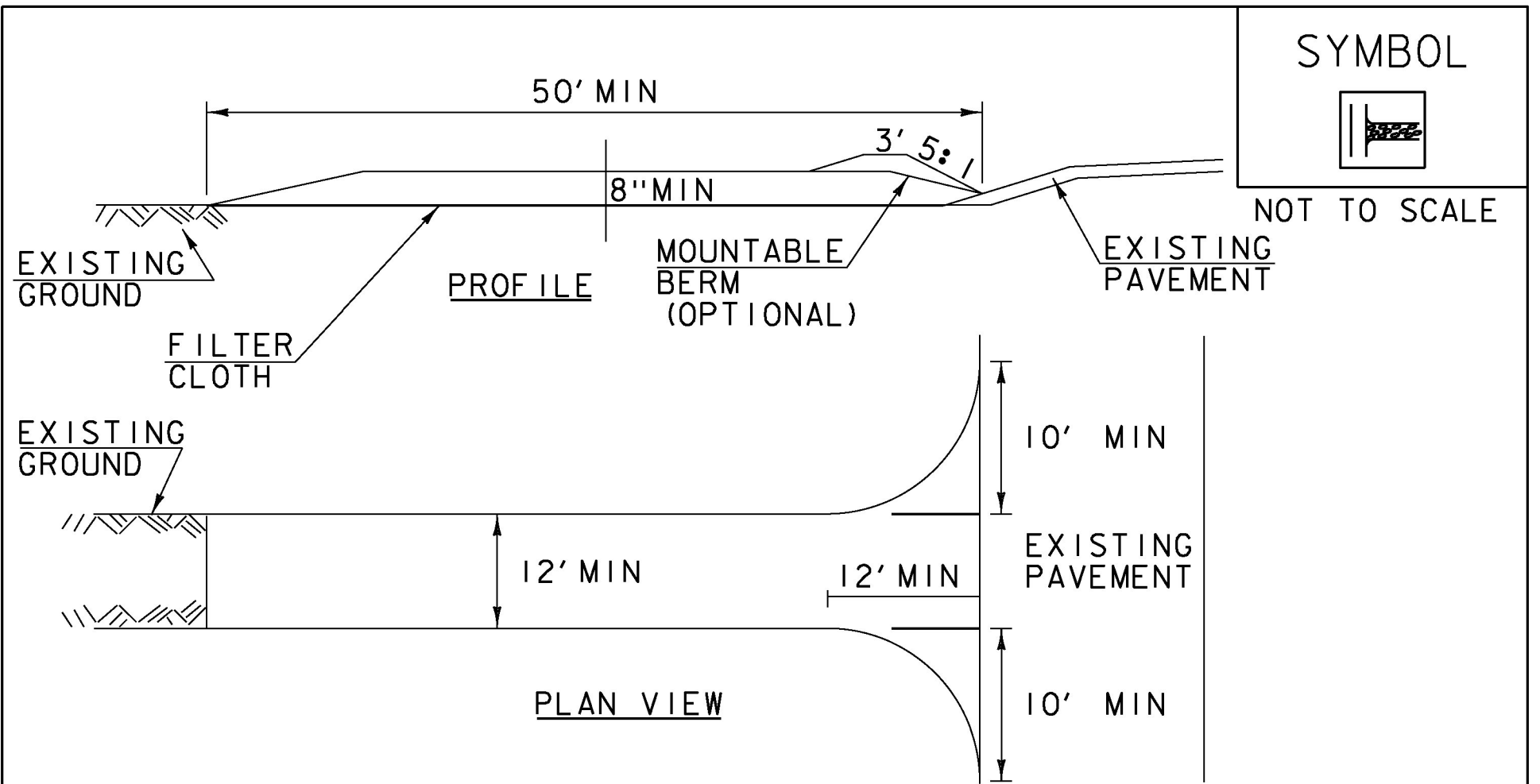
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
 ORIGINALLY DEVELOPED BY USDA-NRCS  
 VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

**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 I (PAY ITEM 653.25)

REVISIONS	
MARCH 21, 2008	WHF
JANUARY 8, 2009	WHF



SYMBOL  
  
 NOT TO SCALE

**CONSTRUCTION SPECIFICATIONS**

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

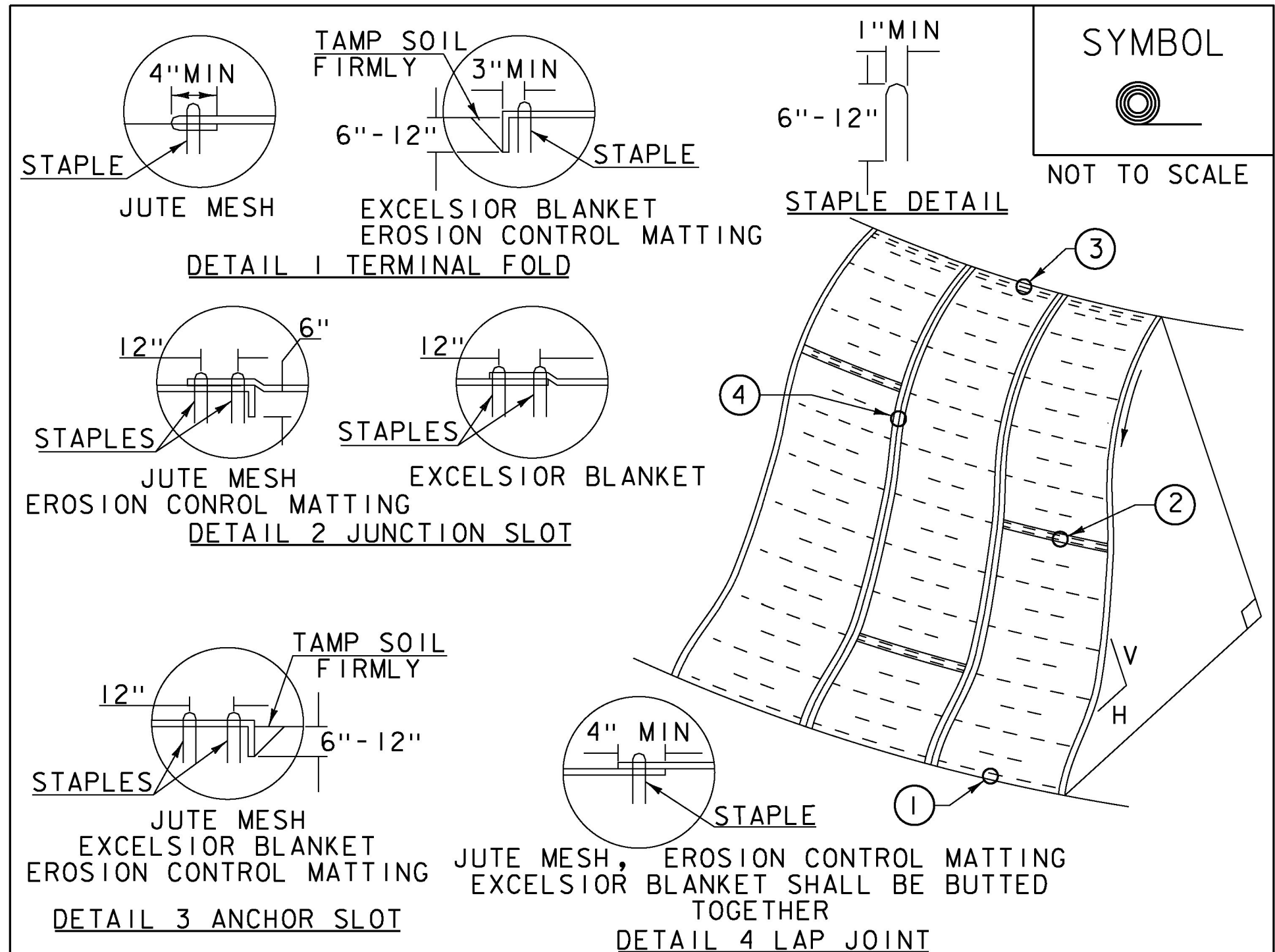
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC  
 ORIGINALLY DEVELOPED BY USDA-NRCS  
 VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

**STABILIZED CONSTRUCTION ENTRANCE**

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

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

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



SYMBOL  
  
 NOT TO SCALE

**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' X 225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4' X 150' 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**

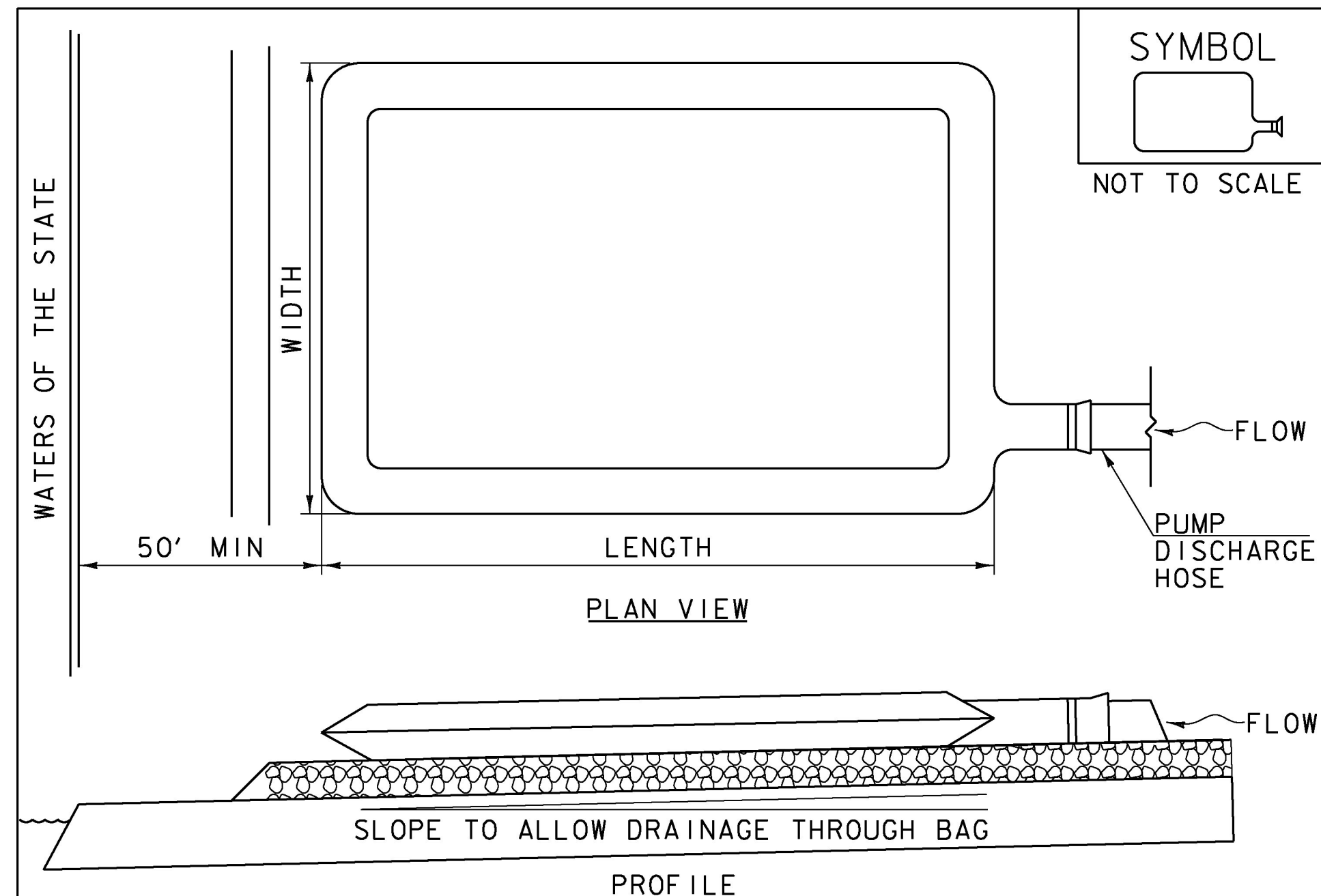
NOTES:  
 REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

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

PROJECT NAME: WALLINGFORD  
 PROJECT NUMBER: ER CULV(39)

FILE NAME: z12b380\_ero\_det.dgn PLOT DATE: 7/12/2016  
 PROJECT LEADER: G. BOGUE DRAWN BY: VAOT  
 DESIGNED BY: VAOT CHECKED BY: VAOT  
 EPSC DETAILS I SHEET 31 OF 36



