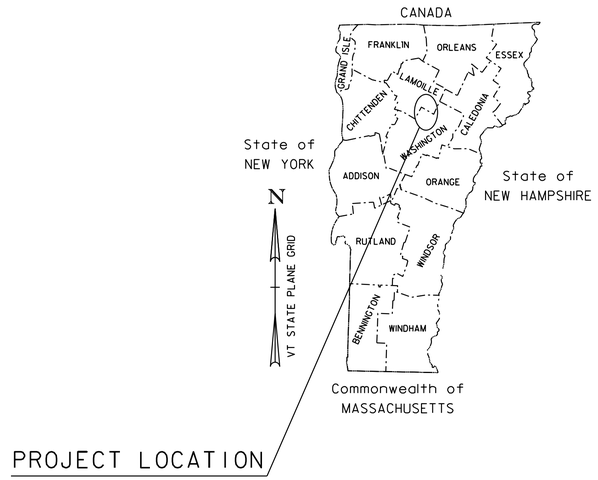
STATE OF VERMONT
AGENCY OF TRANSPORTATION

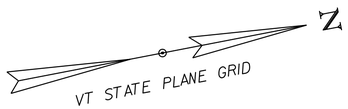
PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWNS OF WORCESTER AND ELMORE
COUNTIES OF WASHINGTON AND LAMOILLE

ROUTE NO: VERMONT ROUTE 12 (MAJOR COLLECTOR)

PROJECT LOCATIONS:	WORCESTER	BF 0241(59)	BRIDGE 84
	WORCESTER	BF 0241(56)	BRIDGE 87
	WORCESTER	BF 0241(57)	BRIDGE 89
	ELMORE	STP CULV(64)	BRIDGE 90
	ELMORE	BF 0241(55)	BRIDGE 94





WORCESTER BF 0241(59)

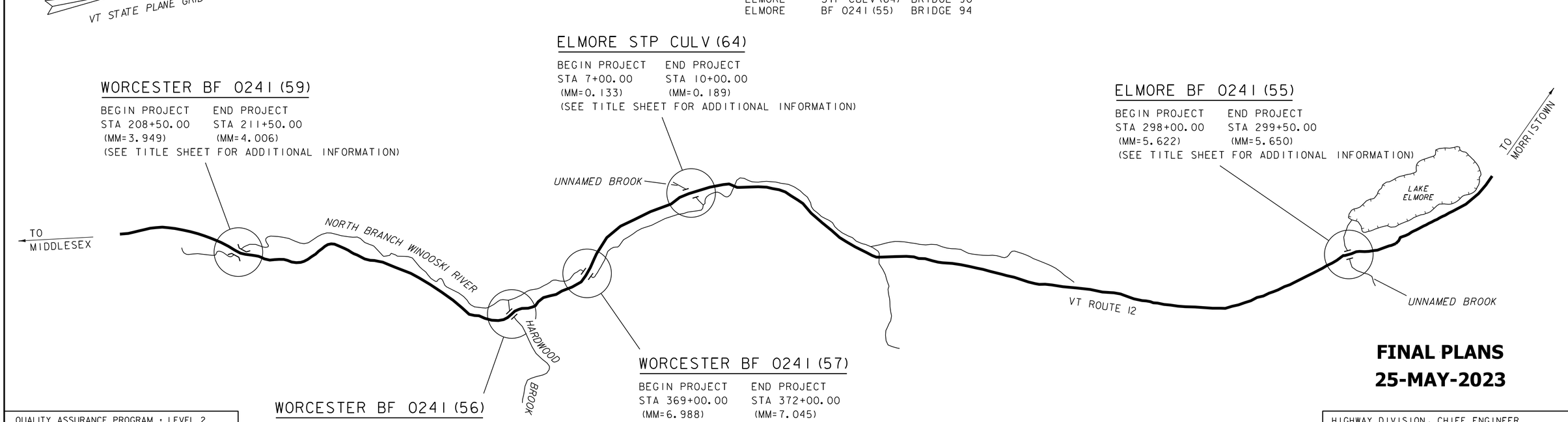
BEGIN PROJECT STA 208+50.00 (MM=3.949)
END PROJECT STA 211+50.00 (MM=4.006)
(SEE TITLE SHEET FOR ADDITIONAL INFORMATION)

ELMORE STP CULV(64)

BEGIN PROJECT STA 7+00.00 (MM=0.133)
END PROJECT STA 10+00.00 (MM=0.189)
(SEE TITLE SHEET FOR ADDITIONAL INFORMATION)

ELMORE BF 0241(55)

BEGIN PROJECT STA 298+00.00 (MM=5.622)
END PROJECT STA 299+50.00 (MM=5.650)
(SEE TITLE SHEET FOR ADDITIONAL INFORMATION)



WORCESTER BF 0241(56)

BEGIN PROJECT STA 326+25.00 (MM=6.179)
END PROJECT STA 329+25.00 (MM=6.236)
(SEE TITLE SHEET FOR ADDITIONAL INFORMATION)

WORCESTER BF 0241(57)

BEGIN PROJECT STA 369+00.00 (MM=6.988)
END PROJECT STA 372+00.00 (MM=7.045)
(SEE TITLE SHEET FOR ADDITIONAL INFORMATION)

SCALE 1" = 2000'-0"
2000 0 2000

FINAL PLANS
25-MAY-2023

QUALITY ASSURANCE PROGRAM : LEVEL 2	
SURVEYED BY :	R.GILMAN, B.HERRING AND H.MCGOWAN
SURVEYED DATE :	7/30/2019 & 8/6/2019
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83(2011)

HOYLE TANNER

HIGHWAY DIVISION, CHIEF ENGINEER
APPROVED _____ DATE _____

PROJECT MANAGER : LAURA STONE

PROJECT NAME : ELMORE - WORCESTER
PROJECT NUMBER :

SHEET 1 OF 370 SHEETS

COMPOSITE SHEETS

WORCESTER BF 0241(59)

WORCESTER BF 0241(56)

WORCESTER BF 0241(57)

ELMORE STP CULV(64)

ELMORE BF 0241(55)

DETAIL SHEETS

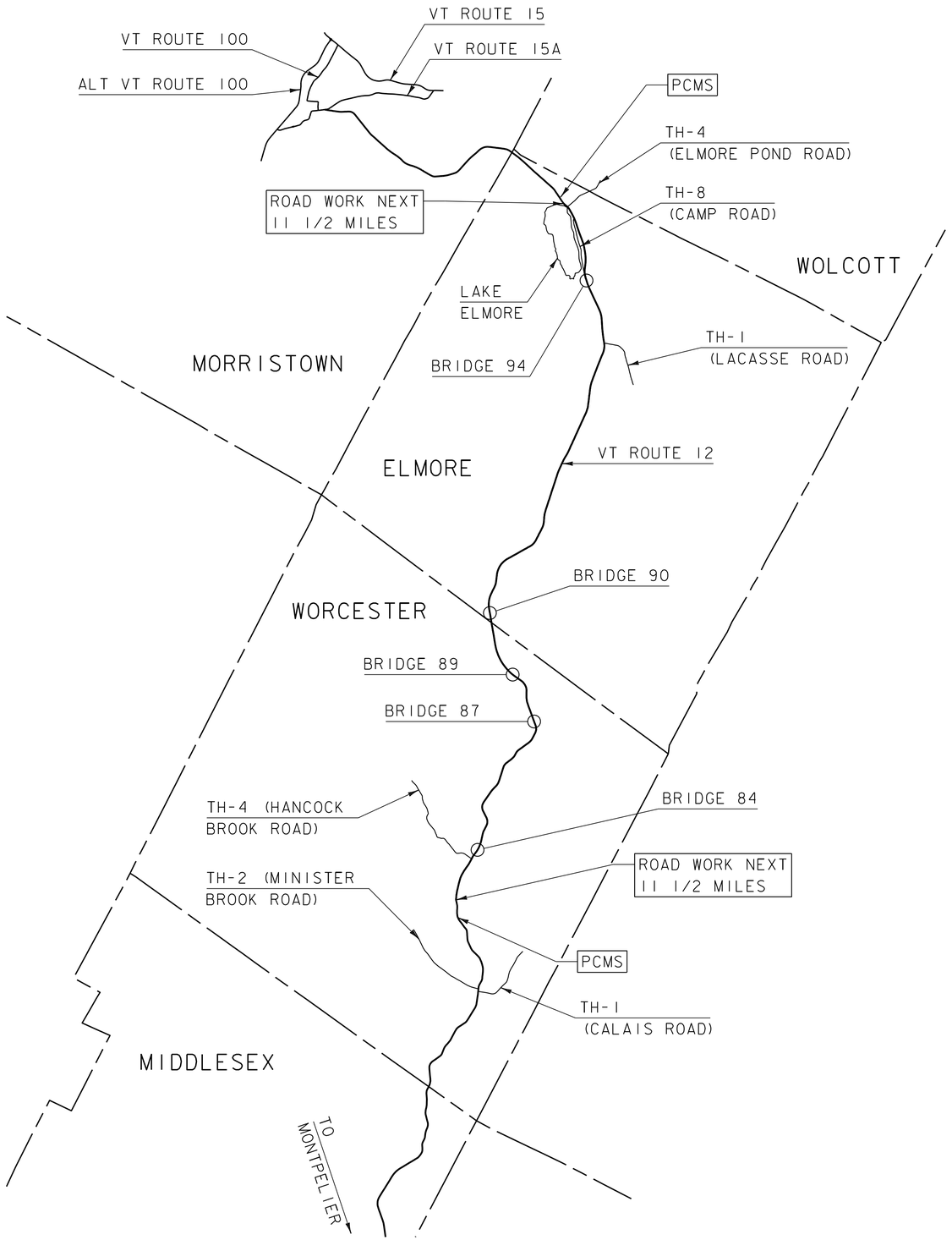
STANDARDS LIST

HOYLE TANNER

PROJECT NAME: WORCESTER - ELMORE
PROJECT NUMBER:

FILE NAME: z86e053ind_C.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY:
COMPOSITE INDEX

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 2 OF 370



REGIONAL TRAFFIC CONTROL PLAN

NOT TO SCALE

	B	R	I	D	G	E	
	C	O	N	S	T	.	
	A	H	E	A	D		

PORTABLE CHANGEABLE SIGN
PHASE 1

	V	T		1	2		
A	P	R	I	L		X	X
	O	C	T		X	X	

PORTABLE CHANGEABLE SIGN
PHASE 2

TRAFFIC CONTROL NOTES

1. TRAFFIC WILL BE MAINTAINED ON VT ROUTE 12 UTILIZING TEMPORARY BRIDGE DETOURS AT EACH BRIDGE LOCATION.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION SIGNING. THE EXACT LOCATION WILL BE COORDINATED BETWEEN THE RESIDENT ENGINEER AND THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND ITS LATEST REVISIONS.

3. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED AT THE APPROXIMATE LOCATIONS SHOWN ON THE PLANS OR WHERE DESIGNATED BY THE RESIDENT ENGINEER. SIGNS SHALL BE PLACED AT THE PROJECT LOCATION 14 DAYS PRIOR TO THE START OF CONSTRUCTION TO WARN OF IMPENDING CONSTRUCTION. PCMS BOARDS SHALL BE PLACED IN LOCATIONS WHERE MESSAGES CAN BE READ TWICE BASED ON POSTED SPEED OF TRAVEL AND IN A LOCATION THAT PROVIDES A SAFE TURN AROUND SPOT FOR ALL SIZES OF VEHICLES. PCMS SIGNS SHALL REMAIN IN PLACE THROUGH THE DURATION OF THE PROJECT.

4. INSTALLATION OF TEMPORARY TRAFFIC CONTROL SIGNS SHALL NOT BLOCK ANY EXISTING TRAFFIC CONTROL SIGN ASSEMBLIES AND SHALL MODIFY OR BE PLACED ADJACENT TO EXISTING SIGN ASSEMBLIES WHEN POSSIBLE. THE CONTRACTOR SHALL, WHENEVER POSSIBLE, MAINTAIN AT LEAST 200 FEET BETWEEN SIGN ASSEMBLIES.

5. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE TRAFFIC FLOW OF THE TEMPORARY DIVERSIONS SHALL BE REMOVED OR COVERED BY THE CONTRACTOR. ALL SIGNS REMOVED OR COVERED SHALL BE REPLACED OR UNCOVERED WHEN THE TRAFFIC CONTROL PLAN IS DISASSEMBLED. PAYMENT FOR THIS WORK WILL BE INCIDENTAL TO ITEM 641.11, TRAFFIC CONTROL, ALL-INCLUSIVE. SIGN COVERING SHALL NOT DAMAGE THE RETRO-REFLECTIVITY OF THE SIGN FACE. ALSO, THE SIGN COVER SHALL NOT DETERIORATE FOR THE DURATION THAT THE SIGN IS COVERED.

6. ALL WORK SHOWN ON THIS SHEET, INCLUDING SIGNAGE AND PCMS, SHALL BE PAID FOR UNDER ITEM 641.11 TRAFFIC CONTROL, ALL INCLUSIVE.

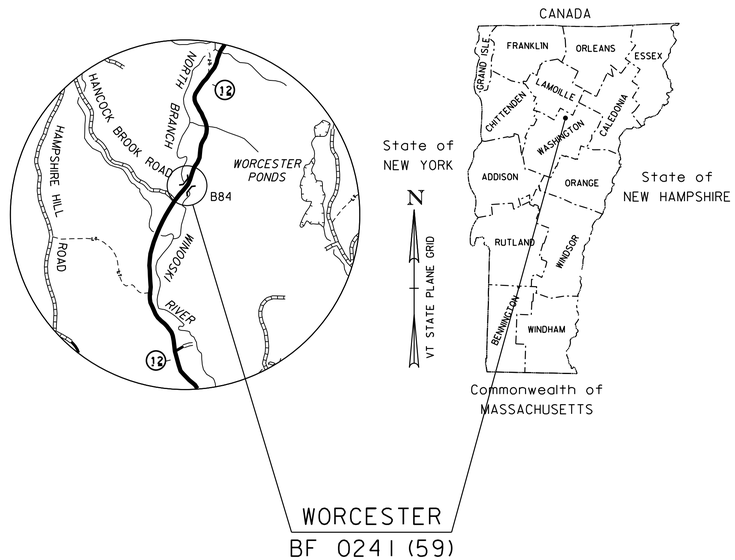
HOYLE TANNER

PROJECT NAME: WORCESTER - ELMORE
PROJECT NUMBER:

FILE NAME: z86e053tcp_c.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: S.HAAS
REGIONAL TRAFFIC CONTROL PLAN

PLOT DATE: 25-MAY-2023
DRAWN BY: K.PRESTON
CHECKED BY: S.HAAS

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

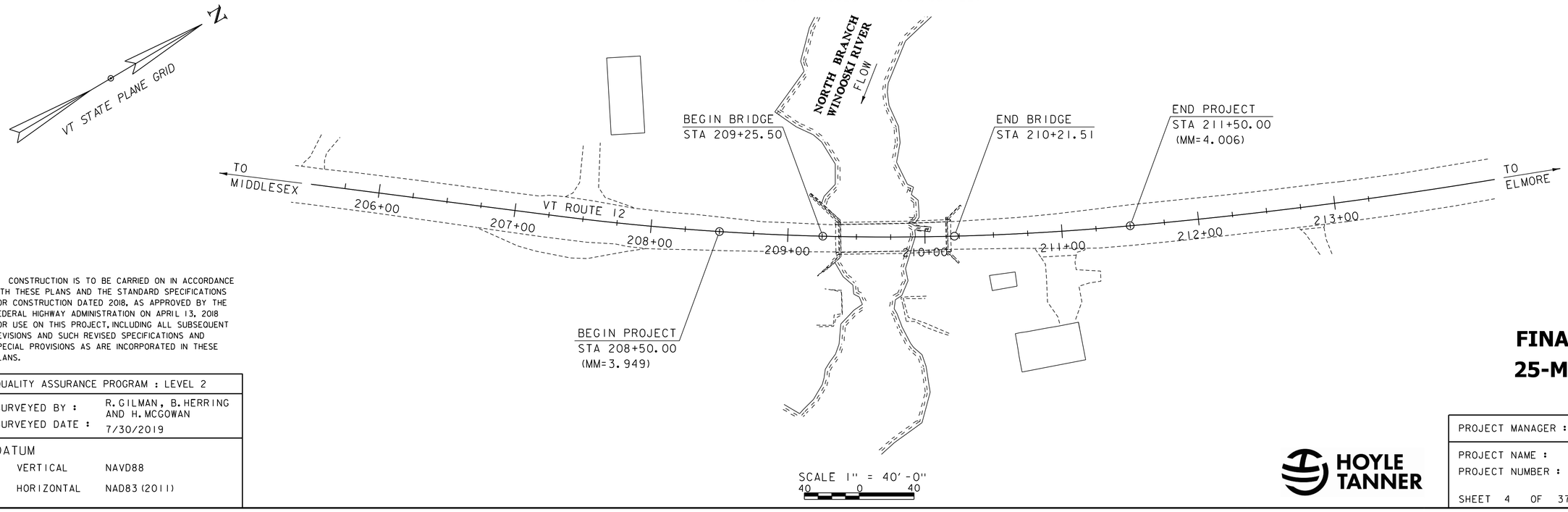
TOWN OF WORCESTER
COUNTY OF WASHINGTON

ROUTE NO: VERMONT ROUTE 12 (MAJOR COLLECTOR) BRIDGE NO: 84

PROJECT LOCATION: VT ROUTE 12, BRIDGE 84, APPROXIMATELY 11.2 MILES NORTH OF THE JUNCTION WITH US ROUTE 2, IN THE TOWN OF WORCESTER

PROJECT DESCRIPTION: EXISTING BRIDGE REPLACEMENT WITH A STEEL GIRDER BRIDGE WITH FOOTINGS FOUNDED ON BEDROCK AND ASSOCIATED ROADWAY IMPROVEMENTS.

LENGTH OF BRIDGE: 96.01 FEET
LENGTH OF ROADWAY: 203.99 FEET
LENGTH OF PROJECT: 300.00 FEET



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 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 :	R. GILMAN, B. HERRING AND H. MCGOWAN
SURVEYED DATE :	7/30/2019
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83 (2011)

FINAL PLANS
25-MAY-2023

HOYLE TANNER

PROJECT MANAGER :	LAURA STONE
PROJECT NAME :	WORCESTER
PROJECT NUMBER :	BF 0241(59)
SHEET 4 OF 370 SHEETS	

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

STANDARDS LIST

SEE SHEET 2 FOR LIST OF STANDARDS

DETAIL SHEETS

SEE SHEET 2 FOR DETAIL SHEETS

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 11/4/2022

DRAINAGE AREA : 22.3 sq. mi.
CHARACTER OF TERRAIN : Mountainous
STREAM CHARACTERISTICS : Meandering with narrow to wide floodplains
NATURE OF STREAMBED : Gravel with ledge outcrops

PEAK FLOW DATA - ANNUAL EXCEEDANCE PROBABILITY (AEP)

43% =	870 cfs	2% =	2,500 cfs
10% =	1,600 cfs	1% =	3,000 cfs
4% =	2,100 cfs	0.2% =	4,200 cfs

DATE OF FLOOD OF RECORD Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ 2% AEP = 10.3 fps
ICE CONDITIONS : Moderate
DEBRIS: Light to Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Unknown
IS ORDINARY RISE RAPID? Unknown
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE:

WATERSHED STORAGE: 1.6%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single Span Rolled Beam
YEAR BUILT: 1936
CLEAR SPAN(NORMAL TO STREAM): 84.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 27.7 ft.
WATERWAY OF FULL OPENING: 1,508.0 ft.
DISPOSITION OF STRUCTURE: Full Replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See Borings

WATER SURFACE ELEVATIONS AT:

43% AEP =	801.1 ft.	VELOCITY =	6.2 fps
10% AEP =	802.2 ft.	"	8.4 fps
4% AEP =	803.1 ft.	"	10 fps
2% AEP =	803.7 ft.	"	10.4 fps
1% AEP =	804.2 ft.	"	11.2 fps

LONG TERM STREAMBED CHANGES: Unknown

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

UPSTREAM STRUCTURE

TOWN: Worcester — DISTANCE: 1.25 mi.
HIGHWAY # : VT-12 — STRUCTURE #: 89
CLEAR SPAN: 15.0 ft. — CLEAR HEIGHT: Unknown
YEAR BUILT: 1964 — FULL WATERWAY: Unknown
STRUCTURE TYPE: CGMPP

DOWNSTRUCTURE STRUCTURE

TOWN: Worcester — DISTANCE: 2.90 mi.
HIGHWAY # : TR 01 — STRUCTURE #: 9
CLEAR SPAN: 98.0 ft. — CLEAR HEIGHT: Unknown
YEAR BUILT: 1949 — FULL WATERWAY: Unknown
STRUCTURE TYPE: Single Span Rolled Beam

PROPOSED STRUCTURE

STRUCTURE TYPE: Single Span

CLEAR SPAN(NORMAL TO STREAM): 93.5 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 27.6 ft.
WATERWAY OF FULL OPENING: 1,589.0 sq. ft.

WATER SURFACE ELEVATIONS AT:

43% AEP =	801.1 ft.	VELOCITY=	6.2 fps
10% AEP =	802.2 ft.	"	8.5 fps
4% AEP =	803.1 ft.	"	9.7 fps
2% AEP =	803.4 ft.	"	10.3 fps
1% AEP =	804.2 ft.	"	11.1 fps

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

BRIDGE LOW CHORD ELEVATION: 816.55 ft.
FREEBOARD: @ 2% AEP = 13.14 ft.

SCOUR: N/A

REQUIRED CHANNEL PROTECTION: Stone Fill Type IV *

PERMIT INFORMATION

AVERAGE DAILY FLOW:	-	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	-	-
ORDINARY HIGH WATER:	-	-

TEMPORARY BRIDGE MINIMUM HYDRAULIC REQUIREMENTS

STRUCTURE TYPE: Single Span Bridge
CLEAR SPAN (NORMAL TO STREAM): 84.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: See Note**
WATERWAY AREA OF FULL OPENING: -

ADDITIONAL INFORMATION

* E-Stone Type IV to be used for all in channel work
** A minimum low chord elevation of 805.9-ft is required

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TWO-WAY ALTERNATING TRAFFIC ON A TEMPORARY BRIDGE.
2. INSTALL AND MAINTAIN TRAFFIC SIGNALS.
3. SIDEWALKS ARE NOT NECESSARY
4. THE APPROACHES FOR THE TEMPORARY BRIDGE SHALL BE PAVED.

DESIGN VALUES

1.	DESIGN LIVE LOAD		HL-93
2.	FUTURE PAVEMENT	d_p:	3.0 INCH
3.	DESIGN SPAN	L:	93.00 FT
4.	MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5.	PRESTRESSING STRAND	f_y:	---
6.	PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7.	PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8.	HIGH PERFORMANCE CONCRETE, CLASS PCD	f'_c:	4.0 KSI
9.	HIGH PERFORMANCE CONCRETE, CLASS PCS	f'_c:	3.5 KSI
10.	CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	---
11.	CONCRETE, CLASS C	f'_c:	3.0 KSI
12.	REINFORCING STEEL	f_y:	60 KSI
13.	STRUCTURAL STEEL AASHTO M270	f_y:	50 KSI
14.	NOMINAL BEARING RESISTANCE OF SOIL	q_n:	---
15.	SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
16.	NOMINAL BEARING RESISTANCE OF ROCK	q_n:	50.7 KSF
17.	ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
18.	PILE RESISTANCE FACTOR	ϕ:	---
19.	LATERAL PILE DEFLECTION	Δ:	---
20.	BASIC WIND SPEED	V_{3s}:	---
21.	MINIMUM GROUND SNOW LOAD	p_g:	---
22.	SEISMIC DATA	PGA: --- S_s:	---
		S_1:	---
23.			
24.			---
25.			---

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	**20**	**36**	**36**	**66**	**30**	**34.5**	**38**
INVENTORY	3.60	1.64					
POSTING							
OPERATING	4.66	2.13	3.40	2.16	3.24	2.88	2.98
COMMENTS:							

BITUMINOUS CONCRETE PAVEMENT SUPERPAVE MIXTURE DESIGN CRITERIA	
DESIGN LANE / DESIGN LIFE ESAL	275,110
DESIGN NUMBER OF GYRATIONS	50
PERFORMANCE GRADE ASPHALT BINDER	SEE TABLE 406.03F

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2023	1500	230	61	6	95
2043	1700	260	61	8.8	150

20 year ESAL for flexible pavement from 2023 to 2043 : 451000
40 year ESAL for flexible pavement from 2023 to 2063 : 1063000
Design Speed : 50 mph

AS BUILT "REBAR" DETAIL

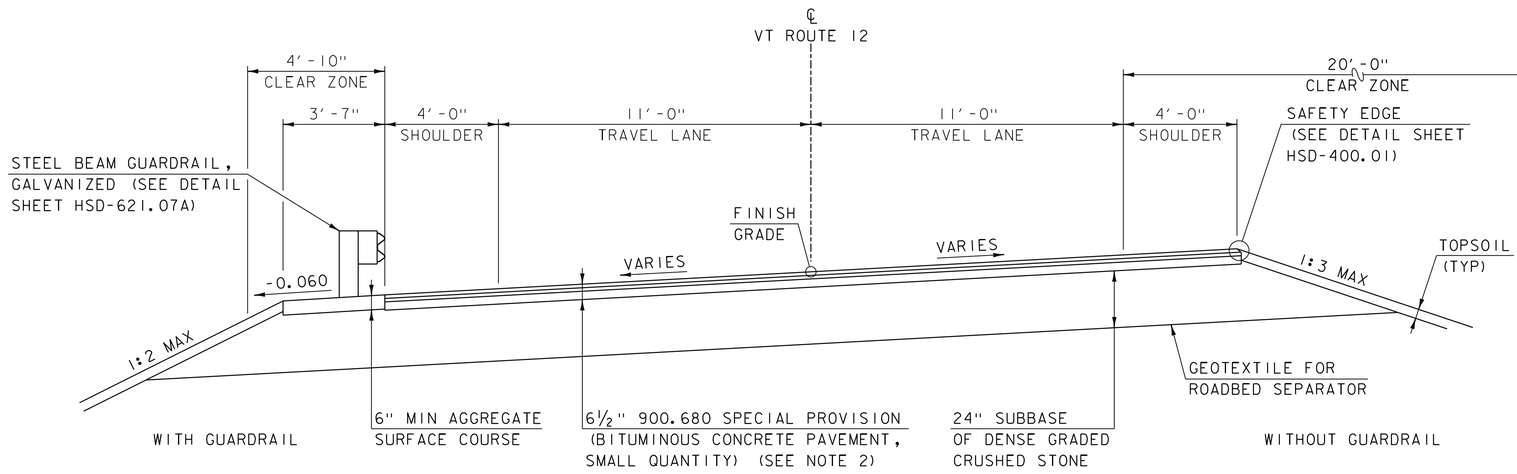
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

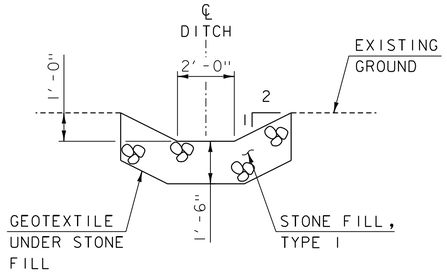
FILE NAME: z86e053pi.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
PRELIMINARY INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 5 OF 370



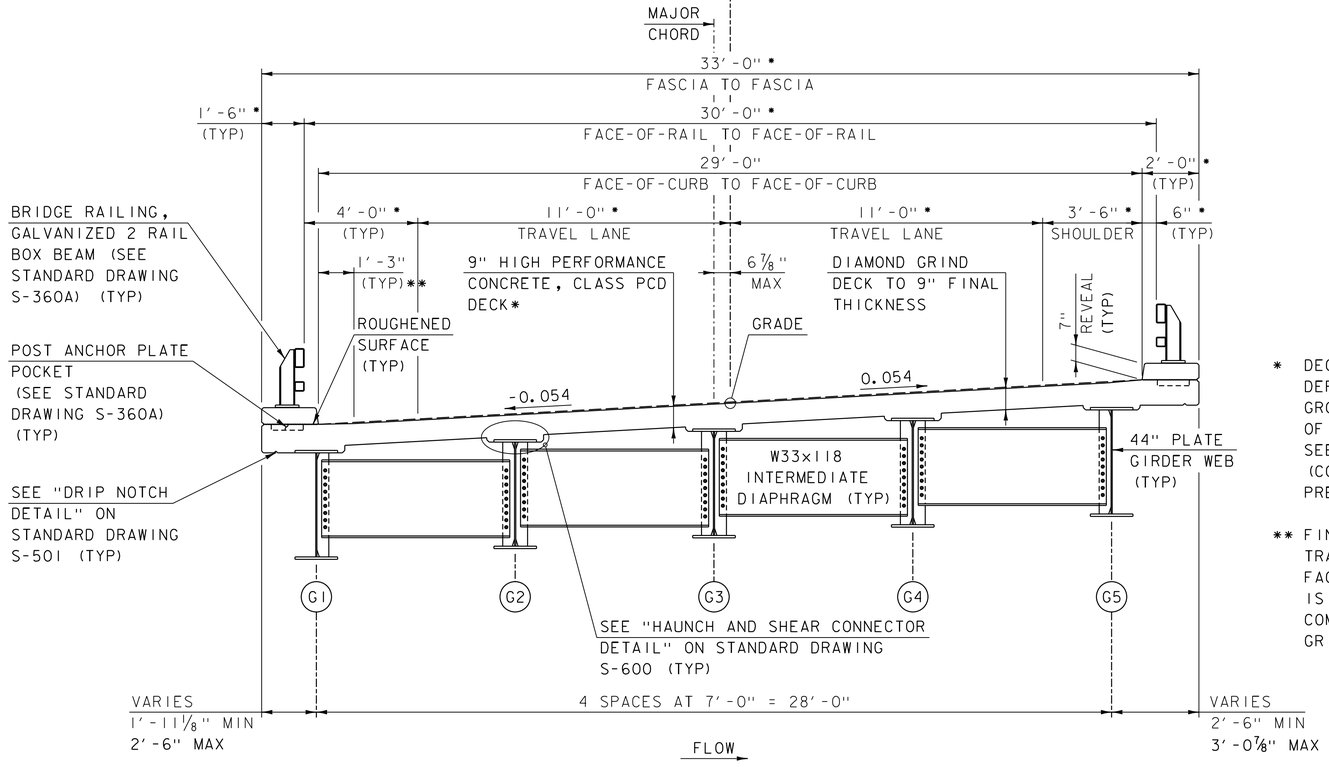
PROPOSED VT ROUTE 12 TYPICAL SECTION

STA 208+50 TO STA 211+50
SCALE: ⅜" = 1'-0"



STONE-LINED DITCH DETAIL

SCALE: ⅜" = 1'-0"



* RADIAL DIMENSION

TYPICAL BRIDGE SECTION

SCALE: ⅜" = 1'-0"

* DECK SHALL BE OVERPOURED TO A DEPTH OF 9½" AND DIAMOND GROUND TO THE FINAL THICKNESS OF 9" AS SHOWN IN THE PLANS. SEE SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION).

** FINISH DECK TO FINAL GRADE OR TRANSITION OVERPOUR TO 0" AT FACE OF CURB. IF ANY OVERPOUR IS TRANSITIONED, IT SHALL BE COMPLETELY REMOVED BY GRINDING.

MATERIAL TOLERANCES
(IF USED ON PROJECT)

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

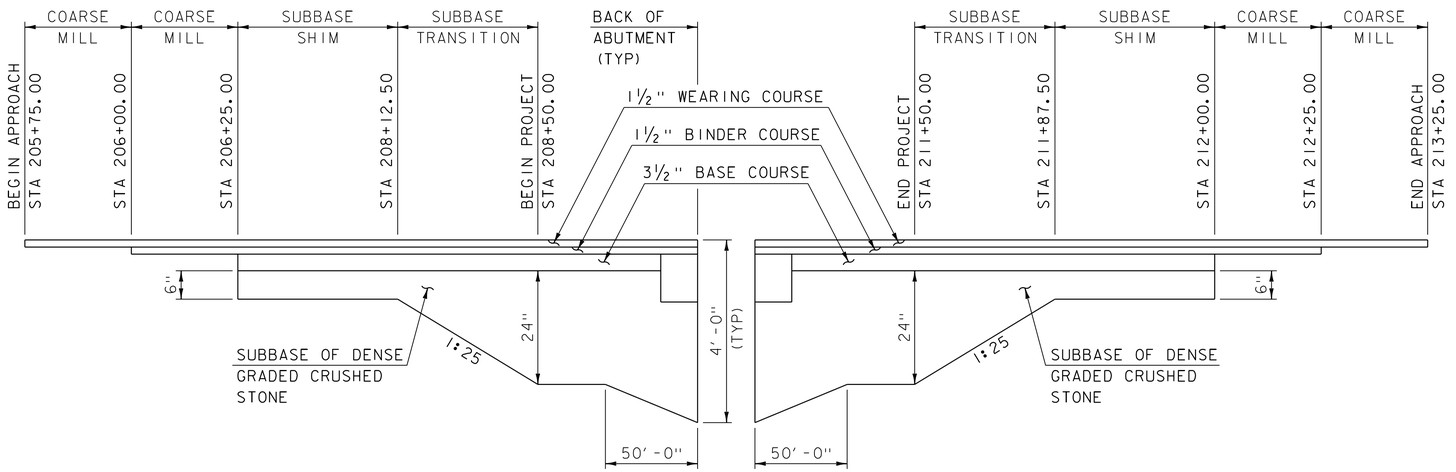
NOTES

1. ROADWAY TYPICAL SECTION IS A GENERAL REPRESENTATION OF TYPICAL ROADWAY MATERIALS AND SLOPES. REFER TO THE LAYOUT SHEETS FOR LOCATION OF GUARDRAIL AND SLOPE TIE IN LOCATIONS.

2. 6½" BITUMINOUS CONCRETE PAVEMENT SHALL CONSIST OF THE FOLLOWING:
   - 1½" TYPE IVS WEARING COURSE OVER
   - 1½" TYPE IVS BINDER COURSE
   - 3½" TYPE IIS BASE COURSE

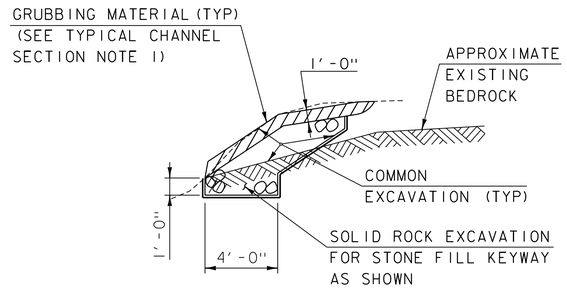
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
TYPICAL SECTIONS I	SHEET 6 OF 370



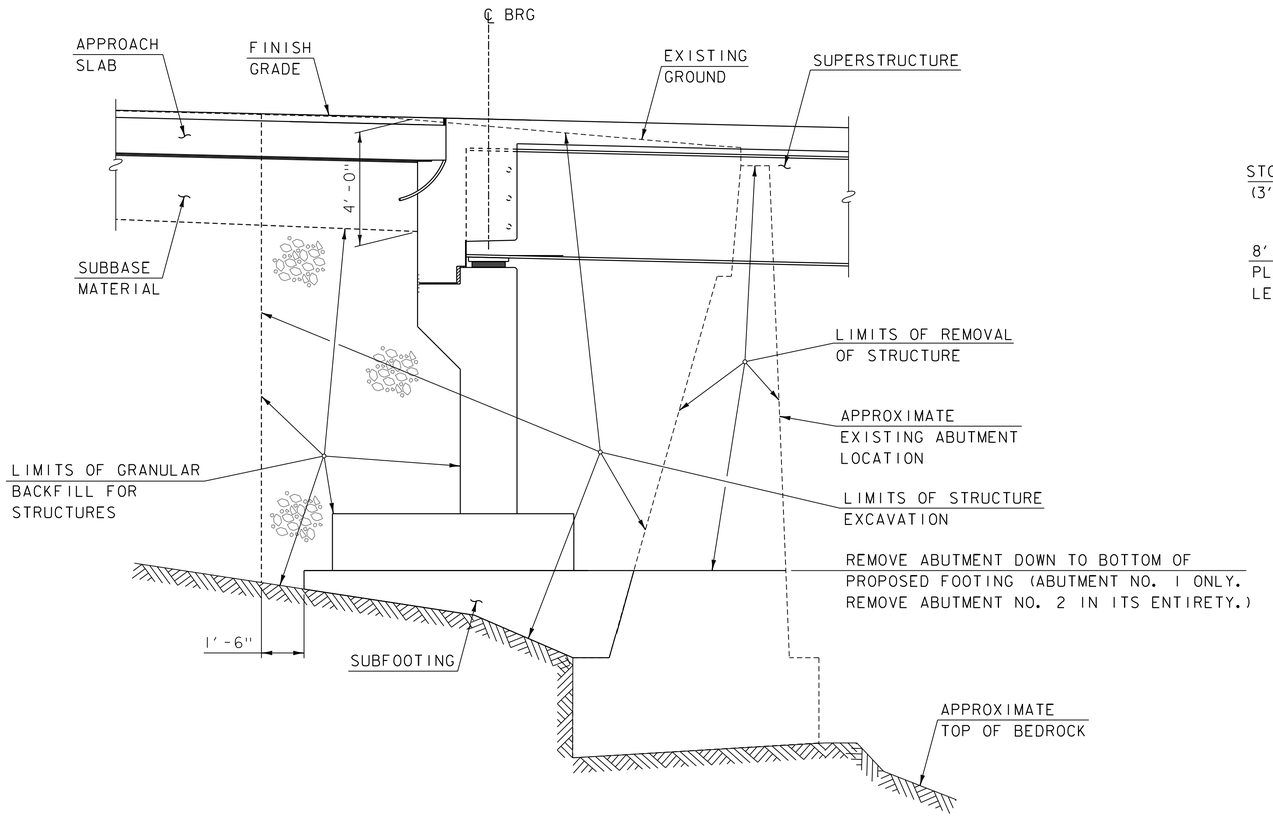
VT ROUTE 12 MATERIAL TRANSITION DETAIL

NOT TO SCALE



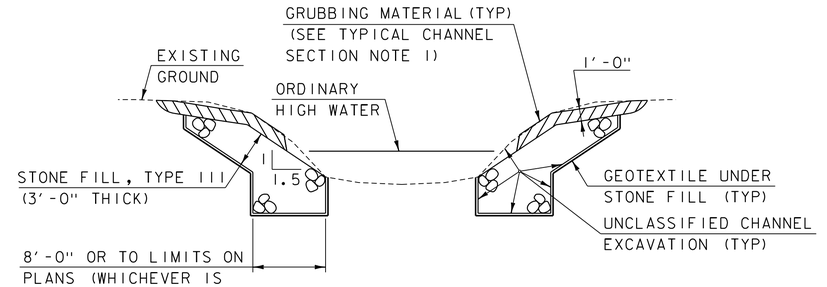
TYPICAL STONE FILL ON BEDROCK SECTION

NOT TO SCALE



TYPICAL ABUTMENT EARTHWORK SECTION

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 SIMILAR)
NOT TO SCALE



TYPICAL CHANNEL SECTION

NOT TO SCALE

TYPICAL CHANNEL SECTION NOTES

1. GRUBBING MATERIAL SHALL BE PLACED UNDERNEATH STRUCTURES WHERE THERE IS MORE THAN 6 FEET VERTICALLY FROM ORDINARY HIGH WATER (OHW) TO THE BOTTOM OF SUPERSTRUCTURE AND MORE THAN 6 FEET HORIZONTALLY FROM OHW LINE TO FRONT FACE OF ABUTMENT. THIS MATERIAL SHALL START JUST ABOVE THE OHW ELEVATION AND TERMINATE 3 FEET HORIZONTALLY FROM THE FRONT FACE OF THE ABUTMENT. THIS MATERIAL SHALL NOT BE PLACED UNDERNEATH DOWNSPOUTS. SEE THE CHANNEL SECTIONS FOR ADDITIONAL DETAILING.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
TYPICAL SECTIONS 2	SHEET 7 OF 370

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2018 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.

2. FINISH GRADE SHOWN ON PLANS ARE BASED ON THE FINAL DECK THICKNESS OF 9 INCHES AFTER COMPLETING THE BRIDGE DECK SURFACE PREPARATION.

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

EARTHWORK

4. THE REMOVAL OF THE EXISTING STRUCTURE WILL BE PAID UNDER ITEM 529.15 REMOVAL OF STRUCTURE (1970 SF – EST) (BRIDGE 84). THIS WORK SHALL INCLUDE REMOVAL OF THE ENTIRE SUPERSTRUCTURE AND ANY PORTIONS OF THE EXISTING ABUTMENTS THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION. UNLESS OTHERWISE NOTED ON THE PLANS.

5. WEATHERED ROCK AS IDENTIFIED ON BORING LOGS IS ANTICIPATED TO BE REMOVED BY STANDARD EARTH-EXCAVATING EQUIPMENT. WEATHERED BEDROCK MATERIAL IDENTIFIED WITHIN EXCAVATION LIMITS HAS BEEN QUANTIFIED UNDER RESPECTIVE PAY ITEMS OF ITEM 203.27 UNCLASSIFIED CHANNEL EXCAVATION AND ITEM 204.25 STRUCTURE EXCAVATION.

6. THE CONTRACTOR SHALL TAKE INTO ACCOUNT THAT VTRANS COMPLETED A CEMENT STABILIZED RECLAIM PROJECT IN 2010 WITHIN THE LIMITS OF THIS PROJECT. THIS MAY IMPACT THE ASSOCIATED EXCAVATION WORK.

BEDROCK

7. UPON COMPLETION OF EXCAVATION FOR SUBSTRUCTURES FOUNDED ON BEDROCK AND PRIOR TO PLACING FORMWORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER THAT THEY INTEND TO BEGIN FORMING FOR FOUNDATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER AND THE VTRANS STATE GEOLOGIST. THE GEOLOGIST WILL DETERMINE IF THE BEDROCK IS COMPETENT TO OBTAIN THE REQUIRED NOMINAL BEARING RESISTANCE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 72 HOURS PRIOR TO WHEN THE ANALYSIS WILL BE NEEDED. THE CONTRACTOR IS INFORMED THAT EXCAVATION LIMITS WILL NOT BE CONSIDERED FINAL UNTIL THE ENGINEER AND STATE GEOLOGIST DETERMINE THAT BEDROCK IS COMPETENT.

8. AFTER BEDROCK HAS BEEN EXPOSED AND DETERMINED COMPETENT BY GEOLOGIST, IF ELEVATIONS VARY FROM THE ELEVATIONS SHOWN IN THE PLANS, ADJUSTMENTS TO THE FOOTING ELEVATIONS MAY BE DESIRABLE TO MINIMIZE BEDROCK REMOVAL AND/OR REDUCE SUBFOOTING CONCRETE QUANTITIES. IF THE ACTUAL SITE CONDITIONS ENCOUNTERED REQUIRE LOWERING THE TOP OF FOOTING ELEVATION BY 2-FEET OR MORE, CONTACT THE PROJECT MANAGER IMMEDIATELY TO INQUIRE ABOUT REDESIGN OF THE FOUNDATION. THE CONTRACTOR SHOULD EXPECT THAT A DESIGN CHANGE MAY TAKE UP TO FIVE BUSINESS DAYS TO PROCESS AND PLAN CONSTRUCTION ACTIVITIES ACCORDINGLY.

9. ALL OVERBREAKAGE BEYOND ALLOWANCE SPECIFIED IN 204.06(B)(1) SHALL BE REPLACED WITH COMPETENT CONCRETE AT THE CONTRACTOR'S EXPENSE.

10. ANY EXPOSED SUBFOOTING FACES EXCEEDING 5 FEET IN HEIGHT SHALL BE REINFORCED WITH #5 REINFORCING STEEL BARS SPACED AT 12 INCHES EACH WAY. AN ESTIMATED QUANTITY FOR THESE BARS HAS BEEN INCLUDED IN ITEM 507.11 REINFORCING STEEL, LEVEL I (UNCOATED).

TRAFFIC CONTROL

11. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE-SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING ALTERNATING ONE-WAY TRAFFIC, AND ROAD CLOSURE, RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE, AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. PAYMENT FOR ALL ACTIVITIES AND MATERIALS ASSOCIATED WITH THIS WORK WILL BE INCLUDED IN ITEM 641.11 – TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 84).

TEMPORARY BRIDGE AND APPROACH

12. THE ONE-WAY TEMPORARY BRIDGE, AS SHOWN ON THE TRAFFIC CONTROL PLANS HAS BEEN LAID OUT BASED ON A 16' RAIL TO RAIL WIDTH FOR THE PURPOSES OF ESTABLISHING ALIGNMENT AND TEMPORARY IMPACTS. THE MINIMUM CLEAR WIDTH SHALL BE AS DEFINED BY SPECIFICATION SECTION 528.

13. THE TEMPORARY BRIDGE APPROACH HAS BEEN ESTABLISHED BASED ON 1:2 EMBANKMENT SLOPES AS SHOWN ON THE TRAFFIC CONTROL PLANS FOR THE PURPOSES OF ESTABLISHING TEMPORARY IMPACT LIMITS. SLOPES AND APPROACH RAILING ARE CONTRACTOR DETERMINED AND ARE NOT SHOWN ON THE TRAFFIC CONTROL PLANS PROVIDED HEREIN. CONTRACTOR SPECIFIED DETAIL SHALL BE INCLUDED ON THE WORKING DRAWINGS SUBMITTAL PER SPECIFICATION SECTION 528.

14. COORDINATE WORKING DRAWINGS AND TRAFFIC CONTROL DEVICES ON BRIDGE APPROACHES WITH THE SITE -SPECIFIC TRAFFIC CONTROL PLAN (REFERENCE NOTE 6 ABOVE).

TEMPORARY TRAFFIC SIGNAL

15. TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM AND IN COMPLIANCE WITH THE LATEST EDITION OF THE MUTCD.

16. SIGNAL FACES SHALL BE LED AND CONSIST OF 12 INCH LENSES (RED, YELLOW AND GREEN).

17. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY LIGHT THE STOP BAR AREAS. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

18. 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 UTILITY POLES, WIRES, ETC. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIGNAL PHASING AND TIMING. THE CONTRACTOR SHALL SUBMIT A PHASING DIAGRAM AND TIMING SCHEDULE TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL MAKE THE SIGNALS OPERATIONAL ONLY AFTER RECEIVING APPROVAL OF BOTH THE PHASING DIAGRAM AND TIMING SCHEDULE BY THE ENGINEER. DEVELOPMENT OF THE PHASING DIAGRAM AND TIMING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 "TEMPORARY TRAFFIC SIGNAL SYSTEM". ADDITIONAL ADJUSTMENTS TO SIGNAL TIMING OR PHASING REQUESTED BY THE ENGINEER SHALL BE COMPLETED WITHIN 48 HOURS OF REQUEST. PAYMENT FOR ADDITIONAL ADJUSTMENTS TO THE SIGNAL TIMING OR PHASING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

20. THE SUBMITTAL FOR ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE IN CONJUNCTION WITH THE SUBMITTAL FOR ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 84) AND SHALL INCLUDE AS A MINIMUM, THE SIGNAL LOCATION, TIMING AND PHASING PLAN, VEHICLE DETECTION SYSTEM AND EMERGENCY VEHICLE PREEMPTION SYSTEM.

STRUCTURAL STEEL

21. THE EXISTING STRUCTURAL STEEL IS PAINTED WITH A MATERIAL THAT MAY CONTAIN LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. THE REMOVED STRUCTURAL STEEL IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE, ITS OFFICERS, AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR'S USE OR DISPOSITION OF THE REMOVED EXISTING STRUCTURAL STEEL.

22. ALL STRUCTURAL STEEL WILL BE METALIZED OR GALVANIZED PER SECTION 506 OF THE STANDARD SPECIFICATIONS.

23. ALL WELDING TO THE STRUCTURAL STEEL SHALL BE COMPLETED PRIOR TO METALIZING OR GALVANIZING.

24. UNLESS OTHERWISE NOTED, ALL NEW STRUCTURAL STEEL SHALL BE METALIZED OR GALVANIZED AND SHALL CONFORM TO AASHTO M270/M270M GRADE 50 AND SHALL BE PAID FOR UNDER ITEM 506.55 STRUCTURAL STEEL, PLATE GIRDER.

25. STRUCTURAL STEEL MEMBERS DESIGNATED CVN IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01 OF THE STANDARD SPECIFICATIONS.

26. GIRDER WEBS, BEARING STIFFENERS AND CONNECTION PLATES SHALL BE PLUMB IN THE FINAL POSITION.

27. FLEMING BRACKETS OR SIMILAR FALSEWORK SHALL BE SPACED AS REQUIRED BY DESIGN BUT SHALL BE LIMITED TO A MAXIMUM SPACING OF 4 FEET. THE DESIGN OF FALSEWORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

28. FLEMING BRACKETS SHOULD EXTEND AS NEAR AS POSSIBLE TO THE BOTTOM FLANGE, BUT IN NO CASE SHALL THE FLEMING BRACKETS BE LESS THAN ¾ OF THE WEB DEPTH IN DEPTH.

CONCRETE

29. THE DECK IS TO BE POURED IN ONE CONTINUOUS POUR WITH A MAXIMUM DURATION OF EIGHT HOURS. IF CIRCUMSTANCES BEYOND THE CONTRACTOR'S CONTROL PREVENT THIS FROM BEING ACCOMPLISHED, A TRANSVERSE CONSTRUCTION JOINT SHALL BE USED BETWEEN ADJACENT POURS. A MINIMUM 96 HOUR DELAY BETWEEN ADJACENT POURS SHALL BE OBSERVED.

30. ALL DECK POURS SHALL BEGIN FROM THE LOW ELEVATION END AND PROCEED TOWARDS THE HIGH ELEVATION END.

31. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1" UNLESS OTHERWISE NOTED.

32. WATER REPELLENT, SILANE, SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES.

33. THE CONCRETE IN THE BRIDGE DECK, CURBS AND ABUTMENTS ABOVE THE BRIDGE SEAT ELEVATION SHALL BE ITEM 501.37, "HIGH PERFORMANCE CONCRETE, CLASS PCD". APPROACH SLABS, ABUTMENTS BELOW THE BRIDGE SEAT AND WINGWALLS SHALL BE ITEM 501.38, "HIGH PERFORMANCE CONCRETE PCS". SUB-FOOTING CONCRETE SHALL BE ITEM 541.30, "CONCRETE, CLASS C".

REINFORCING STEEL

34. ALL REINFORCING STEEL IN THE APPROACH SLAB SHALL BE CORROSION PROTECTION LEVEL I, ITEM 507.11 REINFORCING STEEL, LEVEL I (EPOXY COATED).

35. REINFORCING IN THE ABUTMENTS AND WINGWALL SHALL BE CORROSION PROTECTION LEVEL I, OR LEVEL II AS INDICATED ON THE REINFORCING STEEL SCHEDULE.

36. ALL REINFORCING IN THE DECK AND CURBS SHALL BE CORROSION PROTECTION LEVEL II, ITEM 507.12 REINFORCING STEEL, LEVEL II (CONTINUOUSLY GALVANIZED).

37. CUTTING AND REPAIRING DAMAGED AREAS OF COATED REINFORCING STEEL SHALL BE PERFORMED IN ACCORDANCE WITH SUBSECTION 507.04.

38. REINFORCING STEEL CLEAR COVER REQUIREMENTS ARE STATED ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE NOTED IN THE PLANS:

WALLS BURIED FACE	2.0 INCHES
DIRECT EXPOSURE TO DEICING SALTS (DECK, CURB, ETC.)	3.0 INCHES
CAST AGAINST EARTH	3.0 INCHES

39. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL, AVAILABLE ON THE AGENCY WEBSITE. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE 507 ITEM.

UTILITIES

40. THE CONTRACTOR IS ADVISED THAT THERE ARE HIGH-VOLTAGE UTILITY LINES IN THE VICINITY OF THE PROJECT. SEE UTILITY SHEET FOR MORE DETAILS.

MISCELLANEOUS

41. THE CONTRACTOR SHALL PROVIDE A SITE-SPECIFIC EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH SECTION 653 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. ESTIMATED QUANTITIES FOR EPSC WORK HAVE BEEN INCLUDED IN THE CONTRACT FOR BIDDING PURPOSES. IF THE CONTRACTOR'S EPSC PLAN REQUIRES ITEMS OF WORK THAT ARE NOT INCLUDED IN THE PLANS, THE EXTRA WORK WILL BE PAID FOR AS PART OF ITEM 653.03 MAINTENANCE OF EPSC PLAN (BRIDGE 84).

42. THE REMOVAL OF THE TIMBER SHED LOCATED AT STATION 210+50 RT SHALL BE COMPLETED BETWEEN THE FOLLOWING DATES: OCTOBER 1, 2024 TO NOVEMBER 1, 2024, IN ADVANCE OF UTILITY RELOCATION BY OTHERS. REMOVAL INCLUDES TRANSPORT AND DISPOSAL OF THE SHED. ALL WORK IS INCIDENTAL TO PAY ITEM 635.11 MOBILIZATION/DEMOBILIZATION (BRIDGE 84).

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053nts.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
PROJECT NOTES

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING
1					
1700					
			130		
			110		
230					
70					
1					
			750		
			380		
600					
1590					
90					
20					
100					
1					
			150		
			250		
			111500		
			8730		
			6150		
			41100		
			1		
			40		
			58		
			58		
			200		
			1		
			1		
			10		
			140		
100					
15					
2					
1					
1					
10					
135					
			120		
180					
1					

TOTALS

GRAND TOTAL	FINAL
1	
1700	
130	
110	
230	
70	
1	
750	
380	
600	
1590	
90	
20	
100	
1	
150	
250	
111500	
8730	
6150	
41100	
1	
40	
58	
58	
200	
1	
1	
10	
140	
100	
15	
2	
1	
1	
10	
135	
120	
180	
1	

DESCRIPTIONS

UNIT	ITEMS	ITEM NUMBER	ROUND
LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (BRIDGE 84)	201.10	
CY	COMMON EXCAVATION	203.15	
CY	SOLID ROCK EXCAVATION	203.16	
CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	
CY	EARTH BORROW	203.30	
CY	TRENCH EXCAVATION OF EARTH	204.20	
CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	
CY	STRUCTURE EXCAVATION	204.25	
CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	
SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.10	
CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	
CY	AGGREGATE SURFACE COURSE	401.10	
CWT	EMULSIFIED ASPHALT	404.65	
SY	HAND-PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES	406.38	
LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	
CY	HIGH PERFORMANCE CONCRETE, CLASS PCD	501.37	
CY	HIGH PERFORMANCE CONCRETE, CLASS PCS	501.38	
LB	STRUCTURAL STEEL, PLATE GIRDER (FPQ)	506.55	
LB	REINFORCING STEEL, LEVEL I (UNCOATED)	507.11	
LB	REINFORCING STEEL, LEVEL I (EPOXY COATED)	507.11	
LB	REINFORCING STEEL, LEVEL II (CONTINUOUSLY GALVANIZED)	507.12	
LS	SHEAR CONNECTORS (940 - 7/8" X 7")(BRIDGE 84)	508.15	
GAL	WATER REPELLENT, SILANE	514.10	
LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10	
LF	JOINT SEALER, HOT POURED	524.11	
LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33	
LS	ONE-WAY TEMPORARY BRIDGE (2080 SF - EST.)(BRIDGE 84)	528.10	
EACH	REMOVAL OF STRUCTURE (1970 SF - EST.) (BRIDGE 84)	529.15	
EACH	BEARING DEVICE ASSEMBLY, STEEL REINFORCED ELASTOMERIC PAD	531.17	
CY	CONCRETE, CLASS C	541.30	
LF	15" CPEP	601.0910	
LF	18" CPEP	601.0915	
EACH	15" CPEPES	601.7010	
EACH	18" CPEPES	601.7015	
EACH	PRECAST REINFORCED CONCRETE CATCH BASIN WITH CAST IRON GRATE	604.20	
HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	
CY	STONE FILL, TYPE I	613.10	
CY	STONE FILL, TYPE III	613.12	
LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28	
EACH	REMOVE AND RESET MAILBOX, SINGLE SUPPORT	617.10	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORK SUMMARY
		FILL AVAILABLE
1700	CY	COMMON EXCAVATION (1700 x 1.0)
33	CY	UNCLASSIFIED CHANNEL EXCAVATION (110 x 0.3)
225	CY	STRUCTURE EXCAVATION (750 x 0.3)
0	CY	COFFERDAM EXCAVATION ((0+0) x 0.3)
2	CY	ROUNDING
1960	CY	TOTAL FILL AVAILABLE
		FILL REQUIRED
265	CY	FACTORED FILL REQUIRED (230 x 1.15)
0	CY	ROUNDING
265	CY	TOTAL FILL REQUIRED
		BORROW OR WASTE
1695	CY	WASTE
		BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY
314	TON	BASE COURSE, TYPE IIS
148	TON	INTERMEDIATE COURSE, TYPE IVS
183	TON	WEARING COURSE, TYPE IVS
645	TON	SUBTOTAL
15	TON	ROUNDING
660	TON	TOTAL

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
QUANTITY SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 9 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
				3						3		EACH	YIELDING MARKER POSTS	619.17				
				525						525		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20				
				2						2		EACH	MANUFACTURED TERMINAL SECTION, TANGENT	621.51				
				1						1		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
				4						4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	621.72				
				650						650		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
				115						115		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
				560						560		HR	FLAGGERS	630.15				
								1		1		LS	FIELD OFFICE, ENGINEERS	631.10				
								1		1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
								1		1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
								1200		1200		DL	FIELD OFFICE COMMUNICATIONS (N.A.B.I.)	631.26				
					208					208		HR	EMPLOYEE TRAINEESHIP	634.10				
				1						1		LS	MOBILIZATION/DEMOBILIZATION (BRIDGE 84)	635.11				
				1						1		LS	TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 84)	641.11				
				1550						1550		LF	4 INCH WHITE LINE, WATERBORNE PAINT	646.201				
				1550						1550		LF	4 INCH YELLOW LINE, WATERBORNE PAINT	646.2111				
				105						105		SF	REMOVAL OF EXISTING PAVEMENT MARKINGS	646.85				
				1120						1120		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
							125			125		SY	GEOTEXTILE UNDER STONE FILL	649.31				
						80				80		LB	SEED	651.15				
									6	6		LB	WILDFLOWER SEED (WILDFLOWER SEED)	651.16				
						510				510		LB	FERTILIZER	651.18				
						2.5				2.5		TON	AGRICULTURAL LIMESTONE	651.20				
						550				550		CY	TOPSOIL	651.35				
						110				110		SY	GRUBBING MATERIAL (12 INCH)	651.40				
						1				1		LS	EPSC PLAN (BRIDGE 84)	653.01				
						110				110		HR	MONITORING EPSC PLAN	653.02				
						1				1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.) (BRIDGE 84)	653.03				
						2				2		TON	HAY MULCH	653.10				
						2900				2900		SY	ROLLED EROSION CONTROL PRODUCT, TYPE I	653.20				
						20				20		CY	CHECK DAM, TYPE I	653.25				
						35				35		CY	STABILIZED CONSTRUCTION ENTRANCE	653.35				
						1				1		EACH	FILTER BAG	653.45				
						150				150		LF	SILT FENCE, TYPE I	653.475				
						570				570		LF	SILT FENCE, TYPE II	653.476				
						825				825		LF	BARRIER FENCE	653.50				
						575				575		LF	PROJECT DEMARCATION FENCE	653.55				
						120				120		LF	EROSION LOG	653.60				
									14	14		EACH	EVERGREEN TREES (PICEA GLAUCA)(2'-3' HT.)(CONT.)	656.20				

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
QUANTITY SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 10 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
									7	7		EACH	EVERGREEN TREES (PINUS STROBUS)(2'-3' HT.)(CONT.)	656.20				
									4	4		EACH	DECIDUOUS TREES (ACER RUBRUM)(2" - 2.5" CAL.)(B&B)	656.30				
									2	2		EACH	DECIDUOUS TREES (FAGUS GRANDIFOLIA)(2"-2.5" CAL.)(B&B)	656.30				
									1	1		EACH	DECIDUOUS TREES (ACER RUBRUM)(1 GALLON)(CONT.)	656.30				
									2	2		EACH	DECIDUOUS TREES (FAGUS GRANDIFOLIA)(1 GALLON)(CONT.)	656.30				
									13	13		EACH	DECIDUOUS SHRUBS (CORNUS RACEMOSA)(1 GALLON)(CONT.)	656.35				
									8	8		EACH	DECIDUOUS SHRUBS (ILEX VERTICILLATA ' RED SPRITE')(2 GALLON)(CONT.)	656.35				
									1	1		EACH	DECIDUOUS SHRUBS (ILEX VERTICILLATA 'JIM DANDY')(2 GALLON)(CONT.)	656.35				
									7	7		EACH	DECIDUOUS SHRUBS (SALIX DISCOLOR)(1 GALLON)(CONT.)	656.35				
									3	3		EACH	DECIDUOUS SHRUBS (SYRINGA VULGARIS)(3 GALLON)(CONT.)	656.35				
									8	8		EACH	DECIDUOUS SHRUBS (CORNUS SERICEA)(1 GALLON)(CONT.)	656.35				
									26	26		MGAL	LANDSCAPE WATERING	656.65				
									23	23		CY	LANDSCAPE BACKFILL, TRUCK MEASUREMENT	656.80				
				1						1		SF	TRAFFIC SIGN, TYPE A	675.20				
				32						32		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
				6						6		EACH	REMOVING SIGNS	675.50				
				3						3		EACH	DELINEATOR WITH STEEL POST	676.10				
				3						3		EACH	REMOVAL OF EXISTING DELINEATOR AND POST	676.12				
				1						1		EACH	TEMPORARY TRAFFIC SIGNAL SYSTEM	678.40				
				3						3		EACH	SPECIAL PROVISION (DRIVEWAY ASSISTANCE DEVICE)	900.620				
									2.5	2.5		LB	SPECIAL PROVISION (WET AREA SEED MIX)	900.635				
							100			100		LF	SPECIAL PROVISION (WILDLIFE SHELF)	900.640				
				1						1		LS	SPECIAL PROVISION (REMOVE AND RESET EXISTING STONE WALL)	900.645				
							3364			3364		SF	SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)	900.670				
				660						660		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

N.A.B.I. NOT A BID ITEM

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

HOYLE TANNER

FILE NAME: z86e053qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
QUANTITY SHEET 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 11 OF 370

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

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

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

POINT	CODE	DESCRIPTION
	BF	BARRIER FENCE
	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
	PDF	PROJECT DEMARCATION FENCE
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	R.T.& I.	RIGHT, TITLE, AND INTEREST
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
◎	IPNF	IRON PIN FOUND
●	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 VALVE
	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 RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE
CB	CHORD BEARING

UTILITY SYMBOLOGY

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+TELEPHONE
- 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+TELEPHONE
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

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

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

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

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

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

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

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

ARCHEOLOGICAL & HISTORIC

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

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053leg.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
CONVENTIONAL SYMBOLOGY LEGEND

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 12 OF 370

PRIMARY CONTROL

HVCTRL #26
A 14014
NORTH = 701145.1380
EAST = 1630072.0530
ELEV = 872.9370

GENERAL LOCATION, WORCESTER, VT.
TO REACH FROM THE INTERSECTION OF VT ROUTE 12 (MAIN STREET) AND US ROUTE 2 (BERLIN STREET) GO NORTH ALONG MAIN STREET FOR 0.5 MI (0.8 KM) TO A ROTARY INTERSECTION. PASS THROUGH THE ROTARY AND EXIT THE INTERSECTION AT THE NORTHWEST CORNER AND FOLLOW VT ROUTE 12 (NOW SPRING STREET) FOR 0.1 MI (0.2 KM) TO THE INTERSECTION OF VT ROUTE 12 RIGHT (NOW ELM STREET). TURN RIGHT AND GO NORTHEAST ALONG VT ROUTE 12 FOR 12.3 MI (19.8 KM) TO THE SITE OF THE MARK ON THE LEFT, ABOUT 20 M (65.6 FT) SOUTHWEST OF MILE MARKER 0120/1220/0560.
THE MARK IS SET IN THE TOP OF A 13.0 M (42.7 FT) X 2.8 M (9.2 FT) ROCK OUTCROP WHICH PROJECTS 0.4 M (1.3 FT) ABOVE GROUND SURFACE. IT IS 8.2 M (26.9 FT) NORTHWEST OF AND 0.3 M (1.0 FT) HIGHER THAN VT ROUTE 12, 8.3 M (27.2 FT) SOUTHWEST OF THE CENTERLINE OF A WOODS ROAD, 12.6 M (41.3 FT) NORTH-NORTHEAST OF THE CENTER OF THE NORTHWEST (OUTLET) END OF A 45 CM (18 INCH) DIAMETER PLASTIC CULVERT WITH MARKER POST, 21.2 M (69.6 FT) SOUTHWEST OF POLE NO 100 1/2 /153 AND 37.1 M (121.7 FT) NORTHEAST OF POLE NO 100/153.

HVCTRL #42
A 14017
NORTH = 691687.9160
EAST = 1625931.4410
ELEV = 802.3010

GENERAL LOCATION, WORCESTER, VT.
TO REACH FROM THE INTERSECTION OF VT ROUTE 12 (MAIN STREET) AND US ROUTE 2 (BERLIN STREET) GO NORTH ALONG MAIN STREET FOR 0.5 MI (0.8 KM) TO A ROTARY INTERSECTION. PASS THROUGH THE ROTARY AND EXIT THE INTERSECTION AT THE NORTHWEST CORNER AND FOLLOW VT ROUTE 12 (NOW SPRING STREET) FOR 0.1 MI (0.2 KM) TO THE INTERSECTION OF VT ROUTE 12 RIGHT (NOW ELM STREET). TURN RIGHT AND GO NORTHEAST ALONG VT ROUTE 12 FOR 8.5 MI (13.7 KM) TO THE INTERSECTION OF MINISTER BROOK ROAD. CONTINUE STRAIGHT AHEAD AND GO NORTH ALONG VT ROUTE 12 FOR 1.8 MI (2.9 KM) TO THE SOUTHWEST END OF THE VT ROUTE 12 BRIDGE (NO 83) OVER HANCOCK BROOK AND THE SITE OF THE MARK ON THE RIGHT.
THE MARK IS SET DIRECTLY ABOVE THE BRIDGE DATE PLAQUE IN THE TOP OF THE ABUTMENT AT THE SOUTH CORNER OF THE BRIDGE. IT IS 0.35 M (1.1 FT) SOUTHWEST OF THE HORIZONTAL ANGLE POINT IN THE ABUTMENT, 0.2 M (0.7 FT) WEST OF THE NORTH EDGE OF THE ABUTMENT AND 1.0 M (3.3 FT) NORTHEAST OF THE SOUTHWEST END OF THE BRIDGE CURB.

PRIMARY CONTROL

HVCTRL #50
A 14016
NORTH = 694115.2780
EAST = 1627340.2019
ELEV = 828.4430

GENERAL LOCATION, WORCESTER, VT.

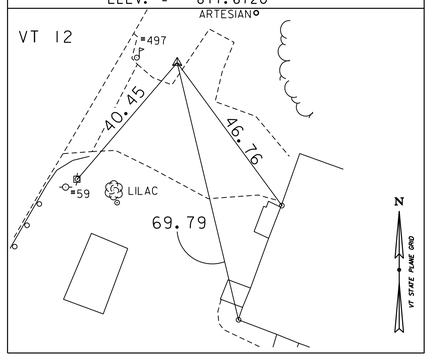
TO REACH FROM THE INTERSECTION OF VT ROUTE 12 (MAIN STREET) AND US ROUTE 2 (BERLIN STREET) GO NORTH ALONG MAIN STREET FOR 0.5 MI (0.8 KM) TO A ROTARY INTERSECTION. PASS THROUGH THE ROTARY AND EXIT THE INTERSECTION AT THE NORTHWEST CORNER AND FOLLOW VT ROUTE 12 (NOW SPRING STREET) FOR 0.1 MI (0.2 KM) TO THE INTERSECTION OF VT ROUTE 12 RIGHT (NOW ELM STREET). TURN RIGHT AND GO NORTHEAST ALONG VT ROUTE 12 FOR 8.5 MI (13.7 KM) TO THE INTERSECTION OF MINISTER BROOK ROAD. CONTINUE STRAIGHT AHEAD AND GO NORTH ALONG VT ROUTE 12 FOR 2.3 MI (3.7 KM) TO THE SITE OF THE MARK ON THE LEFT.

THE MARK IS SET IN A SMALL SHELF IN A MASSIVE LEDGE CUT, OPPOSITE A GRAVEL DRIVE LEADING TO A CAMP AND 120 M (393.7 FT) NORTHEAST OF THE NORTHEAST END OF BRIDGE NO 84. IT IS 7.9 M (25.9 FT) NORTHWEST OF AND LEVEL WITH THE CENTERLINE OF VT ROUTE 12, 15.9 M (52.2 FT) NORTHEAST OF THE CENTER OF THE SOUTHEAST END OF A 60 CM (24 INCH) DIAMETER CONCRETE CULVERT AND MARKER POST, 39.7 M (130.2 FT) NORTHWEST OF THE SOUTHEAST EDGE OF THE LEDGE CUT AND 1.3 M (4.3 FT) SOUTHWEST OF THE NORTHEAST END OF THE LEDGE CUT.

SECONDDARY CONTROL

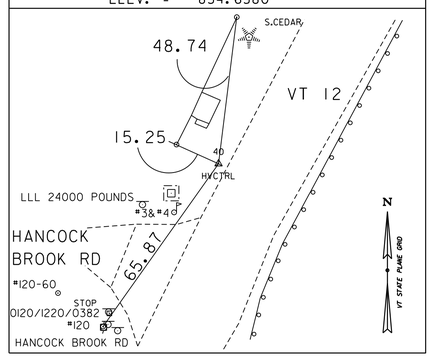
HVCTRL 39

NORTH = 693890.9069
EAST = 1627298.4353
ELEV. = 817.6720



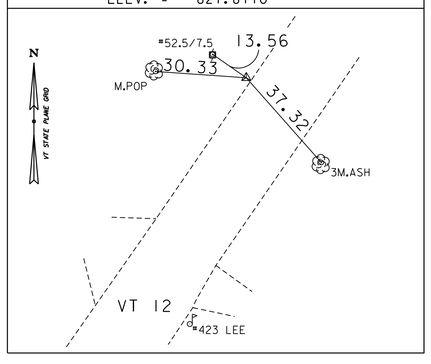
HVCTRL 40

NORTH = 693132.5431
EAST = 1626749.1137
ELEV. = 834.6580



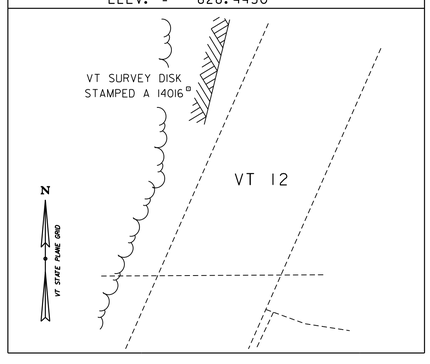
HVCTRL 41

NORTH = 692386.7178
EAST = 1626302.4553
ELEV. = 827.8110



BM 50

NORTH = 694115.2780
EAST = 1627340.2019
ELEV. = 828.4430



NORTH =
EAST =
ELEV. =

DATUM
VERTICAL NAVD88
HORIZONTAL NAD83(2011)
ADJUSTMENT COMPASS

TRAVERSE COMPLETED BY R.GILMAN B.HERRING AND H.MCGOWAN ON 7/30/2019

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

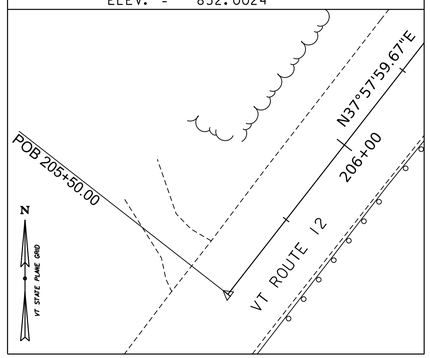
FILE NAME: z86e053ti.dgn
PROJECT LEADER: L.STONE
DESIGNED BY: VTRANS
TIE SHEET I

PLOT DATE: 25-MAY-2023
DRAWN BY: H.MCGOWAN
CHECKED BY: L.MACCORMACK
SHEET 13 OF 370

ALIGNMENT TIES
VT ROUTE 12

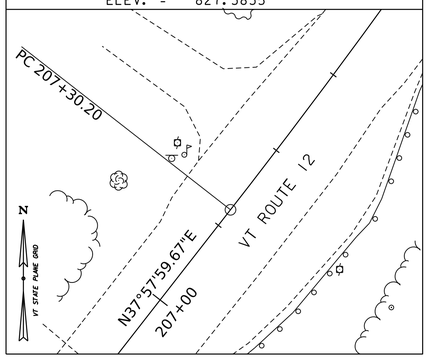
POB 205+50.00

NORTH =	693436.4801
EAST =	1626958.9283
ELEV. =	832.0024



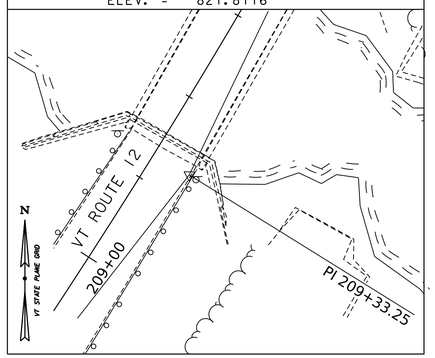
PC 207+30.20

NORTH =	693578.5444
EAST =	1627069.7876
ELEV. =	827.3835



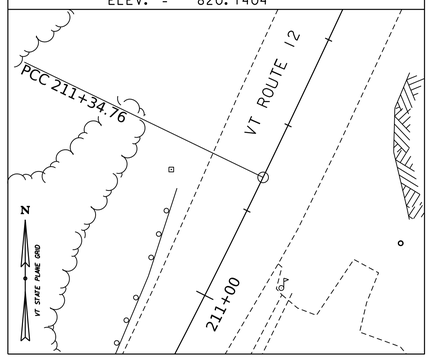
PI 209+33.25

NORTH =	693738.6192
EAST =	1627194.7015
ELEV. =	821.8116



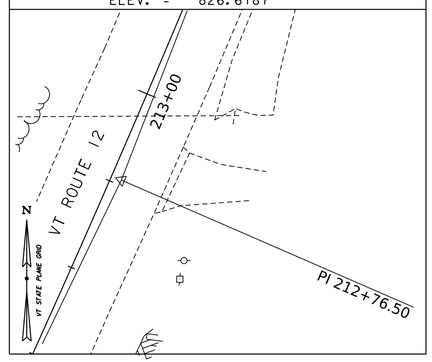
STA 211+34.76

NORTH =	693921.4758
EAST =	1627282.9676
ELEV. =	820.1404



PI 212+76.50

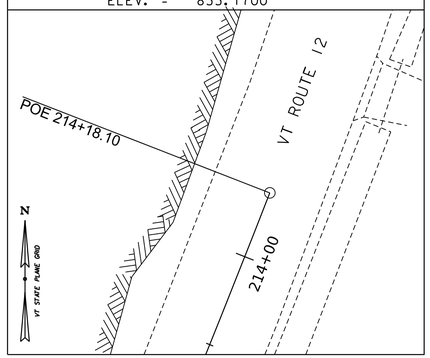
NORTH =	694049.1282
EAST =	1627344.5864
ELEV. =	826.6187



ALIGNMENT TIES
VT ROUTE 12

POE 214+18.10

NORTH =	694181.2303
EAST =	1627395.9776
ELEV. =	833.1700



DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83(2011)
ADJUSTMENT	COMPASS

HOYLE TANNER

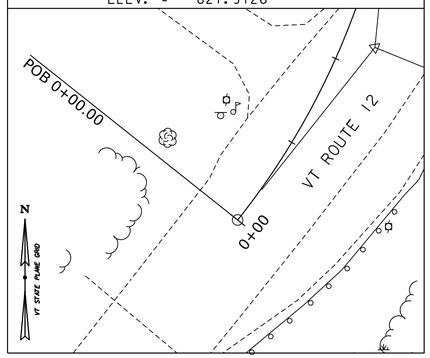
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053ti.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
TIE SHEET 2	SHEET 14 OF 370

ALIGNMENT TIES
DETOUR

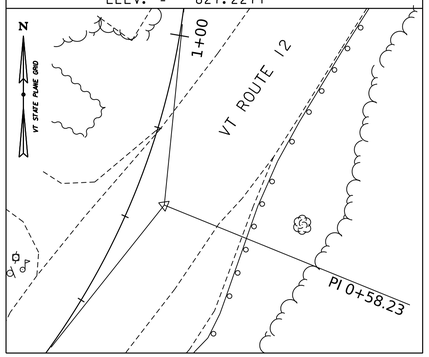
POB 0+00.00

NORTH =	693564.5338
EAST =	1627058.7483
ELEV. =	827.9126



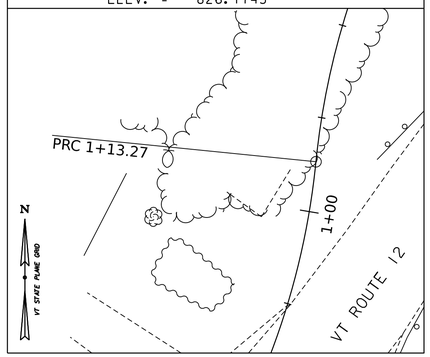
PI 0+58.23

NORTH =	693610.1036
EAST =	1627095.0020
ELEV. =	827.2271



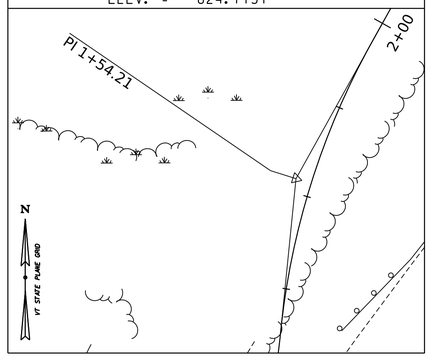
PRC 1+13.27

NORTH =	693668.0446
EAST =	1627100.8131
ELEV. =	826.1743



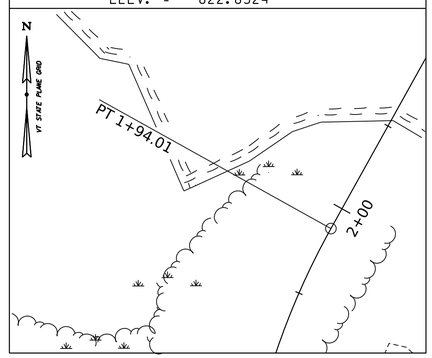
PI 1+54.21

NORTH =	693708.7811
EAST =	1627104.8988
ELEV. =	824.7131



PT 1+94.01

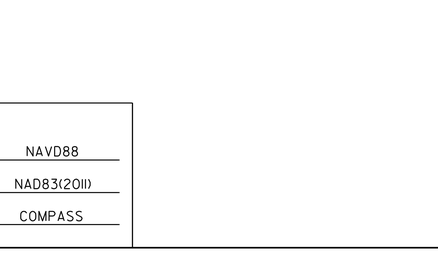
NORTH =	693744.5568
EAST =	1627124.8050
ELEV. =	822.8524



ALIGNMENT TIES
DETOUR

PC 3+79.01

NORTH =	693906.2165
EAST =	1627214.7555
ELEV. =	819.8132



PI 4+25.24

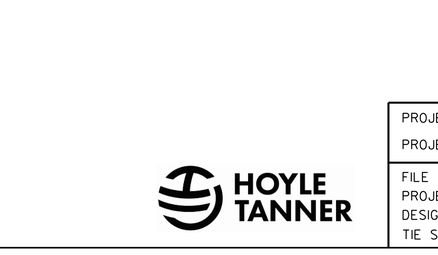
NORTH =	693946.6109
EAST =	1627237.2317
ELEV. =	820.6623

PRC 4+69.84

NORTH =	693972.8770
EAST =	1627275.2710
ELEV. =	822.0908

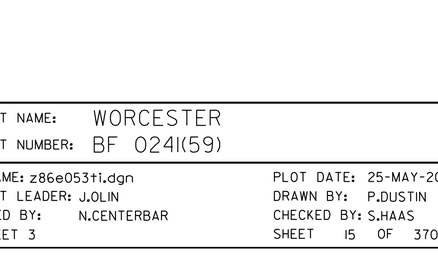
PI 5+25.32

NORTH =	694004.3989
EAST =	1627320.9221
ELEV. =	824.4585



PCC 5+78.02

NORTH =	694055.0514
EAST =	1627343.5491
ELEV. =	826.7402

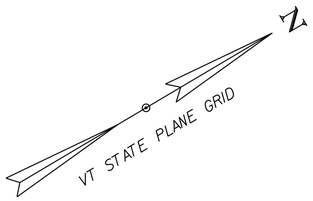


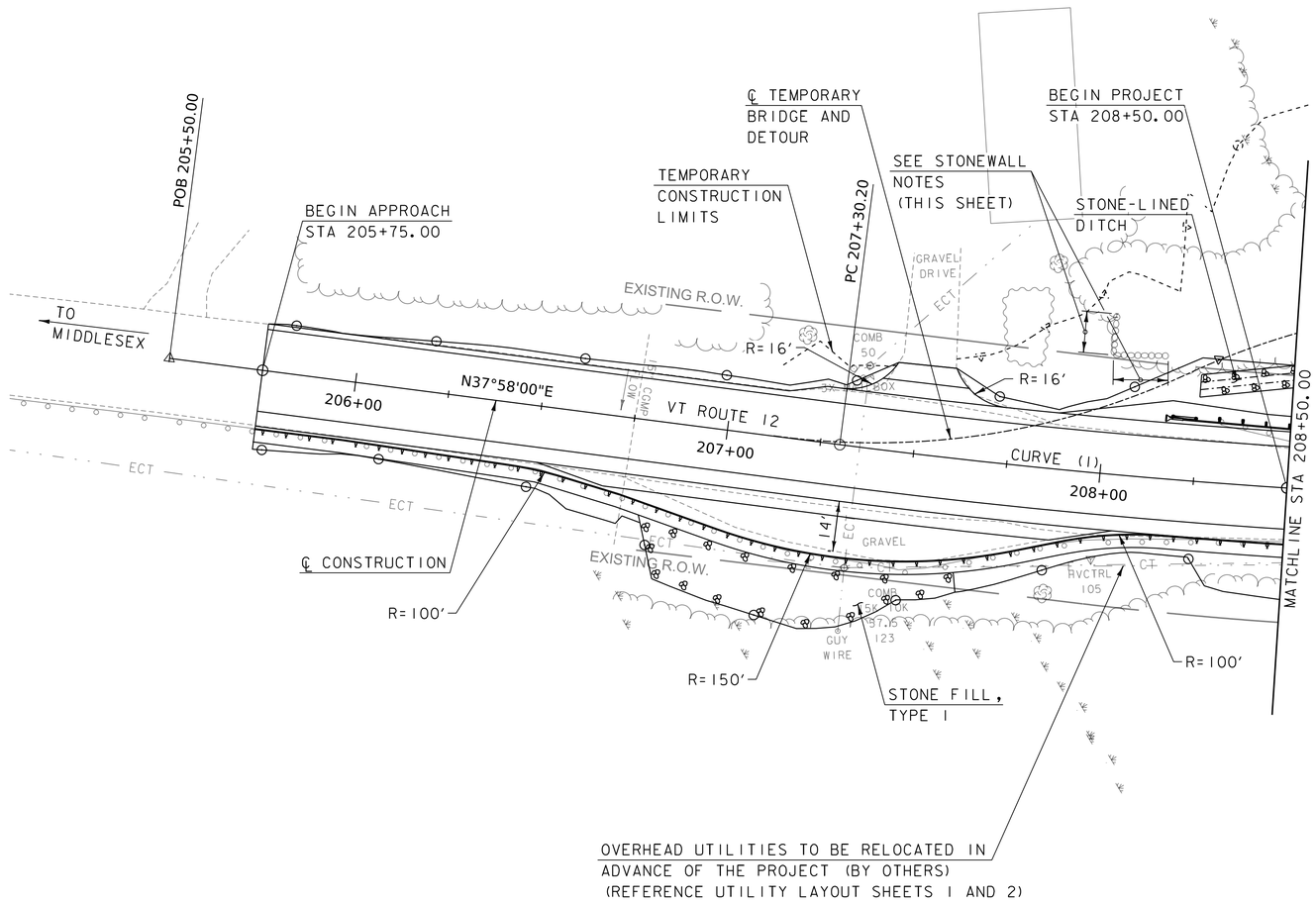
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83(2011)
ADJUSTMENT	COMPASS

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053ti.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
TIE SHEET 3	SHEET 15 OF 370





VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 12°11'59"
D = 3°00'56"
R = 1900.00'
T = 203.05'
L = 404.56'
E = 10.82'

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 205+75, RT - STA 209+35, RT
STA 208+31, LT - STA 209+34, LT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 205+75.00, RT - STA 208+96.06, RT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 208+18.18, LT - STA 208+68.47, LT

CONSTRUCT 4' PAVED DRIVE APRON
STA 207+33 - STA 207+74, LT

CONSTRUCT GRAVEL DRIVE
STA 207+40 - STA 207+63, LT

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

HOYLE TANNER

STONEWALL NOTES

1. STONE WALL TO BE REMOVED, STOCKPILED AND RESTORED AFTER THE TEMPORARY ROAD IS REMOVED. EXISTING STONE WALL DIMENSIONS VARY, BUT IS APPROXIMATED AS 26' LONG x 4' TALL x 2' THICK (PARTIALLY BURIED). PAYMENT WILL BE MADE UNDER PAY ITEM 900.645 SPECIAL PROVISION (REMOVE AND RESET EXISTING STONE WALL).

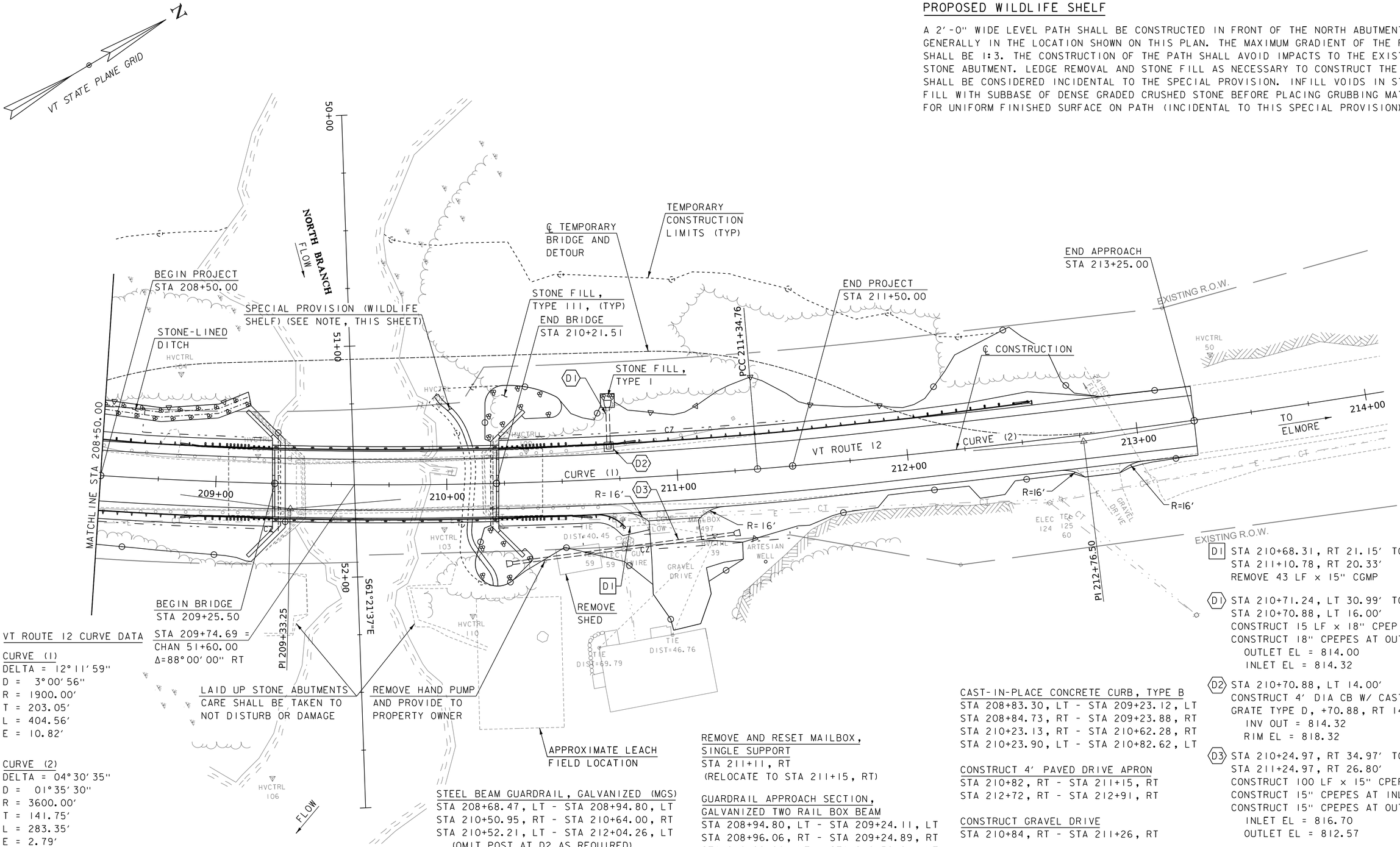
PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053bdr_lay.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
LAYOUT SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 16 OF 370

PROPOSED WILDLIFE SHELF

A 2'-0" WIDE LEVEL PATH SHALL BE CONSTRUCTED IN FRONT OF THE NORTH ABUTMENT GENERALLY IN THE LOCATION SHOWN ON THIS PLAN. THE MAXIMUM GRADIENT OF THE PATH SHALL BE 1:3. THE CONSTRUCTION OF THE PATH SHALL AVOID IMPACTS TO THE EXISTING STONE ABUTMENT. LEDGE REMOVAL AND STONE FILL AS NECESSARY TO CONSTRUCT THE PATH SHALL BE CONSIDERED INCIDENTAL TO THE SPECIAL PROVISION. INFILL VOIDS IN STONE FILL WITH SUBBASE OF DENSE GRADED CRUSHED STONE BEFORE PLACING GRUBBING MATERIAL FOR UNIFORM FINISHED SURFACE ON PATH (INCIDENTAL TO THIS SPECIAL PROVISION).



VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 12°11'59"
D = 3°00'56"
R = 1900.00'
T = 203.05'
L = 404.56'
E = 10.82'

CURVE (2)
DELTA = 04°30'35"
D = 01°35'30"
R = 3600.00'
T = 141.75'
L = 283.35'
E = 2.79'

EXISTING BRIDGE INFORMATION
BUILT 1936
SPAN LENGTH = 84'
CAST-IN-PLACE CONCRETE DECK ON ROLLED BEAMS

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 210+19, RT - STA 210+82, RT
STA 210+19, LT - STA 211+22, LT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 208+68.47, LT - STA 208+94.80, LT
STA 210+50.95, RT - STA 210+64.00, RT
STA 210+52.21, LT - STA 212+04.26, LT
(OMIT POST AT D2 AS REQUIRED)

ANCHOR FOR STEEL BEAM GUARDRAIL
STA 210+64.00, RT - STA 210+76.29, RT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 212+04.26, LT - STA 212+54.35, LT

REMOVE AND RESET MAILBOX, SINGLE SUPPORT
STA 211+11, RT
(RELOCATE TO STA 211+15, RT)

GUARDRAIL APPROACH SECTION, GALVANIZED TWO RAIL BOX BEAM
STA 208+94.80, LT - STA 209+24.11, LT
STA 208+96.06, RT - STA 209+24.89, RT
STA 210+22.90, LT - STA 210+52.21, LT
STA 210+22.12, RT - STA 210+50.95, RT

BRIDGE RAILING, GALVANIZED TWO RAIL BOX BEAM
STA 209+24.11, LT - STA 210+22.90, LT
STA 209+24.89, RT - STA 210+22.12, RT

CAST-IN-PLACE CONCRETE CURB, TYPE B
STA 208+83.30, LT - STA 209+23.12, LT
STA 208+84.73, RT - STA 209+23.88, RT
STA 210+23.13, RT - STA 210+62.28, RT
STA 210+23.90, LT - STA 210+82.62, LT

CONSTRUCT 4' PAVED DRIVE APRON
STA 210+82, RT - STA 211+15, RT
STA 212+72, RT - STA 212+91, RT

CONSTRUCT GRAVEL DRIVE
STA 210+84, RT - STA 211+26, RT

D1 STA 210+68.31, RT 21.15' TO
STA 211+10.78, RT 20.33'
REMOVE 43 LF x 15" CGMP

D1 STA 210+71.24, LT 30.99' TO
STA 210+70.88, LT 16.00'
CONSTRUCT 15 LF x 18" CPEP
CONSTRUCT 18" CPEPES AT OUTLET
OUTLET EL = 814.00
INLET EL = 814.32

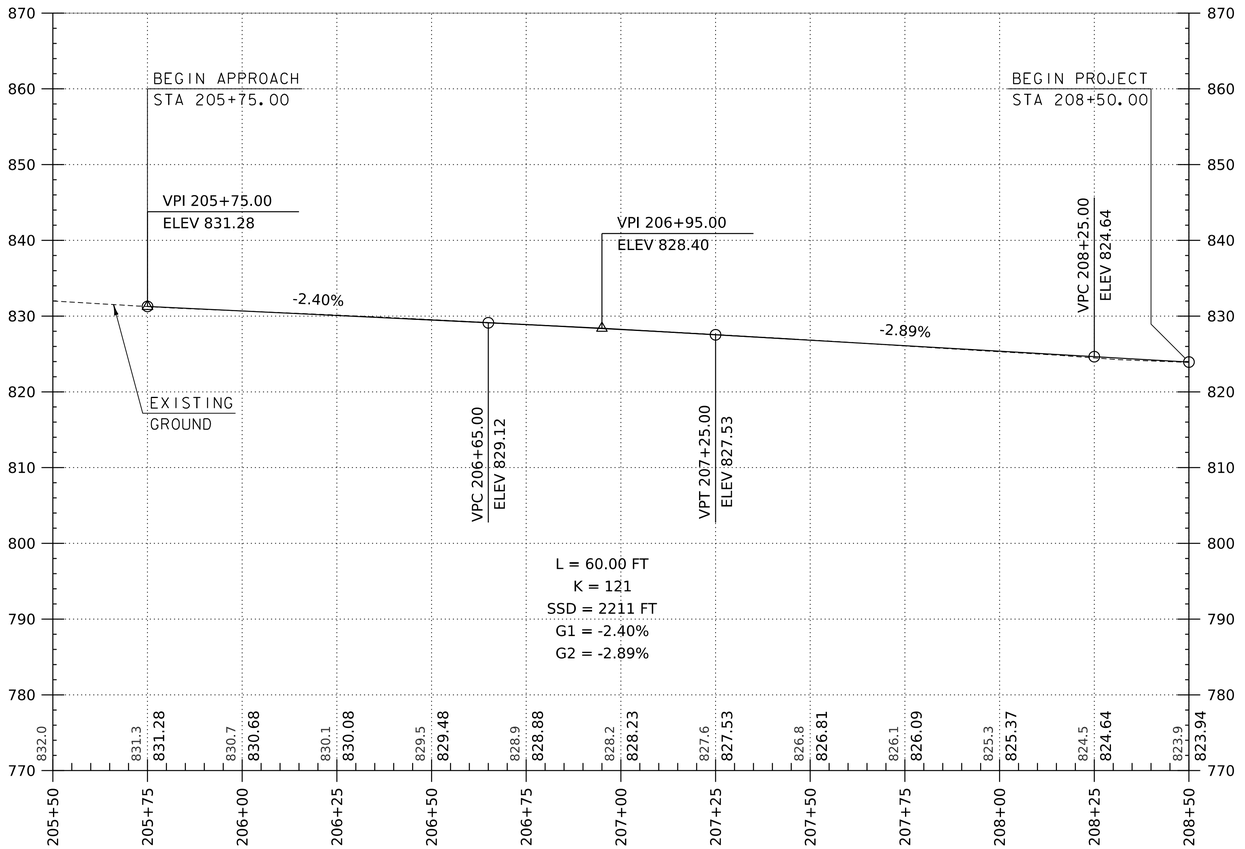
D2 STA 210+70.88, LT 14.00'
CONSTRUCT 4' DIA CB W/ CAST IRON GRATE TYPE D, +70.88, RT 14.00'
INV OUT = 814.32
RIM EL = 818.32

D3 STA 210+24.97, RT 34.97' TO
STA 211+24.97, RT 26.80'
CONSTRUCT 100 LF x 15" CPEP
CONSTRUCT 15" CPEPES AT INLET
CONSTRUCT 15" CPEPES AT OUTLET
INLET EL = 816.70
OUTLET EL = 812.57

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

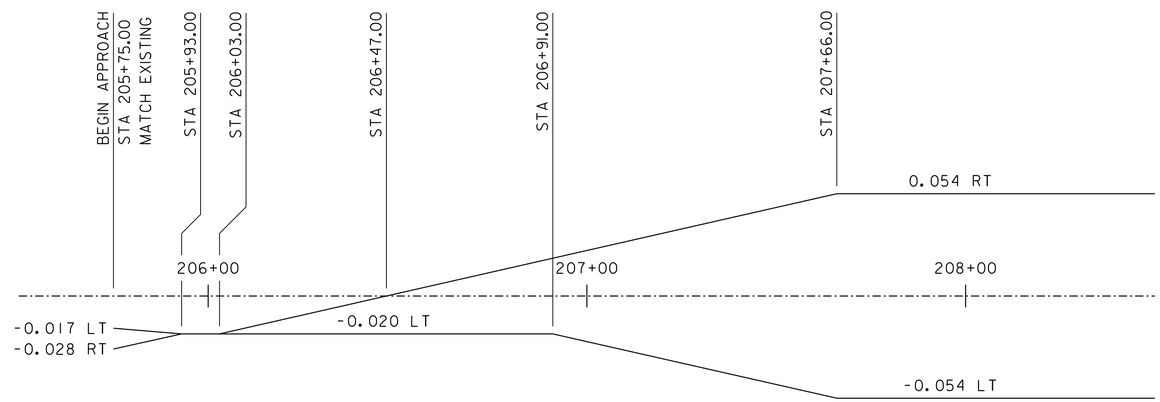
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053bdr_lay.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
LAYOUT SHEET 2	SHEET 17 OF 370



VT ROUTE 12 PROFILE

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



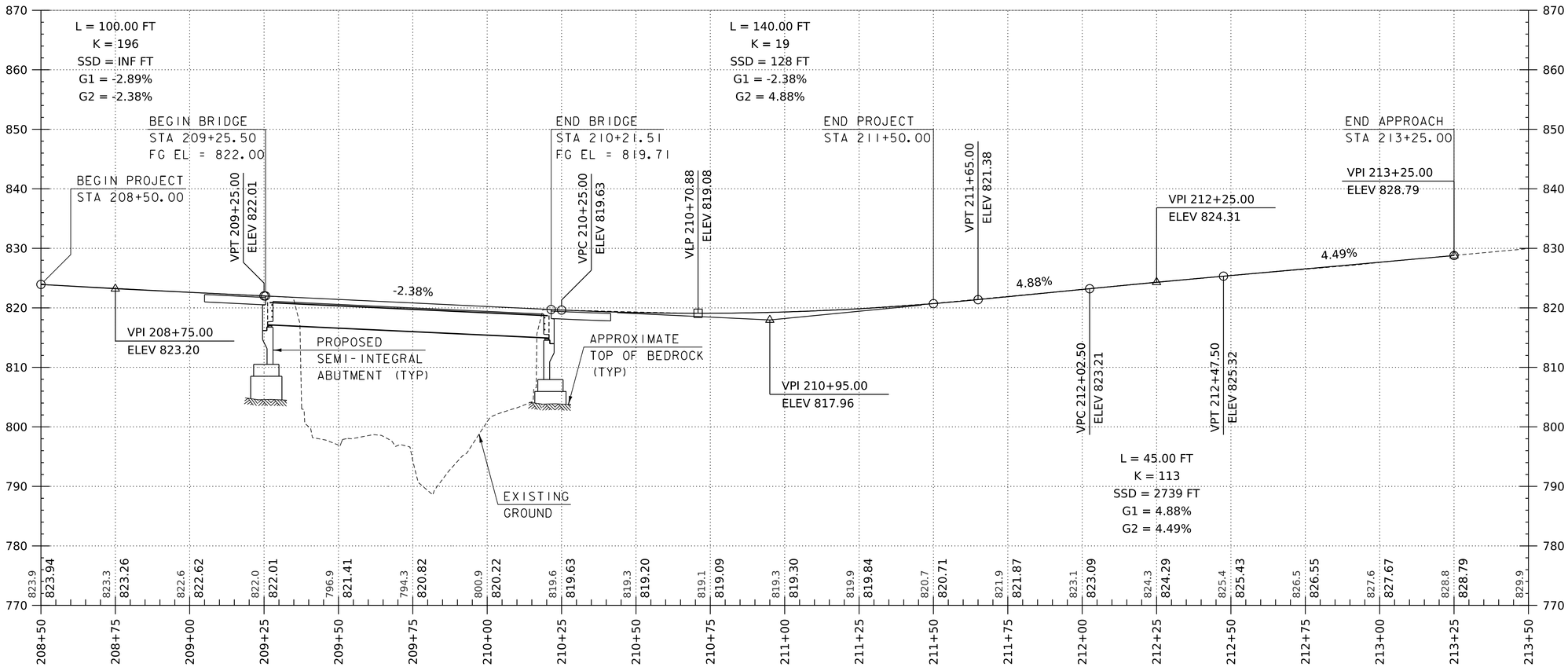
VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

HOYLE TANNER

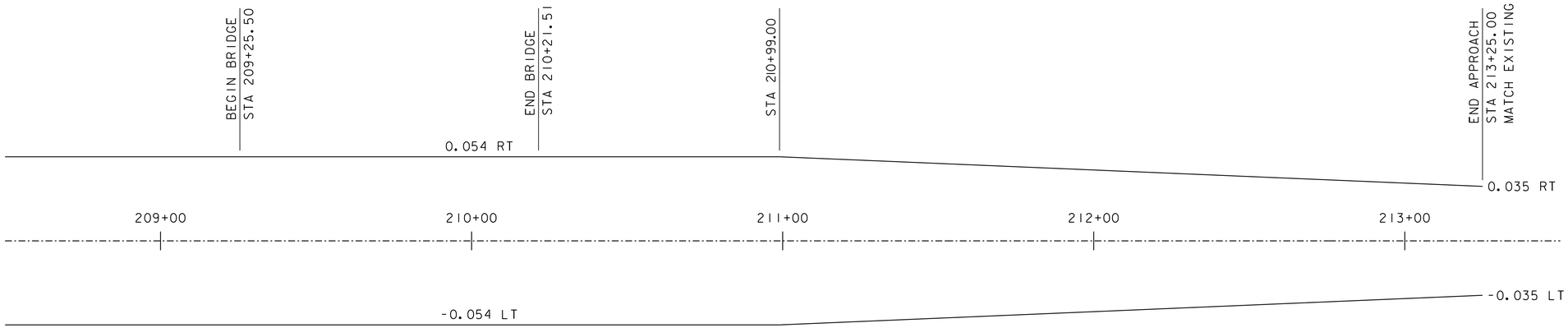
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET 1	SHEET 18 OF 370



VT ROUTE 12 PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

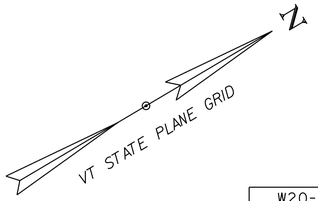


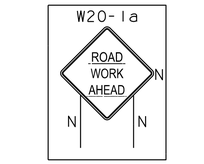
VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

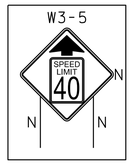
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET 2	SHEET 19 OF 370

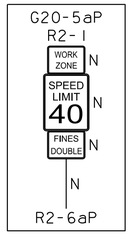




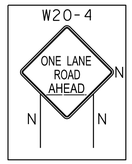
STA 176+69, LT & RT



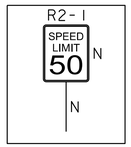
STA 181+69, RT



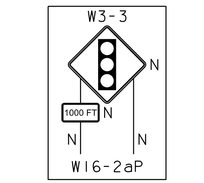
STA 186+69, RT



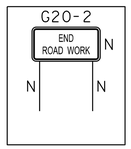
STA 191+69, RT



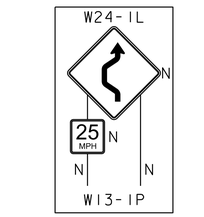
STA 186+69, LT



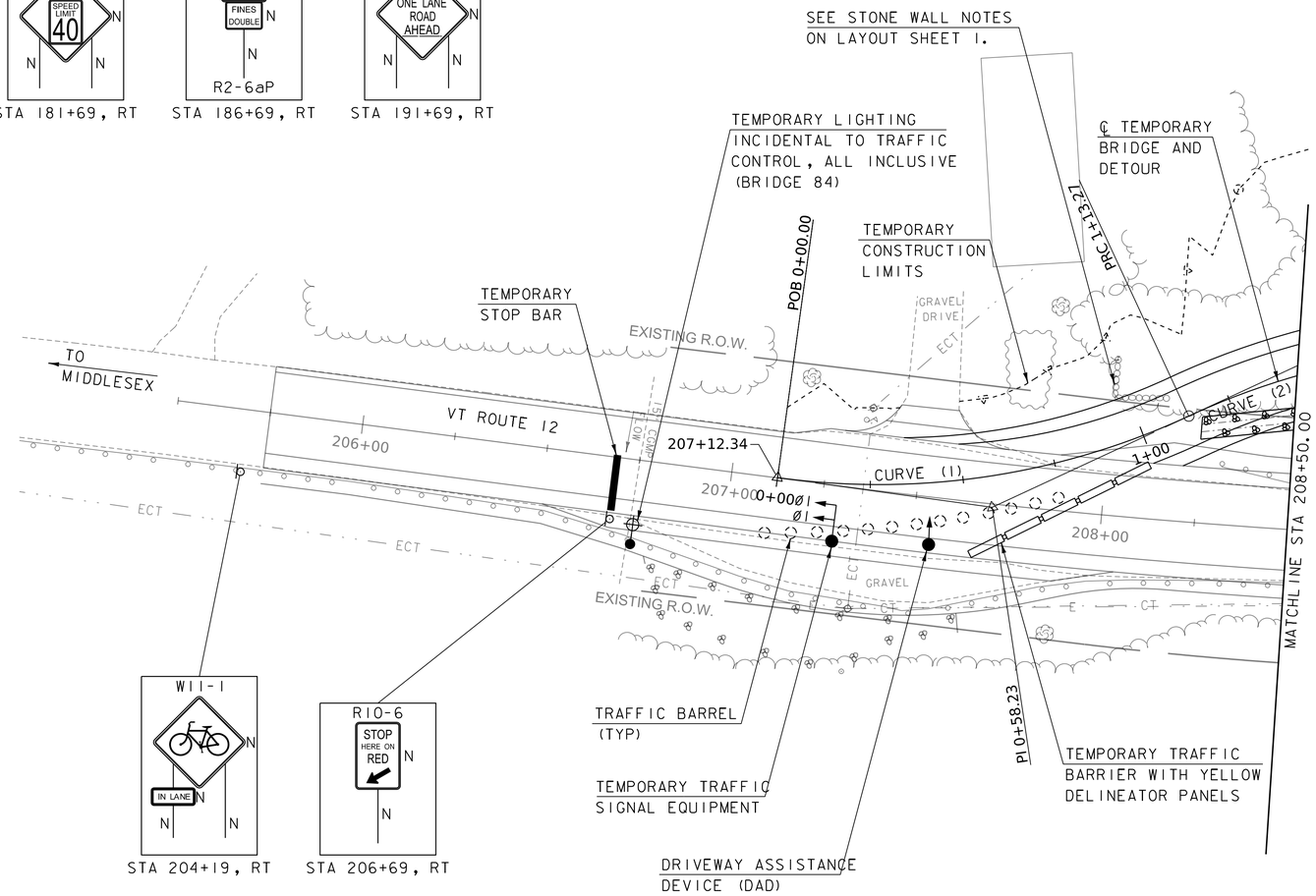
STA 196+69, RT



STA 181+69, LT



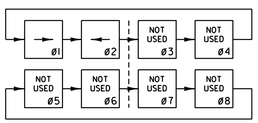
STA 201+69, RT



STA 204+19, RT

STA 206+69, RT

NEMA STD 8Ø CONTROLLER



SIGNAL PHASING		
	Ø1	Ø2
TIMING IN SECONDS	→	←
INITIAL INTERVAL	10	10
VEHICLE EXTENSION	3	3
MAX. 1	13.5	13.5
YELLOW	4.5	4.5
ALL RED	22	22
RECALL	MIN	MIN
DETECTOR MEMORY	L	L
FLASH	RED	RED

MAX 1: ALL TIME PERIODS

NOTES

1. TEMPORARY SIGNAL SHALL PROVIDE MINIMUM RECALL FOR Ø1 AND Ø2 AS THE DAD DO NOT PROVIDE DETECTION.
2. TEMPORARY SIGNAL SHALL PROVIDE BICYCLE DETECTION FOR Ø1 AND Ø2.
3. TEMPORARY SIGNAL SHALL BE CAPABLE OF DETECTING SLOW MOVING VEHICLES AND BICYCLES WITHIN THE WORK ZONE TO EXTEND THE ALL RED TIME TO PROVIDE SAFE PASSAGE.

DETOUR ROAD CURVE DATA

CURVE (1)	CURVE (2)
DELTA = 32°46'38"	DELTA = 23°21'54"
D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'
T = 58.23'	T = 40.94'
L = 113.27'	L = 80.74'
E = 8.39'	E = 4.19'

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

HOYLE TANNER

TRAFFIC CONTROL NOTES

1. TRAFFIC CONTROL SHEETS 1 AND 2 ARE CONCEPTUAL. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY TRAFFIC CONTROL PLANS PER 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE.

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 20 OF 370

N

VT STATE PLANE GRID

NORTH BRANCH
FLOW

℄ TEMPORARY
BRIDGE AND
DETOUR

PC 3+79.01

TEMPORARY
CONSTRUCTION
LIMITS (TYP)

PI 4+25.24

PRC 4+69.84

TRAFFIC BARREL
(TYP)

TEMPORARY TRAFFIC
SIGNAL EQUIPMENT

DRIVEWAY ASSISTANCE
DEVICE (DAD) (TYP)

POE 5+78.02

EXISTING R.O.W.

TEMPORARY
STOP BAR

PI 1+54.21

CURVE (2)

N29°05'33"E

2+00

3+00

4+00

CURVE (3)

5+00

CURVE (4)

VT ROUTE 12

212+81.43

213+00

214+00

TO
ELMORE

MATCHLINE STA 208+50.00

PT 1+94.01

209+00

210+00

211+00

212+00

TEMP
FLOW

ARTESIAN
WELL

GRAVEL
DRIVE

GRAVEL
DRIVE

TEMPORARY LIGHTING
INCIDENTAL TO TRAFFIC
CONTROL, ALL INCLUSIVE
(BRIDGE 84)

EXISTING R.O.W.

PI 5+25.32

TEMPORARY TRAFFIC
BARRIER WITH YELLOW
DELINEATOR PANELS

FLOW

R10-6
STOP HERE ON RED
STA 213+06, LT

W11-1
IN LANE
STA 215+56, LT

W24-1R
25 MPH
W13-1P
STA 218+06, LT

G20-2
END ROAD WORK
STA 238+06, RT

W3-3
1000 FT
W16-2aP
STA 223+06, LT

R2-1
SPEED LIMIT 50
STA 233+06, RT

W20-4
ONE LANE ROAD AHEAD
STA 228+06, LT

G20-5aP
R2-1
WORK ZONE
SPEED LIMIT 40
FINES DOUBLE
R2-6aP
STA 233+06, LT

W3-5
SPEED LIMIT 40
STA 238+06, LT

W20-1a
ROAD WORK AHEAD
STA 243+06, LT & RT

DETOUR ROAD CURVE DATA

CURVE (2)	CURVE (3)	CURVE (4)
DELTA = 23°21'54"	DELTA = 26°16'57"	DELTA = 31°18'15"
D = 28°56'14"	D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'	R = 198.00'
T = 40.94'	T = 46.23'	T = 55.48'
L = 80.74'	L = 90.83'	L = 108.18'
E = 4.19'	E = 5.32'	E = 7.63'

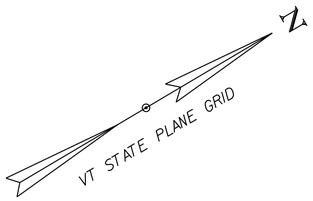
SCALE 1" = 20'-0"
20 0 20

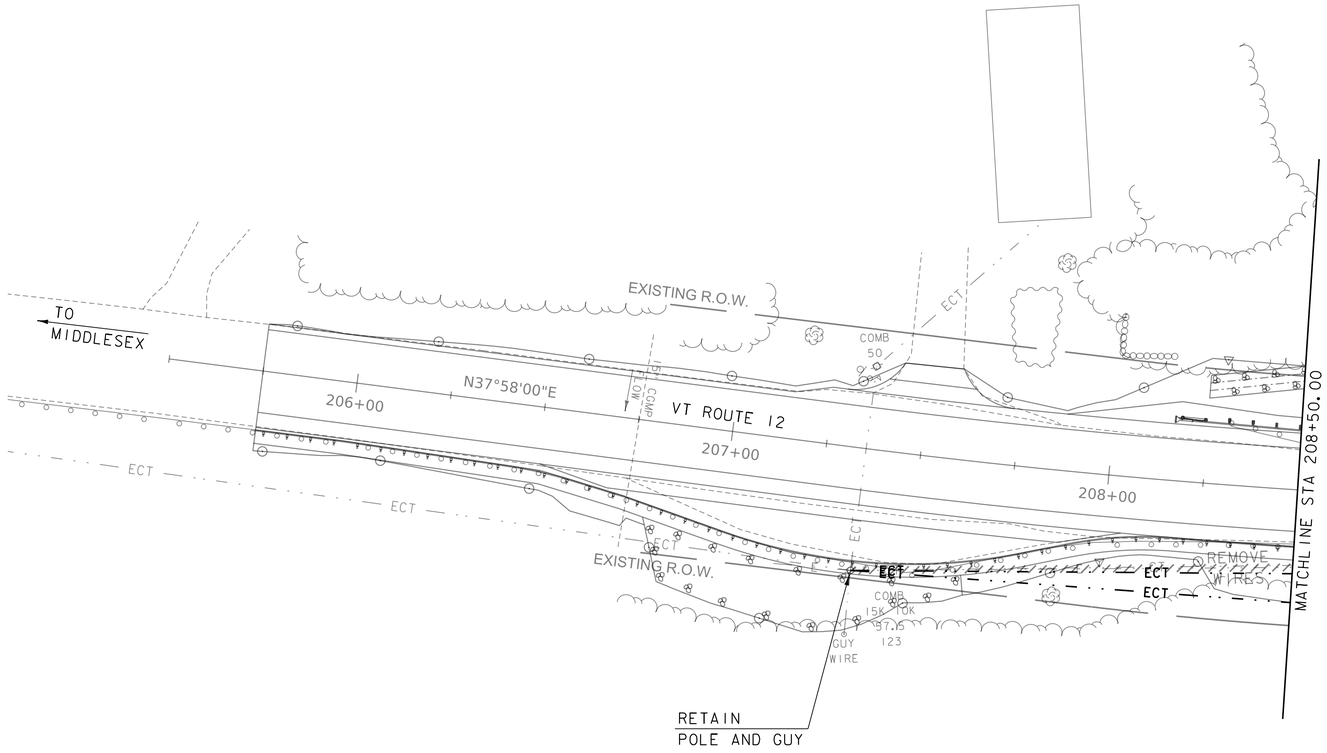
HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 21 OF 370





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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053bdr_utl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
UTILITY LAYOUT SHEET 1	SHEET 22 OF 370

N

VT STATE PLANE GRID

NORTH BRANCH
FLOW

50+00

51+00

MATCHLINE STA 208+50.00

209+00

210+00

211+00

212+00

213+00

214+00

VT ROUTE 12

TO
ELMORE

RETAIN
POLE

EXISTING R.O.W.

REMOVE
POLE

ECT

ELEC
59

GUY
WIRE

ELEC
124

TEL
125
60

S61°21'37"E

52+00

NEW PERMANENT POLE W/
10' BISECT SIDEWALK ANCHOR
STA 210+55.56, RT 22.00'
N: 693840.50
E: 1627265.86

497
ELMORE
ROAD

REMOVE
POLES AND GUY

RELOCATED
RESIDENTIAL DROP

RETAIN POLE 124
RELOCATE COMMUNICATION
LINES FROM POLE 125/60
TO POLE 124

REMOVE POLE
125/60

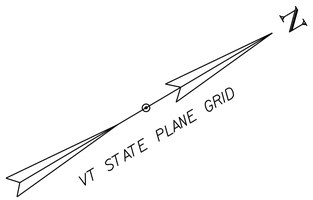
TEMPORARY POLE W/
22' BISECTOR PUSH POLE
STA 210+48.33, RT 42.50'
N: 693824.40
E: 1627280.50

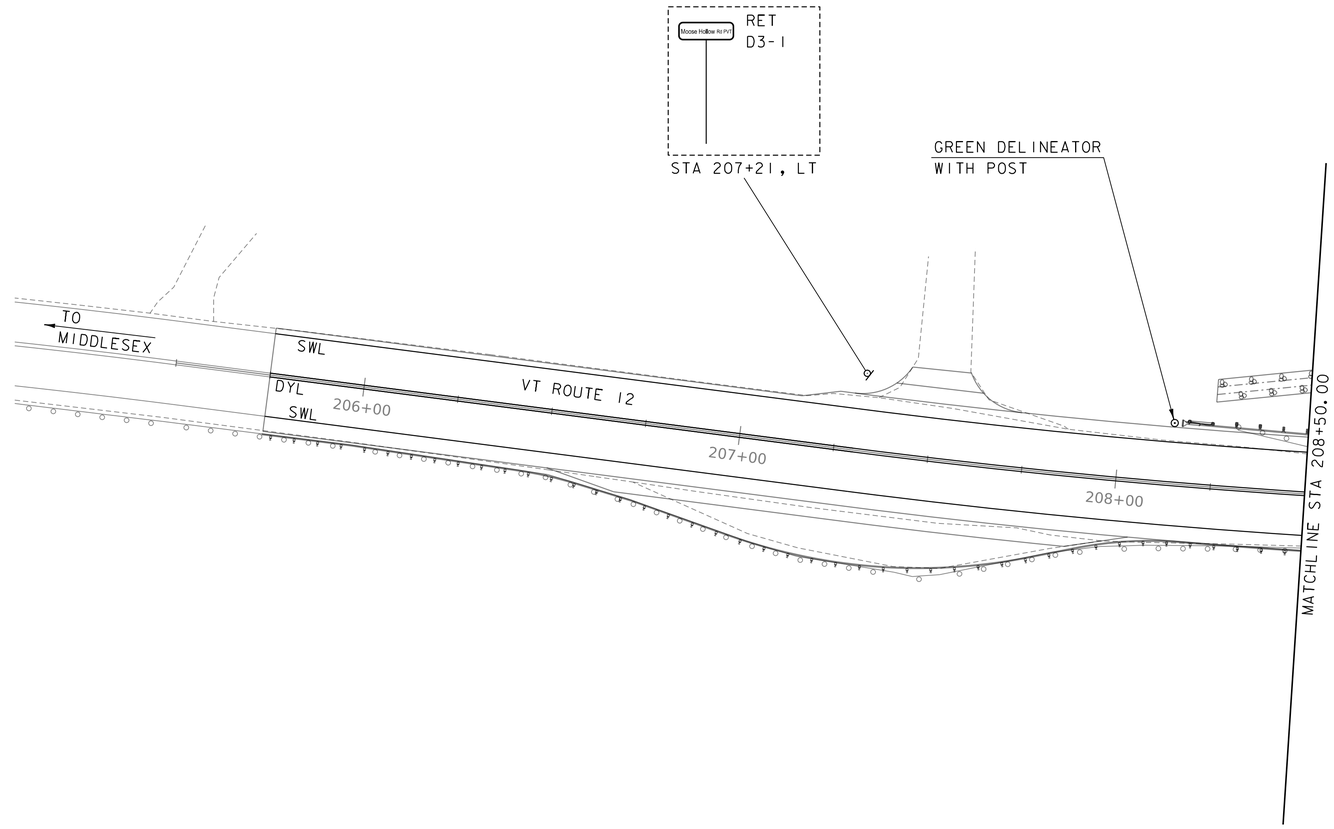
FLOW

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053bdr_utl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
UTILITY LAYOUT SHEET 2	SHEET 23 OF 370





LEGEND

R	REMOVE
R&S	REMOVE AND SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE

4" WHITE LINE
STA 205+75 - STA 213+25, LT & RT

4" YELLOW LINE
STA 205+75 - STA 213+25, ℄ (DOUBLE)

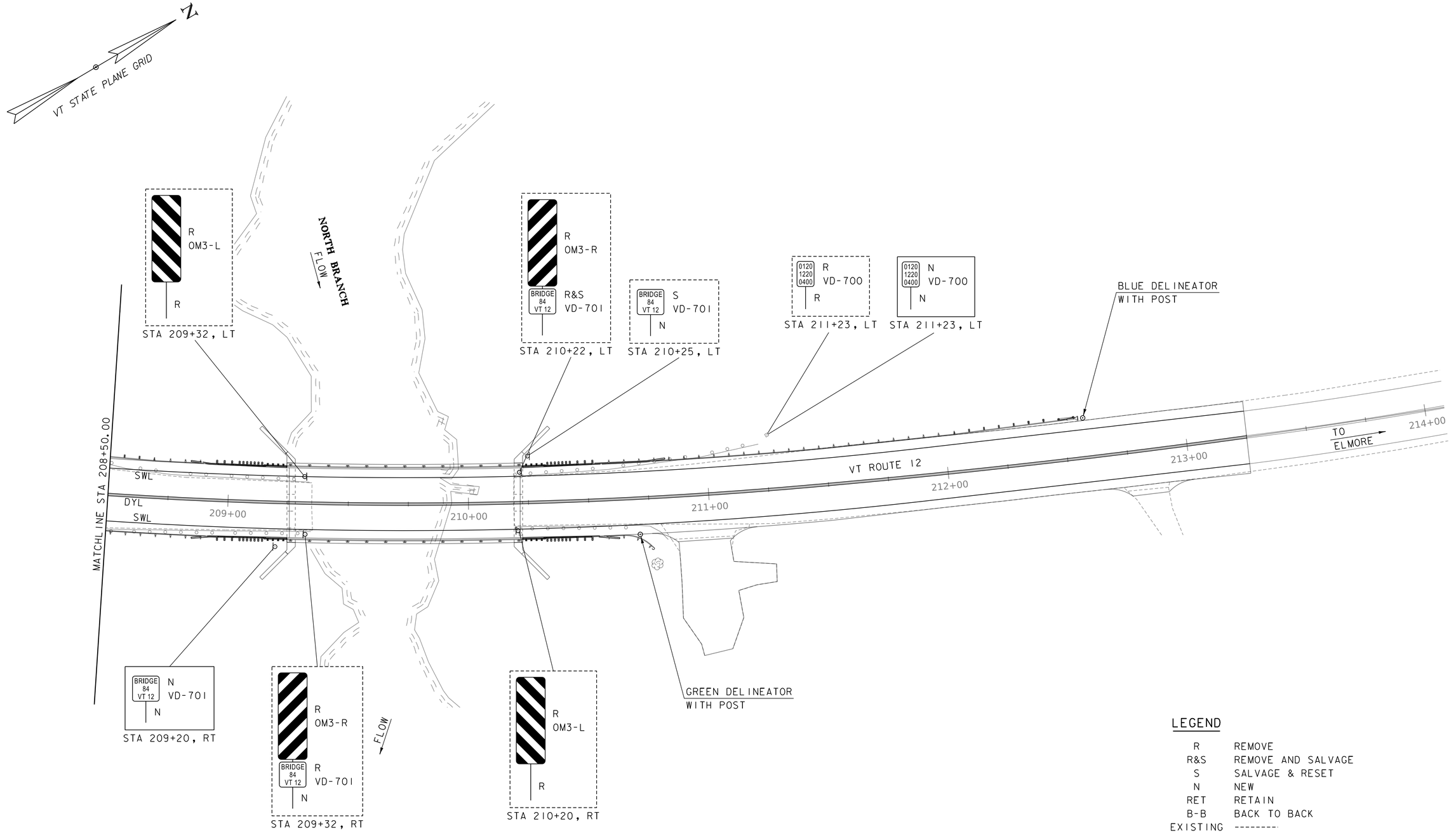
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z. ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 24 OF 370



LEGEND

R	REMOVE
R&S	REMOVE AND SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z. ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 25 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

MILE MARKER, STATION OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS EACH	SIGN DIMENSIONS WIDTH (in)	SIGN DIMENSIONS HEIGHT (in)	NEW & SALVAGED SIGNS "A"	NEW & SALVAGED SIGNS "B"	SALV SIGN	SALV TIS	EXIST POST RETAIN	EXIST POST SALVAGE	NO. OF POST	FLANGED CHANNEL (LB / FT) 1.12	FLANGED CHANNEL (LB / FT) 2.00	FLANGED CHANNEL (LB / FT) 3.00	SQUARE STEEL (in) 1.75 (LB / FT) 1.88	SQUARE STEEL (in) 2.00 (LB / FT) 2.42	SQUARE STEEL (in) 2.50 (LB / FT) 3.35	ANCHOR	SLEEVE	TUBULAR ALUMINUM Ø (IN) 3.00 (LB / FT) 1.30	TUBULAR ALUMINUM Ø (IN) 4.00 (LB / FT) 1.70	TUBULAR ALUMINUM Ø (IN) 4.0 MOD (LB / FT) 1.70	FOUNDATION	TUBULAR STEEL Ø (IN) 3.00 (LB / FT) 7.60	TUBULAR STEEL Ø (IN) 3.50 (LB / FT) 9.00	TUBULAR STEEL Ø (IN) 4.00 (LB / FT) 10.80	TUBULAR STEEL Ø (IN) 5.00 (LB / FT) 14.60	W-SHAPE STEEL FTG. SIZE 24"	W-SHAPE STEEL FTG. SIZE 30"	WEIGHT	POST SIZE	SIGN FRAME REQUIRED	REMARKS	SIGN DETAIL: DETAIL ON SHEET NUMBER	SIGN DETAIL: STANDARD SHEET NUMBER
OPTION ITEMS																																			
209+20, RT	BRIDGE 84 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-701		T-42
210+25, LT	BRIDGE 84 VT 12						x				1.0				8.0			X	X														USE SALVAGED SIGN, VD-701		T-42
211+23, LT	0120 1220 0400	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-700		T-44
												FT .	FT .	FT .	FT 24.	FT .	FT .	XXXXX	EA .	LB .	LB .	LB .		LB .	LB .	LB .	LB .								
TOTALS					SF .8	SF .	EA. .	SF .	XXXXXXXXXXX	XXXXXXXXXXX		FT .			FT 24.					LB .			EA.	LB .				EA. .	EA. .	LB .					

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053tss.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN SUMMARY SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 26 OF 370

SOIL CLASSIFICATION

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

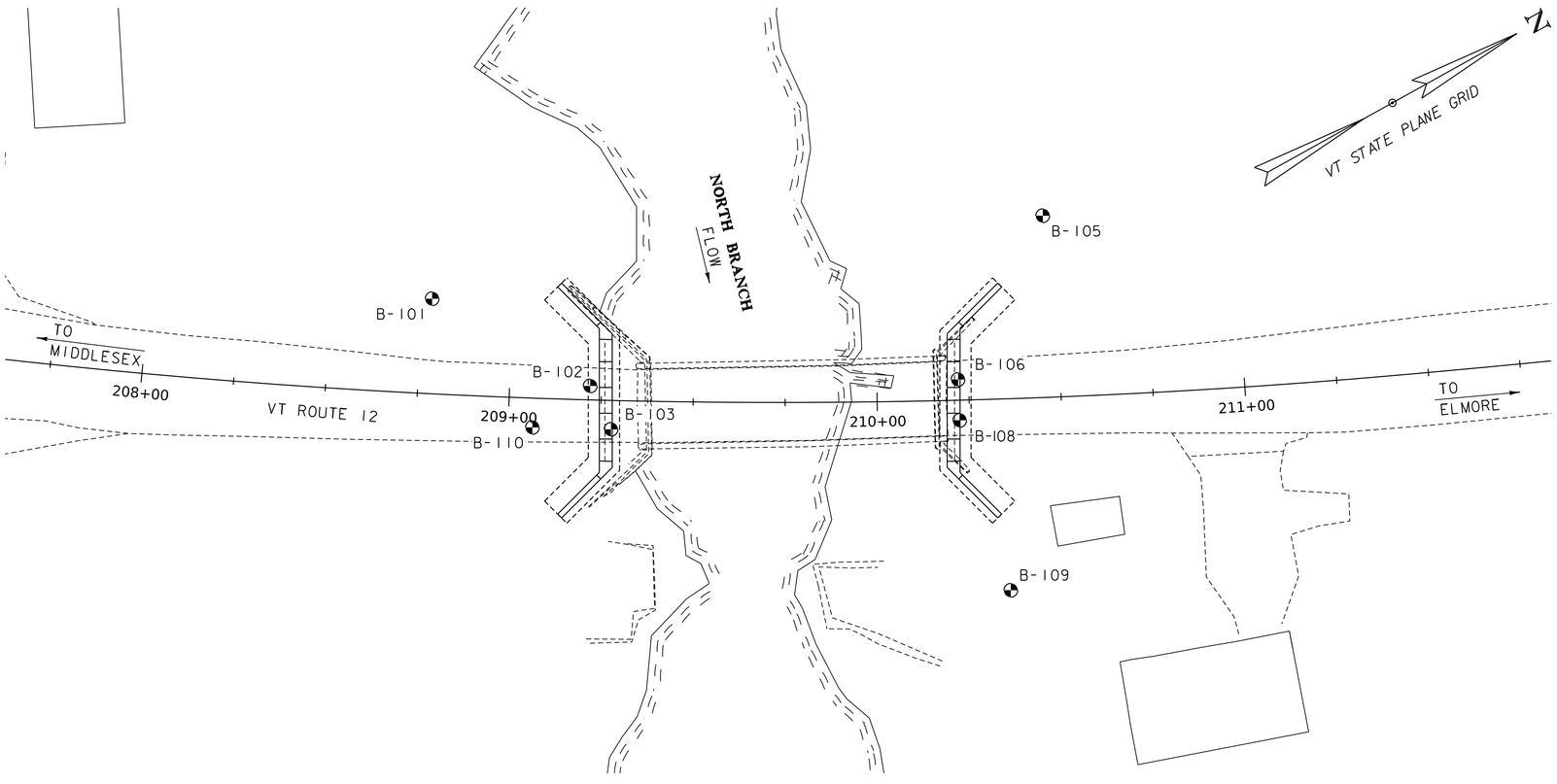
CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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

COMMONLY USED SYMBOLS

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

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



BORING LAYOUT

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB	HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB
B-101	208+78	27 LT	693712.53	1627134.42	818.9	818.0	B-106	210+22	6 LT	693824.30	1627226.11	819.6	804.9
B-102	209+26	5 LT	693737.40	1627176.70	821.9	808.4	B-108	210+22	5 RT	693819.03	1627235.89	819.7	802.7
B-103	209+27	6 RT	693736.25	1627189.74	821.9	804.4	B-109	210+33	52 RT	693807.44	1627282.70	816.1	812.1
B-105	210+48	49 LT	693866.78	1627199.54	812.1	806.9	B-110	209+01	6 RT	693718.14	1627178.40	822.6	808.1

DEFINITIONS (AASHTO)

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

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

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

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

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

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

VARVED - Alternate layers of silt and clay.

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

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

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

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

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

DIP - Inclination of bed with a horizontal plane.

GENERAL NOTES

1. The subsurface explorations shown herein were made August 2021 and overseen by Haley & Aldrich, Inc.

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

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

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

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

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

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

HOYLE TANNER

0 20 40
SCALE IN FEET

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053bor.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 27 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

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

Boring Crew: C. Johnson, J. Fletcher
Date Started: 8/19/21 Date Finished: 8/19/21
VTSPG NAD83: N 693712.53 ft E 1627134.42 ft
Station: 208+78 Offset: 27L
Ground Elevation: 818.9 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:		Auto
Rig: Diedrich D-50 Track		C_E = 1.48

Groundwater Observations

Date	Depth (ft)	Notes
08/19/21	4.8	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate min/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-8, ORGANIC SOIL with Gravel (OL/OH), hard, dark brown, moist, no structure, organic odor, trace roots, mps 0.5 in. (Forest Mat), Rec. = 0.9 ft, 0.0 ft - 0.9 ft				2-100/5"				
		0.9 ft - 1.5 ft, Note: Driller used roller bit to 1.5 ft depth				Top of Bedrock @ 0.9 ft				
2.5		1.5 ft - 6.5 ft, Gray, GRANOFELS, aphanitic to fine grained, moderately hard to hard, slightly weathered. Primary joint set is dipping low to moderate angles, very close to close, rough, fresh to discolored, tight to open, no infilling. No discernible secondary joint set. Poor Rock, NQ, RMR=39 (MORETOWN FORMATION)	C1	100 (72)	4.5 4 4.5 5 4					
5.0										
7.5		6.5 ft, Gray, GRANOFELS, aphanitic to fine grained, moderately hard to hard, slightly weathered. Primary joint set is dipping low to moderate angles, very close to moderate, rough, fresh to discolored, tight to open, no infilling. No discernible secondary joint set. Poor Rock, NQ, RMR=34 (MORETOWN FORMATION)	C2	98 (38)	6 5 4 4 4.5					
10.0										
		Hole stopped @ 11.5 ft								
12.5										
15.0										
17.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
FOOTING
EL 810.50

BORING LOG 200707_VTTRANS_PH2 BR 84.GPJ VERMONT AOT.GDT 1/1/21

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-102**
Page No.: 1 of 2
Pin No.: 86053
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/11/21 Date Finished: 8/11/21
VTSPG NAD83: N 693737.40 ft E 1627176.70 ft
Station: 209+26 Offset: 5L
Ground Elevation: 821.9 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:		Auto
Rig: CME 45 Truck		C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/11/21	14.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate min/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.8 ft								
		(Fill) Well-graded SAND with Gravel (SW), loose, brown, dry, no structure, no odor, mps 0.75 in., 0.8 ft - 5.0 ft Rec. = 1.33 ft				5-5-5-10 (10)		38.6	56.5	4.9
2.5										
5.0		(Fill) Poorly-graded SAND with Gravel (SP), loose, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 0.75 ft, 5.0 ft - 10.0 ft				4-3-3-4 (6)				
7.5										
10.0		(Fill) Well-graded GRAVEL with Sand (GW), medium dense, gray, dry, no structure, no odor, mps 0.75 in., Rec. = 0.92 ft, 10.0 ft - 13.5 ft				9-9-12-9 (21)		77.5	16.5	6.0
12.5		Casing advanced and had refusal at 13.5 ft on possible competent rock. Advanced rollerbit to 15 ft., 13.5 ft - 15.0 ft				Top of Bedrock @ 13.5 ft				
15.0		15.0 ft - 20.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately hard, fresh to slightly weathered. Primary joint set is dipping high angle, close to moderate, rough to smooth, fresh to discolored, tight to open. No discernible secondary joint set present. Fair Rock, NQ, RMR=52 (MORETOWN FORMATION)	C1	100 (70)	1.5 1.5 1 2					
17.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
FOOTING
EL 808.50

BORING LOG 200707_VTTRANS_PH2 BR 84.GPJ VERMONT AOT.GDT 30/3/22

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 28 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-102**
Page No.: 2 of 2
Pin No.: 86053
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/11/21 Date Finished: 8/11/21
VTSPG NAD83: N 693737.40 ft E 1627176.70 ft
Station: 209+26 Offset: 5L
Ground Elevation: 821.9 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/11/21	14.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
20.0					2.5					
		20.0 ft - 25.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, hard, fresh to slightly weathered. Primary joint set is dipping moderately, moderate spacing, rough, fresh to discolored, tight. No discernible secondary joint set. Good Rock, NQ, RMR=61 (MORETOWN FORMATION)	C2	100 (88)	1					
22.5					1.5					
					1.5					
					1.5					
25.0					1.5					
		Hole stopped @ 25.0 ft								
27.5										
30.0										
32.5										
35.0										
37.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 3/30/22

BOTTOM OF
FOOTING
EL 806.50

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-103**
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/11/21 Date Finished: 8/11/21
VTSPG NAD83: N 693736.25 ft E 1627189.74 ft
Station: 209+27 Offset: 6R
Ground Elevation: 821.9 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/11/21	14.7	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.8 ft								
		(Fill) Well-graded SAND with Silt and Gravel (SW-SM), medium dense, brown, dry, no structure, no odor, mps 0.5 in., 0.8 ft - 3.0 ft Rec. = 1.4 ft				8-8-7-4 (15)		46.9	44.5	8.6
2.5		(Fill) Poorly-graded SAND with Silt (SP-SM), medium dense, brown, dry, no structure, no odor, mps 1.0 in., Rec. = 1.0 ft, 3.0 ft - 5.0 ft				6-9-10-10 (19)				
5.0		(Fill) Well-graded SAND with Silt and Gravel (SW-SM), loose, brown, dry, no structure, no odor, mps 1.0 in., Rec. = 1.25 ft, 5.0 ft - 7.0 ft				5-4-3-6 (7)		39.4	52.9	7.7
7.5		(Fill) Poorly-graded SAND with Silt (SP-SM), medium dense, brown, moist, no structure, no odor, trace wood, mps 1.0 in., Rec. = 1.1 ft, 7.0 ft - 10.0 ft				10-14-11-17 (25)				
10.0		(Fill) Well-graded SAND with Gravel (SW), medium dense, brown, moist, no structure, no odor, mps 0.5 in., Rec. = 1.2 ft, 10.0 ft - 12.0 ft				10-10-9-11 (19)		45.8	49.3	4.9
12.5		(Fill) Silty SAND (SM), medium dense, brown, moist, no structure, no odor, mps 0.5 in., Rec. = 0.9 ft, 12.0 ft - 15.0 ft				10-12-13-15 (25)				
15.0		(Fill) Well-graded SAND with Gravel (SW), medium dense, brown, moist, no structure, no odor, mps 1.0 in., Rec. = 1.3 ft, 15.0 ft - 17.5 ft				11-11-11-12 (22)		43.7	51.1	5.2
17.5		Top of Bedrock @ 17.5 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 1/10/21

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-103**
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/11/21 Date Finished: 8/11/21
VTSPG NAD83: N 693736.25 ft E 1627189.74 ft
Station: 209+27 Offset: 6R
Ground Elevation: 821.9 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/11/21	14.7	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
20.0		19.0 ft - 20.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, hard, slightly weathered. Primary joint set is dipping vertically, close, rough, fresh to discolored, open. No discernible secondary joint set. Poor Rock, NQ, RMR=23 (MORETOWN FORMATION)	C1	66 (0)	1					
			C2							
		Hole stopped @ 20.0 ft								
22.5										
25.0										
27.5										
30.0										
32.5										
35.0										
37.5										

Remarks:
Boring terminated at 20.0 ft due to non-vertical casing causing destruction of the core barrel and thus compromising the borehole for advancement.

AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 11/10/21

BOTTOM OF
FOOTING
EL 806.00

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-105**
Page No.: 1 of 1
Pin No.:
Checked By: TJE

Boring Crew: C. Johnson, J. Fletcher
Date Started: 8/18/21 Date Finished: 8/18/21
VTSPG NAD83: N 693866.78 ft E 1627199.54 ft
Station: 210+48 Offset: 49L
Ground Elevation: 812.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	Diedrich D-50 Track	C_E = 1.48

Groundwater Observations

Date	Depth (ft)	Notes
08/18/21	4.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-8, ORGANIC SOIL (OL/OH), soft, dark brown, moist, no structure, organic odor, roots, mps 0.5 in. (Forest Mat), Rec. = 2.0 ft, 0.0 ft - 0.4 ft				2-2-2-4 (4)		0.1	85.3	14.6
2.5		A-1-a, Silty SAND (SM), very loose, light brown, moist, no structure, no odor, mps 2 mm (Fluvial Deposits), 0.4 ft - 4.4 ft								
5.0		A-1-b, Poorly-graded SAND with Gravel (SP), very dense, brown, moist, no structure, no odor, mps 0.75 in. (Fluvial Deposits), 4.4 ft - 5.2 ft				50/2"				
		Rec. = 0.2 ft				Top of Bedrock @ 5.2 ft				
		5.2 ft - 6.0 ft, Note: Driller used roller bit to 6.0 ft.								
7.5		6.0 ft - 16.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately hard to hard, fresh to slightly weathered. Primary joint set is dipping vertical, wide, rough, fresh to discolored, tight, no infilling. No discernible secondary joint set. Good Rock, NQ, RMR=64 (MORETOWN FORMATION)	C1	100 (100)	4.5					
					3.5					
					3.5					
10.0					4					
					3.5					
12.5		11.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately hard, fresh to moderately weathered. Primary joint set is dipping vertical, close, rough, fresh to discolored. tight to open, minor silt infilling at 12.3 and 12.9 ft. No discernible secondary joint set. A moderately weathered zone present from 13.0 to 13.3 ft. Very Poor Rock, NQ, RMR=18 (MORETOWN FORMATION)	C2	80 (18)	4.5					
					1.5					
					1.5					
15.0					2.5					
					2					
		Hole stopped @ 16.0 ft								
17.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 4/1/21

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 30 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-106**
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/10/21 Date Finished: 8/10/21
VTSPG NAD83: N 693824.30 ft E 1627226.11 ft
Station: 209+22 Offset: 6L
Ground Elevation: 819.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/10/21	16.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.8 ft								
		(Fill) Poorly-graded SAND with Silt (SP-SM), medium dense, brown, dry, no structure, no odor, mps 0.75 in., 0.8 ft - 3.0 ft Rec. = 1.25 ft				13-12-10-6 (22)				
2.5		(Fill) Well-graded SAND with Gravel (SW), medium dense, brown, dry, no structure, no odor, mps 1.0 in., Rec. = 0.8 ft, 3.0 ft - 5.0 ft				7-7-8-7 (15)		43.6	49.6	6.8
5.0		(Fill) Poorly-graded SAND with Silt (SP-SM), loose, brown, dry, no structure, no odor, mps 1.25 in., Rec. = 1.3 ft, 5.0 ft - 7.0 ft				4-4-5-5 (9)				
7.5		(Fill) Well-graded GRAVEL with Sand (GW), medium dense, brown, dry, no structure, no odor, mps 1.25 in., Rec. = 0.9 ft, 7.0 ft - 10.0 ft				6-8-9-9 (17)		59.9	33.8	6.3
10.0		(Fill) Poorly-graded SAND (SP), loose, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.0 ft, 10.0 ft - 12.0 ft				3-3-3-4 (6)				
12.5		(Fill) Well-graded GRAVEL with Silt and Sand (GW), medium dense, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 0.7 ft, 12.0 ft - 14.7 ft				5-5-6-50/0' (11)		60.6	31.7	7.7
		Top of Bedrock @ 14.7 ft								
15.0		15.0 ft - 20.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately hard, fresh to slightly weathered. Primary joint set is dipping high to vertical, close to moderate, rough to smooth, fresh to discolored, tight to open. No discernible secondary joint set. Poor Rock, NQ, RMR=33 (MORETOWN FORMATION)	C1	90 (53)	1 1 1 1					
17.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 11/10/21

BOTTOM OF
FOOTING
EL 806.00

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-106**
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/10/21 Date Finished: 8/10/21
VTSPG NAD83: N 693824.30 ft E 1627226.11 ft
Station: 209+22 Offset: 6L
Ground Elevation: 819.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/10/21	16.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
					1					
20.0		20.0 ft - 25.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately hard to hard, fresh to slightly weathered. Primary joint set is dipping high to vertical, close, rough, fresh to discolored, tight to open. No discernible secondary joint set. Poor Rock, NQ, RMR=28 (MORETOWN FORMATION)	C2	100 (43)	1 1 1 1 1					
22.5										
25.0		Hole stopped @ 25.0 ft								
27.5										
30.0										
32.5										
35.0										
37.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 11/10/21

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 4

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 31 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-108**
Page No.: 1 of 2
Pin No.: 86053
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/10/21 Date Finished: 8/10/21
VTSPG NAD83: N 693819.03 ft E 1627235.89 ft
Station: 210+22 Offset: 5R
Ground Elevation: 819.7 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/10/21	16.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.9 ft								
2.5		(Fill) Well-graded SAND with Gravel (SW), medium dense, brown, dry, no structure, no odor, mps 1.0 in., 0.9 ft - 5.0 ft Rec. = 1.75 ft				9-13-11-9 (24)		55.4	38.5	6.1
5.0		(Fill) Poorly-graded SAND with Gravel (SP), loose, brown, dry, no structure, no odor, mps 1.0 in., Rec. = 0.9 ft, 5.0 ft - 16.2 ft				5-5-5-5 (10)				
10.0		(Fill) Poorly-graded SAND with Gravel (SP), very loose, brown, moist, no structure, no odor, mps 1.0 in., Rec. = 0.9 ft, 10.0 ft				2-2-2-2 (4)		64.8	28.7	6.5
15.0		(Fill) Poorly-graded SAND with Gravel (SP), medium dense, brown, wet, no structure, no odor, mps 1.0 in.,, 15.0 ft				4-5-7-6 (12)				
		16.2 ft - 17.0 ft, Note: Sample returned various size pieces of weathered rock. (Weathered Bedrock)								
17.5		17.0 ft - 22.0 ft, Gray, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately hard to hard, fresh to slightly weathered. Primary joint set is dipping high angle, close to moderate, smooth to rough, fresh to discolored, tight to open, no infilling. No discernible secondary joint set. Poor Rock, NQ, RMR=28 (MORETOWN FORMATION)	C1	100 (25)	1.5 1	Top of Bedrock @ 17.0 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
FOOTING
EL 806.00

BORING LOG 20076?_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 3/3/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-108**
Page No.: 2 of 2
Pin No.: 86053
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/10/21 Date Finished: 8/10/21
VTSPG NAD83: N 693819.03 ft E 1627235.89 ft
Station: 210+22 Offset: 5R
Ground Elevation: 819.7 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/10/21	16.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
20.0					1 1 1					
22.5		22.0 ft - 27.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately hard to hard, fresh to slightly weathered. Primary joint set is dipping high angle to vertical, close to moderate, smooth to rough, fresh to discolored, tight to open, no infilling. No discernible secondary joint set. Poor Rock, NQ, RMR=36 (MORETOWN FORMATION)	C2	100 (53)	1 1 1.5 2 1					
27.5		Hole stopped @ 27.0 ft								

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 3/3/22

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 5

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 32 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: **B-109**
Page No.: 1 of 1
Pin No.: 86053
Checked By: TJE

Boring Crew: C. Johnson, H. Hollauer
Date Started: 8/23/21 Date Finished: 8/23/21
VTSPG NAD83: N 693807.44 ft E 1627282.70 ft
Station: 210+33 Offset: 52R
Ground Elevation: 816.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig: Diedrich D-50 Track	C_E = 1.48	

Groundwater Observations

Date	Depth (ft)	Notes
08/23/21	12.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-8, Silty SAND (SM), medium dense, medium brown, moist, no structure, no odor, trace roots, mps 2 mm (Forest Mat), Rec. = 1.3 ft, 0.0 ft - 0.3 ft				12-10-6-4 (16)				
2.5		Medium gray, broken fragments of fine grained GRANOFELS, dry. (Rock/Rock Fragments), 0.3 ft - 4.0 ft Cobbly from 2.5 to 4.0 ft, 2.5 ft Note: Advanced solid-stem auger to 4.0 ft., 3.0 ft								
5.0		4.0 ft - 14.0 ft, Gray and white, GRANOFELS, aphanitic to fine grained, very hard to hard, fresh to slightly weathered. Primary joint set is dipping moderately, close to moderate, smooth, fresh to discolored, tight, no infilling. No discernible secondary joint set. Good Rock, NQ, RMR=61 (MORETOWN FORMATION)	C1	93 (87)	4 4 3 3 3	Top of Bedrock @ 4.0 ft				
7.5										
10.0		9.0 ft, Good Rock, NQ, RMR=64 (MORETOWN FORMATION)	C2	92 (100)	3 3 2 3					
12.5		13.0 ft, Similar to C1. Good Rock, NQ, RMR=64 (MORETOWN FORMATION)	C3	100 (100)	3					
		Hole stopped @ 14.0 ft								
15.0		Remarks: Distance from top of bridge deck/pavement to stream approximately 28 ft. AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.								
17.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 84.GPJ VERMONT.AOT.GDT 3/23/22

BOTTOM OF
FOOTING
EL 809.00

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: B-110
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/11/21 Date Finished: 8/11/21
VTSPG NAD83: N 693718.14 ft E 1627178.40 ft
Station: 209+01 Offset: 6R
Ground Elevation: 822.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig: CME 45 Truck	C_E = 1.51	

Groundwater Observations

Date	Depth (ft)	Notes
08/11/21	15.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.8 ft								
		(Fill) Silty SAND (SM), dense, brown, dry, no structure, no odor, mps 0.5 in., 0.8 ft - 5.0 ft Rec. = 1.3 ft				12-14-20-14 (34)				
2.5										
5.0		(Fill) Poorly-graded SAND with Silt (SP-SM), dense, brown, dry, no structure, no odor, mps 1.0 in., Rec. = 1.4 ft, 5.0 ft - 11.0 ft				5-7-11-9 (18)				
7.5										
10.0		Rec. = 1.4 ft				3-3-10-19 (13)				
12.5		A-8, ORGANIC SOIL (OL/OH), stiff, dark brown, moist, no structure, organic odor, mps 0.4 mm (Forest Mat), 11.0 ft - 12.2 ft Note: Drilling action indicates a strata change at 12.2 ft depth likely to fluvial deposits. (Fluvial Deposits), 12.2 ft - 14.5 ft								
15.0		Top of Bedrock @ 14.5 ft								
17.5		16.0 ft - 19.5 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderately to hard, slightly weathered. Primary joint set is dipping vertically, close, rough, fresh to discolored, tight. No discernible secondary joint set. Poor Rock, NQ, RMR=23 (MORETOWN FORMATION)	C1	79 (17)	2 3.5 1.5					

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 84.GPJ VERMONT.AOT.GDT 1/11/21

BOTTOM OF
FOOTING
EL 806.50

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 6

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241059-100 BR 84
Worcester, Vermont

Boring No.: B-110
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/11/21 Date Finished: 8/11/21
VTSPG NAD83: N 693718.14 ft E 1627178.40 ft
Station: 209+01 Offset: 6R
Ground Elevation: 822.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/11/21	15.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
					2.5					
20.0		19.5 ft - 21.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, moderate to hard, slightly weathered. Primary joint set is dipping vertically, close, rough, fresh to discolored, tight. No discernible secondary joint set. Poor Rock, NQ, RMR=28 (MORETOWN FORMAATION)	C2	39 (39)	1.5					
		Hole stopped @ 21.0 ft								
22.5										
25.0										
27.5										
30.0										
32.5										
35.0										
37.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 84.GPJ VERMONT AOT.GDT 1/1/021

NOTES

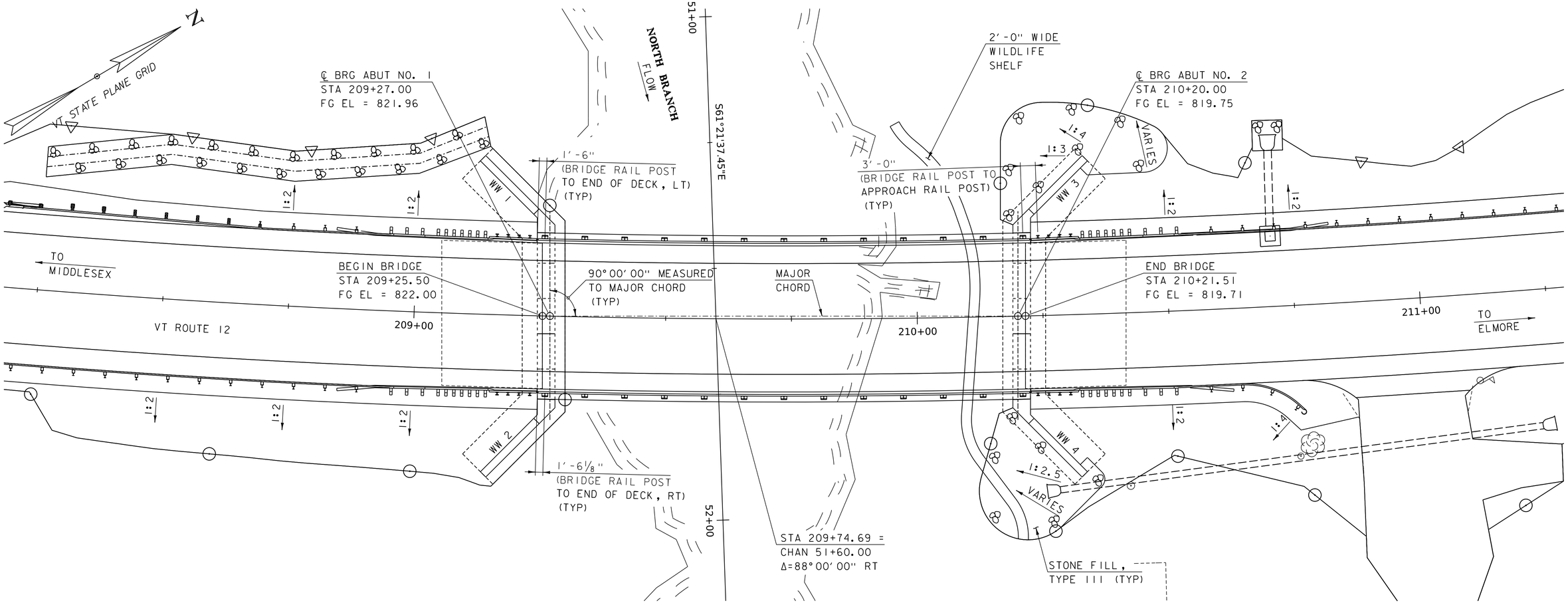
1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

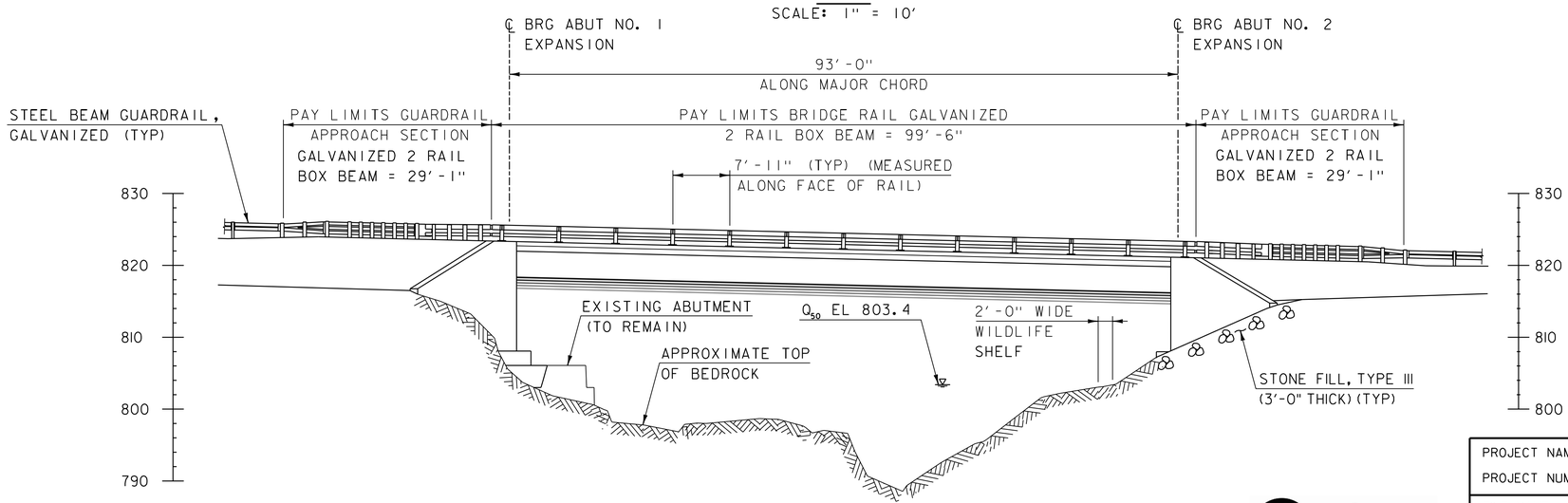
PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 7

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 34 OF 370



PLAN
SCALE: 1" = 10'



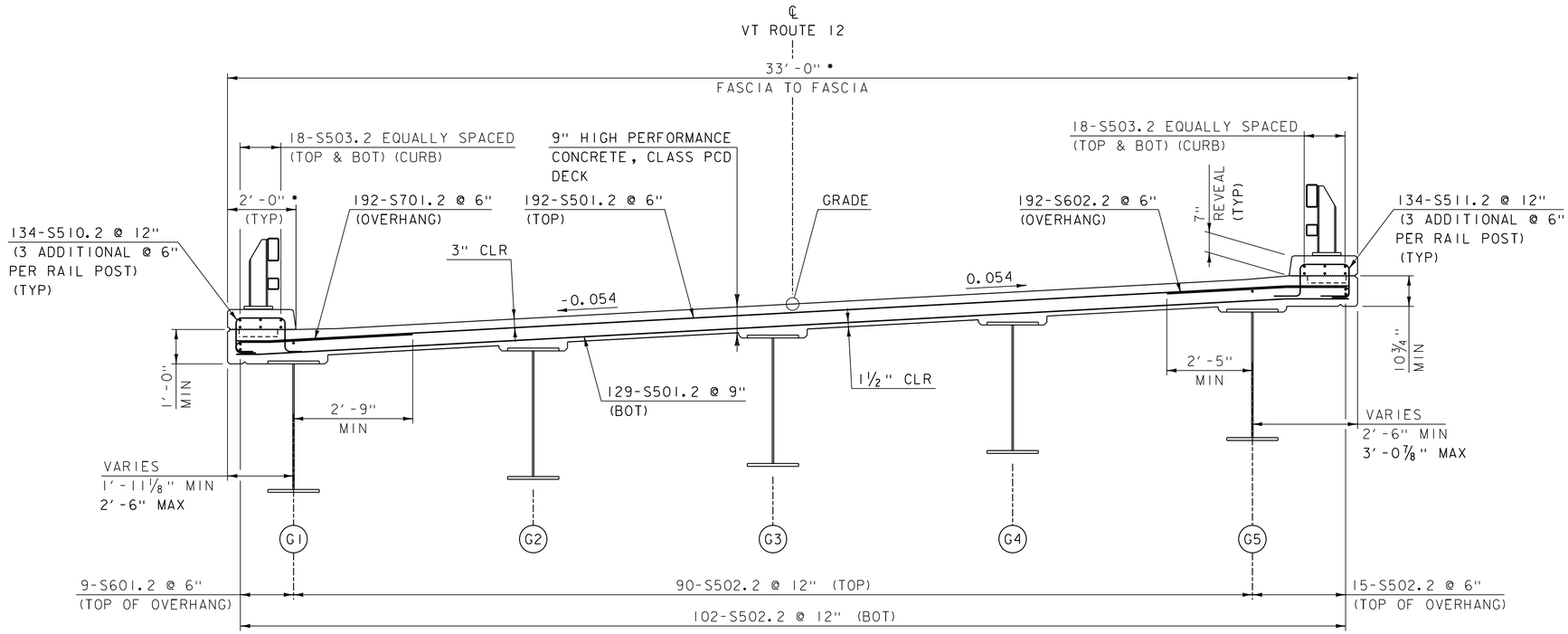
ELEVATION
SCALE: 1" = 10'

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053pe.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
PLAN AND ELEVATION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 35 OF 370



BRIDGE STRUCTURAL TYPICAL SECTION

SCALE: ½" = 1′-0"

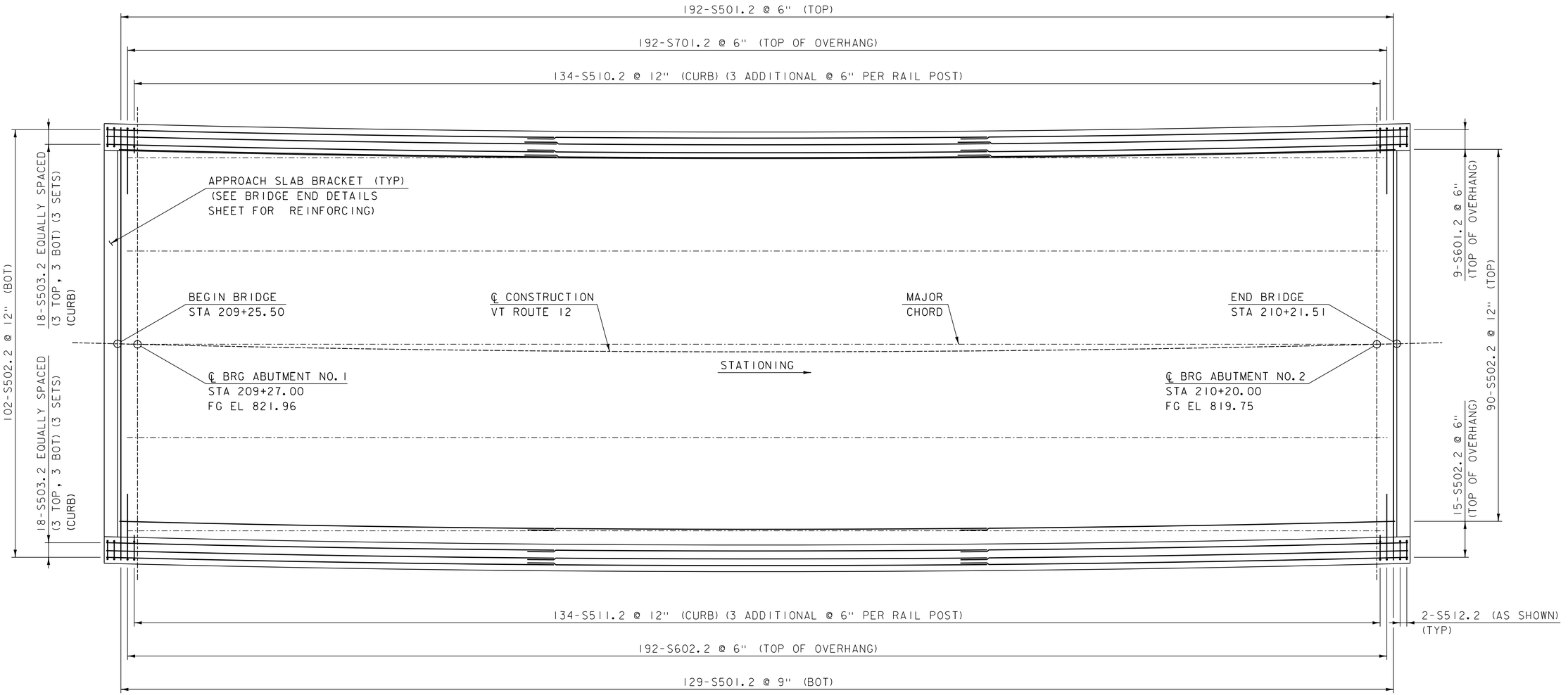
* RADIAL DIMENSION

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053supl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
BRIDGE STRUCTURAL TYPICAL SECTION	SHEET 36 OF 370



DECK REINFORCING PLAN

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

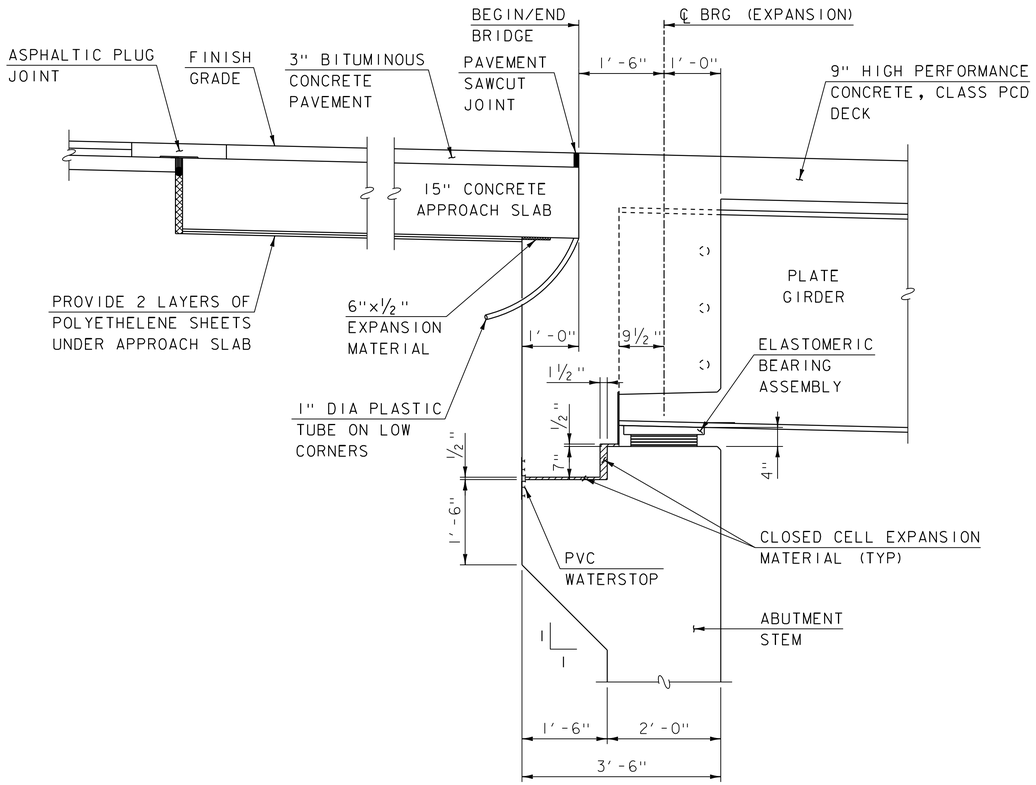
NOTES

1. MAINTAIN 3" CLEAR COVER UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

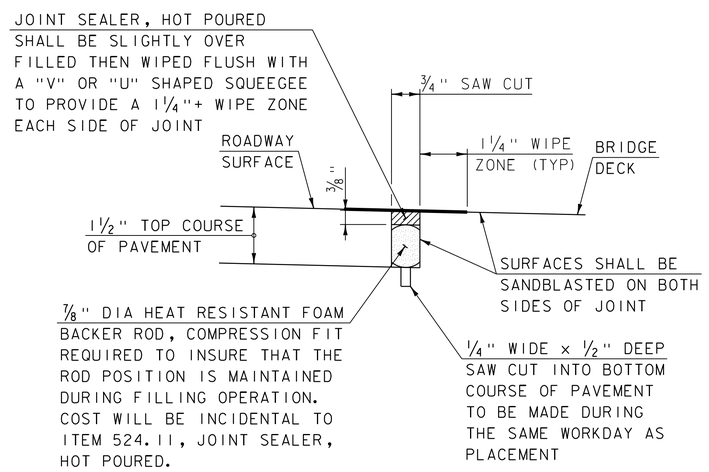
FILE NAME: z86e053sup2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
DECK REINFORCING PLAN

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 37 OF 370



BRIDGE END DETAIL

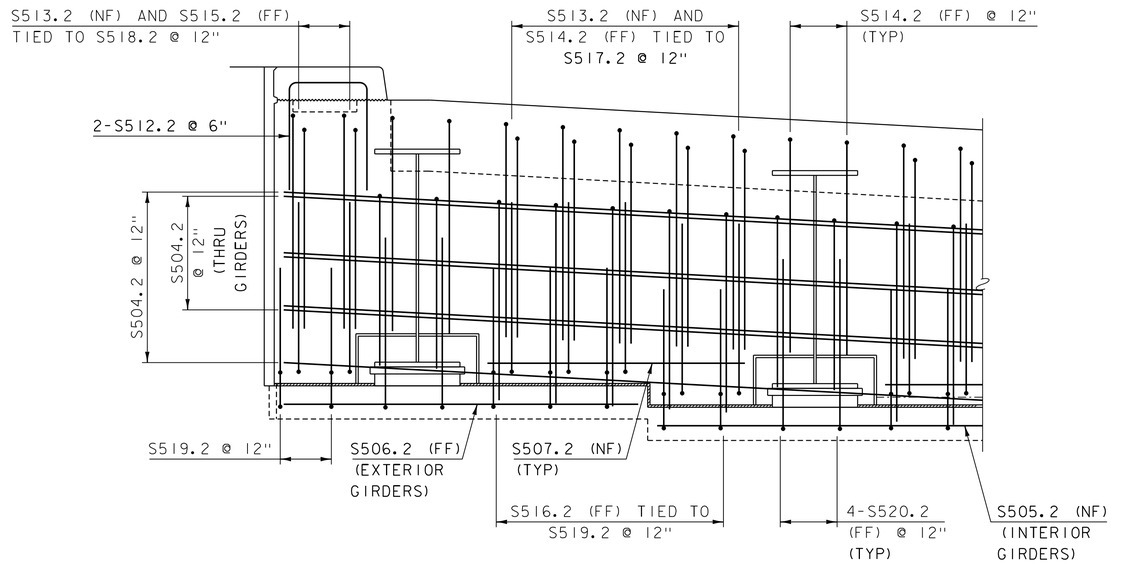
(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 OPPOSITE HAND)
SCALE: ¾" = 1'-0"



NOTES
1. JOINTS SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. JOINTS SHALL BE CLEANED PRIOR TO APPLYING THE JOINT SEALER.
2. SAW CUT JOINT WILL BE PAID OR UNDER ITEM 524.11, JOINT SEALER, HOT POURED.

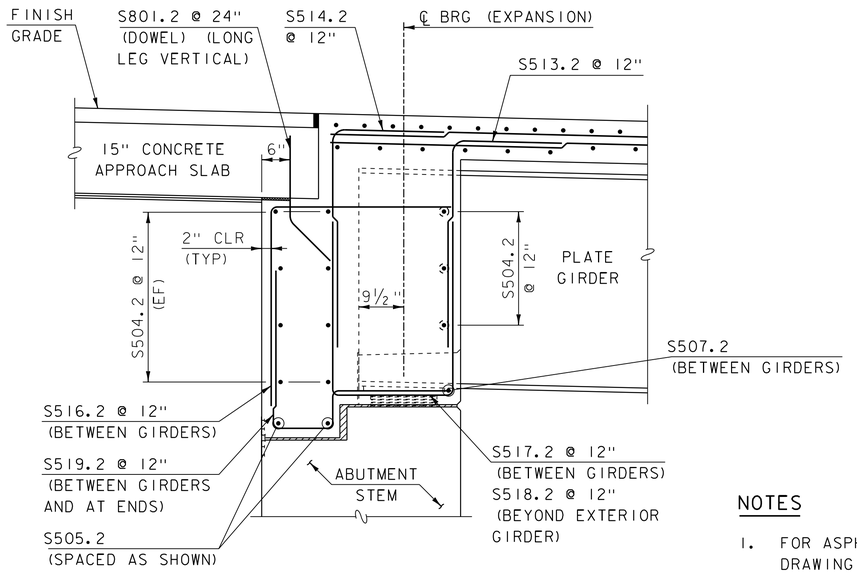
SAW CUT JOINT DETAIL

NOT TO SCALE



BRIDGE END REINFORCING PARTIAL ELEVATION

SCALE: ¾" = 1'-0"



BRIDGE END REINFORCING DETAIL

SCALE: ¾" = 1'-0"

NOTES
1. FOR ASPHALTIC PLUG JOINT DETAIL, SEE STANDARD DRAWING S-400.
2. MAINTAIN 3" CLEAR COVER UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3. REFERENCE ELASTOMERIC BEARING DETAILS SHEET FOR CURTAIN WALL BEARING BOXOUT DETAILS.

LEGEND

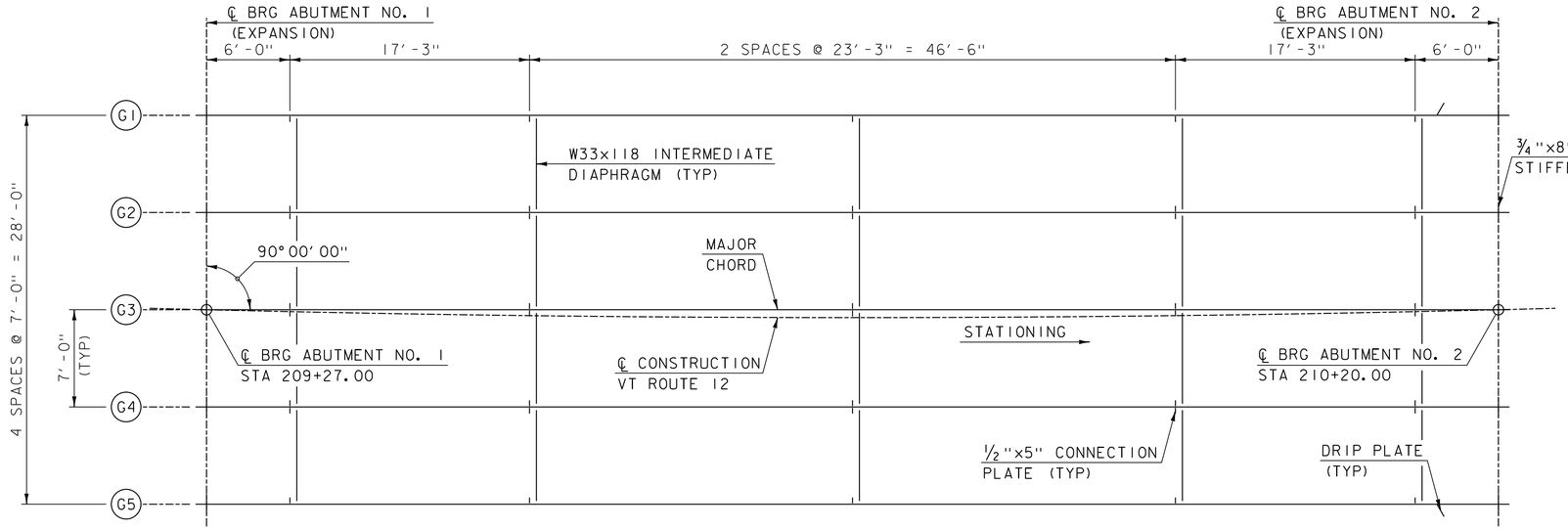
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

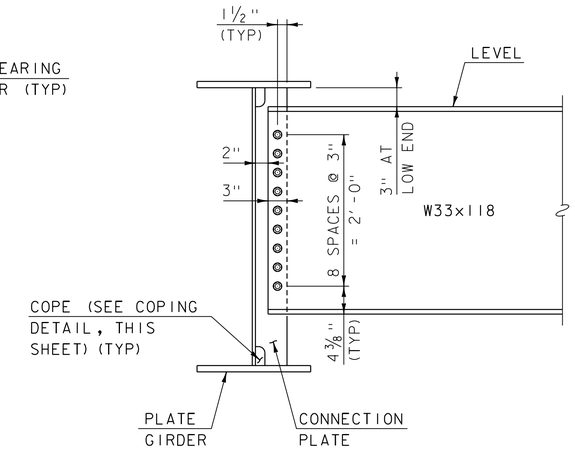
FILE NAME: z86e053sup3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BRIDGE END DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 38 OF 370



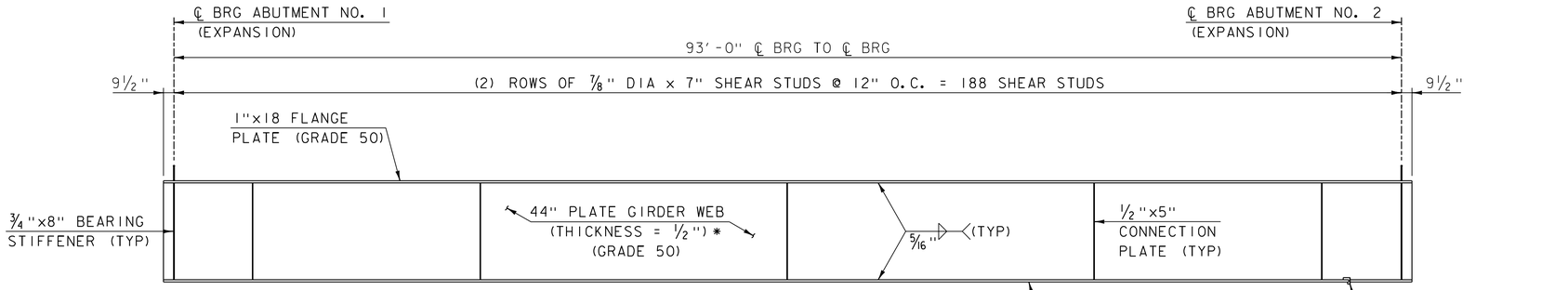
FRAMING PLAN

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



INTERMEDIATE DIAPHRAGM

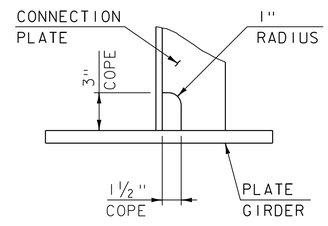
SCALE: 1" = 1'-0"



* DENOTES CHARPY V-NOTCH TEST REQUIREMENT

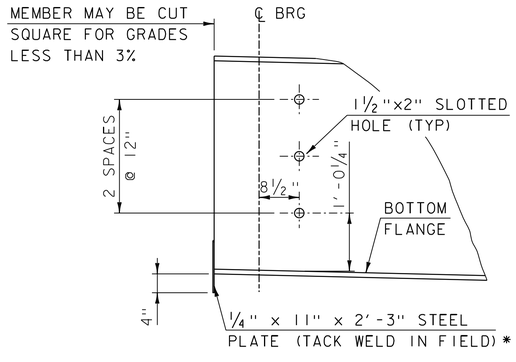
PLATE GIRDER ELEVATION

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



COPING DETAIL

NOT TO SCALE



GIRDER END DETAIL

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

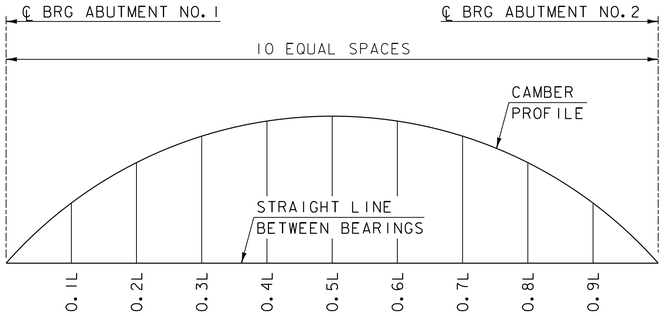
* INCIDENTAL TO ITEM 506.55 STRUCTURAL STEEL, PLATE GIRDER. REFERENCE ELASTOMERIC BEARING DETAILS SHEET.

NOTES

1. FOR DRIP PLATE DETAIL, SEE STANDARD DRAWING S-600.
2. FOR ADDITIONAL DIAPHRAGM, WELD TERMINATION/COPING AND CONNECTION/BEARING PLATE DETAILS, SEE STANDARD DRAWING S-601.

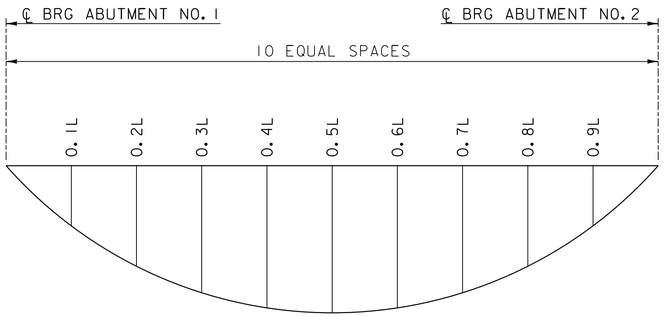
HOYLE TANNER

PROJECT NAME: WORCESTER	
PROJECT NUMBER: BF 0241(59)	
FILE NAME: z86e053sup4.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
FRAMING PLAN AND GIRDER ELEVATION	SHEET 39 OF 370



CAMBER DIAGRAM

NOT TO SCALE



DEAD LOAD DEFLECTION DIAGRAM

NOT TO SCALE

CAMBER AND DEAD LOAD DEFLECTION TABLE AT TENTH POINTS (INCHES)

	POINT ON GIRDER	℄ BRG ABUT NO. 1	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG ABUT NO. 2
GIRDER 1	STEEL DL	0.000	0.183	0.348	0.476	0.558	0.585	0.558	0.476	0.348	0.183	0.000
	CONCRETE DL	0.000	0.603	1.140	1.560	1.826	1.918	1.826	1.560	1.140	0.603	0.000
	SUPERIMPOSED DL	0.000	0.044	0.084	0.114	0.134	0.141	0.134	0.114	0.084	0.044	0.000
	TOTAL DEFLECTION	0.000	0.830	1.572	2.150	2.518	2.644	2.518	2.150	1.572	0.830	0.000
	RESIDUAL CAMBER	0.000	0.419	0.744	0.977	1.116	1.163	1.116	0.977	0.744	0.419	0.000
	TOTAL CAMBER	0.000	1.249	2.316	3.127	3.634	3.807	3.634	3.127	2.316	1.249	0.000

CAMBER AND DEAD LOAD DEFLECTION TABLE AT TENTH POINTS (INCHES)

	POINT ON GIRDER	℄ BRG ABUT NO. 1	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG ABUT NO. 2
GIRDERS 2 - 4	STEEL DL	0.000	0.200	0.381	0.521	0.610	0.641	0.610	0.521	0.381	0.200	0.000
	CONCRETE DL	0.000	0.741	1.401	1.919	2.247	2.359	2.247	1.919	1.401	0.741	0.000
	SUPERIMPOSED DL	0.000	0.041	0.078	0.107	0.125	0.131	0.125	0.107	0.078	0.041	0.000
	TOTAL DEFLECTION	0.000	0.982	1.860	2.547	2.982	3.131	2.982	2.547	1.860	0.982	0.000
	RESIDUAL CAMBER	0.000	0.419	0.744	0.977	1.116	1.163	1.116	0.977	0.744	0.419	0.000
	TOTAL CAMBER	0.000	1.401	2.604	3.524	4.098	4.294	4.098	3.524	2.604	1.401	0.000

CAMBER AND DEAD LOAD DEFLECTION TABLE AT TENTH POINTS (INCHES)

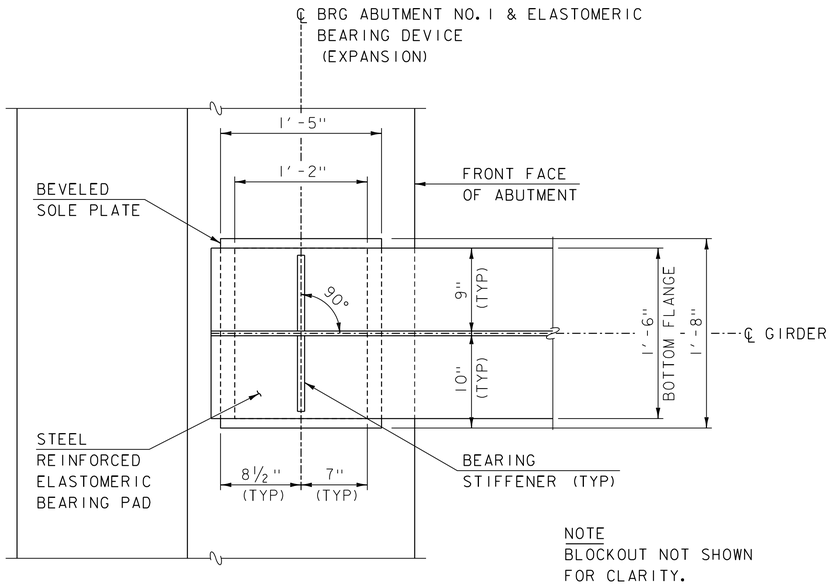
	POINT ON GIRDER	℄ BRG ABUT NO. 1	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG ABUT NO. 2
GIRDER 5	STEEL DL	0.000	0.183	0.348	0.476	0.558	0.585	0.558	0.476	0.348	0.183	0.000
	CONCRETE DL	0.000	0.690	1.304	1.786	2.092	2.197	2.092	1.786	1.304	0.690	0.000
	SUPERIMPOSED DL	0.000	0.042	0.080	0.109	0.128	0.135	0.128	0.109	0.080	0.042	0.000
	TOTAL DEFLECTION	0.000	0.915	1.732	2.371	2.778	2.917	2.778	2.371	1.732	0.915	0.000
	RESIDUAL CAMBER	0.000	0.419	0.744	0.977	1.116	1.163	1.116	0.977	0.744	0.419	0.000
	TOTAL CAMBER	0.000	1.334	2.476	3.348	3.894	4.080	3.894	3.348	2.476	1.334	0.000

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

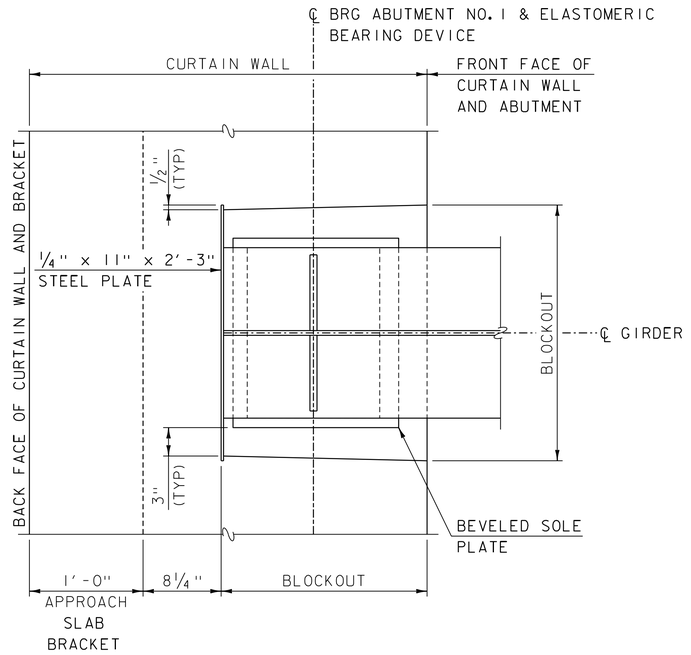
FILE NAME: z86e053sup5.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
CAMBER AND DEAD LOAD DEFLECTION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN



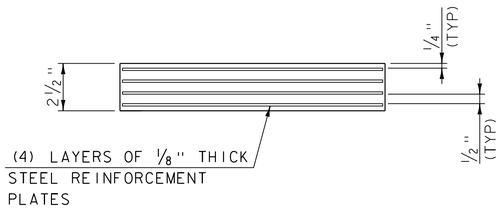
PLAN

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 OPPOSITE HAND)
SCALE: 1½" = 1'-0"



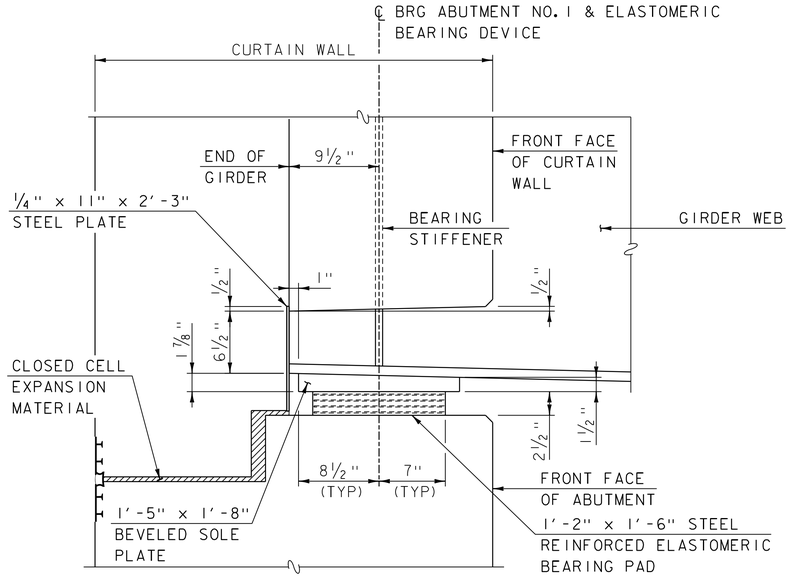
CONCRETE CURTAIN WALL AROUND BEARING DEVICE

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 OPPOSITE HAND)
SCALE: 1½" = 1'-0"



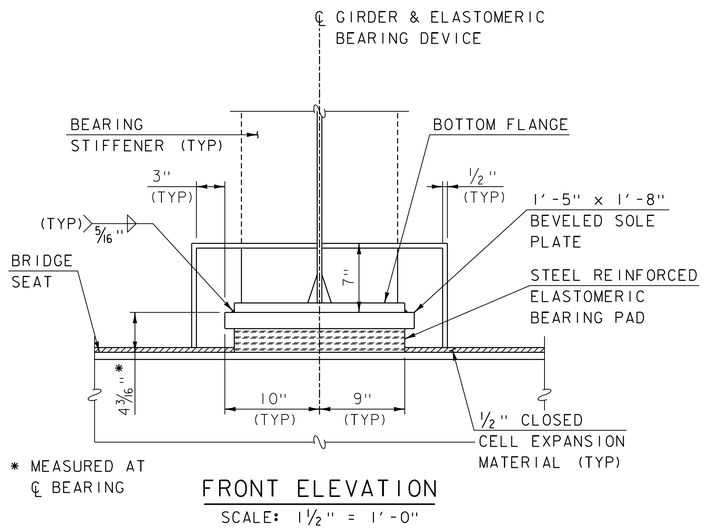
ELASTOMERIC BEARING PAD SECTION

SCALE: 3" = 1'-0"



SIDE ELEVATION

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 OPPOSITE HAND)
SCALE: 1½" = 1'-0"



FRONT ELEVATION

SCALE: 1½" = 1'-0"

ELASTOMERIC BEARING NOTES

1. BEARINGS SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF STANDARD SPECIFICATIONS SECTION 531 AND 731.
2. ALL REINFORCEMENT BETWEEN LAYERS OF ELASTOMER SHALL BE STEEL AASHTO M270M/M270 GRADE 36. ALL INTERNAL STEEL PLATES SHALL BE BLAST CLEANED AND FREE OF COATINGS, RUST AND MILL SCALE. THE PLATES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. STEEL REINFORCED ELASTOMERIC BEARINGS SHALL HAVE A MINIMUM OF ¼" EDGE SEAL OF ELASTOMER INTEGRAL WITH BEARING OVER ALL INTERNAL SURFACES.
4. THE STEEL REINFORCED ELASTOMERIC BEARING PADS SHALL NOT BE VULCANIZED TO THE STEEL SOLE PLATES.
5. THE ELASTOMER SHALL MEET THE REQUIREMENTS OF LOW TEMPERATURE ZONE D, GRADE 4.
6. THE CONCRETE UNDER THE BEARING DEVICE SHALL BE LEVEL.
7. CENTER THE ELASTOMERIC BEARING PAD UNDER THE SOLE PLATE DURING ERECTION.
8. GIRDERS SHALL BE ERECTED WHEN THE STEEL TEMPERATURE IS BETWEEN 25° AND 65°. IF THE GIRDERS ARE ERECTED AT OTHER STEEL TEMPERATURES AND THE BEARING PAD SHEAR DEFLECTION EXCEEDS ⅛", THE GIRDERS SHALL BE JACKED FROM THE GROUND IN FRONT OF THE ABUTMENT AND THE ELASTOMERIC BEARINGS RECENTERED AND RESET TO PLUMB (UNDEFORMED SHAPE) AT 45° +/- 10°.
9. THE ELASTOMER WAS DESIGNED WITH A SHEAR MODULUS OF 110 PSI.