**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

VAOT LOW GROW/FINE FESCUE MIX						
WEIGHT	LBS/AC		NAME	LATIN NAME	GERM	PURITY
	BROADCAST	HYDROSEED				
38%	57	95	CREeping RED FESCUE	FESTUCA RUBRA VAR. RUBRA	90%	98%
29%	43.5	72.5	HARD FESCUE	FESTUCA LONGIFOLIA	85%	95%
15%	22.5	37.5	CHEWINGS FESCUE	FESTUCA RUBRA VAR. COMMUTATA	87%	95%
15%	22.5	37.5	ANNUAL RYEGRASS	LOLIUM MULTIFLORUM	90%	95%
3%	4.5	7.5	INERTS			
100%	150	250				

VAOT RURAL AREA MIX						
WEIGHT	LBS/AC		NAME	LATIN NAME	GERM	PURITY
	BROADCAST	HYDROSEED				
37.5%	22.5	45	CREeping RED FESCUE	FESTUCA RUBRA VAR. RUBRA	85%	98%
37.5%	22.5	45	TALL FESCUE	FESTUCA ARUNDINACEA	90%	95%
5.0%	3	6	RED TOP	AGROSTIS GIGANTEA	90%	95%
15.0%	9	18	WHITE FIELD CLOVER	TRIFOLIUM REPENS	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	LOLIUM MULTIFLORUM	85%	95%
100%	60	120				

GENERAL AMENDMENT GUIDANCE		
FERTILIZER	LIME	
10/20/10	AG LIME	PELLITIZED
500 LBS/AC	2 TONS/AC	1 TONS/AC

**CONSTRUCTION GUIDANCE**

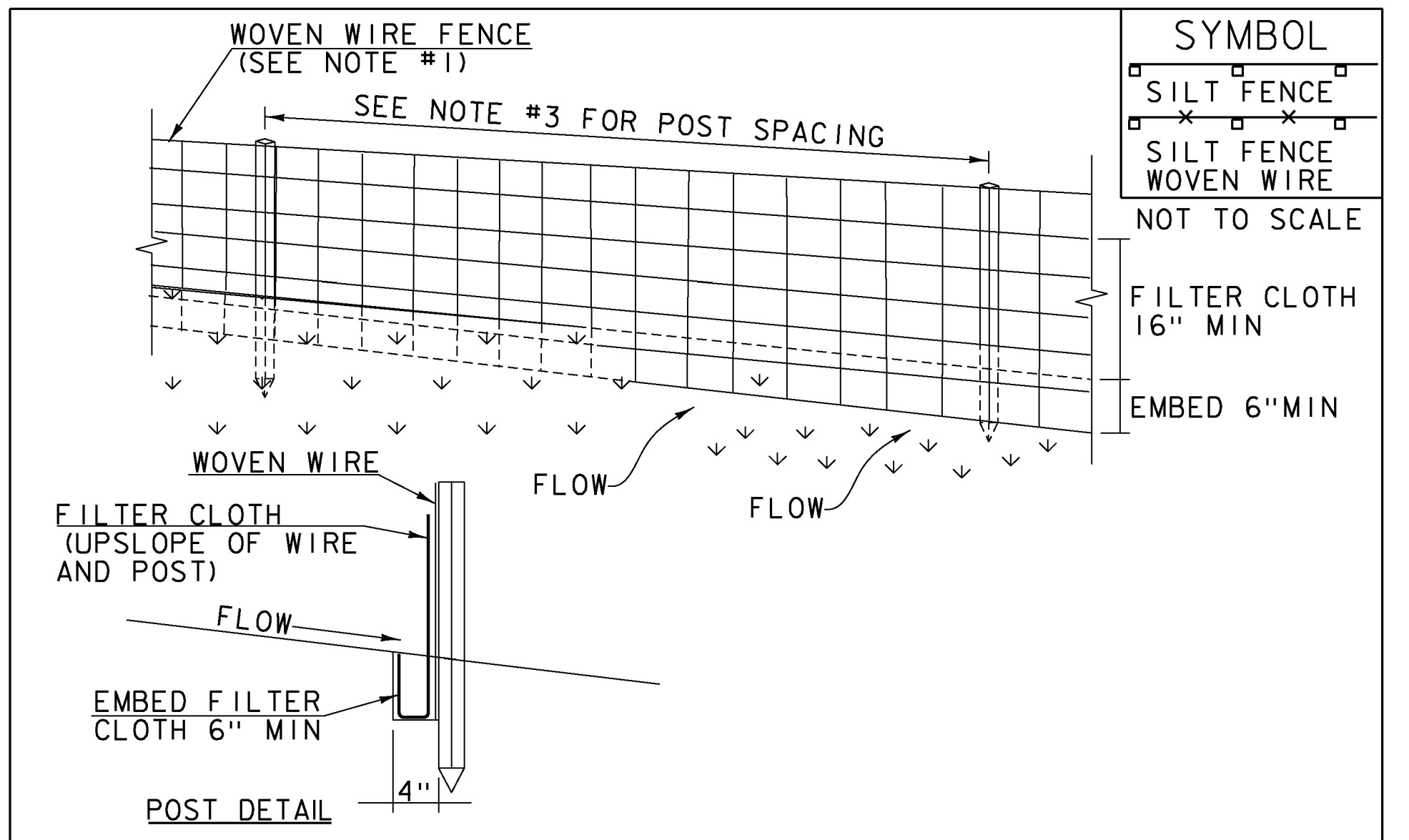
1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT 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. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED PROPOSED FOR USE WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED.
7. 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**

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.15)

REVISIONS	
JANUARY 12, 2015	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**

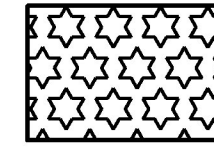
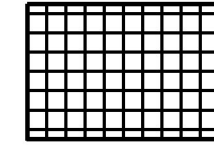
NOTES:  
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

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

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

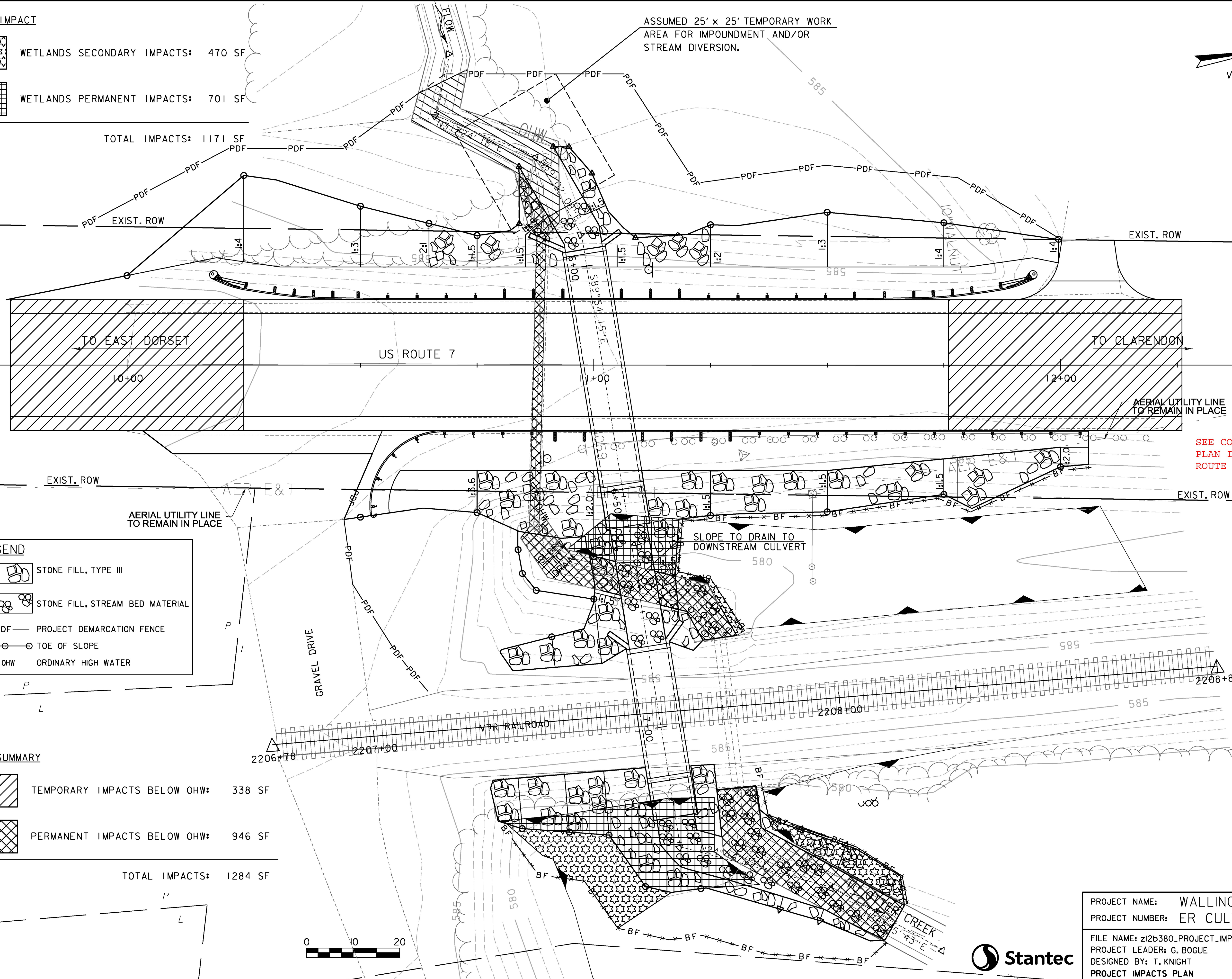
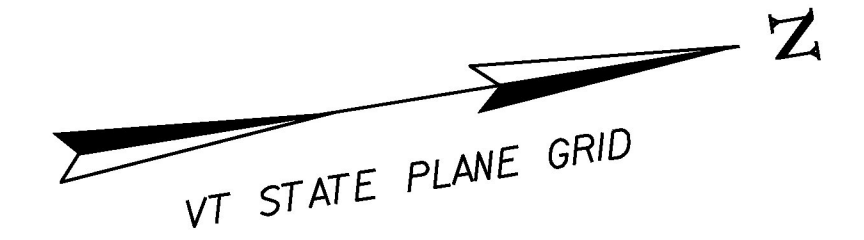
PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME: z12b380_ero_det.dgn	PLOT DATE: 7/12/2016
PROJECT LEADER: G. BOGUE	DRAWN BY: VAOT
DESIGNED BY: VAOT	CHECKED BY: VAOT
EPSC DETAILS 2	SHEET 32 OF 36

WETLANDS IMPACT

-  WETLANDS SECONDARY IMPACTS: 470 SF
-  WETLANDS PERMANENT IMPACTS: 701 SF

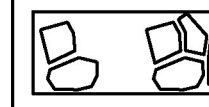
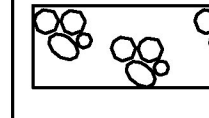
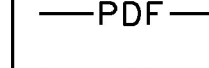
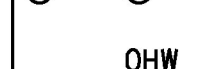
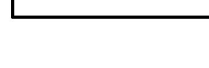
TOTAL IMPACTS: 1171 SF

ASSUMED 25' x 25' TEMPORARY WORK AREA FOR IMPOUNDMENT AND/OR STREAM DIVERSION.

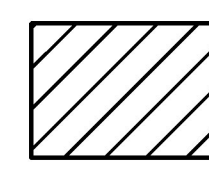
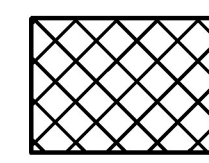


SEE CONTRACTOR'S APPROVED EPSC PLAN INCLUDING CHANGES WEST OF ROUTE 7 DUE TO DETOUR.