DESIGN CRITERIA (SERVICE LIMIT STATE)

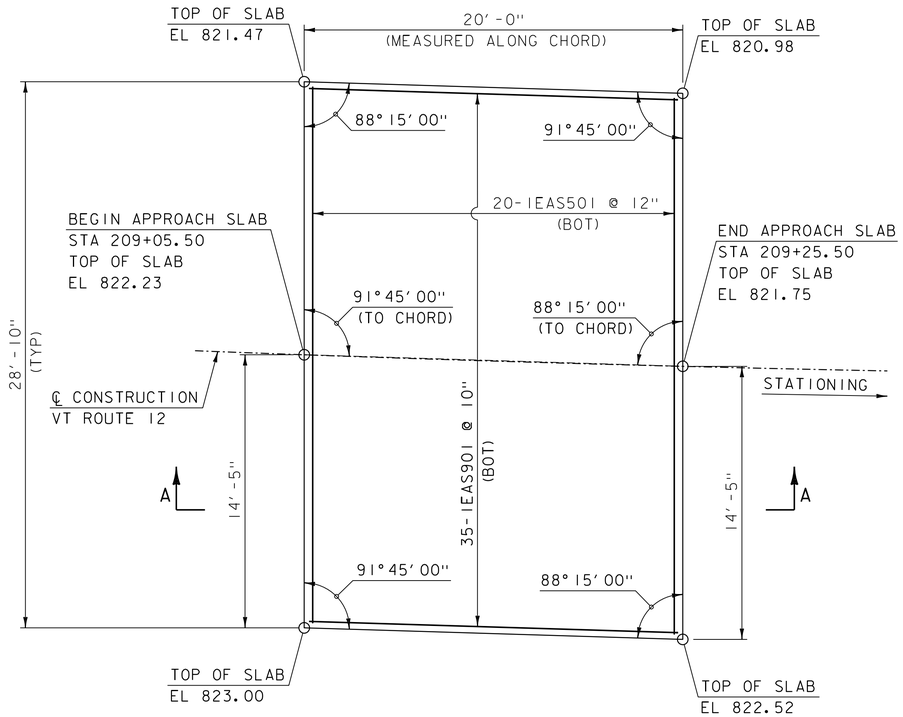
AASHTO METHOD A
DEAD LOAD = 67.1 KIPS
LIVE LOAD = 70.2 KIPS
LONGITUDINAL MOVEMENT = 0.42 INCHES AT EACH ABUTMENT

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

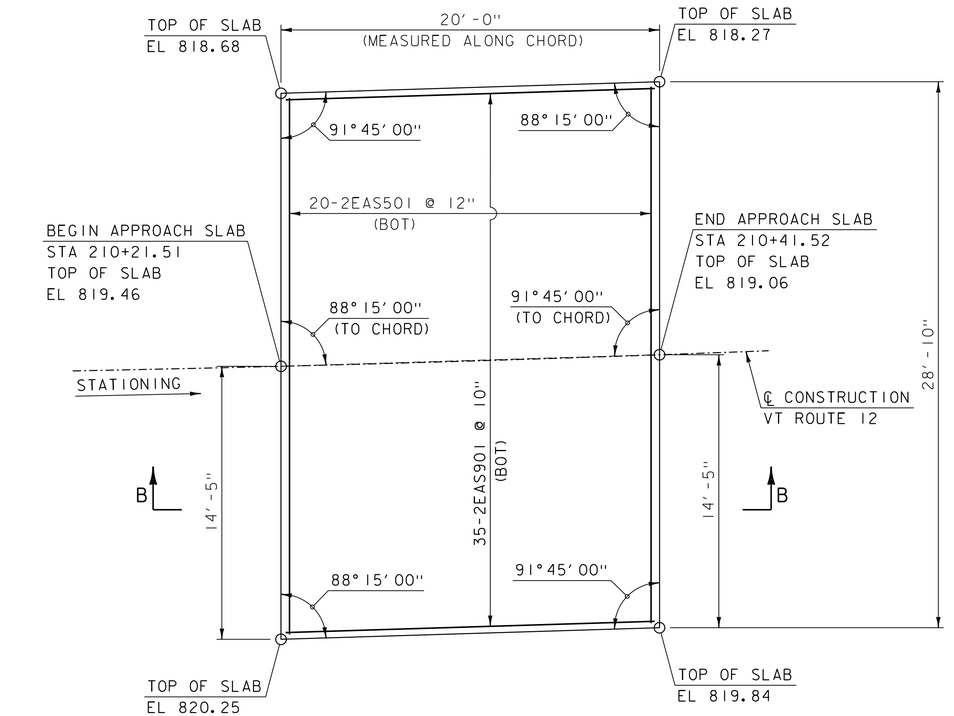
FILE NAME: z86e053sup6.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ELASTOMERIC BEARING DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 41 OF 370



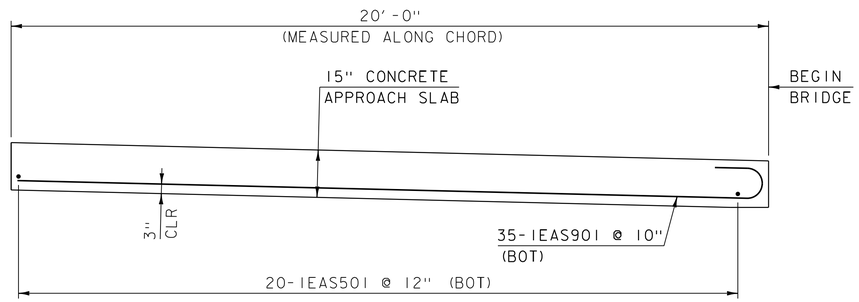
APPROACH SLAB NO. 1 PLAN

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



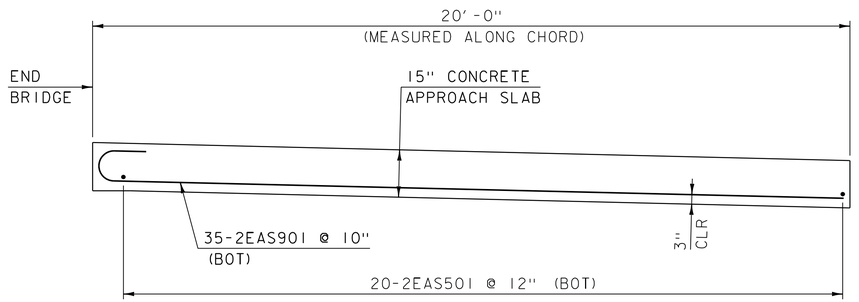
APPROACH SLAB NO. 2 PLAN

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



SECTION A-A

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

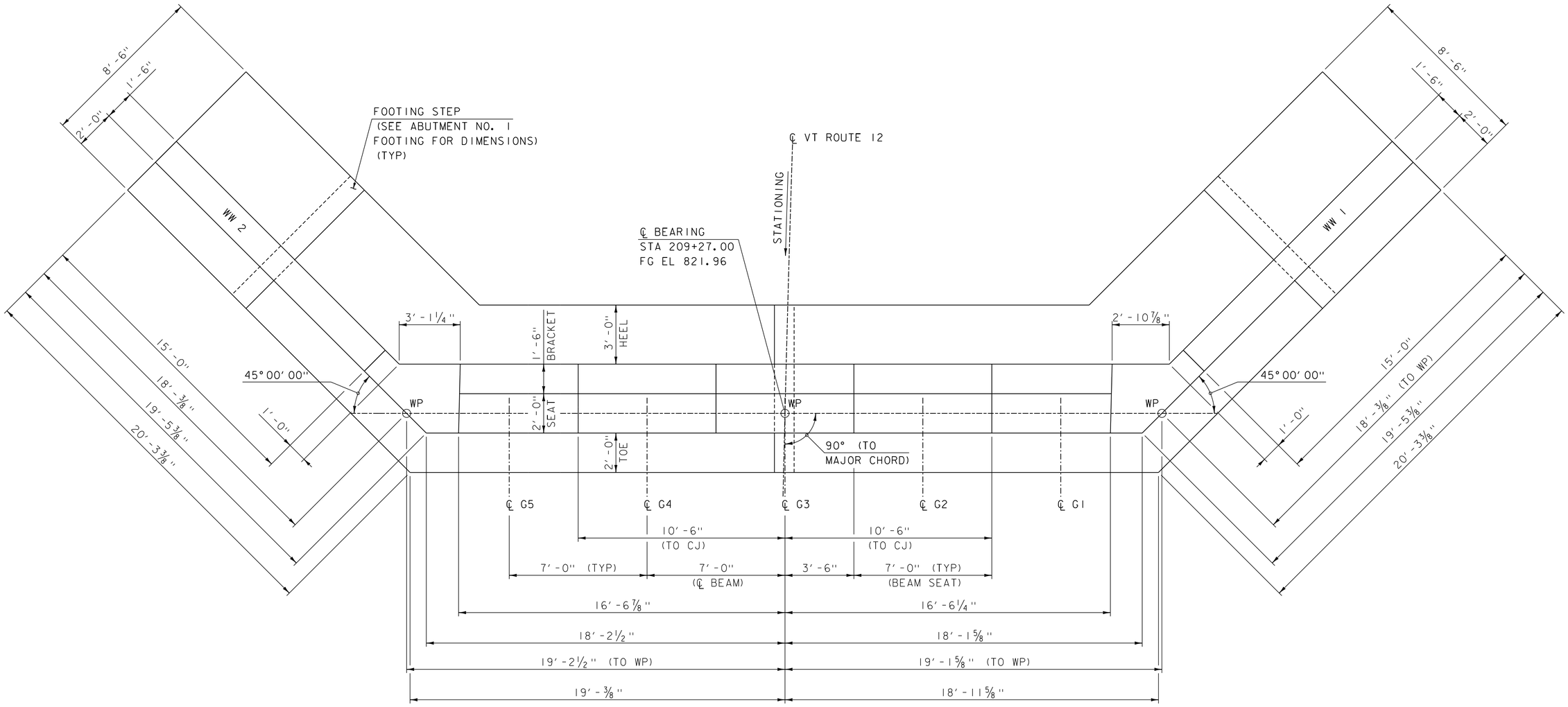


SECTION B-B

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053app.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
APPROACH SLAB DETAILS	SHEET 42 OF 370

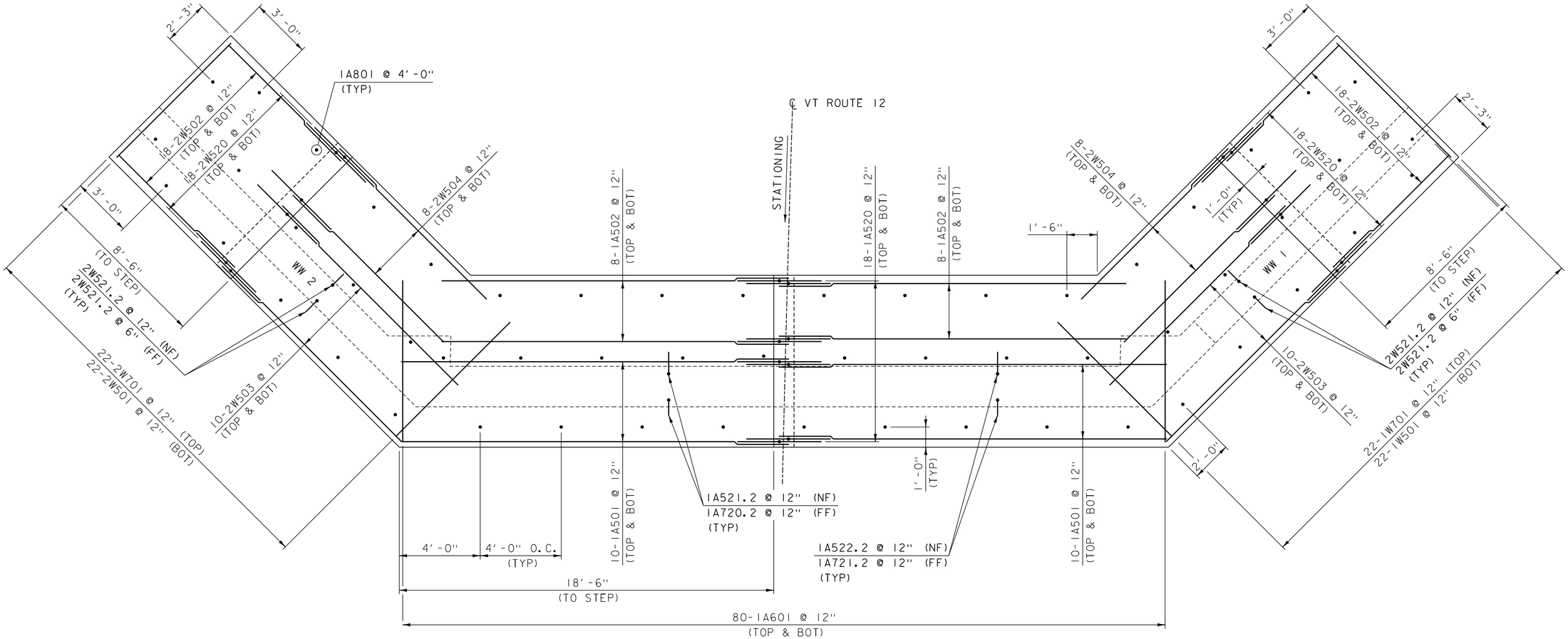


ABUTMENT NO. 1 PLAN

SCALE: ⅜" = 1'-0"

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053subl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
ABUTMENT NO. 1 PLAN	SHEET 43 OF 370



ABUTMENT NO. 1 FOOTING REINFORCING PLAN

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

NOTES

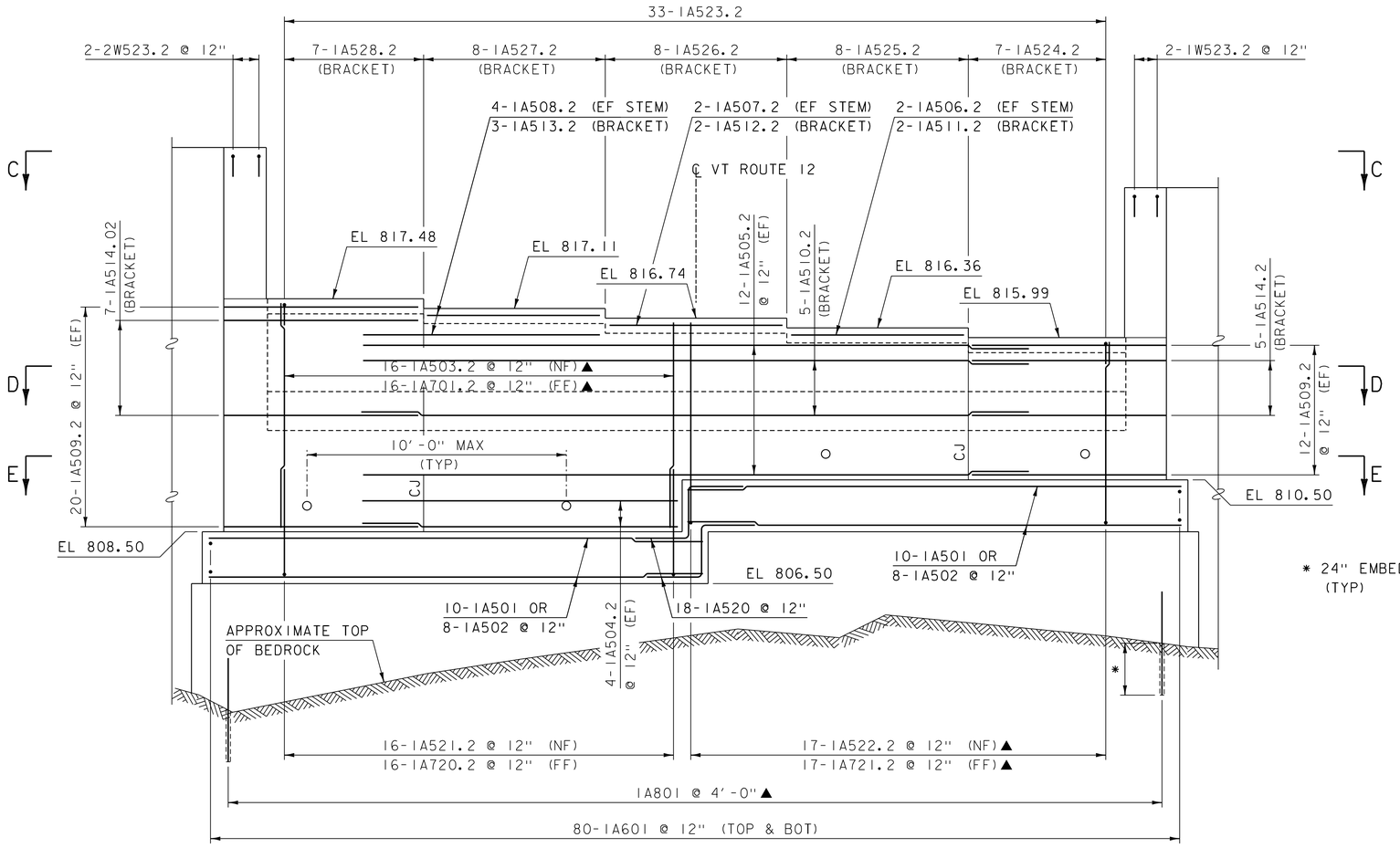
1. 3" CLEAR UNLESS SPECIFIED ON PLANS.
2. SUBFOOTING GEOMETRY SHALL BE DETERMINED IN THE FIELD ONCE COMPETENT BEDROCK HAS BEEN EXPOSED.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

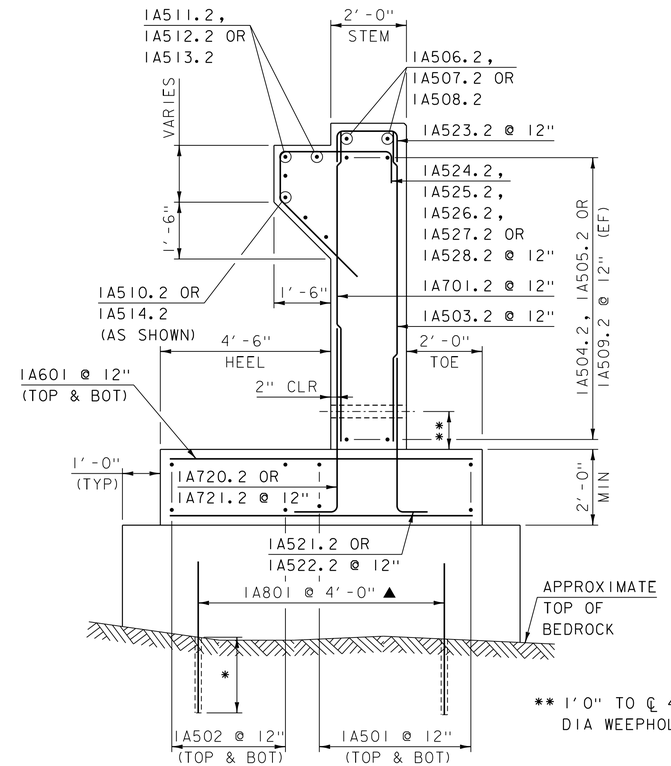
FILE NAME: z86e053sub2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO.1 FOOTING

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 44 OF 370



ABUTMENT NO. 1 ELEVATION

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



* 24" EMBEDMENT (TYP)

** 1'0" TO ℄ 4" DIA WEEPHOLE

ABUTMENT NO. 1 TYPICAL SECTION

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

NOTES

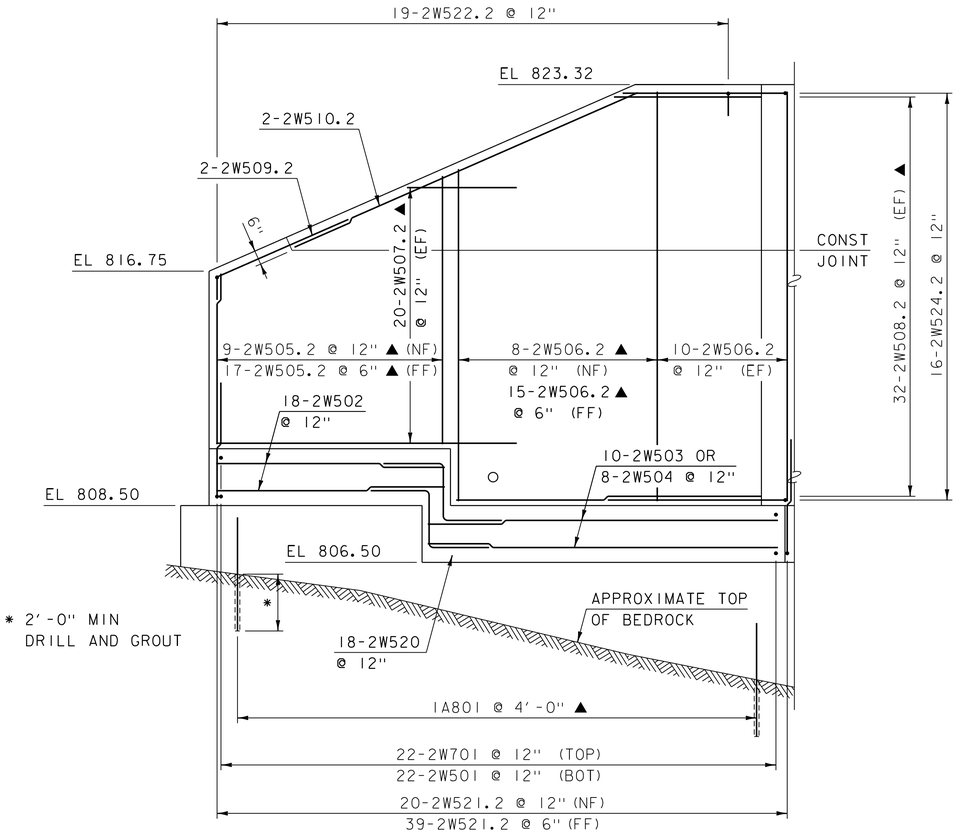
1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 1 FOOTING REINFORCING SHEET. FOR WINGWALL DETAILS SEE ABUTMENT NO. 1 WINGWALL SHEET. FOR SECTIONS C-C, D-D AND E-E, SEE ABUTMENT NO. 1 DETAILS SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

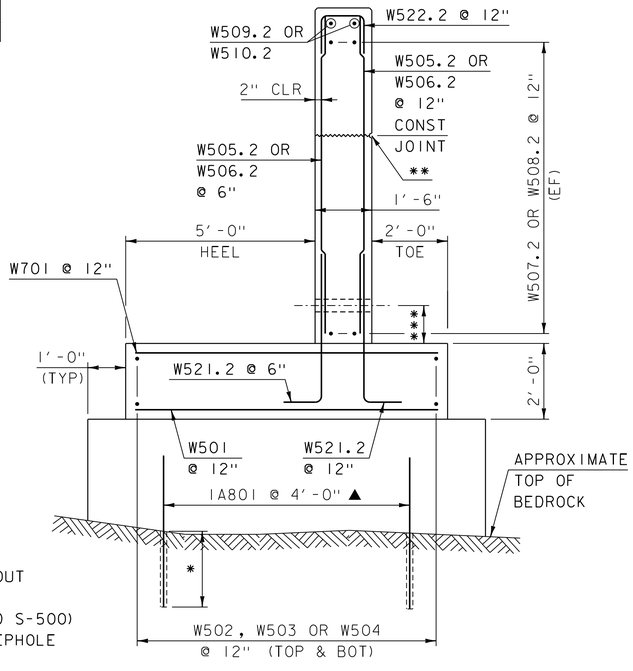
FILE NAME: z86e053subl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 1 ELEVATION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 45 OF 370



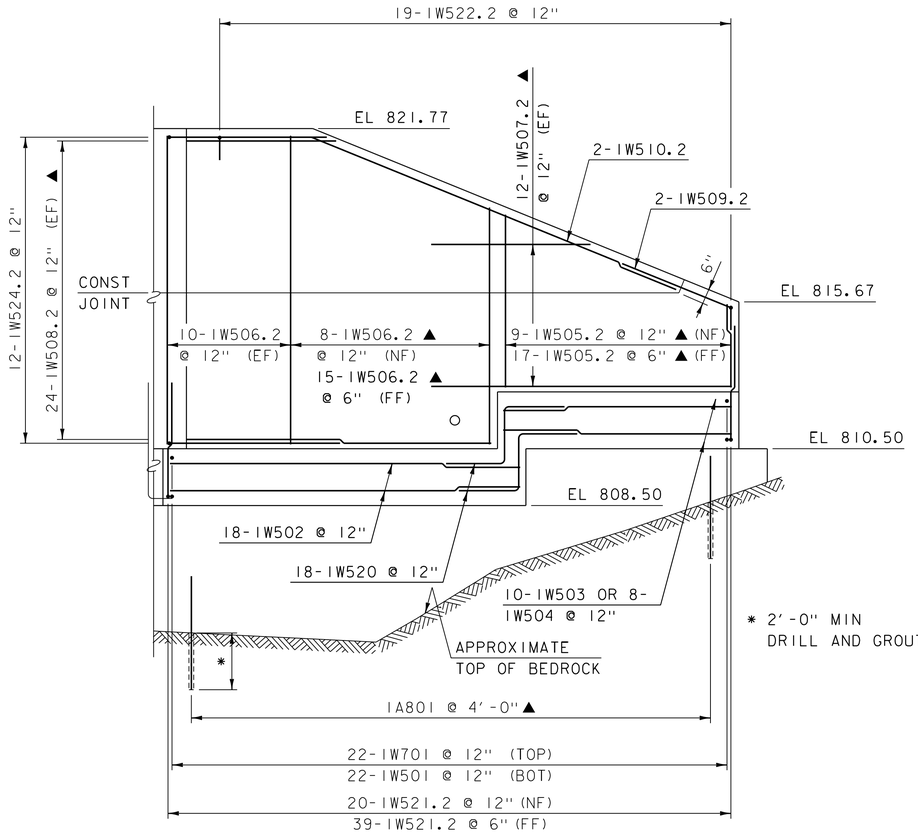
WINGWALL NO. 2 ELEVATION

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



WINGWALL TYPICAL SECTION

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



WINGWALL NO. 1 ELEVATION

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 1 FOOTING REINFORCING SHEET.
3. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

LEGEND

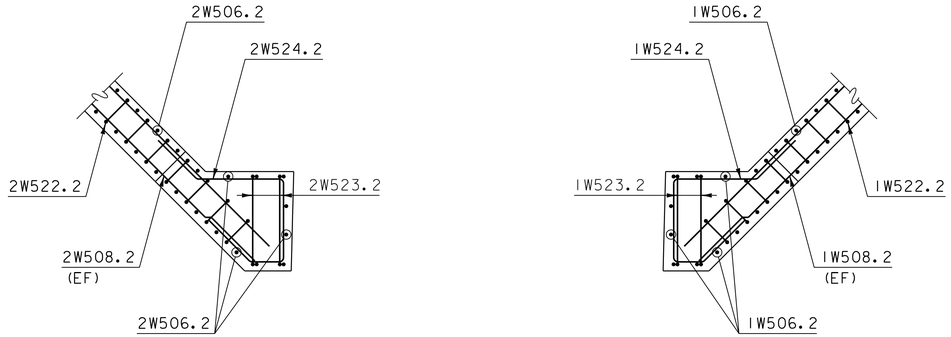
NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

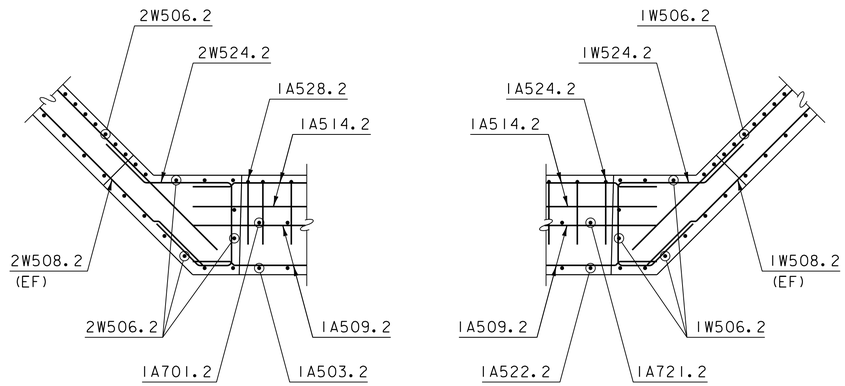
FILE NAME: z86e053sub3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 1 WINGWALLS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN



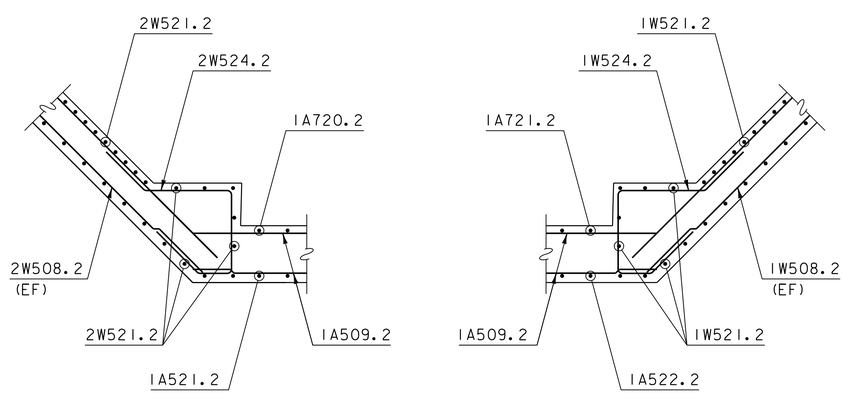
SECTION C-C

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



SECTION D-D

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



SECTION E-E

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR LOCATION OF SECTIONS C-C, D-D AND E-E, SEE ABUTMENT NO. 1 ELEVATION SHEET.

LEGEND

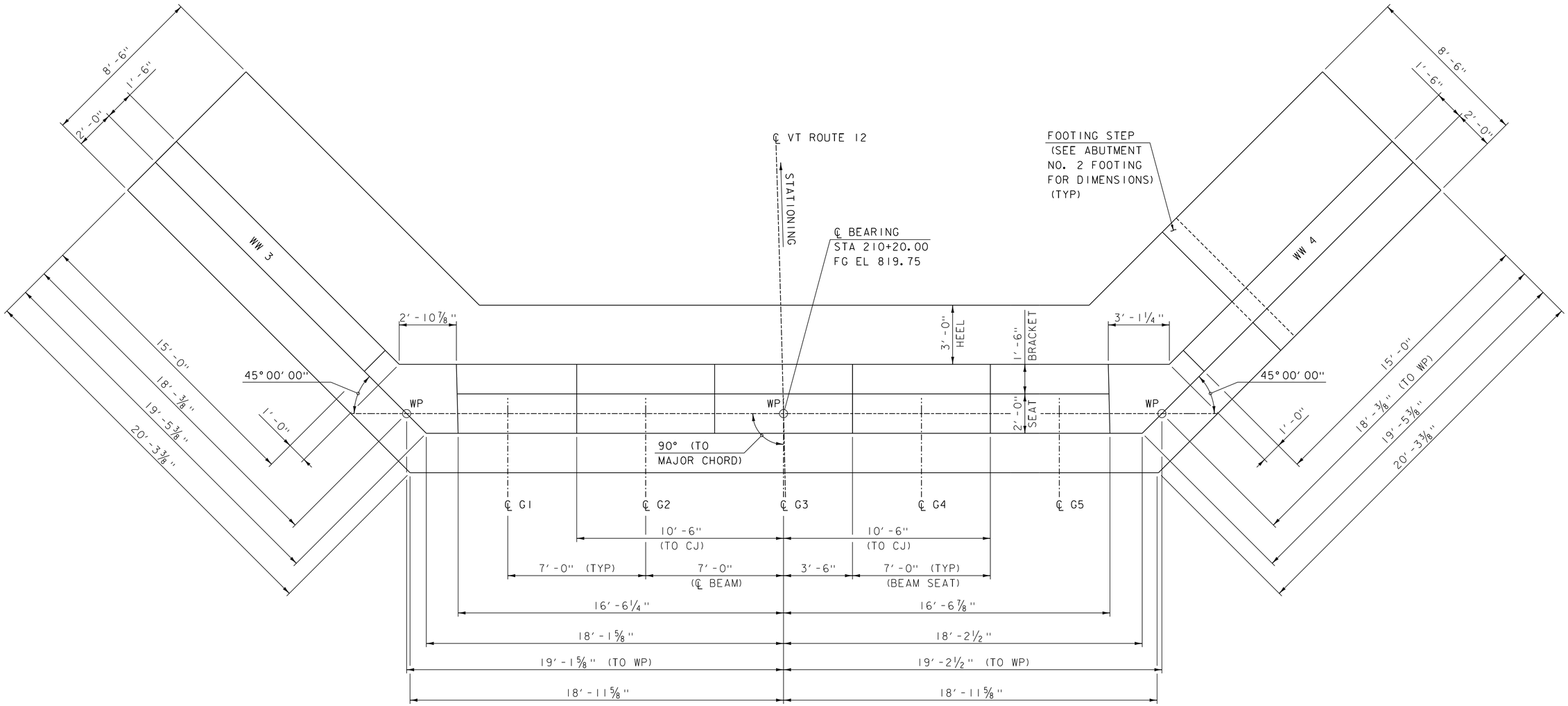
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053sub4.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO.1 DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 47 OF 370



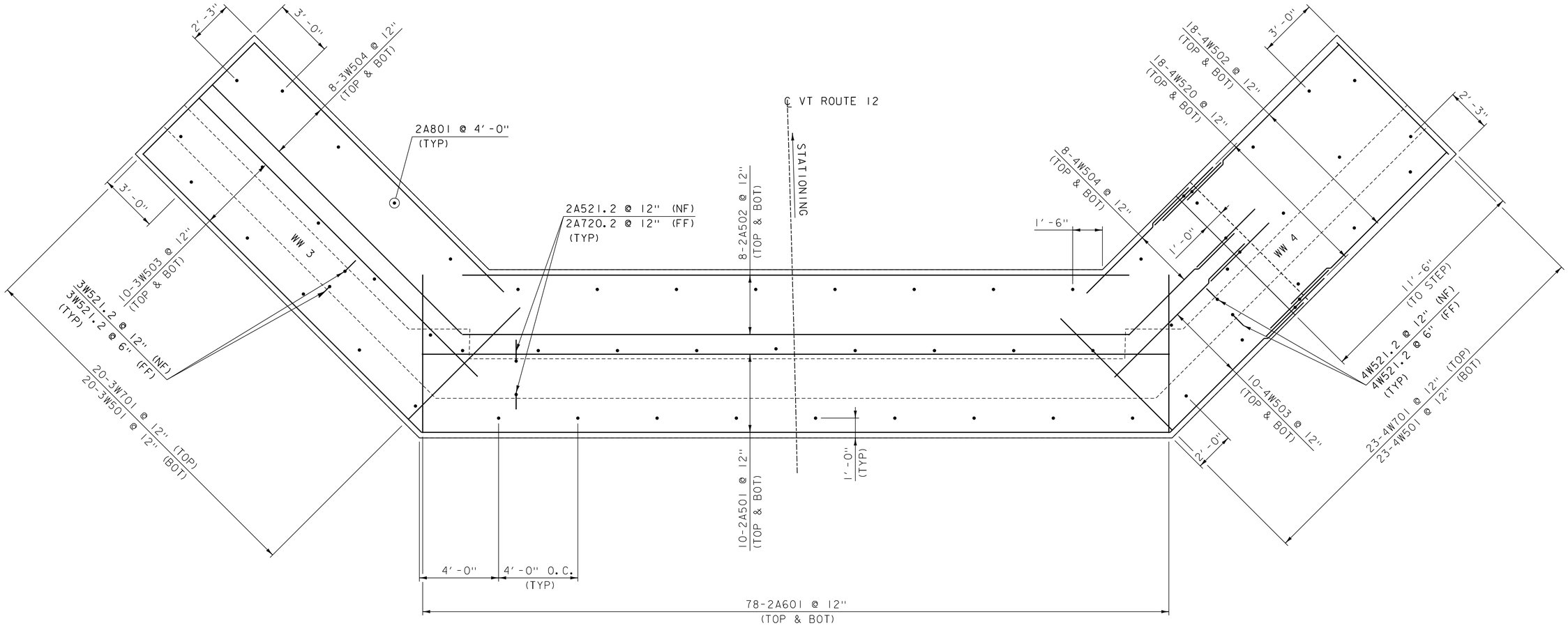
ABUTMENT NO. 2 PLAN

SCALE: ⅜" = 1'-0"

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053sub5.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
ABUTMENT NO. 2 PLAN	SHEET 48 OF 370



ABUTMENT NO. 2 FOOTING REINFORCING PLAN

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

NOTES

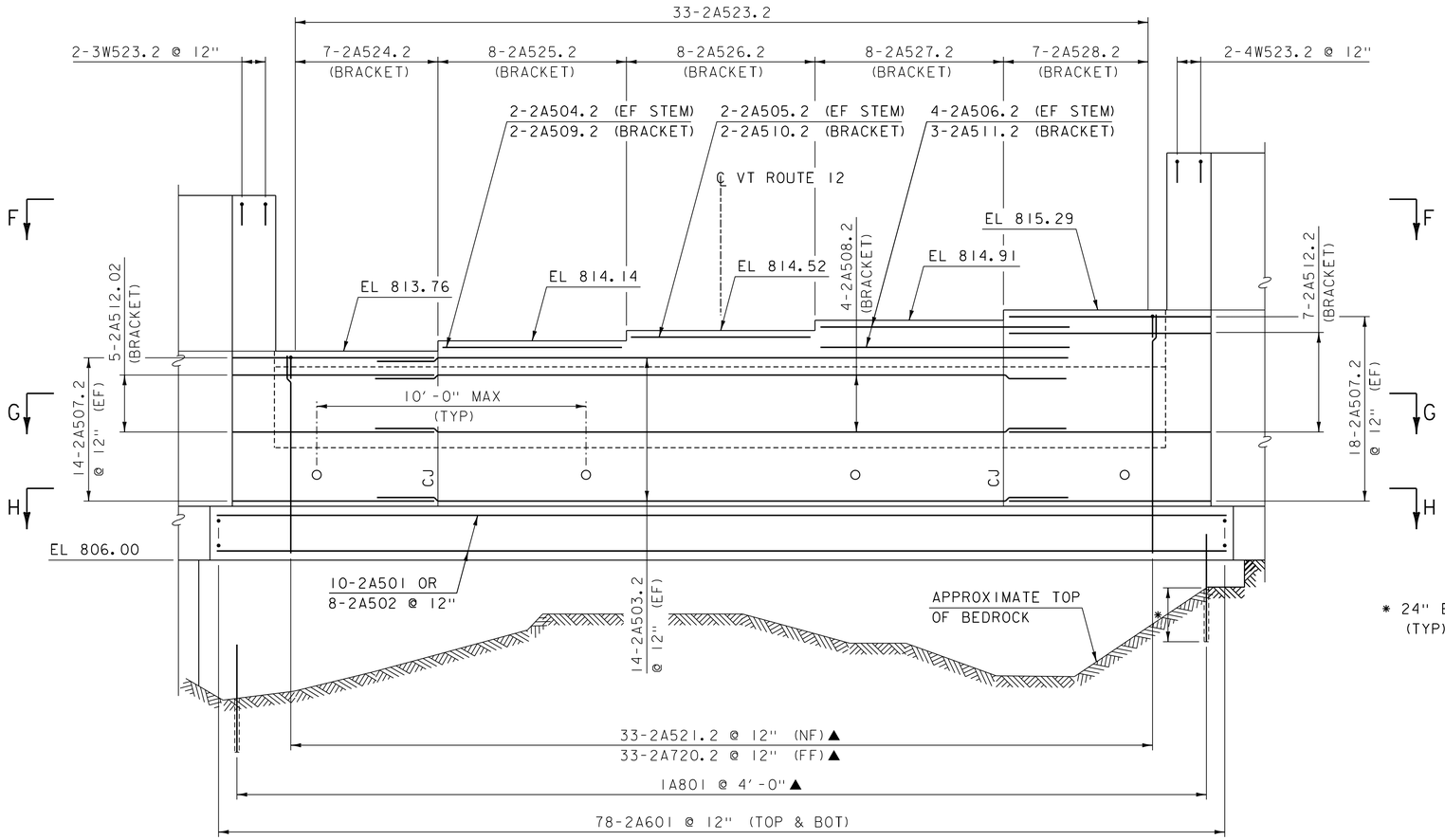
1. 3" CLEAR UNLESS SPECIFIED ON PLANS.
2. SUBFOOTING GEOMETRY SHALL BE DETERMINED IN THE FIELD ONCE COMPETENT BEDROCK HAS BEEN EXPOSED.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

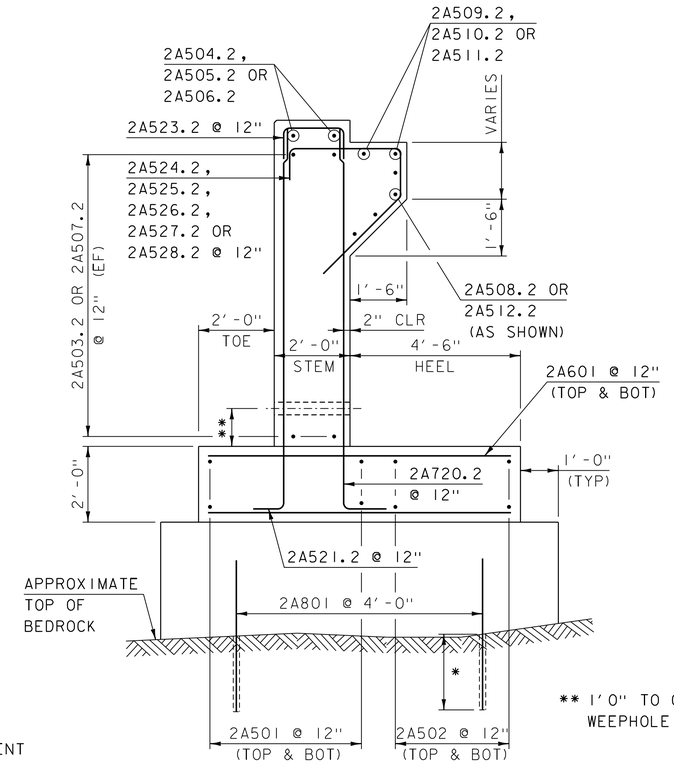
FILE NAME: z86e053sub6.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 2 FOOTING

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 49 OF 370



ABUTMENT NO. 2 ELEVATION

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



* 24" EMBEDMENT (TYP)

** 1'0" TO ℄ WEEPHOLE

ABUTMENT NO. 2 TYPICAL SECTION

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

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 2 FOOTING REINFORCING SHEET. FOR WINGWALL DETAILS SEE ABUTMENT NO.2 WINGWALL SHEET. FOR SECTIONS F-F, G-G AND H-H, SEE ABUTMENT NO. 2 DETAILS SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

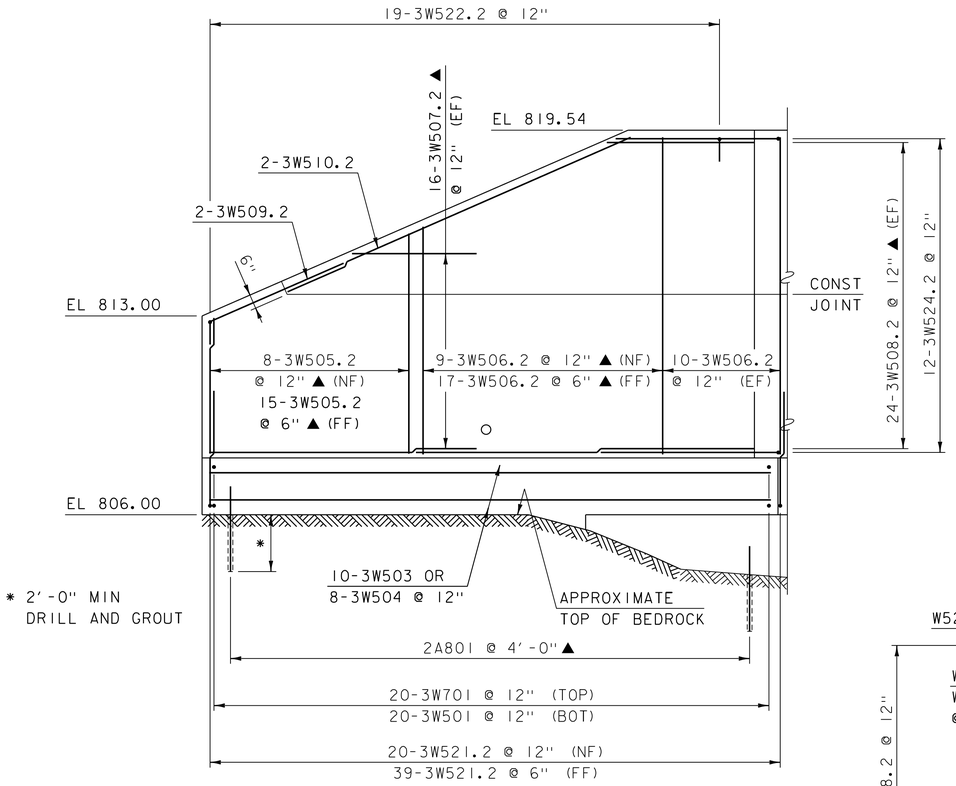
REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

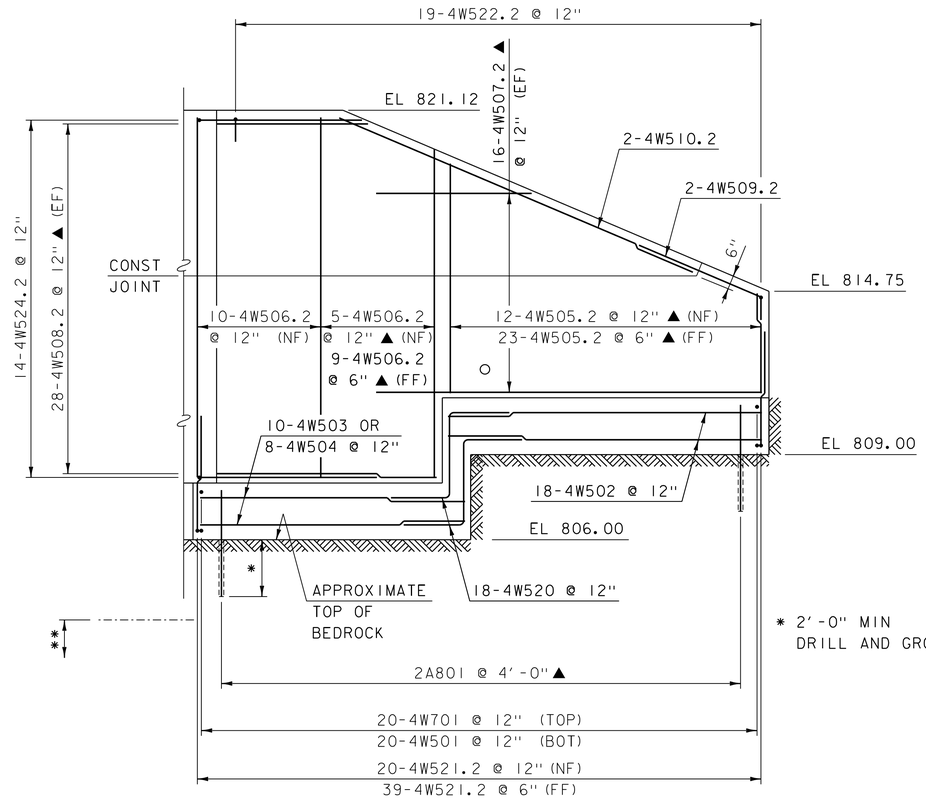
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053sub5.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: R.MCMULLEN
ABUTMENT NO. 2 ELEVATION	SHEET 50 OF 370



WINGWALL NO. 3 ELEVATION

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



WINGWALL NO. 4 ELEVATION

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

WINGWALL TYPICAL SECTION

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
CJ = CONTRACTION JOINT

NOTES

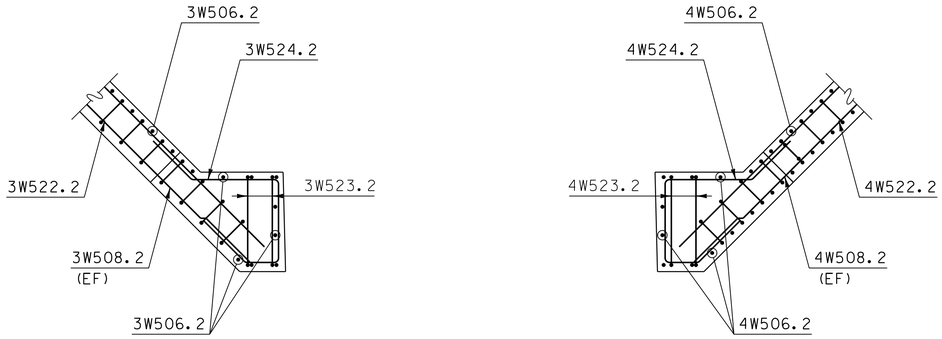
1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 2 FOOTING REINFORCING SHEET.
3. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

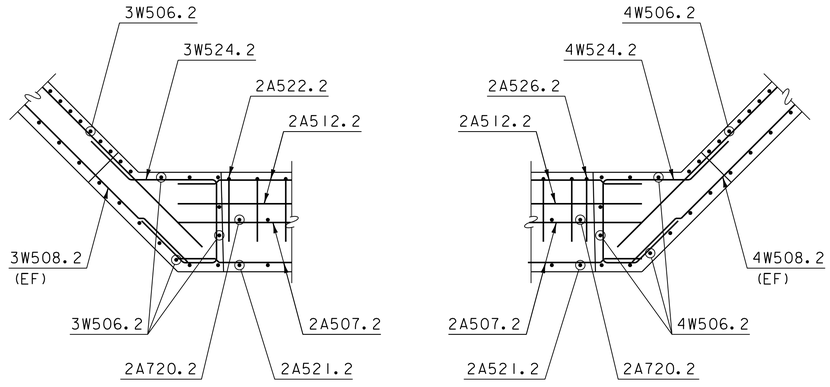
FILE NAME: z86e053sub7.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 2 WINGWALLS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 51 OF 370



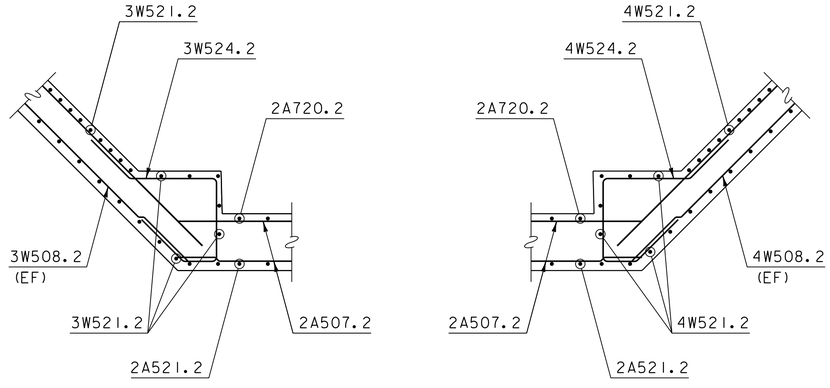
SECTION F-F

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



SECTION G-G

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



SECTION H-H

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR LOCATION OF SECTIONS F-F, G-G AND H-H, SEE ABUTMENT NO. 2 ELEVATION SHEET.

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053sub8.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 2 DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 52 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

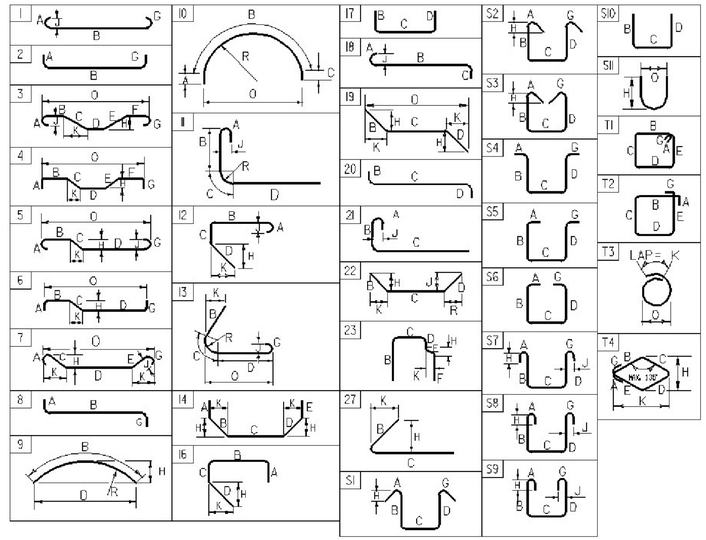
REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	DECK																
	321	5	32'- 6"	S501.2	STR	32'- 6"											
	207	5	33'- 3"	S502.2	STR	33'- 3"											
	36	5	34'- 0"	S503.2	STR	34'- 0"											
	22	5	32'- 8"	S504.2	STR	32'- 8"											
✳	12	5	6'- 8"	S505.2	STR	6'- 8"											
	8	5	5'- 8"	S506.2	STR	5'- 8"											
	8	5	4'- 4"	S507.2	STR	4'- 4"											
	134	5	5'- 3"	S510.2	S5	0'- 10"	1'- 1"	1'- 5"	1'- 1"			0'- 10"					
	134	5	4'- 11"	S511.2	S5	0'- 10"	0'- 11"	1'- 5"	0'- 11"			0'- 10"					
	8	5	5'- 3"	S512.2	S10		1'- 11"	1'- 5"	1'- 11"								
	48	5	5'- 6"	S513.2	2	2'- 0"	3'- 6"										
	60	5	5'- 9"	S514.2	2	2'- 0"	3'- 9"										
	8	5	6'- 10"	S515.2	2	3'- 1"	3'- 9"										
	40	5	6'- 7"	S516.2	2	3'- 1"	3'- 6"										
	40	5	8'- 0"	S517.2	17		3'- 0"	2'- 0"	3'- 0"								
	8	5	9'- 1"	S518.2	17		3'- 0"	3'- 1"	3'- 0"								
	48	5	6'- 6"	S519.2	S4		2'- 9"	1'- 0"	0'- 8"	2'- 1"							
	40	5	7'- 0"	S520.2	17		3'- 0"	1'- 0"	3'- 0"								
	9	6	33'- 3"	S601.2	STR	33'- 3"											
	192	6	6'- 0"	S602.2	3	0'- 8"	1'- 10"	3'- 6"	---	---	---	---	0'- 2"				
	192	7	6'- 0"	S701.2	3	0'- 10"	1'- 0"	---	---	4'- 2"	---	---	0'- 3"				
	30	8	2'- 6"	S801.2	19		1'- 1"	1'- 5"	---				0'- 9"		0'- 10"		
	APPROACH SLAB NO. 1																
✳	20	5	28'- 4"	1EAS501	STR	28'- 4"											
	35	9	20'- 10"	1EAS901	1	1'- 3"	19'- 7"	---									
	APPROACH SLAB NO. 2																
	20	5	28'- 4"	2EAS501	STR	28'- 4"											
	35	9	20'- 10"	2EAS901	1	1'- 3"	19'- 7"	---									
	ABUTMENT NO. 1																
	20	5	19'- 2"	1A501	STR	19'- 2"											
	16	5	17'- 2"	1A502	STR	17'- 2"											
	16	5	10'- 8"	1A503	STR	10'- 8"											
	4	5	12'- 2"	1A504.2	STR	12'- 2"											
	12	5	25'- 8"	1A505.2	STR	25'- 8"											
	2	5	6'- 8"	A1506.2	STR	6'- 8"											
	2	5	6'- 8"	1A507.2	STR	6'- 8"											
	4	5	9'- 3"	1A508.2	STR	9'- 3"											
	32	5	7'- 6"	1A509.2	STR	7'- 6"											
	4	5	25'- 8"	1A510.2	STR	25'- 8"											
	2	5	6'- 8"	1A511.2	STR	6'- 8"											
	2	5	6'- 8"	1A512.2	STR	6'- 8"											
	3	5	9'- 3"	1A513.2	STR	9'- 3"											
	12	5	7'- 6"	1A514.2	STR	7'- 6"											
	18	5	6'- 2"	1A520	20		2'- 1"	2'- 0"	2'- 1"								
	16	5	6'- 0"	1A521.2	2	0'- 10"	5'- 2"					---					
	17	5	10'- 8"	1A522.2	2	0'- 10"	9'- 10"					---					
	33	5	3'- 3"	1A523.2	17		0'- 10"	1'- 7"	0'- 10"								
	7	5	8'- 1"	1A524.2	16	0'- 10"	3'- 1"	1'- 2"	3'- 0"				2'- 1"		2'- 1"		
	8	5	8'- 5"	1A525.2	16	0'- 10"	3'- 1"	1'- 6"	3'- 0"				2'- 1"		2'- 1"		
	8	5	8'- 10"	1A526.2	16	0'- 10"	3'- 1"	1'- 11"	3'- 0"				2'- 1"		2'- 1"		
	8	5	9'- 2"	1A527.2	16	0'- 10"	3'- 1"	2'- 3"	3'- 0"				2'- 1"		2'- 1"		
	7	5	9'- 7"	1A528.2	16	0'- 10"	3'- 1"	2'- 8"	3'- 0"				2'- 1"		2'- 1"		
	80	6	8'- 0"	1A601	STR	8'- 0"											
	16	7	10'- 8"	1A701.2	STR	10'- 8"											
	16	7	7'- 1"	1A720.2	2	1'- 2"	5'- 11"					---					
	17	7	11'- 0"	1A721.2	2	1'- 2"	9'- 10"					---					
	56	8	4'- 0"	1A801	STR	4'- 0"											

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	WINGWALL 1																
	22	5	8'- 0"	1W501	STR	8'- 0"											
	18	5	8'- 0"	1W502	STR	8'- 0"											
	10	5	12'- 5"	1W503	STR	12'- 5"											
	8	5	10'- 5"	1W504	STR	10'- 5"											
▲	26	5	8'- 1"	1W505.2	STR	8'- 1"											
▲	33	5	12'- 10"	1W506.2	STR	12'- 10"											
▲	12	5	10'- 7"	1W507.2	STR	10'- 7"											
▲	24	5	10'- 9"	1W508.2	STR	10'- 9"											
	2	5	4'- 2"	1W509.2	STR	4'- 2"											
	2	5	13'- 11"	1W510.2	STR	13'- 11"											
	18	5	6'- 2"	1W520	20		2'- 1"	2'- 0"	2'- 1"								
	59	5	5'- 11"	1W521.2	2	0'- 10"	5'- 1"					---					
	19	5	2'- 9"	1W522.2	17		0'- 10"	1'- 1"	0'- 10"								
	2	5	4'- 8"	1W523.2	17		0'- 10"	3'- 0"	0'- 10"								
	12	5	11'- 1"	1W524.2	S2	2'- 1"	1'- 2"	2'- 11"	2'- 10"				2'- 1"	1'- 6"	<>		
	22	7	8'- 0"	1W701	STR	8'- 0"											
	WINGWALL 2																
	22	5	8'- 0"	2W501	STR	8'- 0"											
	18	5	8'- 0"	2W502	STR	8'- 0"											
	10	5	12'- 5"	2W503	STR	12'- 5"											
	8	5	10'- 5"	2W504	STR	10'- 5"											
▲	26	5	11'- 5"	2W505.2	STR	11'- 5"											
▲	33	5	16'- 5"	2W506.2	STR	16'- 5"											
▲	20	5	10'- 7"	2W507.2	STR	10'- 7"											
▲	32	5	10'- 9"	2W508.2	STR	10'- 9"											
	2	5	5'- 1"	2W509.2	STR	5'- 1"											
	2	5	13'- 3"	2W510.2	STR	13'- 3"											
	18	5	6'- 2"	2W520	20		2'- 1"	2'- 0"	2'- 1"								
	59	5	5'- 11"	2W521.2	2	0'- 10"	5'- 1"					---					
	19	5	2'- 9"	2W522.2	17		0'- 10"	1'- 1"	0'- 10"								
	2	5	4'- 8"	2W523.2	17		0'- 10"	3'- 0"	0'- 10"								
	16	5	11'- 1"	2W524.2	S2	2'- 1"	1'- 2"	2'- 11"	2'- 10"				2'- 1"	1'- 6"	<>		
	78	6	8'- 0"	2A601	STR	8'- 0"											
	33	7	12'- 0"	2A720.2	2	1'- 2"	10'- 10"										
	56	8	4'- 0"	2A801	STR	4'- 0"											
	WINGWALL 3																
	20	5	8'- 0"	3W501	STR	8'- 0"											
	10	5	19'- 11"	3W503	STR	19'- 11"											
	8	5	17'- 10"	3W504	STR	17'- 10"											
▲	23	5	9'- 9"	3W505.2	STR	9'- 9"											
▲	36	5	13'- 2"	3W506.2	STR	13'- 2"											
▲	16	5	9'- 5"	3W507.2	STR	9'- 5"											
▲	24	5	11'- 11"	3W508.2	STR	11'- 11"											
	2	5	5'- 2"	3W509.2	STR	5'- 2"											
	2	5	13'- 3"	3W510.2	STR	13'- 3"											
	59	5	5'- 11"	3W521.2	2	0'- 10"	5'- 1"					---					
	19	5	2'- 9"	3W522.2	17		0'- 10"	1'- 1"	0'- 10"								
	2	5	4'- 8"	3W523.2	17		0'- 10"	3'- 0"	0'- 10"								
	12	5	11'- 1"	3W524.2	S2	2'- 1"	1'- 2"	2'- 11"	2'- 10"				2'- 1"	1'- 6"	<>		
	20	7	8'- 0"	3W701	STR	8'- 0"											

~ NOTES ~

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



ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION		
		DIAMETER INCHES	AREA INCHES 2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.04	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.14
#9	3.400	1.13	1.00	3.54
#10	4.3	1.270	1.27	3.990
#11	5.31	1.410	1.56	4.430
#14	7.65	1.69	2.25	5.32
#18	13.60	2.26	4.00	7.09

~ REINFORCING STEEL CORROSION RESISTANCE LEVEL ~

THE REINFORCING STEEL MARKS IN THIS SCHEDULE INDICATE THE REQUIRED BAR CORROSION RESISTANCE LEVEL. CORROSION RESISTANCE LEVEL IS DENOTED WITH A .2 FOR LEVEL TWO SUFFIX OR .3 FOR LEVEL THREE SUFFIX. .1 FOR LEVEL ONE IS TO BE OMITTED. THE BAR MATERIAL TYPE AND BAR STEEL GRADE PROVIDED FOR EACH CORROSION LEVEL WILL BE RECORDED ON THE PLAN SET PI SHEET FOR AS-BUILT RECORD PLAN ARCHIVES.

<> INDICATES DIMENSION IN OPPOSITE DIRECTION OF WHAT IS SHOWN IN THE BEND DIAGRAM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053reinf.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
REINFORCING STEEL SCHEDULE I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN

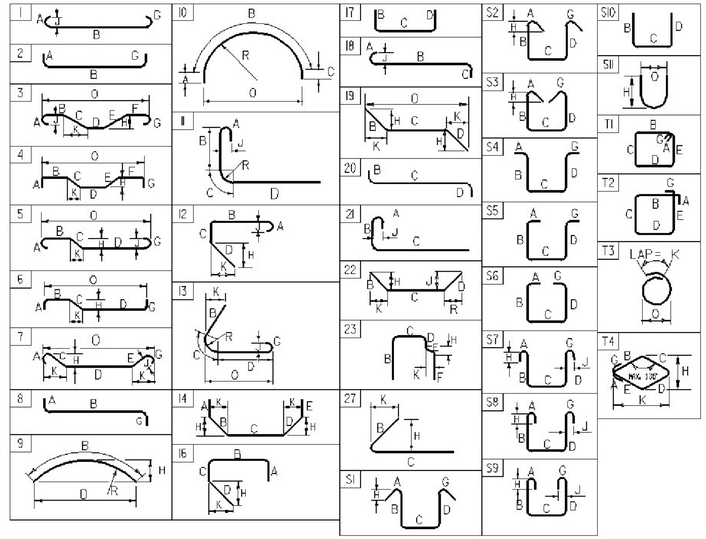
STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
WINGWALL 4																	
	23	5	8'- 0"	4W501	STR	8'- 0"											
	18	5	11'- 0"	4W502	STR	11'- 0"											
	10	5	9'- 5"	4W503	STR	9'- 5"											
	8	5	7'- 5"	4W504	STR	7'- 5"											
▲	35	5	10'- 1"	4W505.2	STR	10'- 1"											
▲	24	5	14'- 8"	4W506.2	STR	14'- 8"											
▲	16	5	13'- 7"	4W507.2	STR	13'- 7"											
▲	28	5	7'- 9"	4W508.2	STR	7'- 9"											
	2	5	4'- 8"	4W509.2	STR	4'- 8"											
	2	5	13'- 7"	4W510.2	STR	13'- 7"											
	18	5	7'- 2"	4W520	20		2'- 1"	3'- 0"	2'- 1"								
	59	5	5'- 11"	4W521.2	2	0'- 10"	5'- 1"					---					
	19	5	2'- 9"	4W522.2	17		0'- 10"	1'- 1"	0'- 10"								
	2	5	4'- 8"	4W523.2	17		0'- 10"	3'- 0"	0'- 10"								
	14	5	11'- 1"	4W524.2	S2	2'- 1"	1'- 2"	2'- 11"	2'- 10"			2'- 1"	1'- 6"	<>			
	23	7	8'- 0"	4W701	STR	8'- 0"											

~ NOTES ~

1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M31 (ASTM A 615-SI). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
3. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
4. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
5. "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE. OTHERWISE, STANDARD HOOKS ARE TO BE USED.
6. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
7. WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.
8. ▲ DENOTES BARS TO BE CUT IN FIELD.
9. ✳ DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.
10. △ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.
11. E IN BAR MARK PREFIX DENOTES EPOXY COATED REINFORCING STEEL.



ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION DIAMETER INCHES	AREA INCHES 2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.04	0.875	0.60	2.749
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~ REINFORCING STEEL CORROSION RESISTANCE LEVEL ~

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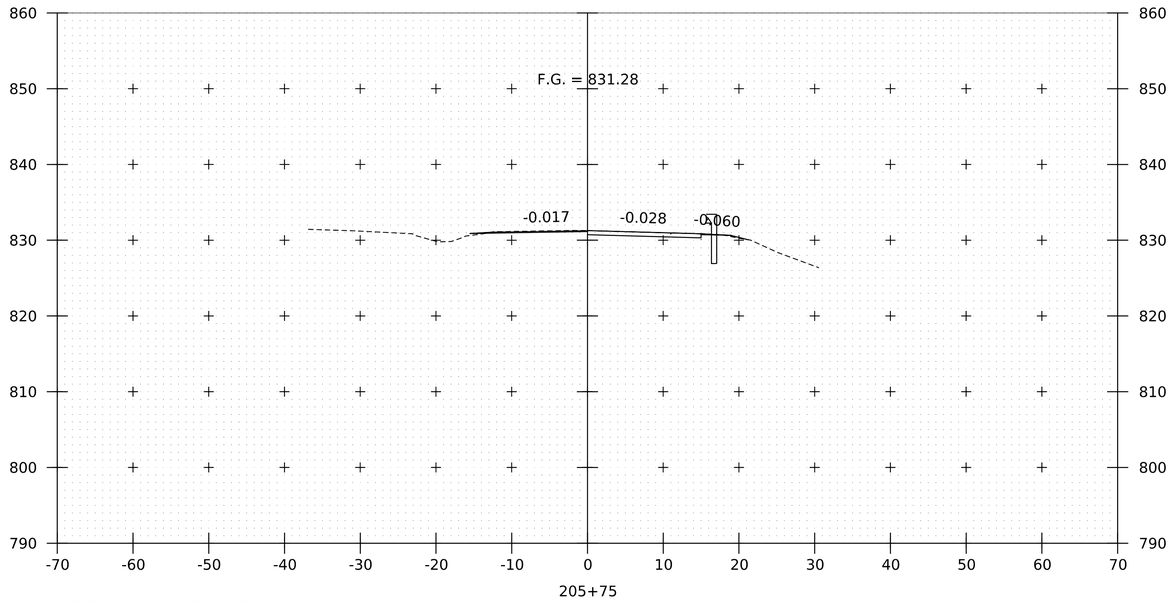
<> INDICATES DIMENSION IN OPPOSITE DIRECTION OF WHAT IS SHOWN IN THE BEND DIAGRAM

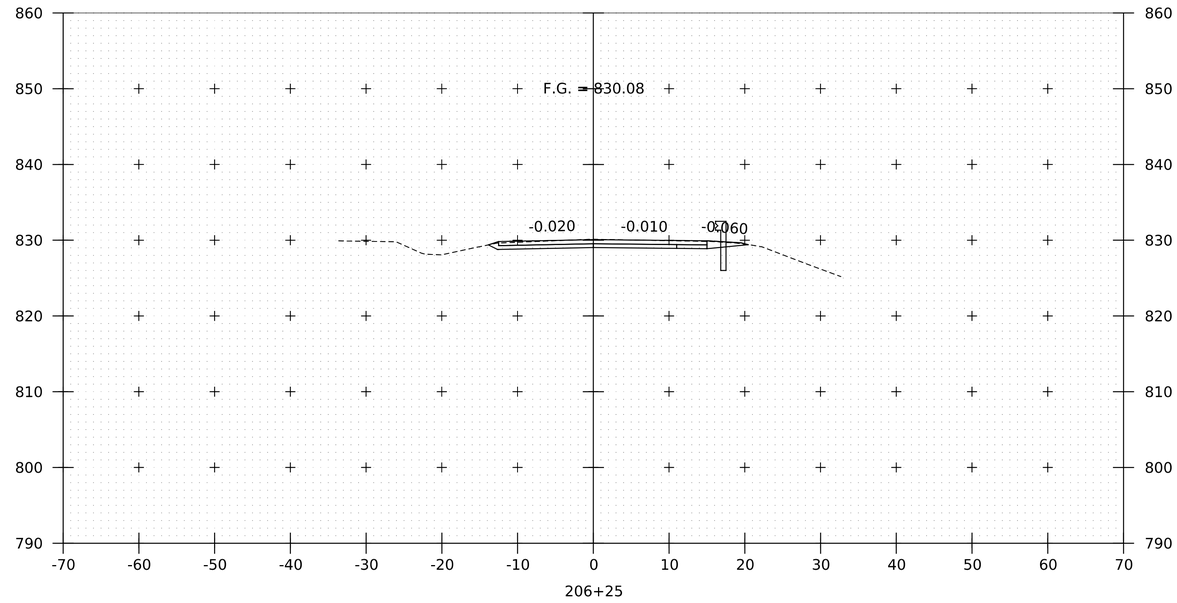
HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

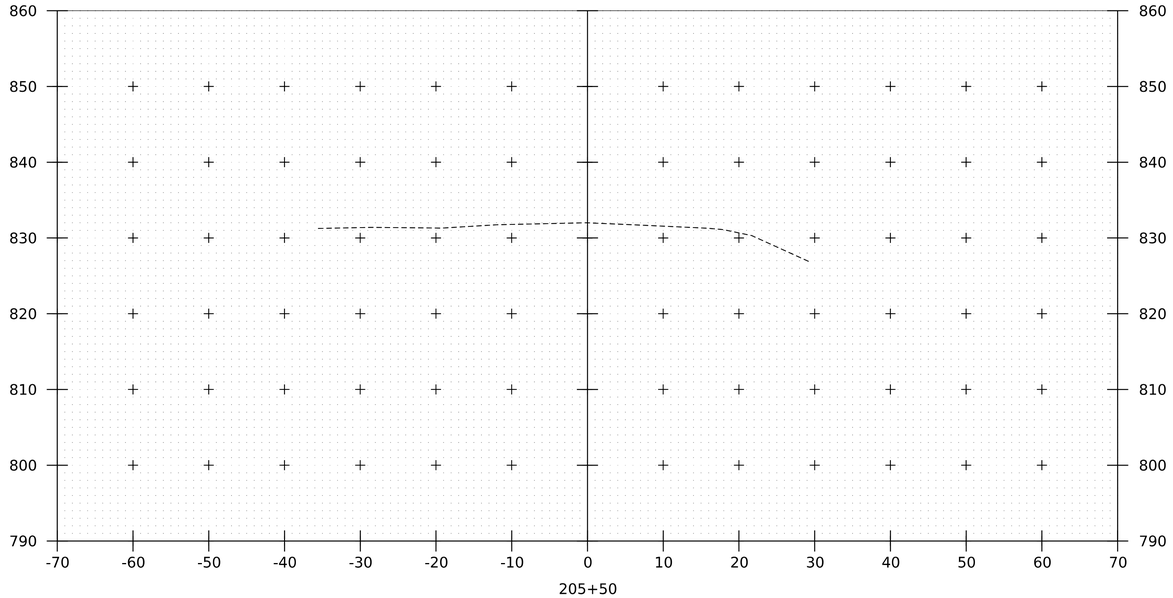
FILE NAME: z86e053reinf.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
REINFORCING STEEL SCHEDULE 2

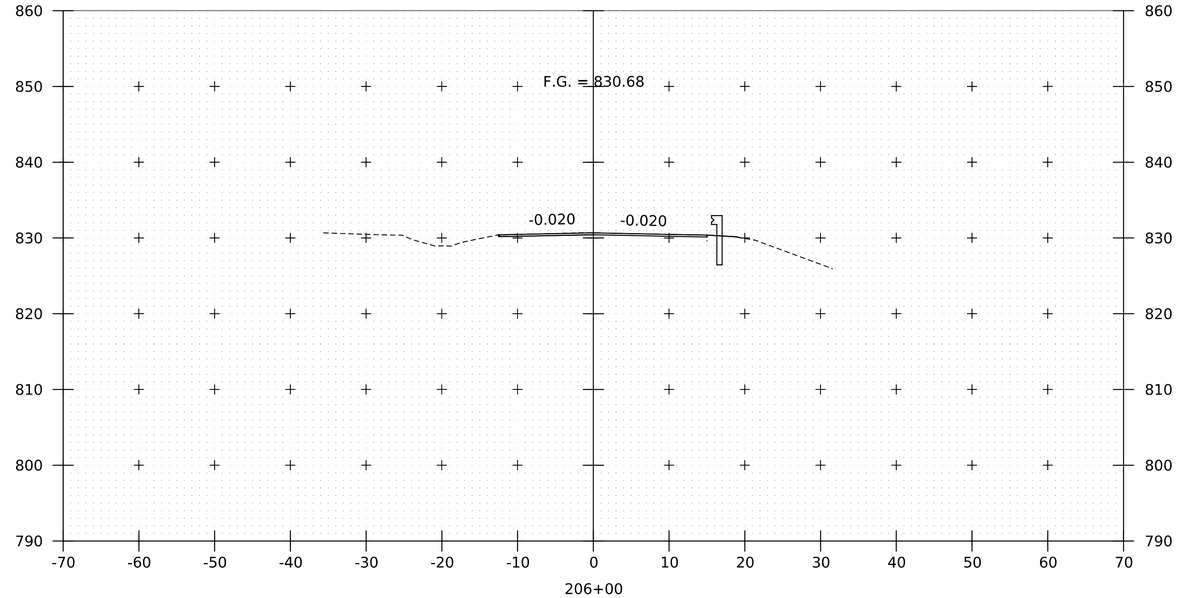
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: R.MCMULLEN
SHEET 54 OF 370





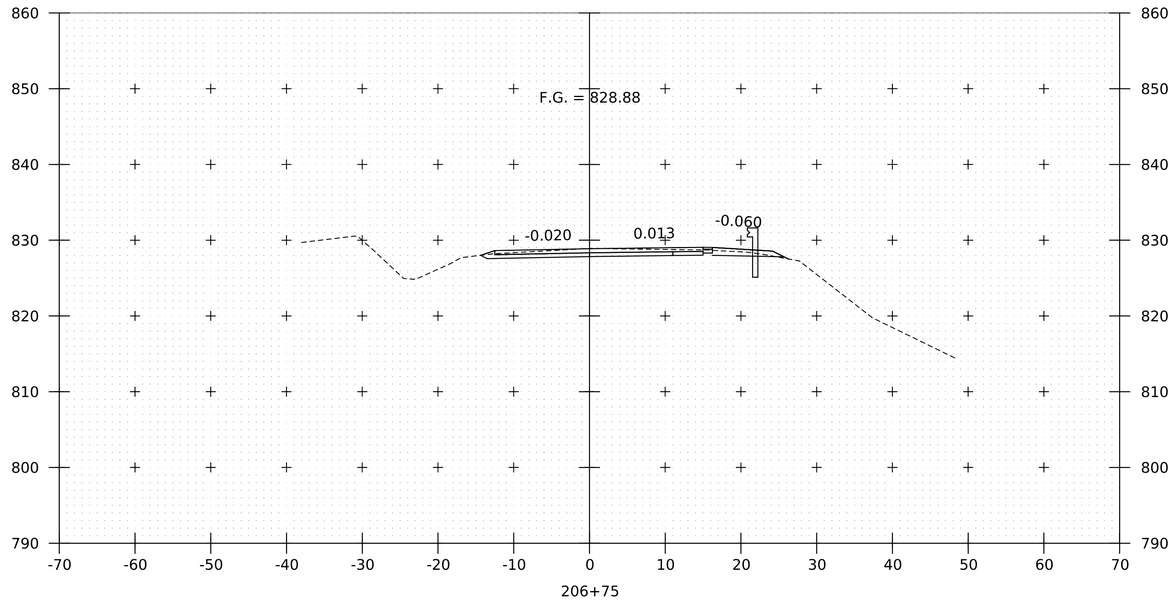
BEGIN APPROACH
STA 205+75.00
MATCH EXISTING

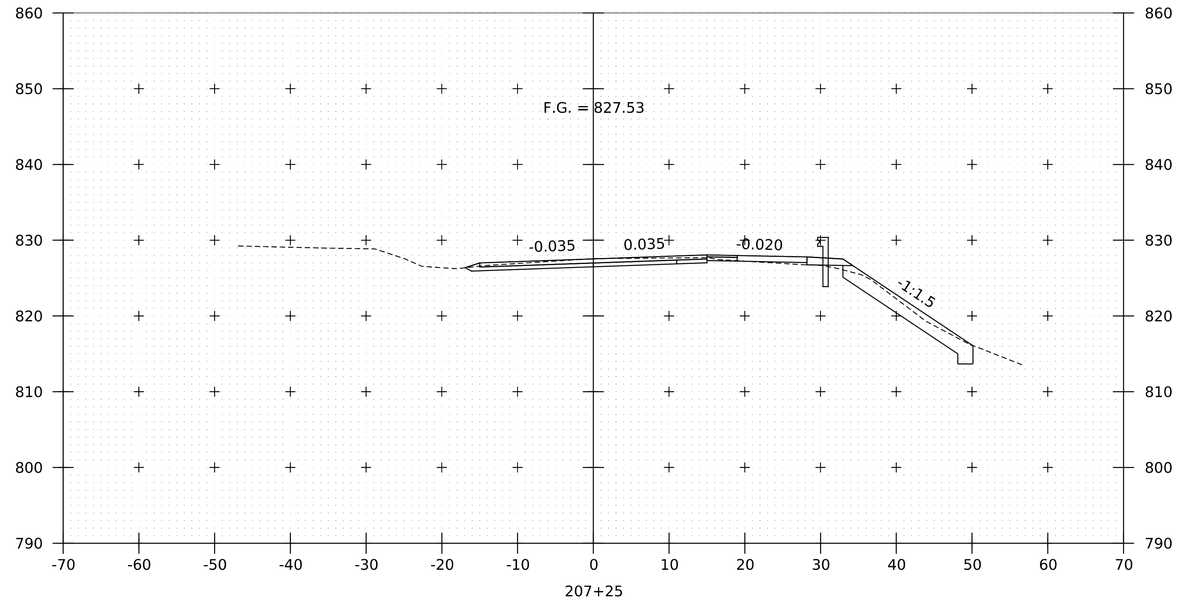


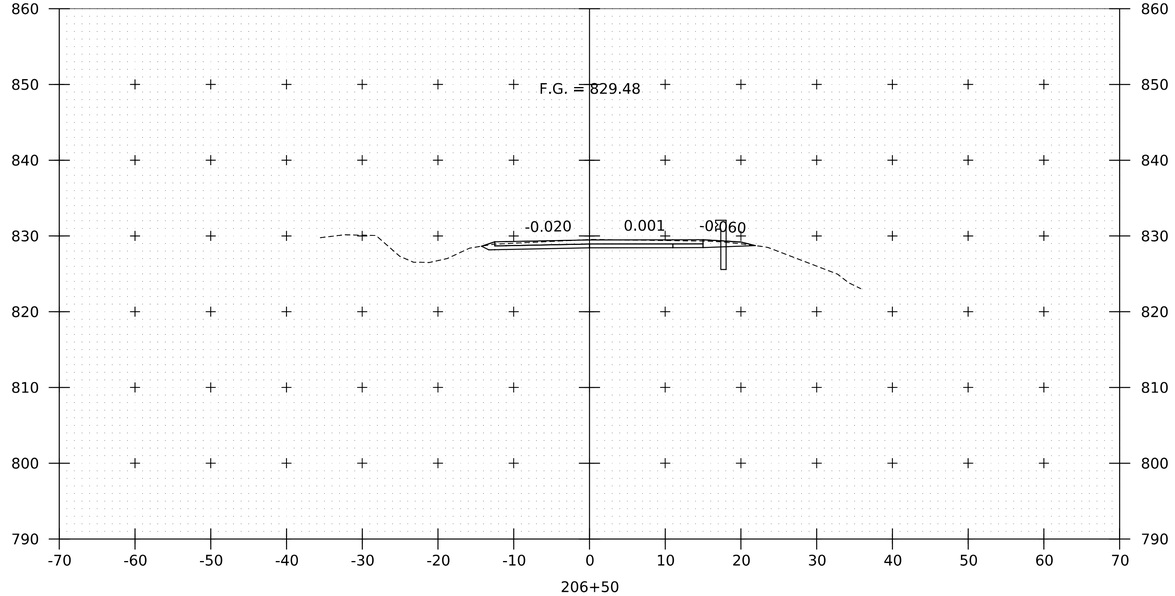


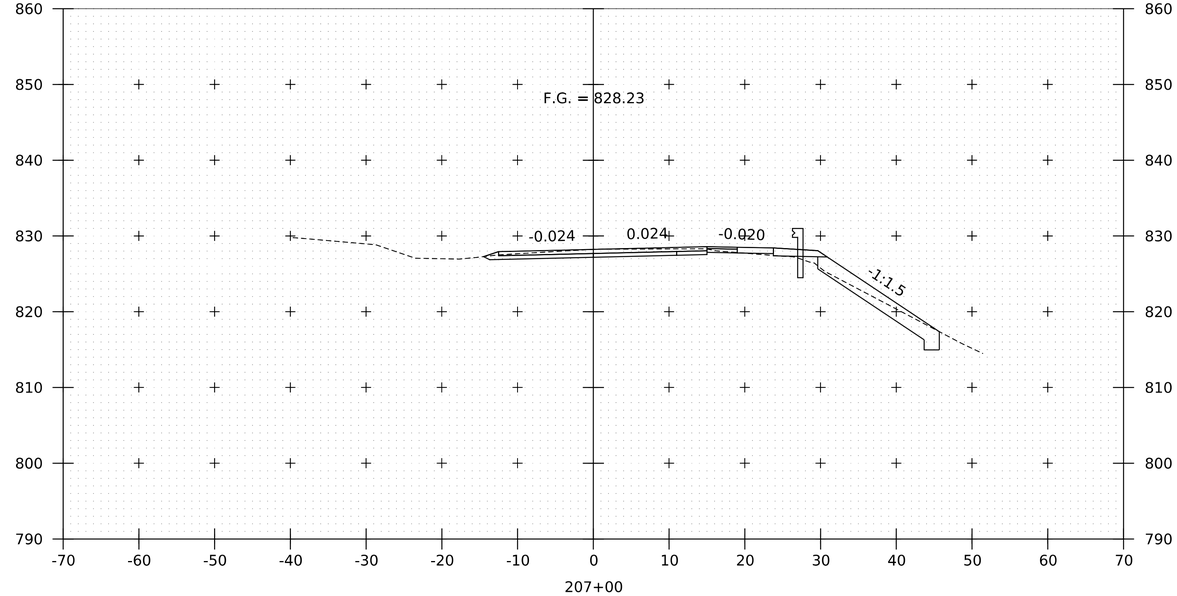
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 1	SHEET 55 OF 370