LEGEND

-  STONE FILL, TYPE III
-  STONE FILL, STREAM BED MATERIAL
-  PROJECT DEMARCATION FENCE
-  TOE OF SLOPE
-  ORDINARY HIGH WATER

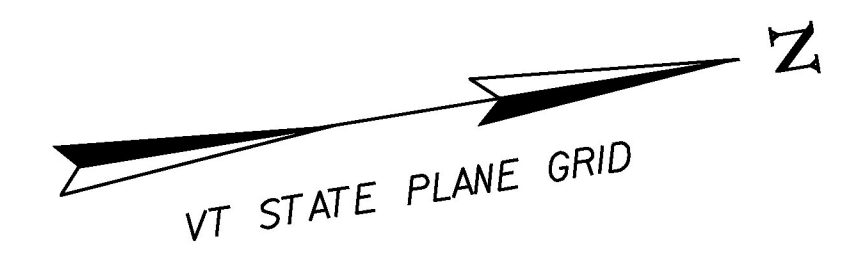
IMPACT SUMMARY

-  TEMPORARY IMPACTS BELOW OHW: 338 SF
-  PERMANENT IMPACTS BELOW OHW: 946 SF

TOTAL IMPACTS: 1284 SF

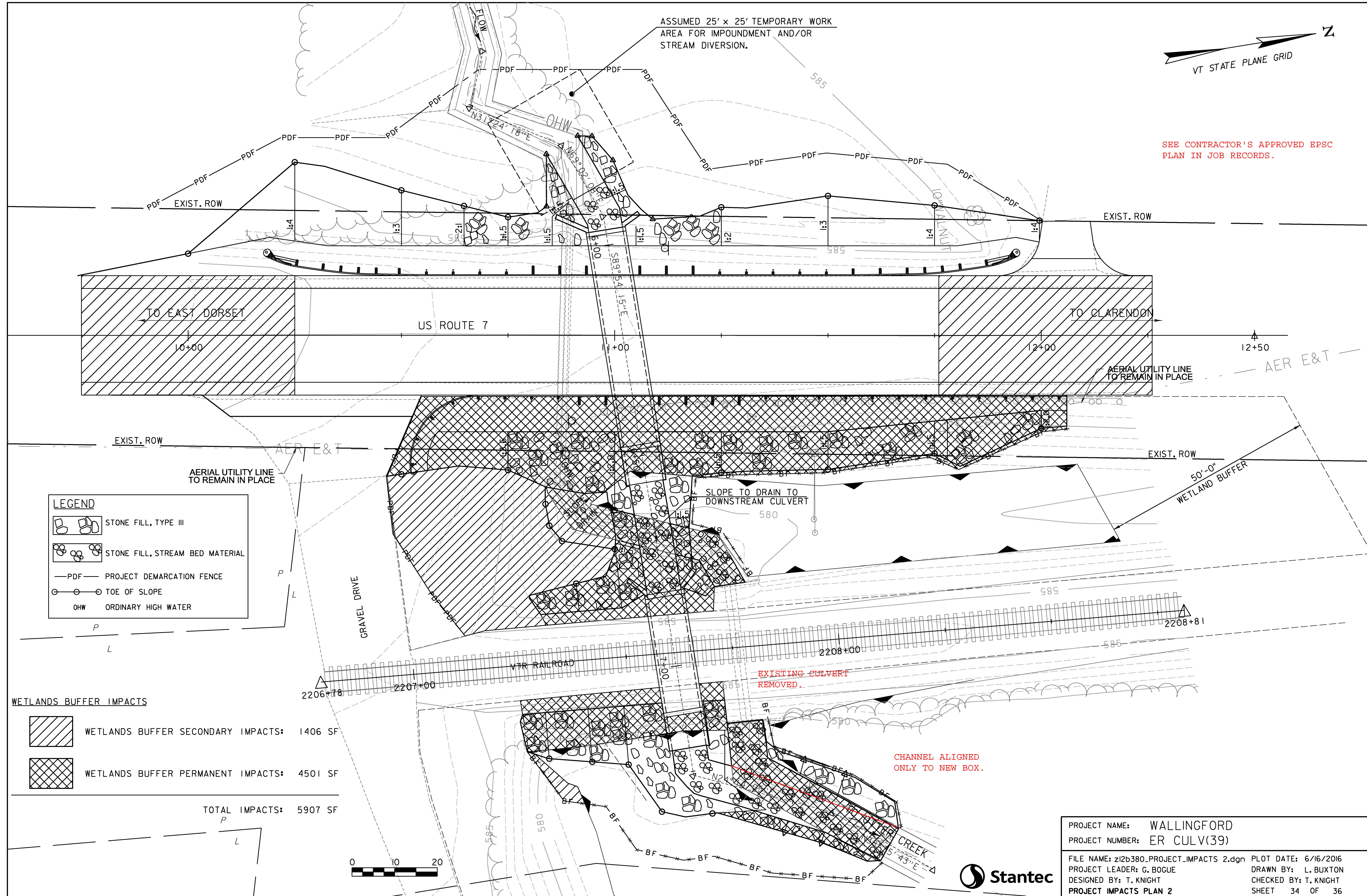
PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	z12b380_PROJECT_IMPACTS.dgn
PROJECT LEADER:	G. BOGUE
DESIGNED BY:	T. KNIGHT
PROJECT IMPACTS PLAN	
PLOT DATE:	6/16/2016
DRAWN BY:	L. BUXTON
CHECKED BY:	T. KNIGHT
SHEET	33 OF 36





SEE CONTRACTOR'S APPROVED EPSC PLAN IN JOB RECORDS.

ASSUMED 25' x 25' TEMPORARY WORK AREA FOR IMPOUNDMENT AND/OR STREAM DIVERSION.



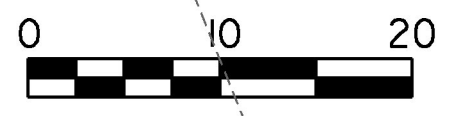
**LEGEND**

- STONE FILL, TYPE III
- STONE FILL, STREAM BED MATERIAL
- PROJECT DEMARCATION FENCE
- TOE OF SLOPE
- ORDINARY HIGH WATER

**WETLANDS BUFFER IMPACTS**

- WETLANDS BUFFER SECONDARY IMPACTS: 1406 SF
- WETLANDS BUFFER PERMANENT IMPACTS: 4501 SF

**TOTAL IMPACTS: 5907 SF**



EXISTING CULVERT REMOVED.

CHANNEL ALIGNED ONLY TO NEW BOX.

PROJECT NAME:	WALLINGFORD
PROJECT NUMBER:	ER CULV(39)
FILE NAME:	z12b380_PROJECT_IMPACTS 2.dgn
PROJECT LEADER:	G. BOGUE
DESIGNED BY:	T. KNIGHT
PROJECT IMPACTS PLAN 2	
PLOT DATE:	6/16/2016
DRAWN BY:	L. BUXTON
CHECKED BY:	T. KNIGHT
SHEET	34 OF 36



# RIGHT - OF - WAY DETAIL SHEET

TABLE OF PROPERTY ACQUISITION

TABLE OF REVISIONS

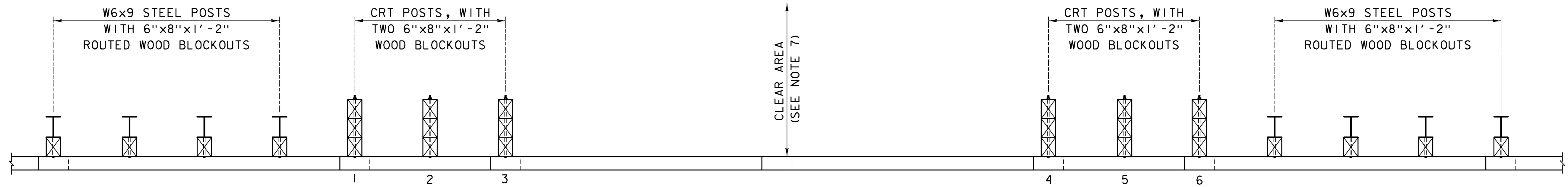
PARCEL NO.	PROPERTY OWNER	ROW LAYOUT NO.	BEGINNING STATION	ENDING STATION	TAKE	REMAINDER	RIGHT			RECORDING DATA				REMARKS		
							AREA +/-	AREA +/-	TYPE	T/P	AREA +/-	TITLE	DATE		TOWN / CITY	BOOK
1	OMYA, INC.	1	9+90 LT	12+00 LT			CONSTRUCTION	T	2,585 SF						INCL. PDF & EC	
			10+12 LT	10+50 LT			SLOPE	T	290 SF							
			10+50.00 LT	10+71.52 LT			SLOPE	P	55 SF							
			10+80.23 LT	11+08.92 LT			CHANNEL	P	622 SF							INCL. WINGWALL, TEMP. EC & STONE FILL
			11+-08.92 LT	11+50.00 LT			SLOPE	P	105 SF							
			11+50 LT	12+00 LT			SLOPE	T	145 SF							
			12+06 LT													FIELD DRIVE, MM 0213
2	STATE OF VERMONT, LESSOR VERMONT RAILWAY, INC., LESSEE	1	10+25 RT	10+53 RT			ACCESS	T							TEMP. ACCESS OVER GRAVEL DRIVE AT MM 0211 TO CONSTRUCT BOX CULVERTS	
			10+46 RT	10+75 RT			SLOPE	T	127 SF							
			10+46 RT	11+67 RT			CONSTRUCTION	T	0.14 AC							INCL. BOX CULVERT PLACEMENT, CHANNEL WORK, GRADING, REMOVING EXISTING CULVERTS, REMOVE & REINSTALL TRACK SECTION, BF, PDF & EC
			10+53 RT				INSTALL & MAINTAIN	P								GUARD RAIL
			10+75.00 RT	10+93.00 RT			SLOPE	P	134 SF							
			10+91.39 RT	11+23.65 RT			HIGHWAY	P	638 SF							INCL. NEW BOX CULVERT, STONE LINED CHANNEL
			11+20.40 RT	11+71.62 RT			SLOPE	P	164 SF							
3	TOWN OF WALLINGFORD	1	10+17 RT	10+27 RT			ACCESS	T	70 SF						PORTION OF GRAVEL DRIVE AT MM 0211	
4	GREEN MOUNTAIN POWER COMPANY		9+90 LT	12+00 LT											UTILITY	
5	TELEPHONE OPERATING COMPANY OF VERMONT, LLC		9+90 LT	12+00 LT											UTILITY	
6	COMCAST OF CONNECTICUT/GEORGIA/ MASSACHUSETTS/NEW HAMPSHIRE/ NEW YORK/NORTH CAROLINA/VIRGINIA/ VERMONT, LLC		9+90 LT	12+00 LT											UTILITY	

REVISION NO.	ROW SET SHEET #	DESCRIPTION	DATE
1	1, 3	GENERAL: TITLE SHEET REVISE LENGTH OF R.O.W. PROJECT: 210 FT = 0.040 MI.; REVISE END OF R.O.W. PROJECT: STA. 12+00, 26.87' LT; REMOVE PROPERTY LINE DISCLOSURE; DATE SHEET 04-28-15.	01/15/16
		GENERAL: DETAIL SHEET REVISE UTILITY END STA. 12+00; DETAIL SHEET DATE: 04-28-15. COMCAST: ADD VIRGINIA JUST BEFORE VERMONT; COMPLETED BY: STANTEC PER C.O. 10071; APPROVED BY: HP	
2	3, 4	PARCEL 2: CONST(T) END STATION CHANGED - 12+03 RT TO 11+67 RT, AREA - 0.17 AC TO 0.14 AC; SLOPE(P) END STATION CHANGED - 11+00 RT TO 10+93 RT, AREA - 220 SF TO 134 SF; HWY(P) BEGIN AND END STA. CHANGED - 11+00 RT - 11+35.25 RT TO 10+91.39 RT TO 11+23.65 RT; HWY(P) AREA CHANGED - 683 SF TO 638 SF; SLOPE(P) BEGIN STA. CHANGED - 11+35.25 RT TO 11+20.40 RT; AREA - 1095 SF TO 164 SF; ADDED CONST(T) AT 11+21 RT TO 11+87 RT, AREA 43 FT COMPLETED BY: STANTEC PER C.O. 10072; APPROVED BY: HP	01/13/16

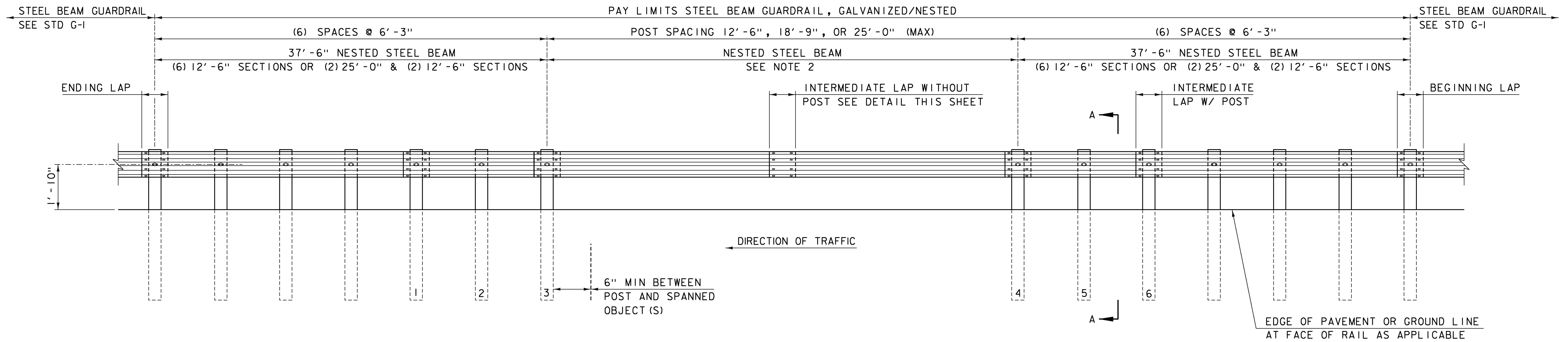
APPROVED: RYAN CLOUTIER DATE: 04-28-2015  
CHIEF, PLANS & TITLES

PROJECT NAME: **WALLINGFORD**  
PROJECT NUMBER: **ER CULV(39)**  
FILE NAME: **z12b380\_row\_ROW\_DET-SHT** PLOT DATE: 2/25/2016  
PROJECT LEADER: **GEORGE BOGUE** DRAWN BY: **L. BUXTON**  
DESIGNED BY: **H. PETROVS** CHECKED BY: **G. BOGUE**  
R.O.W. DETAIL SHEET #1 SHEET 35 OF 36

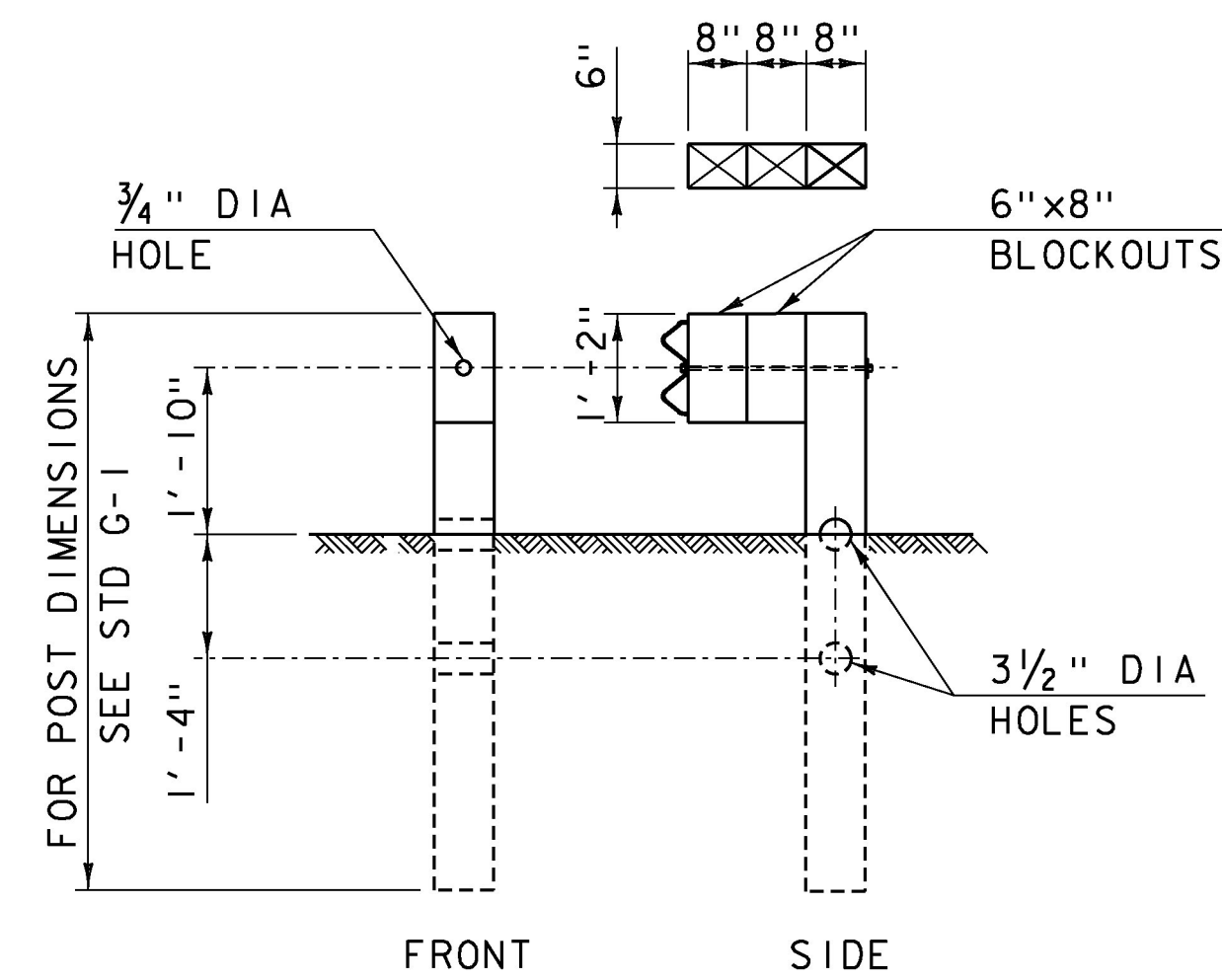




LONGSPAN STEEL BEAM GUARDRAIL PLAN

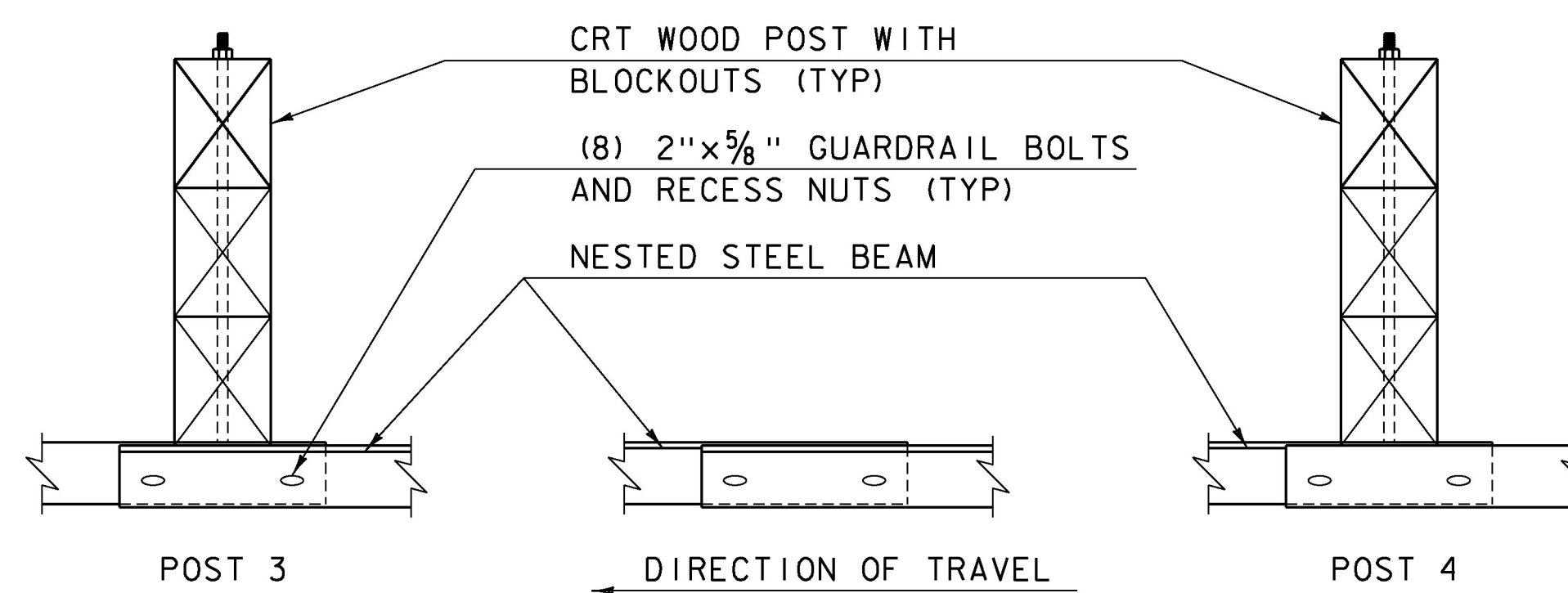


LONGSPAN STEEL BEAM GUARDRAIL ELEVATION



SECTION A-A

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



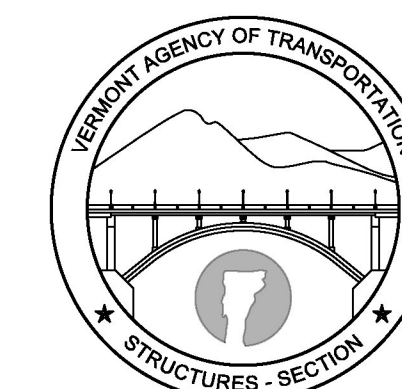
INTERMEDIATE LAP WITHOUT POST

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 G-1, SHALL BE 26" LONG.
6. ON ALL POSTS WHERE THE RAIL IS NESTED GUARDRAIL BOLT "A", AS SHOWN ON STD G-1, 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

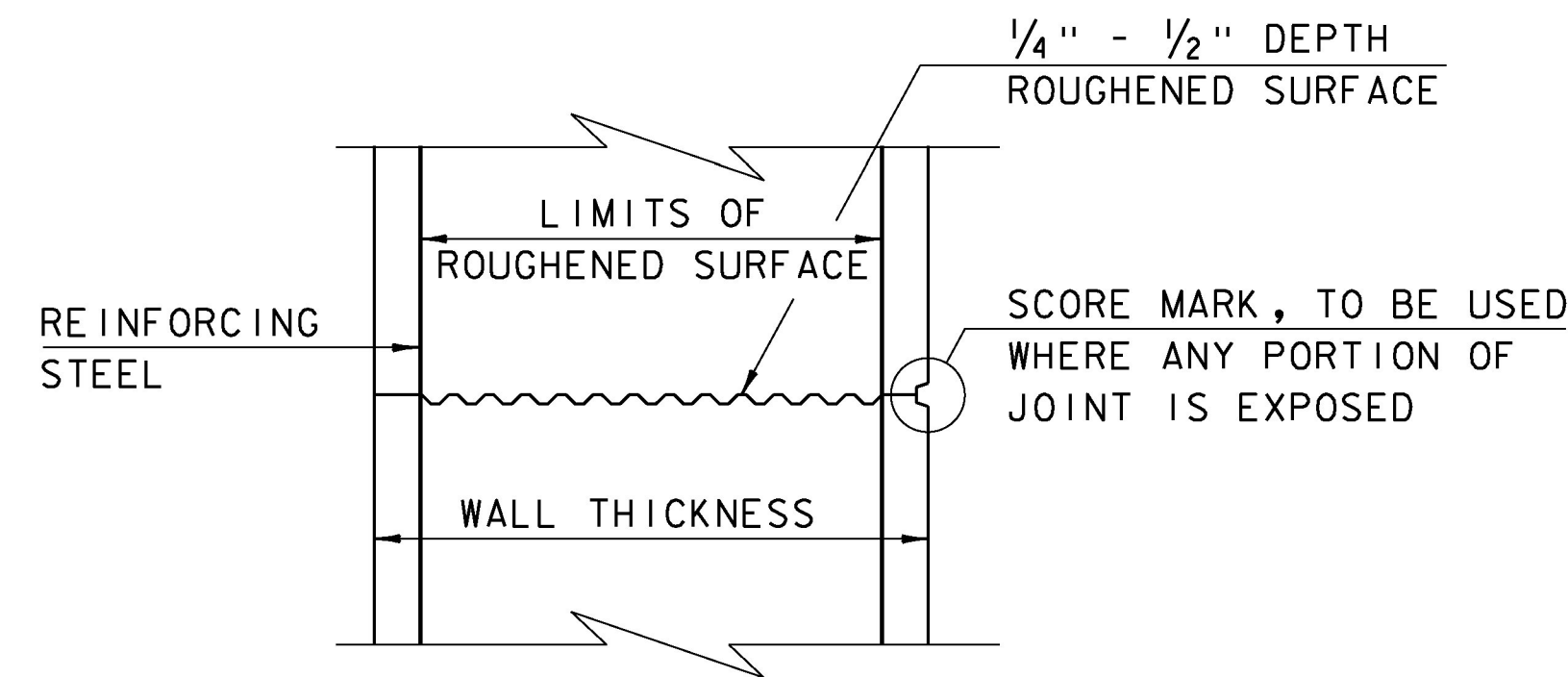
LONGSPAN  
STEEL BEAM GUARDRAIL,  
GALVANIZED