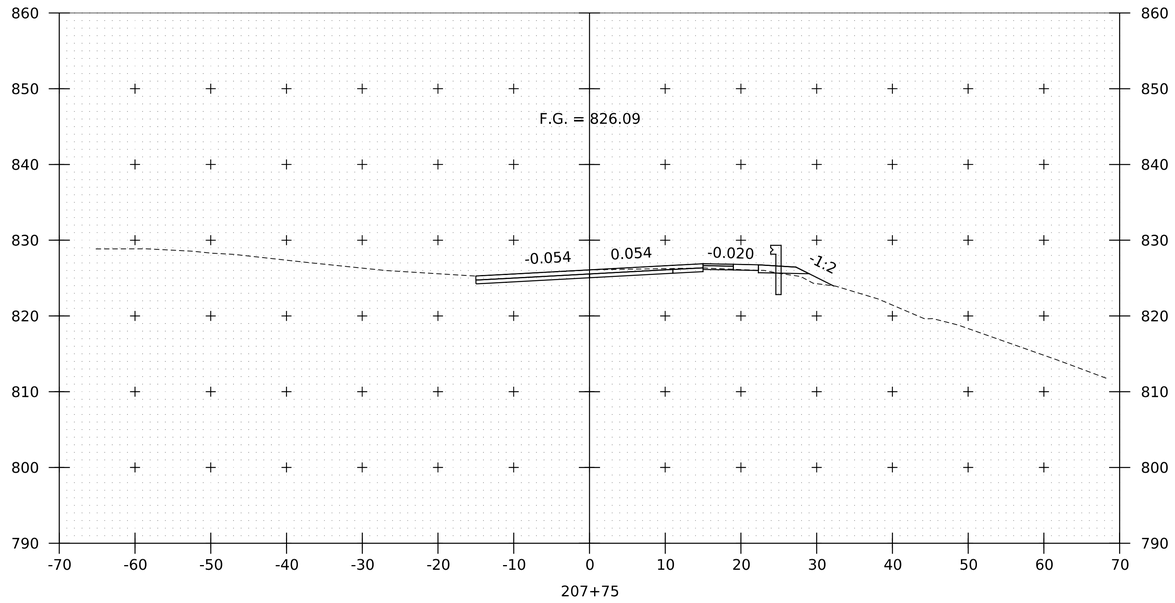


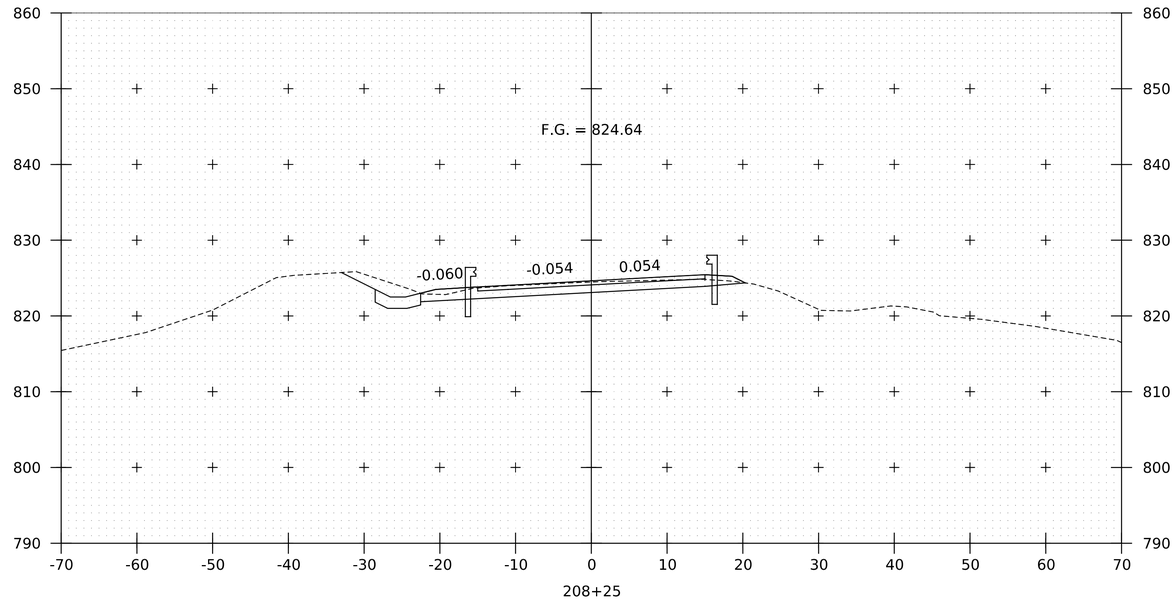


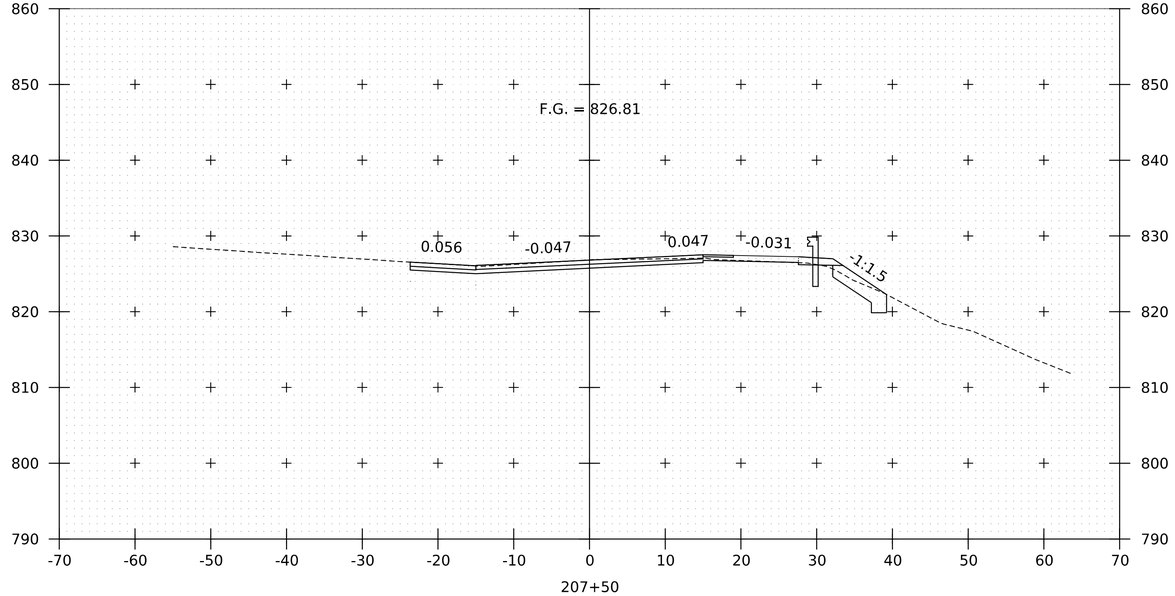
HOYLE TANNER

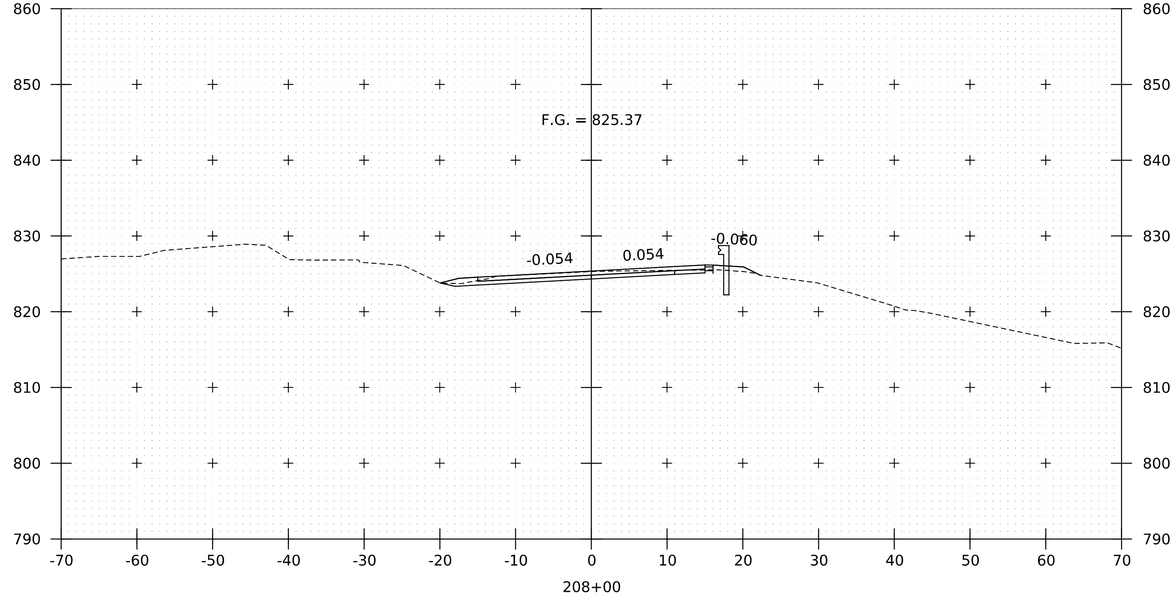
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)

FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 2	SHEET 56 OF 370





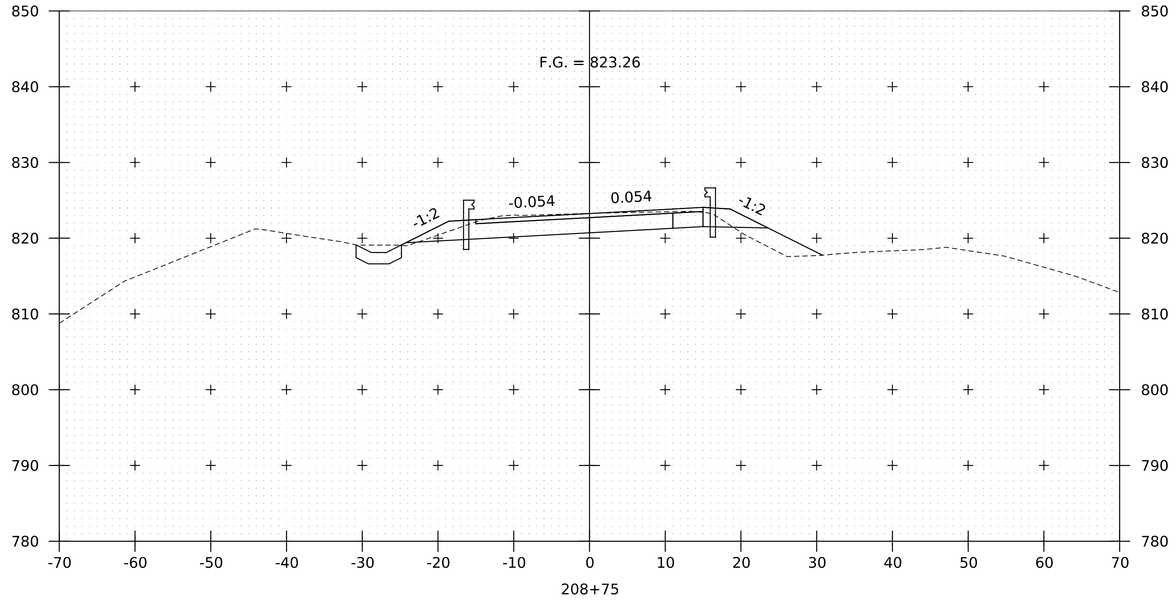


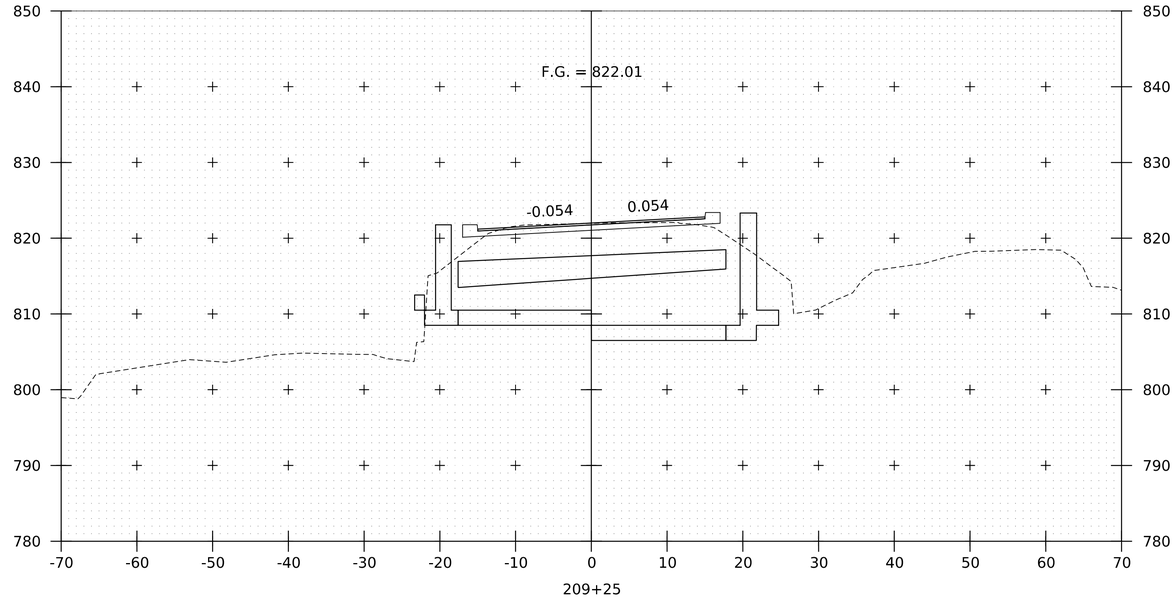


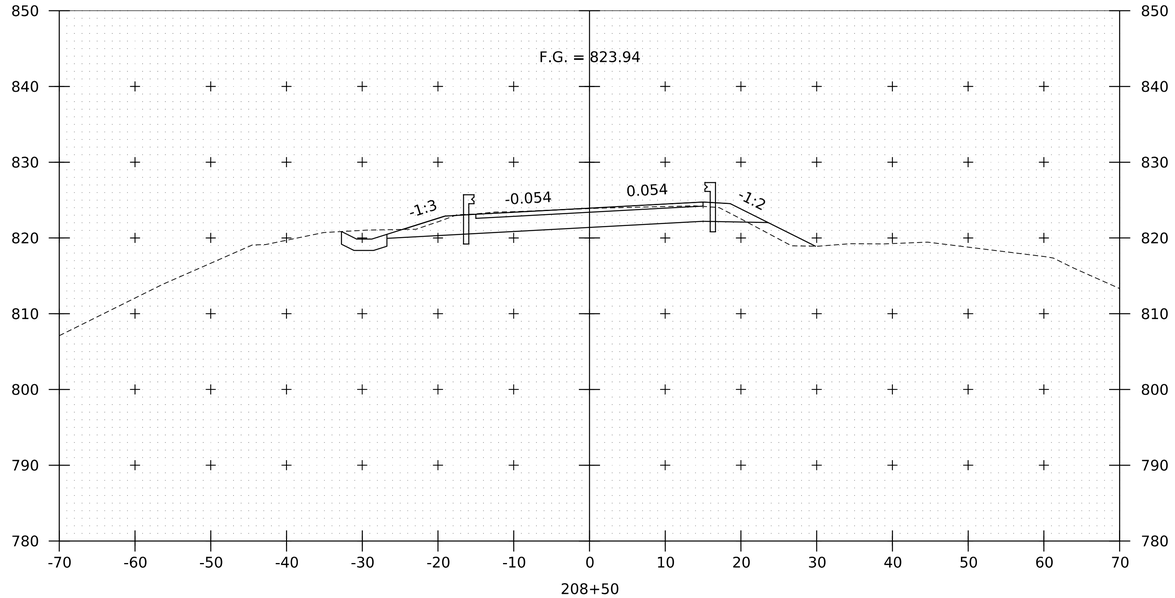
HOYLE TANNER

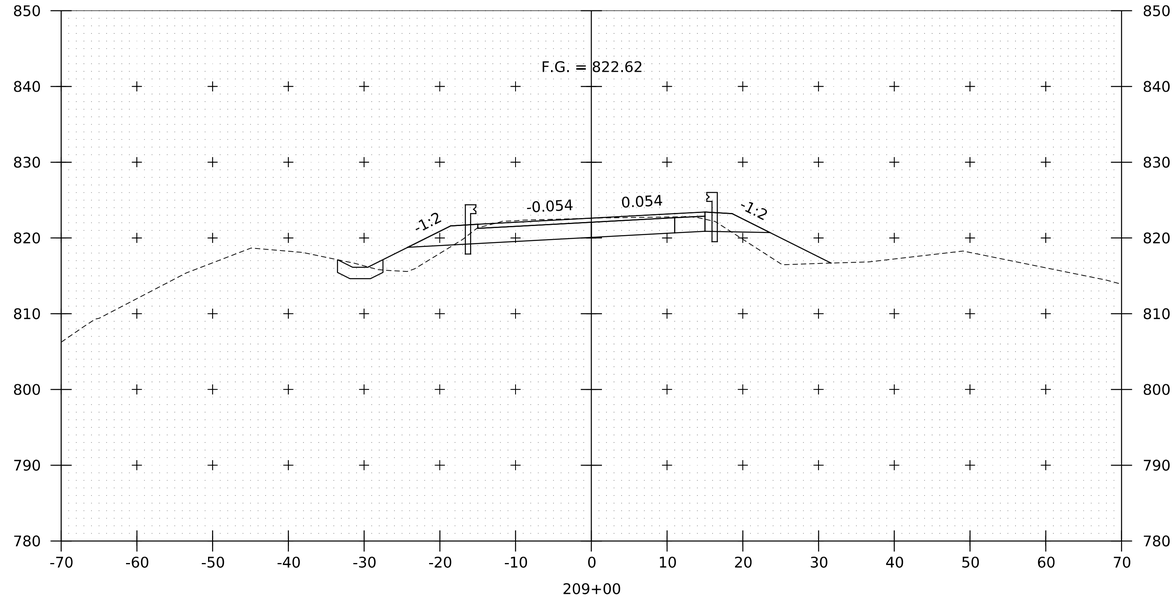
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)
FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 3	SHEET 57 OF 370

BEGIN BRIDGE
STA 209+25.50







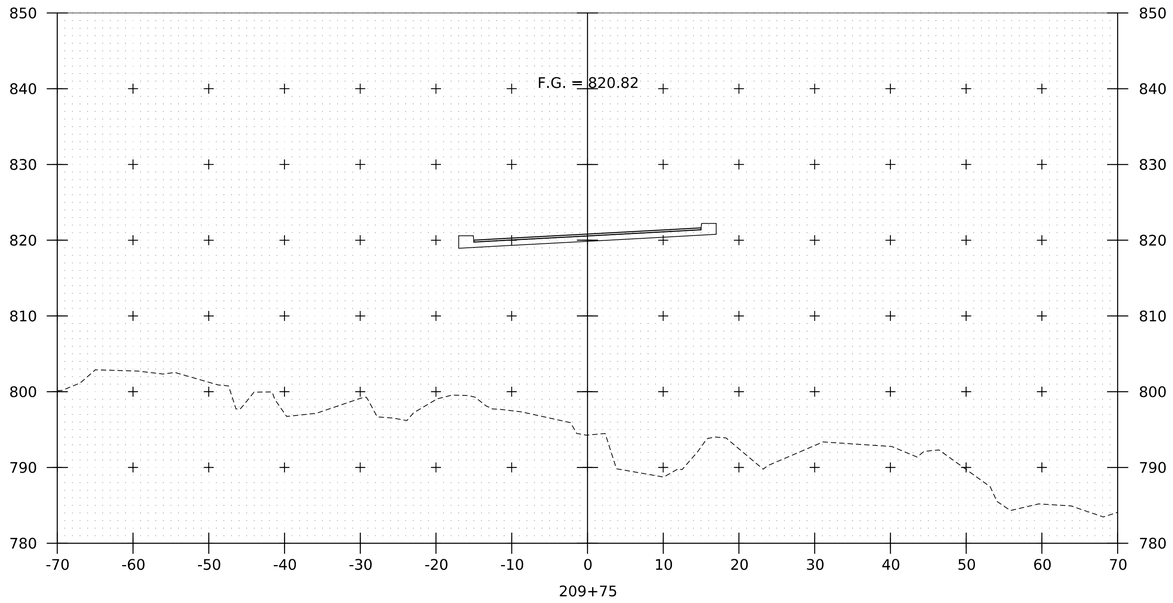


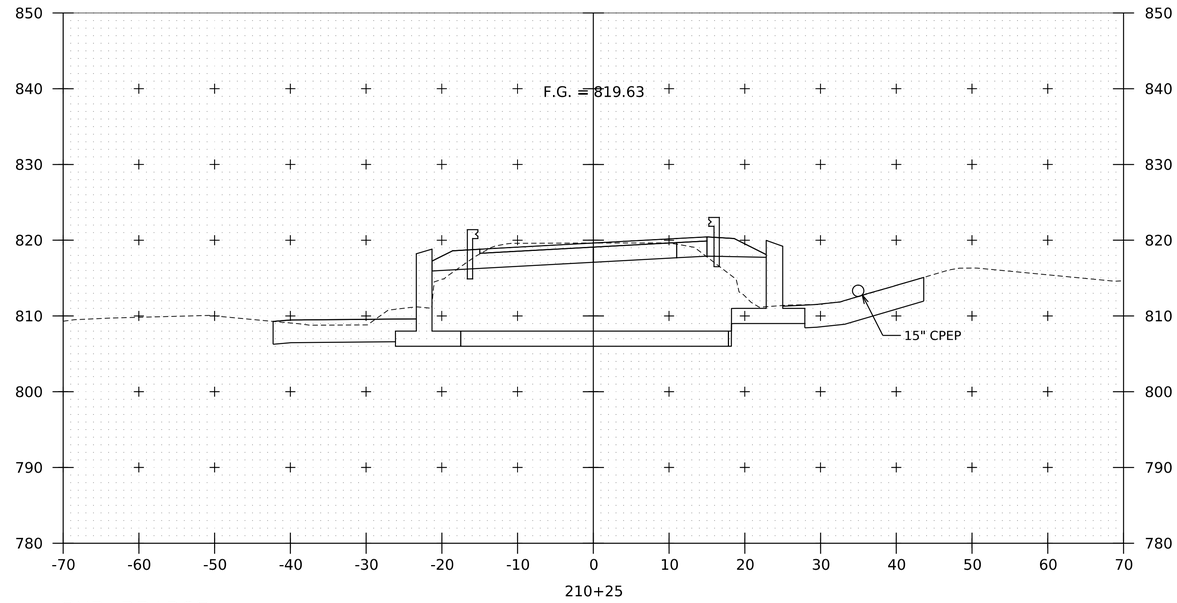
BEGIN PROJECT
STA 208+50.00

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)

FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 4	SHEET 58 OF 370





END BRIDGE
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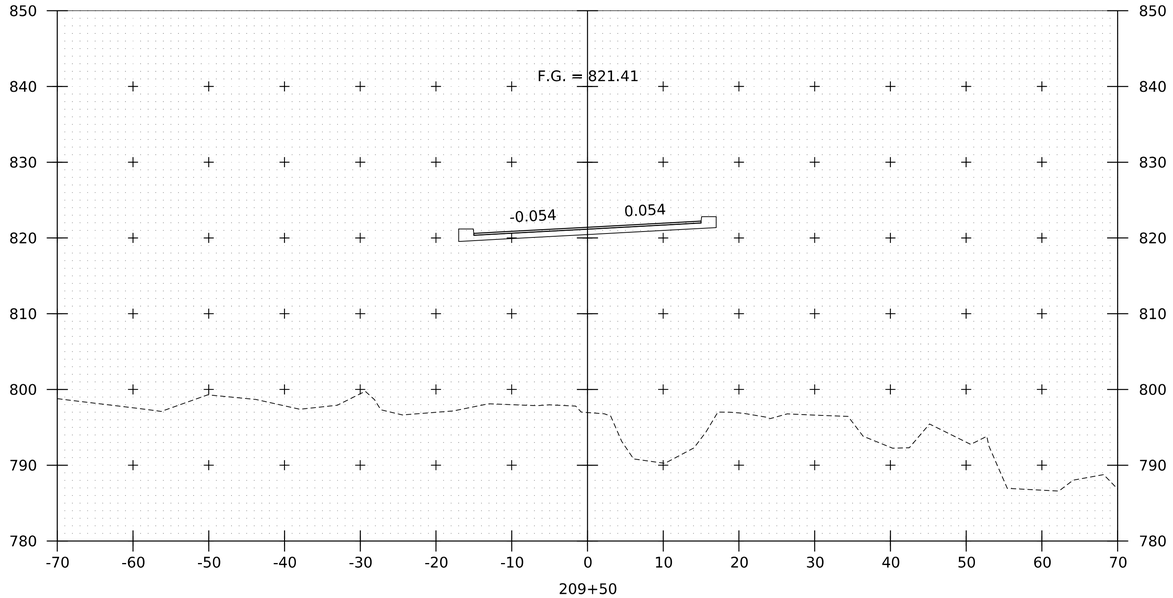
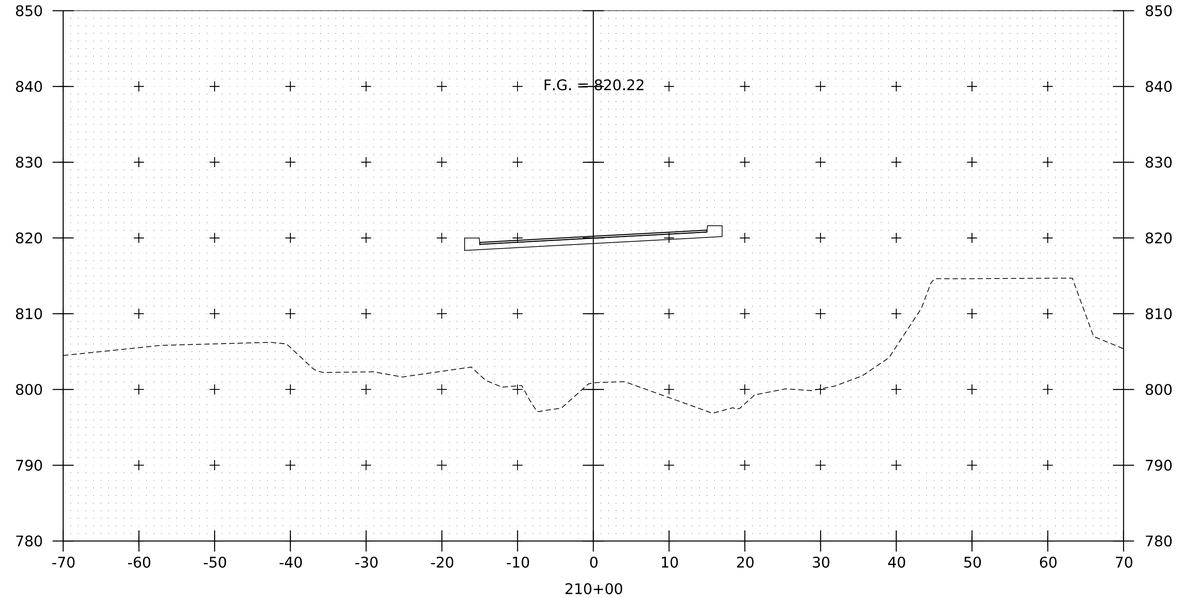
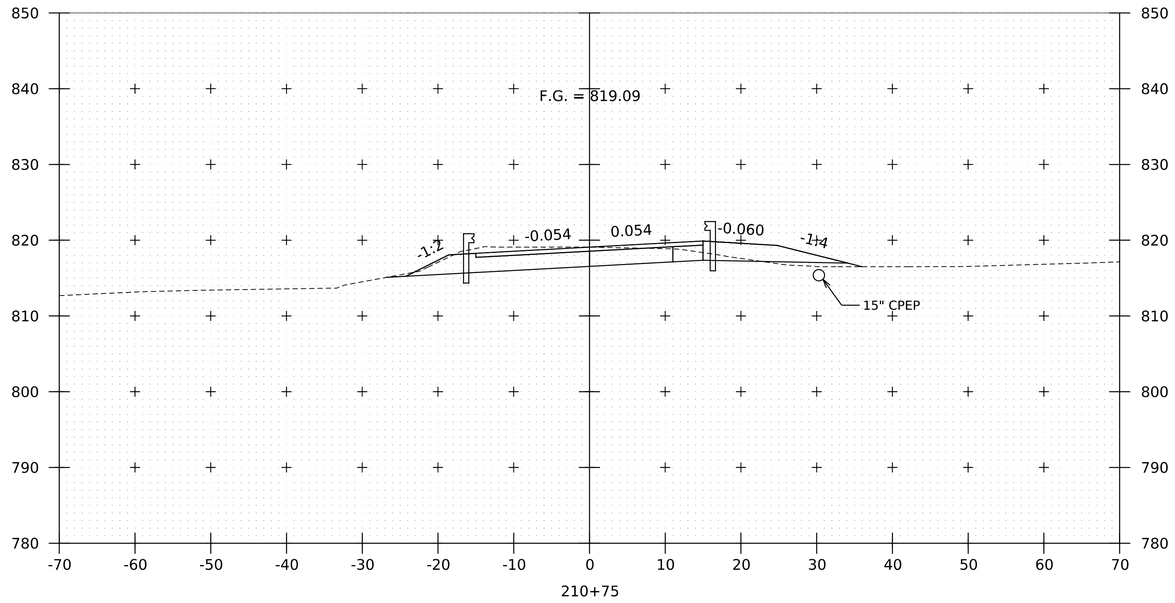
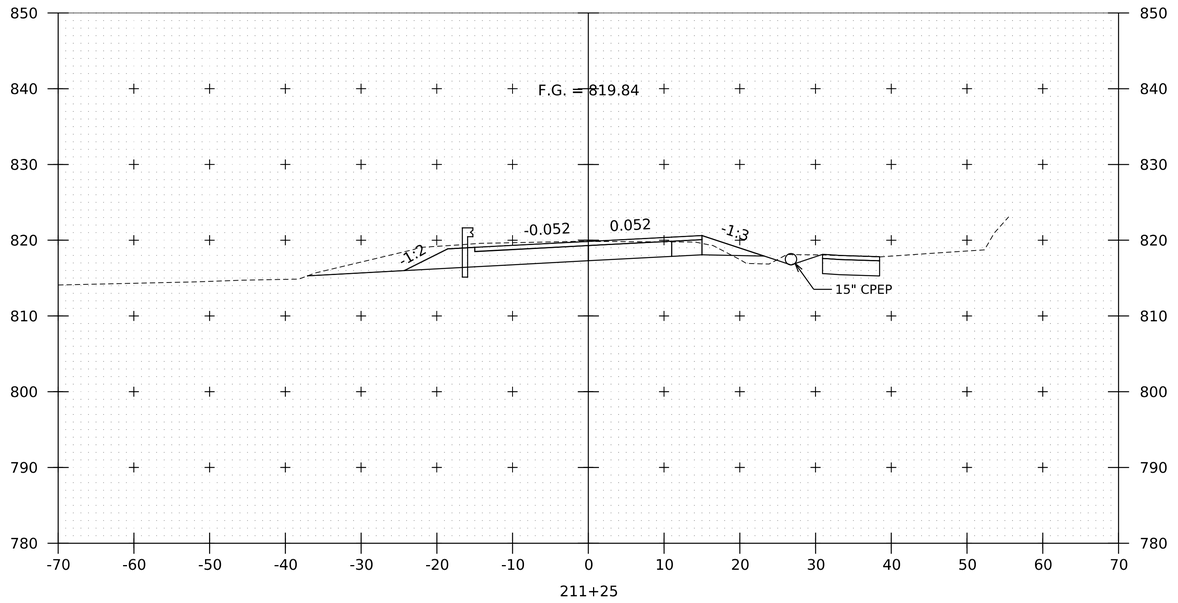


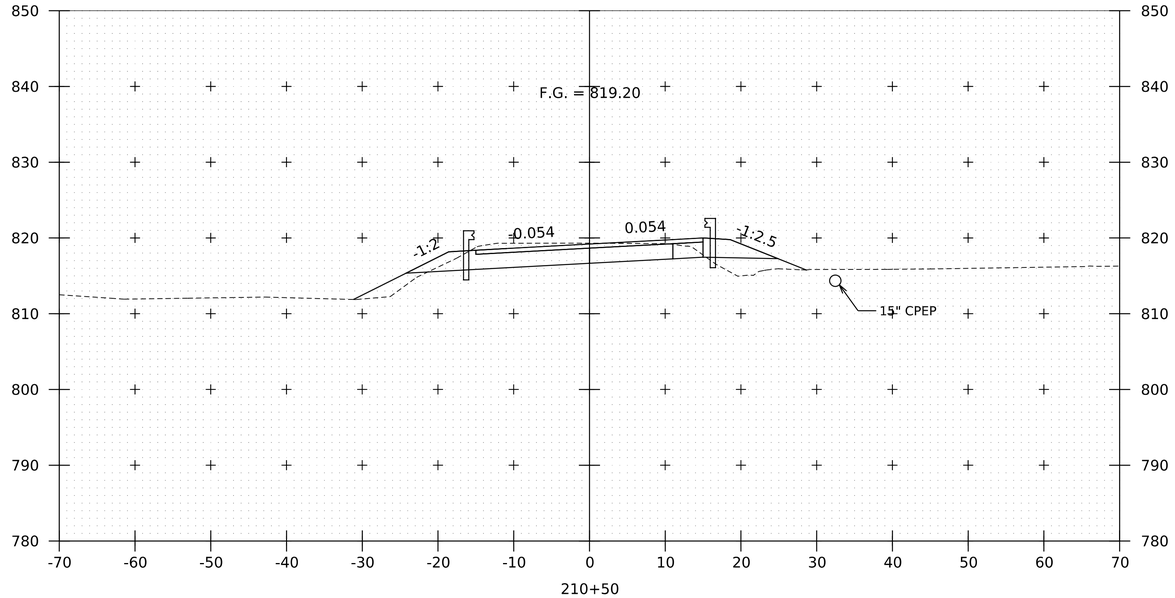


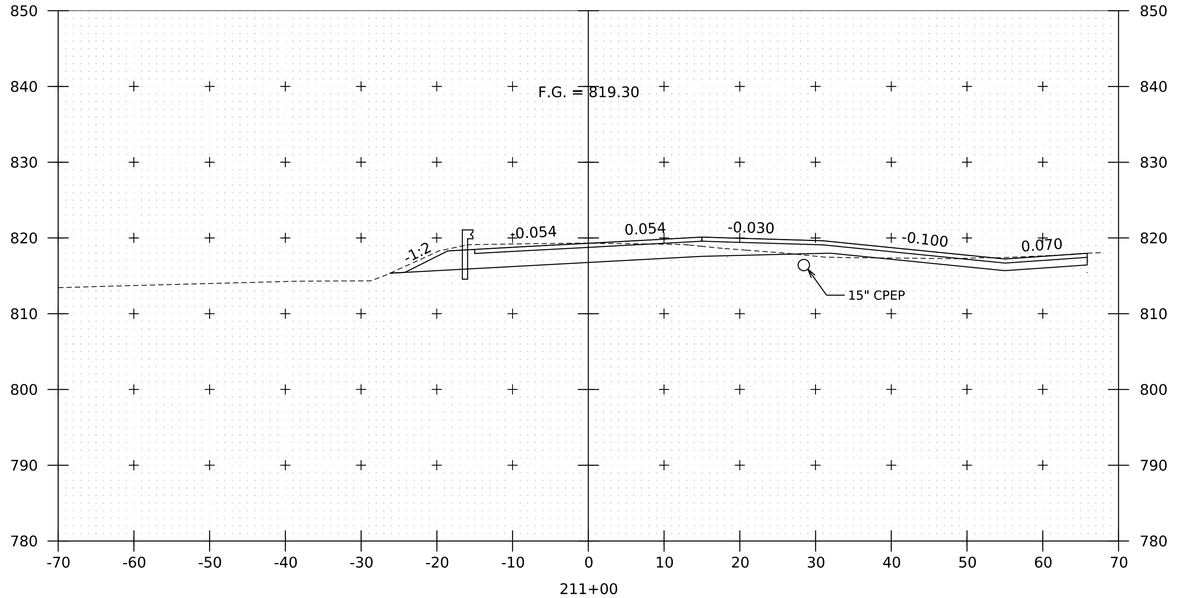
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 5	SHEET 59 OF 370



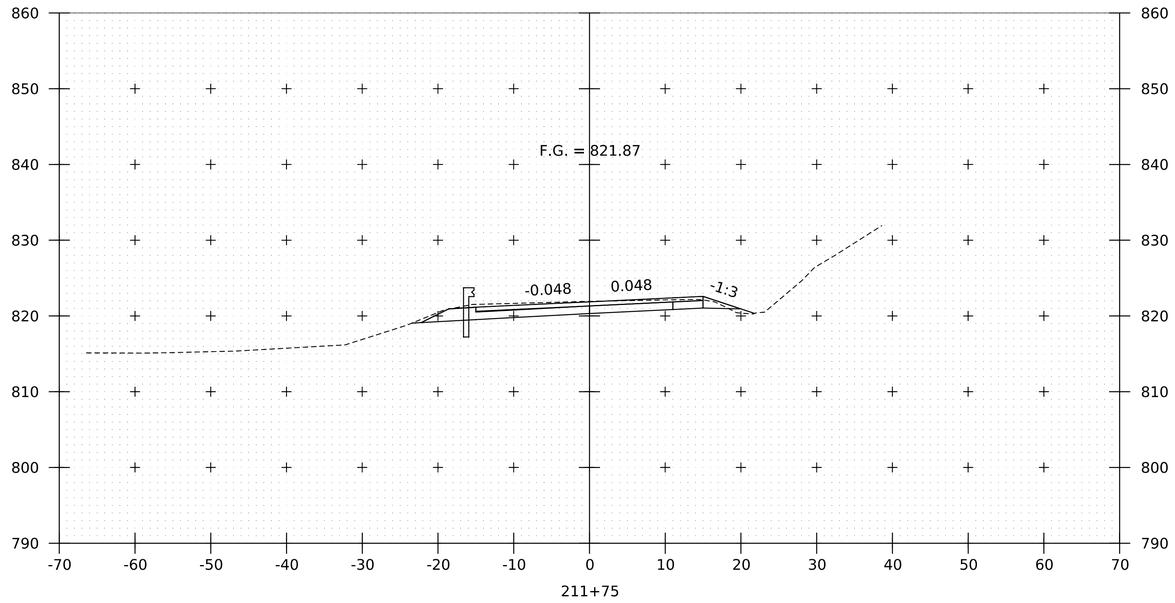


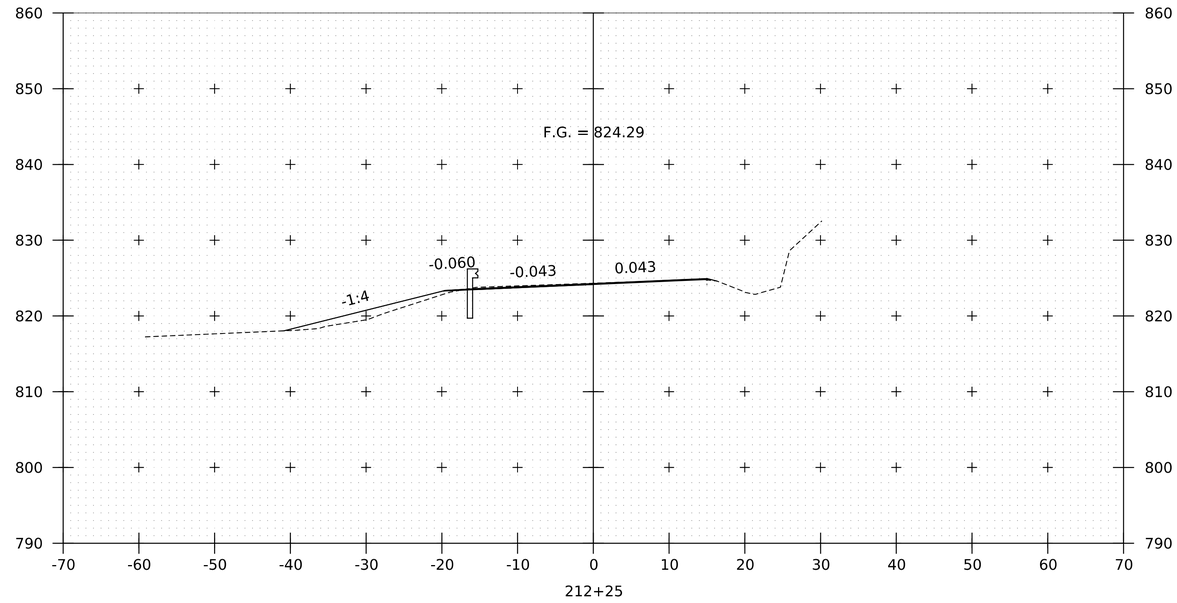


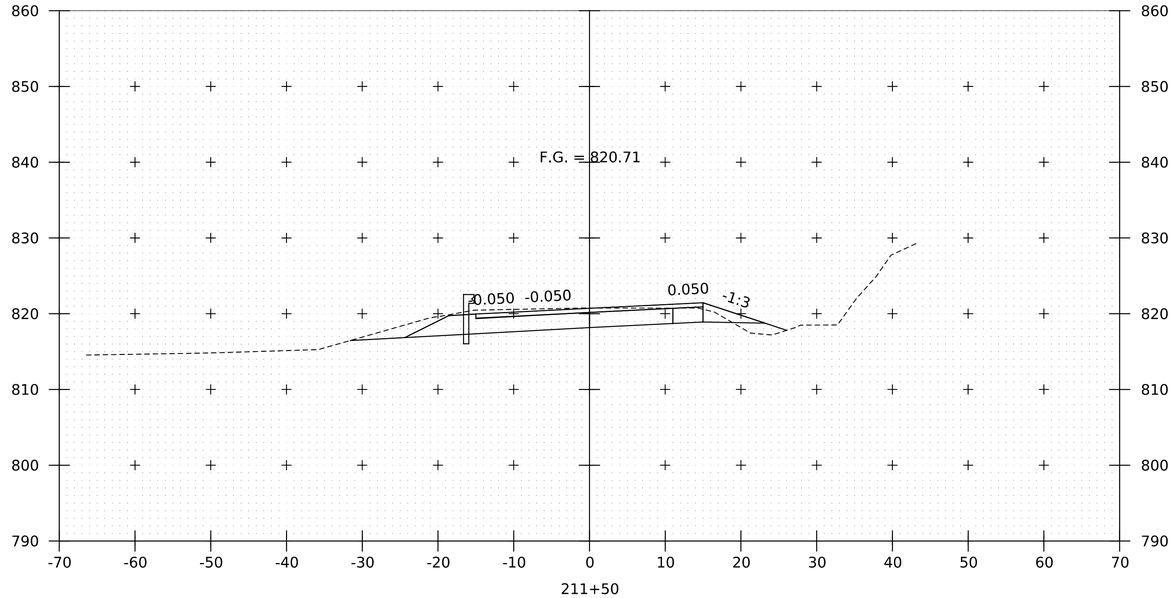


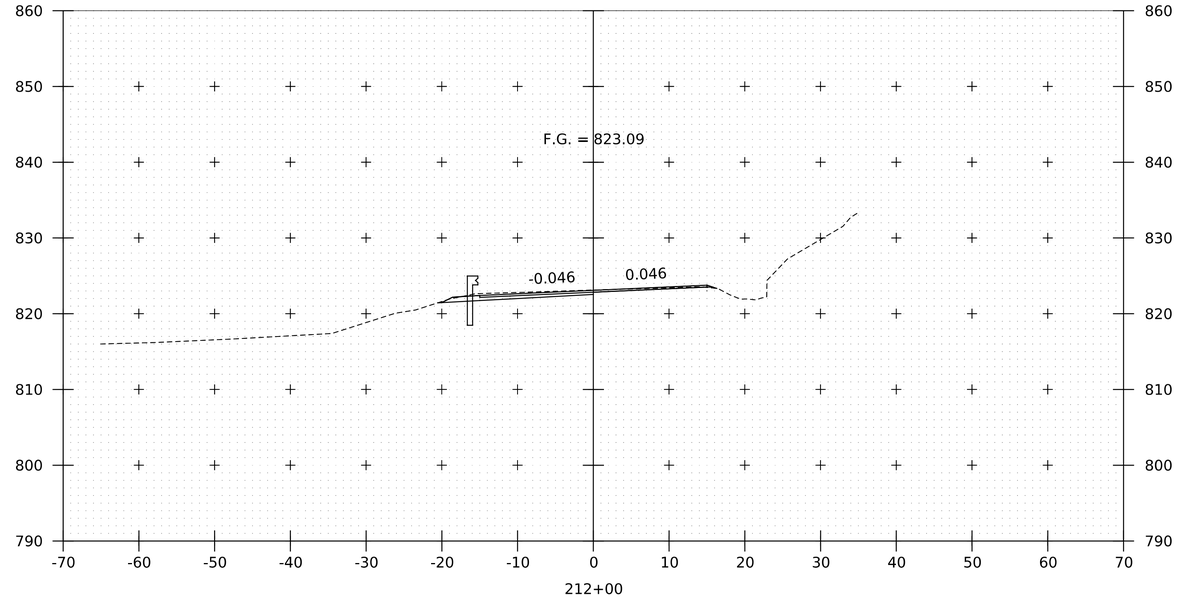
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)
FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 6	SHEET 60 OF 370





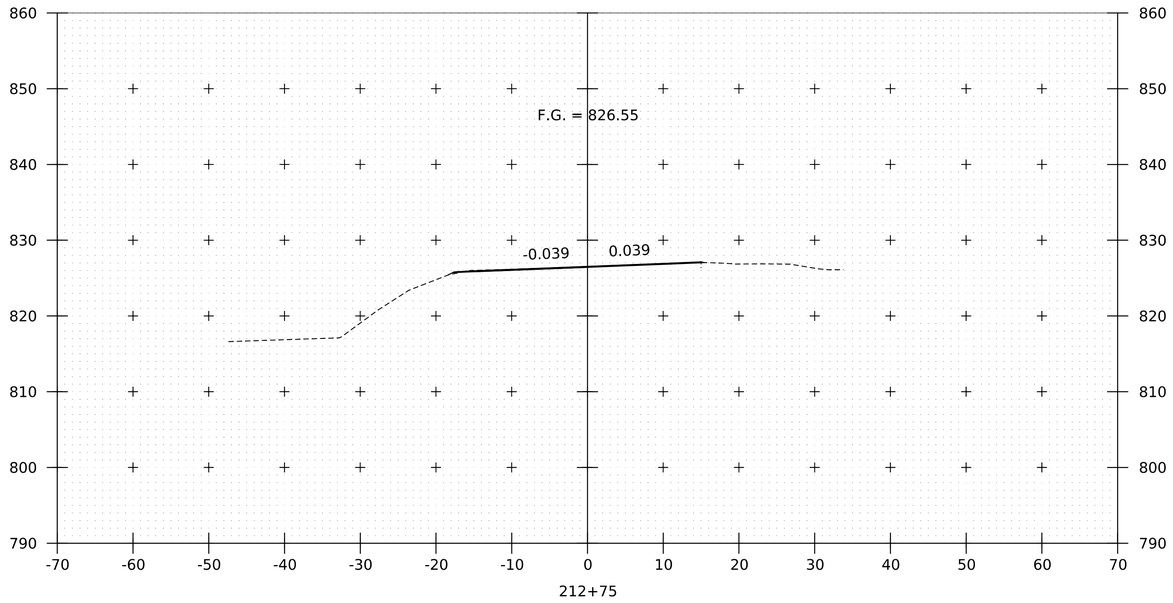


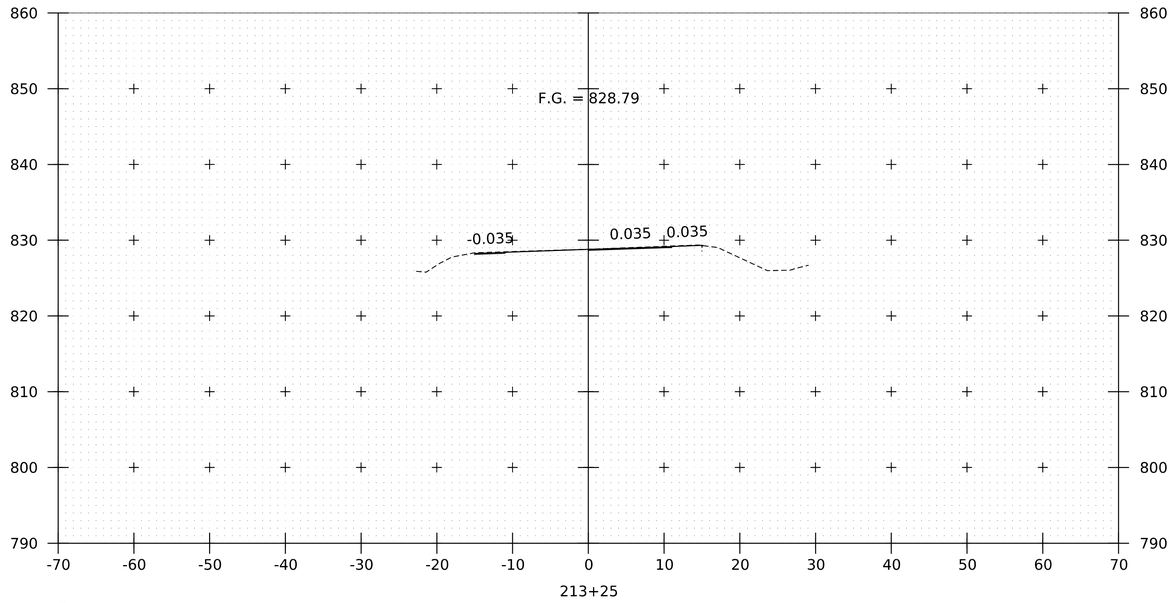


END PROJECT
STA 211+50.00

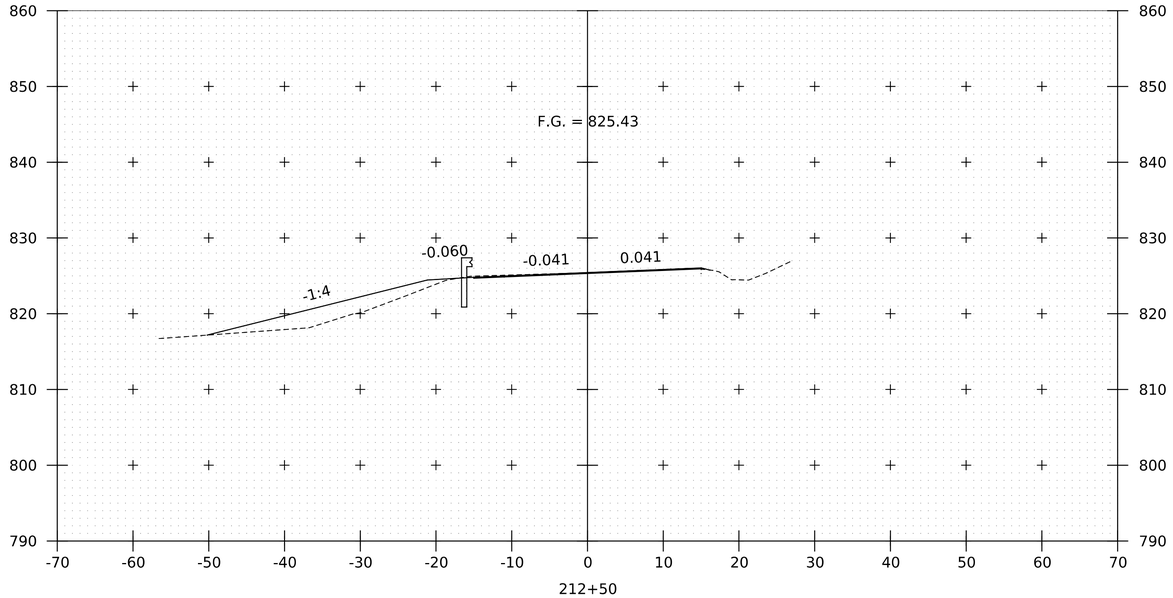
HOYLE TANNER

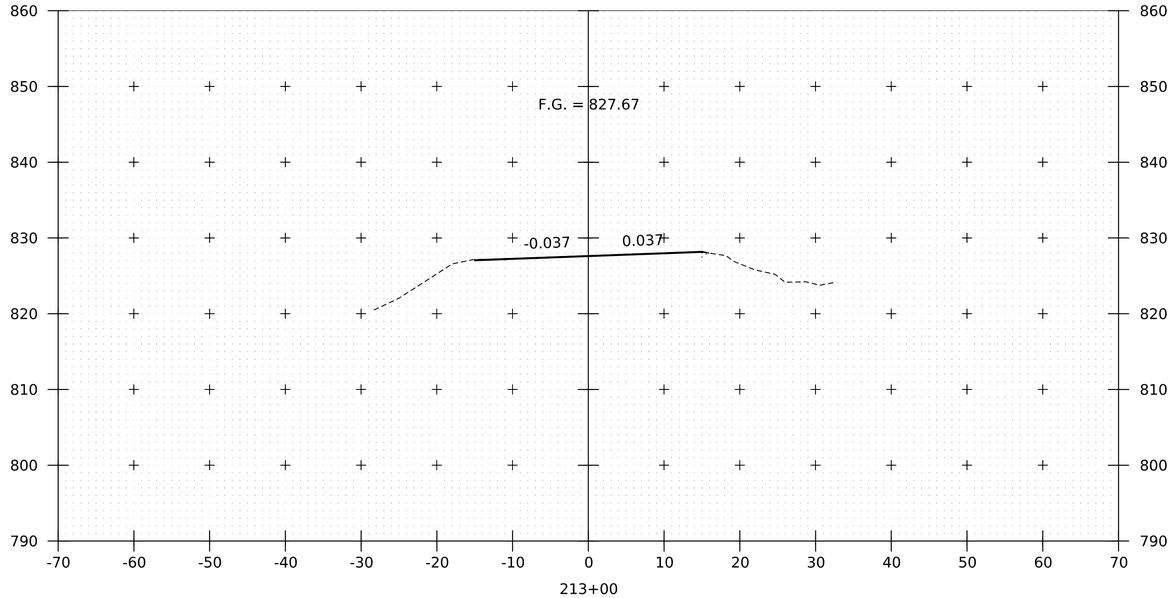
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)
FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 7	SHEET 61 OF 370





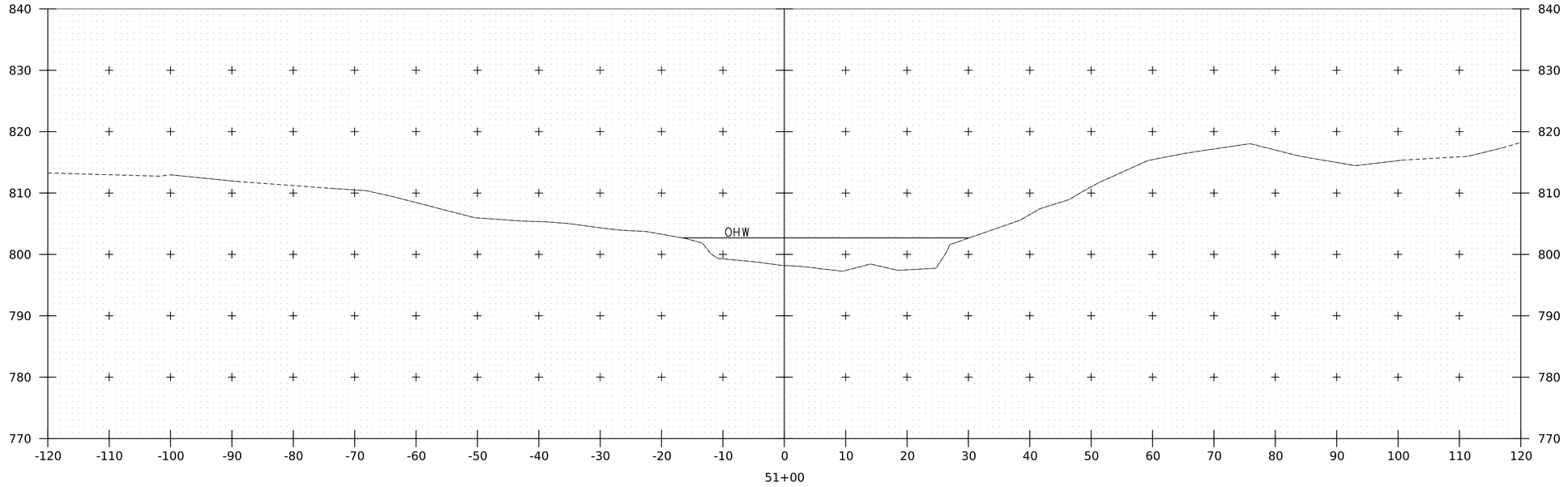
END APPROACH
STA 213+25.00
MATCH EXISTING

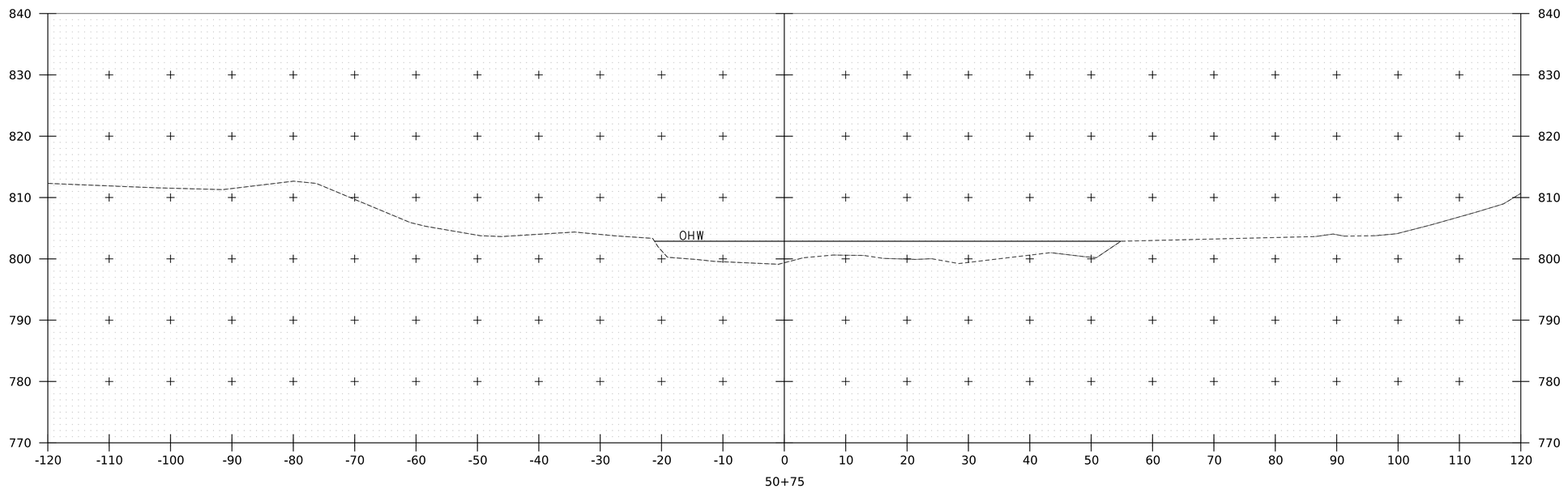




HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)
FILE NAME: z86e053xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 8	SHEET 62 OF 370

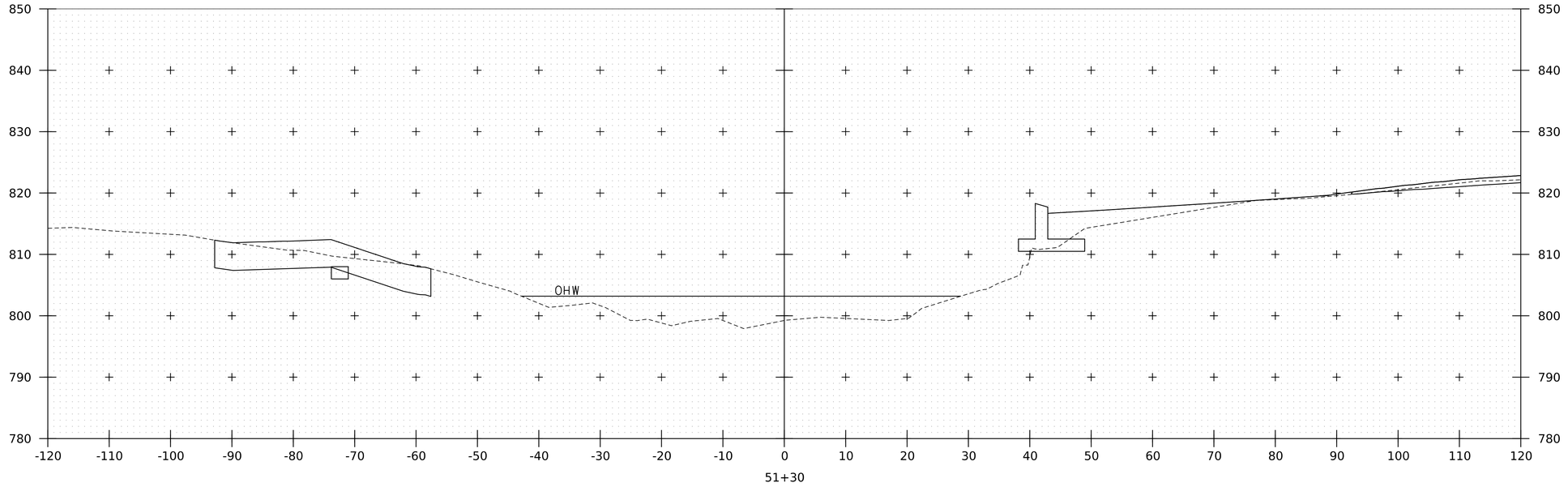




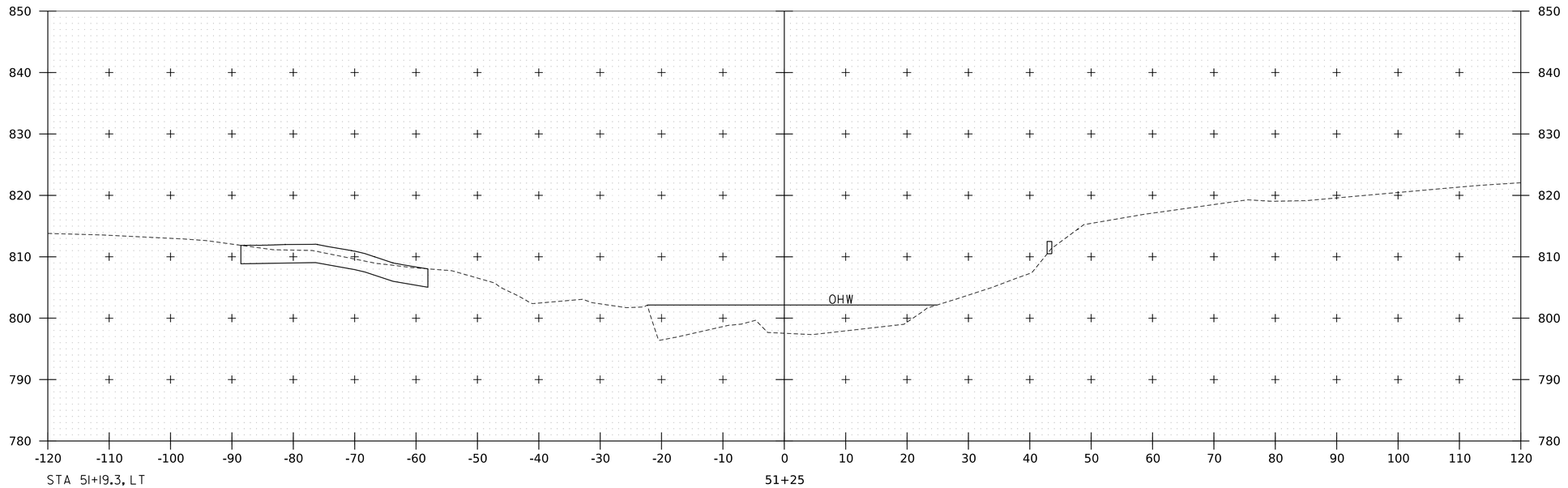
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)

FILE NAME: z86e053xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
CHANNEL CROSS SECTIONS I	SHEET 63 OF 370



51+30



STA 51+19.3, LT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

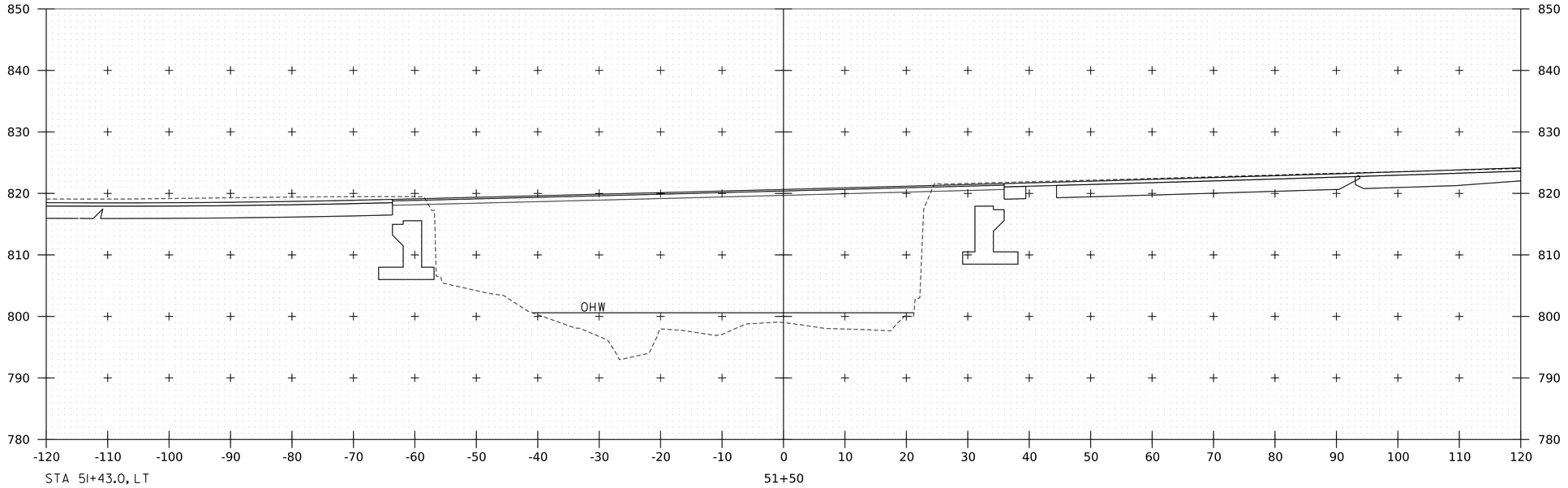
51+25

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(59)

FILE NAME: z86e053xs3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
CHANNEL CROSS SECTIONS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
SHEET 64 OF 370



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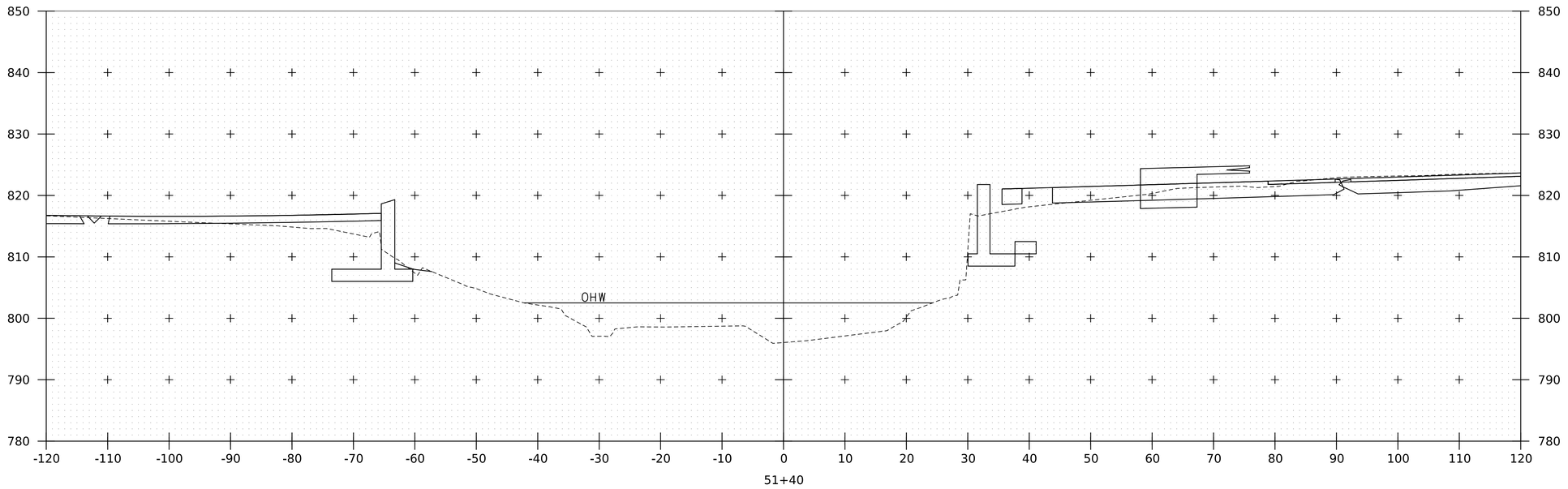
STONE FILL, TYPE III
GRUBBING MATERIAL

51+50

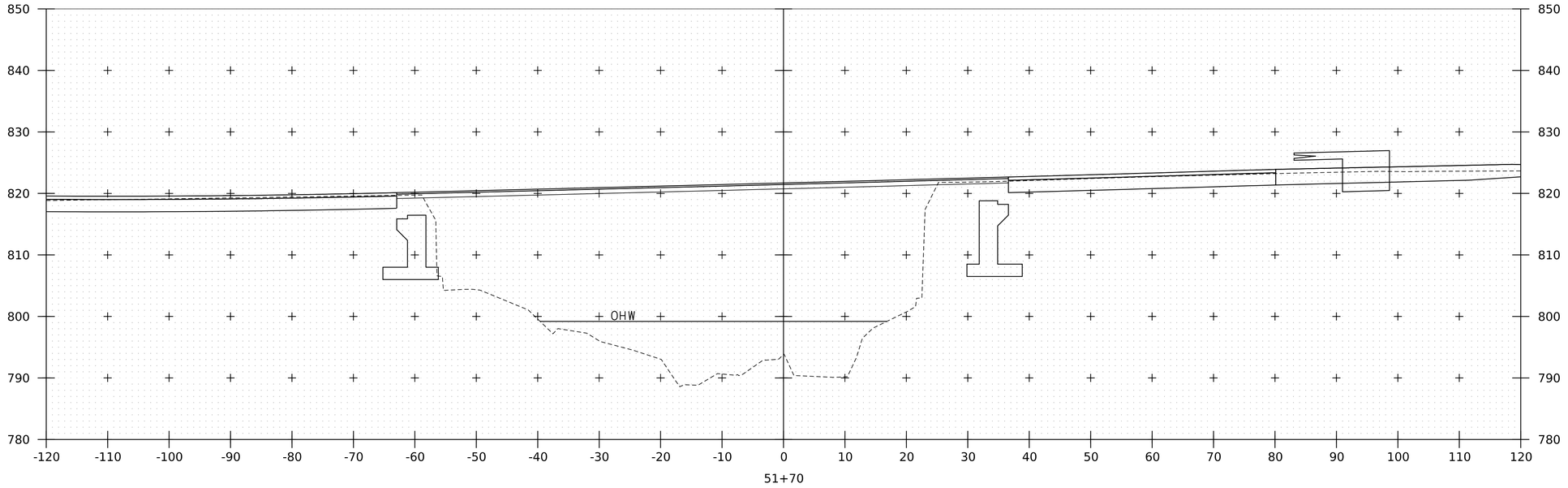


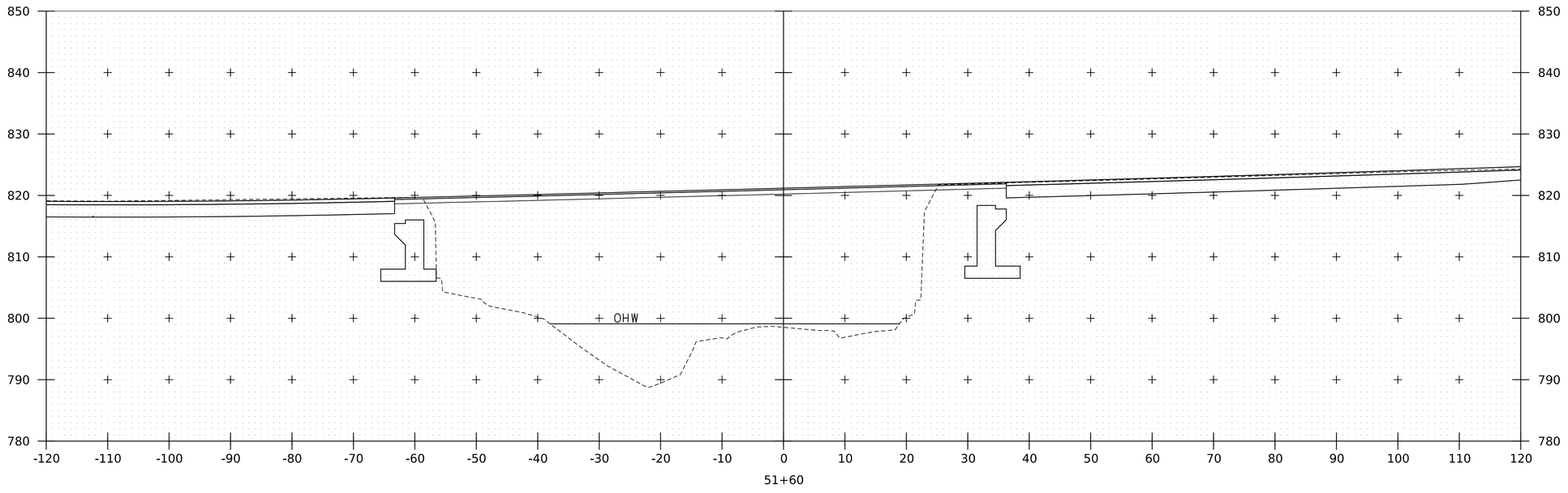
51+40

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)

FILE NAME: z86e053xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
CHANNEL CROSS SECTIONS 3	SHEET 65 OF 370

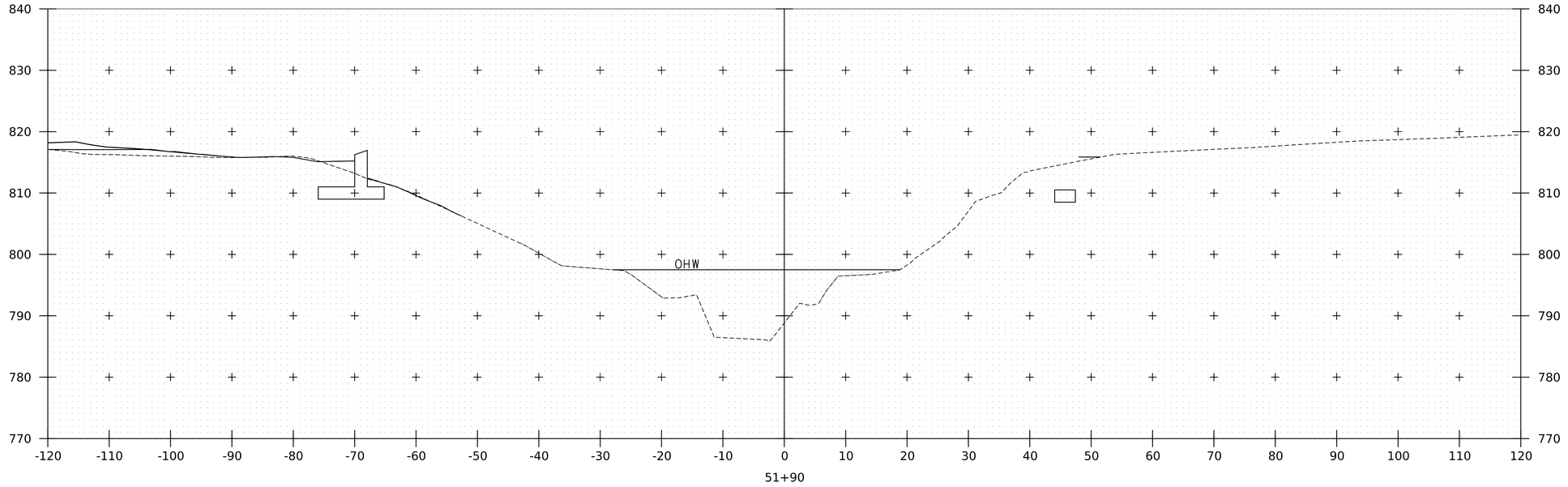




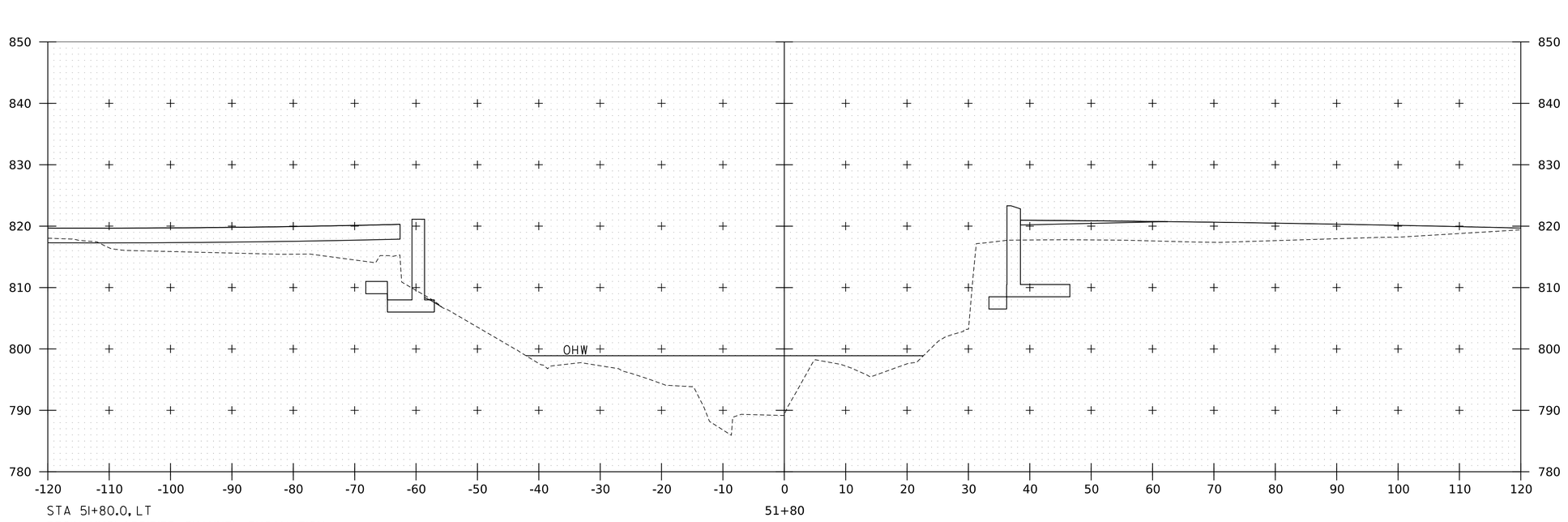
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
CHANNEL CROSS SECTIONS 4	SHEET 66 OF 370



51+90



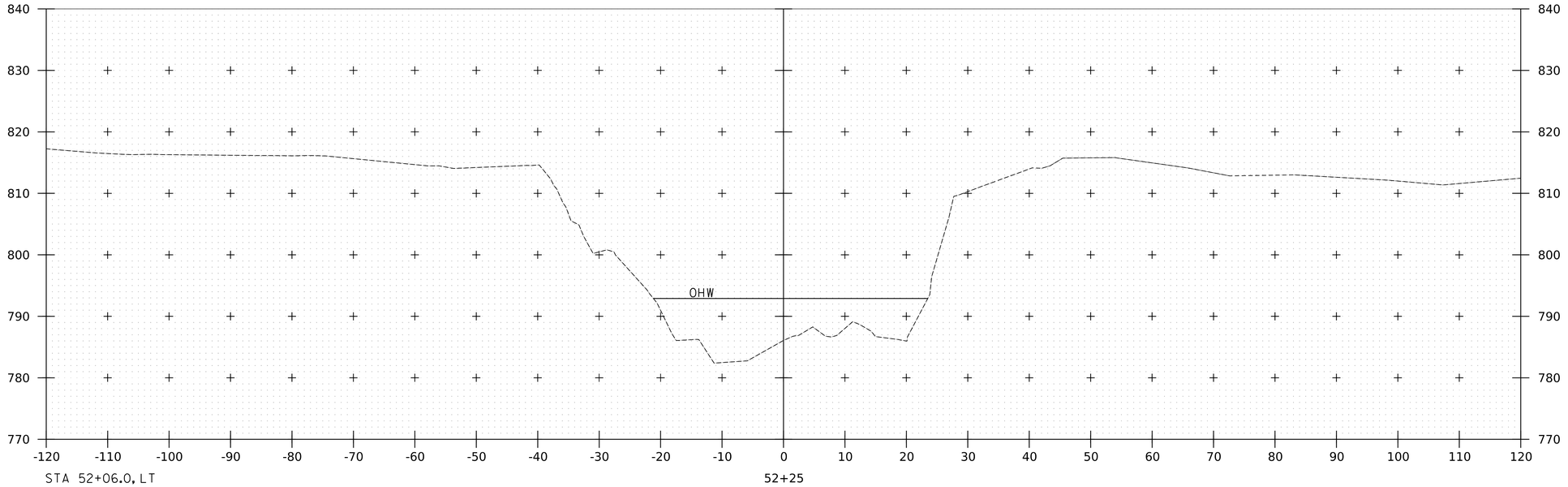
51+80

STA 51+80.0, LT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

HOYLE TANNER

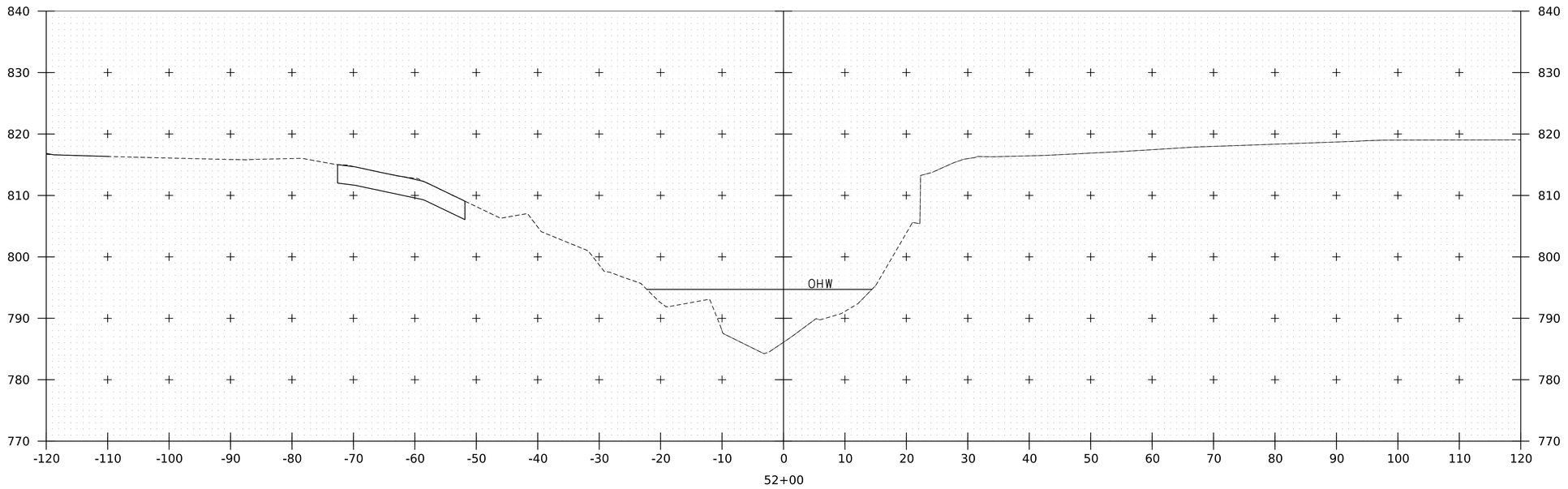
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(59)

FILE NAME: z86e053xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
CHANNEL CROSS SECTIONS 5	SHEET 67 OF 370



STA 52+06.0, LT
ENDN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

52+25



52+00

HOYLE TANNER

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PROJECT NUMBER:	BF 024I(59)
FILE NAME: z86e053xs3.dgn	PLOT DATE: 25-MAY-2023
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DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
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EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THIS PROJECT INVOLVES REMOVAL AND REPLACEMENT OF BRIDGE NO. 84 WITH A NEW A STEEL GIRDER BRIDGE ON SEMI-INTEGRAL CONCRETE ABUTMENTS WITH FOOTINGS FOUNDED ON BEDROCK CONVEYING NORTH BRANCH OF WINOOSKI RIVER IN WORCESTER, VT. BRIDGE NO. 84 IS LOCATED ON VT ROUTE 12 APPROXIMATELY 11.2 MILES NORTH OF THE JUNCTION WITH US ROUTE 2. THE EXISTING STRUCTURE IS A CAST-IN-PLACE CONCRETE DECK ON ROLLED BEAMS WITH CONCRETE ABUTMENTS FOUNDED ON BEDROCK WHICH WILL BE ENTIRELY REPLACED IN THE SAME LOCATION.

CONSTRUCTION WILL ALSO INCLUDE 0.09 MILES OF ROADWAY RECONSTRUCTION. TRAFFIC CONTROL DURING CONSTRUCTION WILL CONSIST OF A TEMPORARY BRIDGE INCLUDING TEMPORARY PAVED ROADWAY APPROACHES WITH EMBANKMENTS AND SIDESLOPES UPSTREAM OF BRIDGE NO. 84.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST ONE CONSTRUCTION SEASON.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 1.34 ACRES.

THE MAXIMUM CONCURRENT EARTH DISTURBANCE USED TO SCORE THIS PROJECT IN APPENDIX A RISK ASSESSMENT IS 1.34 ACRES.

THIS PROJECT REQUIRES COVERAGE UNDER GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES FOR LOW RISK PROJECTS.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

THE MAJOR COMPONENTS OF THE PROJECT AND A PROPOSED GENERAL SEQUENCE IS AS FOLLOWS:

CONSTRUCTION OF THE PROJECT WILL BE BROKEN INTO FOUR MAIN PHASES THAT CONSIST OF INSTALLING THE TEMPORARY BRIDGE AND APPROACHES, REMOVING AND REPLACING BR. 84, RECONSTRUCTING THE NEW ROADWAY APPROACHES BETWEEN THE TEMPORARY BRIDGE APPROACHES, AND THEN FINAL ROADWAY RECONSTRUCTION, SITE GRADING, AND CLEANUP TASKS.

PHASE 1
- ESTABLISH PERIMETER CONTROLS AND PROJECT DEMARCATION
- INSTALL SEDIMENT CONTROL MEASURES
- CLEARING
- CONSTRUCT TEMPORARY BRIDGE AND APPROACHES WHILE MAINTAINING TRAFFIC ON VT ROUTE 12
- COMPLETE INSTALLATION OF TEMPORARY EROSION CONTROL MEASURES FOR TEMPORARY DETOUR
- SHIFT TRAFFIC ONTO TEMPORARY BRIDGE AND APPROACHES

PHASE 2
- ADJUST SEDIMENT CONTROL MEASURES, AS NECESSARY
- REMOVE EXISTING BRIDGE
- CONSTRUCT ABUTMENTS AND WINGWALLS
- BUILD CHANNEL EMBANKMENTS AND PLACE CHANNEL STONE FILL
- CONSTRUCT NEW SUPERSTRUCTURE AND APPROACH SLABS

PHASE 3
- CONSTRUCT ROADWAY EMBANKMENTS AND STABILIZE SIDE SLOPES BETWEEN THE TEMPORARY BRIDGE APPROACHES
- INSTALL NEW DRAINAGE STRUCTURES
- PLACE ROADWAY SUBBASE
- INSTALL PERMANENT STABILIZATION MEASURES WHERE POSSIBLE
- PAVE ROADWAY BETWEEN THE TEMPORARY BRIDGE APPROACHES
- SWITCH TRAFFIC TO NEW ROADWAY AND BRIDGE

PHASE 4
- REMOVE TEMPORARY BRIDGE AND APPROACHES
- RE-ESTABLISH REMAINING PORTIONS OF THE ROADWAY EMBANKMENTS AND SHAPE FINAL SLOPES
- PAVE REMAINING ROADWAY
- INSTALL REMAINING PERMANENT STABILIZATION MEASURES

4. SITE DESCRIPTION

4.1 VEGETATED BUFFERS

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

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. SILT FENCE OR BARRIER FENCE WILL BE PLACED IN APPROPRIATE LOCATIONS AS SHOWN ON THE CONSTRUCTION SITE PLANS.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES (1) STREAM CROSSINGS, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THE PROJECT INVOLVES 3,104 SF OF WETLAND AND 11,985 SF OF WETLAND BUFFER. THIS WORK WITHIN THESE AREAS IS BEING AUTHORIZED THROUGH THE VANR WETLANDS OFFICE AND THE US ARMY CORPS OF ENGINEERS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE PROJECT AREA IS GENERALLY FOREST LAND WITH RESIDENCES ADJACENT TO THE EXISTING BRIDGE IN THE NORTHEAST, AND SOUTHWEST QUADRANTS.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF MOWED ROADSIDE GRASS, HERBACIOUS VEGETATION, SHRUBS, AND HARDWOODS. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:
RUMNEY FINE SANDY LOAMS, 0% TO 3% SLOPES, FREQUENTLY FLOODED, “K FACTOR” = 0.23
MACHIAS FINE SANDY LOAMS, 0% TO 3% SLOPES, “K FACTOR” = 0.14
TUNBRIDGE-LYMAN COMPLEX, 8% TO 15% SLOPES, VERY ROCKY, “K FACTOR” = 0.33

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

4.7 OTHER SENSITIVE RESOURCES

THE ARCHAEOLOGICALLY SENSITIVE AREAS LOCATED IN THE SOUTHWEST AND NORTHEAST QUADRANTS OF THE BRIDGE AND SHOWN ON THESE PLANS ARE WITHIN THE LIMITS OF DISTURBANCE FOR THE TEMPORARY BRIDGE AND APPROACH. THIS AREA SHALL BE PROTECTED WITH ORANGE BARRIER FENCE.

THERE IS A STONEWALL LOCATED AT APPROXIMATE STATION 208+00 LT THAT NEEDS TO BE PROTECTED DURING CONSTRUCTION. REFERENCE NOTES ON TRAFFIC CONTROL SHEETS.

THE PROJECT IS LOCATED WITHIN THE NORTHERN LONG-EARED BAT RANGE. POTENTIAL ROOSTING TREES IDENTIFIED ON THESE PLANS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 656.11 TREE PROTECTION. ANY TREE CUTTING OF GREATER THAN OR EQUAL TO 3 INCHES, WILL ADHERE TO TIME OF YEAR RESTRICTIONS. THE CONTRACTOR SHALL REFERENCE NOTICE TO BIDDERS AND PERMIT RESTRICTIONS FOR TIME OF YEAR RESTRICTIONS ON TREE CLEARING.

THE PROJECT AREA IS IDENTIFIED AS A HIGHEST PRIORITY WILDLIFE CROSSING, HIGHEST PRIORITY SURFACE WATER AND RIPARIAN AREA.

THERE ARE NO OTHER RARE, THREATENED, OR ENDANGERED SPECIES, HISTORIC OR SECTION 4(F) RESOURCES IDENTIFIED WITHIN THE PROJECT VICINITY.

5. DRAINAGE

5.1 RECEIVING WATERS

NORTH BRANCH OF WINOOSKI RIVER AND ADJACENT CLASS II WETLANDS ARE THE ONLY WATER SOURCES ON THE PROJECT SITE. RESIDENCE WATER SUPPLIES ARE FROM DRILLED WELLS. THE RIVER IS CLASSIFIED AS A STEEP STEP-POOL SYSTEM WITH BOTH BEDROCK AND BOULDER SUBSTRATE. THE RIVER IS CONFINED BY BEDROCK AT THE BRIDGE. THERE IS A LARGE SCOUR POOL DOWNSTREAM OF BRIDGE NO. 84. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 22.3 MILES^2.

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF A BRIDGE PROJECT BEING LOCATED DIRECTLY OVER THE RECEIVING WATER, THERE ARE NO DISCRETE DISCHARGE POINTS. ALL WATER FROM THE PROJECT AREA DRAINS TOWARD THE BROOK AND ENTERS THE RECEIVING WATER IN MULTIPLE LOCATIONS IN THE AREAS DIRECTLY ADJACENT TO THE BRIDGE.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

THE PROJECT IS NOT CURBED AND RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES BEFORE REACHING THE RECEIVING WATER. A CULVERT COLLECTS AND CONVEYS STORMWATER UNDER THE NORTHEAST QUADRANT DRIVEWAY WHICH SHEET FLOWS INTO THE RECEIVING WATER. THERE IS A CLOSED DRAINAGE STRUCTURE AT THE LOW POINT OF THE ROADWAY SAG VERTICAL CURVE TO CAPTURE SNOW MELT DURING THE WINTER. OTHERWISE, SHEET FLOW OFF THE ROADWAY IS EXPECTED.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION’S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

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

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.

6.3 STABILIZE DISTURBED AREAS

6.3.1 ACCESS POINTS/ENTRANCE/EXITS

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

STABILIZED CONSTRUCTION ENTRANCES ARE ANTICIPATED ON THIS PROJECT AND SHALL BE LOCATED AS SHOWN ON THIS EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

SURFACE ROUGHENING OF EXPOSED SLOPES, SEEDING OF TEMPORARY SLOPES AND STOCKPILES, AND STANDARD MULCHING PRACTICES DESCRIBED IN SPECIFICATION SECTION 653.07 SHALL BE UTILIZED TO TEMPORARILY STABILIZE DISTURBED AREAS.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.SEMPRINI
EPSC NARRATIVE 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
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6.3.3 PERMANENT STABILIZATION 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, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH.

STONE FILL SHALL BE USED TO ARMOR THE CHANNEL AND WINGWALL SLOPES.

6.4 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 LOCATED WITHIN A VERTICAL SAG CURVE WITH THE NORTH AND SOUTH APPROACHES DRAINING TOWARD THE PROJECT AREA. RUNOFF FROM THESE AREAS MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA. VT ROUTE 12 IS SUPERELEVATED TO DRAIN ALL RUNOFF INTO THE DITCH LINE ON THE WEST SIDE OF VT ROUTE 12. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

SILT FENCE SHALL BE INSTALLED ALONG THE CONTOURS AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF RECEIVING WATERS.

6.6 SLOW DOWN CHANNELIZED RUNOFF

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

TEMPORARY STONE CHECK DAMS SHALL BE INSTALLED AS SHOWN ON THE PLANS.

7. CONSTRUCT PERMANENT CONTROLS

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

A STONE LINED DITCH IN GENERALLY THE SAME LOCATION AS THE EXISTING DITCH IN THE SOUTHWEST QUADRANT OF THE PROJECT ADJACENT TO VT ROUTE 12 WILL BE INTALLED. ALSO, RE-STABLISHING EXISTING VEGETATED DITCH SWALES ALONG VT ROUTE 12 IN THE NORTHWEST QUADRANT OF THE PROJECT IS ANTICIPATED. A DROP INLET AT THE LOW POINT OF THE HIGHWAY WILL BE INSTALLED.

8. DEWATERING

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. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN THE LIMITS OF STUCTURE EXCAVATION IS ANTICIPATED. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12" OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRADIENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1" THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT'S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC 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.