STRUCTURES  
DETAIL  
SD-366.00

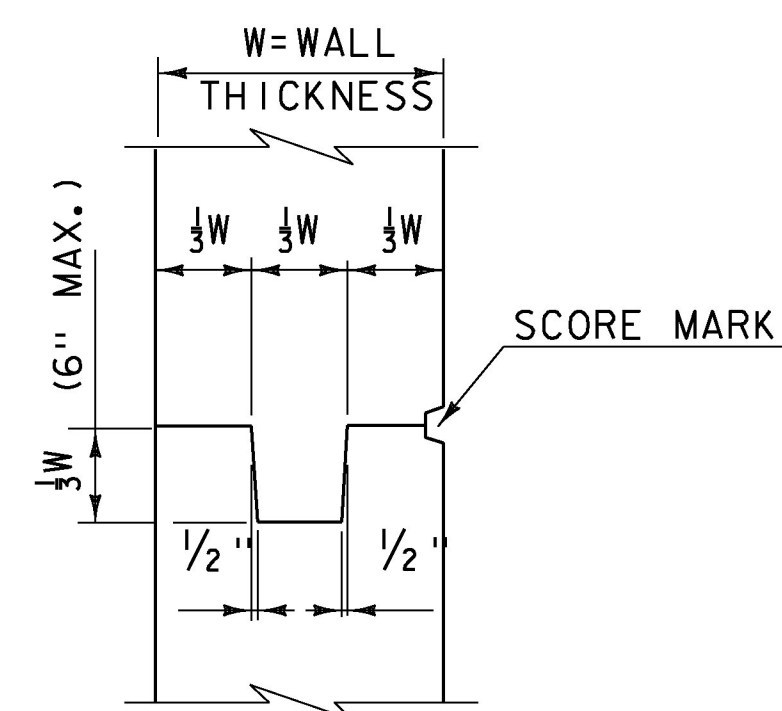
### CONCRETE GENERAL NOTES

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

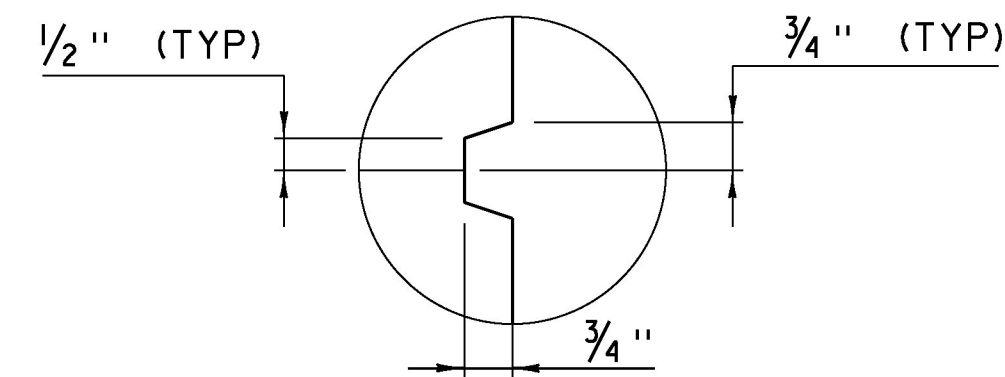


**TYPICAL HORIZONTAL CONSTRUCTION JOINT**  
(NOT TO SCALE)

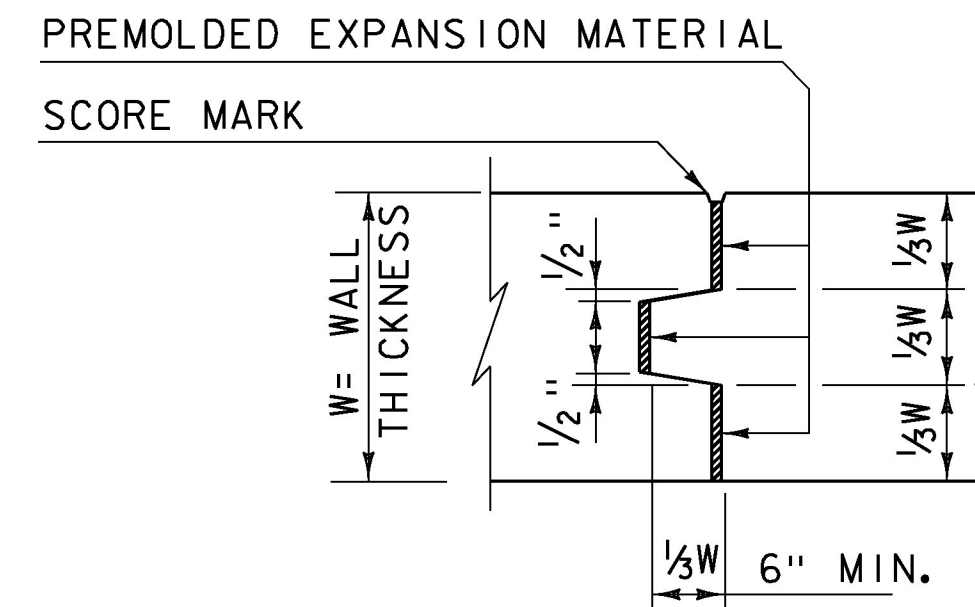
1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



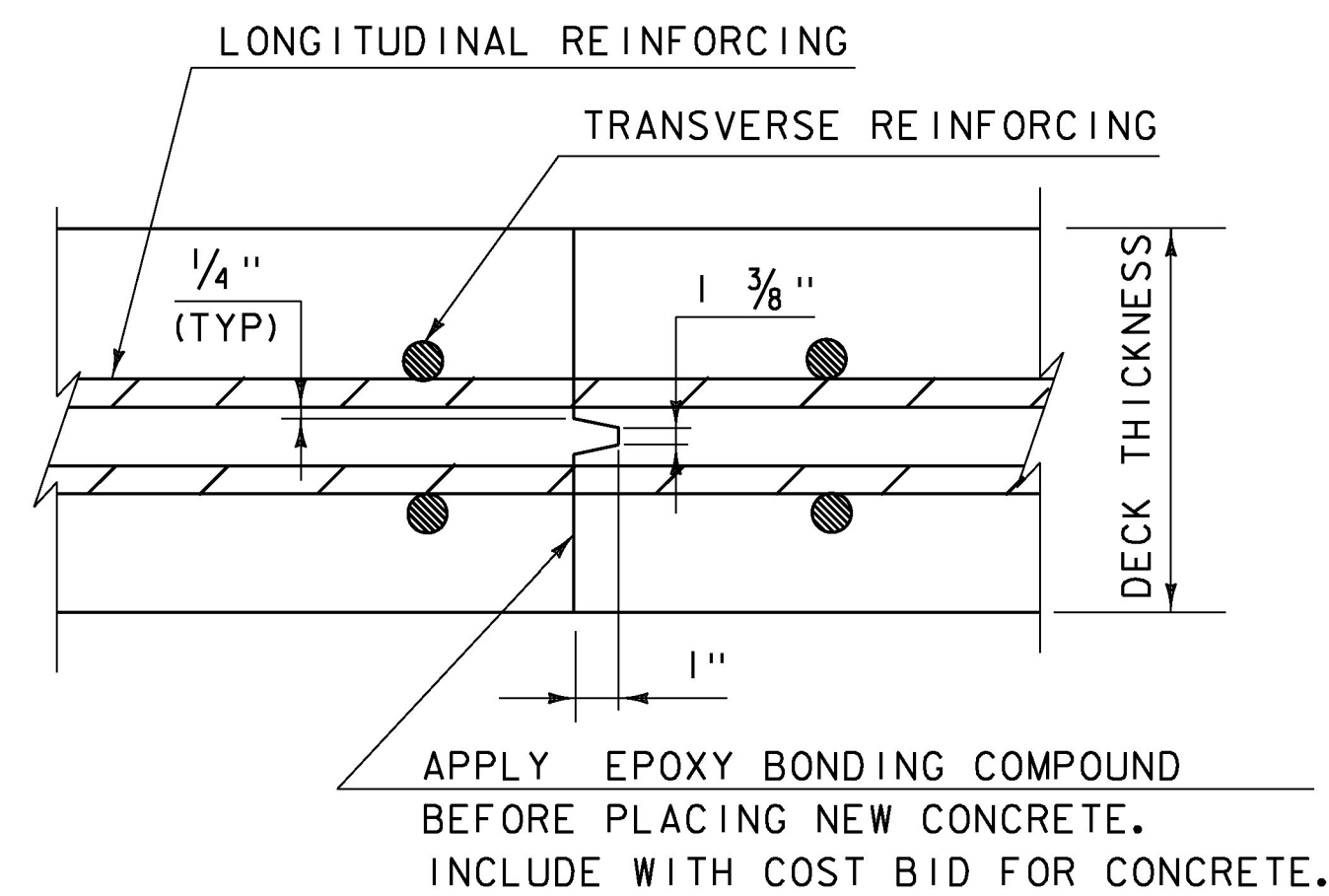
**TYPICAL CONCRETE CONSTRUCTION JOINT**  
(NOT TO SCALE)



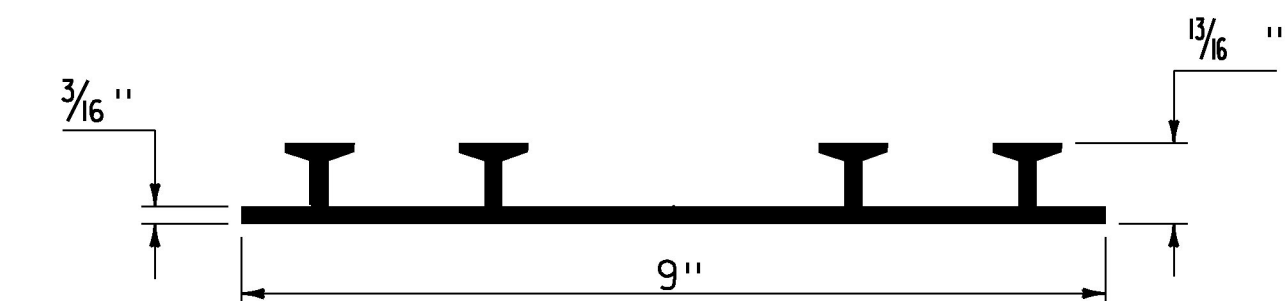
**SCORE MARK DETAIL**  
(NOT TO SCALE)



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



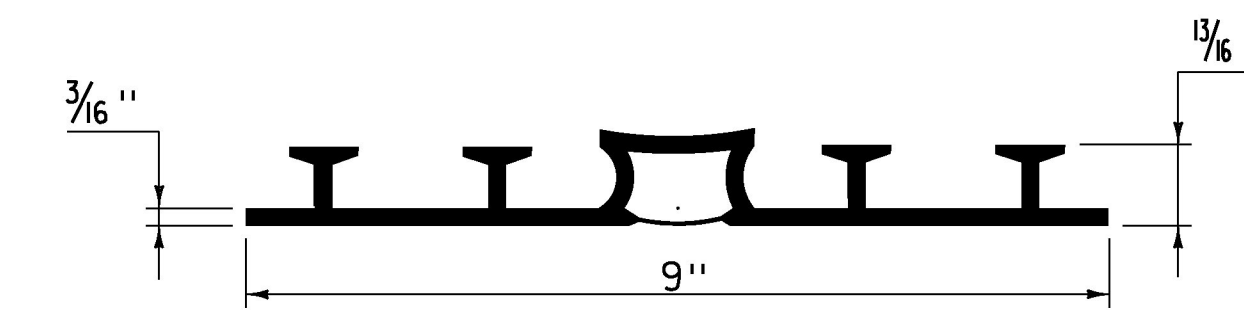
**TRANSVERSE BRIDGE SLAB CONSTRUCTION JOINT DETAILS**  
(NOT TO SCALE)



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

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

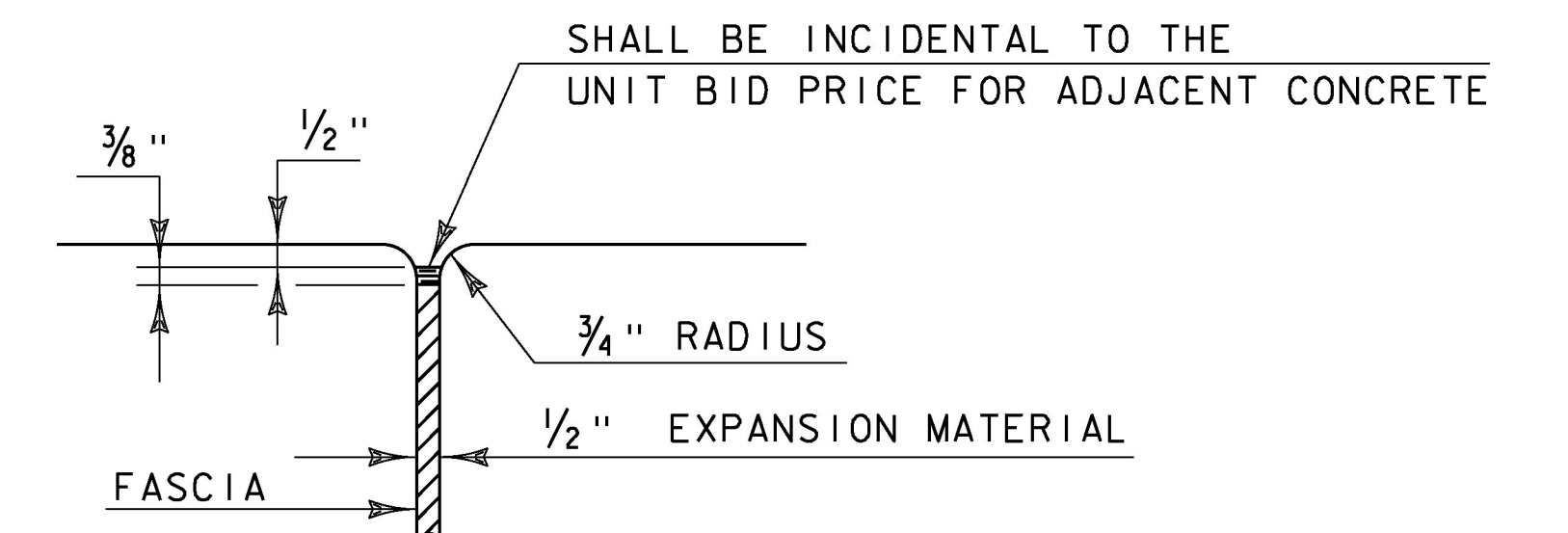
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



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

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

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

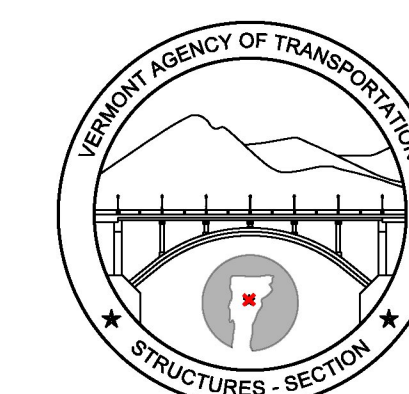


**JOINT BETWEEN FASCIA AND WINGWALL**  
(NOT TO SCALE)

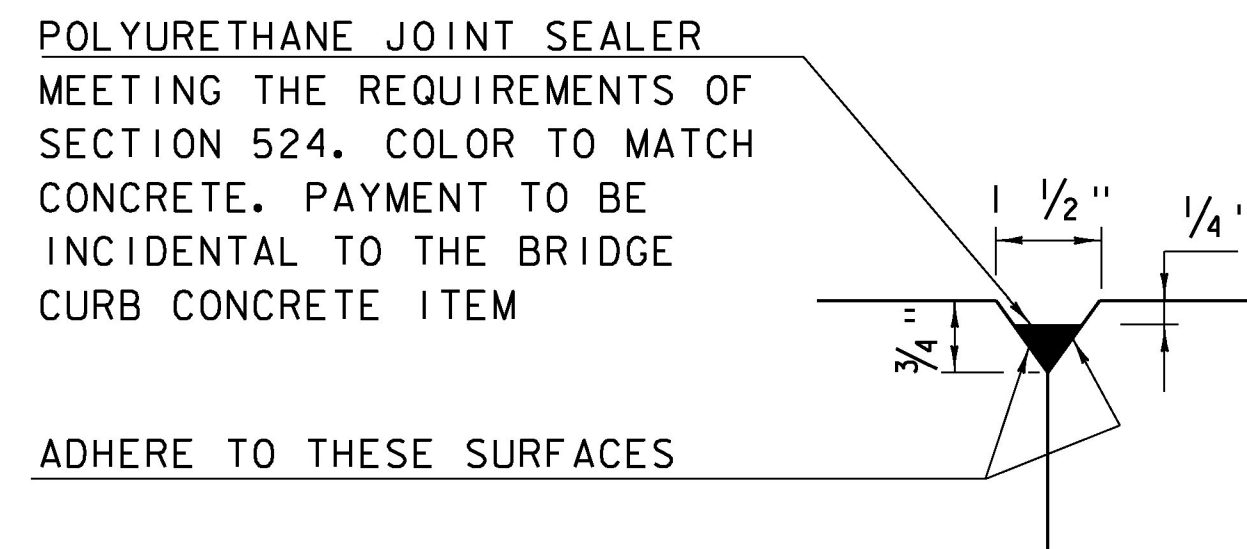
#### REVISIONS

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

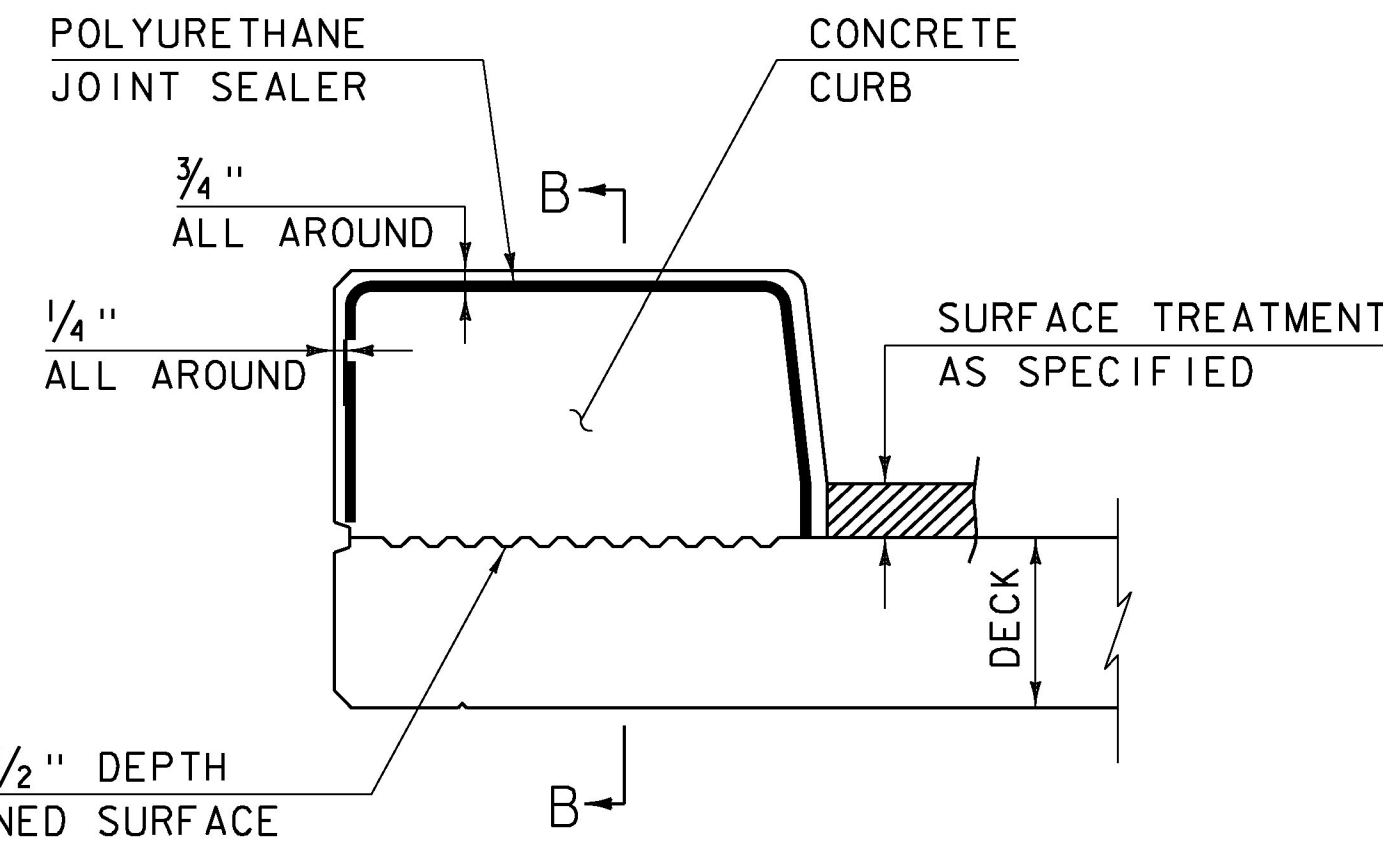
## CONCRETE DETAILS AND NOTES



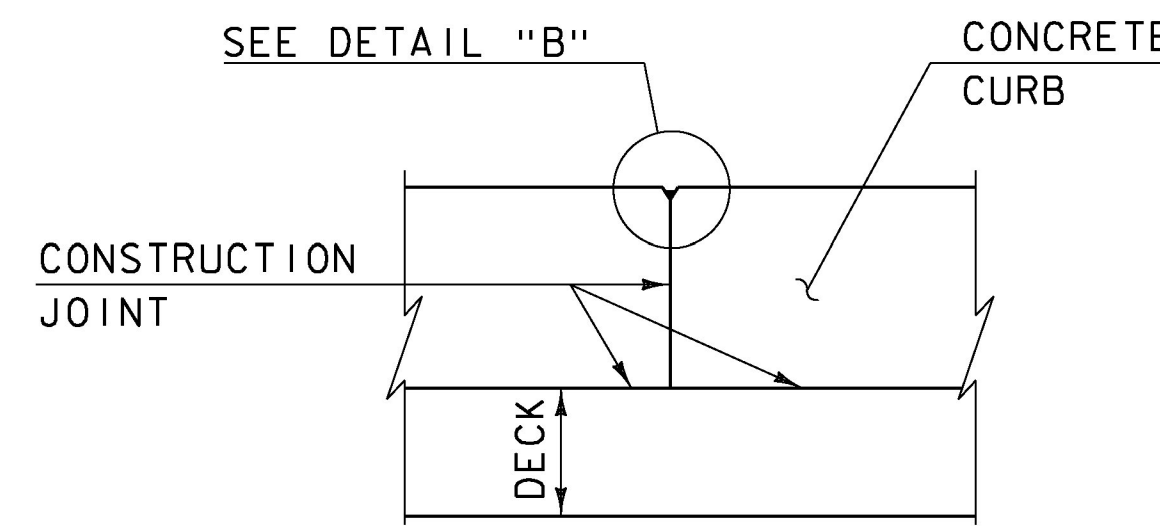
**STRUCTURES  
DETAIL  
SD-501.00**



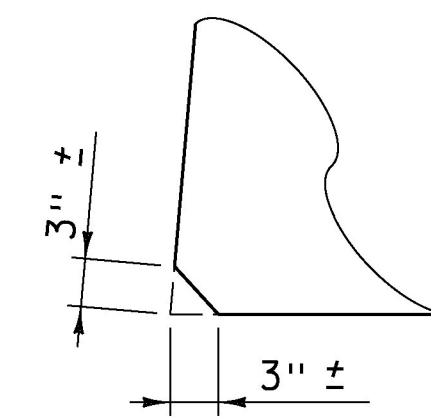
DETAIL "B"  
(NOT TO SCALE)



CONCRETE CURB JOINT SECTION  
(NOT TO SCALE)

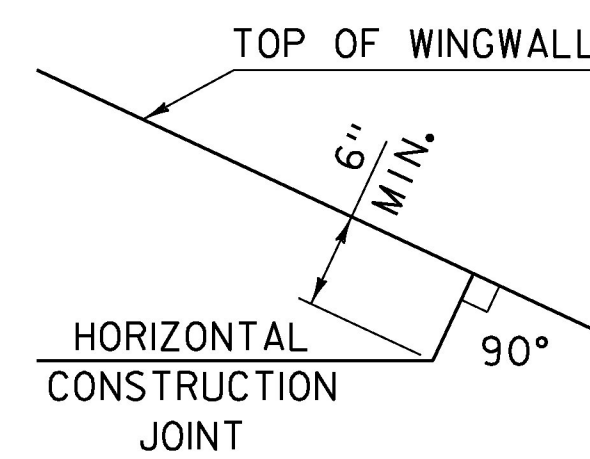


SECTION B - B  
(NOT TO SCALE)