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EPSC NARRATIVE 2

PLOT DATE: 25-MAY-2023
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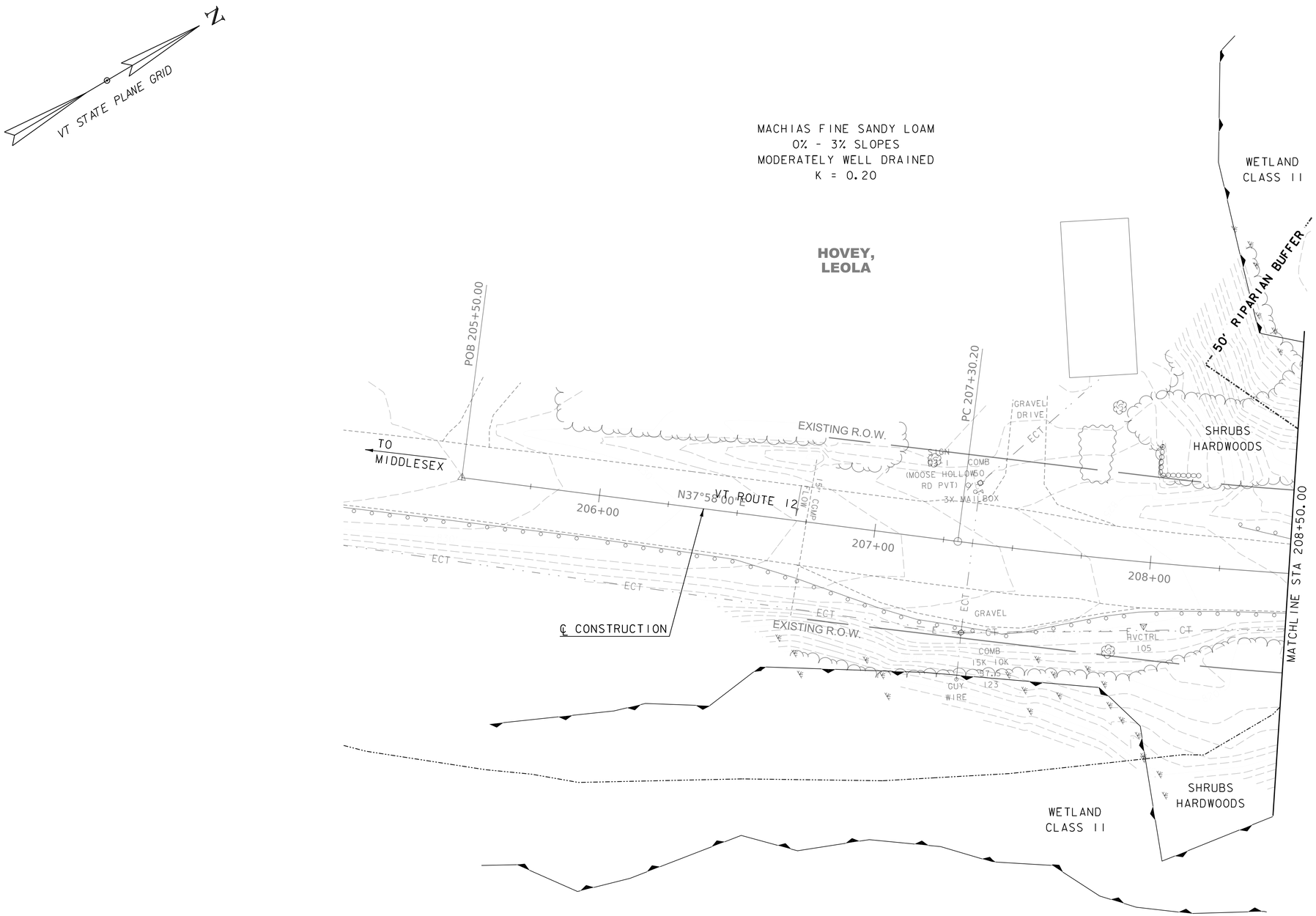
SHEET 70 OF 370



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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC EXISTING SITE PLAN 1	SHEET 71 OF 370

N

VT STATE PLANE GRID

MACHIAS FINE SANDY LOAM
0% - 3% SLOPES
MODERATELY WELL DRAINED
K = 0.20

WETLAND
CLASS II

WETLAND
CLASS II

RUMNEY FINE SANDY LOAM
0% - 3% SLOPES
FREQUENTLY FLOODED
K = 0.20

OWNERSHIP UNCERTAIN

N/F
ORTEGA, JUANITA

HOVEY,
LEOLA

NORTH BRANCH
FLOW

50' RIPARIAN BUFFER

SHRUBS
HARDWOODS

EXISTING R.O.W.

℄ CONSTRUCTION

HVCTRL
104

HVCTRL
102

HVCTRL
50

SIGN
OM3-R
VD-700
(BR 84
VT-121)

VD-700
(0120
0122
0400)

VT ROUTE 12

TO
ELMORE

214+00

213+00

212+00

211+00

210+00

209+00

MATCHLINE STA 208+50.00

HVCTRL
101

SIGN
OM3-R
VD-700
(BR 84
VT-121)

MH10

SIGN
OM3-R

BOUNDRY
MARKER
VT 1962
S 004/1

HVCTRL
103

15" COMP
FLOW

MAILBOX
#497

HVCTRL
39

ARTESIAN
WELL

TEL
59

ELEC
59

GUY
WIRE

GRAVEL
DRIVE

ELEC
124

TEL
125
60

GRAVEL
DRIVE

EXISTING R.O.W.

SHRUBS
HARDWOODS

HVCTRL
110

50' RIPARIAN BUFFER

DAVIS, JOANNE M.
& STEPHEN M.

TUNBRIDGE-LYMAN COMPLEX
0% - 15% SLOPES
VERY ROCKY
WELL DRAINED

WETLAND
CLASS II

50' RIPARIAN BUFFER

HVCTRL
106

FLOW

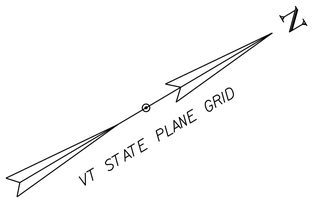
DAVIS, JOANNE M.
& STEPHEN M.

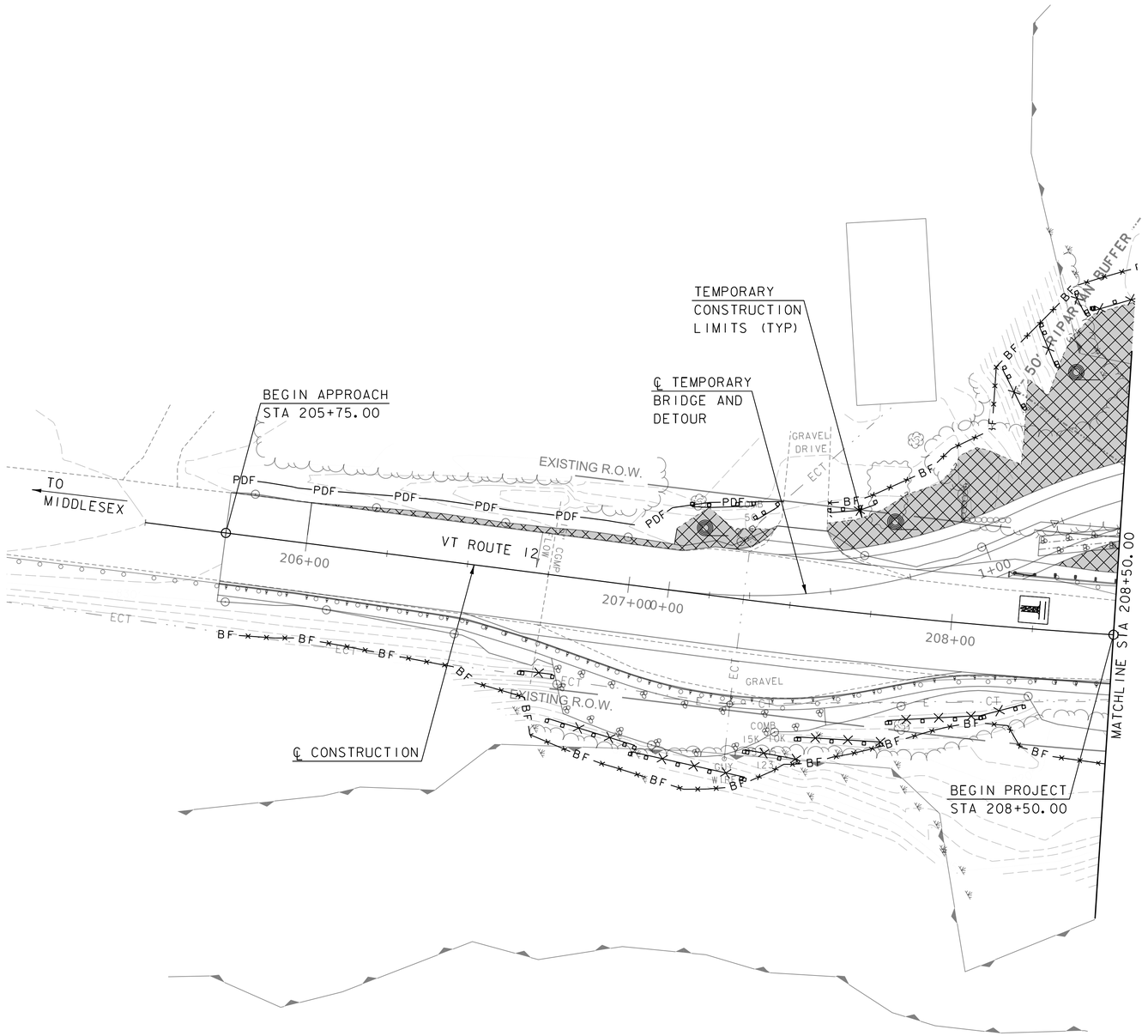
LONEGREN, LUCAS S.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC EXISTING SITE PLAN 2	SHEET 72 OF 370





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

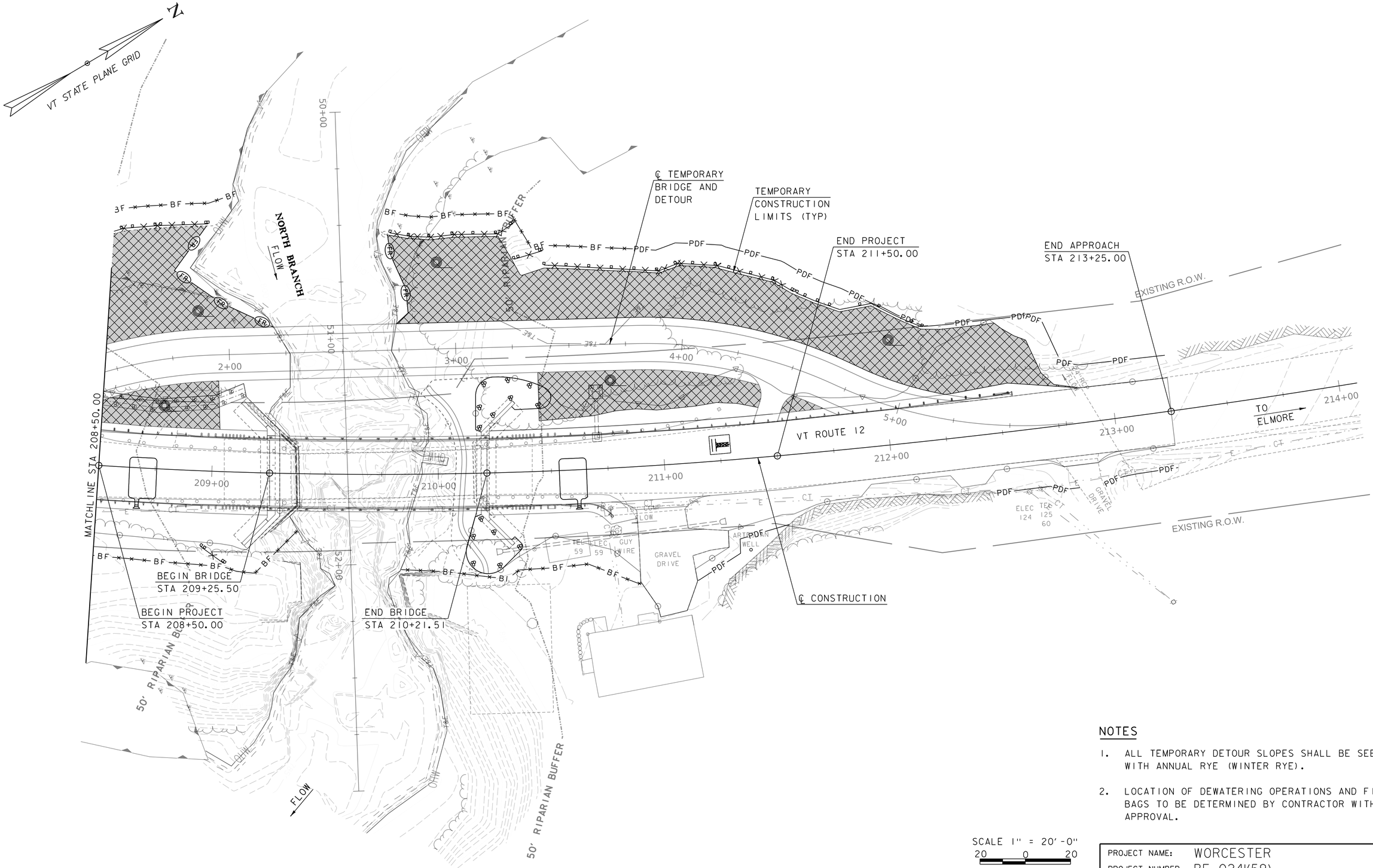
HOYLE TANNER

NOTES

1. ALL TEMPORARY DETOUR SLOPES SHALL BE SEEDED WITH ANNUAL RYE (WINTER RYE).
2. LOCATION OF DEWATERING OPERATIONS AND FILTER BAGS TO BE DETERMINED BY CONTRACTOR WITH RE APPROVAL.

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC CONSTRUCTION SITE PLAN 1	SHEET 73 OF 370



NOTES

1. ALL TEMPORARY DETOUR SLOPES SHALL BE SEEDED WITH ANNUAL RYE (WINTER RYE).

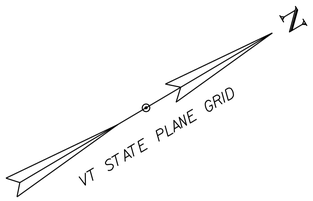
2. LOCATION OF DEWATERING OPERATIONS AND FILTER BAGS TO BE DETERMINED BY CONTRACTOR WITH RE APPROVAL.

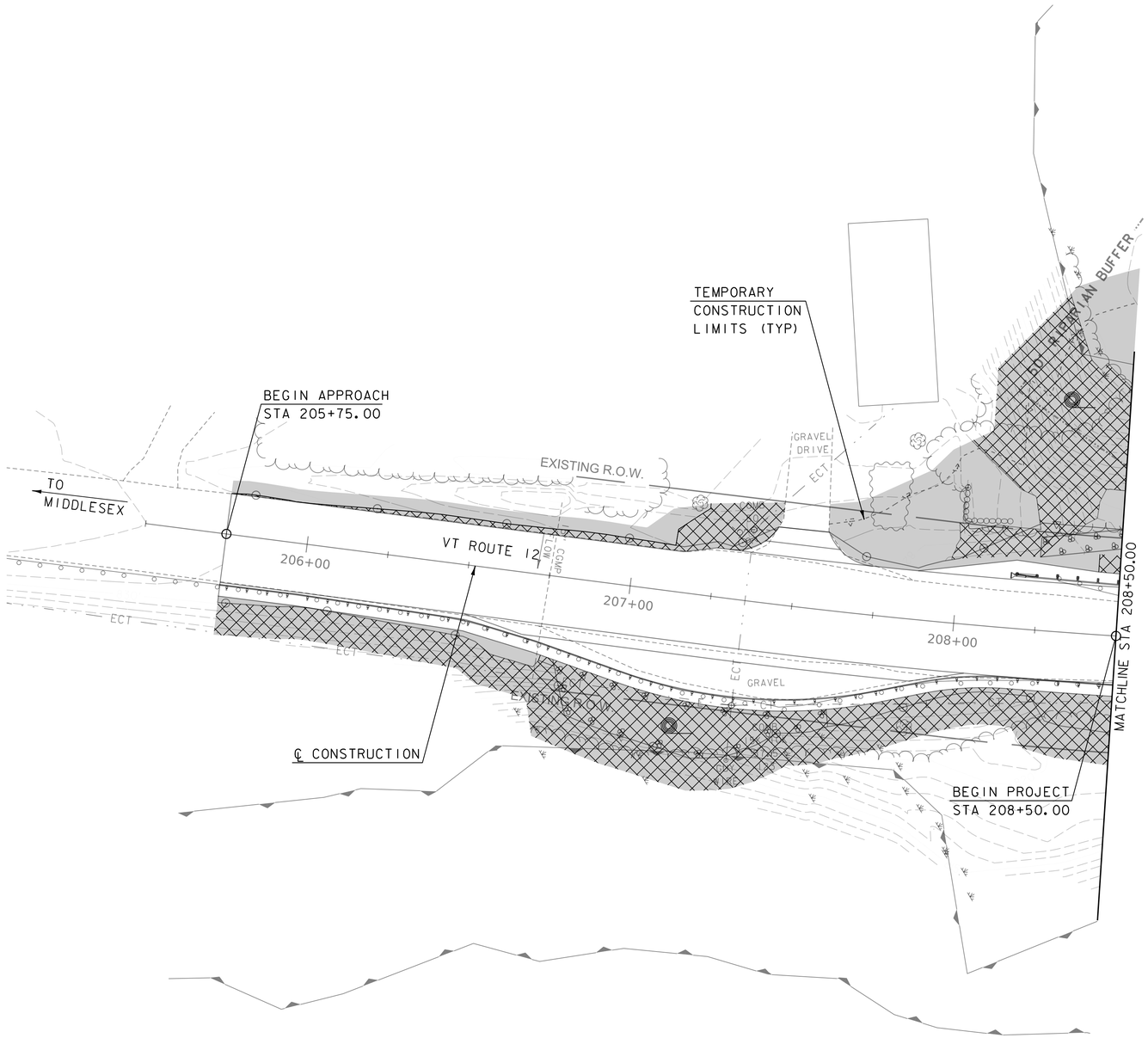
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC CONSTRUCTION SITE PLAN 2	SHEET 74 OF 370





NOTES

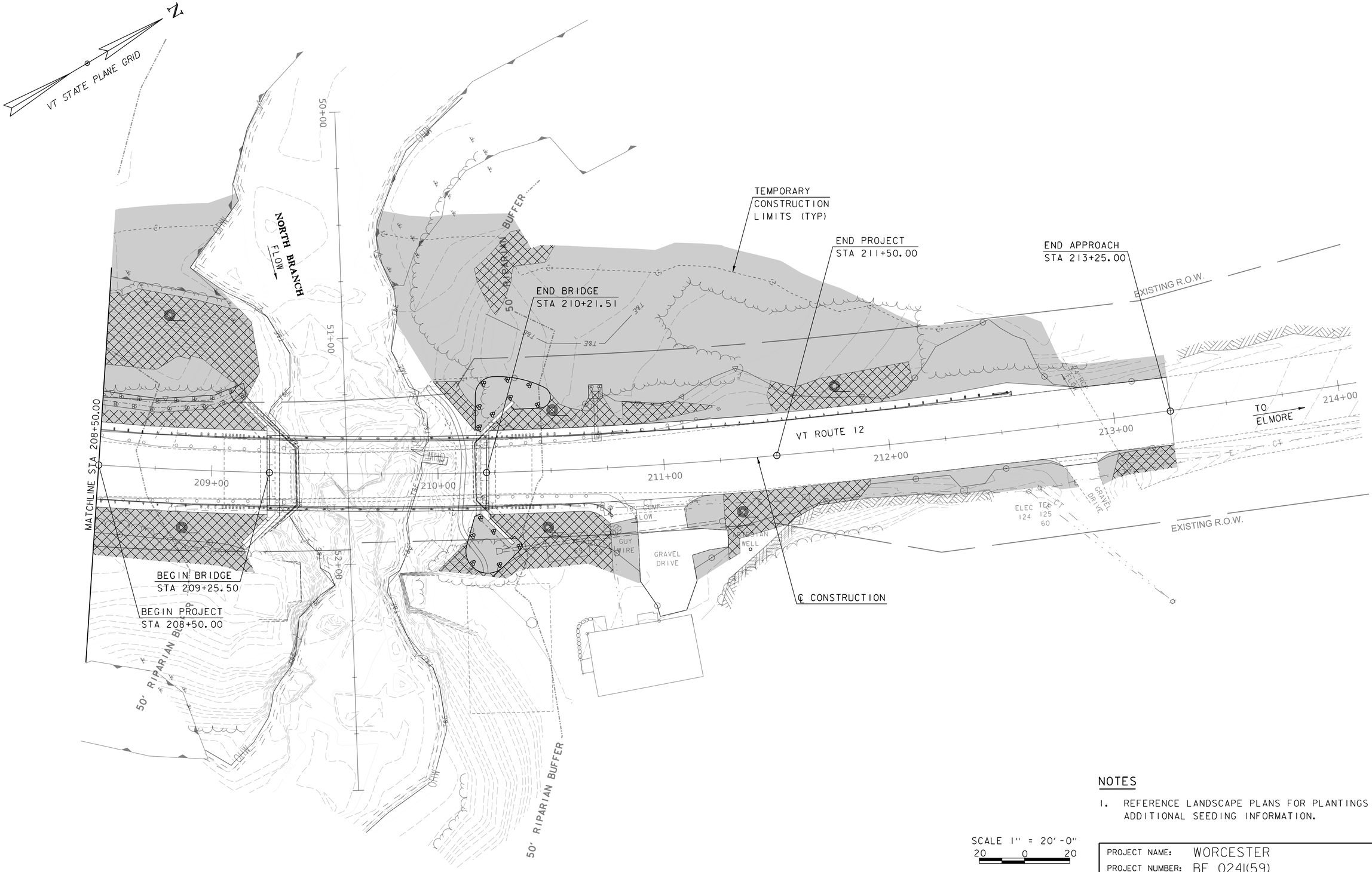
1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC FINAL SITE PLAN 1	SHEET 75 OF 370



NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)

FILE NAME: z86e053bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC FINAL SITE PLAN 2	SHEET 76 OF 370

VAOT LOW GROW/FINE FESCUE MIX

	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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

	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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

VAOT URBAN LAWN MIX

	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
42.5%	34	68	CREEPING RED FESCUE	FESTUCA RUBRA X RUBRA	85%	98%
20.0%	16	32	PERENNIAL RYE GRASS	LOLIUM PERENNE	90%	95%
32.5%	26	52	KENTUCKY BLUE GRASS	POA PRATENSIS	85%	85%
5.0%	4	8	ANNUAL RYE GRASS	LOLIUM MULTIFLORUM	85%	95%
100%	80	160				

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 URBAN AREA MIX SHALL NOT BE USED IN WETLANDS OR ANY WATERS OF THE STATE OF VERMONT.
2. SEED MIX: USE ONLY AS INDICATED IN THE PLANS.
3. SEED MIX: 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 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 22, 2015	WHF

HOYLE TANNER

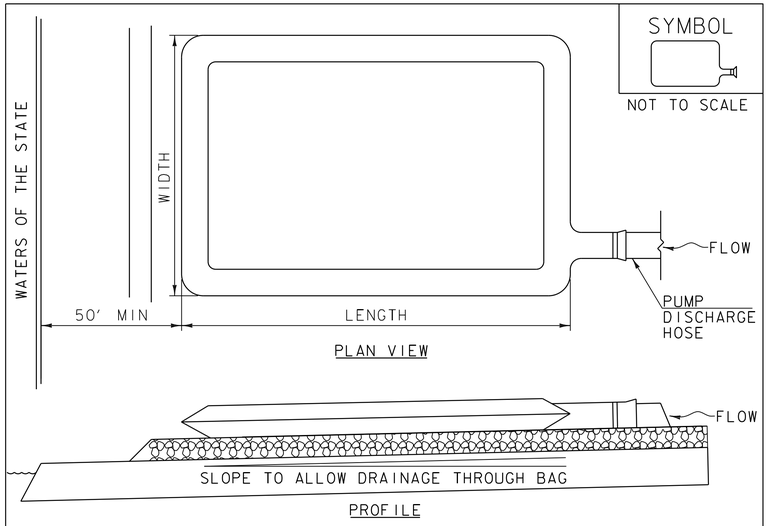
PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053ero_dtl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC DETAILS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER

SYMBOL

NOT TO SCALE



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.

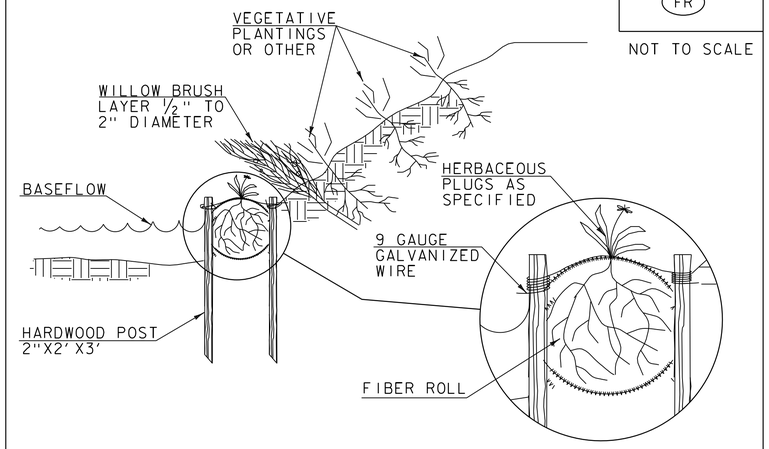
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR FILTER BAG (PAY ITEM 653.45) AND AS SPECIFIED IN THE CONTRACT.

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF

SYMBOL

FR

NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4" TRENCH ON SLOPE CONTOURS
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2"X2" POSTS PLACED ON BOTH SIDES FO THE ROLL AND SPACED LATERALLY ON 2' TO 4' CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL, IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL, WITH 9 GAUGE GALVANIZED WIRE OR 1/8" DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. PLANTWITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.

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

FIBER ROLL (EROSION LOG)

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 EROSION LOG (PAY ITEM 653.60)

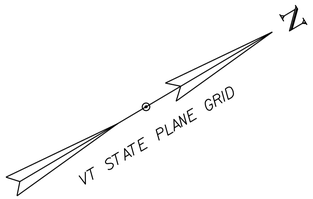
REVISIONS	
MARCH 21, 2008	WHF
JANUARY 13, 2009	WHF

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053ero_dtl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC DETAILS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
SHEET 78 OF 370



LEGEND

- AOT RURAL AREA MIX
- WET AREA SEED
- WILDFLOWER SEED

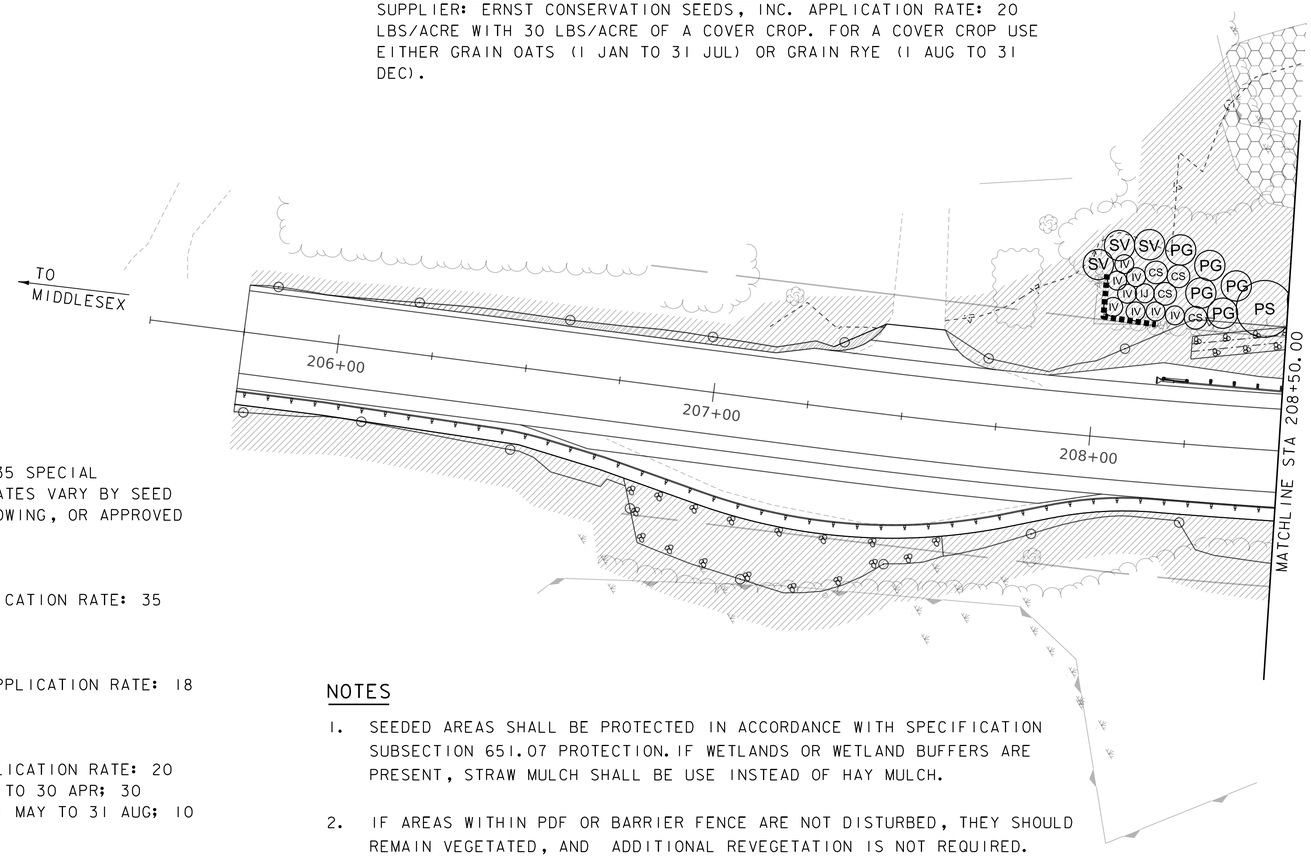
WILDFLOWER SEED

WILDFLOWER SEED TO BE PAID FOR UNDER 651.16 WILDFLOWER SEED. APPLICATION RATES VARY BY SEED MIX. WILDFLOWER SEED TO BE ONE OF THE FOLLOWING, OR APPROVED EQUAL:

-VERMONT NATIVE WILDFLOWER & GRASS MIX
SUPPLIER: VERMONT WETLAND PLANT SUPPLY. APPLICATION RATE: 18 LBS/ACRE.

-NEW ENGLAND WILDFLOWER MIX
SUPPLIER: NEW ENGLAND WETLAND PLANTS, INC. APPLICATION RATE: 23 LBS/ACRE.

-PA NEW ENGLAND PROVINCE UPL MEADOW MIX
SUPPLIER: ERNST CONSERVATION SEEDS, INC. APPLICATION RATE: 20 LBS/ACRE WITH 30 LBS/ACRE OF A COVER CROP. FOR A COVER CROP USE EITHER GRAIN OATS (1 JAN TO 31 JUL) OR GRAIN RYE (1 AUG TO 31 DEC).



WET AREA SEED MIX

WET AREA SEED MIX TO BE PAID FOR UNDER 900.635 SPECIAL PROVISION (WET AREA SEED MIX). APPLICATION RATES VARY BY SEED MIX. WET AREA SEED MIX TO BE ONE OF THE FOLLOWING, OR APPROVED EQUAL:

- VERMONT WET MEADOW & DETENTION BASIN MIX
SUPPLIER: VERMONT WETLAND PLANT SUPPLY. APPLICATION RATE: 35 LBS/ACRE.

- NEW ENGLAND WET MIX (WETLAND SEED MIX)
SUPPLIER: NEW ENGLAND WETLAND PLANTS, INC. APPLICATION RATE: 18 LBS/ACRE.

- PA NEW ENGLAND PROVINCE FACW MIX
SUPPLIER: ERNST CONSERVATION SEEDS, INC. APPLICATION RATE: 20 LBS/ACRE WITH A COVER CROP (GRAIN RYE (1 SEP TO 30 APR; 30 LBS/ACRE) JAPANESE MILLET OR BARNYARD GRASS (1 MAY TO 31 AUG; 10 LBS/ACRE)).

KEY	QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
TREES - EVERGREEN						
PG	14	*Picea glauca*	White spruce	2-3' height, natural	CONT.	8' O.C.
PS	7	*Pinus strobus*	White pine	2-3' height, natural	CONT.	15' O.C.
TREES - DECIDUOUS						
AR	4	*Acer rubrum*	Red Maple	2"-2 1/2" CAL.	B&B	25' O.C.
ARC	1	*Acer rubrum*	Red Maple	1 GAL.	CONT.	25' O.C.
FG	2	*Fagus grandifolia*	American Beech	2"-2 1/2" CAL.	B&B	30' O.C.
FGC	2	*Fagus grandifolia*	American Beech	1 GAL.	CONT.	30' O.C.
SHRUBS - DECIDUOUS						
CR	13	*Cornus racemosa*	Gray dogwood	1 GAL	CONT.	12' O.C.
CS	8	*Cornus sericea*	Red twig dogwood	1 GAL	CONT.	6' O.C.
IV	8	*Ilex verticillata* 'Red Sprite'	Winterberry	2 GAL	CONT.	5' O.C.
IJ	1	*Ilex verticillata* 'Jim Dandy'	Winterberry	2 GAL	CONT.	5' O.C.
SD	7	*Salix discolor*	Common pussy willow	1 GAL	CONT.	6' O.C.
SV	3	*Syringa vulgaris* 'Alba'	Common white lilac	3 GAL.	CONT.	8' O.C.

NOTES

1. SEEDED AREAS SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION SUBSECTION 651.07 PROTECTION. IF WETLANDS OR WETLAND BUFFERS ARE PRESENT, STRAW MULCH SHALL BE USE INSTEAD OF HAY MULCH.

2. IF AREAS WITHIN PDF OR BARRIER FENCE ARE NOT DISTURBED, THEY SHOULD REMAIN VEGETATED, AND ADDITIONAL REVEGETATION IS NOT REQUIRED.

3. FOR WETLAND AREAS RECEIVING WET AREA SEED, NO TOPSOIL OR GRUBBINGS SHALL BE ADDED. SCARIFY SOIL SURFACE TO LOOSEN SOIL FOR BETTER SEED-SOIL CONTACT. FOR TREES AND SHRUBS, LANDSCAPE BACKFILL SHALL BE USED PER VTRANS STANDARD E-1 TREE PLANTING AND E-2 SHRUB PLANTING.

4. PROVIDING SUFFICIENT MOISTURE IS CRITICAL DURING THE ENTIRE PLANT ESTABLISHMENT PERIOD. WATERING TO BE PAID FOR UNDER 656.65 LANDSCAPE WATERING.

5. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 1 WEEK PRIOR TO PLANTING OPERATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER, VTRANS LANDSCAPE ARCHITECT, AND LANDSCAPE INSPECTOR WHO WILL CONFIRM PLANTING LOCATIONS BASED ON THE PREPARED SITE.

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(59)

FILE NAME: z86e053bdr_lds.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.DONAHUE
LANDSCAPE PLAN 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: J.OLIN

LEGEND

- AOT RURAL AREA MIX
- WET AREA SEED
- WILDFLOWER SEED

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(59)
FILE NAME: z86e053bdr_lds.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.DONAHUE	CHECKED BY: J.OLIN
LANDSCAPE PLAN 2	SHEET 80 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:

PROJECT NUMBER:

FILE NAME: z86e053row_c.dgn
PROJECT LEADER:
DESIGNED BY:
R.O.W. LAYOUT SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY:
CHECKED BY:
SHEET 81 OF 370

Replace this sheet

HOYLE TANNER

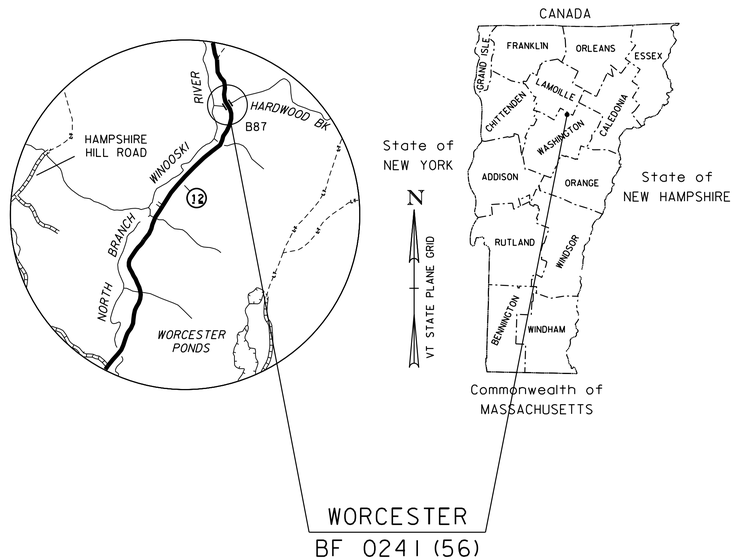
PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 2	SHEET 82 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. DETAIL SHEET	SHEET 83 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

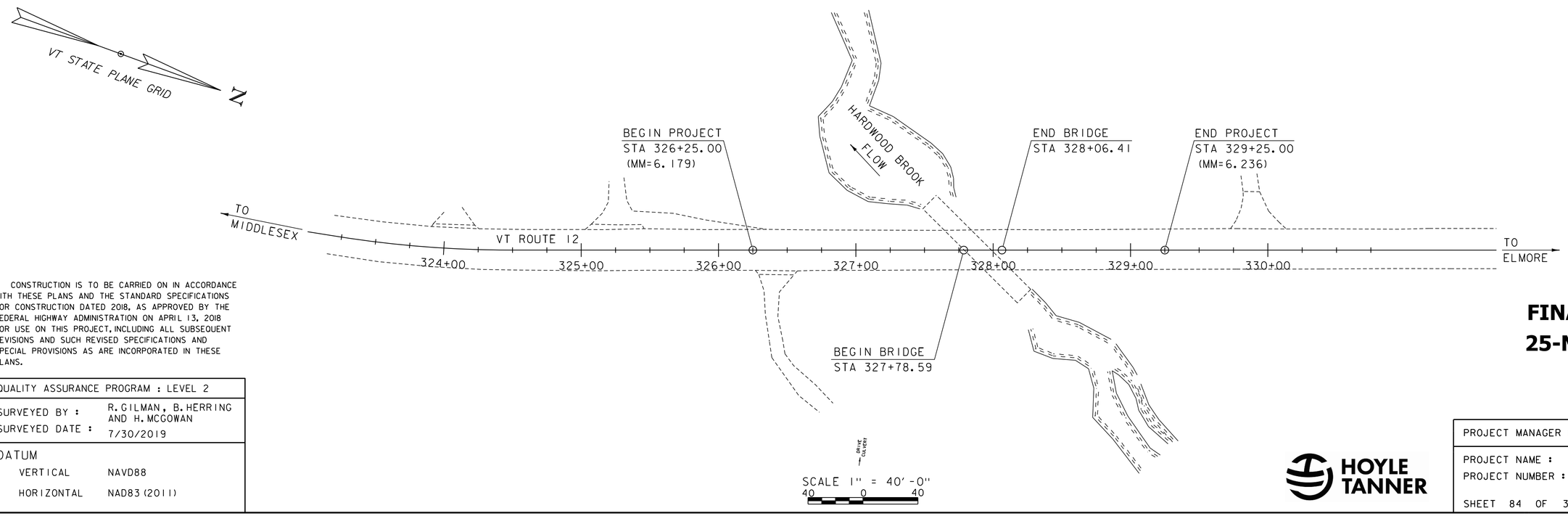
TOWN OF WORCESTER
COUNTY OF WASHINGTON

ROUTE NO: VERMONT ROUTE 12 (MAJOR COLLECTOR) BRIDGE NO: 87

PROJECT LOCATION: VT ROUTE 12, BRIDGE 87 OVER HARDWOOD BROOK, APPROXIMATELY 4.5 MILES NORTH OF THE JUNCTION WITH CALAIS ROAD IN THE TOWN OF WORCESTER.

PROJECT DESCRIPTION: EXISTING CULVERT REPLACEMENT WITH A FOUR-SIDED PRECAST CONCRETE BOX CULVERT WITH ASSOCIATED ROADWAY IMPROVEMENTS

LENGTH OF BRIDGE:	27.82	FEET
LENGTH OF ROADWAY:	272.18	FEET
LENGTH OF PROJECT:	300.00	FEET



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 FOR USE ON THIS PROJECT. INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

FINAL PLANS
25-MAY-2023

QUALITY ASSURANCE PROGRAM : LEVEL 2	
SURVEYED BY :	R. GILMAN, B. HERRING AND H. MCGOWAN
SURVEYED DATE :	7/30/2019
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83(2011)

HOYLE TANNER

PROJECT MANAGER :	LAURA STONE
PROJECT NAME :	WORCESTER
PROJECT NUMBER :	BF 0241(56)
SHEET 84 OF 370 SHEETS	

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (CULVERT)

Version

LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

STANDARDS LIST

SEE SHEET 2 FOR STANDARDS LIST

DETAIL SHEETS

SEE SHEET 2 FOR DETAIL SHEETS

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 10/29/2021

DRAINAGE AREA : 5.01 sq. mi.
CHARACTER OF TERRAIN : Rural Area with Moutainous to Hilly Terrain
STREAM CHARACTERISTICS : Meandering with wide floodplain
NATURE OF STREAMBED : Gravel with Silt substrate

PEAK FLOW DATA - ANNUAL EXCEEDANCE PROBABILITY (AEP)

43% =	200 cfs	2% =	610 cfs
10% =	380 cfs	1% =	720 cfs
4% =	500 cfs	0.2% =	1000 cfs

DATE OF FLOOD OF RECORD Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ 2% AEP = 5.0 fps
ICE CONDITIONS : Low to Moderate
DEBRIS: Low to Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Unknown
IS ORDINARY RISE RAPID? Unknown
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes
IF YES, DESCRIBE: Tailwater effected by North Branch Winooski River

WATERSHED STORAGE: 2.6%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Corrugated Metal Plate Pipe Arch
YEAR BUILT: 1961
CLEAR SPAN(NORMAL TO STREAM): 13.91 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 8.58 ft.
WATERWAY OF FULL OPENING: 92.58 sq. ft.
DISPOSITION OF STRUCTURE: Replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See Borings

WATER SURFACE ELEVATIONS AT:

43% AEP =	923.3 ft.	VELOCITY =	5.6 fps
10% AEP =	925.2 ft.	"	5.5 fps
4% AEP =	926.3 ft.	"	6.5 fps
2% AEP =	927.2 ft.	"	9.8 fps
1% AEP =	928.2 ft.	"	11.0 fps

LONG TERM STREAMBED CHANGES: Unknown

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

UPSTREAM STRUCTURE

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

DOWNSTREAM STRUCTURE

TOWN: Worcester — DISTANCE: 2.5 mi.
HIGHWAY # : VT-12 — STRUCTURE #: BR 84
CLEAR SPAN: 82 ft. — CLEAR HEIGHT: Unknown
YEAR BUILT: 1936 — FULL WATERWAY: Unknown
STRUCTURE TYPE: Single Span Steel Rolled Beam

PROPOSED STRUCTURE

STRUCTURE TYPE: Concrete Box Culvert

CLEAR SPAN(NORMAL TO STREAM): 19.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 7.0 ft.
WATERWAY OF FULL OPENING: 133.0 ft.

WATER SURFACE ELEVATIONS AT:

43% AEP =	921.4 ft.	VELOCITY=	5.6 fps
10% AEP =	922.8 ft.	"	6.7 fps
4% AEP =	923.5 ft.	"	7.6 fps
2% AEP =	924.1 ft.	"	8.3 fps
1% AEP =	924.8 ft.	"	9.2 fps

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

BRIDGE LOW CHORD ELEVATION: 926.0 ft +/-
FREEBOARD: @ 2% AEP = 1.9 ft.

SCOUR: N/A

REQUIRED CHANNEL PROTECTION: Stone Fill Type III *

PERMIT INFORMATION

AVERAGE DAILY FLOW:	-	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	-	-
ORDINARY HIGH WATER:	-	-

TEMPORARY BRIDGE MINIMUM HYDRAULIC REQUIREMENTS

STRUCTURE TYPE: Box
CLEAR SPAN (NORMAL TO STREAM): 15.0 ft
VERTICAL CLEARANCE ABOVE STREAMBED: 9.1 ft. **
WATERWAY AREA OF FULL OPENING: 136.5 ft.

ADDITIONAL INFORMATION

* E-Stone Type III to be used for all in-channel work
** Temporary Bridge was modeled with Existing Bridge in place, minimum low chord elevation of 928.1 ft. to provide 1-ft. of freeboard, E-Stone Type II will be adequate for use.

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TWO-WAY ALTERNATING TRAFFIC ON A TEMPORARY BRIDGE.
2. INSTALL AND MAINTAIN TRAFFIC SIGNALS.
3. SIDEWALKS ARE NOT NECESSARY
4. THE APPROACHES FOR THE TEMPORARY BRIDGE SHALL BE PAVED.

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	---
3. CULVERT OPENING	W:	19.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5. PRESTRESSING STRAND	f_y:	---
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8. HIGH PERFORMANCE CONCRETE, CLASS PCD	f'_c:	4.0 KSI
9. HIGH PERFORMANCE CONCRETE, CLASS PCS	f'_c:	3.5 KSI
10. CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	---
11. CONCRETE, CLASS C	f'_c:	---
12. REINFORCING STEEL	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y:	---
14. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	39.5 KSF
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
16. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	---
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_{3s}:	---
21. MINIMUM GROUND SNOW LOAD	p_g:	---
22. SEISMIC DATA PGA: ---	S_s:	---
	S_1:	---
23.		---
24.		---
25.		---
26.		---

BITUMINOUS CONCRETE PAVEMENT SUPERPAVE MIXTURE DESIGN CRITERIA	
DESIGN LANE / DESIGN LIFE ESAL	200,260
DESIGN NUMBER OF GYRATIONS	50
PERFORMANCE GRADE ASPHALT BINDER	SEE TABLE 406.03F

LRFD LOAD RATING FACTORS

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

CULVERT DESIGN CRITERIA

1. PROPOSED CULVERT IS A PRECAST CONCRETE STRUCTURE (19'-0" X 10'-0" X 87'-0" BOX).
2. CULVERT ENDS ARE NOT SKEWED.
3. CULVERT WILL BE SET AT A SLOPE OF 7.80 IN. ON 100 FT.
4. CULVERT WILL REQUIRE FISH PASSAGE ACCOMODATIONS
5. CULVERT CONSTRUCTION WILL REQUIRE A TEMPORARY PIPE

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2023	1100	170	62	6	70
2043	1200	180	62	8.8	110

20 year ESAL for flexible pavement from 2023 to 2043 : 323000
40 year ESAL for flexible pavement from 2023 to 2063 : 748000
Design Speed : 50 mph

AS BUILT "REBAR" DETAIL

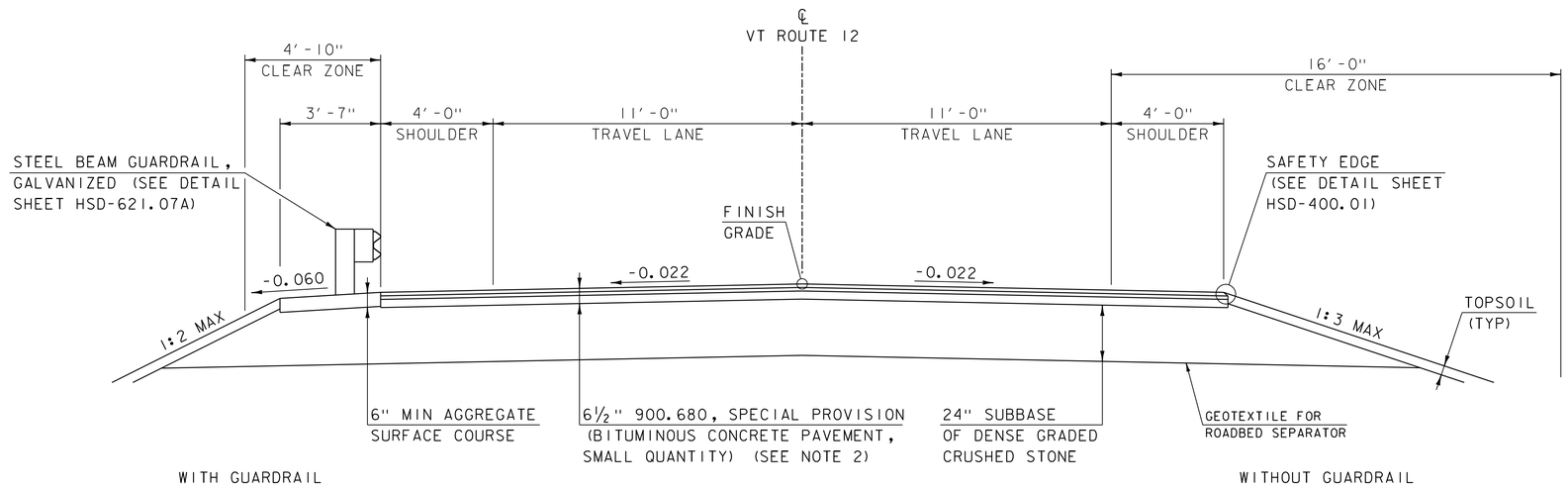
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(56)

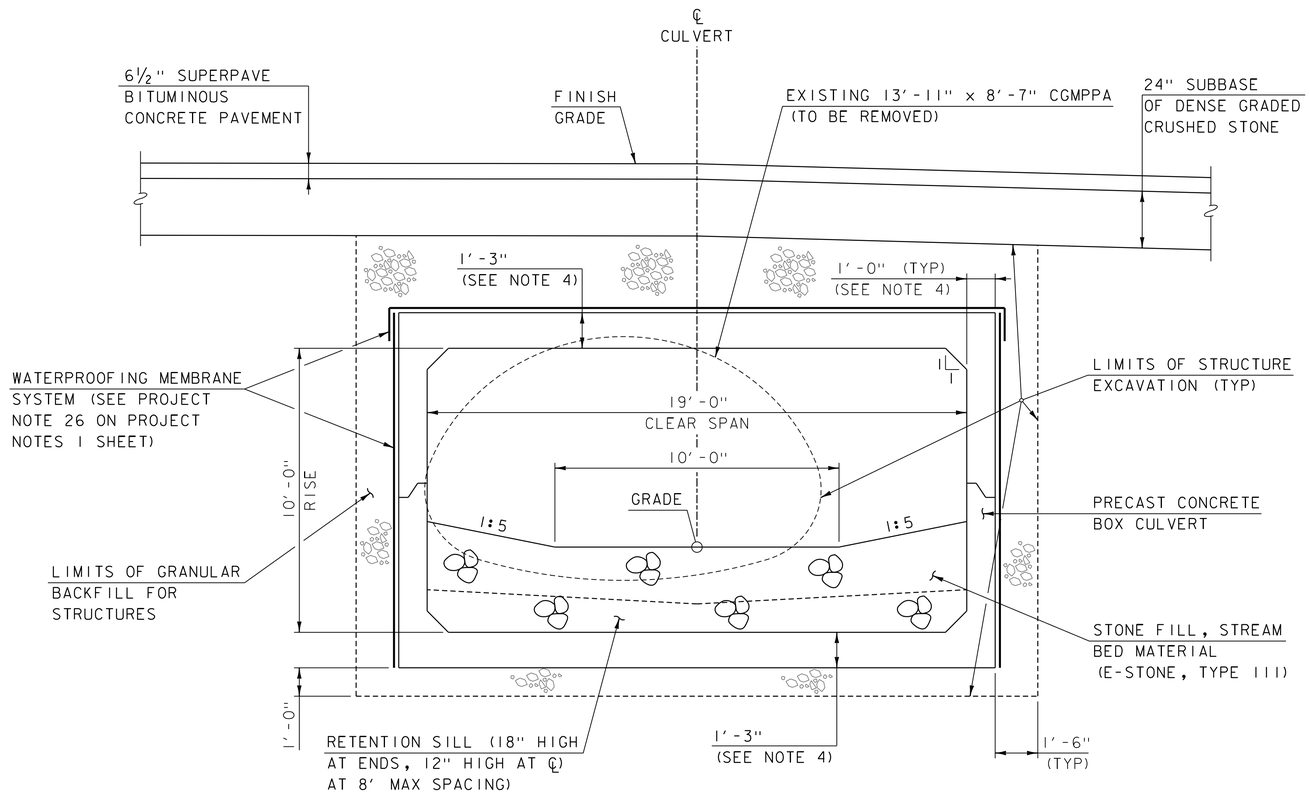
FILE NAME: z19b213pi.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
PRELIMINARY INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 85 OF 370



PROPOSED VT ROUTE 12 TYPICAL SECTION

SCALE: ⅜″ = 1′-0″



CULVERT TYPICAL SECTION

SCALE: ⅜″ = 1′-0″

MATERIAL TOLERANCES
(IF USED ON PROJECT)

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

NOTES

1. ROADWAY TYPICAL SECTION IS A GENERAL REPRESENTATION OF TYPICAL ROADWAY MATERIALS AND SLOPES. REFER TO THE LAYOUT SHEETS FOR LOCATION OF GUARDRAIL AND SLOPE TIE IN LOCATIONS.

2. 6½″ BITUMINOUS CONCRETE PAVEMENT SHALL CONSIST OF THE FOLLOWING:
   - 1½″ TYPE IVS WEARING COURSE OVER
   - 1½″ TYPE IVS BINDER COURSE
   - 3½″ TYPE IIS BASE COURSE

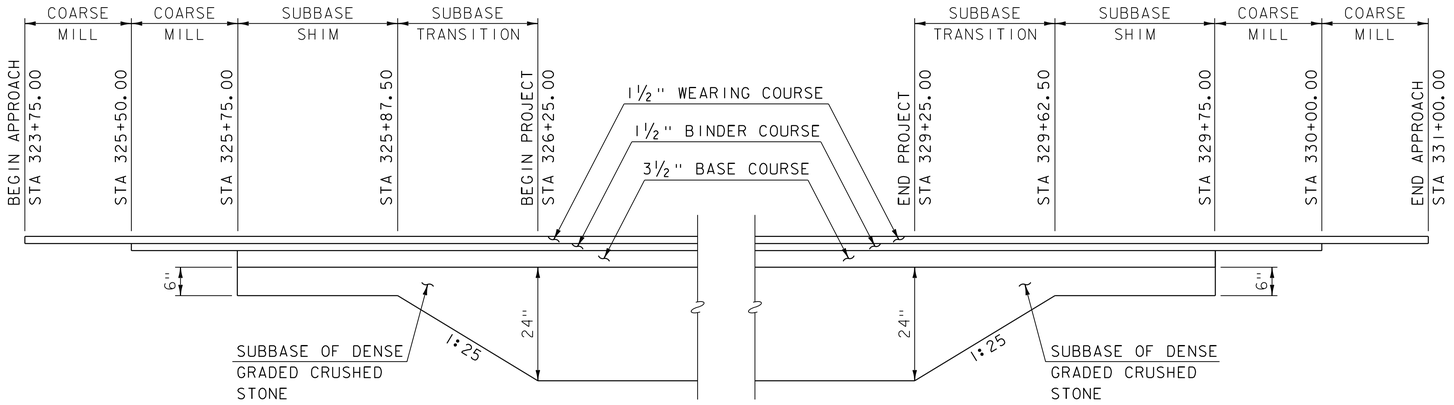
3. THE PRECAST CONCRETE BOX CULVERT WALLS AND SLABS, AND CAST-IN-PLACE WINGWALL THICKNESSES ARE ASSUMED. ACTUAL DIMENSIONS TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

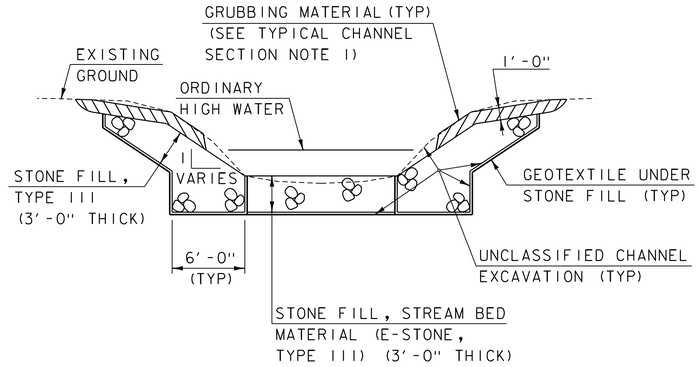
FILE NAME: z19b213typ.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
TYPICAL SECTIONS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER



VT ROUTE 12 MATERIAL TRANSITION DETAIL

NOT TO SCALE



TYPICAL CHANNEL SECTION

NOT TO SCALE

TYPICAL CHANNEL SECTION NOTES

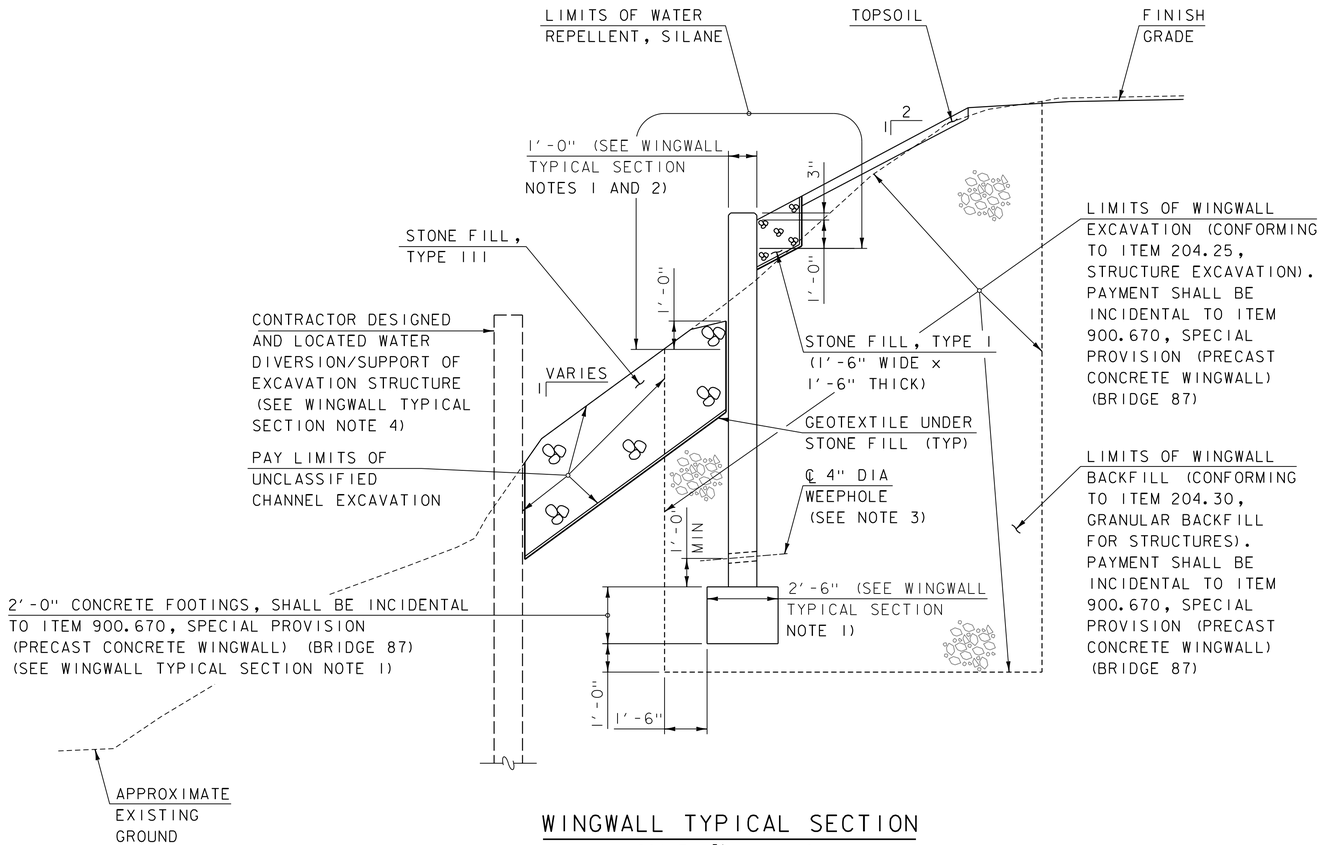
1. GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE BOX CULVERT.

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

DIVERSION STRUCTURE NOTES

1. THE TEMPORARY WATER DIVERSION/SUPPORT OF EXCAVATION STRUCTURE (DIVERSION STRUCTURE) DIMENSIONS AND LAYOUT ARE TO BE DETERMINED BY THE CONTRACTOR. THE DIVERSION STRUCTURE SHALL BE LOCATED WITHIN THE MAXIMUM PERMISSIBLE IMPACT LIMITS AS SHOWN ON THESE PLANS.

2. THE PAY LIMITS OF STRUCTURE EXCAVATION OR SOLID ROCK EXCAVATION FOR THE BOX CULVERT OR INCIDENTAL STRUCTURE EXCAVATION FOR THE WINGWALL SHALL BE 1'-6" OUTSIDE THE FRONT FACE OF THE CUT-OFF WALL OR WINGWALL FOOTING, RESPECTIVELY REGARDLESS OF THE LOCATION OF THE DIVERSION STRUCTURE.



WINGWALL TYPICAL SECTION

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

WINGWALL TYPICAL SECTION NOTES

1. ASSUMED DIMENSION. ACTUAL DIMENSION TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.

2. FABRICATOR SHALL HOLD THE BACK FACE OF THE WINGWALL AND ADJUST THE FRONT FACE FOR DIMENSIONS GREATER THAN 10".

3. MINIMUM OF TWO WEEPHOLES PER WINGWALL AT 10'-0" O.C. MAXIMUM.

4. A CONTRACTOR DESIGNED WATER DIVERSION/SUPPORT OF EXCAVATION STRUCTURE IS REQUIRED AT THE CULVERT OUTLET AND ASSOCIATED NORTHWEST AND SOUTHWEST WINGWALLS. SHALL BE INCIDENTAL TO ITEM 900.645, SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM) (BRIDGE 87). SEE DIVERSION STRUCTURE NOTES ON THIS SHEET.

5. MINIMIZE OR ELIMINATE WALL BATTER AS MUCH AS POSSIBLE.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(56)

FILE NAME: z19b213typ.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
TYPICAL SECTIONS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2018 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.

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

EARTHWORK

3. THE REMOVAL OF THE EXISTING STRUCTURE WILL BE PAID UNDER ITEM 529.15 REMOVAL OF STRUCTURE. THIS WORK SHALL INCLUDE REMOVAL OF THE ENTIRE PIPE AND ANY PORTIONS OF THE EXISTING THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION.

4. THE USE OF EQUIPMENT AND METHOD OF BACKFILLING AROUND THE BURIED STRUCTURE SHALL BE IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATIONS, CARE SHALL BE TAKEN WHEN BACKFILLING AGAINST JOINT SEALING MATERIALS.

5. CONTACT THE RIVER MANAGEMENT ENGINEER, JARON BORG – (802) 371-8342 – A MINIMUM OF TWO WEEKS PRIOR TO CONSTRUCTION FOR APPROVAL OF STREAM BED MATERIAL AND FOR CONSULTATION REGARDING FINAL GRADING OF THE CHANNEL.

6. WEATHERED ROCK AS IDENTIFIED ON BORING LOGS IS ANTICIPATED TO BE REMOVED BY STANDARD EARTH-EXCAVATING EQUIPMENT. WEATHERED BEDROCK MATERIAL IDENTIFIED WITHIN EXCAVATION LIMITS HAS BEEN QUANTIFIED UNDER THE RESPECTIVE PAY ITEMS OF ITEM 203.27 UNCLASSIFIED CHANNEL EXCAVATION, ITEM 204.25 STRUCTURE EXCAVATION AND ITEM 900.670 SPECIAL PROVISION (PRECAST CONCRETE WINGWALL) (BRIDGE 87).

7. THE CONTRACTOR SHALL TAKE INTO ACCOUNT THAT VTRANS COMPLETED A CEMENT STABILIZED RECLAIM PROJECT IN 2010 WITHIN THE LIMITS OF THIS PROJECT. THIS MAY IMPACT THE ASSOCIATED EXCAVATION WORK.

TRAFFIC CONTROL

8. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE-SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING ALTERNATING ONE-WAY TRAFFIC, AND ROAD CLOSURE, RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE, AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. PAYMENT FOR ALL ACTIVITIES AND MATERIALS ASSOCIATED WITH THIS WORK WILL BE INCLUDED IN ITEM 641.11 – TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 87).

TEMPORARY BRIDGE AND APPROACH

9. THE ONE-WAY TEMPORARY BRIDGE AS SHOWN ON THE TRAFFIC CONTROL PLANS HAS BEEN LAID OUT BASED ON A 16' RAIL TO RAIL WIDTH FOR THE PURPOSES OF ESTABLISHING ALIGNMENT AND TEMPORARY IMPACTS. THE MINIMUM CLEAR WIDTH SHALL BE AS DEFINED BY SPECIFICATION SECTION 528.

10. THE TEMPORARY BRIDGE APPROACH HAS BEEN ESTABLISHED BASED ON 1:2 EMBANKMENT SLOPES AS SHOWN ON THE TRAFFIC CONTROL PLANS FOR THE PURPOSES OF ESTABLISHING TEMPORARY IMPACT LIMITS. SLOPES AND APPROACH RAILING ARE CONTRACTOR DETERMINED AND ARE NOT SHOWN ON TRAFFIC CONTROL PLANS PROVIDED HEREIN. CONTRACTOR SPECIFIED DETAIL SHALL BE INCLUDED ON THE WORKING DRAWINGS SUBMITTAL PER SPECIFICATION SECTION 528.

11. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORKING DRAWINGS AND TRAFFIC CONTROL DEVICES ON BRIDGE APPROACHES WITH THE SITE -SPECIFIC TRAFFIC CONTROL PLAN (REFERENCE NOTE 7 ABOVE).

12. TEMPORARY BRIDGE APPROACH WILL REQUIRE THE USE OF A CONSTRUCTION MAT IN WETLAND AREAS. SEE TRAFFIC CONTROL DETAILS SHEET FOR DETAILS AND ADDITIONAL NOTES.

TEMPORARY TRAFFIC SIGNAL

13. TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM AND IN COMPLIANCE WITH THE LATEST EDITION OF THE MUTCD.

14. SIGNAL FACES SHALL BE LED AND CONSIST OF 12 INCH LENSES (RED, YELLOW AND GREEN).

15. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY LIGHT THE STOP BAR AREAS. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

16. 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 UTLITY POLES, WIRES, ETC. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIGNAL PHASING AND TIMING. THE CONTRACTOR SHALL SUBMIT A PHASING DIAGRAM AND TIMING SCHEDULE TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL MAKE THE SIGNALS OPERATIONAL ONLY AFTER RECEIVING APPROVAL OF BOTH THE PHASING DIAGRAGM AND TIMING SCHEDULE BY THE ENGINEER. DEVELOMENT OF THE PHASING DIAGRAGM AND TIMING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO THE ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM. ADDITIONAL ADJUSTMENTS TO SIGNAL TIMING OR PHASING REQUESTED BY THE ENGINEER SHALL BE COMPLETED WITHIN 48 HOURS OF REQUEST. PAYMENT FOR ADDITIONAL ADJUSTMENTS TO THE SIGNAL TIMING OR PHASING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

18. THE SUBMITTAL FOR ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE IN CONJUCTION WITH THE SUBMITTAL FOR ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 87) AND SHALL INCLUDE AS A MINIMUM, THE SIGNAL LOCATION, TIMING AND PHASING PLAN, VEHICLE DETECTION SYSTEM AND EMERGENCY VEHICLE PREEMPTION SYSTEM.

CONCRETE/PRECAST CONCRETE

19. ALL CORNERS OF CONCRETE SHALL BE CHAMFERED 1", UNLESS NOTED OTHERWISE.

20. WATER REPELLENT, SILANE, SHALL BE APPLIED TO ALL EXPOSED EXTERIOR SURFACES OF THE PRECAST STRUCTURE. SILANE WILL BE PAID UNDER ITEM 514.10 WATER REPELLENT, SILANE.

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING CONSISTENCY BETWEEN THE FABRICATOR'S SHOP DRAWINGS AND ENSURING THAT ALL PRECAST COMPONENTS FIT TOGETHER.

22. ALL LIFTING POINTS SHALL BE REMOVABLE OR COVERABLE TO THE MINIMUM CLEAR COVER FOR REINFORCING STEEL SPECIFIED IN THE PLANS. THE LIFTING POINTS SHALL BE DETAILED IN THE APPROPRIATE FABRICATION DRAWING. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE PRECAST ITEM.

23. ALL RECESSED LIFTING POINTS AND BLOCK OUTS SHALL BE FILLED WITH MORTAR, TYPE IV PER SUBSECTION 540.11 AND 707.03. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE CORRESPONDING PRECAST ITEM.

24. THE BOX CULVERT HEADWALLS, CUTOFF WALLS AND RETENTION SILLS WILL BE CONSIDERED INCIDENTAL TO ITEM 540.10 PRECAST CONCRETE STRUCTURE (19' X 10' X 87' BOX CULVERT).

25. THE PRECAST CONCRETE BOX CULVERT SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS REFERENCED IN PROJECT NOTE 1. DESIGNS SHALL BE STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF VERMONT. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND CALCULATIONS TO THE ENGINEER IN ACCORDANCE WITH SECTION 105. USE THE FOLLOWING DESIGN CRITERIA:
    a. SOIL UNIT WEIGHT = 140 PCF
    b. DESIGN LIVE LOAD = HL-93
    c. NOMINAL BEARING RESISTANCE = 39.5 KSF
    d. BEARING RESISTANCE FACTOR = 0.45
    e. DESIGN FILL OVER BOX CULVERT = 6.5 FEET
    f. AT-REST EARTH PRESSURE (K_O) = 0.44
    g. REQUIRED DESIGN LIFE = 75 YEARS
    h. VEHICULAR SURCHARGE = PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

26. THE PRECAST BOX CULVERT DETAILS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND CONFIGURATION WILL BE DEPENDENT ON THE FABRICATOR. THE SPAN, RISE, AND LENGTH OF THE BOX CULVERT MAY BE NO LESS THAN SHOWN IN THE TYPICAL SECTIONS AND STRUCTURE DETAILS.

27. A TWO-FOOT-WIDE STRIP OF SHEET MEMBRANE WATERPROOFING MEETING THE REQUIREMENTS OF 540.10(c), SHALL BE PLACED AT EACH BOX CULVERT SECTION JOINT ALONG THE SIDES OF THE STRUCTURE. THE SHEET MEMBRANE MUST COVER ONE FOOT TO EACH SIDE OF THE JOINT ALONG THE FULL HEIGHT OF THE STRUCTURE. COVER THE ENTIRE TOP OF THE STRUCTURE WITH MEMBRANE WATERPROOFING. SHINGLE ANY JOINTS IN THE MEMBRANE WITH AN OVERLAP OF ONE FOOT. PAYMENT FOR THE MEMBRANE WILL BE INCLUDED IN THE UNIT BID PRICE FOR CONTRACT ITEM 540.10 PRECAST CONCRETE STRUCTURE (19' X 10' X 87' BOX CULVERT). A 1" THICK POLYSTYRENE INSULATION BOARD, MEETING THE REQUIREMENTS OF 735.01, SHALL BE PLACED OVER THE MEMBRANE PRIOR TO BACKFILLING. PAYMENT FOR THIS WORK AND MATERIALS SHALL BE INCIDENTAL TO ITEM 540.10, PRECAST CONCRETE STRUCTURE (19' x 10' x 87' BOX CULVERT).

28. THE FABRICATOR SHALL SUPPLY THE STATE WITH THE LRFD LOAD RATING FACTORS FOR THE BOX CULVERT. COMPLETE AND SUBMIT THE LOAD RATING TABLE ON THE PRELIMINARY INFORMATION SHEET AND SUBMIT IT WITH THE BOX CULVERT DESIGN.

REINFORCING STEEL

29. ALL REINFORCING IN THE BOX CULVERT, HEADWALLS, CUTOFF WALLS, RETENTION SILLS AND WINGWALLS SHALL BE CORROSION PROTECTION LEVEL I, PER SECTION 507. PAYMENT WILL BE INCIDENTAL TO THE PRECAST ITEM.

30. REINFORCING STEEL CLEAR COVER REQUIREMENTS ARE STATED ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE NOTED IN THE PLANS:

INSIDE FACES OF BOX	1.5 INCHES
EXPOSED TO EARTH OR WEATHER	2.0 INCHES
TOP OF OUTSIDE FACES OF BOX	2.5 INCHES
DIRECT EXPOSURE TO DEICING SALTS (HEADWALL FASCIA, CURB, ETC.)	3.0 INCHES
CAST AGAINST EARTH	3.0 INCHES

31. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL, AVAILABLE ON THE AGENCY WEBSITE. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.

PRECAST CONTRETE WINGWALLS

32. THE PRECAST CONCRETE WINGWALLS SHALL BE DESIGNED BY THE FABRICATOR. ALL DESIGN WORK SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS REFERENCED IN PROJECT NOTE 1. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND CALCULATIONS TO THE ENGINEER IN ACCORDANCE WITH SECTION 105. USE THE FOLLOWING DESIGN CRITERIA:
    a. SOIL UNIT WEIGHT = 140 PCF
    b. DESIGN LIVE LOAD = HL-93
    c. NOMINAL BEARING RESISTANCE = 3.0 KSF
    d. BEARING RESISTANCE FACTOR = 0.45
    e. AT-REST EARTH PRESSURE (K_O) = 0.44
    f. REQUIRED DESIGN LIFE = 75 YEARS

33. THE DESIGN OF THE WALLS MUST INCORPORATE PROVISIONS FOR ADJACENT OBSTRUCTIONS SUCH AS DRAINAGE FEATURES AND GUARDRAIL POSTS IF NECESSARY. DETAIL ANY CHANGES TO THE WALL SYSTEM IN THE FABRICATION DRAWINGS.

34. A BRIDGE PLAQUE FURNISHED BY THE AGENCY SHALL BE CAST INTO THE FACE OF THE BOX CULVERT ON THE WINGWALL #2 SIDE. SEE S-501 FOR FURTHER DETAILS.

35. ANY ADDITIONAL BEDROCK REMOVAL REQUIRED TO ACCOMMODATE RETAINING WALLS AND/OR ADDITIONAL RELATED ELEMENTS WILL BE INCLUDED IN PAYMENT FOR ITEMS 900.670 SPECIAL PROVISION (PRECAST CONCRETE WINGWALLS) (BRIDGE 87).

36. DUE TO SHALLOW BEDROCK IN THE VICINITY OF THE STRUCTURE INLET RETAINING WALLS, RETAINING WALLS MAY BEAR ON DIFFERING SUBSURFACE STRATA. THE CONTRACTOR AND FABRICATOR SHALL MAKE ACCOMODATIONS FOR DIFFERENTIAL SETTLEMENT IN THEIR WALL DESIGN, IF NECESSARY.

UTILITIES

37. THE CONTRACTOR IS ADVISED THAT THERE ARE HIGH-VOLTAGE UTILITY LINES IN THE VICINITY OF THE PROJECT.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213nts.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
PROJECT NOTES 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER

MISCELLANEOUS

1. THE CONTRACTOR SHALL PROVIDE A SITE-SPECIFIC EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH SECTION 653 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. ESTIMATED QUANTITIES FOR EPSC WORK HAVE BEEN INCLUDED IN THE CONTRACT FOR BIDDING PURPOSES. IF THE CONTRACTOR'S EPSC PLAN REQUIRES ITEMS OF WORK THAT ARE NOT INCLUDED IN THE PLANS, THE EXTRA WORK WILL BE PAID FOR AS PART OF ITEM 653.03 MAINTENANCE OF EPSC PLAN (BRIDGE 87).

2. STONE FILL, STREAM BED MATERIAL SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 613 AND 706. CONTRACTOR SHALL ENSURE E-STONE MATERIAL IS SUPPLEMENTED WITH MATERIAL EXCAVATED FROM THE CHANNEL AND/OR THE TAILINGS OF A TOPSOIL SCREENING OPERATION.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213nts.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
PROJECT NOTES 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 89 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
1						1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (BRIDGE 87)	201.10	
1790						1790		CY	COMMON EXCAVATION	203.15	
10			10			20		CY	SOLID ROCK EXCAVATION	203.16	
			240			240		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	
420						420		CY	EARTH BORROW	203.30	
50						50		CY	TRENCH EXCAVATION OF EARTH	204.20	
5						5		CY	TRENCH EXCAVATION OF ROCK	204.21	
1						1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	
			1020			1020		CY	STRUCTURE EXCAVATION	204.25	
			450			450		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	
1100						1100		SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.10	
1270						1270		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	
90						90		CY	AGGREGATE SURFACE COURSE	401.10	
21						21		CWT	EMULSIFIED ASPHALT	404.65	
90						90		SY	HAND-PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES	406.38	
1						1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	
760						760		LB	REINFORCING STEEL, LEVEL I (UNCOATED)	507.11	
			9			9		GAL	WATER REPELLENT, SILANE	514.10	
			1			1		LS	ONE-WAY TEMPORARY BRIDGE (900 SF - EST.)(BRIDGE 87)	528.10	
			1			1		EACH	REMOVAL OF STRUCTURE (13'-11" X 8'-7" X 97'-0" CGMPPA)	529.15	
			1			1		LS	PRECAST CONCRETE STRUCTURE (19' X 10' X 87' BOX CULVERT)	540.10	
5						5		CY	CONCRETE, CLASS B	541.25	
80						80		LF	18" CPEP	601.0915	
10						10		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	
			360			360		CY	STONE FILL, STREAM BED MATERIAL (E-STONE TYPE III)	613.06	
20			20			40		CY	STONE FILL, TYPE I	613.10	
			140			140		CY	STONE FILL, TYPE III	613.12	
1						1		EACH	REMOVE AND RESET MAILBOX, SINGLE SUPPORT	617.10	
2						2		EACH	YIELDING MARKER POSTS	619.17	
855						855		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20	
5						5		EACH	MANUFACTURED TERMINAL SECTION, TANGENT	621.51	
1150						1150		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80	
115						115		HR	UNIFORMED TRAFFIC OFFICERS	630.10	
560						560		HR	FLAGGERS	630.15	
				1		1		LS	FIELD OFFICE, ENGINEERS	631.10	
				1		1		LS	TESTING EQUIPMENT, CONCRETE	631.16	
				1		1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17	
				1200		1200		DL	FIELD OFFICE COMMUNICATIONS (N.A.B.I.)	631.26	
	208					208		HR	EMPLOYEE TRAINEESHIP	634.10	
1						1		LS	MOBILIZATION/DEMOBILIZATION (BRIDGE 87)	635.11	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORK SUMMARY
		FILL AVAILABLE
1790	CY	COMMON EXCAVATION (1790 x 1.0)
72	CY	UNCLASSIFIED CHANNEL EXCAVATION (240 x 0.3)
306	CY	STRUCTURE EXCAVATION (1020 x 0.3)
0	CY	COFFERDAM EXCAVATION ((0+0) x 0.3)
2	CY	ROUNDING
2170	CY	TOTAL FILL AVAILABLE
		FILL REQUIRED
483	CY	FACTORED FILL REQUIRED (420 x 1.15)
2	CY	ROUNDING
485	CY	TOTAL FILL REQUIRED
		BORROW OR WASTE
1685	CY	WASTE
		BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY
298	TON	BASE COURSE, TYPE IIS
142	TON	INTERMEDIATE COURSE, TYPE IVS
205	TON	WEARING COURSE, TYPE IVS
645	TON	SUBTOTAL
15	TON	ROUNDING
660	TON	TOTAL

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
QUANTITY SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 90 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
				1						1		LS	TRAFFIC CONTROL, ALL-INCLUSIVE	641.11				
				1500						1500		LF	4 INCH WHITE LINE, WATERBORNE PAINT	646.201				
				1025						1025		LF	4 INCH YELLOW LINE, WATERBORNE PAINT	646.2111				
				1450						1450		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
							480			480		SY	GEOTEXTILE UNDER STONE FILL	649.31				
						110				110		LB	SEED	651.15				
						700				700		LB	FERTILIZER	651.18				
						3				3		TON	AGRICULTURAL LIMESTONE	651.20				
						750				750		CY	TOPSOIL	651.35				
						130				130		SY	GRUBBING MATERIAL (12 INCH)	651.40				
						1				1		LS	EPSC PLAN (BRIDGE 87)	653.01				
						170				170		HR	MONITORING EPSC PLAN	653.02				
						1				1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.) (BRIDGE 87)	653.03				
						3.5				3.5		TON	HAY MULCH	653.10				
						4270				4270		SY	ROLLED EROSION CONTROL PRODUCT, TYPE I	653.20				
						35				35		CY	STABILIZED CONSTRUCTION ENTRANCE	653.35				
						1				1		EACH	FILTER BAG	653.45				
						540				540		LF	SILT FENCE, TYPE I	653.475				
						330				330		LF	SILT FENCE, TYPE II	653.476				
						500				500		LF	BARRIER FENCE	653.50				
						975				975		LF	PROJECT DEMARCATION FENCE	653.55				
						275				275		LF	EROSION LOG	653.60				
									10	10		EACH	EVERGREEN TREES (ABIES BALSAMEA)(3'-4' HT.)(CONT.)	656.20				
									15	15		EACH	EVERGREEN TREES (PICEA GLAUCA)(3'-4' HT.)(CONT.)	656.20				
									9	9		EACH	EVERGREEN TREES (PICEA GLAUCA)(6'-7' HT.)(B&B)	656.20				
									13	13		EACH	EVERGREEN TREES (PINUS STROBUS)(3'-4' HT.)(CONT.)	656.20				
									15	15		EACH	DECIDUOUS SHRUBS (SPIRAEA LATIFOLIA)(1 GALLON)(CONT.)	656.35				
									8	8		EACH	DECIDUOUS SHRUBS (SPIRAEA TOMENTOSA)(1 GALLON)(CONT.)	656.35				
									13	13		EACH	DECIDUOUS SHRUBS (SALIX DISCOLOR)(1 GALLON)(CONT.)	656.35				
									14	14		EACH	DECIDUOUS SHRUBS (SALIX SERICEA)(1 GALLON)(CONT.)	656.35				
									15	15		EACH	DECIDUOUS SHRUBS (ILEX VERTICILLATA ' RED SPRITE')(1 GALLON)(CONT.)	656.35				
									3	3		EACH	DECIDUOUS SHRUBS (ILEX VERTICILLATA 'JIM DANDY')(1 GALLON)(CONT.)	656.35				
									42	42		MGAL	LANDSCAPE WATERING	656.65				
									36	36		CY	LANDSCAPE BACKFILL, TRUCK MEASUREMENT	656.80				
									1	1		LS	TREE PROTECTION (BRIDGE 87)	656.85				
				1.5						1.5		SF	TRAFFIC SIGN, TYPE A	675.20				
				24						24		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
				3						3		EACH	REMOVING SIGNS	675.50				
				5						5		EACH	DELINEATOR WITH STEEL POST	676.10				
				5						5		EACH	REMOVAL OF EXISTING DELINEATOR AND POST	676.12				

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b2l3qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
QUANTITY SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 91 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING
1					
2					
					18
			365		
			1		
			1365		
660					

TOTALS

GRAND TOTAL	FINAL
1	
2	
18	
365	
1	
1365	
660	

DESCRIPTIONS

UNIT	ITEMS	ITEM NUMBER	ROUND
EACH	TEMPORARY TRAFFIC SIGNAL SYSTEM	678.40	
EACH	SPECIAL PROVISION (DRIVEWAY ASSISTANCE DEVICE)	900.620	
LB	SPECIAL PROVISION (WET AREA SEED MIX)	900.635	
LF	SPECIAL PROVISION (WILDLIFE GUIDE FENCE)	900.640	
LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)(BRIDGE 87)	900.645	
SF	SPECIAL PROVISION (PRECAST CONCRETE WINGWALL)(BRIDGE 87)	900.670	
TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
QUANTITY SHEET 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 92 OF 370

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

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

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

POINT	CODE	DESCRIPTION
	BF	BARRIER FENCE
	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
	PDF	PROJECT DEMARCATION FENCE
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	R.T.& I.	RIGHT, TITLE, AND INTEREST
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
◎	IPNF	IRON PIN FOUND
●	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 VALVE
	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 RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE
CB	CHORD BEARING

UTILITY SYMBOLOGY

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+TELEPHONE
- 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+TELEPHONE
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

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

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

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

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

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

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

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

ARCHEOLOGICAL & HISTORIC

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

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213leg.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
CONVENTIONAL SYMBOLOGY LEGEND

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 93 OF 370

PRIMARY CONTROL

HVCTRL #14
A 14011
NORTH =707856.2370
EAST =1629571.3080
ELEV. =1057.5310

GENERAL LOCATION, WORCESTER, VT.
TO REACH FROM THE INTERSECTION OF VT ROUTE 15A (PARK STREET) AND VT ROUTE 12 (UPPER MAIN STREET) AT THE CIVIL WAR MONUMENT IN MORRISTOWN, GO SOUTHEAST ALONG VT ROUTE 12 FOR 11.9 MI (19.1 KM) TO THE SITE OF THE MARK ON THE LEFT, ABOUT 75 M (246.1 FT) SOUTHWEST OF THE TOWN/COUNTY LINE AND ABOUT OPPOSITE 0120/1220/0780.
THE MARK IS SET IN THE TOP OF THE NORTHEAST END OF A MASSIVE LEDGE CUT. IT IS 9.4 M (30.8 FT) WEST OF AND 0.1 M (0.3 FT) HIGHER THAN THE CENTERLINE OF VT ROUTE 12, 0.6 M (2.0 FT) NORTHWEST OF THE SOUTHEAST EDGE OF THE LEDGE CUT, 55.5 M (182.1 FT) SOUTH-SOUTHWEST OF THE CENTER OF THE WEST END OF 45 CM (18 INCHES) DIAMETER METAL CULVERT WITH MARKER POST, 29.5 M (96.8 FT) NORTH OF THE CENTERLINE OF A GATED WOODS ROAD AND 23.4 M (76.8 FT) NORTH-NORTHWEST OF THE CENTER OF WEST END OF A 45 CM (18 INCH) DIAMETER METAL CULVERT.

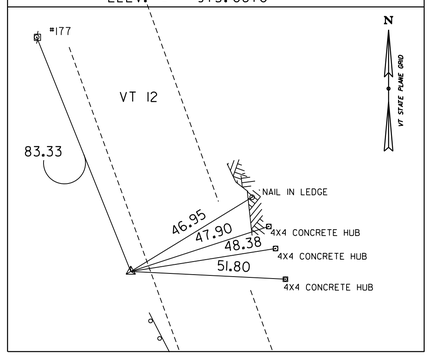
HVCTRL #26
A 14014
NORTH =701145.1380
EAST =1630072.0530
ELEV. =872.9370

GENERAL LOCATION, WORCESTER, VT.
TO REACH FROM THE INTERSECTION OF VT ROUTE 12 (MAIN STREET) AND US ROUTE 2 (BERLIN STREET) GO NORTH ALONG MAIN STREET FOR 0.5 MI (0.8 KM) TO A ROTARY INTERSECTION. PASS THROUGH THE ROTARY AND EXIT THE INTERSECTION AT THE NORTHWEST CORNER AND FOLLOW VT ROUTE 12 (NOW SPRING STREET) FOR 0.1 MI (0.2 KM) TO THE INTERSECTION OF VT ROUTE 12 RIGHT (NOW ELM STREET). TURN RIGHT AND GO NORTHEAST ALONG VT ROUTE 12 FOR 12.3 MI (19.8 KM) TO THE SITE OF THE MARK ON THE LEFT, ABOUT 20 M (65.6 FT) SOUTHWEST OF MILE MARKER 0120/1220/0560.
THE MARK IS SET IN THE TOP OF A 13.0 M (42.7 FT) X 2.8 M (9.2 FT) ROCK OUTCROP WHICH PROJECTS 0.4 M (1.3 FT) ABOVE GROUND SURFACE. IT IS 8.2 M (26.9 FT) NORTHWEST OF AND 0.3 M (1.0 FT) HIGHER THAN VT ROUTE 12, 8.3 M (27.2 FT) SOUTHWEST OF THE CENTERLINE OF A WOODS ROAD, 12.6 M (41.3 FT) NORTH-NORTHEAST OF THE CENTER OF THE NORTHWEST (OUTLET) END OF A 45 CM (18 INCH) DIAMETER PLASTIC CULVERT WITH MARKER POST, 21.2 M (69.6 FT) SOUTHWEST OF POLE NO 100 1/2 /153 AND 37.1 M (121.7 FT) NORTHEAST OF POLE NO 100/153.