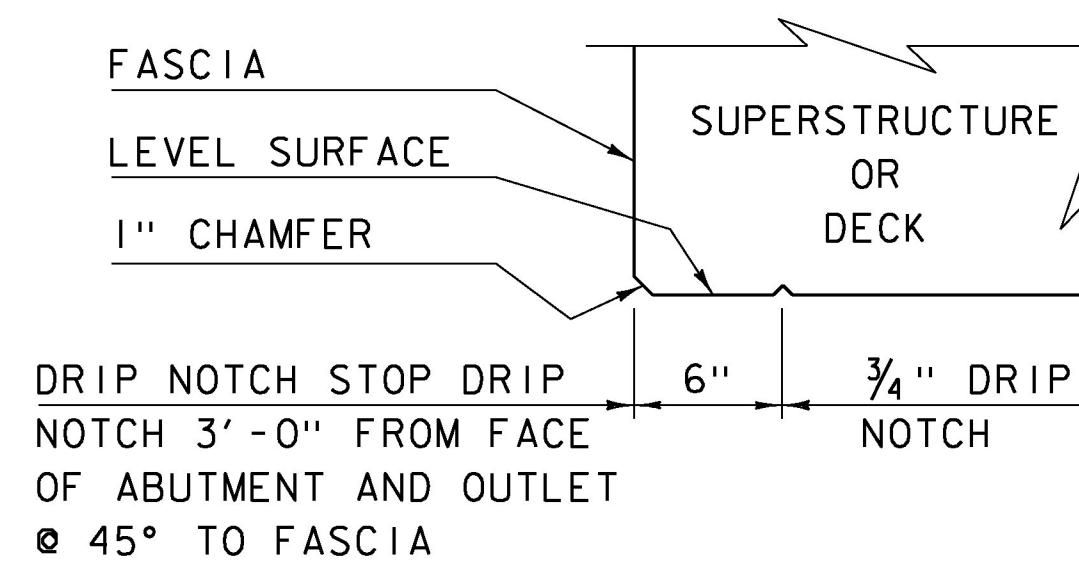


ACUTE ANGLE  
CLIP DETAIL  
(NOT TO SCALE)

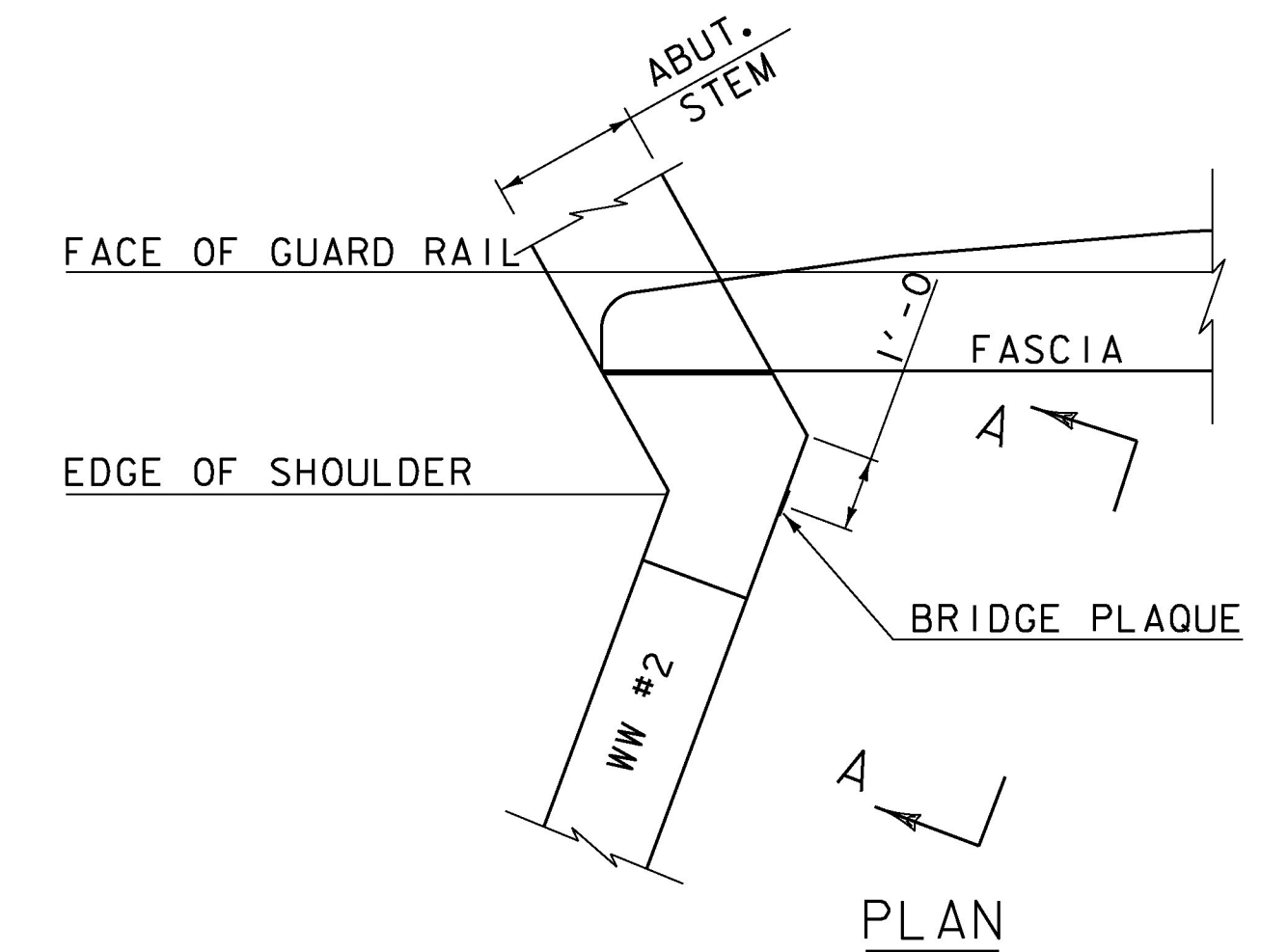
- SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION



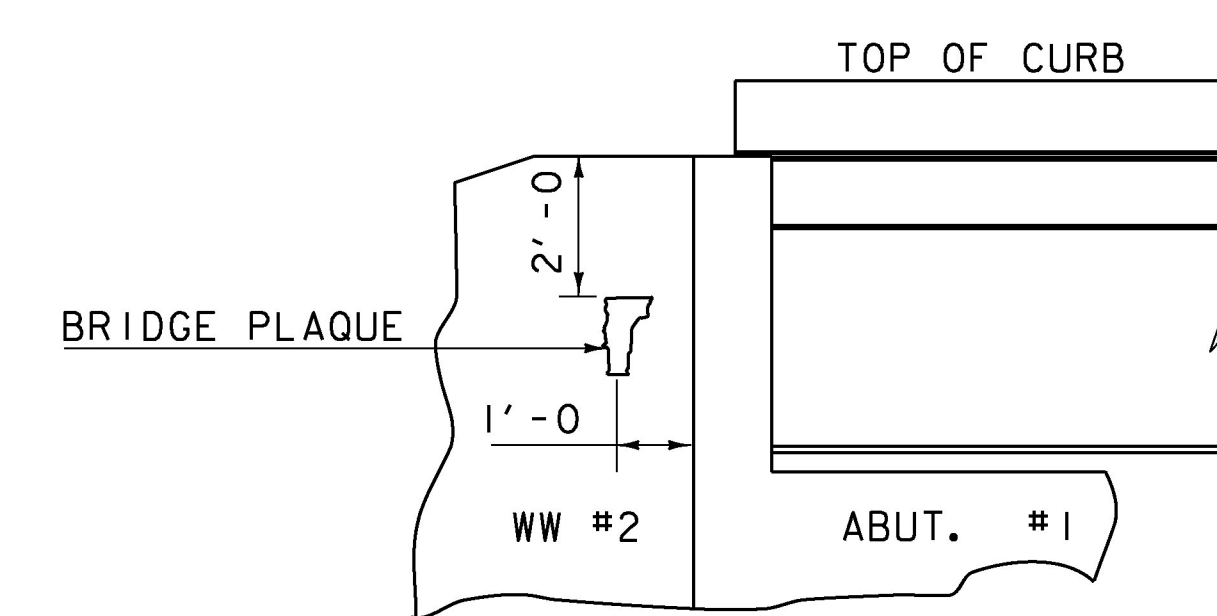
HORIZONTAL WINGWALL  
CONSTRUCTION JOINT  
(NOT TO SCALE)



DRIP NOTCH DETAIL  
(NOT TO SCALE)



PLAN



VIEW "A - A"

BRIDGE PLAQUE  
(NOT TO SCALE)