SECONDARY CONTROL

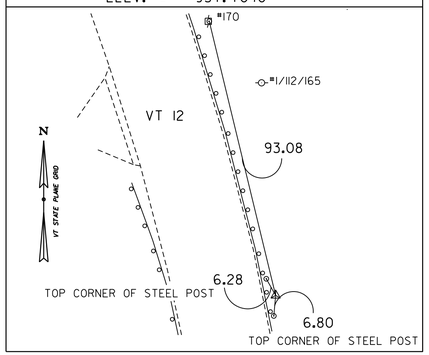
HVCTRL 19

NORTH = 704999.1260
EAST = 1631157.6800
ELEV. = 975.0670



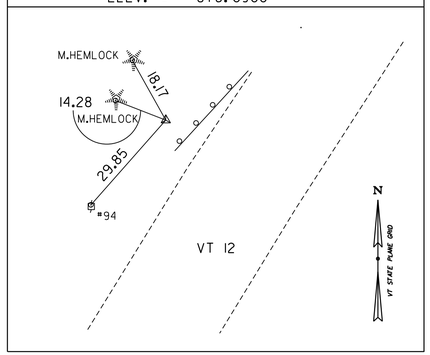
HVCTRL 20

NORTH = 703369.4060
EAST = 1631787.2760
ELEV. = 931.7040



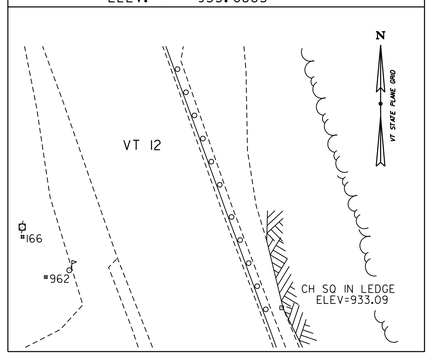
HVCTRL 25

NORTH = 701407.1833
EAST = 1630221.1452
ELEV. = 876.0900



BM 1075

NORTH = 703544.7808
EAST = 1631734.4765
ELEV. = 933.0885



NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
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NORTH =
EAST =
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NORTH =
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ELEV. =

NORTH =
EAST =
ELEV. =

TRAVERSE COMPLETED BY R.GILMAN B.HERRING AND H.MCGOWAN ON 7/30/2019 SEE FILE 86E053 FOR TRAVERSE DATA

DATUM
VERTICAL NAVD88
HORIZONTAL NAD83(2011)
ADJUSTMENT COMPASS

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

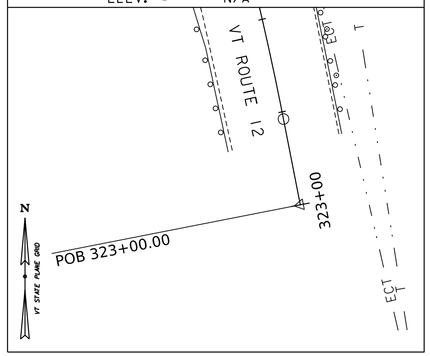
FILE NAME: z19b213ti.dgn
PROJECT LEADER: L.STONE
DESIGNED BY: VTRANS
TIE SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: H.MCGOWAN
CHECKED BY: G.HITCHCOCK
SHEET 94 OF 370

ALIGNMENT TIES
VT ROUTE 12

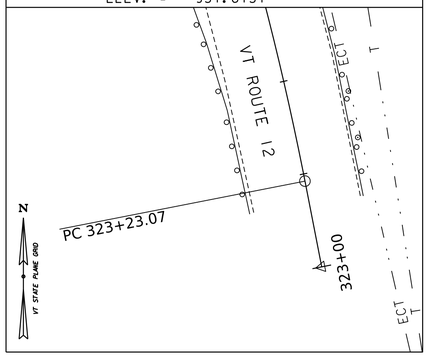
POB 323+00.00

NORTH =	703328.4538
EAST =	1631777.1684
ELEV. =	N/A



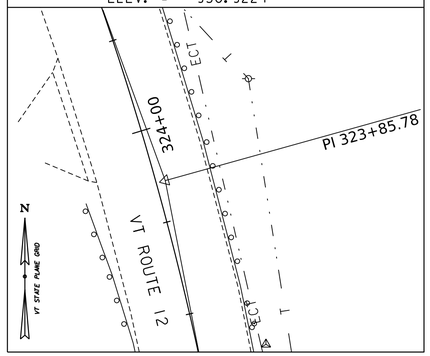
PC 323+23.07

NORTH =	703351.0943
EAST =	1631772.7347
ELEV. =	931.6131



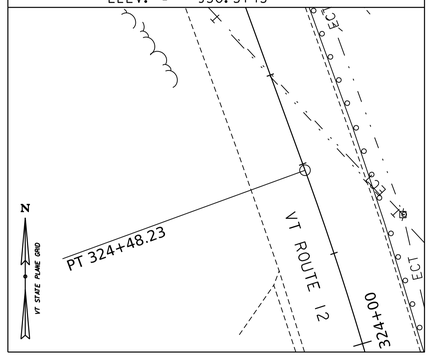
PI 323+85.78

NORTH =	703412.6344
EAST =	1631760.6832
ELEV. =	930.9224



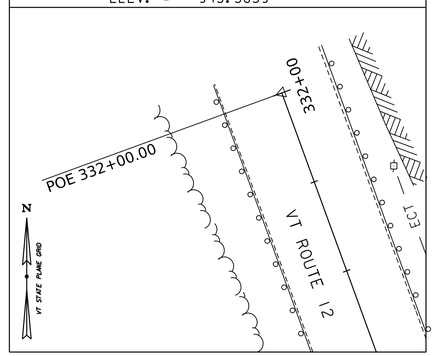
PT 324+48.23

NORTH =	703471.5451
EAST =	1631739.1900
ELEV. =	930.5743



POE 332+00.00

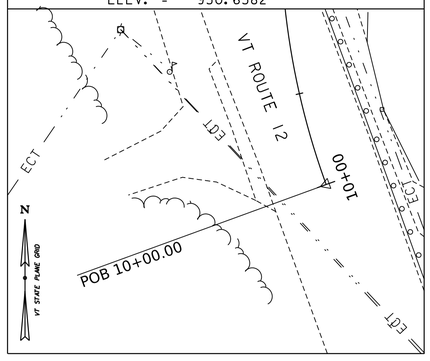
NORTH =	704177.7769
EAST =	1631481.5259
ELEV. =	945.5859



ALIGNMENT TIES
DETOUR

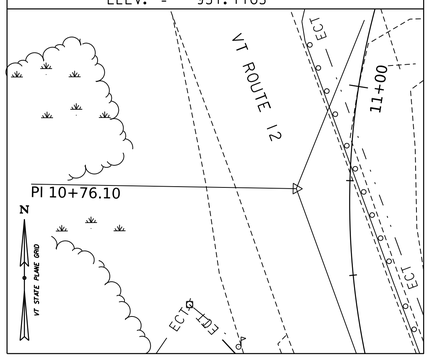
POB 10+00.00

NORTH =	703524.9580
EAST =	1631719.7023
ELEV. =	930.6382



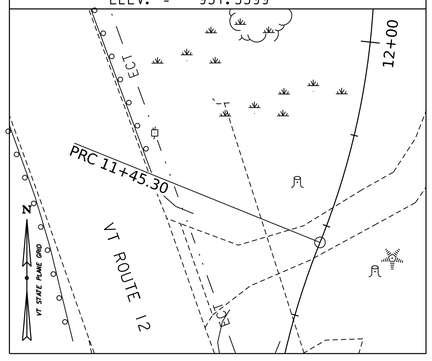
PI 10+76.10

NORTH =	703596.4439
EAST =	1631693.6208
ELEV. =	931.1105



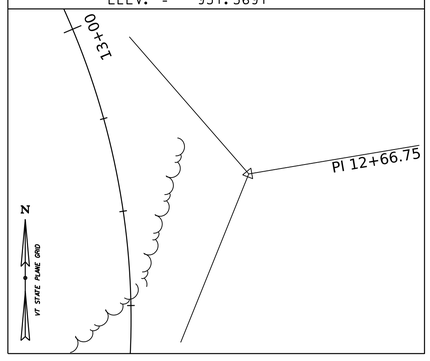
PRC 11+45.30

NORTH =	703666.9976
EAST =	1631722.1277
ELEV. =	931.5399



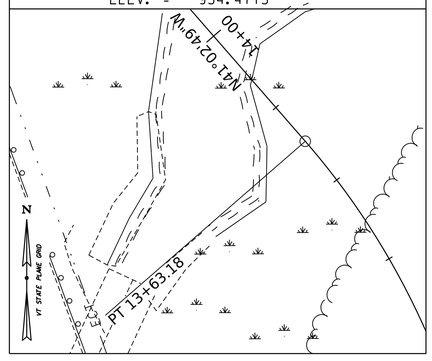
PI 12+66.75

NORTH =	703779.6018
EAST =	1631767.6249
ELEV. =	931.5691



PT 13+63.18

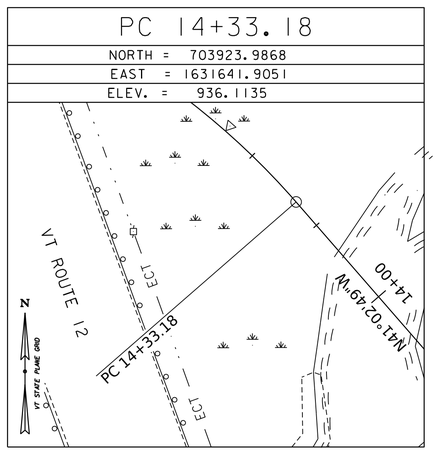
NORTH =	703871.1947
EAST =	1631687.8725
ELEV. =	934.4715



ALIGNMENT TIES
DETOUR

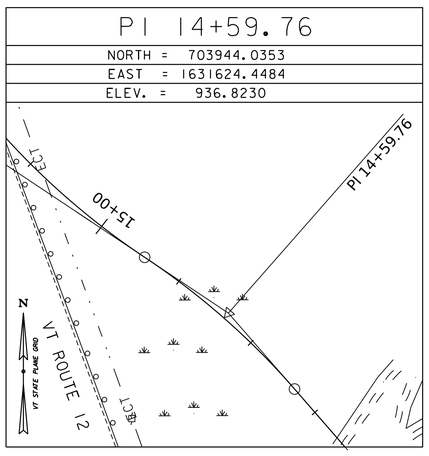
PC 14+33.18

NORTH =	703923.9868
EAST =	1631641.9051
ELEV. =	936.1135



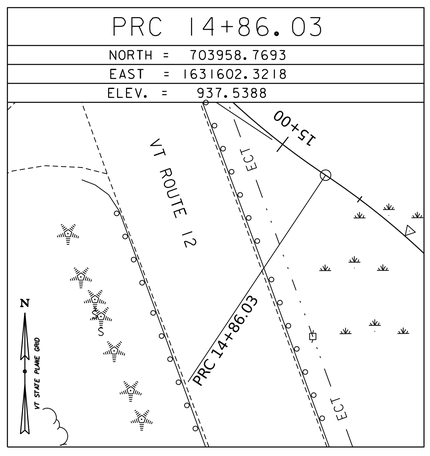
PI 14+59.76

NORTH =	703944.0353
EAST =	1631624.4484
ELEV. =	936.8230



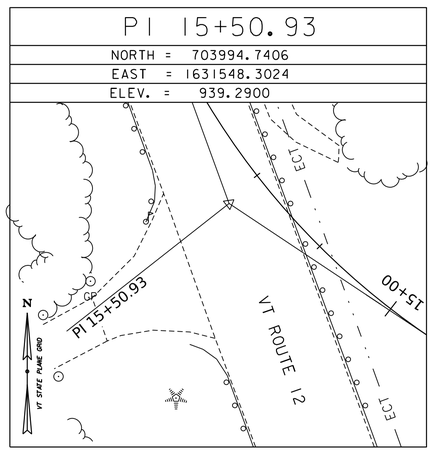
PRC 14+86.03

NORTH =	703958.7693
EAST =	1631602.3218
ELEV. =	937.5388



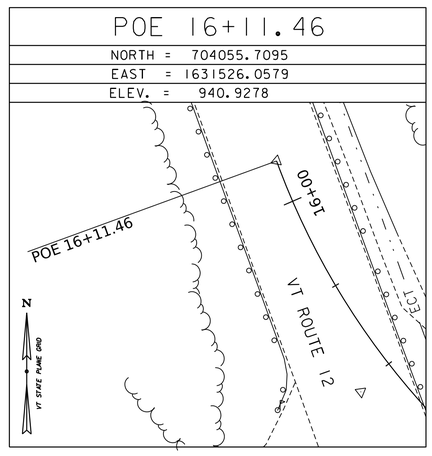
PI 15+50.93

NORTH =	703994.7406
EAST =	1631548.3024
ELEV. =	939.2900



POE 16+11.46

NORTH =	704055.7095
EAST =	1631526.0579
ELEV. =	940.9278

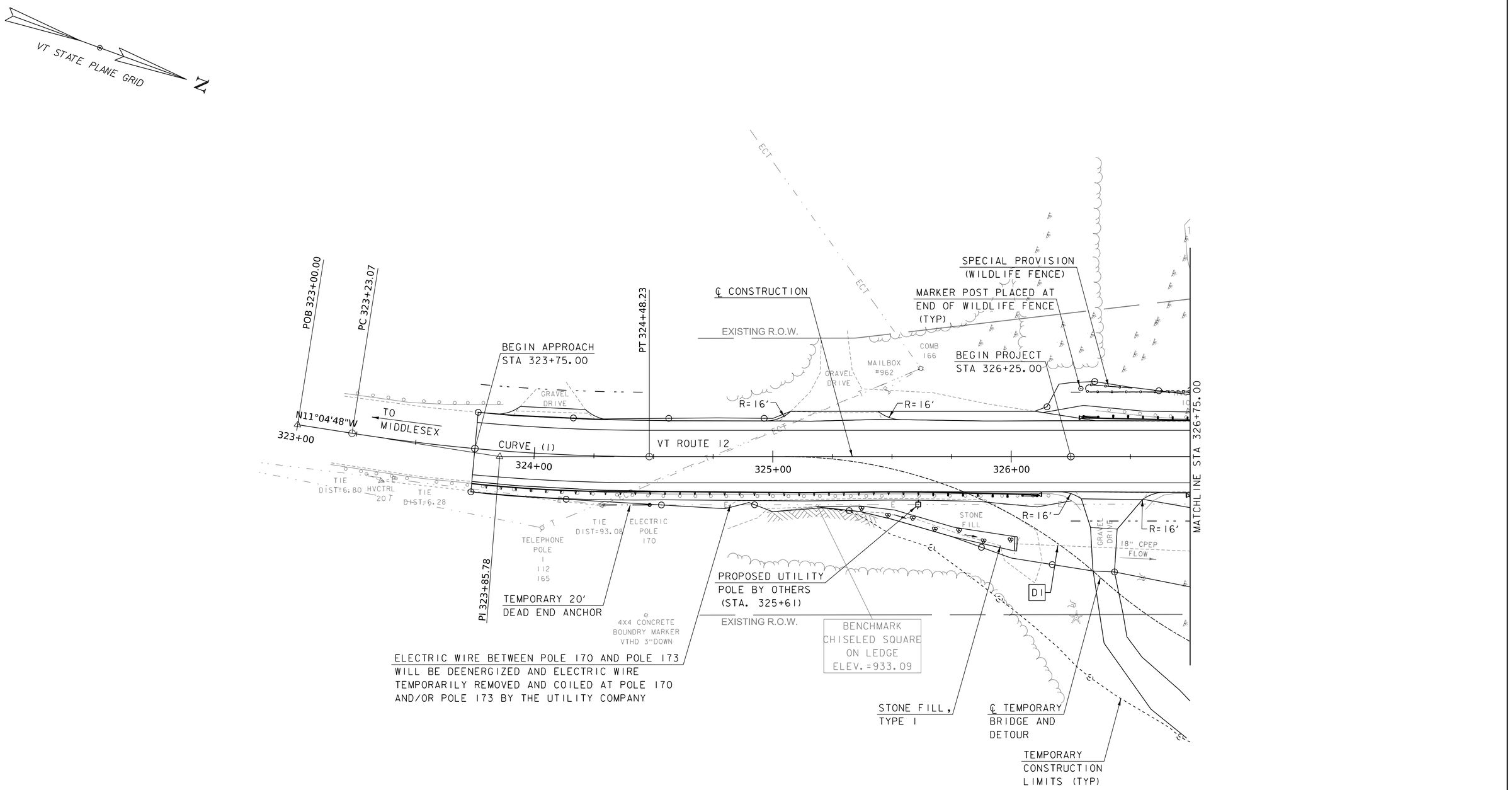


DATUM

VERTICAL	NAVD88
HORIZONTAL	NAD83(2011)
ADJUSTMENT	COMPASS

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(56)
FILE NAME:	z19b213ti.dgn
PROJECT LEADER:	J.OLIN
DESIGNED BY:	N.CENTERBAR
TIE SHEET 2	
PLOT DATE:	25-MAY-2023
DRAWN BY:	P.DUSTIN
CHECKED BY:	S.HAAS
SHEET	95 OF 370



VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 8°57'52"
D = 7°09'43"
R = 800.00'
T = 62.71'
L = 125.17'
E = 2.45'

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 323+75, RT - STA 326+29, RT
STA 326+36, LT - STA 329+74, LT
STA 326+56, RT - STA 331+00, RT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 323+75.00, RT - STA 325+61.07, RT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 325+61.07, RT - STA 326+10.93, RT
STA 326+30.30, LT - STA 326+80.16, LT

CONSTRUCT 4' PAVED DRIVE APRON
STA 323+81 - STA 324+32, LT
STA 324+97 - STA 325+54, LT
STA 326+20 - STA 326+65 RT

CONSTRUCT GRAVEL DRIVE
STA 325+46 - STA 326+35, LT
STA 326+29 - STA 326+55, RT

REMOVE AND RESET MAILBOX,
SINGLE SUPPORT
STA 325+47, LT
(SEE TRAFFIC CONTROL SHEET
1 FOR TEMPORARY RELOCATION)

CONSTRUCT WILDLIFE FENCE
STA 326+31 - STA 327+15, LT

D1 STA 312+81.59, RT 39.86' TO
STA 326+01.41, RT 36.55'
RETAIN 80 LF 18" CPEP & HEADWALLS

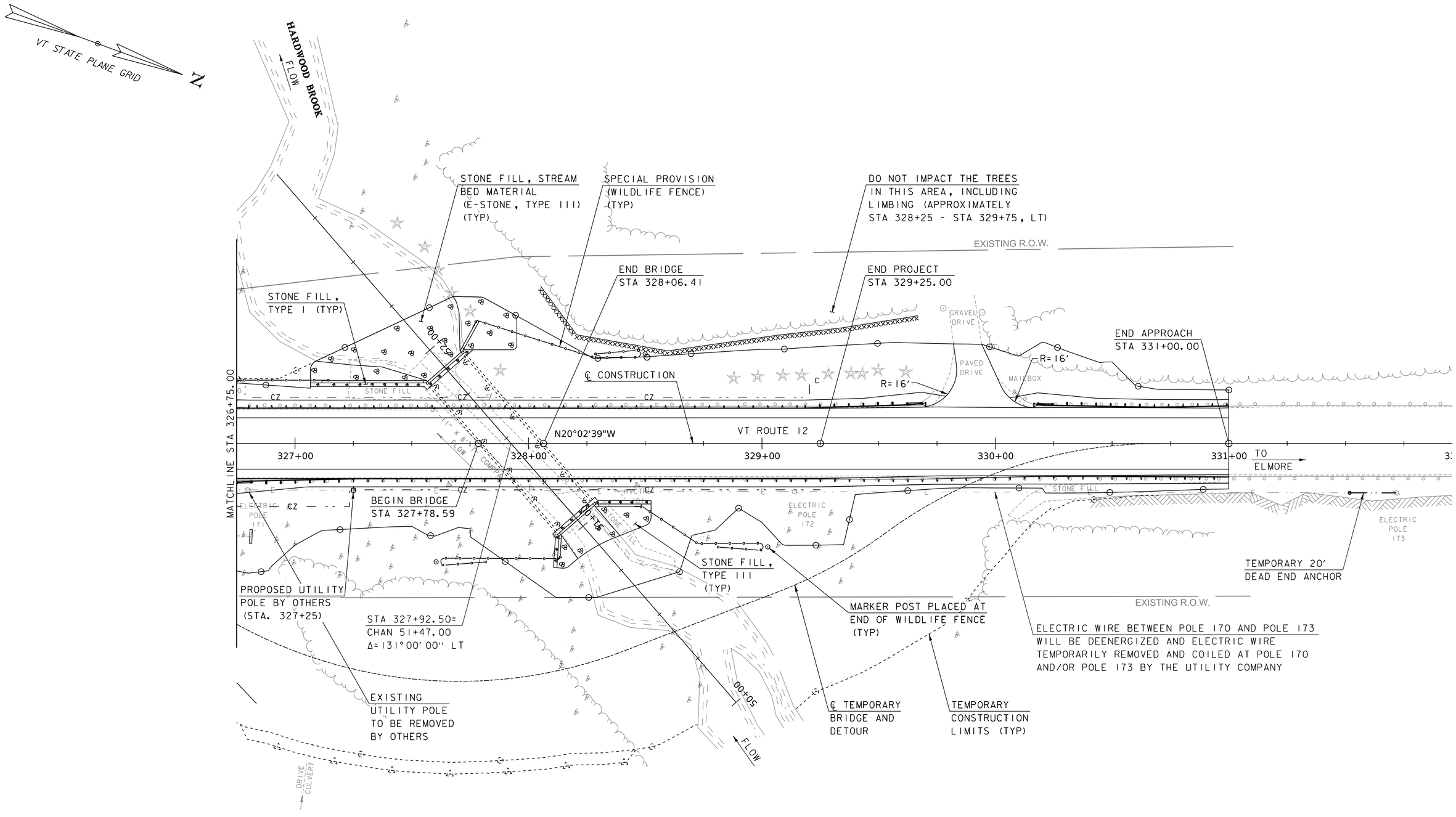
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213bdr_lay.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
LAYOUT SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 96 OF 370



EXISTING CULVERT INFORMATION
13'-11" x 8'-7" CGMPPA, 96' LONG
BUILT 1961
6.5' AVERAGE COVER
93 SQ.FT. WATERWAY AREA

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 330+05, LT - STA 331+00, LT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 327+25.02, RT - STA 331+00.00, RT
STA 326+80.16, LT - STA 329+18.57, LT
STA 330+68.10, LT - STA 331+00.00, LT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 326+75.17, RT - STA 327+25.02, RT
STA 329+18.57, LT - STA 329+68.41, LT
STA 330+18.24, LT - STA 330+68.10, LT

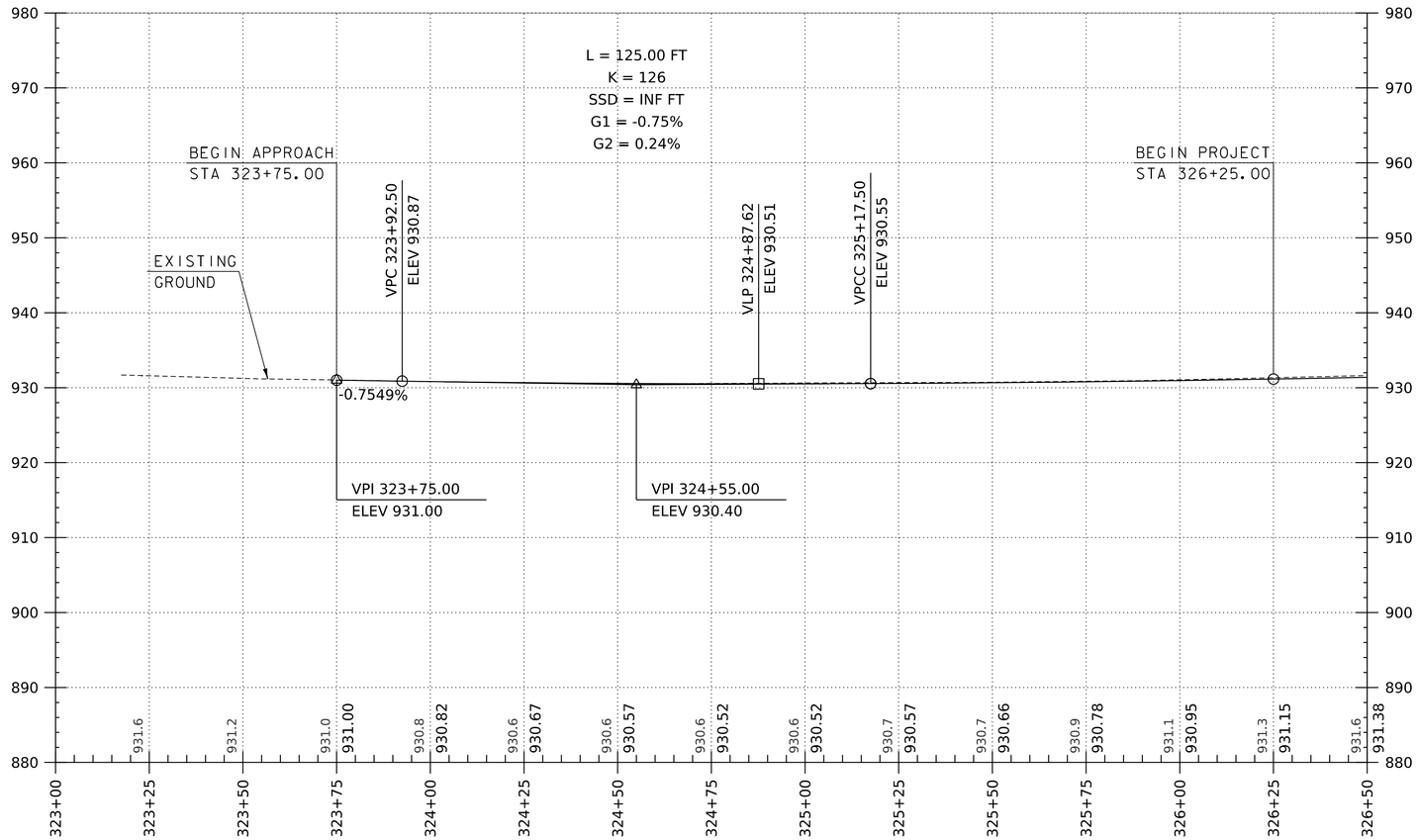
CONSTRUCT PAVED DRIVE
STA 329+68 - STA 330+16, LT

CONSTRUCT WILDLIFE FENCE
STA 326+31 - STA 327+15, LT
STA 327+62 - STA 328+14, RT
STA 327+76 - STA 328+48, LT
STA 328+45 - STA 329+00, RT

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

HOYLE TANNER

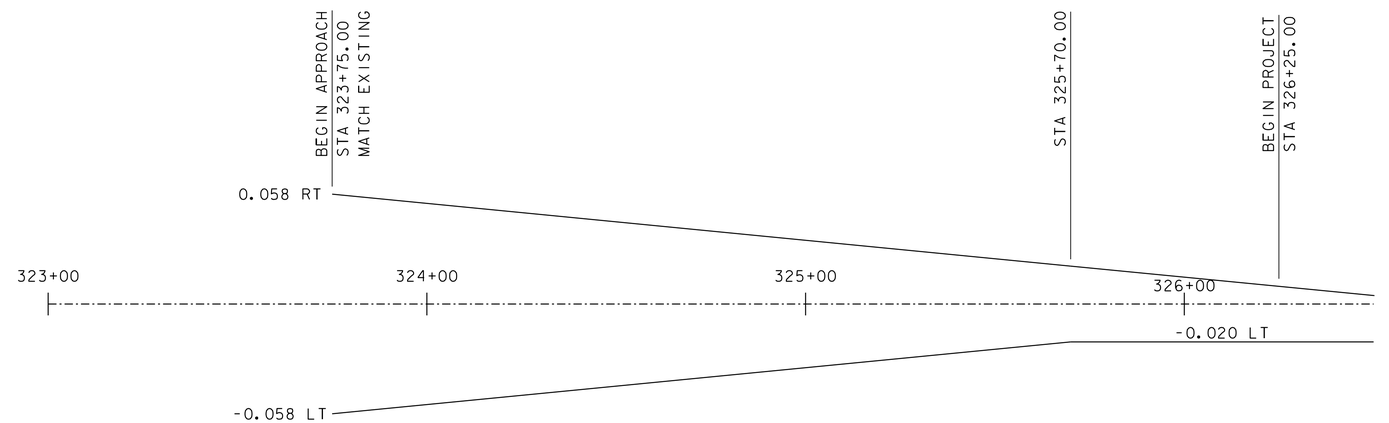
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213bdr_lay.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
LAYOUT SHEET 2	SHEET 97 OF 370



VT ROUTE 12 PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

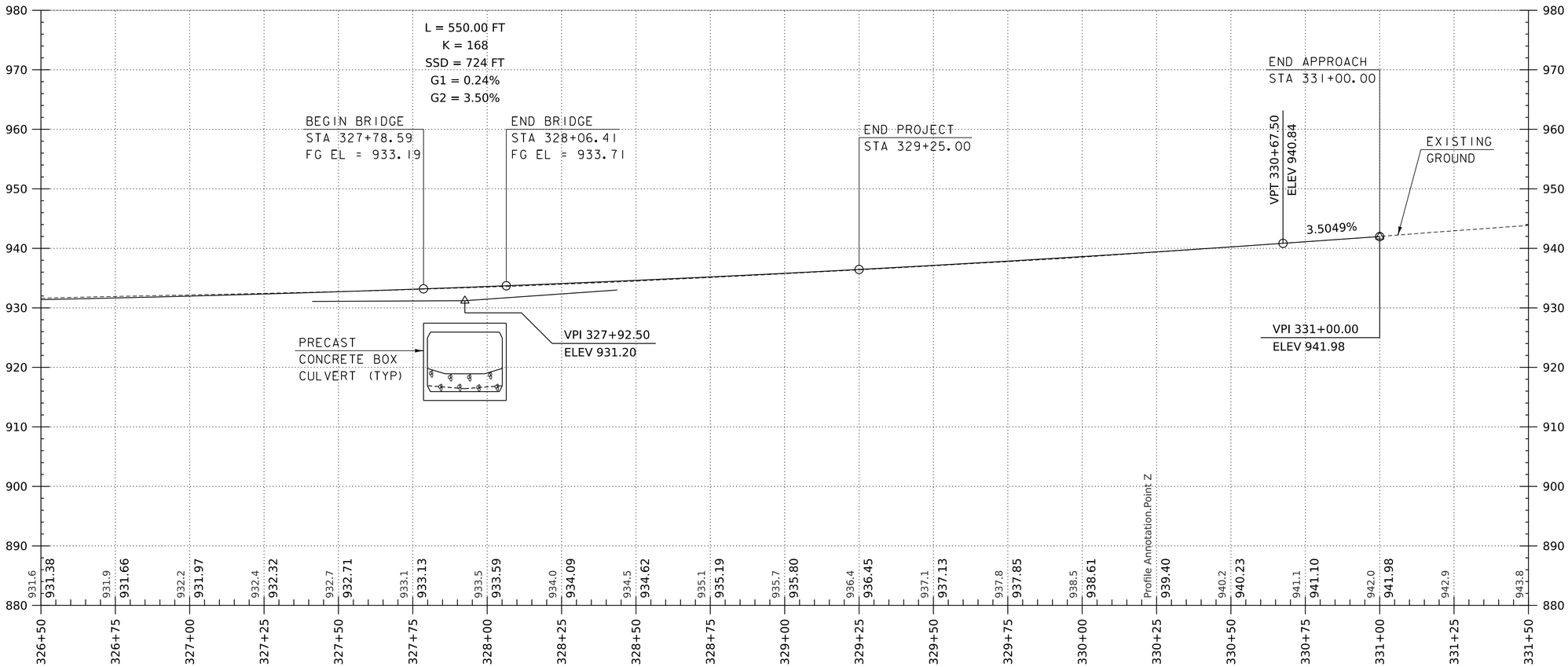


VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

HOYLE TANNER

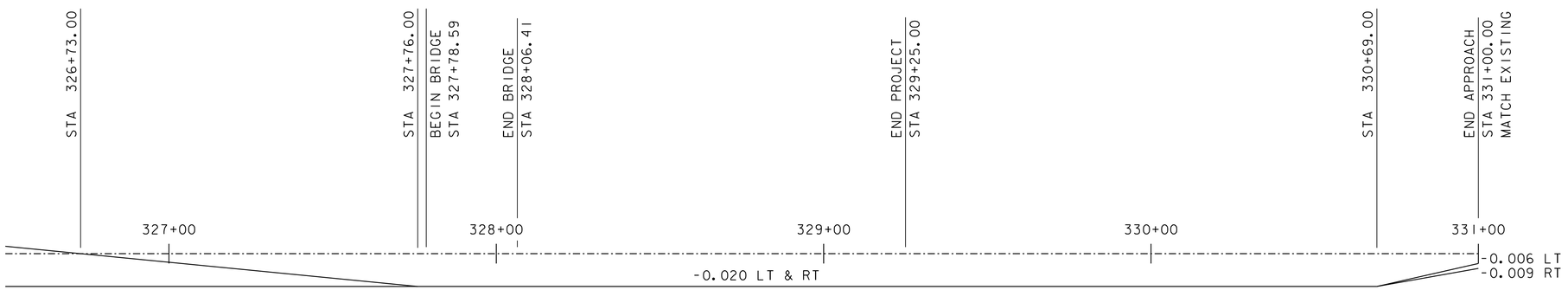
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I)56)
FILE NAME: z19b2I3pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET I	SHEET 98 OF 370



VT ROUTE 12 PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

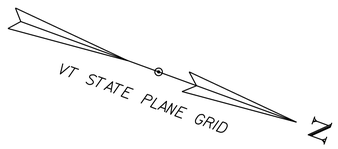


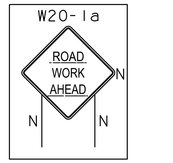
VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

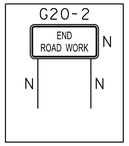
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b2l3pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET 2	SHEET 99 OF 370





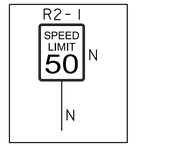
STA 294+62, LT & RT



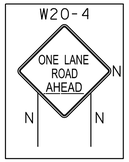
STA 299+62, LT

STA 299+62, RT

STA 304+62, RT

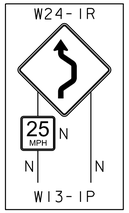


STA 304+62, LT



STA 309+62, RT

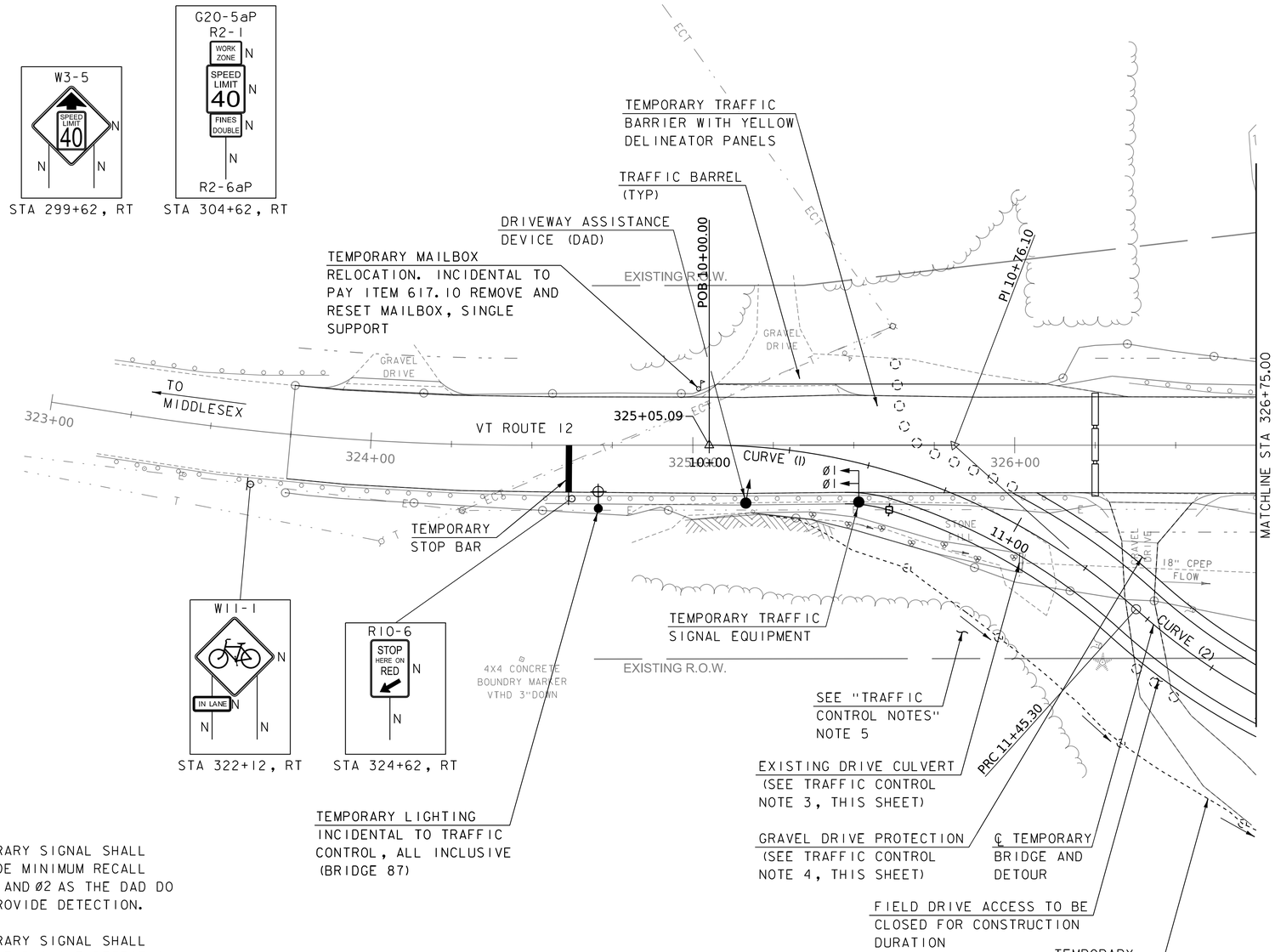
STA 314+62, RT



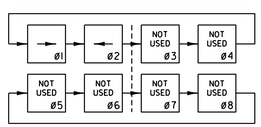
STA 319+62, RT

STA 322+12, RT

STA 324+62, RT



NEMA STD 8Ø CONTROLLER



SIGNAL PHASING	Ø1	Ø2
TIMING IN SECONDS	→	←
INITIAL INTERVAL	10	10
VEHICLE EXTENSION	3	3
MAX 1	13	13
YELLOW	4.5	4.5
ALL RED	23	23
RECALL	MIN	MIN
DETECTOR MEMORY	L	L
FLASH	RED	RED

MAX 1: ALL TIME PERIODS

NOTES

1. TEMPORARY SIGNAL SHALL PROVIDE MINIMUM RECALL FOR Ø1 AND Ø2 AS THE DAD DO NOT PROVIDE DETECTION.
2. TEMPORARY SIGNAL SHALL PROVIDE BICYCLE DETECTION FOR Ø1 AND Ø2.
3. TEMPORARY SIGNAL SHALL BE CAPABLE OF DETECTING SLOW MOVING VEHICLES AND BICYCLES WITHIN THE WORK ZONE TO EXTEND THE ALL RED TIME TO PROVIDE SAFE PASSAGE.

DETOUR ROAD CURVE DATA

CURVE (1)	CURVE (2)
DELTA = 42°02'43"	DELTA = 63°02'52"
D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'
T = 76.10'	T = 121.45'
L = 145.30'	L = 217.88'
E = 14.12'	E = 34.28'

0 20 40
SCALE IN FEET

HOYLE TANNER

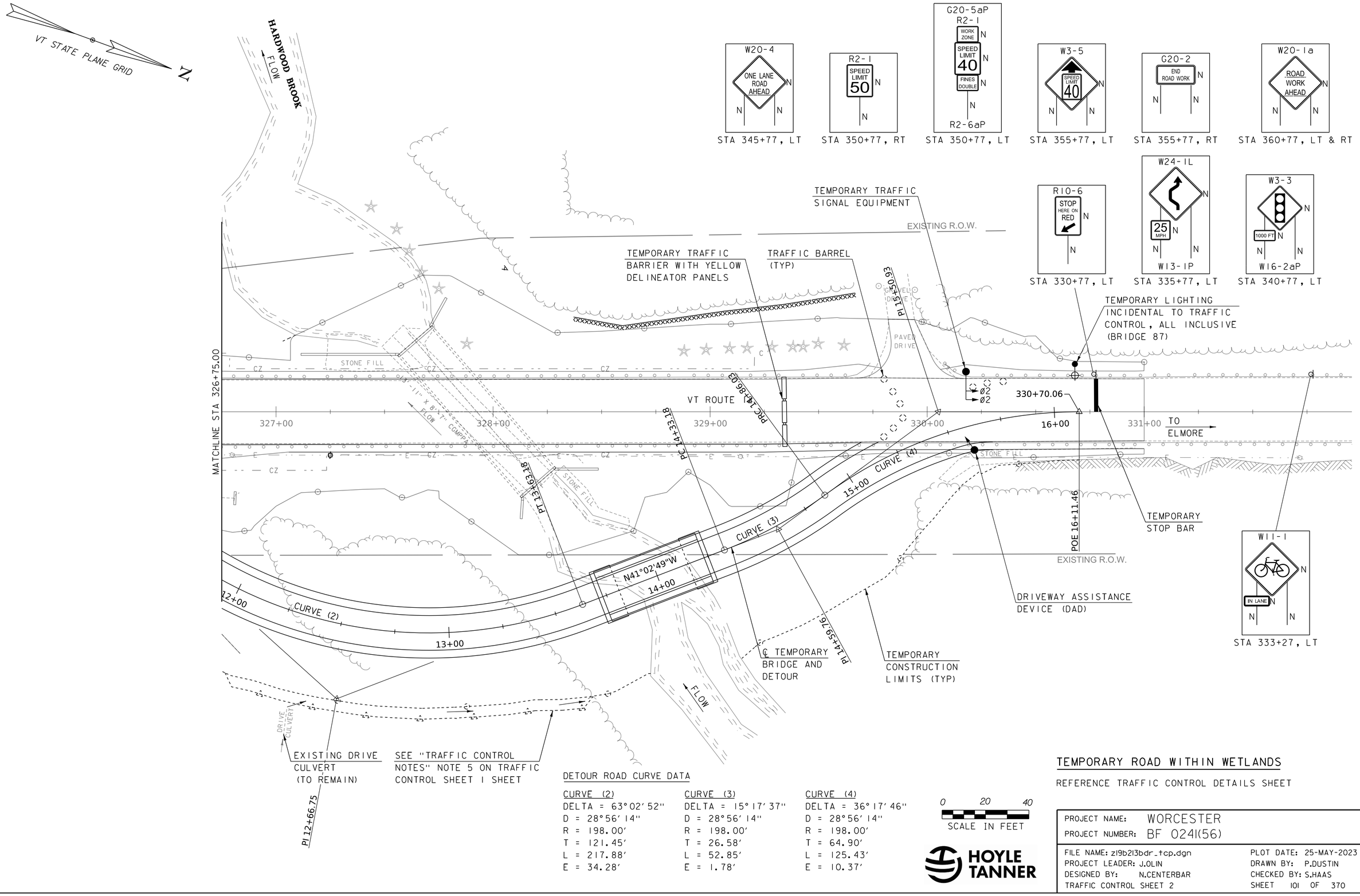
TRAFFIC CONTROL NOTES

1. TRAFFIC CONTROL SHEETS 1 AND 2 ARE CONCEPTUAL. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY TRAFFIC CONTROL PLANS PER 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE.
2. CONTRACTOR SHALL UTILIZE YELLOW TEMPORARY TYPE C TAPE TO CHANGE PASSING ZONE PAVEMENT MARKINGS WITHIN 1,000 FEET OF THE WORK ZONE TO A DOUBLE YELLOW CENTERLINE. CONTRACTOR SHALL ALSO COVER EXISTING SIGNAGE PERTAINING TO THESE PASSING ZONES WITHIN 1,000 FEET OF THE WORK ZONE.
3. EXISTING PIPE TO BE PLUGGED DURING CONSTRUCTION. TEMPORARILY DIRECT DRAINAGE AROUND TEMPORARY ROAD. RE-ESTABLISH CULVERT AFTER TEMPORARY ROAD IS REMOVED. (COST INCIDENTAL TO TEMPORARY BRIDGE ITEM).
4. CONTRACTOR SHALL INSTALL GEOTEXTILE FOR ROADBED SEPARATOR OVER LIMITS OF EXISTING GRAVEL DRIVEWAY BEFORE CONSTRUCTING TEMPORARY BRIDGE AND DETOUR ROAD. FILL SHALL BE CAREFULLY PLACED AND REMOVED TO MINIMIZE LOSS OF MATERIAL ON DRIVEWAY SURFACE BELOW. (COST INCIDENTAL TO TEMPORARY BRIDGE ITEM).
5. CONTRACTOR RESPONSIBLE FOR MANAGEMENT OF STORMWATER DRAINAGE DURING TEMPORARY DETOUR (COST INCIDENTAL TO TEMPORARY BRIDGE ITEM).

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b2l3bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS



DETOUR ROAD CURVE DATA

CURVE (2)	CURVE (3)	CURVE (4)
DELTA = 63°02'52"	DELTA = 15°17'37"	DELTA = 36°17'46"
D = 28°56'14"	D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'	R = 198.00'
T = 121.45'	T = 26.58'	T = 64.90'
L = 217.88'	L = 52.85'	L = 125.43'
E = 34.28'	E = 1.78'	E = 10.37'

0 20 40
SCALE IN FEET

HOYLE TANNER

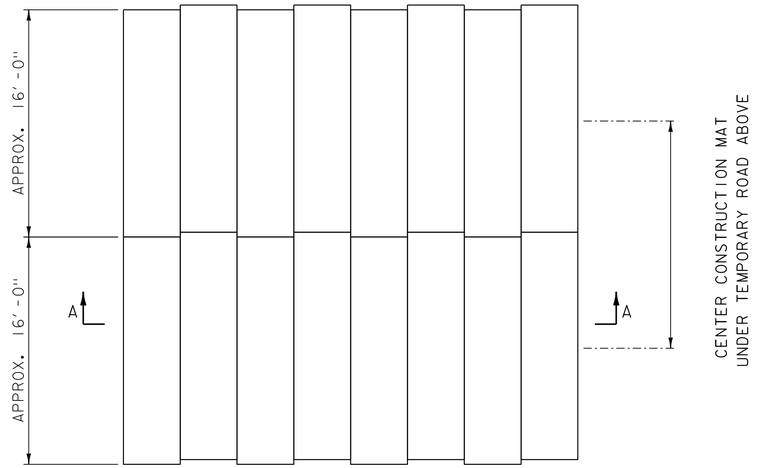
TEMPORARY ROAD WITHIN WETLANDS

REFERENCE TRAFFIC CONTROL DETAILS SHEET

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 101 OF 370

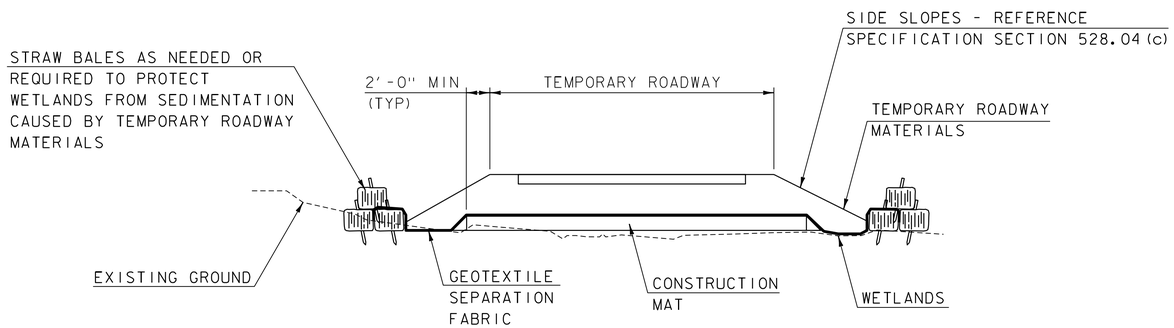


PLAN VIEW

SECTION A-A

TYPICAL MAT DETAIL

NOT TO SCALE



TYPICAL TEMPORARY ROAD SECTION WITHIN WETLANDS
(TEMPORARY DETOUR STATION 11+60 TO 15+00)

NOT TO SCALE

CONSTRUCTION MAT NOTES

GENERAL

1. THE CONTRACTOR SHALL INSTALL A CONSTRUCTION MAT AS SHOWN ON THIS SHEET FROM TEMPORARY ROAD STATION 11+60 TO 15+00.

2. GEOTEXTILE FOR ROADBED SEPARATOR SHALL BE PLACED BETWEEN THE MATS AND TEMPORARY ROADWAY FILL MATERIAL TO PROVIDE EASIER CLEAN UP AND TO MINIMIZE IMPACTS OT THE WATER RESOURCE.

3. ALL WORK FOR ESTABLISHING THE TEMPORARY ROADWAY AS SHOWN ON THIS SHEET INCLUDING THE CONSTRUCTION MAT, GEOTEXTILE FABRIC, ROADWAY FILL, AND STRAW BALES SHALL BE CONSIDERED INCIDENTAL TO PAY ITEM 528.10 ONE-WAY TEMPORARY BRIDGE (BRIDGE 87).

INSTALLATION

1. WOODY VEGETATION (TREES, SHRUBS, ETC.) SHALL BE CUT AT OR ABOVE GROUND LEVEL AND NOT UPROOTED IN ORDER TO PREVENT DISRUPTION TO THE WETLAND SOIL STRUCTURE AND TO ALLOW STUMP SPROUTS TO REVEGETATE THE WORK AREA.

2. MINIMIZE IMPACTS TO WETLAND AREAS DURING INSTALLATION, USE, AND REMOVAL.

3. INSTALL ADEQUATE EROSION AND SEDIMENT CONTROLS AT APPROACHES TO MATS TO PROMOTE A SMOOTH TRANSITION TO, AND MINIMIZE SEDIMENT TRACKING ONTO, CONSTRUCTION MATS.

4. IN MOST CASES, CONSTRUCTION MATS SHOULD BE PLACED ALONG THE TRAVEL AREA SO THAT THE INDIVIDUAL BOARDS ARE RESTING PERPENDICULAR TO THE DIRECTION OF TRAFFIC. NO GAPS SHOULD EXIST BETWEEN MATS. PLACE MATS FAR ENOUGH ON EITHER SIDE OF THE RESOURCE AREA TO REST ON FIRM GROUND.

5. AVOID PLACING FILL BELOW MATS. IF FILL IS NEEDED OT LEVEL UNEAVEN AREAS. GEOTEXTILE FOR ROADBED SEPARATOR MUST FIRST BE INSTALLED BEYOND THE LIMIS OF FILL SO IT CAN BE REMOVED UPON PROJECT COMPLETION.

WETLAND/STREAM CHANNEL CROSSING

1. MATS SHOULD NOT BE PLACED SO THAT THEY RESTRICT THE NATURAL FLOW OF THE STREAM.

2. MORE THAN ONE LAYER OF MATS MAY BE NECESSARY IN AREAS WHICH ARE INUNDATED OR HAVE DEEP ORGANIC WETLAND SOILS.

REMOVAL

1. CONTRACTOR SHALL TAKE CARE TO REMOVE ROADWAY FILL, STRAW BALES, AND GEOTEXTILE TO MINIMIZE LOSS OF MATERIAL ON NATIVE GRADE BELOW. ENGINEER MAY REQUIRE CONTRACTOR TO REMOVE MATERIAL BY HAND FROM WETLAND AREAS.

2. MATTING SHOULD BE ROMOVED BY "BACKING" OUT OF THE SITE, REMOVING MATS ONE AT A TIME. ANY RUTTING OR SIGNIFICANT INDENTATIONS IDENTIFIED DURING MAT REMOVAL SHOULD BE REGRADED IMMEDIATELY, TAKING CARE NOT TO COMPACT SOILS. EXTEND GEOTEXTILE OVER STRAW BALES TO CONTAIN TEMPORARY ROADWAY FILL.

3. MATS SHOULD BE CLEANED BEFORE TRANSPORT TO ANOTHER WETLAND LOCATION TO REMOVE SOIL AND INVASIVE PLANT SPECIES SEED STOCK OR PLANT MATERIAL.

4. CLEANING METHODS MAY INCLUDE BUT ARE NOT LIMITED TO SHAKING OR DROPPING MATS IN A CONTROLLED MANNER WITH A PIECE OF MACHINERY TO KNOCK OFF ATTACHED SOIL AND DEBRIS, SPRAYING WITH WATER OR AIR, AND SWEEPING.

5. CROSSINGS SHOULD BE INSPECTED FOLLOWING MAT REMOVAL TO DETERMINE THE LEVEL OF RESTORATION REQUIRED.

RESTORATION

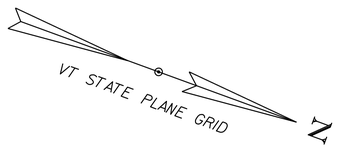
1. REFERENCE LANDSCAPE PLANS FOR RESTORATION, INCLUDING GRADING, PLANTING, AND SEEDING.

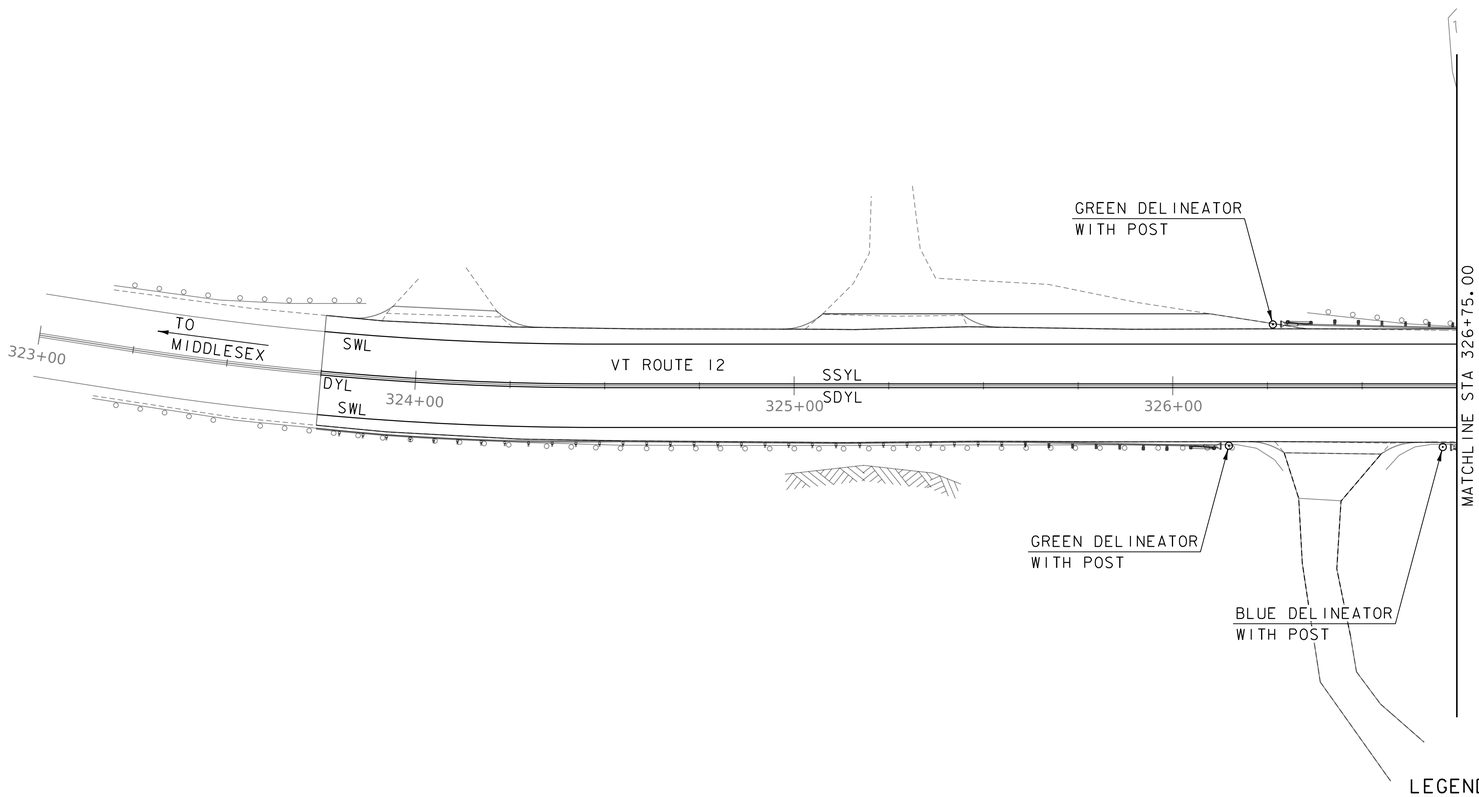
HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213detail.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
TRAFFIC CONTROL DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: J.HOLLSTEIN
CHECKED BY: T.SUMNER





LEGEND

R	REMOVE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

4" WHITE LINE
STA 323+75 - STA 331+00, LT & RT

4" YELLOW LINE
STA 323+75 - STA 325+00, ℄ (DOUBLE)
STA 325+00 - STA 331+00, ℄
STA 325+00 - STA 331+00, ℄ (DASHED)

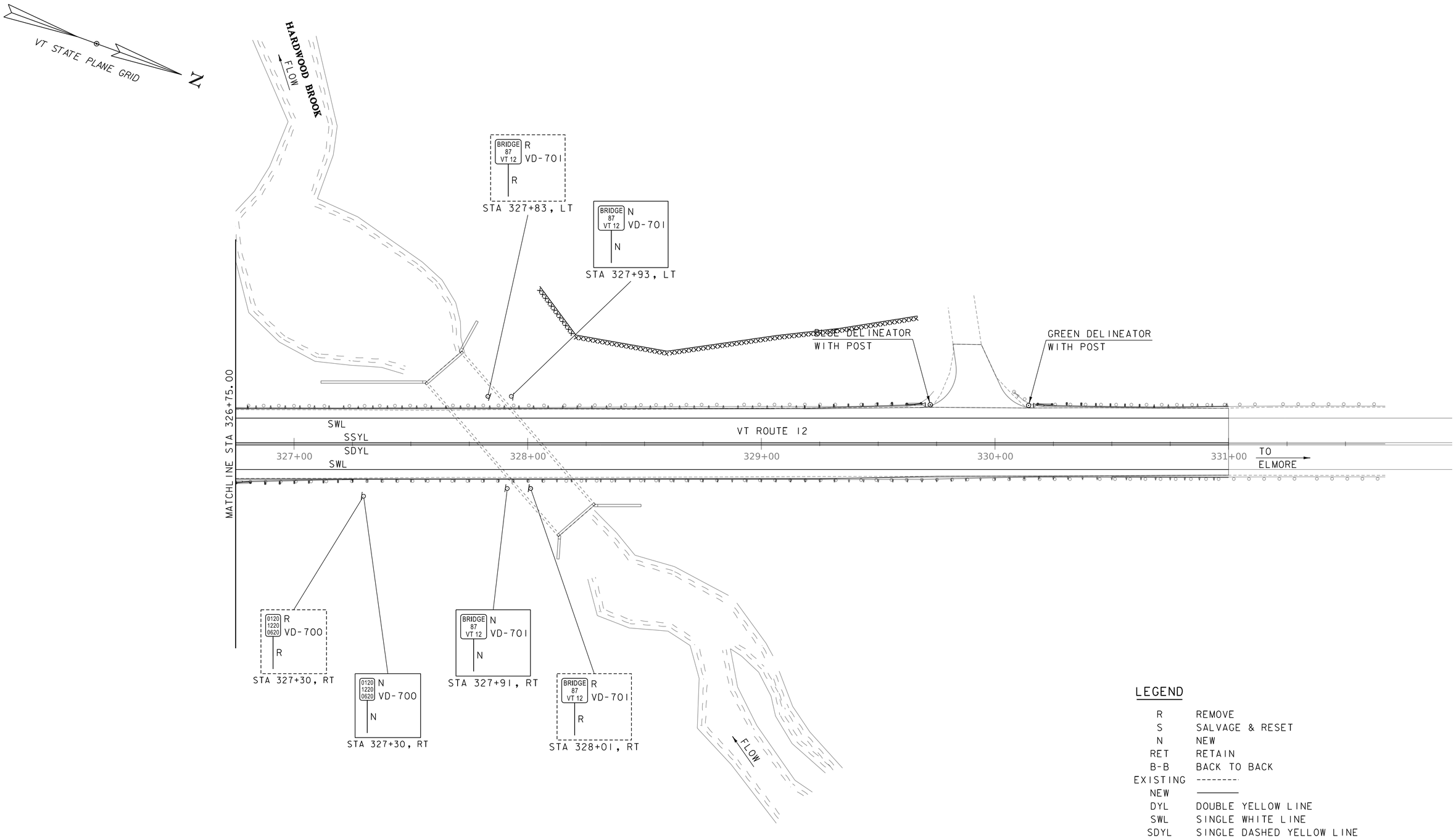
0 20 40
SCALE IN FEET

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 103 OF 370



LEGEND

R	REMOVE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

4" WHITE LINE
STA 326+75 - STA 331+00, LT & RT

0 20 40
SCALE IN FEET

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(56)

FILE NAME: z19b2l3bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 104 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

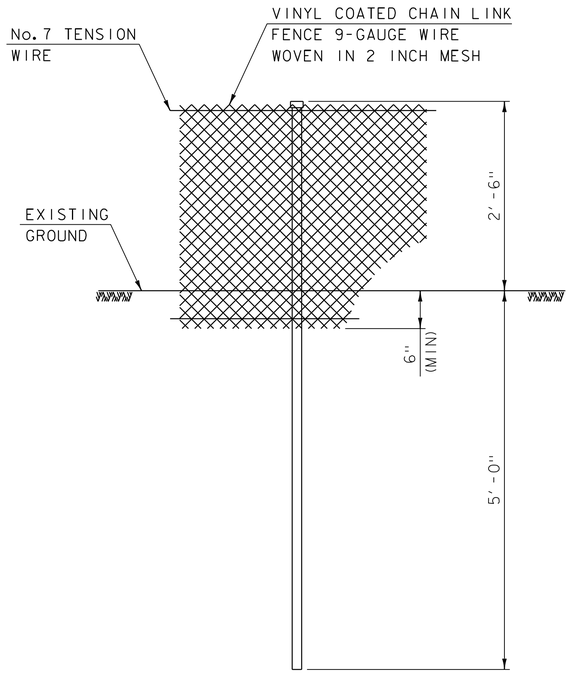
TRAFFIC SIGN SUMMARY SHEET

MILE MARKER, STATION OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS EACH	SIGN DIMENSIONS WIDTH (in)	SIGN DIMENSIONS HEIGHT (in)	NEW & SALVAGED SIGNS "A"	NEW & SALVAGED SIGNS "B"	SALV SIGN	SALV TIS	EXIST POST RETAIN	EXIST POST SALVAGE	NEW SIGN POSTS: NO. OF POST	FLANGED CHANNEL (LB / FT) 1.12	FLANGED CHANNEL (LB / FT) 2.00	FLANGED CHANNEL (LB / FT) 3.00	SQUARE STEEL (in) 1.75 (LB / FT) 1.88	SQUARE STEEL (in) 2.00 (LB / FT) 2.42	SQUARE STEEL (in) 2.50 (LB / FT) 3.35	ANCHOR	SLEEVE	TUBULAR ALUMINUM Ø (IN) 3.00 (LB / FT) 1.30	TUBULAR ALUMINUM Ø (IN) 4.00 (LB / FT) 1.70	TUBULAR ALUMINUM Ø (IN) 4.0 MOD (LB / FT) 1.70	FOUNDATION	TUBULAR STEEL Ø (IN) 3.00 (LB / FT) 7.60	TUBULAR STEEL Ø (IN) 3.50 (LB / FT) 9.00	TUBULAR STEEL Ø (IN) 4.00 (LB / FT) 10.80	TUBULAR STEEL Ø (IN) 5.00 (LB / FT) 14.60	W-SHAPE STEEL FTG. SIZE 24"	W-SHAPE STEEL FTG. SIZE 30"	WEIGHT	POST SIZE	SIGN FRAME REQUIRED	REMARKS	SIGN DETAIL: DETAIL ON SHEET NUMBER	SIGN DETAIL: STANDARD SHEET NUMBER
OPTION ITEMS																																			
327+30, RT	0120 1220 0620	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-700		T-44
327+91, RT	BRIDGE 87 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-701		T-42
327+93, LT	BRIDGE 87 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-701		T-44
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE VTRANS "SIGN POST DESIGN GUIDELINE."												FT .	FT .	FT .	FT 24.	FT .	FT .	XXXXX XXXXX XXXXX XXXXX	EA .	LB .	LB .	LB .		LB .	LB .	LB .	LB .								
	TOTALS				SF 1.2	SF .	EA. .	SF .	XXXXXXXXXXX	XXXXXXXXXXX		FT .			FT 24.					LB .			EA.	LB .				EA. .	EA. .	LB .					

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

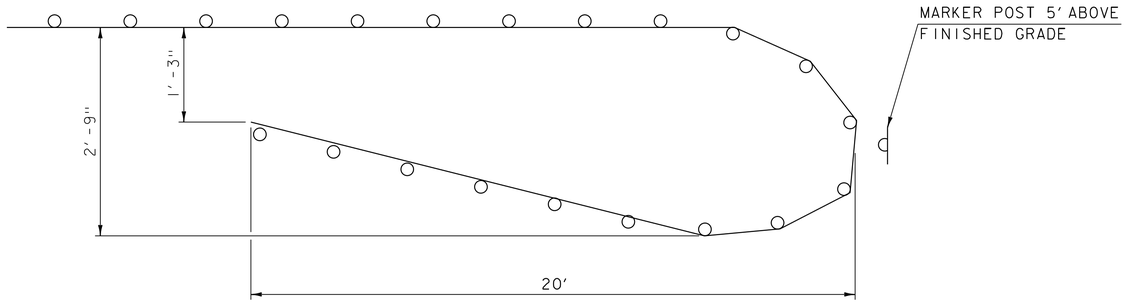
HOYLE TANNER

FILE NAME: z19b213tss.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN SUMMARY SHEET
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 105 OF 370



FENCE CHAIN LINK ANIMAL BARRIER

SCALE: 1" = 1'-0"



NOTE

THE PURPOSE OF THE ANIMAL TURN AROUNDS ARE TO REDIRECT THE ANIMALS AWAY FROM THE ROADWAY. DESIGN SHOULD ALSO INCLUDE TRENCHED IN FENCING AND FENCING SUPPORTS ON UPSLOPE SIDE OF FENCE. ANIMAL BARRIER POSTS FOR THE TURN-AROUND SHOULD BE ON THE INSIDE OF THE TURNAROUND.

ANIMAL TURN AROUND DETAIL

NOT TO SCALE

GENERAL NOTES

1. ALL FENCING SHALL MEET VTRANS SPECIFICATION SECTION 620.
2. CHAIN-LINK FENCING SHALL BE INSTALLED A MINIMUM OF 6" BELOW FINAL GRADE.
3. UNLESS OTHERWISE SPECIFIED, ATTACH CHAIN-LINK FABRIC TO POSTS AND BRACES WITH STANDARD TIE WIRE MEETING SPECIFICATIONS.
4. ALL CHAIN LINK FENCE, TIES AND TENSION WIRE SHALL BE VINYL COATED.
5. TOP SELVEDGE SHALL BE KNUCKLED.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213detail.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
WILDLIFE FENCE DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: J.HOLLSTEIN
CHECKED BY: T.SUMNER
SHEET 106 OF 370

SOIL CLASSIFICATION

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

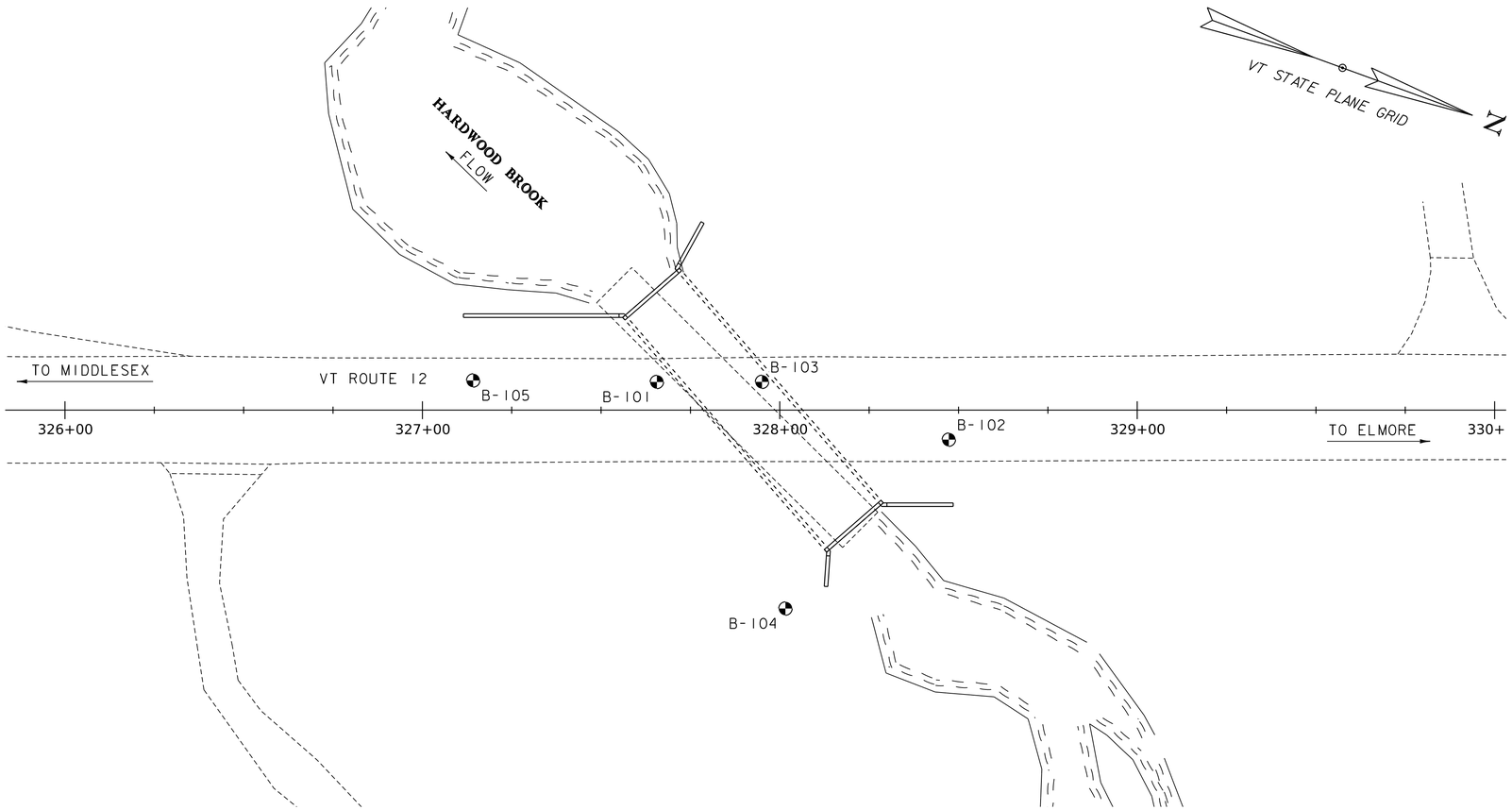
CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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

COMMONLY USED SYMBOLS

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

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



BORING LAYOUT

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB
B-101	327+65	8 LT	703767.86	1631623.19	933.0	910.3
B-102	328+47	8 RT	703849.25	1631610.16	934.4	914.4
B-103	327+95	8 LT	703794.62	1631612.89	933.5	909.6

HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB
B-104	328+02	56 RT	703822.51	1631670.20	919.0	900.6
B-105	327+15	8 LT	703718.57	1631640.23	932.2	913.4

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.

1. The subsurface explorations shown herein were made between February 2021 and August 2021 and overseen by Haley & Aldrich, Inc.

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

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

GENERAL NOTES

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

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

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

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

HOYLE TANNER

0 20 40
SCALE IN FEET

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(56)

FILE NAME: z19b213bor.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 107 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100
Worcester Bridge 87

Boring No.: **B-101**
Page No.: 1 of 2
Pin No.: 19B213
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 2/22/21 Date Finished: 2/22/21
VTSPG NAD83:
Station: 327+65 Offset: 8 ft Left
Ground Elevation:

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig:	MOBILE Drill B-53	C_E = 1.55

Groundwater Observations

Date	Depth (ft)	Notes

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Based on drilling noise change and visual, 0.0 ft - 1.4 ft								
2.5		(Fill) Silty SAND (SM), very dense, gray-brown, dry, no structure, no odor, Rec. = 0.5 ft				100				
		Similar, Rec. = 0.25 ft				100/4"				
5.0		(Fill - Reworked Natural) Poorly-graded GRAVEL with Silt and Sand (GP-GM), very dense, brown, dry, no structure, no odor, Rec. = 1.5 ft				58-56-25-18 (81)	8.1	47.9	38.8	13.3
7.5		(Fill - Reworked Natural) Poorly-graded SAND (SP), medium dense, gray-brown, wet, no structure, no odor, Rec. = 1.5 ft				10-14-9-8 (22)				
		(Fill - Reworked Natural) Poorly-graded SAND with Silt and Gravel (SP-SM), very dense, brown, dry, no structure, no odor, Rec. = 1.0 ft				7-8-13-11 (21)	7.6	31.1	57.1	11.8
10.0		A-2-4, Poorly-graded SAND with Silt and Gravel (SP-SM), medium dense, brown, dry, no structure, no odor, trace wood fragments, Rec. = 1.67 ft (Fluvial Deposits)				10-10-9-9 (19)	7.2	21.8	66.8	11.4
12.5										
15.0		A-1-b, Poorly-graded SAND with Silt and Gravel (SP-SM), medium dense, gray-brown, wet, no structure, no odor, trace wood fragments, Rec. = 1.5 ft (Fluvial Deposits)				12-11-9-7 (20)	16.4	42.1	43.5	14.3
17.5										
20.0		A-4, Sandy SILT (ML), medium stiff, gray, wet, no structure, no odor, Rec. = 1.0 ft (Alluvial Deposits)				5-4-3-3 (7)	23.6	0.2	48.3	51.5
22.5		22.7 ft - 23.0 ft, Top of Competent Rock	R1	93 (93)	8 8	Top of Bedrock @ 22.7 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
BOX CULVERT
EL 914.82
(SEE NOTE 1)

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR87.GPJ VERMONT AOT.GDT 12/5/21

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100
Worcester Bridge 87

Boring No.: **B-101**
Page No.: 2 of 2
Pin No.: 19B213
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 2/22/21 Date Finished: 2/22/21
VTSPG NAD83:
Station: 327+65 Offset: 8 ft Left
Ground Elevation:

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig:	MOBILE Drill B-53	C_E = 1.55

Groundwater Observations

Date	Depth (ft)	Notes

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
27.5		23.0 ft - 28.0 ft, Light gray-green and light gray to white, GRANOFELS AND QUARTZITE, Hard to very hard, fine-grained slightly fractured to massive, fresh primary joints dipping at horizontal to low angles, spaced moderately to close, undulating, smooth, moderately tight to open. Core has pure quartz throughout as thick as 12-inches. Good Rock, NQ, RMR = 67 (MORETOWN FORMATION)			6 7 5					
		Hole stopped @ 28.0 ft								
30.0										
32.5										
35.0										
37.5										
40.0										
42.5										
45.0										
47.5										

Remarks:
Core hole backfilled with bentonite. Overburden backfilled with drill cuttings and sand. Capped with approximately 1.5 ft cold patch.

AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR87.GPJ VERMONT AOT.GDT 12/5/21

NOTES

1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-3" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING LOGS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 108 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100 BR 87
Worcester, Vermont

Boring No.: **B-102**
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/04/21 Date Finished: 8/04/21
VTSPG NAD83: N 703849.25 ft E 1631610.16 ft
Station: 328+47 Offset: 8R
Ground Elevation: 934.4 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/04/21	13.2	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.6 ft								
		Rec. = 1.3 ft				18-12-10-9 (22)		18.8	34.1	47.1
		(Fill) Silty SAND with Gravel (SM), medium dense, brown, dry, no structure, no odor, mps 0.75 in., 0.6 ft - 4.8 ft								
2.5		(Fill) Silty SAND (SM), medium dense, brown, moist, no structure, no odor, mps 0.5 in., Rec. = 1.25 ft, 2.5 ft				7-7-8-11 (15)		6.7	46.7	46.6
5.0		A-1-b, Well-graded SAND with Silt (SW-SM), medium dense, brown, moist, no structure, no odor, mps 0.55 in. (Fluvial Deposits), 4.8 ft - 10.0 ft				7-8-11-9 (19)		24.3	66.5	9.2
		Rec. = 1.7 ft								
7.5		A-1-b, Well-graded SAND with Silt (SW-SM), medium dense, brown, moist, no structure, no odor, mps 0.55 in. (Fluvial Deposits), Rec. = 1.25 ft, 7.0 ft				13-13-13-13 (26)				
10.0		A-3, Well-graded SAND (SW), medium dense, brown, moist, no structure, no odor, mps 0.5 in. (Fluvial Deposits), Rec. = 1.7 ft, 10.0 ft - 15.0 ft				5-6-7-8 (13)		19.5	73.3	7.2
12.5										
15.0		A-1-b, Silty SAND (SM), medium dense, brown, moist, no structure, no odor, mps 0.5 in. (Fluvial Deposits), Rec. = 0.3 ft, 15.0 ft - 20.0 ft				5-8-5-20 (13)				
17.5		Note: Cobble in tip of spoon, 16.0 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 87.GPJ VERMONT AOT.GDT 1/1/021

BOTTOM OF
WINGWALL
FOOTING
EL 913.50

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100 BR 87
Worcester, Vermont

Boring No.: **B-102**
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/04/21 Date Finished: 8/04/21
VTSPG NAD83: N 703849.25 ft E 1631610.16 ft
Station: 328+47 Offset: 8R
Ground Elevation: 934.4 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/04/21	13.2	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
22.5		20.0 ft - 25.0 ft, Gray, GRANOFELS, aphanitic, moderately hard, slightly weathered. Joints dipping at moderate angles, moderate to close, undulating, tight to open, quartz intrusion at 22.4 ft, vertical foliations. Fair Rock, NQ, RMR=60 (MORETOWN FORMATION)	C1	97 (70)	2	Top of Bedrock @ 20.0 ft				
					2					
					2					
					2					
25.0					1.5					
		25.0 ft - 30.0 ft, Gray, GRANOFELS, aphanitic, moderately hard, slightly weathered. Joints dipping at high to vertical angles, close to moderate, undulating, smooth, tight to open. Good Rock, NQ, RMR=64 (MORETOWN FORMATION)	C2	100 (87)	2					
27.5					2.5					
					3.5					
30.0					1.5					
		Hole stopped @ 30.0 ft								
32.5		Remarks: AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.								
35.0										
37.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 87.GPJ VERMONT AOT.GDT 1/1/021

NOTES

1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-3" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING LOGS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 109 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100
Worcester Bridge 87

Boring No.: **B-103**
Page No.: 1 of 2
Pin No.: 19B213
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 2/17/21 Date Finished: 2/18/21
VTSPG NAD83:
Station: 327+95 Offset: 8 ft Left
Ground Elevation:

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig:	MOBILE Drill B-53	C_E = 1.55

Groundwater Observations		
Date	Depth (ft)	Notes
02/18/21	13.3	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Asphalt Pavement, 0.0 ft - 1.8 ft								
2.5		(Fill) Poorly-graded SAND with Silt and Gravel (SP-SM), very dense, dark brown, dry, no structure, no odor, Rec. = 0.4 ft				185/6"-100/5"				
		Note: Cobble from 2.9 to 4.0 ft, roller coned used through it.								
5.0		(Fill) Poorly-graded SAND with Silt and Gravel (SP-SM), very dense, brown, dry, no structure, no odor, Rec. = 1.5 ft				40-34-26-26 (60)				
		Note: 4-in. casing advanced to 5.0 ft, no blow counted. 0 to 3 ft opened, so not representative casing counting., 5.0 ft								
7.5		(Fill) Poorly-graded SAND with Silt and Gravel (SP-SM), very dense, brown, dry, no structure, no odor, Rec. = 1.5 ft				15-29-41-28 (70)	7.5	23.8	63.1	13.1
		(Fill) Poorly-graded SAND with Gravel (SP), very dense, brown, dry, no structure, no odor, Rec. = 1.67 ft				15-17-40-33 (57)				
10.0		(Fill) Poorly-graded SAND with Gravel (SP), very dense, brown, dry, no structure, no odor, Rec. = 1.0 ft				60-120				
		A-1-b, Poorly-graded SAND with Silt (SP-SM), medium dense, gray, wet, no structure, no odor, Rec. = 1.5 ft (Alluvial Deposits)				31-18-13-12 (31)	14.6	37.5	53.0	9.6
12.5		A-2-4, Poorly-graded SAND with Silt and Gravel (SP-SM), dense, brown, dry, no structure, no odor, Rec. = 1.5 ft (Fluvial Deposits)								
		A-2-4, Poorly-graded SAND with Silt and Gravel (SP-SM), dense, brown, moist, no structure, no odor, Rec. = 1.5 ft (Fluvial Deposits)								
15.0		A-4, Silty SAND (SM), dense, gray, wet, no structure, no odor, Rec. = 1.5 ft (Alluvial Deposits)				15-13-11-10 (24)	21.2	13.0	42.4	44.6
17.5		Note:, Casing advanced to 24.0 ft into rock								
20.0										
22.5		23.5 ft - 23.9 ft, Top of Weathered Bedrock								
		23.9 ft - 24.0 ft, Top of Competent Rock	R1	100 (95)	11	Top of Bedrock @ 23.9 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
BOX CULVERT
EL 914.94
(SEE NOTE 1)

BORING LOG 200787_VTTRANS_WORCESTER-ELMORE BR87.GPJ VERMONT AOT.GDT 12/5/21

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100
Worcester Bridge 87

Boring No.: **B-103**
Page No.: 2 of 2
Pin No.: 19B213
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 2/17/21 Date Finished: 2/18/21
VTSPG NAD83:
Station: 327+95 Offset: 8 ft Left
Ground Elevation:

Casing: Type: WB; I.D.: 4 in; Hammer Wt: 300 lb.; Hammer Fall: 24; Hammer/Rod Type: Auto; Rig: MOBILE Drill B-53
Sampler: SS; 2 in; 140 lb.; 30 in.; C_E = 1.55

Groundwater Observations: 02/18/21 | 13.3

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
27.5		24.0 ft - 29.0 ft, Gray-green and light gray-white, GRANOFELS AND QUARTZITE, Hard to very hard, fine-grained, fresh, slightly fractured to massive. Primary joints dipping at horizontal to low angles, spaced moderately close, undulating, smooth, moderately tight to open. Fair Rock, NQ, RMR = 57, Core C1 is approximately 80% quartz from 24.0 ft to 26.5 ft depth, Advanced core barrel from 26.3 ft to 27.3 ft in attempt to break core to recover (MORETOWN FORMATION)			8 13 13 20					
30.0		29.0 ft - 30.0 ft, Similar to above, recovered 2.7 ft of core run R1 and 1-ft of run R2. Fair Rock, NQ, RMR = 60	R2	67 (67)	16					
		30.0 ft - 31.5 ft, Similar to above except less quartzite intrusions. Fair Rock, NQ, RMR = 57	R3	100 (100)	15 20					
32.5		31.5 ft - 34.0 ft, Similar, Good Rock, NQ, RMR = 67 (Moretown Formation)	R4	100 (100)	24 10					
35.0		Hole stopped @ 34.0 ft								

Remarks:
Core hole backfilled with bentonite chips. Overburden backfilled with drill cuttings. 2 ft cold patch cap. Photo taken of core box.
Note: All four core runs contain numerous quartz stringers of varying thickness.

AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200787_VTTRANS_WORCESTER-ELMORE BR87.GPJ VERMONT AOT.GDT 12/5/21

NOTES

1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-3" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213log.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
BORING LOGS 3	SHEET 110 OF 370

BOTTOM OF
WINGWALL
FOOTING
EL 913.50

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100
Worcester Bridge 87

Boring No.: **B-104**
Page No.: 1 of 2
Pin No.: 19B213
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 2/23/21 Date Finished: 2/23/21
VTSPG NAD83: N 703822.51 ft E 1631670.20 ft
Station: 328+02 Offset: 56R
Ground Elevation: 919.0 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:		Auto
Rig: MOBILE Drill B-53	C_E = 1.56	

Groundwater Observations

Date	Depth (ft)	Notes

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Rec. = 1.0 ft, 0.0 ft - 1.9 ft, Top 1 in. - TOPSOIL and ROOT MAT A-8, SILT (OL/OH), Dark brown, Moist, Soft, mps 0.425 mm, trace roots/organics				WOH-WOH-2-4				
2.5		1.9 ft - 9.0 ft, Bottom 1 in. coarse gravel A-2-4, Silty SAND with Gravel (SM), Dark brown, Wet, Rec. = 0.1 ft, Medium dense, mps 0.75 in. (FLUVIAL DEPOSITS)				6-9-8-7 (17)				
5.0		A-2-4, Silty SAND with gravel (SM), Dark brown, Wet, Rec. = 0.5 ft, Medium dense, mps 1.5 in. (FLUVIAL DEPOSITS)				6-6-6-6 (12)				
10.0		A-3, Poorly-graded SAND (SP), Gray, Wet, Rec. = 1.0 ft, Very loose, mps 0.425 (ALLUVIAL DEPOSITS)				1-2-1-1 (3)				
		A-3, Same as S5 (ALLUVIAL DEPOSITS), Rec. = 0.3 ft				2-3-3-4 (6)				
12.5		A-3, Poorly-graded SAND (SP), Gray, Wet, Rec. = 1.5 ft, Loose, mps 0.425 mm (ALLUVIAL DEPOSITS)				2-3-3-4 (6)				
15.0		A-3, Same as S6 (ALLUVIAL DEPOSITS), Rec. = 1.0 ft				3-2-3-3 (5)				
17.5		A-3, Poorly-graded SAND (SP), Gray, Wet, Rec. = 1.17 ft, Loose to dense, mps 0.425 mm (ALLUVIAL DEPOSITS)				1-3-100/5"				
		18.4 ft - 19.0 ft, Top of Competent Rock				Top of Bedrock @ 18.4 ft				
20.0		19.0 ft - 29.0 ft, Gray-green, GRANOFELS, fine-grained, slightly fractured to massive. Primary joints dipping at moderate to high angles, spaced close to moderately close, undulating, smooth, tight to moderately wide. No stains on fracture surfaces.. Hard to very hard, Fresh, NQ, Core shows characteristic "pinstriped" pattern. Unable to recover bottom 1.7 ft of core in hole. Attempted to advance core barrel over core to recover.	R1	97 (88)	6 5 6 6 6					
22.5		24.0 ft, Same as R1, core barrel jamed at 25.4 ft.. NQ	R2	100 (82)	5					

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR87.GPJ VERMONT AOT.GDT 30/3/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100
Worcester Bridge 87

Boring No.: **B-104**
Page No.: 2 of 2
Pin No.: 19B213
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 2/23/21 Date Finished: 2/23/21
VTSPG NAD83: N 703822.51 ft E 1631670.20 ft
Station: 328+02 Offset: 56R
Ground Elevation: 919.0 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:		Auto
Rig: MOBILE Drill B-53	C_E = 1.56	

Groundwater Observations

Date	Depth (ft)	Notes

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
27.5		25.4 ft, Same as R1, except fracture zone from 25.8 to 26.3 ft, quartzite from 28.8-29.0 ft (MORETOWN FORMATION). NQ	R3	100 (72)	6 6 5 6					
30.0		Hole stopped @ 29.0 ft								
32.5										
35.0										
37.5										
40.0										
42.5										
45.0										
47.5										

Remarks:
Core hole backfilled with bentonite chips. Overburden backfilled with drill cuttings and sand. Stake placed in hole. Location flagged and tie-off measurements taken.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR87.GPJ VERMONT AOT.GDT 30/3/22

NOTES

1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-3" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(56)
FILE NAME: z19b213log.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
BORING LOGS 4	SHEET III OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100 BR 87
Worcester, Vermont

Boring No.: **B-105**
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/03/21 Date Finished: 8/03/21
VTSPG NAD83: N 703718.57 ft E 1631640.23 ft
Station: 327+15 Offset: 8L
Ground Elevation: 932.2 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/03/21	11.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.5 ft								
		(Fill) Poorly-graded GRAVEL with Sand (GP), dense, gray-brown, dry, no structure, no odor, mps 0.75 in., Rec. = 0.75 ft, 0.5 ft - 2.5 ft				17-19-14-14 (33)		57.6	35.2	7.2
2.5		(Fill) Well-graded SAND with Silt and Gravel (SW-SM), dense, gray-brown, dry, no structure, no odor, mps 0.75 in., Rec. = 0.6 ft, 2.5 ft - 5.0 ft				17-11-20-20 (31)		50.1	37.8	12.1
5.0		(Fill) Silty SAND with Gravel (SM), medium dense, gray-brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.6 ft, 5.0 ft - 7.0 ft				6-10-12-13 (22)		43.2	42.2	14.6
7.5		(Fill) Silty GRAVEL with Sand (GM), medium dense, gray-brown, moist, no structure, no odor, mps 0.75 in., Rec. = 1.4 ft, 7.0 ft - 9.3 ft				10-12-10-12 (22)		60.1	25.4	14.5
10.0		A-3, Poorly-graded GRAVEL with Sand (GP), loose, gray-brown, no structure, no odor, wet, mps 0.75 (Fluvial Deposits), 9.3 ft - 11.6 ft Rec. = 1.4 ft				4-4-5-10 (9)		77.6	15.2	7.2
		Note: Drill action indicates a cobble from 11.6 to 12.1 ft., 11.6 ft - 12.1 ft								
12.5		A-3, Poorly-graded SAND (SP), loose, gray-brown, wet, no structure, no odor, mps 2 mm (Alluvial Deposits), 12.1 ft - 18.8 ft								
15.0		Rec. = 1.25 ft				4-5-5-5 (10)				
17.5		Top of Bedrock @ 18.8 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 87.GPJ VERMONT AOT.GDT 11/10/21

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241056-100 BR 87
Worcester, Vermont

Boring No.: **B-105**
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/03/21 Date Finished: 8/03/21
VTSPG NAD83: N 703718.57 ft E 1631640.23 ft
Station: 327+15 Offset: 8L
Ground Elevation: 932.2 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/03/21	11.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
22.5		20.0 ft - 25.0 ft, Light gray, SCHIST, aphanitic to fine grained, hard, fresh to slightly weathered. Joints dipping at high angles, close to moderate, undulating, smooth, tight. No discernible secondary joint set. Fair Rock, NQ, RMR=56 (MORETOWN FORMATION)	C1	88 (88)	1 1.5 1.5 1.5 1.5					
25.0		25.0 ft - 30.0 ft, Similar to C1. Good Rock, NQ, RMR=64 (MORETOWN FORMATION)	C2	95 (88)	1.5 1 1.5 1 1.5					
27.5										
30.0		Hole stopped @ 30.0 ft								
32.5										
35.0										
37.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 87.GPJ VERMONT AOT.GDT 11/10/21

NOTES

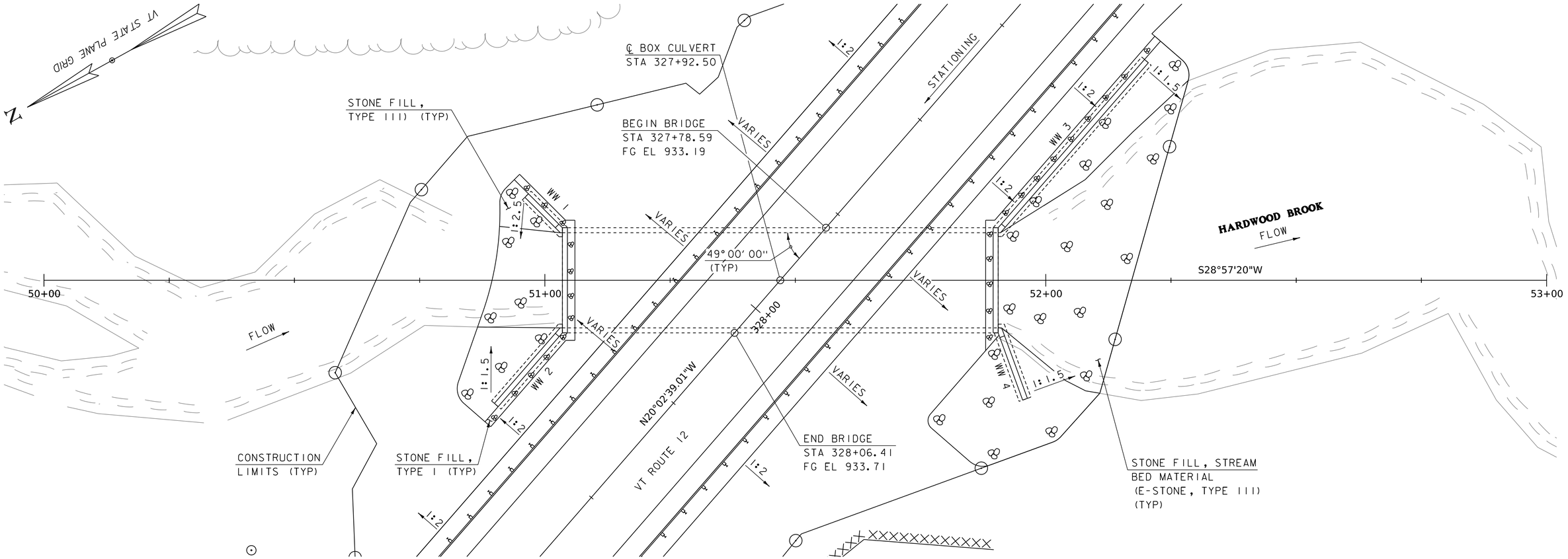
1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-3" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

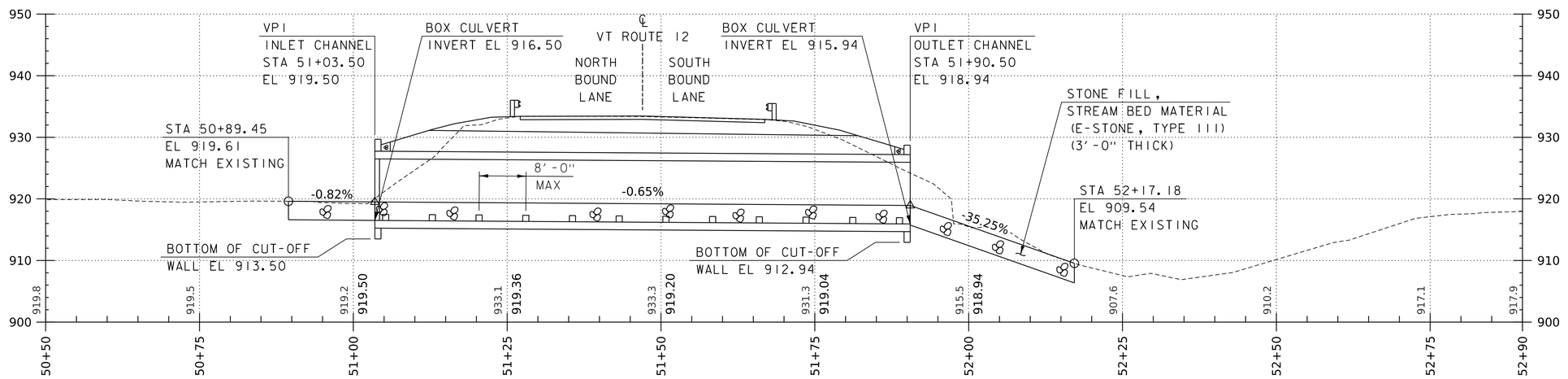
PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(56)

FILE NAME: z19b213log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING LOGS 5

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 112 OF 370



CULVERT PLAN
SCALE: 1" = 10'

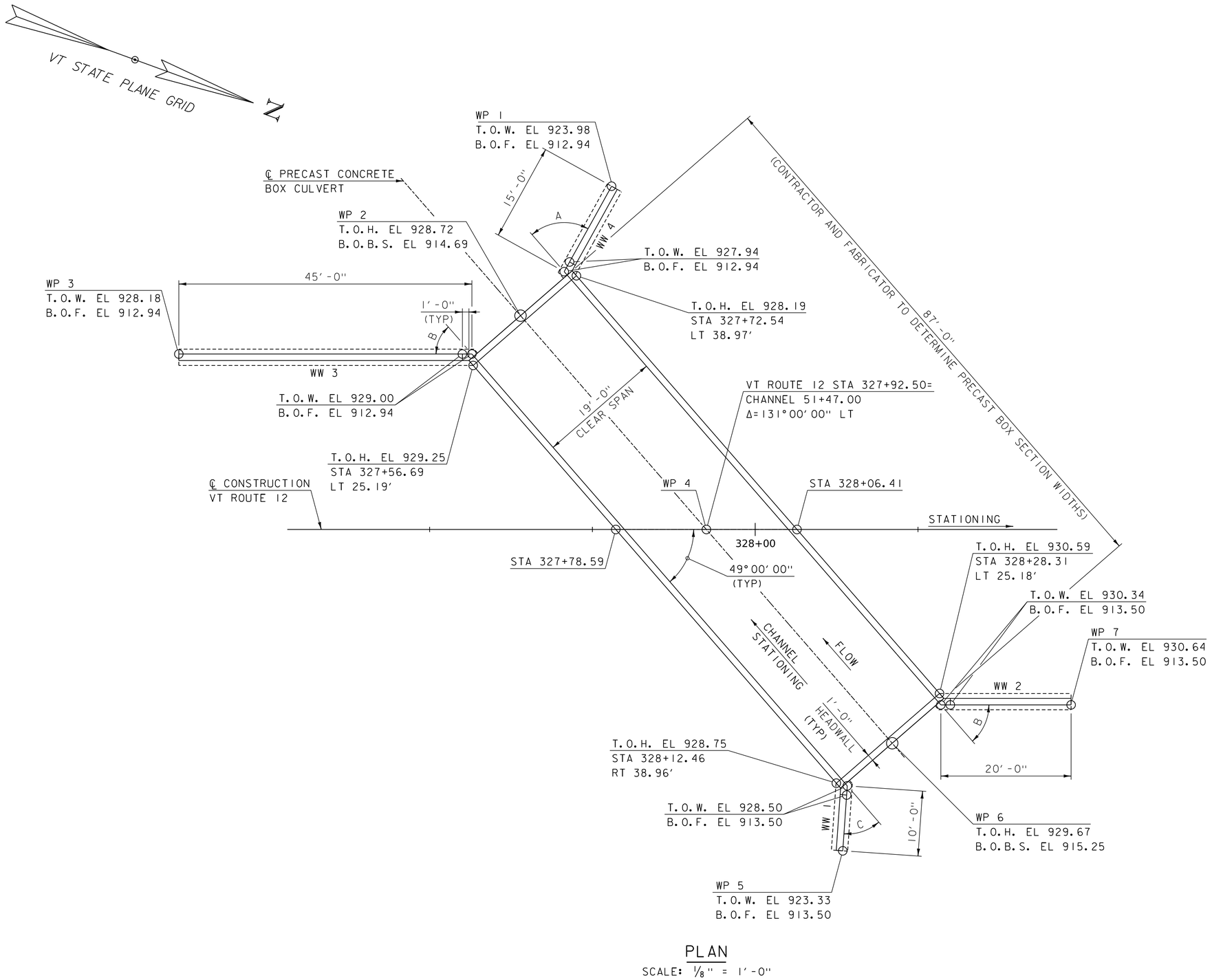


CULVERT PROFILE
SCALE: 1" = 10'

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b2i3pln.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: L.STONE	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
CULVERT PLAN AND PROFILE	SHEET 113 OF 370



PLAN

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

WORKING POINT COORDINATES		
WP	NORTHING	EASTING
1	703763.2183	1631576.6643
2	703756.8968	1631600.1329
3	703709.6246	1631623.6485
4	703794.9607	1631621.1935
5	703831.5484	1631660.3757
6	703833.0214	1631642.2523
7	703856.8079	1631627.3054

LEGEND

T.O.H.	TOP OF HEADWALL
T.O.W.	TOP OF WINGWALL
B.O.F.	BOTTOM OF FOOTING
B.O.B.S.	BOTTOM OF BOTTOM SLAB
A	70°00'00"
B	49°00'00"
C	45°00'00"

NOTES

1. THE PRECAST CONCRETE BOX CULVERT WALLS AND SLABS, AND PRECAST WINGWALL THICKNESSES ARE ASSUMED. ACTUAL DIMENSIONS TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.