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

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

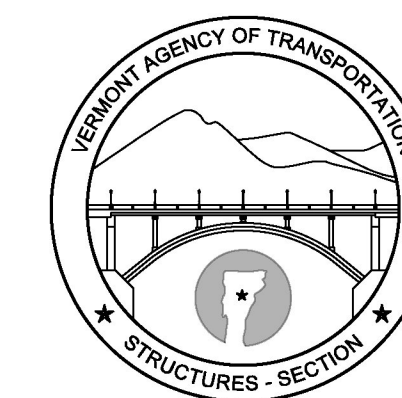
### CONCRETE CURB JOINT NOTES

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

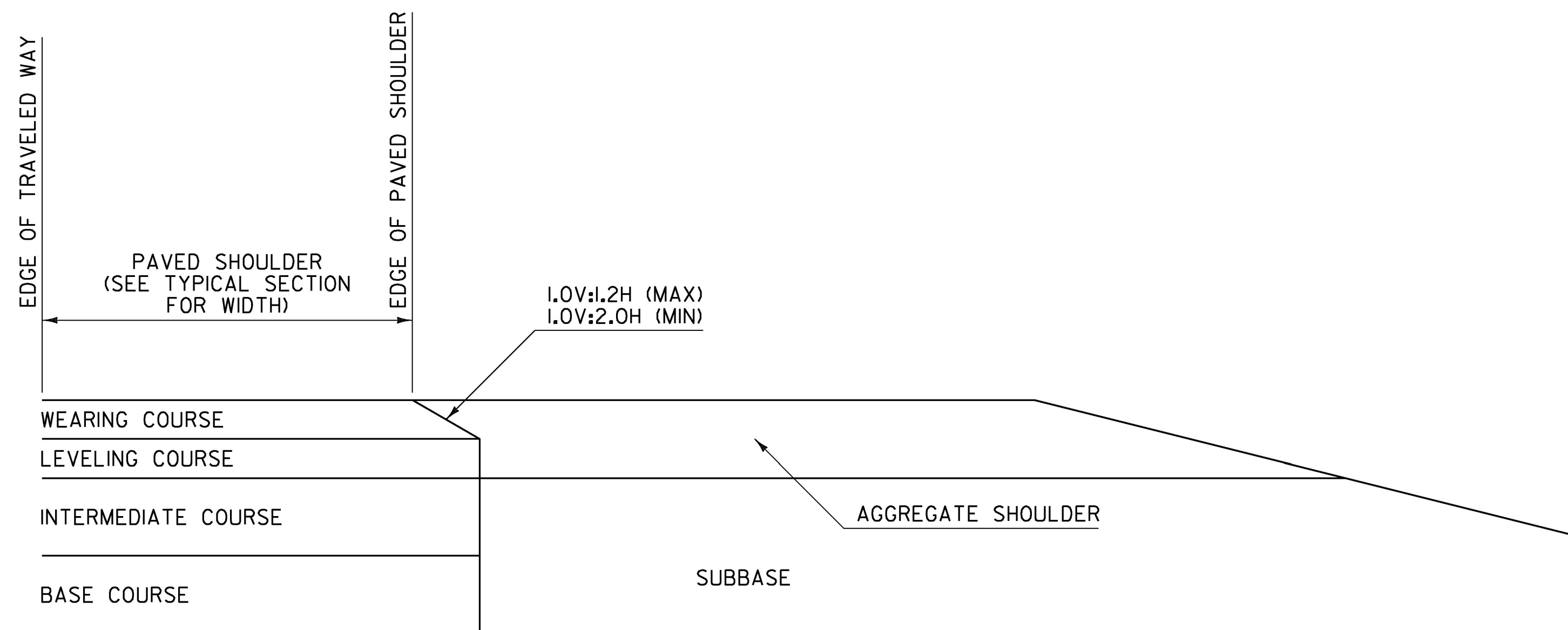
### REVISIONS

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

# CONCRETE DETAILS AND NOTES



STRUCTURES  
DETAIL  
SD-502.00

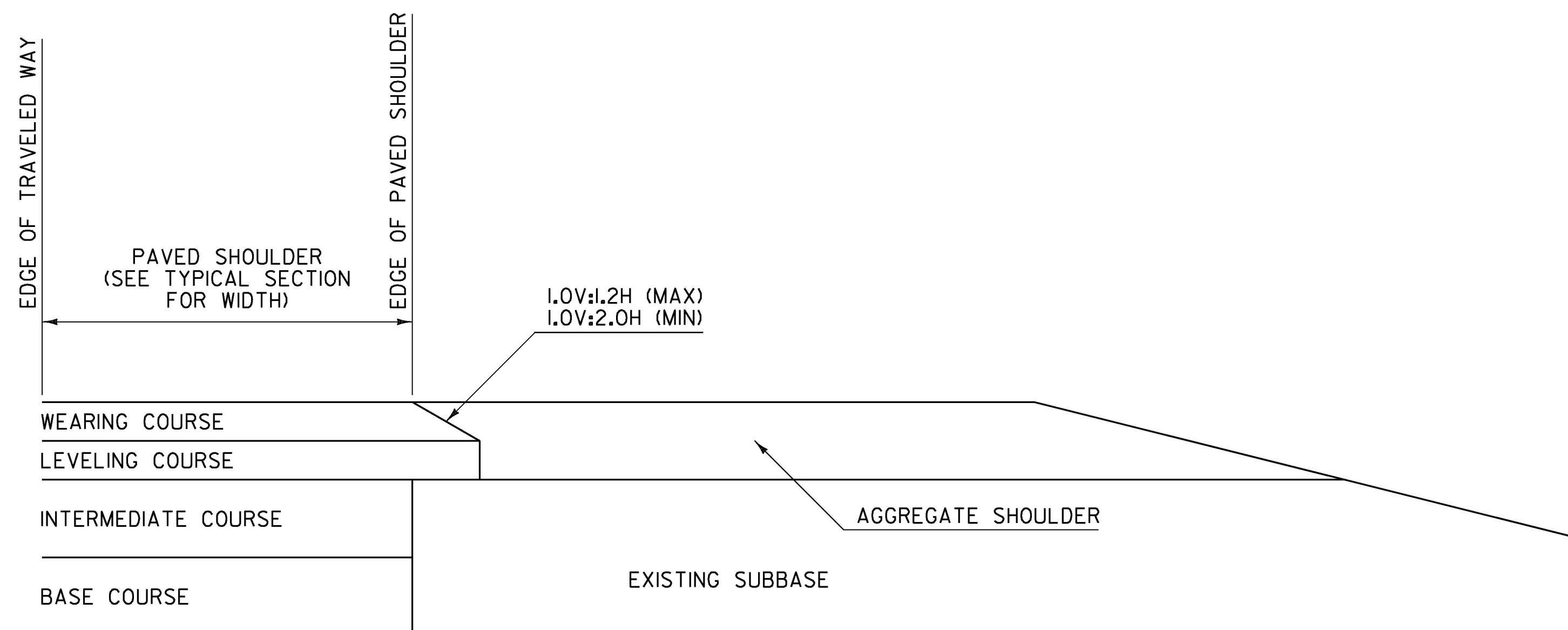


**NOTES:**

1. THIS DETAIL IS INTENDED FOR WHEN PAVING EXTENDS BELOW THE WEARING COURSE.
2. PRIOR TO PLACEMENT OF THE LEVELING AND/OR WEARING COURSE, THE SUBBASE LOCATED BENEATH THE AGGREGATE SHOULDER SHALL BE PREPARED FLUSH WITH THE BOTTOM OF THE LEVELING COURSE.
3. BASE COURSE LIMITS MAY VARY, SEE TYPICAL SECTIONS FOR WIDTH.

**SAFETY EDGE DETAIL  
FOR PAVING BELOW WEARING COURSE**

SAFETY EDGE WIDTH BASED ON WEARING COURSE THICKNESS AND A 1V:1.6H SLOPE	
WEARING COURSE THICKNESS (INCHES)	NOMINAL SAFETY EDGE WIDTH (INCHES)
1.25	2.000
1.50	2.375
1.75	2.750
2.00	3.125
2.25	3.500
2.50	4.000



**NOTES:**

1. THIS DETAIL IS INTENDED FOR WHEN ONLY THE LEVELING AND/OR WEARING COURSE IS TO BE PLACED.
2. PAVEMENT COURSES MAY VARY, SEE TYPICAL SECTIONS FOR ACTUAL PAVEMENT COURSES REQUIRED.

**SAFETY EDGE DETAIL  
FOR PAVING WEARING COURSE ONLY**

**GENERAL NOTES:**

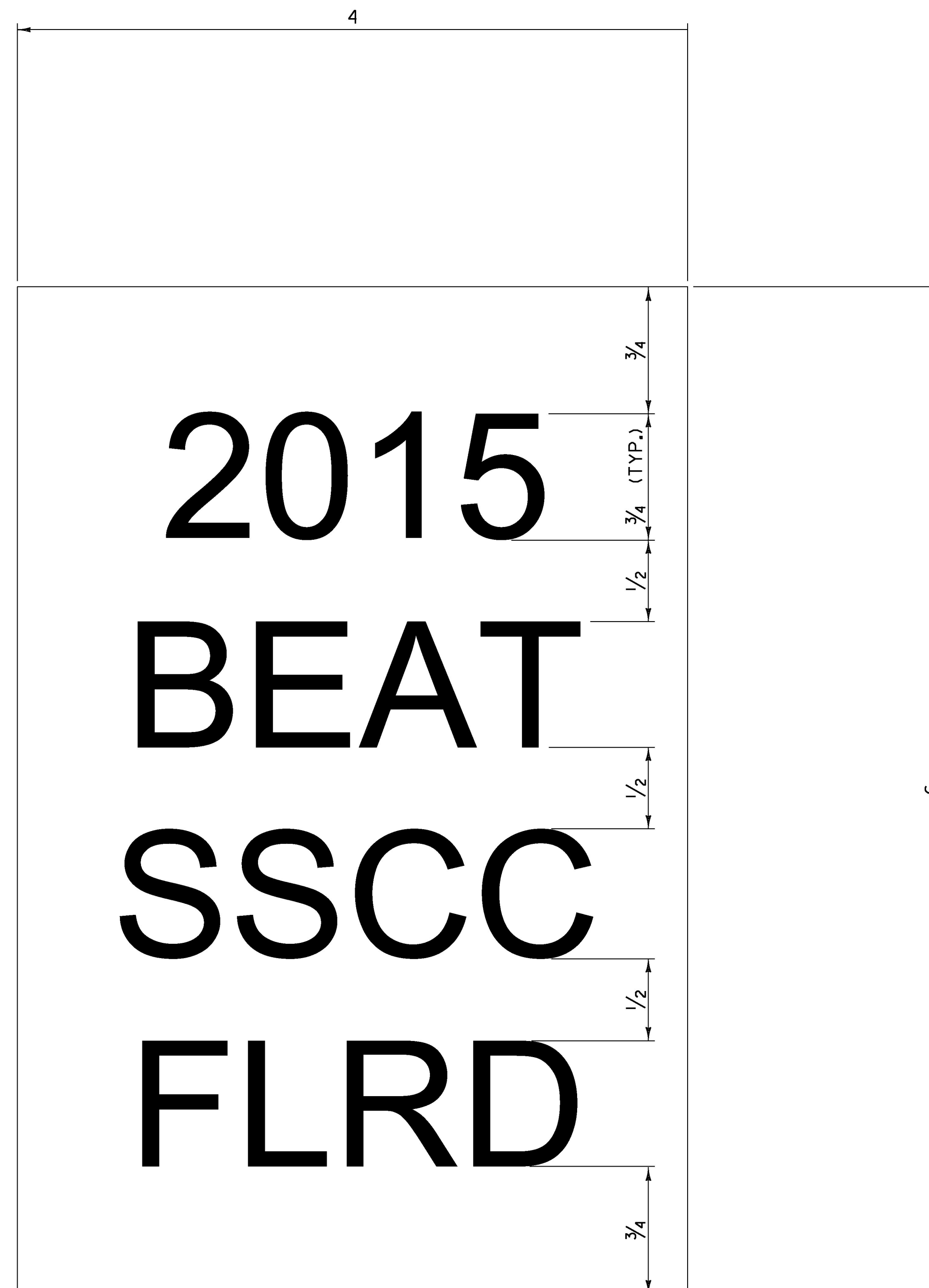
1. PLACEMENT OF THE WEARING COURSE SHALL INCLUDE THE SAFETY EDGE, UNLESS THE FOLLOWING APPLIES:
  - A. THE ADJACENT SLOPE IS STEEPER THAN THE SAFETY EDGE.
  - B. THE EDGE OF PAVEMENT BEING PLACED ABUTS BOUND MATERIAL.
  - C. VEHICLES ARE RESTRICTED FROM LEAVING THE PAVED SURFACE (EXAMPLE: GUARDRAIL).
2. THE SAFETY EDGE SHALL BE FORMED IN SUCH A WAY THAT THE BITUMINOUS CONCRETE PAVEMENT IS EXTRUDED OR COMPRESSED TO FORM THE SLOPE. DEVICES THAT SIMPLY STRIKE-OFF THE MIX WITHOUT PROVIDING ANY COMPACTIVE EFFORT WILL NOT BE ALLOWED.
3. THE SAFETY EDGE SHALL NOT BE CONSIDERED PART OF THE PAVED SHOULDER.
4. THIS WORK SHALL BE INCIDENTAL TO THE RESPECTIVE BITUMINOUS CONCRETE PAVEMENT ITEM.

REV.	DATE	DESCRIPTION
0	MAR. 29, 2016	ORIGINAL APPROVAL
OTHER DETAILS REQUIRED: NONE		
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN		

SAFETY EDGE DETAILS



HIGHWAY SAFETY  
& DESIGN DETAIL  
HSD-400.01



**GENERAL NOTES:**

1. LINE ONE SHALL INDICATE THE INSTALLATION YEAR (YYYY).
2. LINE TWO SHALL INDICATE THE MODEL AS IDENTIFIED ON THE APPROVED PRODUCTS LIST. FOR GENERIC INSTALLATIONS THE STANDARD DRAWING DESIGNATION OR NAME AS IDENTIFIED IN THE FHWA ELIGIBILITY LETTER SHALL BE USED.
3. LINE THREE SHALL INDICATE ADDITIONAL MODEL INFORMATION IF NECESSARY.
4. LINE FOUR SHALL INDICATE FLARED (FLRD) OR TANGENT (TANG).
5. LEGEND SHALL BE ONE ARIEL FONT.
6. LEGEND SHALL BE BLACK ON A WHITE BACKGROUND, LEGEND AND BACKGROUND SHALL NOT BE REFLECTIVE.
7. SUITABLE MATERIAL SHALL BE USED SO AS TO NOT DETERIORATE DURING EXPOSURE TO WEATHER.
8. LABELS SHALL BE APPLIED IN SUCH A WAY THAT THEY REMAIN INTACT DURING THE LIFE OF THE TERMINAL.
9. FOR W-BEAM GUARDRAIL, LABEL SHALL BE PLACED ON THE TOP OF POST ONE FACING AWAY FROM TRAFFIC.
10. FOR BOX BEAM GUARDRAIL, LABEL SHALL BE PLACED ON THE BOX BEAM ADJACENT TO POST ONE FACING AWAY FROM TRAFFIC.
11. PAYMENT SHALL BE INCIDENTAL TO OTHER TRAFFIC BARRIER ITEMS.
12. ALL DIMENSIONS IN INCHES.

REV.	DATE	DESCRIPTION
0	NOV. 3, 2015	ORIGINAL APPROVAL
OTHER DETAILS REQUIRED: NONE		
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN		

GUARDRAIL TERMINAL LABEL DETAIL



HIGHWAY SAFETY  
& DESIGN DETAIL  
HSD - 621.06