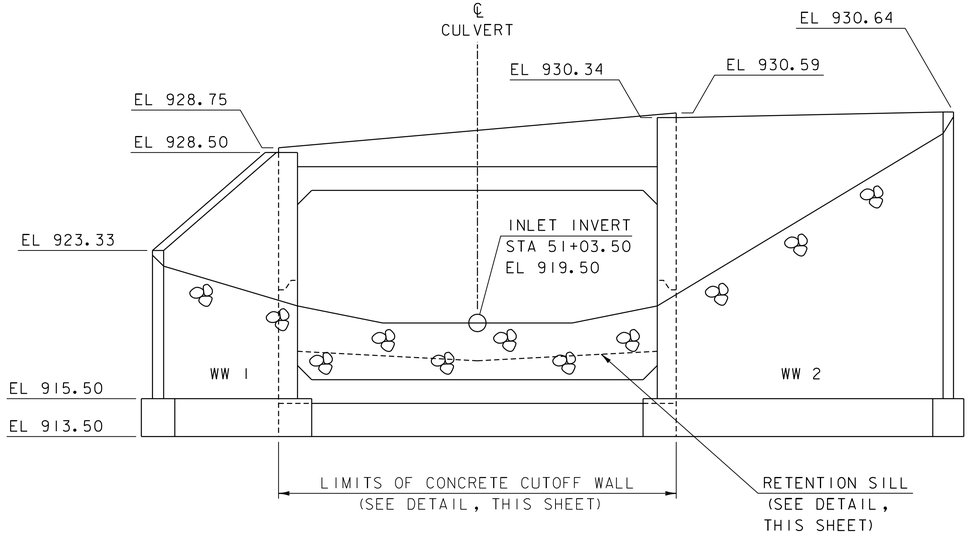
2. THE FABRICATOR TO HOLD THE FRONT FACE OF THE BOX CULVERT AND WINGWALLS AND ADJUST THE BACK FACE IF THE DESIGN DIFFERS FROM WHAT IS SHOWN HERE.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

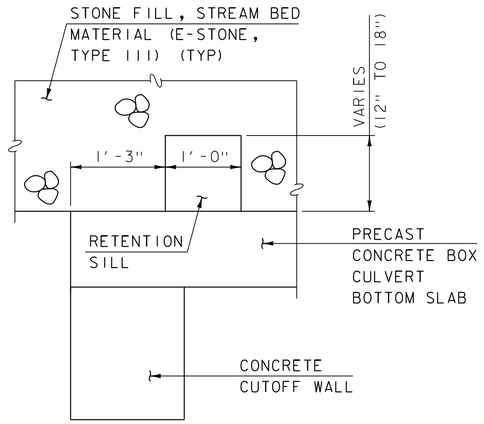
FILE NAME: z19b2l3subl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
CULVERT LAYOUT PLAN

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 114 OF 370



INLET ELEVATION

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

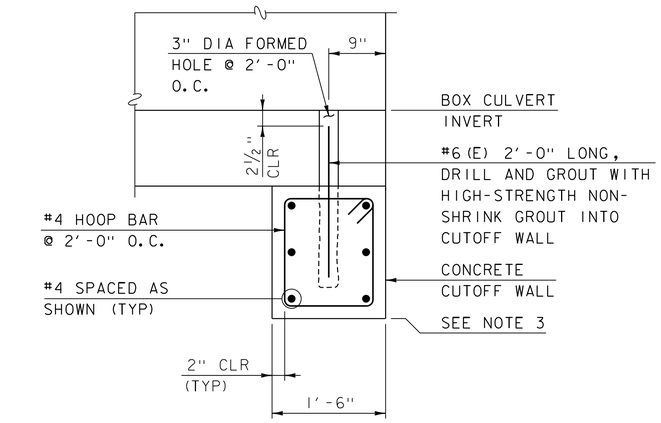


RETENTION SILL REQUIREMENTS	
	DIMENSION
HEIGHT AT ENDS	18"
HEIGHT AT CENTER	12"
SPACING (O.C.)	8'-0"

NOTES
1. PLACE A RETENTION SILL AT THE INLET AND OUTLET OF THE STRUCTURE, AS SHOWN, AS WELL AS CONTINUOUSLY THROUGHOUT THE STRUCTURE AT THE MAX SPACING SPECIFIED.
2. BOX CULVERT FABRICATOR SHALL DESIGN AND DETAIL THE PRECAST RETENTION SILL TO BE CAST INTEGRAL WITH THE BOX CULVERT.

CULVERT RETENTION SILL DETAIL

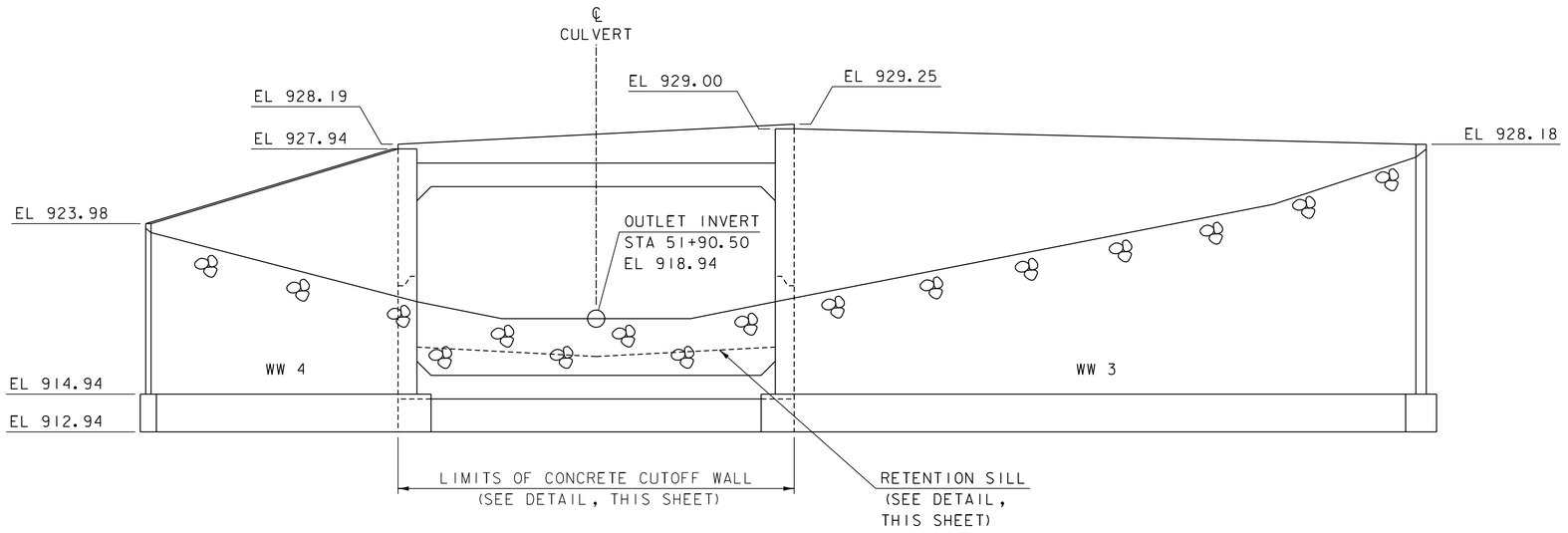
SCALE: 1" = 1'-0"



NOTES
1. LENGTH OF CUTOFF WALL TO MATCH TOTAL WIDTH OF CULVERT.
2. ALL WORK INCIDENTAL TO BOX CULVERT.
3. REFERENCE ELEVATION VIEWS THIS SHEET FOR BOTTOM OF CUTOFF WALL ELEVATIONS.

CONCRETE CUTOFF WALL DETAIL

SCALE: 1" = 1'-0"



OUTLET ELEVATION

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

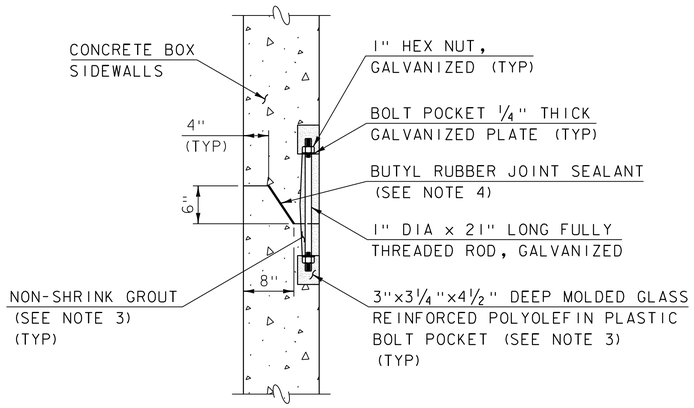
NOTES

1. THE PRECAST BOX SECTIONS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND SHAPE WILL BE DEPENDENT ON THE FABRICATOR.
2. FOR BOX PROFILE SEE CULVERT PLAN AND PROFILE SHEET.

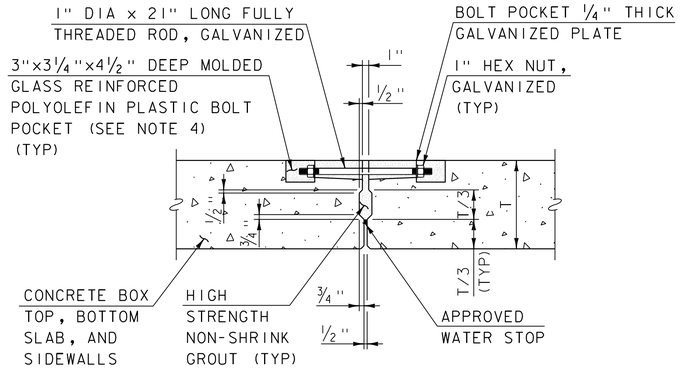
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)

FILE NAME: z19b213sub2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
SUBSTRUCTURE DETAILS I	SHEET 115 OF 370



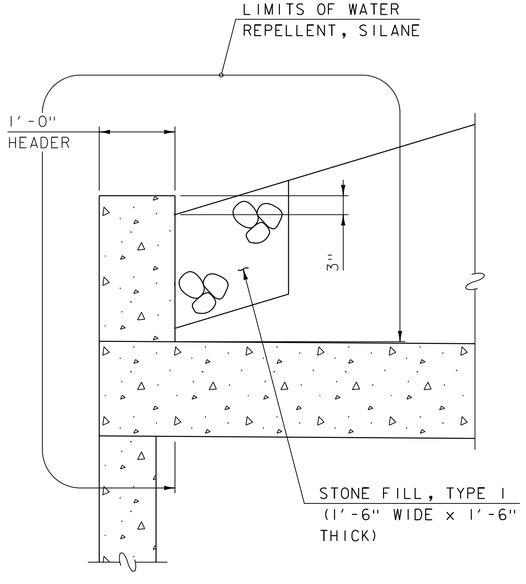
SIDEWALL HORIZONTAL JOINTS



TOP, BOTTOM SLAB JOINTS AND SIDEWALL VERTICAL JOINTS

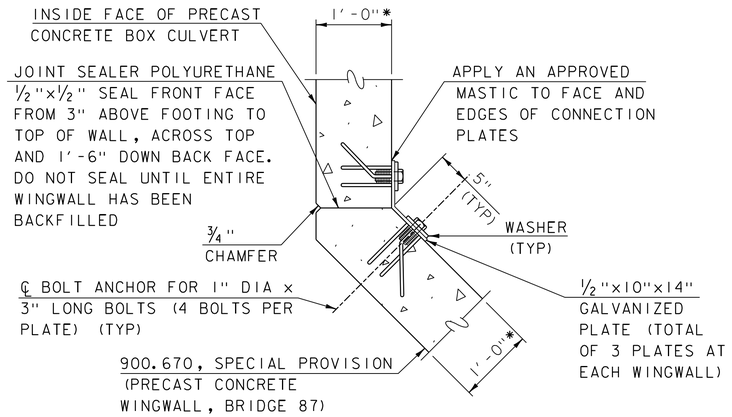
BOX CULVERT MECHANICAL CONNECTION DETAIL

NOT TO SCALE



HEADER WATER REPELLENT DETAIL

NOT TO SCALE



* ASSUMED DIMENSION, ACTUAL DIMENSION TO BE DETERMINED BY FABRICATOR

WINGWALL TO PRECAST CONCRETE STRUCTURE CONNECTION DETAIL

NOT TO SCALE

BOX CULVERT MECHANICAL CONNECTION NOTES

1. ALTERNATIVE MECHANICAL PRECAST BOX CONNECTION MAY BE SUBMITTED FOR VTRANS REVIEW AND APPROVAL.

2. ALL WORK INCIDENTAL TO BOX CULVERT.

3. 3"x3 1/4"x4 1/2" DEEP MOLDED GLASS REINFORCED POLYOLEFIN PLASTIC BOLT POCKETS CAST IN TOP FACE OF TOP SLAB AND TOP FACE OF BOTTOM SLAB AND EXTERIOR SIDEWALLS TO ACCEPT 1" DIA GALVANIZED THREADED ROD, NUTS AND WASHERS FOR PERMANENT ASSEMBLY IN FIELD. UPON SUCCESSFUL INSTALLATION, ALL POCKETS SHALL BE THOROUGHLY FILLED IN WITH AN VTRANS APPROVED, NON-SHRINK GROUT AND STRUCK LEVEL.

SIDEWALL HORIZONTAL JOINTS

4. BUTYL RUBBER JOINT SEALANT PER ASTM C-990 AND AASHTO M-198 SHALL BE PROVIDED.

5. A MINIMUM OF 2 MECHANICAL CONNECTORS ARE REQUIRED FOR EACH PRECAST BOX CULVERT UNIT (1 CROSSING EACH HORIZONTAL LEG CONSTRUCTION JOINT).

BOX TOP, BOTTOM SLAB JOINTS AND SIDEWALL VERTICAL JOINTS

6. A MINIMUM OF 8 MECHANICAL CONNECTORS ARE REQUIRED FOR EACH BOX UNIT (2 TOP, 2 BOTTOM AND 2 EACH EXTERIOR SIDEWALL) (1 ABOVE AND 1 BELOW THE HORIZONTAL JOINT).

WINGWALL TO STRUCTURE CONNECTION NOTES

1. ALL HARDWARE TO BE HOT-DIPPED GALVANIZED.

2. FABRICATOR TO DESIGN ALL CONNECTION PLATES, BOLTS AND BOLT ANCHORS, BUT SHALL NOT BE SIZED SMALLER THAN AS DETAILED.

3. ALL CONNECTION MATERIALS AND WORK SHALL BE INCIDENTAL TO ITEM 900.670, SPECAIL PROVISION (PRECAST CONCRETE WINGWALL, BRIDGE 87).

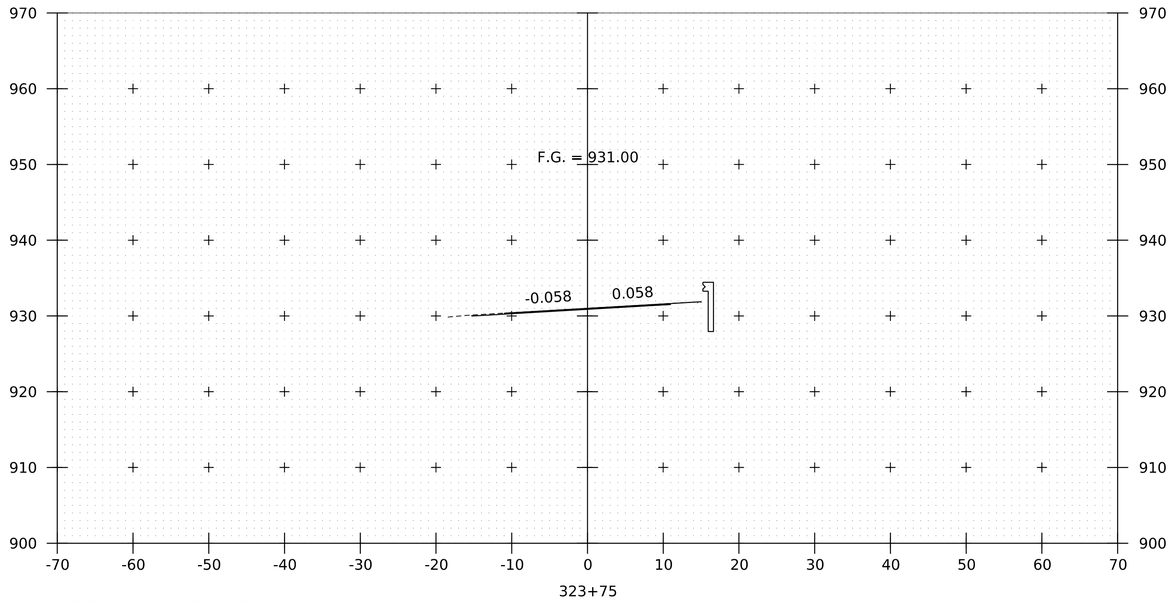
4. CONTRACTOR IS RESPONSIBLE FOR PROPER FIT UP OF CULVERT AND WINGWALL CONNECTION.

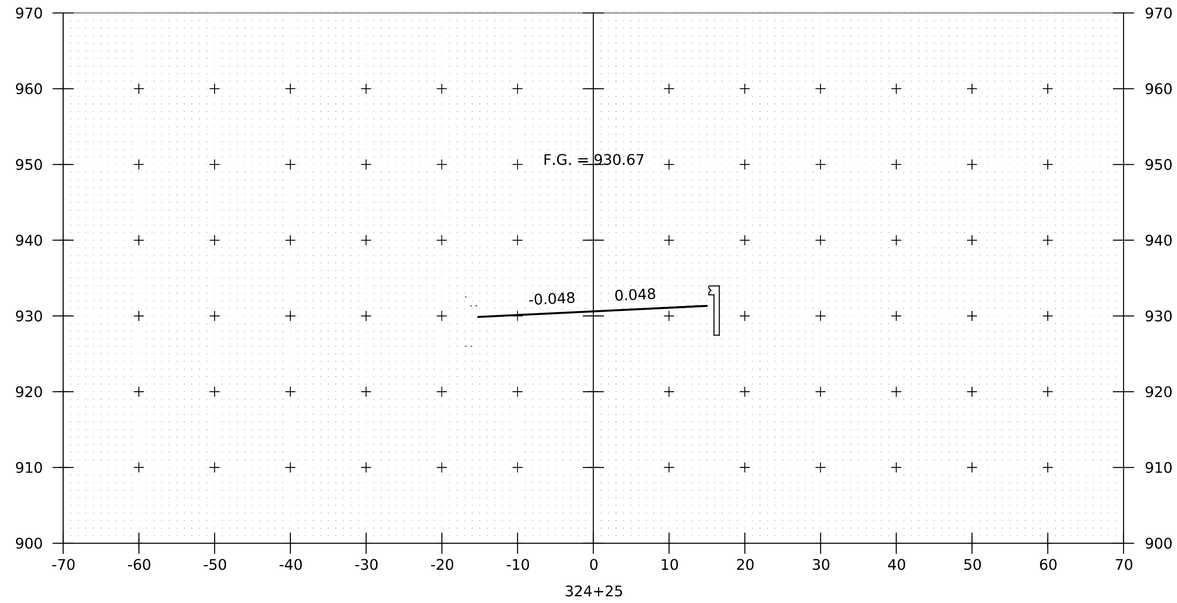
5. BOLTS, BOLT ANCHORS AND CONNECTION PLATES SHALL BE SUPPLIED BY THE PRECAST WINGWALL FABRICATOR TO THE PRECAST BOX FABRICATOR (IF DIFFERENT) FOR INCLUSION IN BOX FABRICATION.

6. ALTERNATIVE MECHANICAL CONNECTION MAY BE SUBMITTED FOR VTRANS REVIEW AND APPROVAL.

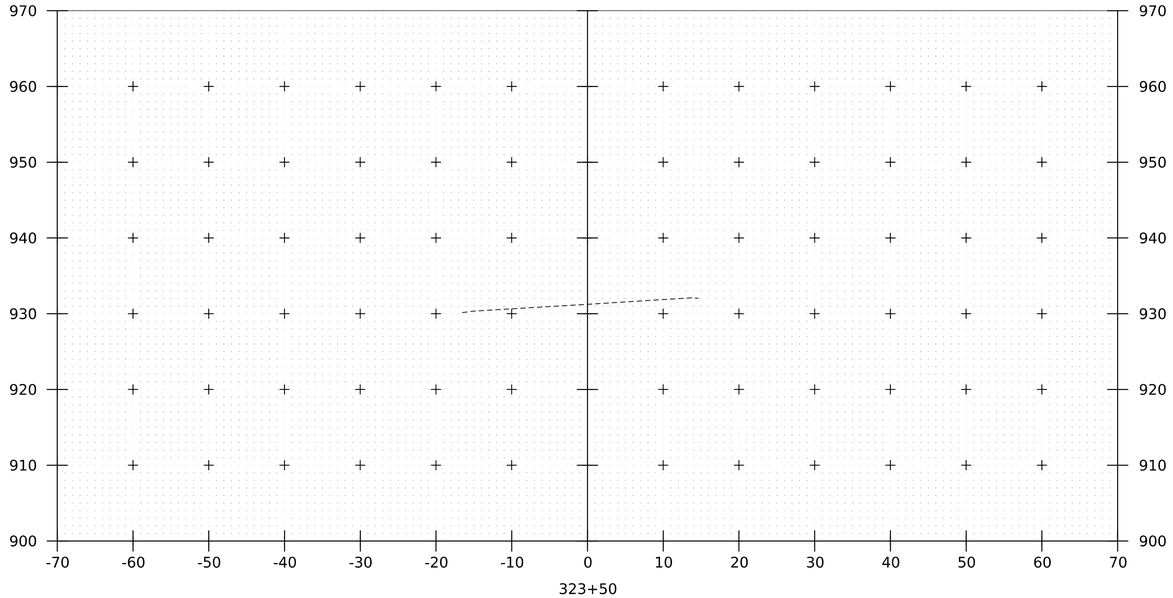
HOYLE TANNER

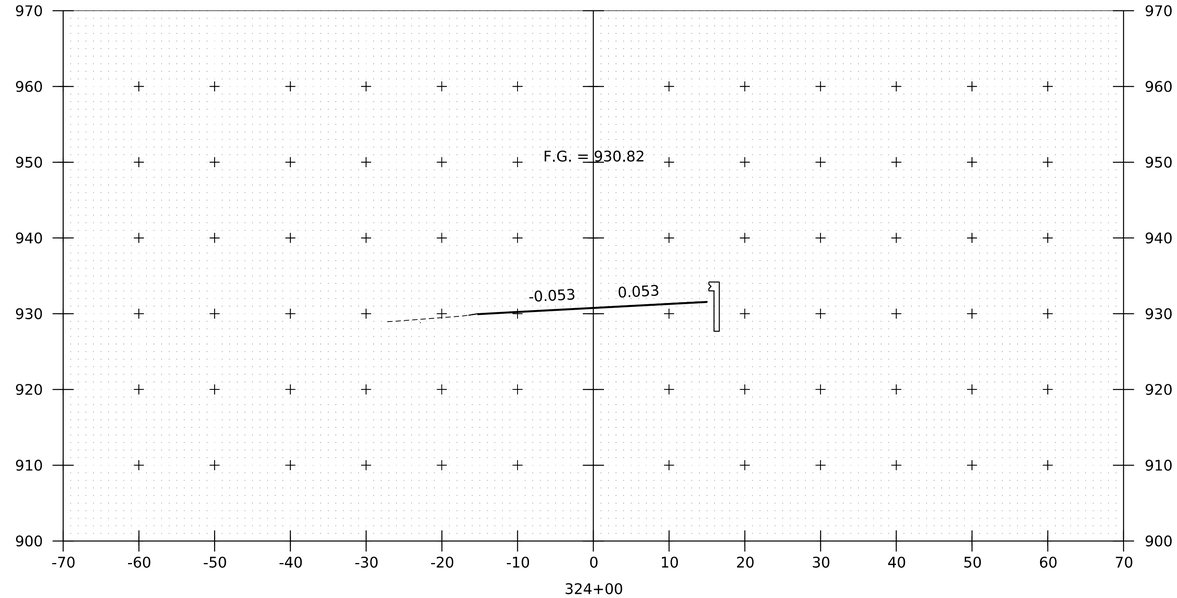
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213sub2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
SUBSTRUCTURE DETAILS 2	SHEET 116 OF 370





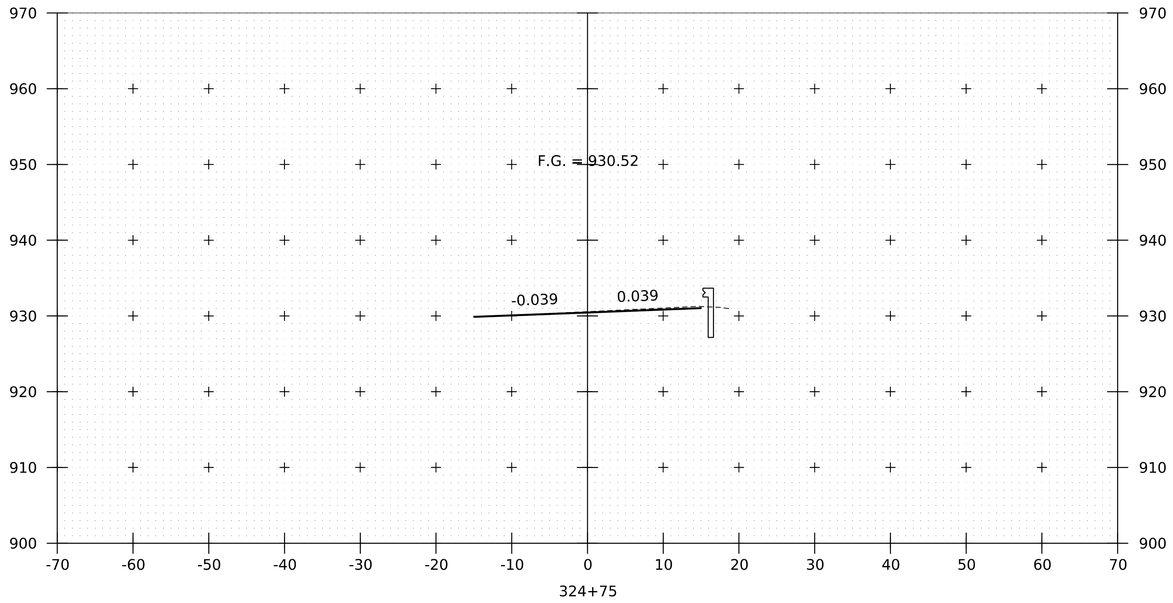
BEGIN APPROACH
STA 323+75.00
MATCH EXISTING





HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 1	SHEET 117 OF 370



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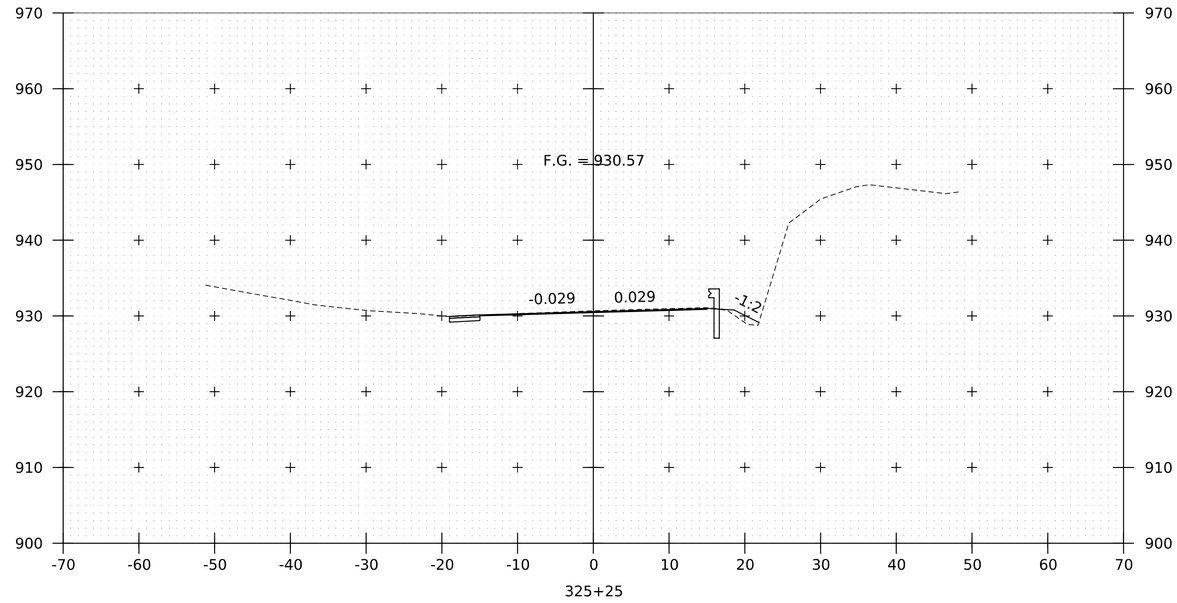
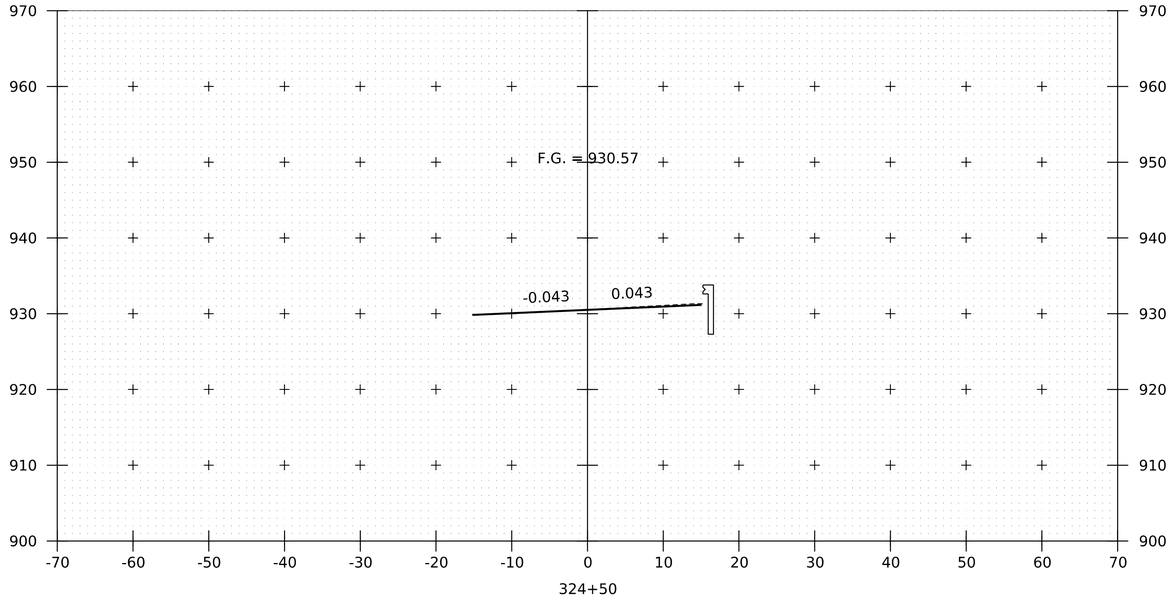
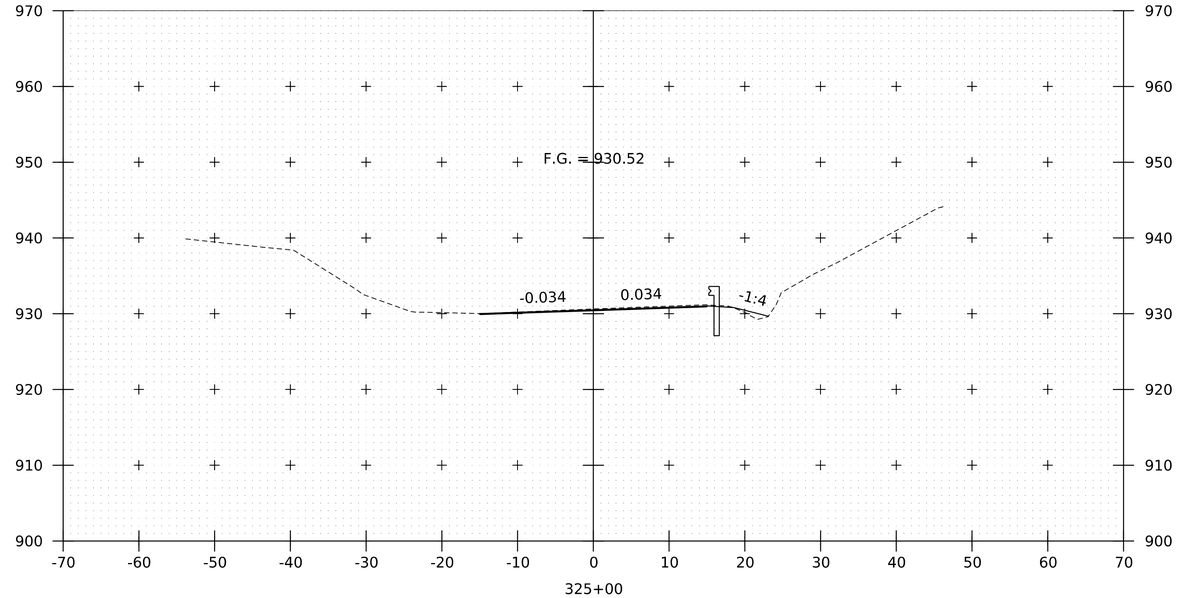


325+25



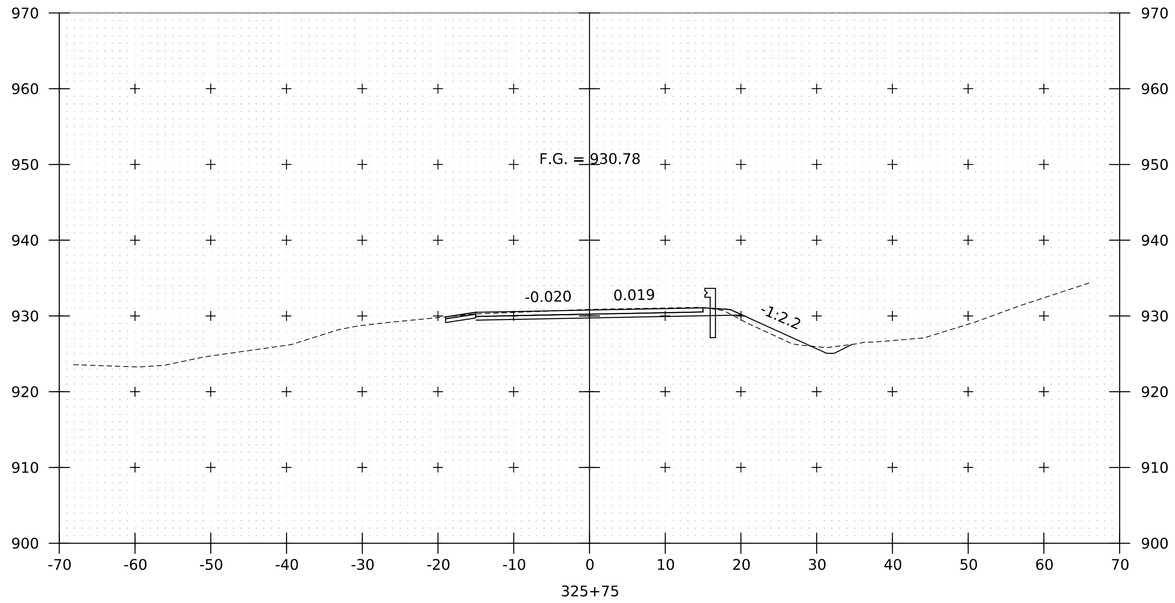
324+50

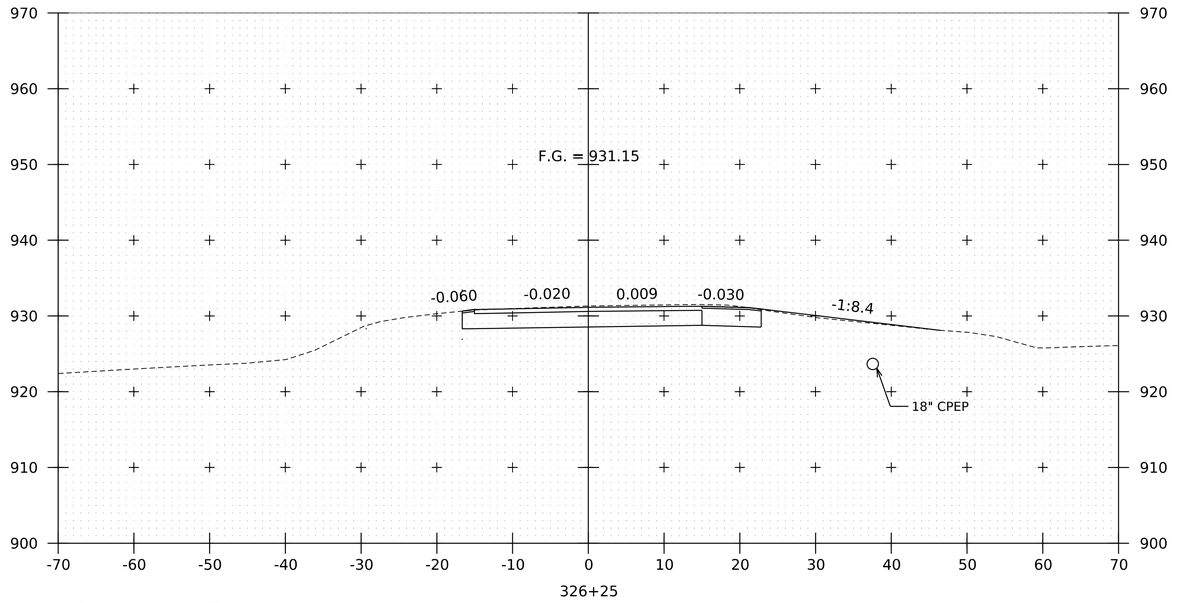


325+00

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 2	SHEET 118 OF 370





BEGIN PROJECT
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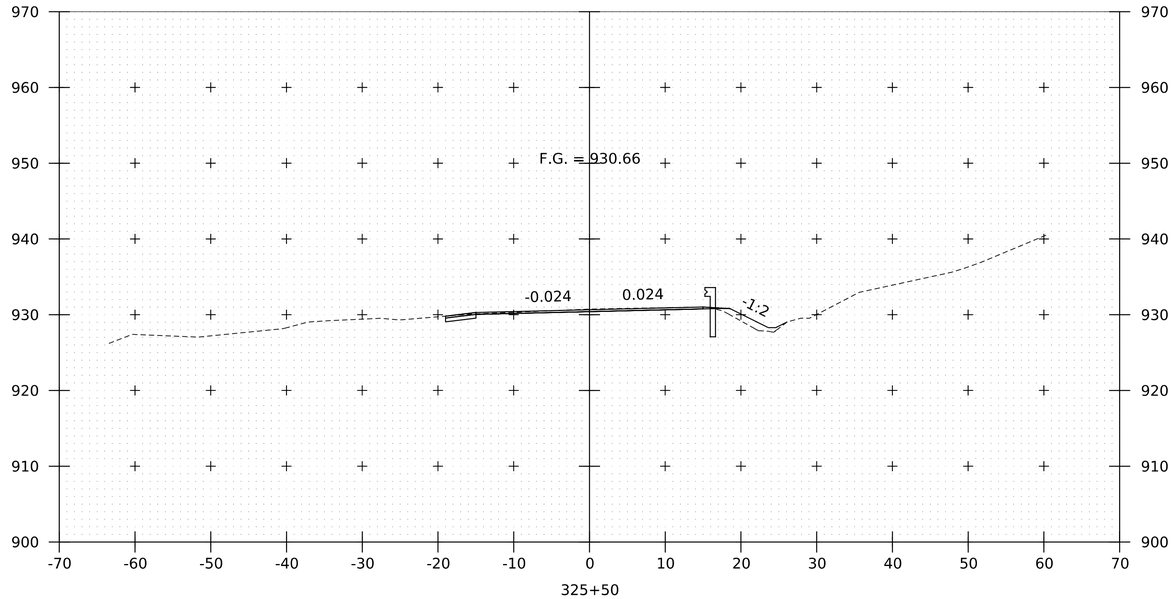
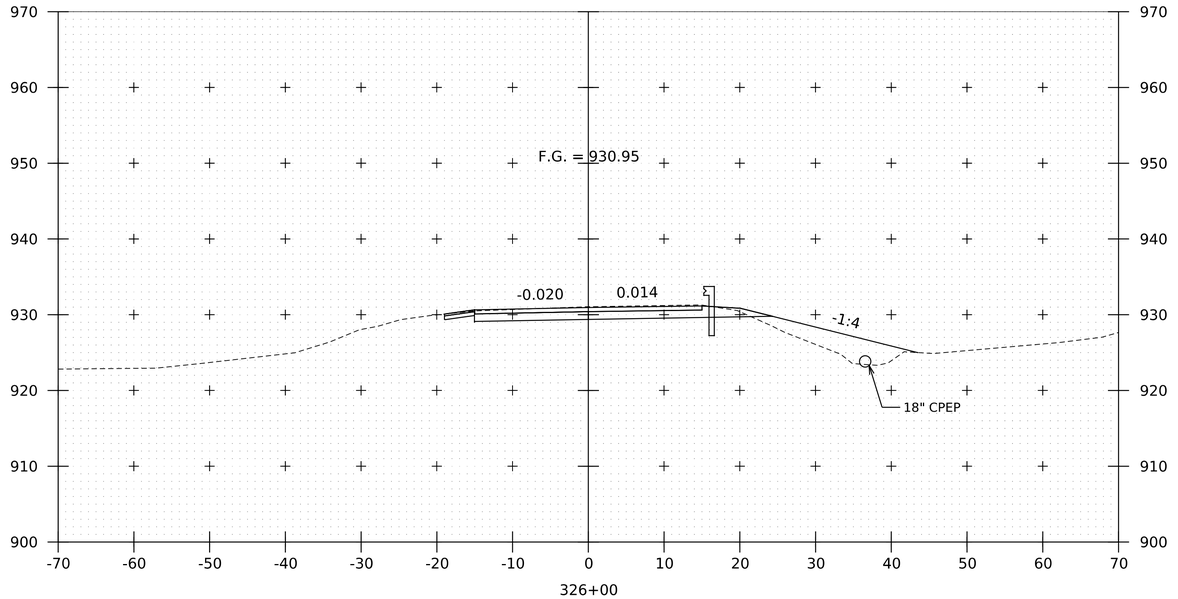
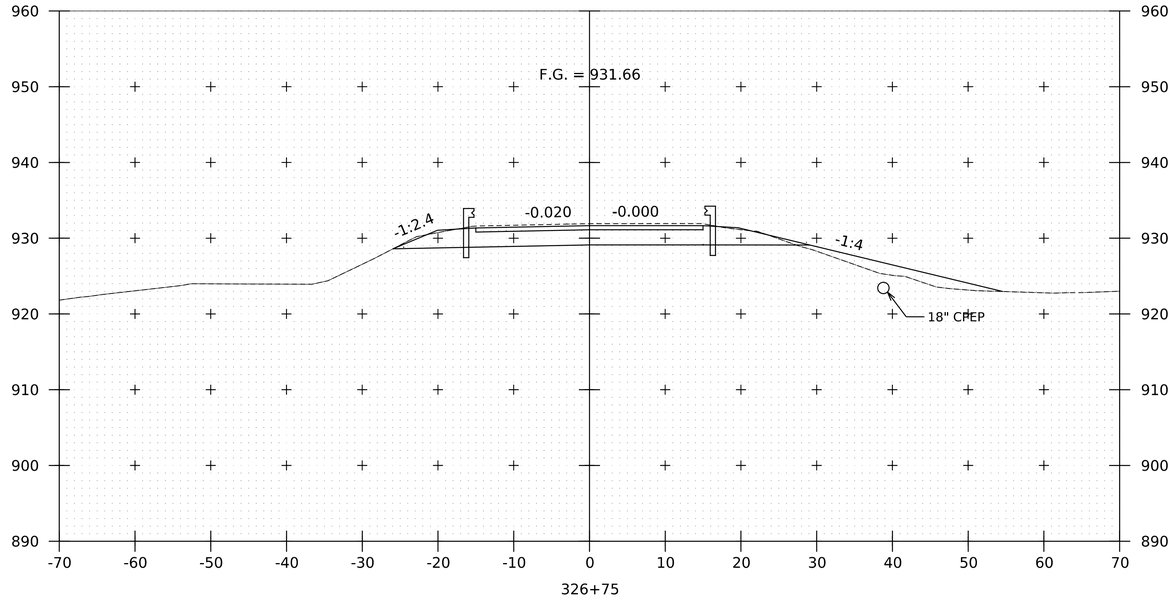


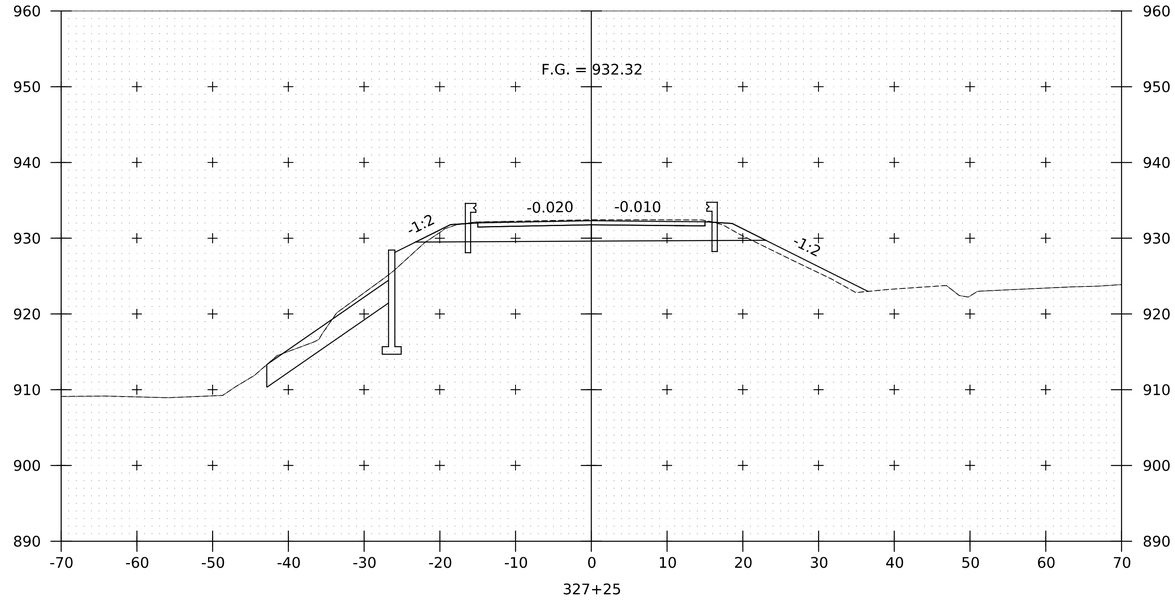


HOYLE TANNER

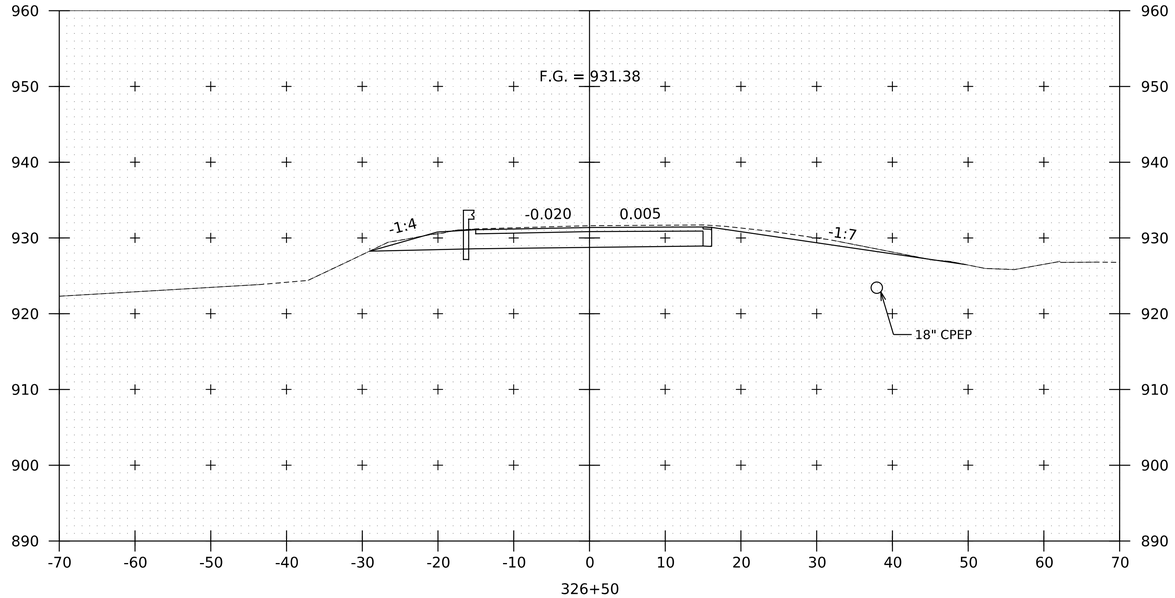
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 3	SHEET 119 OF 370



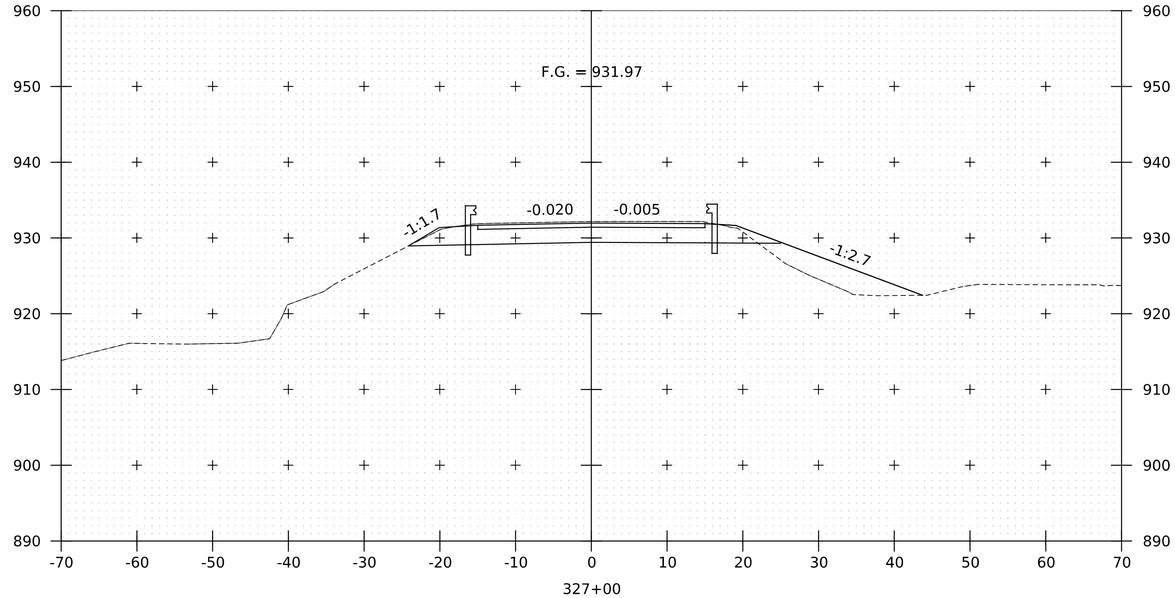
326+75



327+25



326+50



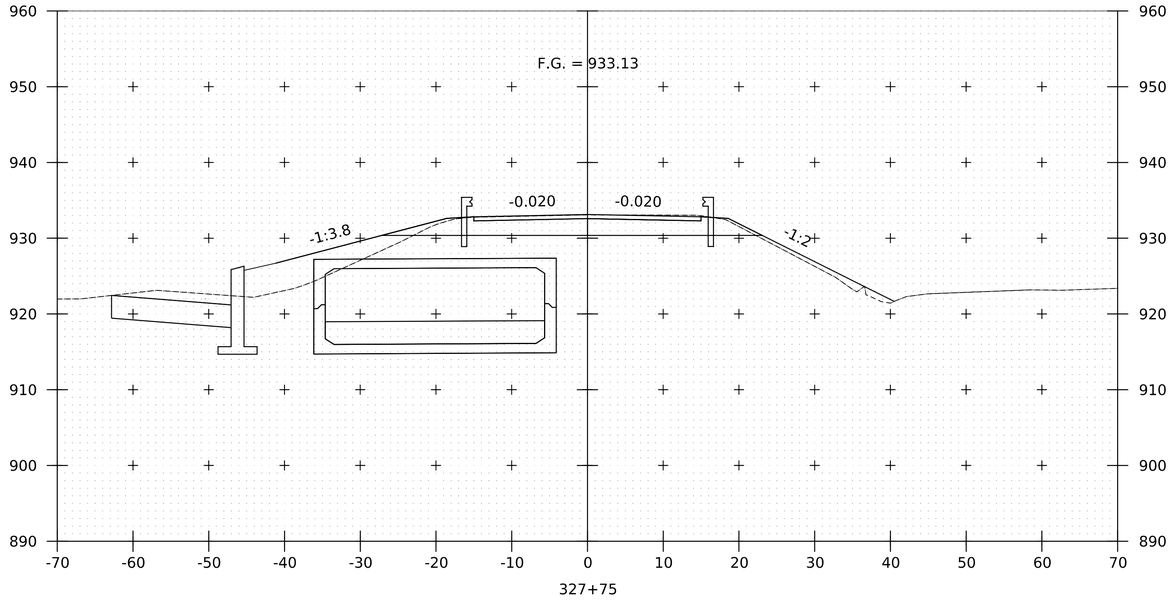
327+00

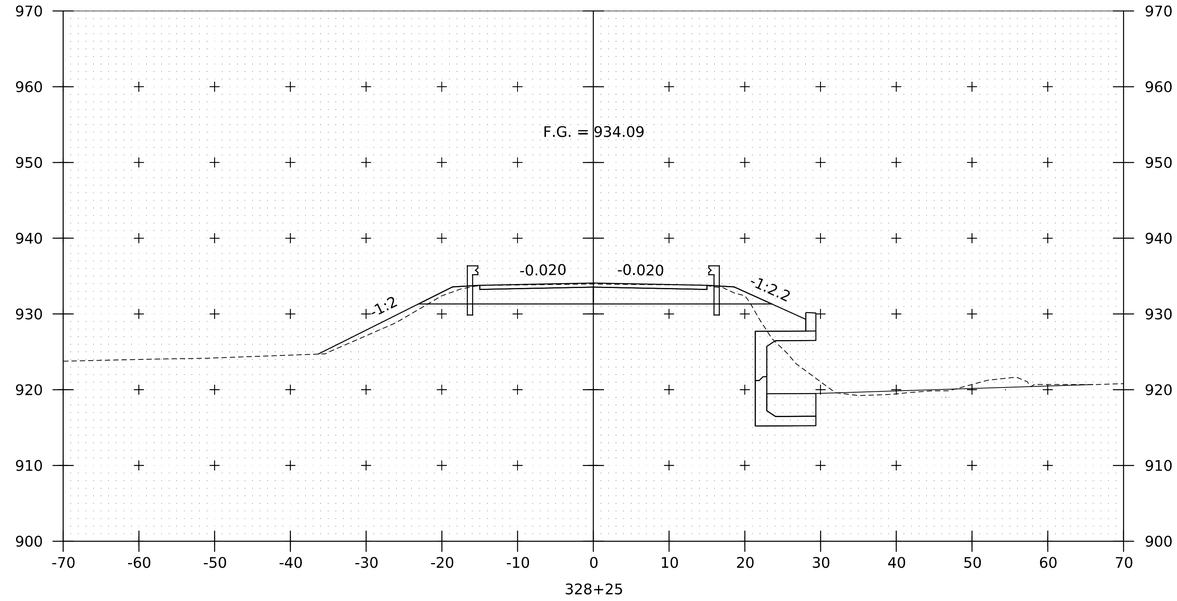
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)

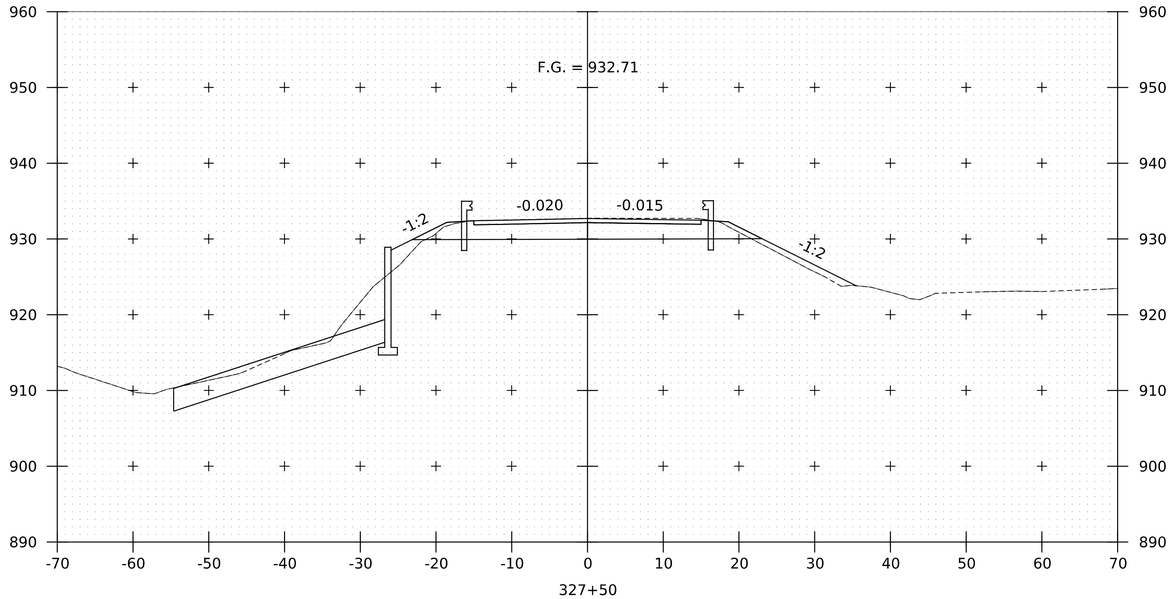
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 4	SHEET 120 OF 370

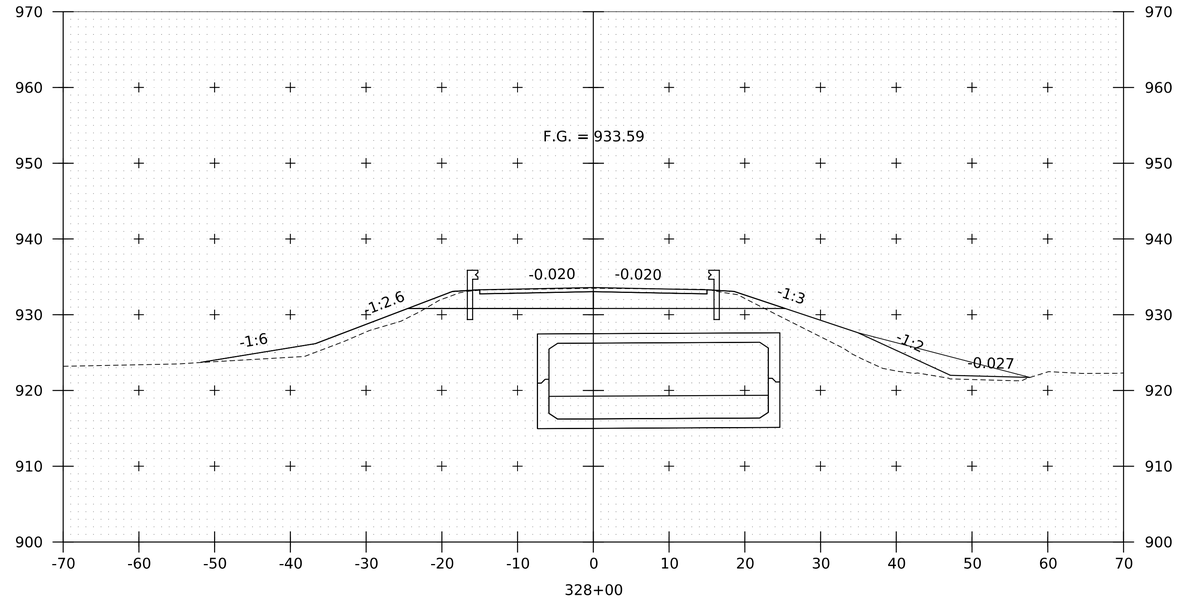
BEGIN BRIDGE
STA 327+78.59





END BRIDGE
STA 328+06.41

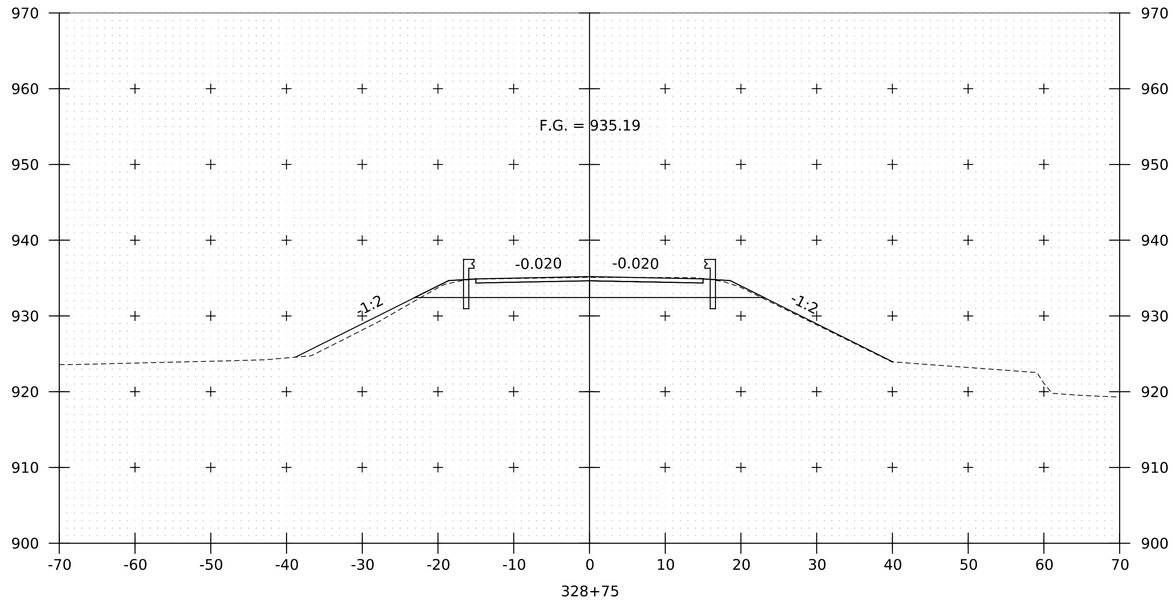


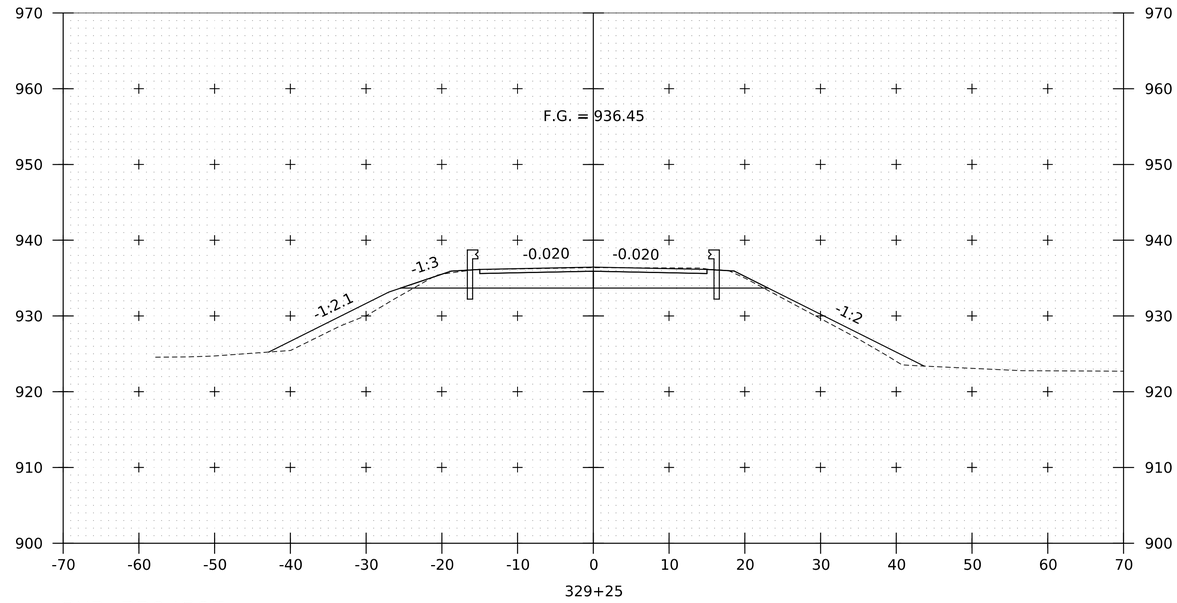


HOYLE TANNER

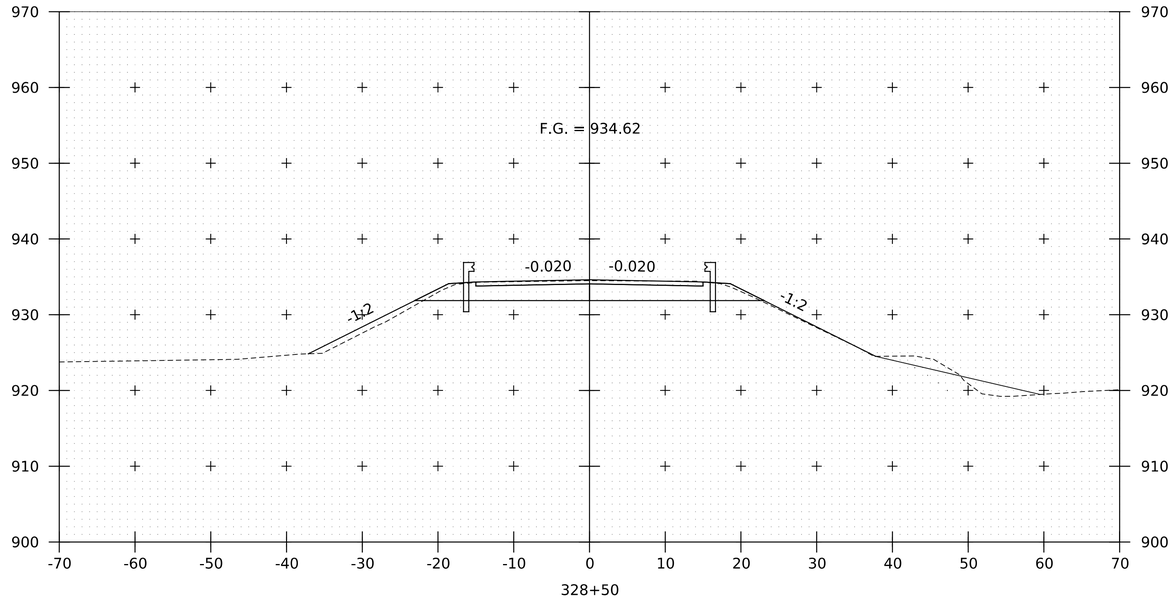
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)

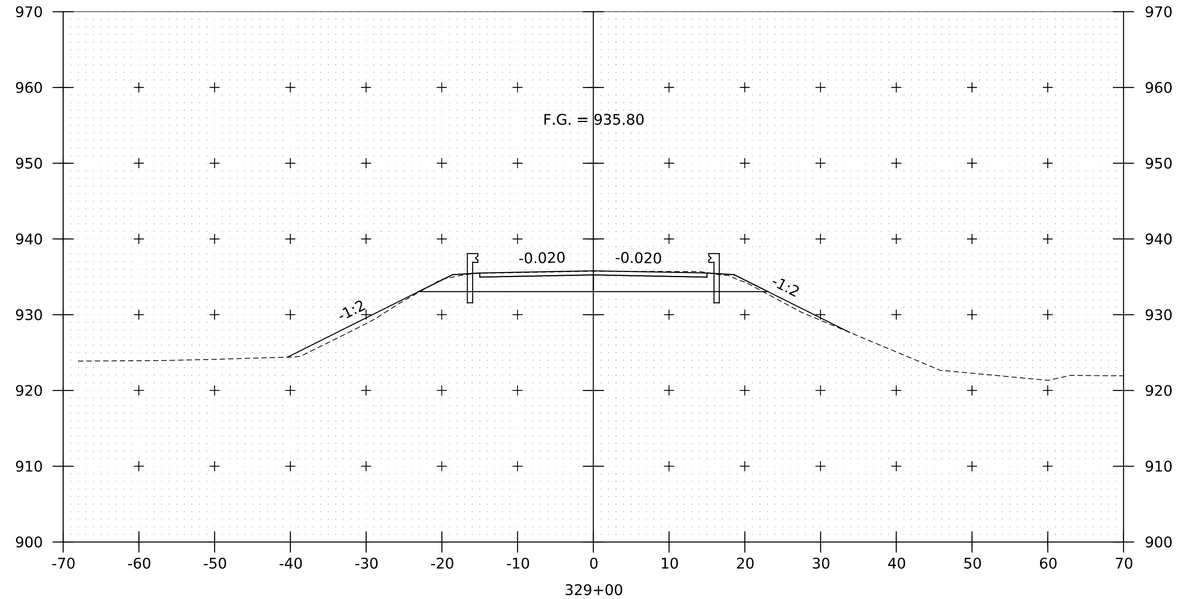
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 5	SHEET 121 OF 370





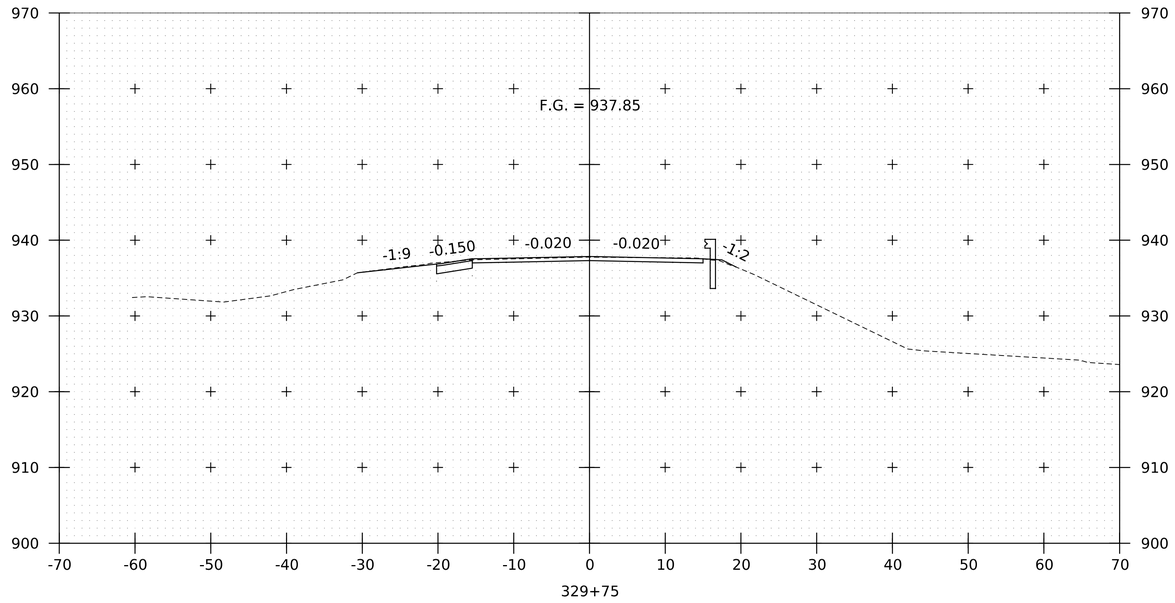
END PROJECT
STA 329+25.00

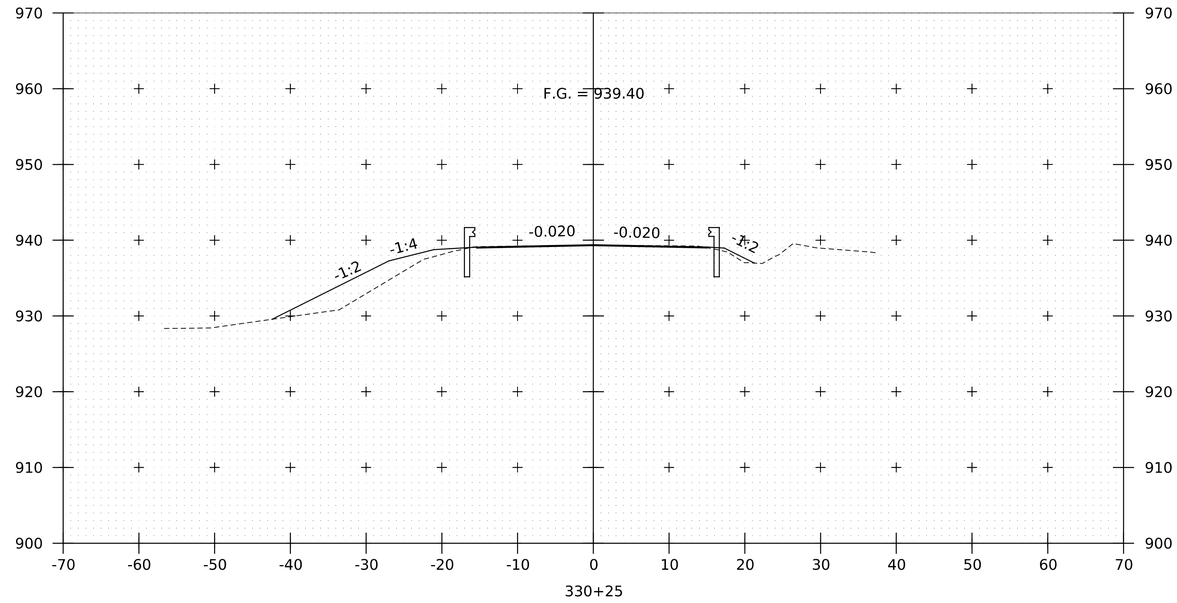


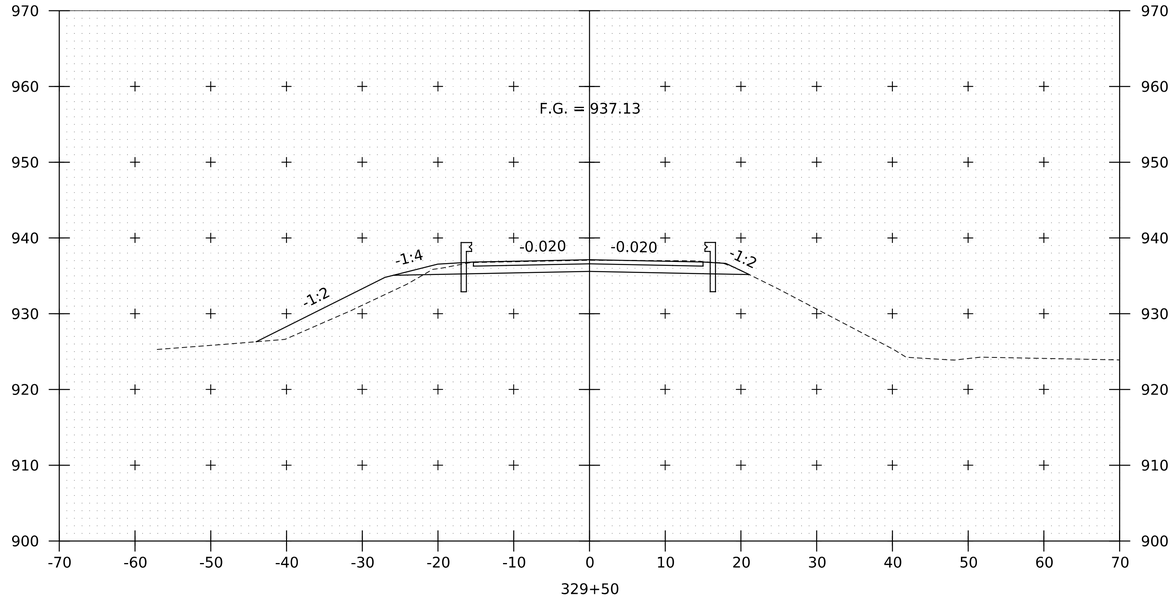


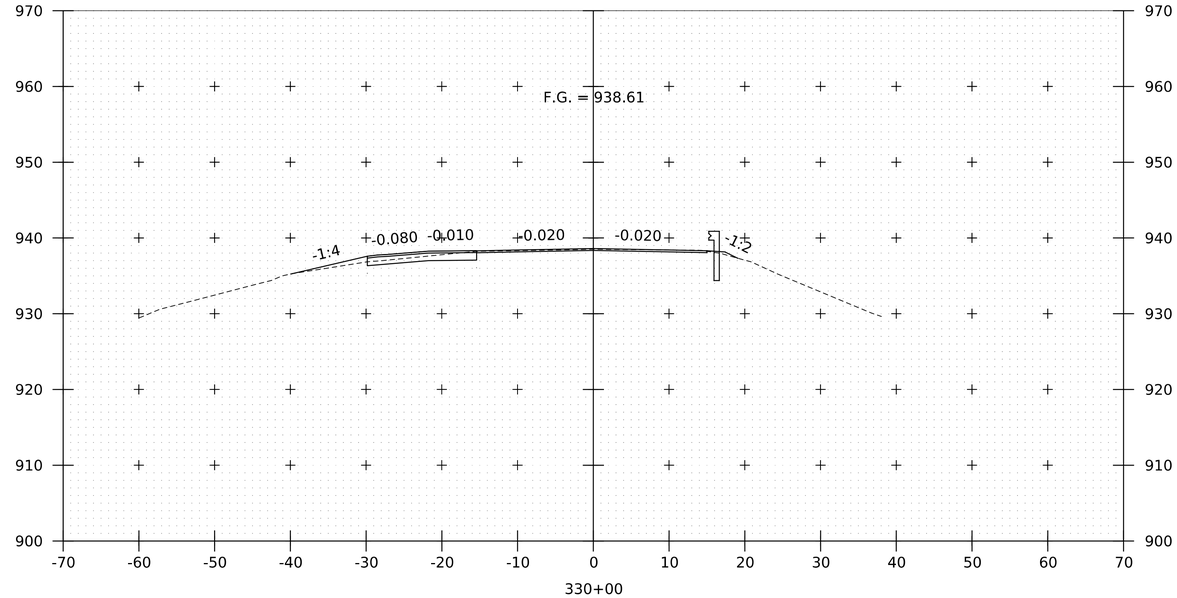
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 6	SHEET 122 OF 370



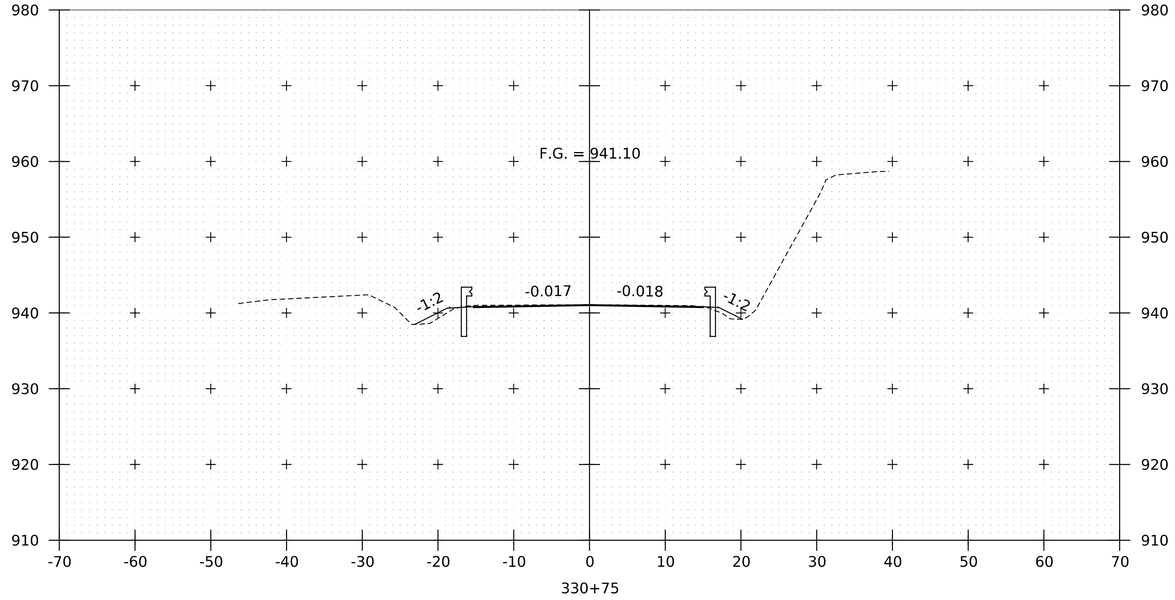


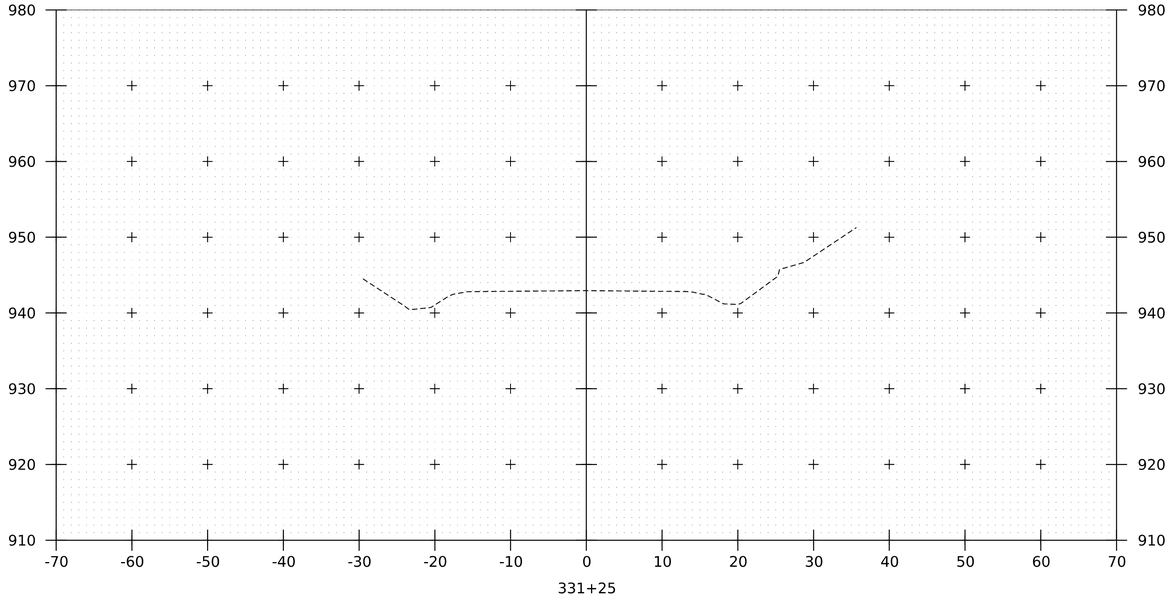


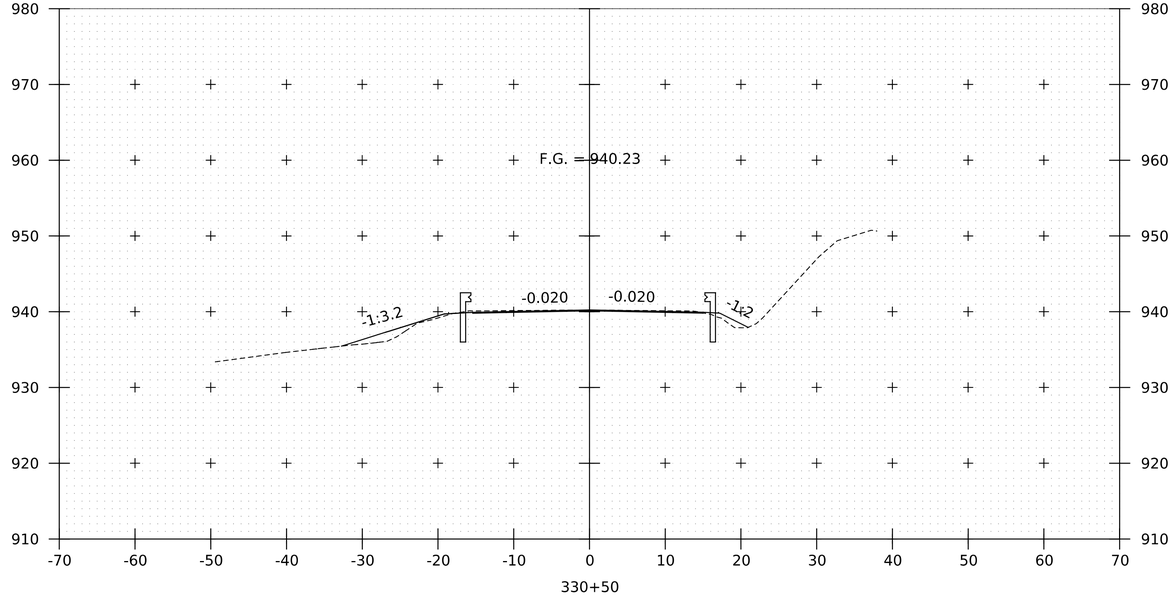


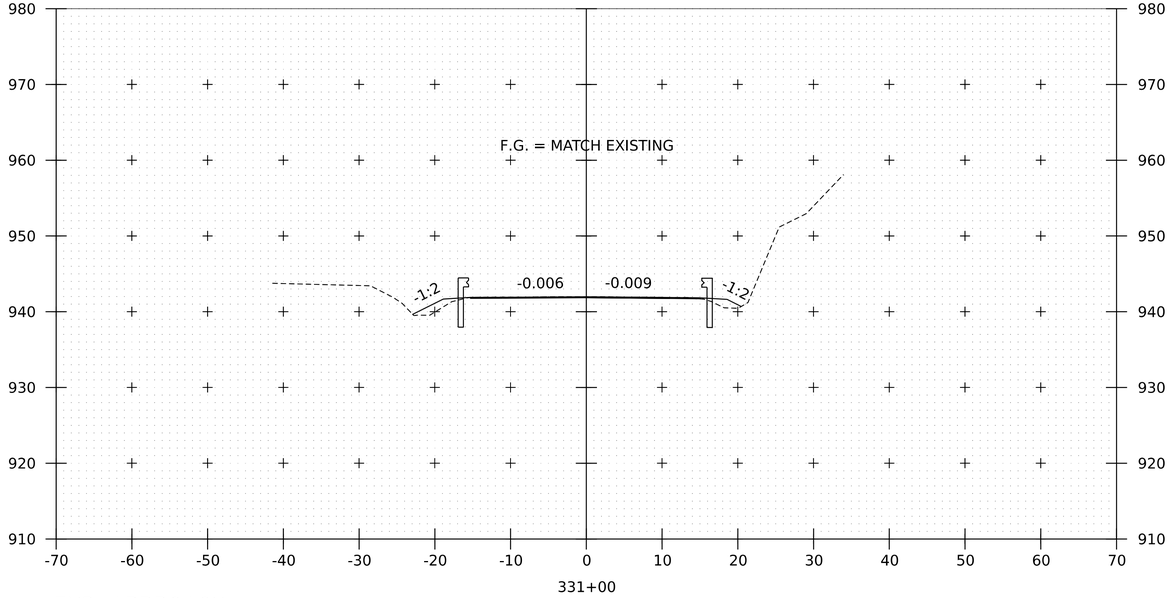
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(56)
FILE NAME: z19b2l3xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 7	SHEET 123 OF 370







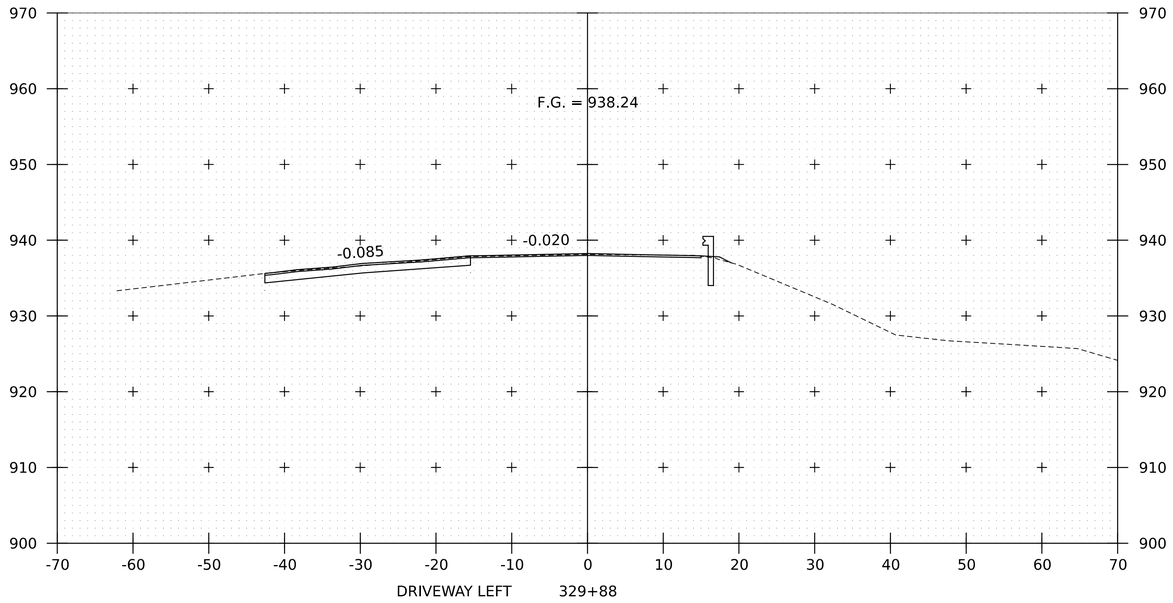


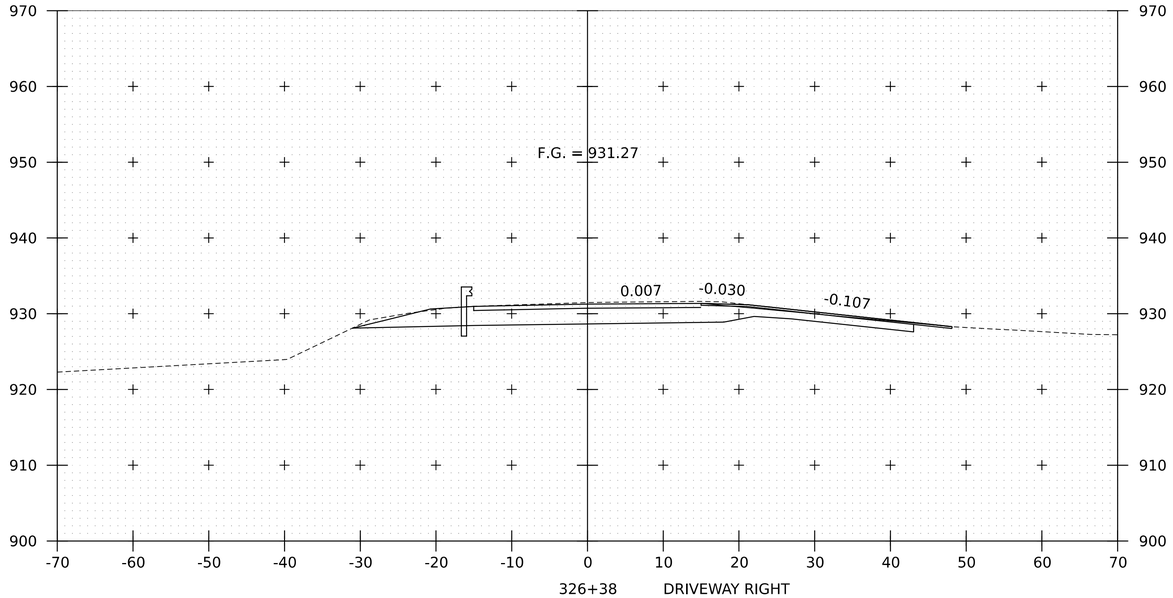
END APPROACH
STA 331+00.00
MATCH EXISTING

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)

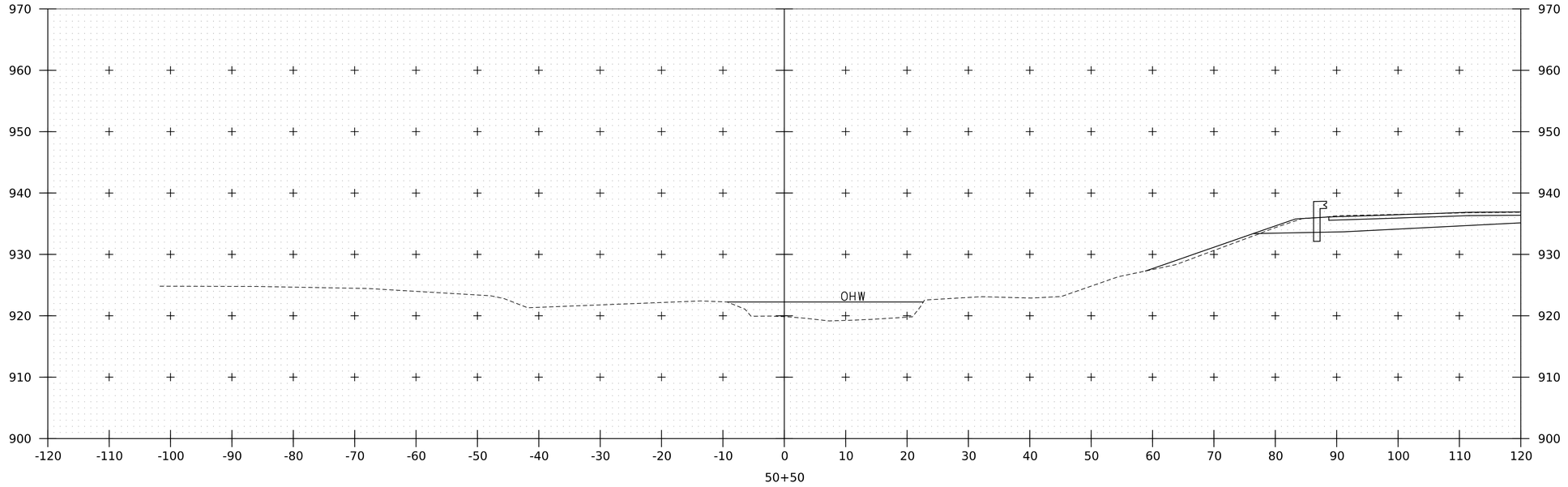
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 8	SHEET 124 OF 370



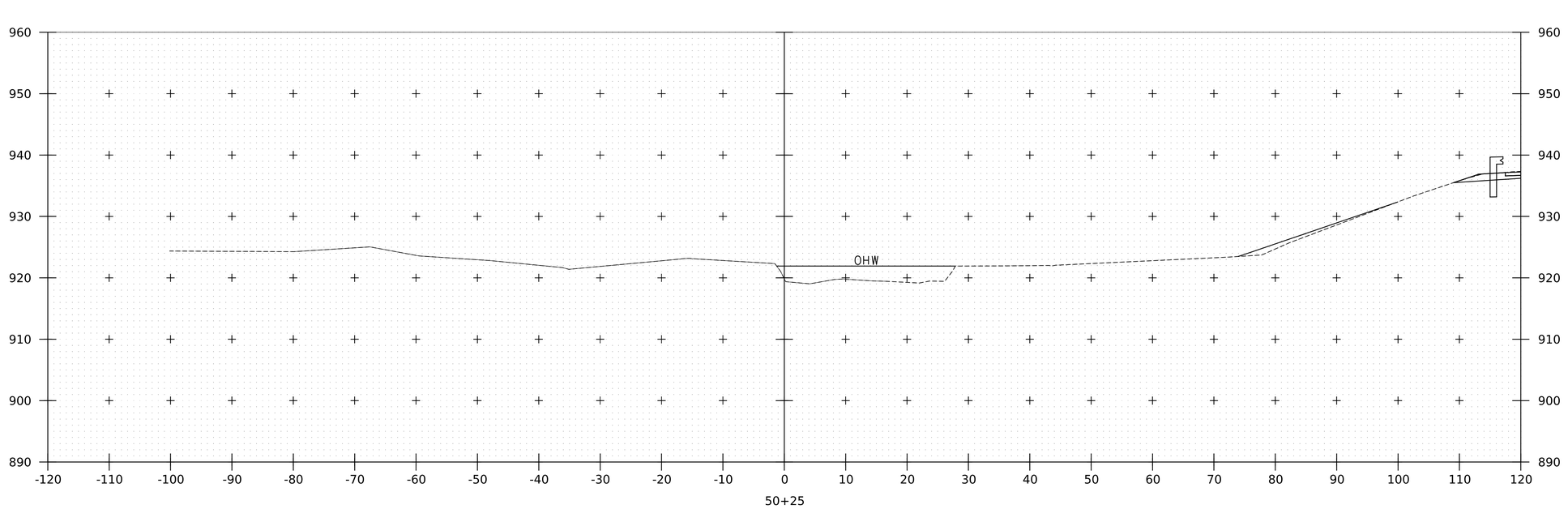


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 9	SHEET 125 OF 370



50+50



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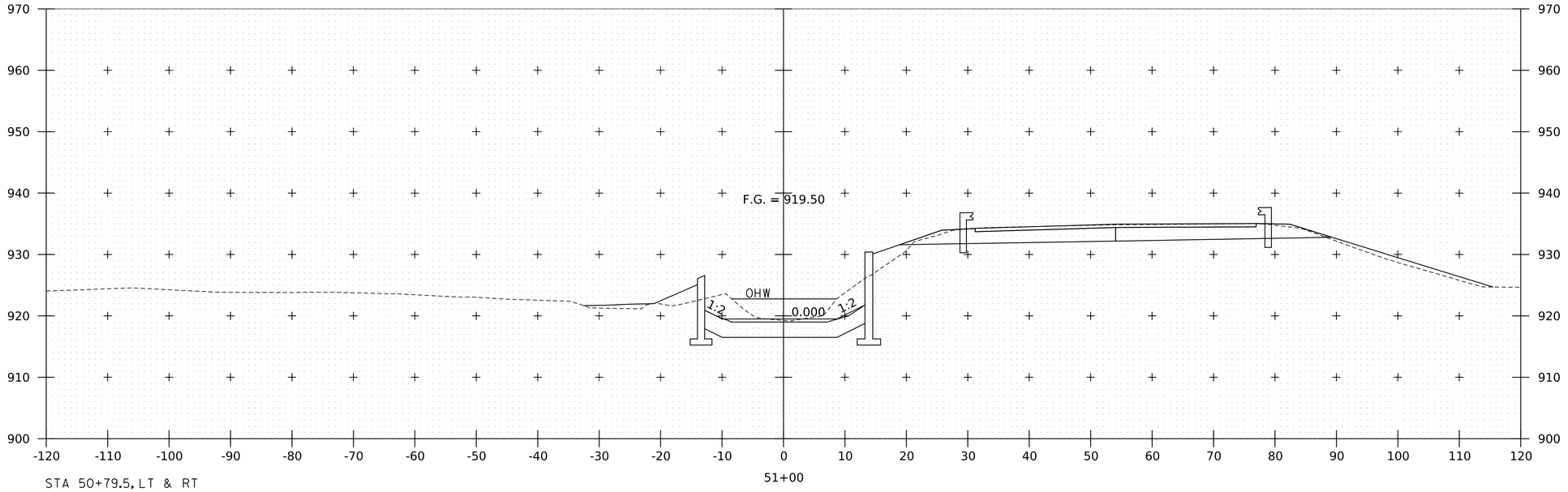
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(56)

FILE NAME: z19b213xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
CHANNEL CROSS SECTIONS 1	SHEET 126 OF 370

STA 51+03.5, LT & RT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
GRUBBING MATERIAL



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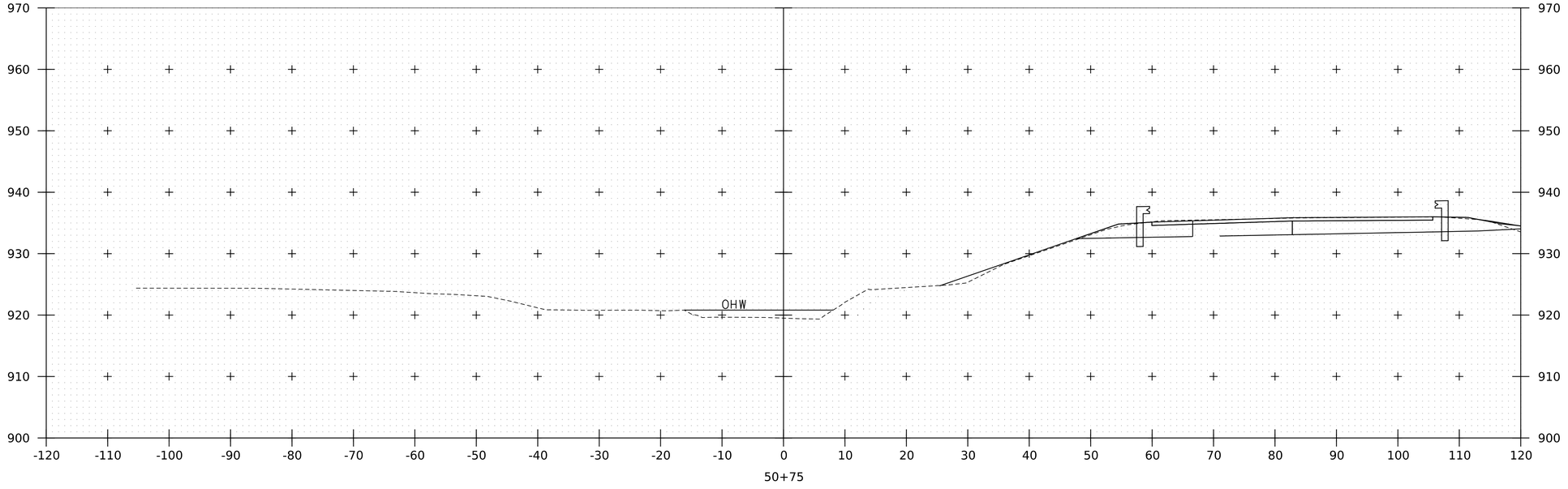
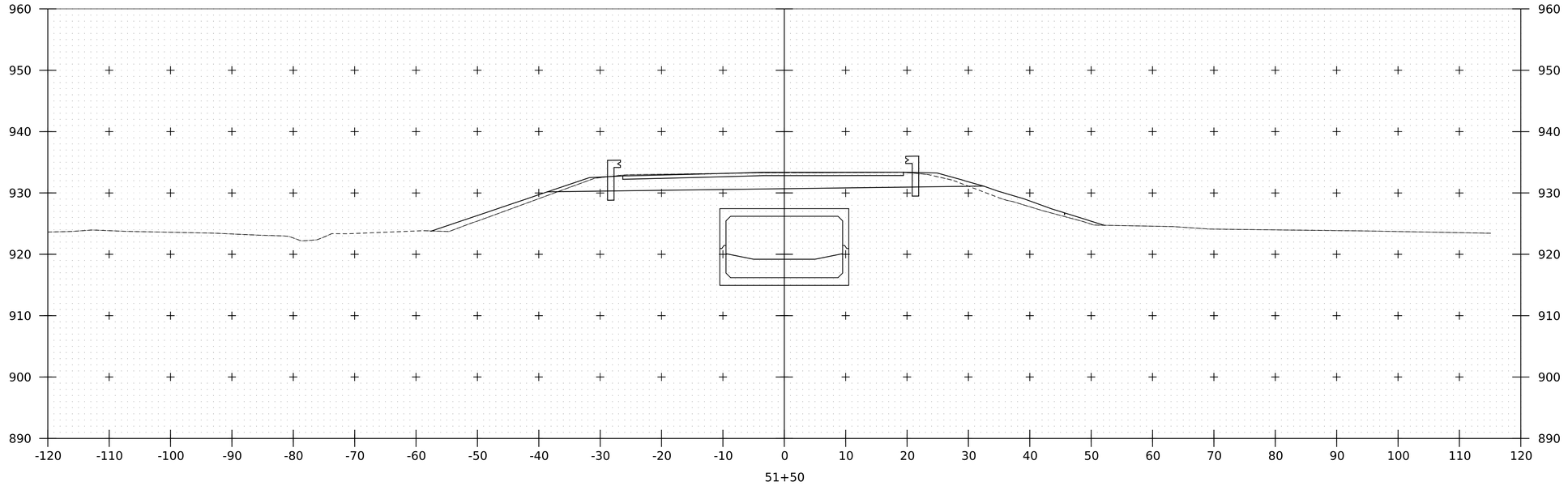
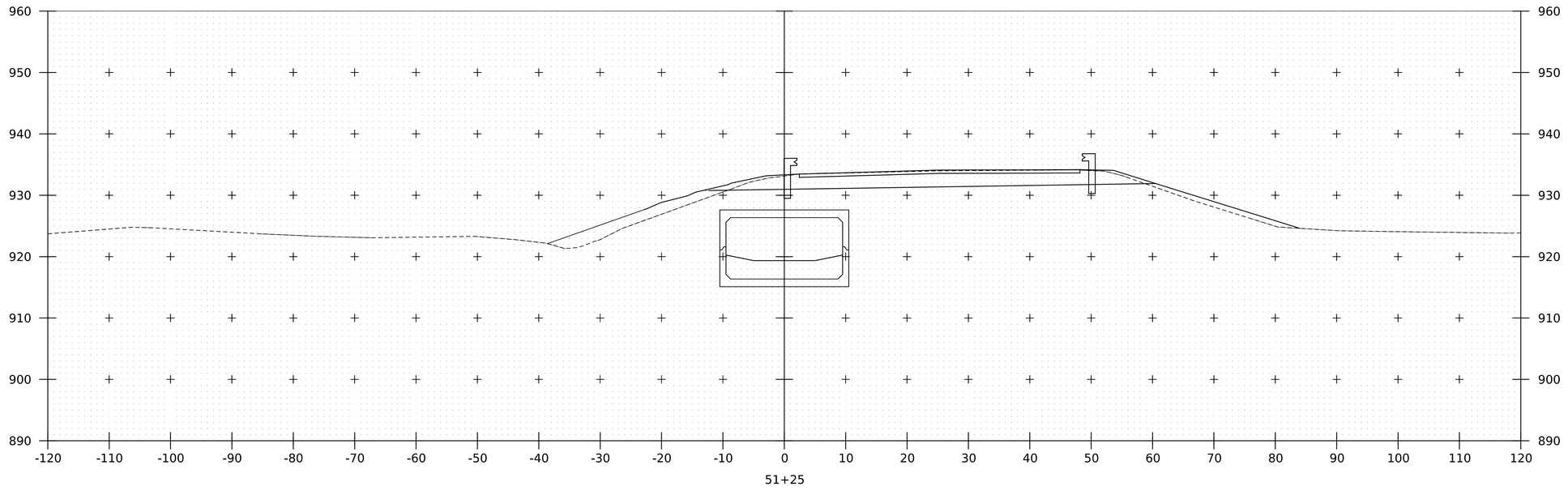
GEOTEXTILE UNDER STONE FILL
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE III)
GRUBBING MATERIAL



HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(56)
FILE NAME: z19b213xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
CHANNEL CROSS SECTIONS 2	SHEET 127 OF 370

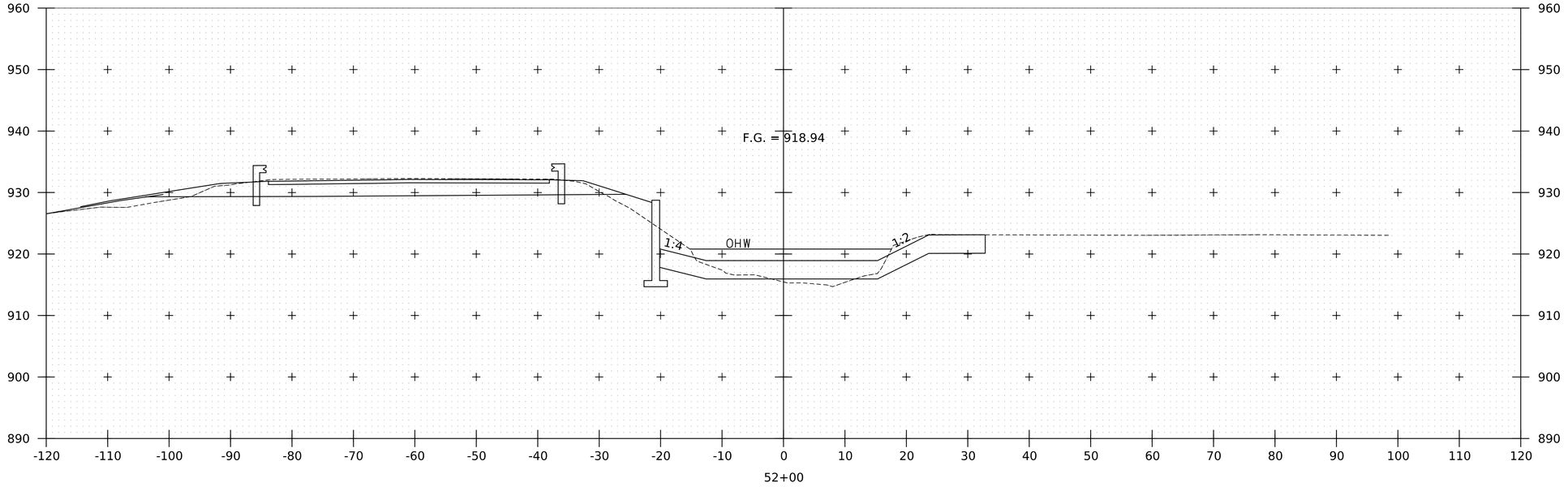




HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(56)

FILE NAME: z19b213xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
CHANNEL CROSS SECTIONS 3	SHEET 128 OF 370



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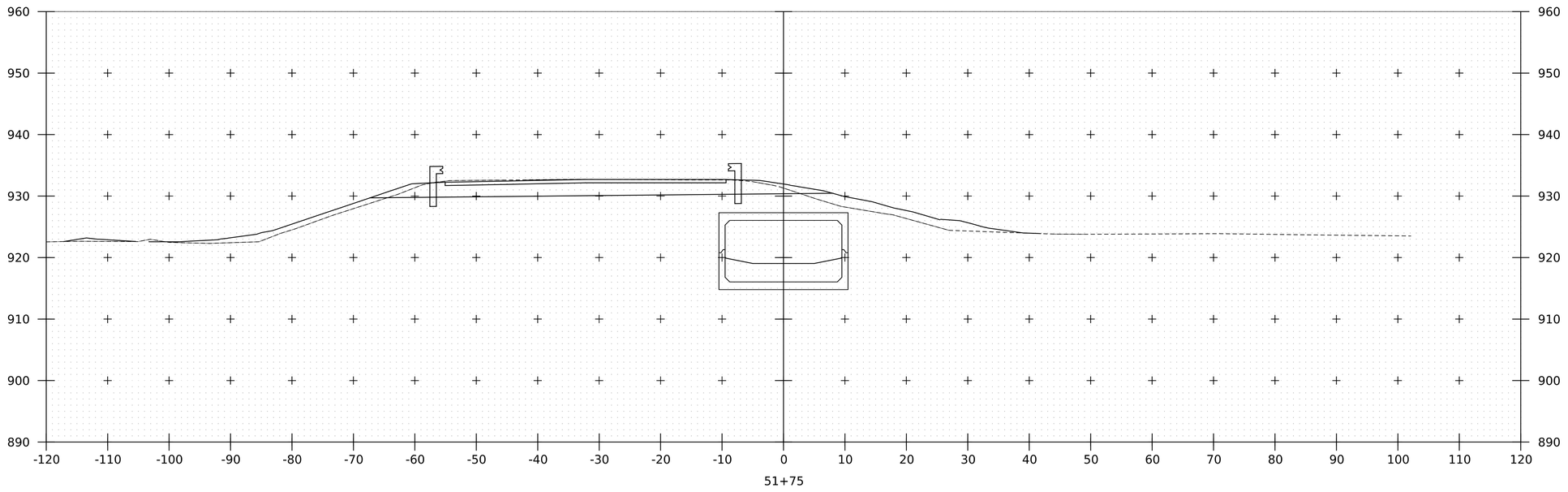
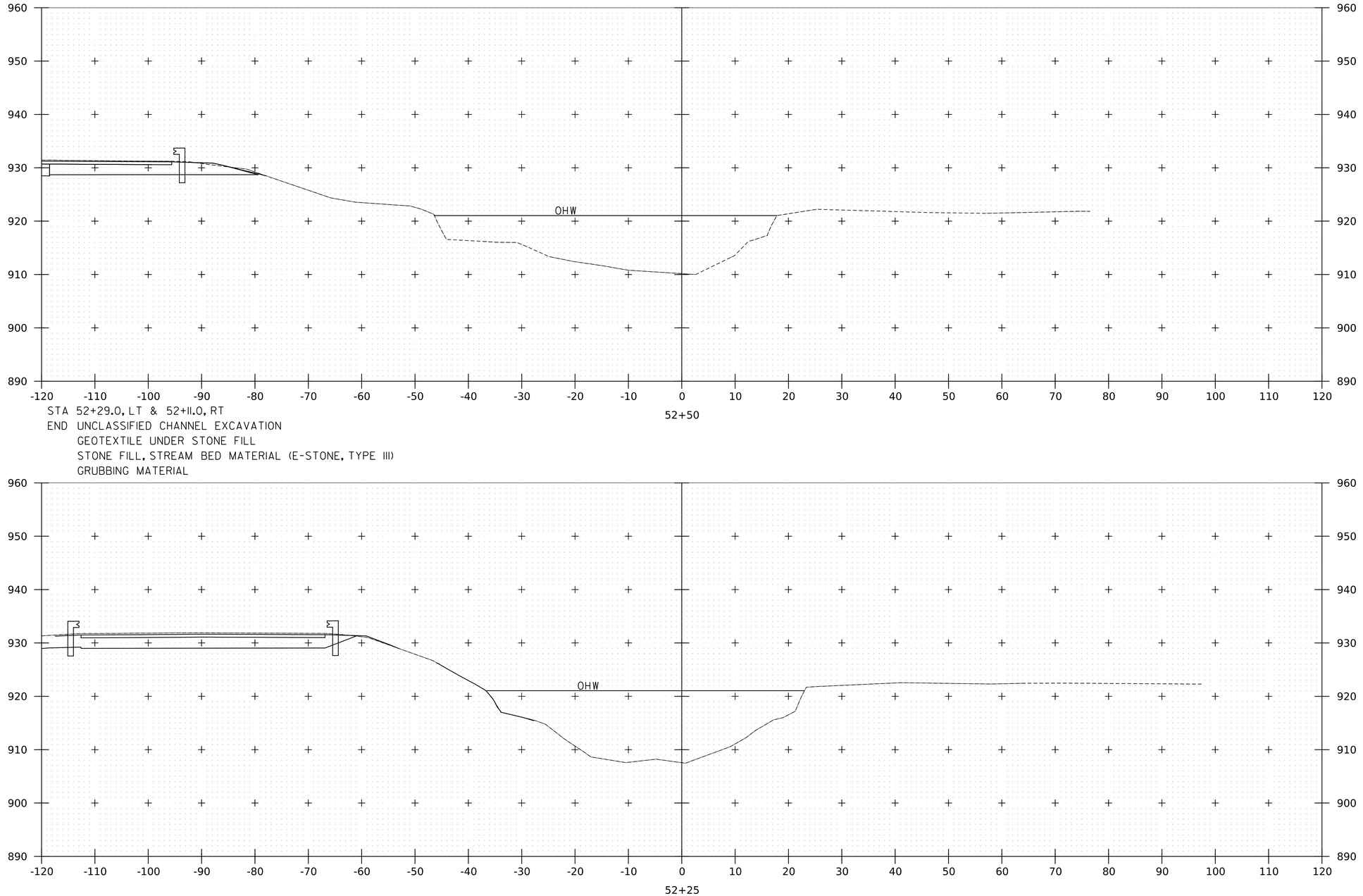
GEOTEXTILE UNDER STONE FILL
GRUBBING MATERIAL



HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)

FILE NAME: z19b213xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
CHANNEL CROSS SECTIONS 4	SHEET 129 OF 370



STA 52+29.0, LT & 52+11.0, RT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE III)
GRUBBING MATERIAL

HOYLE TANNER

PROJECT NAME: WORCESTER	
PROJECT NUMBER: BF 0241(56)	
FILE NAME: z19b213xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
CHANNEL CROSS SECTIONS 5	SHEET 130 OF 370

EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THIS PROJECT INVOLVES REMOVAL AND REPLACEMENT OF BRIDGE NO. 87 WITH A NEW PRECAST CONCRETE BOX CULVERT CONVEYING HARDWOOD BROOK IN WORCESTER, VT. BRIDGE NO. 87 IS LOCATED ON VT ROUTE 12 AT MILE MARKER 6.2, APPROXIMATELY 4.6 MILES NORTH OF THE JUNCTION WITH CALAIS ROAD. THE EXISTING STRUCTURE IS A 14 FOOT SPAN CORRUGATED GALVANIZED METAL PLATE PIPE ARCH.

CONSTRUCTION WILL ALSO INCLUDE 0.057 MILES OF ROADWAY RECONSTRUCTION. TRAFFIC CONTROL DURING CONSTRUCTION WILL CONSISTS OR A TEMPORARY BRIDGE INCLUDING TEMPORARY PAVED ROADWAY APPROACHES WITH EMBANKMENTS AND SIDE SLOPES UPSTREAM OF BRIDGE NO. 87.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST ONE CONSTRUCTION SEASON.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 1.85 ACRES.

THE MAXIMUM CONCURRENT EARTH DISTURBANCE USED TO SCORE THIS PROJECT IN APPENDIX A RISK ASSESSMENT IS 1.85 ACRES.

THIS PROJECT REQUIRES COVERAGE UNDER GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES FOR LOW RISK PROJECTS.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

THE MAJOR COMPONENTS OF THE PROJECT AND A PROPOSED GENERAL SEQUENCE IS AS FOLLOWS:

CONSTRUCTION OF THE PROJECT WILL BE BROKEN INTO FOUR MAIN PHASES THAT CONSIST OF INSTALLING THE TEMPORARY BRIDGE AND APPROACHES, REMOVING AND REPLACING BR. 87, RECONSTRUCTING THE NEW ROADWAY APPROACHES BETWEEN THE TEMPORARY BRIDGE APPROACHES, AND THEN FINAL ROADWAY RECONSTRUCTION, SITE GRADING, AND CLEANUP TASKS.

PHASE 1
- ESTABLISH PERIMETER CONTROLS AND MARK PROJECT BOUNDARIES
- INSTALL SEDIMENT CONTROL MEASURES
- CLEARING
- CONSTRUCT TEMPORARY BRIDGE AND APPROACHES WHILE MAINTAINING TRAFFIC CONTROL ON VT ROUTE 12
- SHIFT TRAFFIC ONTO TEMPORARY BRIDGE AND APPROACHES

PHASE 2
- INSTALL TEMPORARY RELOCATION OF STREAM STRUCTURE AND DIVERT HARDWOOD BROOK AROUND BR. 87
- EXCAVATE AND REMOVE THE EXISTING METAL CULVERT (BRIDGE NO. 87)
- INSTALL THE LOWER HALF OF THE NEW BOX CULVERT
- INSTALL E-STONE WITHIN THE BOX CULVERT
- COMPLETE ERECTION OF THE BOX CULVERT AND WINGWALLS
- DIVERT HARDWOOD BROOK FLOW BACK THROUGH BR. 87

PHASE 3
- REMOVE TEMPORARY STREAM DIVERSION
- CONSTRUCT ROADWAY EMBANKMENTS AND STABILIZE SIDE SLOPES BETWEEN THE TEMPORARY BRIDGE APPROACHES
- PLACE ROADWAY SUBBASE AND PAVE ROADWAY BETWEEN THE TEMPORARY BRIDGE APPROACHES
- SWITCH TRAFFIC TO NEW ROADWAY AND BRIDGE
- INSTALL PERMANENT EROSION MEASURES WHERE POSSIBLE

PHASE 4
- REMOVE TEMPORARY BRIDGE AND APPROACHES
- CONSTRUCT REMAINING PORTIONS OF THE ROADWAY EMBANKMENTS AND STABILIZE SIDE SLOPES
- PAVE REMAINING ROADWAY
- INSTALL REMAINING PERMANENT STABILIZATION MEASURES

4. SITE DESCRIPTION
4.1 VEGETATED BUFFERS

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

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. SILT FENCE OR BARRIER FENCE WILL BE PLACED IN APPROPRIATE LOCATIONS AS SHOWN ON THE CONSTRUCTION SITE PLANS.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES (1) STREAM CROSSINGS, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THE PROJECT INVOLVES 22,950 SF OF WETLAND AND 9,791 SF OF WETLAND BUFFER. THIS WORK WITHIN THESE AREAS IS BEING AUTHORIZED THROUGH THE VANR WETLANDS OFFICE AND THE US ARMY CORPS OF ENGINEERS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE PROJECT AREA IS GENERALLY RURAL WITH RESIDENCES ADJACENT TO THE EXISTING BRIDGE IN THE NORTHWEST AND SOUTHWEST QUADRANT.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF SHRUBS AND TREES. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:
RUMNEY FINE SANDY LOAM, 0% TO 3% SLOPES, “K FACTOR” = 0.20
MACHIAS FINE SANDY LOAM, 3% TO 8% SLOPE, “K FACTOR” = 0.20

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

4.7 OTHER SENSITIVE RESOURCES

PROPERTIES AT 980 ELMORE ROAD AND 962 ELMORE ROAD IN THE NORTHWEST AND SOUTHWEST QUADRANTS, RESPECTIVELY ARE IDENTIFIED AS HISTORIC. THESE PROPERTIES ARE BEYOND THE LIMITS OF DISTURBANCE FOR THIS PROJECT. THERE ARE NO AREAS OF ARCHAEOLOGICAL SENSITIVITY IN THE PROJECT AREA.

RARE, THREATENED, OR ENDANGERED SPECIES IDENTIFIED WITHIN THE PROJECT VICINITY INCLUDE NORTHERN LONG-EARED BAT AND WOOD TURTLES. THIS PROJECT SHALL BE SUBJECT TO AVOIDANCE AND MITIGATION MEASURES TO PROTECT THE HABITAT OF THE NORTHERN LONG-EARED BAT. MEASURES APPLICABLE TO THIS PROJECT INCLUDE TIME-OF-YEAR (TOY) RESTRICTIONS FOR TREES ≥ 3” DIAMETER BREST HEIGHT (DBH). THE CONTRACTOR SHALL REFERENCE NOTICE TO BIDDERS AND PERMIT RESTRICTIONS FOR TIME OF YEAR RESTRICTIONS ON TREE CLEARING. A “WILDLIFE FENCE” IS INCORPORATED INTO THE PROJECT TO CHANNELIZE TURTLES TOWARDS BRIDGE NO. 87.

5. DRAINAGE
5.1 RECEIVING WATERS

HARDWOOD BROOK AND CLASS II WETLANDS ARE THE ONLY WATER SOURCE ON THE PROJECT SITE. RESIDENCE WATER SUPPLIES ARE FROM DRILLED WELLS. THE BROOK IS CLASSIFIED AS GRADUAL, SINUOUS, NARROW, WITH A CONFINED AND ARMORED CHANNEL AT THE SITE. THE STREAM BED CONSISTS OF GRAVEL AND SMALL COBBLES. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 5.0 MILES^2.

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF A BRIDGE PROJECT BEING LOCATED DIRECTLY OVER THE RECEIVING WATER, THERE ARE NO DISCRETE DISCHARGE POINTS. ALL WATER FROM THE PROJECT AREA DRAINS TOWARD THE BROOK AND ENTERS THE RECEIVING WATER IN MULTIPLE LOCATIONS IN THE AREAS DIRECTLY ADJACENT TO THE BRIDGE.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

PROJECT IS NOT CURBED AND RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES BEFORE REACHING THE RECEIVING WATER.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION’S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

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

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.

6.3 STABILIZE DISTURBED AREAS
6.3.1 ACCESS POINTS/ENTRANCE/EXITS

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

STABILIZED CONSTRUCTION ENTRANCES ARE ANTICIPATED ON THIS PROJECT AND SHALL BE LOCATED AS SHOWN ON THIS EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

SURFACE ROUGHENING OF EXPOSED SLOPES, SEEDING OF TEMPORARY SLOPES AND STOCKPILES, AND STANDARD MULCHING PRACTICES DESCRIBED IN SPECIFICATION SECTION 653.07 SHALL BE UTILIZED TO TEMPORARILY STABILIZE DISTURBED AREAS.

6.3.3 PERMANENT STABILIZATION 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, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH.

E-STONE TYPE III WILL BE USED TO ARMOR THE AND AT THE INLET AND OUTLET OF THE BOX CULVERT. STONE FILL TYPE III WILL BE USED TO ARMOR THE WINGWALLS.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
EPSC NARRATIVE I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 131 OF 370

6.4 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 LOCATED WITHIN A VERTICAL SAG CURVE WITH THE NORTH APPROACH DRAINING TOWARD THE PROJECT AREA. RUNOFF MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

SILT FENCE WILL BE INSTALLED ALONG THE CONTOURS AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF RECEIVING WATERS.

6.6 SLOW DOWN CHANNELIZED RUNOFF

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

TEMPORARY STONE CHECK DAMS ARE NOT REQUIRED ON THIS PROJECT DUE TO THE ABSENCE OF ANY EXISTING OR PROPOSED DITCH LINE. STORMWATER WILL SHEET FLOW OFF OF THE EXISTING AND PROPOSED SIDE SLOPES.

7. CONSTRUCT PERMANENT CONTROLS

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

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED TO BE NEEDED AS DESIGNED.

8. DEWATERING

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. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN THE LIMITS OF STRUCTURE EXCAVATION IS ANTICIPATED. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12" OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRADIENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1" THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT'S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC 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.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(56)

FILE NAME: z19b213ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
EPSC NARRATIVE 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER

VT STATE PLANE GRID

N

MACHIAS FINE SANDY LOAM
3% - 8% SLOPES
MODERATELY WELL DRAINED
K = 0.20

MEREDITH, JAMIE C.
& DAVIS, JENNIFER S.

LYON, LORY D.

RUMNEY FINE SANDY LOAM
0% - 3% SLOPES
FREQUENTLY FLOODED
K = 0.20

SHRUBS
HARDWOODS
SOFTWOODS

RIPARRIAN BUFFER

WETLAND CLASS II

℄ CONSTRUCTION

EXISTING R.O.W.

COMB
166

MAILBOX
#962

GRAVEL DRIVE

GRAVEL DRIVE

TO MIDDLESEX

323+00

VT ROUTE 12

324+00

325+00

326+00

MATCHLINE STA 326+75.00

HVCTRL
20T

ELECTRIC
POLE
170

TELEPHONE
POLE
1
112
165

STONE FILL

GRAVEL DRIVE

18" CPEP
FLOW

4X4 CONCRETE
BOUNDRY MARKER
VTHD 3"DOWN

EXISTING R.O.W.

WONSQUEAK AND PONDICHERRY MUCKS
0% - 2% SLOPES
VERY POORLY DRAINED

SHRUBS
HARDWOODS
SOFTWOODS

LOWE, DAVID E.;
SROKA, CHARLENE

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

HOYLE TANNER

PROJECT NAME: WORCESTER	
PROJECT NUMBER: BF 0241(56)	
FILE NAME: z19b213bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC EXISTING SITE PLAN 1	SHEET 133 OF 370

VT STATE PLANE GRID

N

RUMNEY FINE SANDY LOAM
0% - 3% SLOPES
FREQUENTLY FLOODED
K = 0.20

LYON, LORY D.

MACHIAS FINE SANDY LOAM
3% - 8% SLOPES
MODERATELY WELL DRAINED
K = 0.20

HARDWOOD BROOK

FLOW

OHW

WETLAND
CLASS II

RIPARRIAN BUFFER

SHRUBS
HARDWOODS
SOFTWOODS

EXISTING R.O.W.

℄ CONSTRUCTION

GRAVEL DRIVE

PAVED DRIVE

MAILBOX

STONE FILL

T&E

VT ROUTE 12

MATCHLINE STA 326+75.00

327+00

328+00

329+00

330+00

331+00

TO ELMORE

3'-11" x 8'-7" CGMPPA

HVCTRL
101

ELECTRIC POLE 171

ELECTRIC POLE 172

ELECTRIC POLE 173

STONE FILL

WETLAND
CLASS II

RIPARRIAN BUFFER

EXISTING R.O.W.

SHRUBS
HARDWOODS
SOFTWOODS

LOWE, DAVID E.;
SROKA, CHARLENE

DRIVE CULVERT

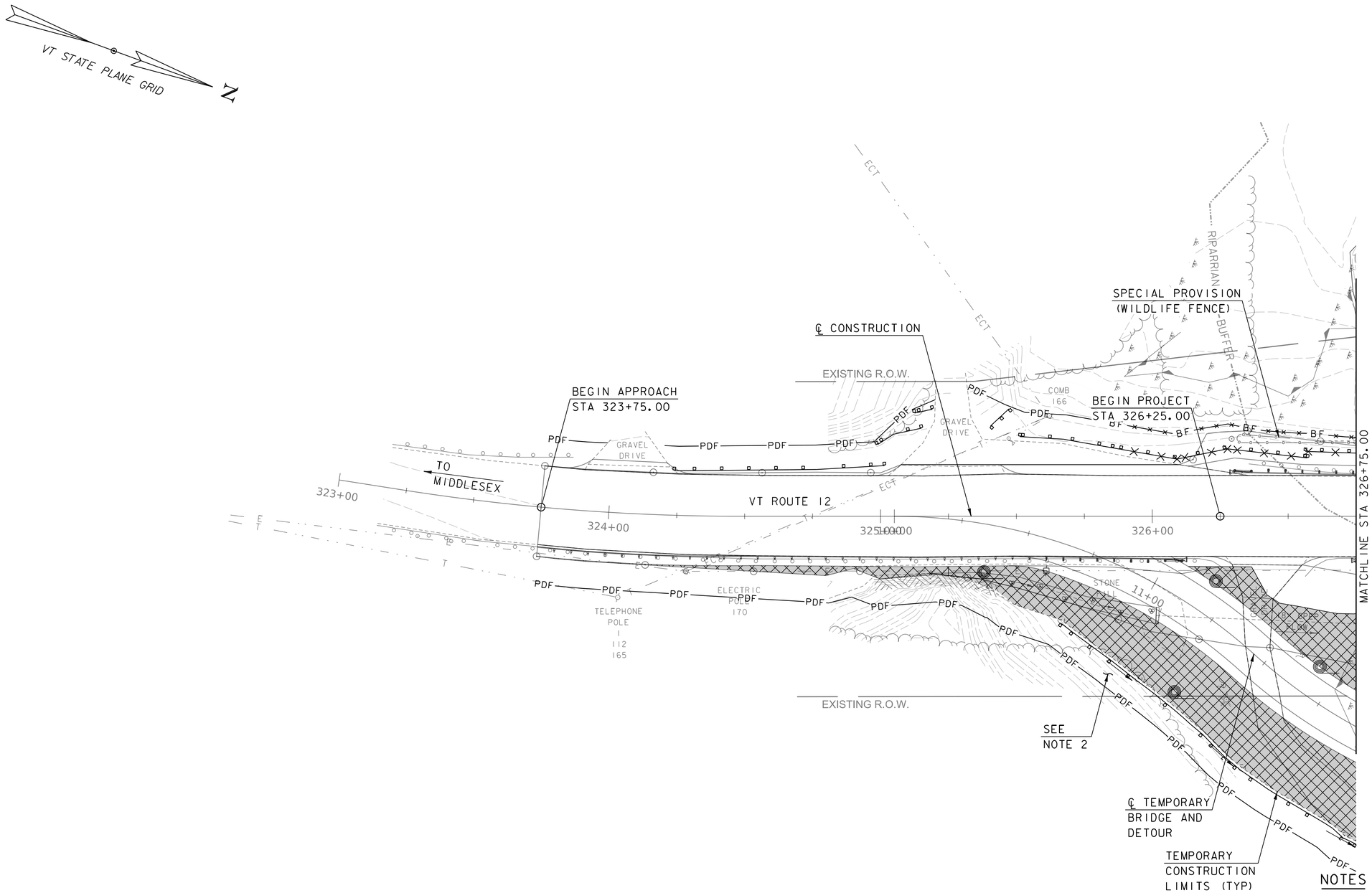
BADO, VIRGINIA;
BADO, ROBERT T.;
BADO, JOHN A. III;
BADO, VIRGINIA A.;
BADO, THOMAS P.

MACHIAS FINE SANDY LOAM
3% - 8% SLOPES
MODERATELY WELL DRAINED
K = 0.20

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME:	z19b213bdr_erol.dgn
PROJECT LEADER:	J.OLIN
DESIGNED BY:	P.DUSTIN
EPSC EXISTING SITE PLAN 2	
PLOT DATE:	25-MAY-2023
DRAWN BY:	P.DUSTIN
CHECKED BY:	T.SUMNER
SHEET	134 OF 370



NOTES

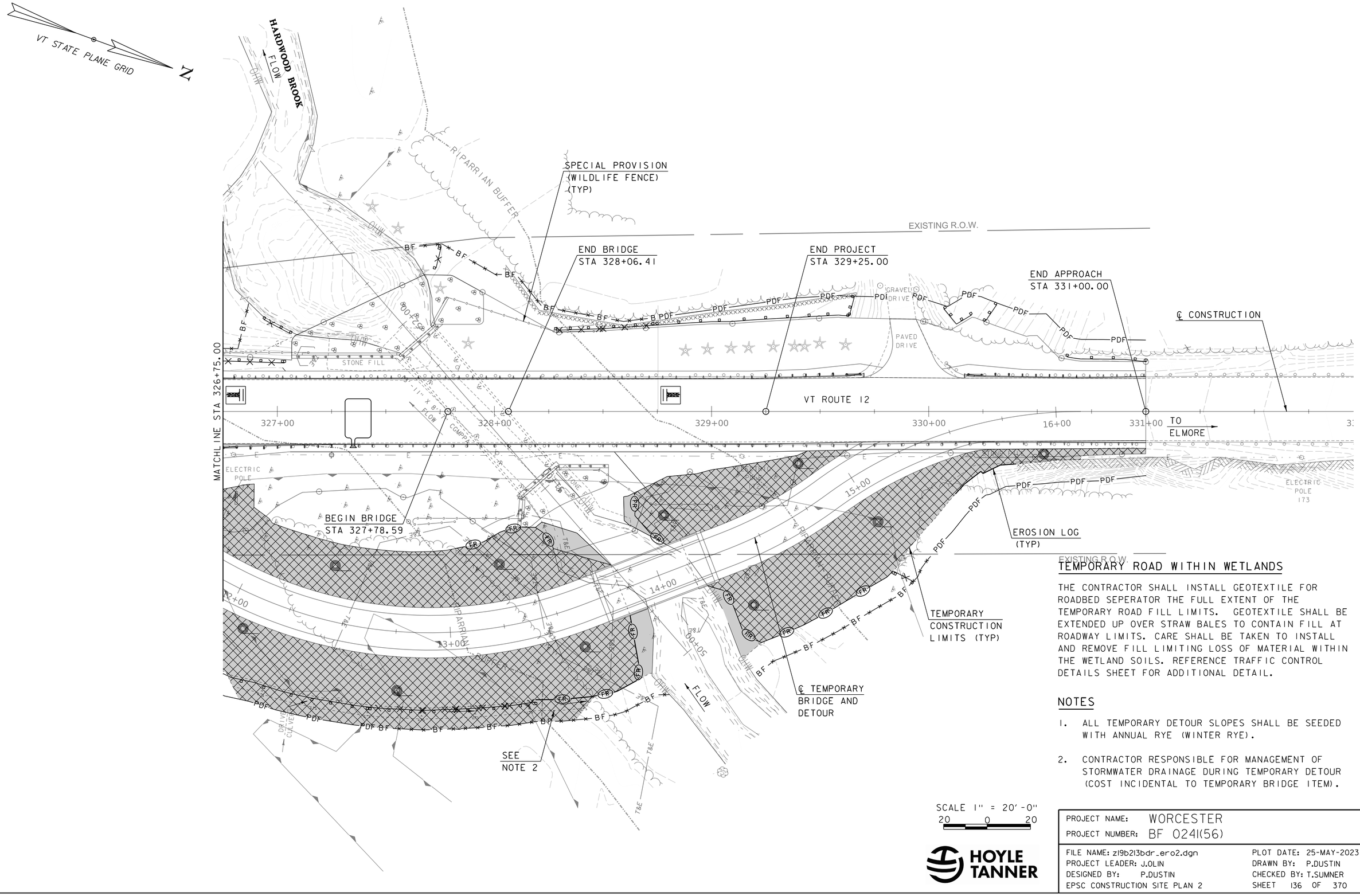
1. ALL TEMPORARY DETOUR SLOPES SHALL BE SEEDED WITH ANNUAL RYE (WINTER RYE).

2. CONTRACTOR RESPONSIBLE FOR MANAGEMENT OF STORMWATER DRAINAGE DURING TEMPORARY DETOUR (COST INCIDENTAL TO TEMPORARY BRIDGE ITEM).

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC CONSTRUCTION SITE PLAN 1	SHEET 135 OF 370



TEMPORARY ROAD WITHIN WETLANDS

THE CONTRACTOR SHALL INSTALL GEOTEXTILE FOR ROADBED SEPERATOR THE FULL EXTENT OF THE TEMPORARY ROAD FILL LIMITS. GEOTEXTILE SHALL BE EXTENDED UP OVER STRAW BALES TO CONTAIN FILL AT ROADWAY LIMITS. CARE SHALL BE TAKEN TO INSTALL AND REMOVE FILL LIMITING LOSS OF MATERIAL WITHIN THE WETLAND SOILS. REFERENCE TRAFFIC CONTROL DETAILS SHEET FOR ADDITIONAL DETAIL.

NOTES

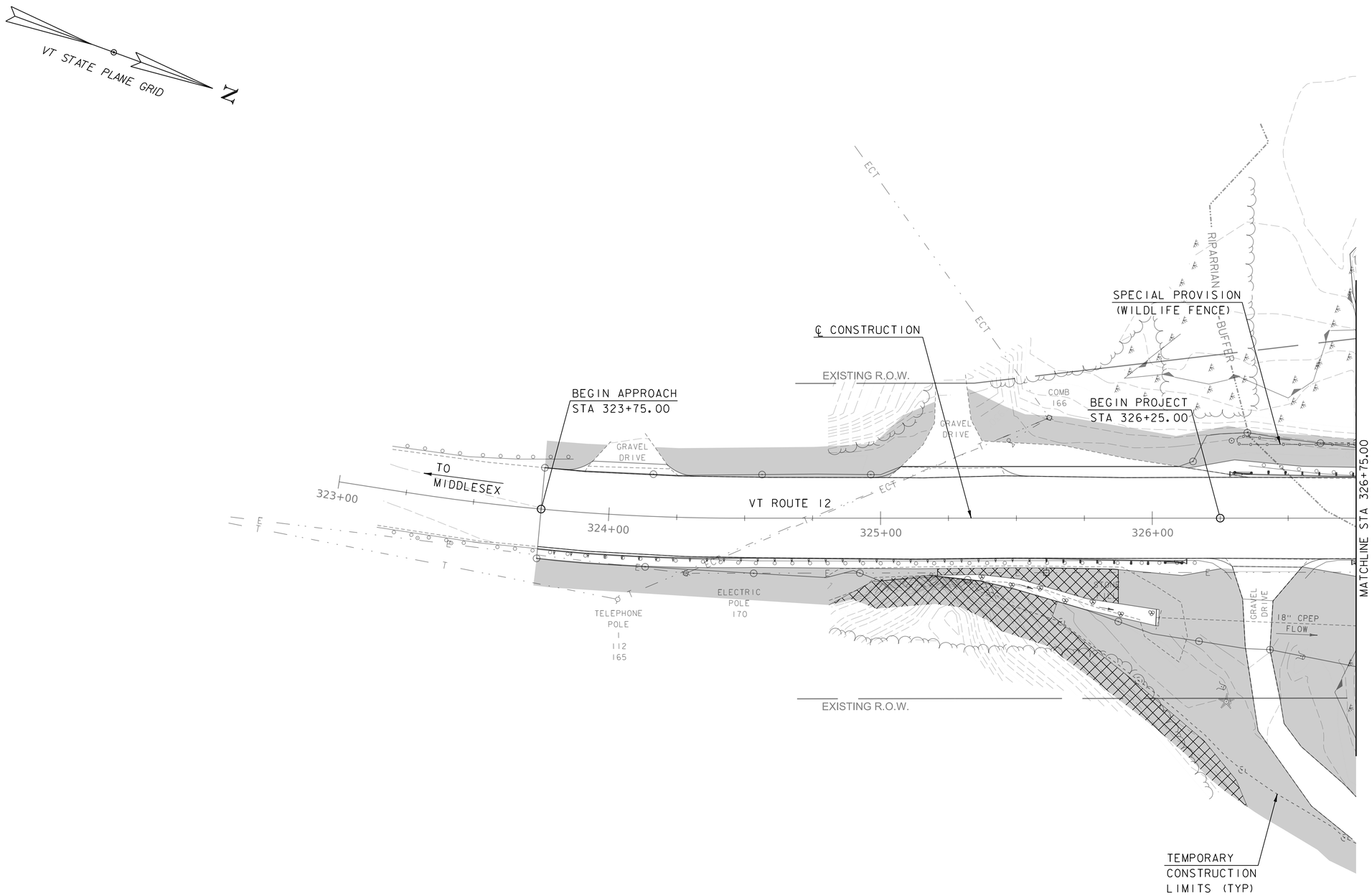
1. ALL TEMPORARY DETOUR SLOPES SHALL BE SEEDED WITH ANNUAL RYE (WINTER RYE).

2. CONTRACTOR RESPONSIBLE FOR MANAGEMENT OF STORMWATER DRAINAGE DURING TEMPORARY DETOUR (COST INCIDENTAL TO TEMPORARY BRIDGE ITEM).

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC CONSTRUCTION SITE PLAN 2	SHEET 136 OF 370



NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME: WORCESTER	
PROJECT NUMBER: BF 0241(56)	
FILE NAME: z19b213bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC FINAL SITE PLAN 1	SHEET 137 OF 370

VT STATE PLANE GRID

N

SPECIAL PROVISION
(WILDLIFE FENCE)
(TYP)

RIPARRIAN BUFFER

EXISTING R.O.W.

END BRIDGE
STA 328+06.41

END PROJECT
STA 329+25.00

END APPROACH
STA 331+00.00

℄ CONSTRUCTION

GRAVEL DRIVE

PAVED DRIVE

VT ROUTE 12

MATCHLINE STA 326+75.00

327+00 328+00 329+00 330+00 331+00

TO ELMORE

ELECTRIC POLE 171

ELECTRIC POLE 173

BEGIN BRIDGE
STA 327+78.59

11" X 8" FLOW COMPRESSOR

STONE RIPRAP

RIPARRIAN BUFFER

EXISTING R.O.W.

TEMPORARY
CONSTRUCTION
LIMITS (TYP)

DRIVE CULVERT

NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(56)
FILE NAME: z19b213bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC FINAL SITE PLAN 2	SHEET 138 OF 370

VAOT LOW GROW/FINE FESCUE MIX						
	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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						
	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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

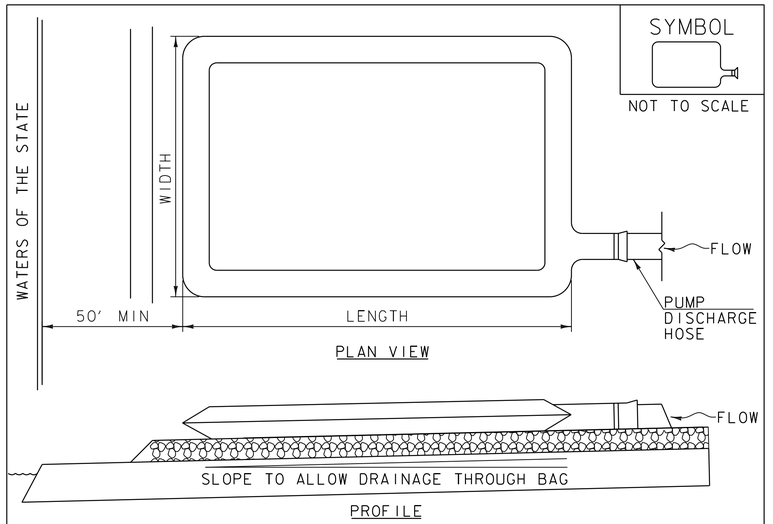
1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT 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. 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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

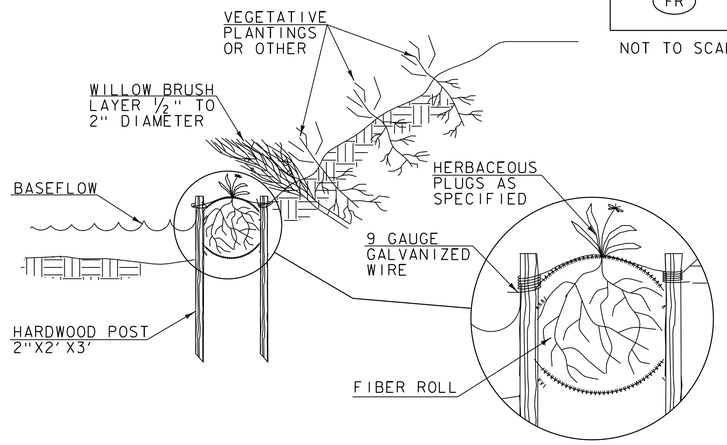
FILE NAME: z19b213ero_dt1.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC DETAILS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 139 OF 370

SYMBOL

FR

NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4" TRENCH ON SLOPE CONTOURS
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2"X2" POSTS PLACED ON BOTH SIDES FO THE ROLL AND SPACED LATERALLY ON 2' TO 4' CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL, IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL, WITH 9 GAUGE GALVANIZED WIRE OR 1/8" DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. PLANTWITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.

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

FIBER ROLL (EROSION LOG)

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 EROSION LOG (PAY ITEM 653.60)

REVISIONS	
MARCH 21, 2008	WHF
JANUARY 13, 2009	WHF

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213ero_dtl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC DETAILS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 140 OF 370

VT STATE PLANE GRID

N

LEGEND

AOT RURAL AREA MIX

WET AREA SEED

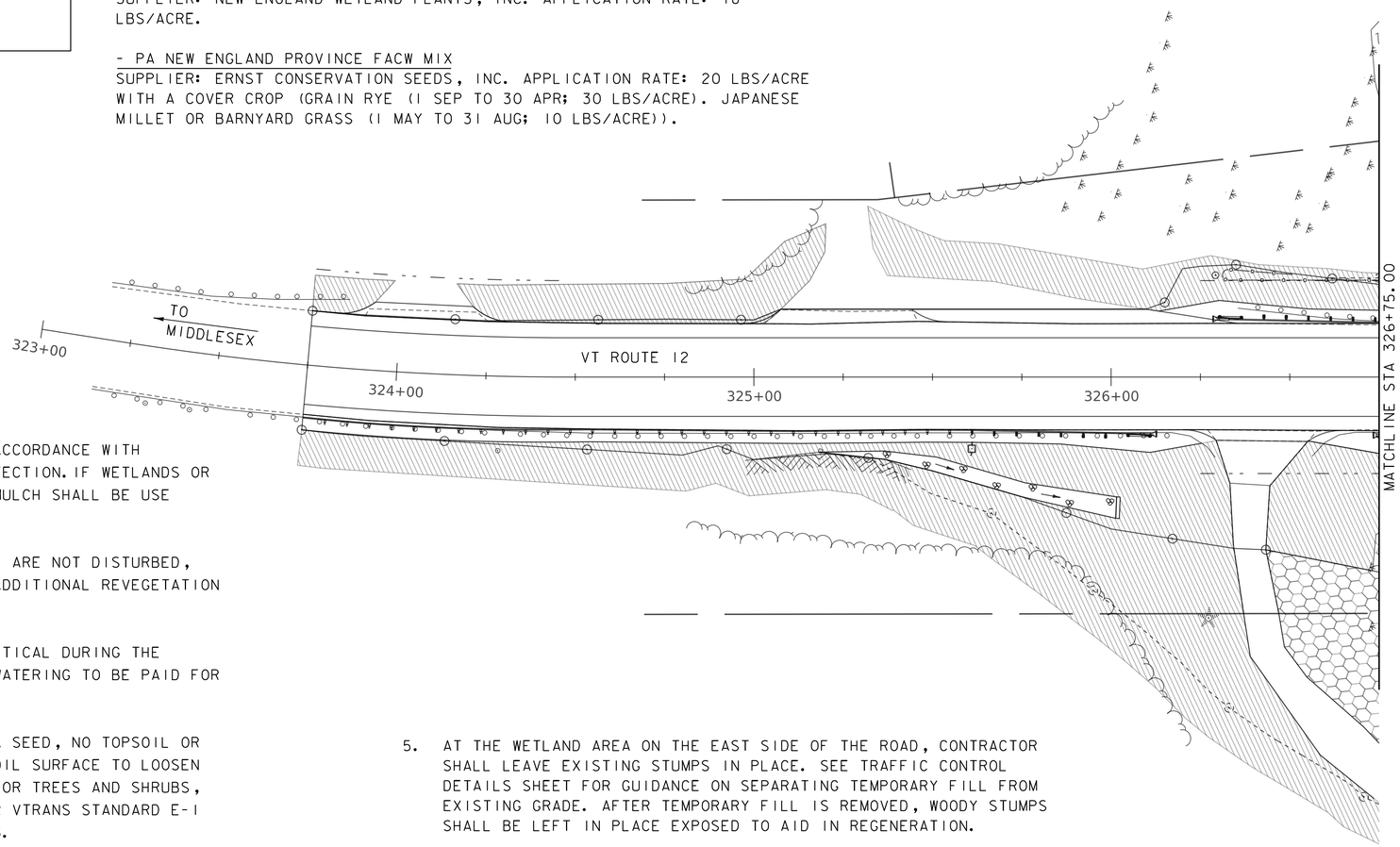
WET AREA SEED MIX

WET AREA SEED MIX TO BE PAID FOR UNDER 900.635 SPECIAL PROVISION (WET AREA SEED MIX). APPLICATION RATES VARY BY SEED MIX. WET AREA SEED MIX TO BE ONE OF THE FOLLOWING, OR APPROVED EQUAL:

- VERMONT WET MEADOW & DETENTION BASIN MIX
SUPPLIER: VERMONT WETLAND PLANT SUPPLY. APPLICATION RATE: 35 LBS/ACRE.

- NEW ENGLAND WET MIX (WETLAND SEED MIX)
SUPPLIER: NEW ENGLAND WETLAND PLANTS, INC. APPLICATION RATE: 18 LBS/ACRE.

- PA NEW ENGLAND PROVINCE FACW MIX
SUPPLIER: ERNST CONSERVATION SEEDS, INC. APPLICATION RATE: 20 LBS/ACRE WITH A COVER CROP (GRAIN RYE (1 SEP TO 30 APR; 30 LBS/ACRE). JAPANESE MILLET OR BARNYARD GRASS (1 MAY TO 31 AUG; 10 LBS/ACRE)).



NOTES

1. SEEDED AREAS SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION SUBSECTION 651.07 PROTECTION. IF WETLANDS OR WETLAND BUFFERS ARE PRESENT, STRAW MULCH SHALL BE USE INSTEAD OF HAY MULCH.

2. IF AREAS WITHIN PDF OR BARRIER FENCE ARE NOT DISTURBED, THEY SHOULD REMAIN VEGETATED, AND ADDITIONAL REVEGETATION IS NOT REQUIRED.

3. PROVIDING SUFFICIENT MOISTURE IS CRITICAL DURING THE ENTIRE PLANT ESTABLISHMENT PERIOD. WATERING TO BE PAID FOR UNDER 656.65 LANDSCAPE WATERING.

4. FOR WETLAND AREAS RECEIVING WET AREA SEED, NO TOPSOIL OR GRUBBINGS SHALL BE ADDED. SCARIFY SOIL SURFACE TO LOOSEN SOIL FOR BETTER SEED-SOIL CONTACT. FOR TREES AND SHRUBS, LANDSCAPE BACKFILL SHALL BE USED PER VTRANS STANDARD E-1 TREE PLANTING AND E-2 SHRUB PLANTING.

KEY	QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
TREES - EVERGREEN - GENERAL						
AB	10	*Abies balsamea*	Balsam Fir	3-4' height, natural	CONT.	12' O.C.
PG	15	*Picea glauca*	White spruce	3-4' height, natural	CONT.	8' O.C.
PI	9	*Picea glauca*	White spruce	6-7' height	B&B	8' O.C.
PS	13	*Pinus strobus*	White pine	3-4' height, natural	CONT.	15' O.C.
SHRUBS - DECIDUOUS						
IV	15	*Ilex verticillata* ' Red Sprite'	Winterberry	1 GAL	CONT.	5' O.C.
IJ	3	*Ilex verticillata* 'Jim Dandy'	Winterberry	1 GAL	CONT.	5' O.C.
SL	15	*Spiraea latifolia*	Meadowsweet	1 GAL	CONT.	4' O.C.
ST	8	*Spiraea tomentosa*	Steeplebush	1 GAL	CONT.	10' O.C.
SD	13	*Salix discolor*	Pussy willow	1 GAL	CONT.	8' O.C.
SS	14	*Salix sericea*	Silky willow	1 GAL	CONT.	8' O.C.

5. AT THE WETLAND AREA ON THE EAST SIDE OF THE ROAD, CONTRACTOR SHALL LEAVE EXISTING STUMPS IN PLACE. SEE TRAFFIC CONTROL DETAILS SHEET FOR GUIDANCE ON SEPARATING TEMPORARY FILL FROM EXISTING GRADE. AFTER TEMPORARY FILL IS REMOVED, WOODY STUMPS SHALL BE LEFT IN PLACE EXPOSED TO AID IN REGENERATION.

6. AT THE WETLAND AREA ON THE EAST SIDE OF THE ROAD, FINAL GRADE TO BE LEFT UNEVEN, WITH SURFACE UNDULATIONS TO CREATE ADDITIONAL HABITAT, MATCHING ADJACENT, NATURAL LANDSCAPE CONDITIONS. DEPRESSIONS IN FINISH GRADE SHALL VARY, WITH 6"-12" IN DEPTH, AND LESS THAN 2' IN DIAMETER. EXISTING STUMPS AND ROCKS TO BE LEFT IN PLACE. NEW PLANTINGS TO FIT WITHIN EXISTING STUMPS. PAYMENT FOR WETLAND DEPRESSIONS TO BE INCIDENTAL TO PAY ITEM 528.10 ONE-WAY TEMPORARY BRIDGE.

7. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 1 WEEK PRIOR TO PLANTING OPERATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER, VTRANS LANDSCAPE ARCHITECT, AND LANDSCAPE INSPECTOR WHO WILL CONFIRM PLANTING LOCATIONS BASED ON THE PREPARED SITE.

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213bdr_lds.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.DONAHUE
LANDSCAPE PLAN 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: J.OLIN

VT STATE PLANE GRID

N

HARDWOOD BROOK
FLOW

LEGEND

AOT RURAL AREA MIX

WET AREA SEED

SAVE TREES

MATCHLINE STA 326+75.00

VT ROUTE 12

327+00 328+00 329+00 330+00 331+00

TO ELMORE

FLOW

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(56)

FILE NAME: z19b213bdr_lds.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.DONAHUE
LANDSCAPE PLAN 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: J.OLIN
SHEET 142 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 1	SHEET 143 OF 370

Replace this sheet

HOYLE TANNER

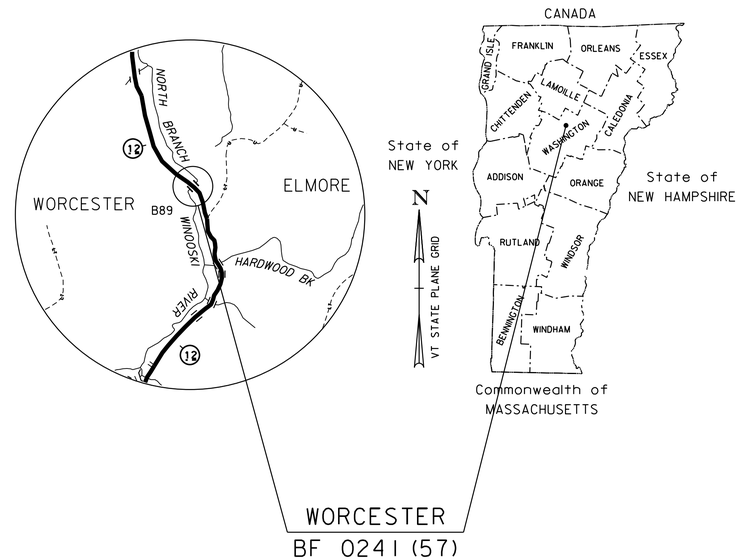
PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 2	SHEET 144 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. DETAIL SHEET	SHEET 145 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

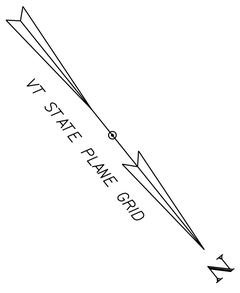
TOWN OF WORCESTER
COUNTY OF WASHINGTON

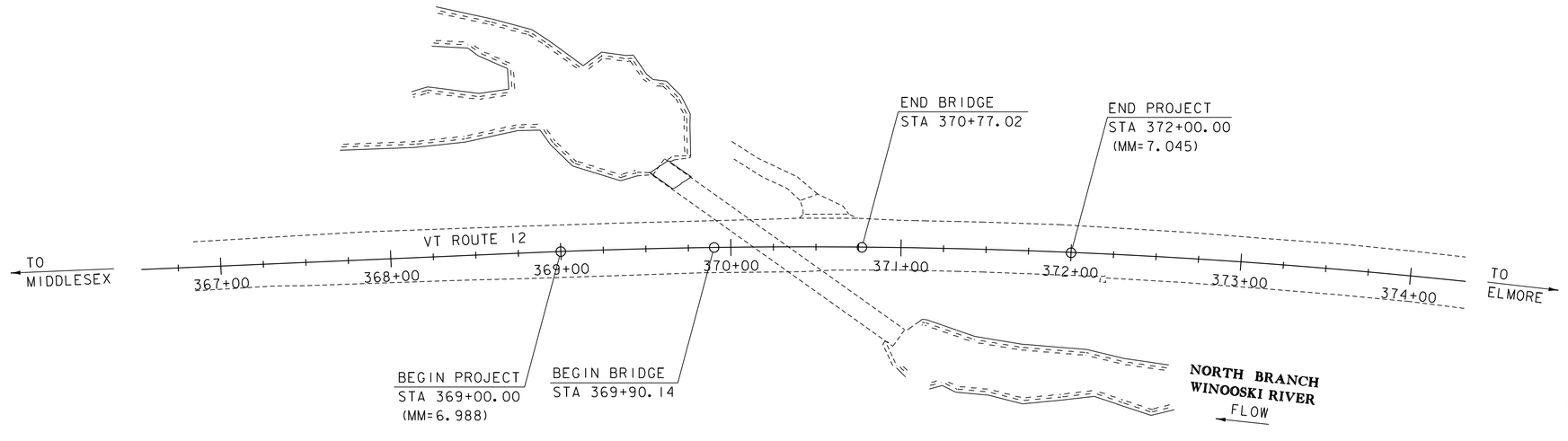
ROUTE NO: VERMONT ROUTE 12 (MAJOR COLLECTOR) BRIDGE NO: 89

PROJECT LOCATION: VT ROUTE 12, BRIDGE 89, APPROXIMATELY 5.3 MILES NORTH OF THE JUNCTION WITH CALAIS IN THE TOWN OF WORCESTER

PROJECT DESCRIPTION: EXISTING CULVERT REPLACEMENT WITH STEEL GIRDER BRIDGE WITH ASSOCIATED ROADWAY IMPROVEMENTS.

LENGTH OF BRIDGE:	86.88	FEET
LENGTH OF ROADWAY:	213.12	FEET
LENGTH OF PROJECT:	300.00	FEET





CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 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 :	R. GILMAN, B. HERRING AND H. MCGOWAN
SURVEYED DATE :	7/30/2019
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83(2011)

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

FINAL PLANS
25-MAY-2023

HOYLE TANNER

PROJECT MANAGER :	LAURA STONE
PROJECT NAME :	WORCESTER
PROJECT NUMBER :	BF 0241(57)
SHEET	146 OF 370 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version
LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

STANDARDS LIST

SEE SHEET 2 FOR LIST OF STANDARDS

DETAIL SHEETS

SEE SHEET 2 FOR DETAIL SHEETS

BITUMINOUS CONCRETE PAVEMENT SUPERPAVE MIXTURE DESIGN CRITERIA	
DESIGN LANE / DESIGN LIFE ESAL	200,260
DESIGN NUMBER OF GYRATIONS	50
PERFORMANCE GRADE ASPHALT BINDER	SEE TABLE 406.03F

TRAFFIC DATA

	ADTT	20 year ESAL for flexible pavement from	2023	to	2043	: 323000
	70	40 year ESAL for flexible pavement from	2023	to	2063	: 748000
	110	Design Speed : 50 mph				

AS BUILT "REBAR" DETAIL

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

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 11/4/2022

DRAINAGE AREA : 8.9 sq. mi.
CHARACTER OF TERRAIN : Rural and Mountainous
STREAM CHARACTERISTICS : Steep and Straight with Narrow Floodplain
NATURE OF STREAMBED : Gravel with Sand Substrate

PEAK FLOW DATA - ANNUAL EXCEEDANCE PROBABILITY (AEP)

43% =	380 cfs	2% =	1,100 cfs
10% =	690 cfs	1% =	1,300 cfs
4% =	910 cfs	0.2% =	1,900 cfs

DATE OF FLOOD OF RECORD Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ 2% AEP = 9.0 fps
ICE CONDITIONS : Light to Moderate
DEBRIS: Light to Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Unknown
IS ORDINARY RISE RAPID? Unknown
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE: N/A

WATERSHED STORAGE: 2.3%
HEADWATERS: X
UNIFORM:
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Corrugated Metal Plate Pipe
YEAR BUILT: 1964
CLEAR SPAN(NORMAL TO STREAM): 15.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 20.0 ft.
WATERWAY OF FULL OPENING: 235.6 sq. ft.
DISPOSITION OF STRUCTURE: Full Replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See Borings

WATER SURFACE ELEVATIONS AT:

43% AEP =	999.6 ft.	VELOCITY =	10.0 fps
10% AEP =	1,002.2 ft.	"	11.8 fps
4% AEP =	1,003.5 ft.	"	12.8 fps
2% AEP =	1,004.1 ft.	"	13.5 fps
1% AEP =	1,004.7 ft.	"	14.2 fps

LONG TERM STREAMBED CHANGES: 10.0 ft. +/- deep scour pool found downstream of existing structure

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

UPSTREAM STRUCTURE

TOWN: Elmore — DISTANCE: 1.5 mi.
HIGHWAY # : VT-12 — STRUCTURE #: 91
CLEAR SPAN: 38.0 ft. — CLEAR HEIGHT: Unknown
YEAR BUILT: 1935 — FULL WATERWAY: Unknown
STRUCTURE TYPE: Single Span Rolled Beam

DOWNSTREAM STRUCTURE

TOWN: Worcester — DISTANCE: 3.1 mi.
HIGHWAY # : VT-12 — STRUCTURE #: 84
CLEAR SPAN: 82.0 ft. — CLEAR HEIGHT: Unknown
YEAR BUILT: 1936 — FULL WATERWAY: Unknown
STRUCTURE TYPE: Single Span Rolled Beam

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	**20**	**36**	**36**	**66**	**30**	**34.5**	**38**
INVENTORY	3.99	1.94					
POSTING							
OPERATING	5.18	2.51	4.00	2.60	3.63	3.24	3.46
COMMENTS:							

PROPOSED STRUCTURE

STRUCTURE TYPE: Single Span

CLEAR SPAN(NORMAL TO STREAM): 65.2 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 16.5 ft.
WATERWAY OF FULL OPENING: 961.4 sq. ft.

WATER SURFACE ELEVATIONS AT:

43% AEP =	995.8 ft.	VELOCITY=	9.2 fps
10% AEP =	997.2 ft.	"	11.6 fps
4% AEP =	997.9 ft.	"	12.7 fps
2% AEP =	998.5 ft.	"	13.5 fps
1% AEP =	999.0 ft.	"	14.3 fps

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

BRIDGE LOW CHORD ELEVATION: 1008.0 ft *
FREEBOARD: @ 2% AEP = 9.53 ft.

SCOUR: 8.5 ft. **

REQUIRED CHANNEL PROTECTION: Stone Fill Type IV **

PERMIT INFORMATION

AVERAGE DAILY FLOW:	-	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	-	-
ORDINARY HIGH WATER:	-	-

TEMPORARY BRIDGE MINIMUM HYDRAULIC REQUIREMENTS

STRUCTURE TYPE: TBD
CLEAR SPAN (NORMAL TO STREAM): 30.0 ft. ****
VERTICAL CLEARANCE ABOVE STREAMBED: See Note ****
WATERWAY AREA OF FULL OPENING: 270.0 sq. ft.

ADDITIONAL INFORMATION

* Average Low chord elevation is reported
** Calculation also includes long term degradation component
*** E-Stone Type IV is to be used for all in channel work
**** Measured along alignment with minimum low chord elevation of 1002.0 ft. is required

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TWO-WAY ALTERNATING TRAFFIC ON A TEMPORARY BRIDGE.
2. INSTALL AND MAINTAIN TRAFFIC SIGNALS.
3. SIDEWALKS ARE NOT NECESSARY
4. THE APPROACHES FOR THE TEMPORARY BRIDGE SHALL BE PAVED.

DESIGN VALUES

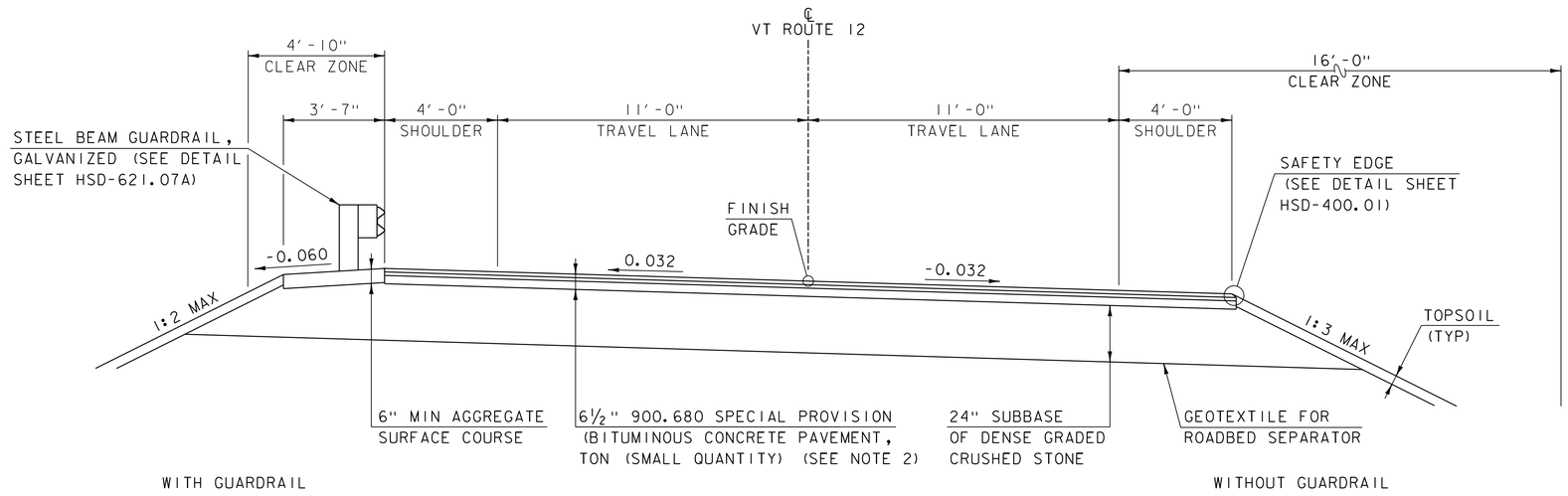
1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	3.0 INCH
3. DESIGN SPAN	L:	77.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5. PRESTRESSING STRAND	f_y:	---
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8. HIGH PERFORMANCE CONCRETE, CLASS PCD	f'_c:	4.0 KSI
9. HIGH PERFORMANCE CONCRETE, CLASS PCS	f'_c:	3.5 KSI
10. CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	---
11. CONCRETE, CLASS C	f'_c:	3.0 KSI
12. REINFORCING STEEL	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y:	50 KSI
14. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	---
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
16. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	70.4 KSF
17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
18. PILE RESISTANCE FACTOR	ϕ:	---
19. LATERAL PILE DEFLECTION	Δ:	---
20. BASIC WIND SPEED	V_{3s}:	---
21. MINIMUM GROUND SNOW LOAD	p_g:	---
22. SEISMIC DATA PGA: ---	S_s:	---
	S_1:	---
23.		---
24.		---
25.		---
26.		---

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

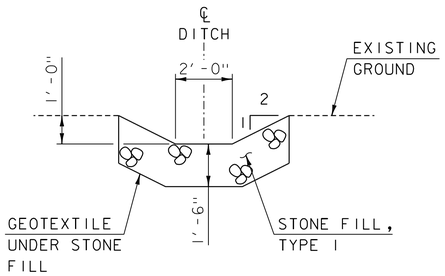
FILE NAME: z19b214pi.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.SEMPRINI
PRELIMINARY INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
SHEET 147 OF 370



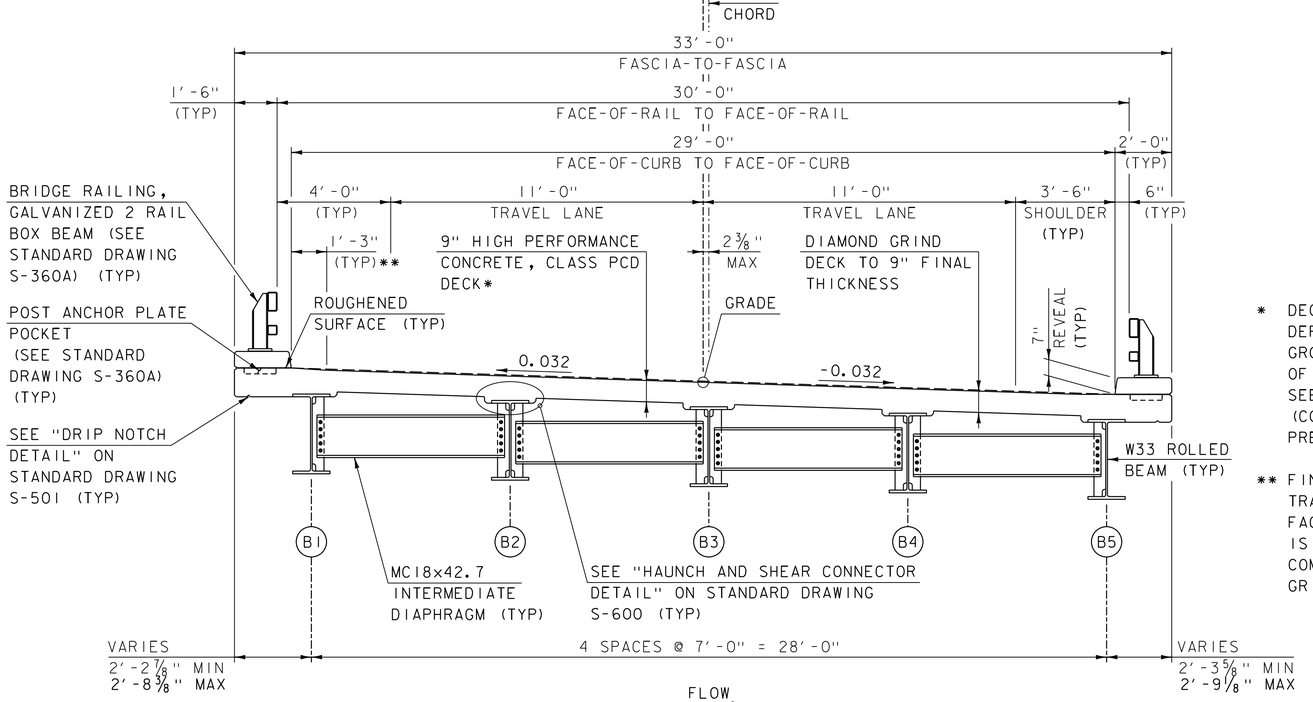
PROPOSED VT ROUTE 12 TYPICAL SECTION

SCALE: ⅜″ = 1′-0″



STONE-LINED DITCH DETAIL

SCALE: ⅜″ = 1′-0″



TYPICAL BRIDGE SECTION

SCALE: ⅜″ = 1′-0″

* DECK SHALL BE OVERPOURED TO A DEPTH OF 9½″ AND DIAMOND GROUND TO THE FINAL THICKNESS OF 9″ AS SHOWN IN THE PLANS. SEE SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION).

** FINISH DECK TO FINAL GRADE OR TRANSITION OVERPOUR TO 0″ AT FACE OF CURB. IF ANY OVERPOUR IS TRANSITIONED, IT SHALL BE COMPLETELY REMOVED BY GRINDING.

MATERIAL TOLERANCES
(IF USED ON PROJECT)

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

NOTES

1. ROADWAY TYPICAL SECTION IS A GENERAL REPRESENTATION OF TYPICAL ROADWAY MATERIALS AND SLOPES. REFER TO THE LAYOUT SHEETS FOR LOCATION OF GUARDRAIL AND SLOPE TIE IN LOCATIONS.

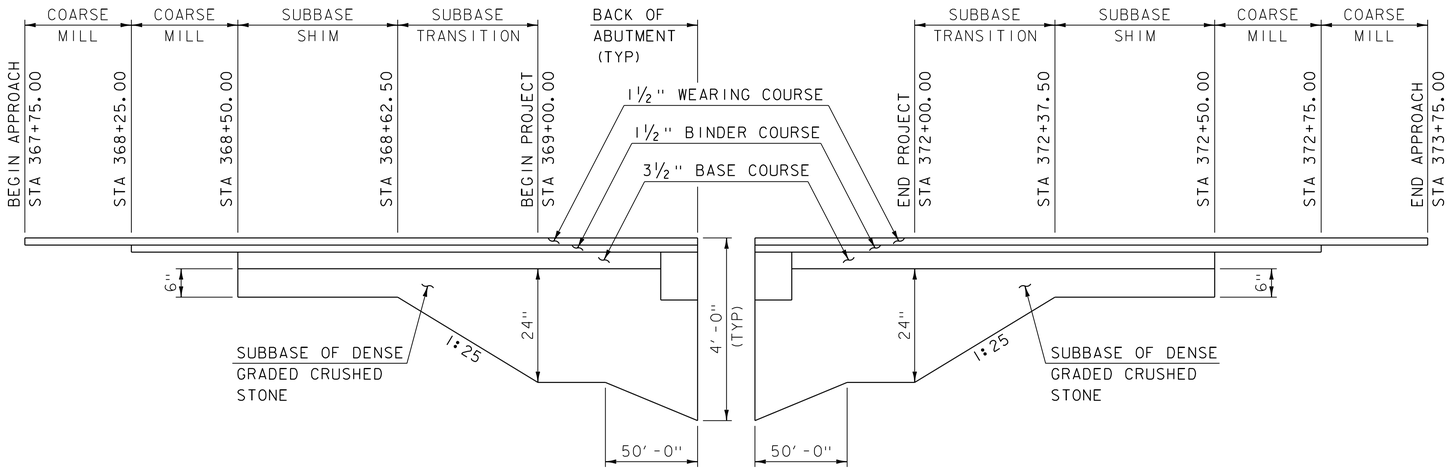
2. 6½″ BITUMINOUS CONCRETE PAVEMENT SHALL CONSIST OF THE FOLLOWING:
   - 1½″ TYPE IVS WEARING COURSE OVER
   - 1½″ TYPE IVS BINDER COURSE OVER
   - 3½″ TYPE IIS BASE COURSE

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

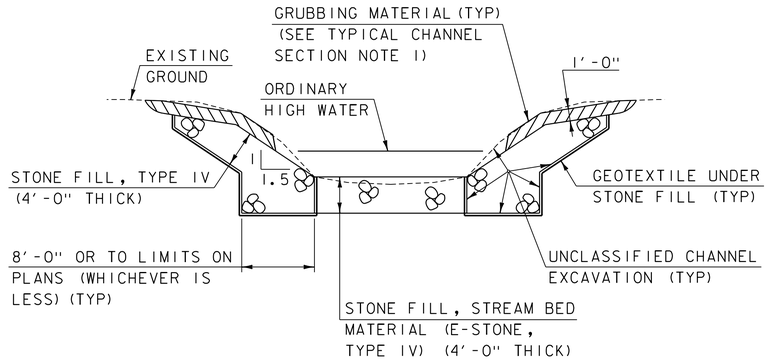
FILE NAME: z19b214typ.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
TYPICAL SECTIONS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER



VT ROUTE 12 MATERIAL TRANSITION DETAIL

NOT TO SCALE



TYPICAL CHANNEL SECTION

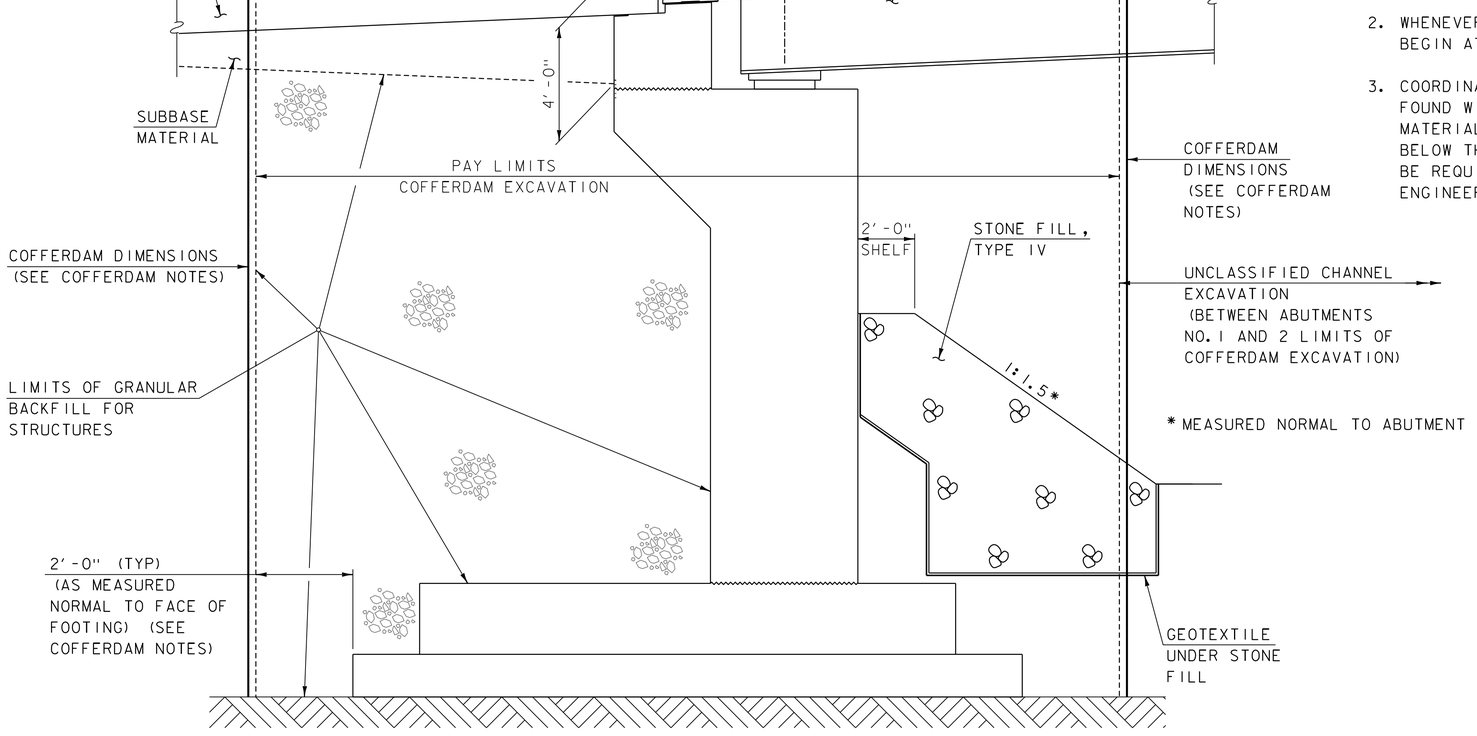
NOT TO SCALE

TYPICAL CHANNEL SECTION NOTES

1. GRUBBING MATERIAL SHALL BE PLACED UNDERNEATH STRUCTURES WHERE THERE IS MORE THAN 6 FEET VERTICALLY FROM ORDINARY HIGH WATER (OHW) TO THE BOTTOM OF SUPERSTRUCTURE AND MORE THAN 6 FEET HORIZONTALLY FROM OHW LINE TO FRONT FACE OF ABUTMENT. THIS MATERIAL SHALL START JUST ABOVE THE OHW ELEVATION AND TERMINATE 3 FEET HORIZONTALLY FROM THE FRONT FACE OF THE ABUTMENT. THIS MATERIAL SHALL NOT BE PLACED UNDERNEATH DOWNSPOUTS. SEE THE CHANNEL SECTIONS FOR ADDITIONAL DETAILING.

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

3. COORDINATE WITH ENGINEER AND VTRANS HYDRAULICS ENGINEER WHERE BEDROCK IS FOUND WITHIN EXCAVATED AREA. EXCAVATION OF BEDROCK OR SUITABLE NATIVE MATERIAL THAT MATCHES PROPOSED E-STONE MAY NOT BE REQUIRED TO BE REMOVED BELOW THE FINISHED STREAMBED ELEVATION WHEN FOUND. SOME ROCK EXCAVATION MAY BE REQUIRED TO KEY-IN NEW FILL MATERIAL. ENGINEER AND VTRANS HYDRAULICS ENGINEER TO CONFIRM CHANNEL PROFILE AND CHANNEL EXCAVATION LIMITS.



TYPICAL ABUTMENT EARTHWORK SECTION

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 SIMILAR)
(SECTION SHOWN ALONG MAJOR CHORD)
NOT TO SCALE

COFFERDAM NOTES

1. COFFERDAM DIMENSIONS TO BE DETERMINED BY THE CONTRACTOR.

2. THE PAY LIMITS OF EITHER "COFFERDAM EXCAVATION, EARTH" AND "COFFERDAM EXCAVATION, ROCK" SHALL BE 2'-0" OUTSIDE THE PERIMETER OF THE FOOTING AND FROM BOTTOM OF EXCAVATION UP TO THE EXISTING GROUND OR BOTTOM OF SUBBASE, WHICHEVER IS LOWER.

3. IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN THE INDICATED COFFERDAM EXCAVATION PAY LIMITS, PAYMENT FOR ALL UNCLASSIFIED CHANNEL EXCAVATION, INCLUDING THAT PORTION WHICH IS INSIDE THE COFFERDAM BUT OUTSIDE THE COFFERDAM PAY LIMITS, WILL BE MADE AT THE CONTRACT UNIT PRICE FOR UNCLASSIFIED CHANNEL EXCAVATION. NO MEASUREMENT AND PAYMENT WILL BE MADE FOR COFFERDAM EXCAVATION AND GRANULAR BACKFILL FOR STRUCTURES OUTSIDE THE PAY LIMITS DEFINED IN NOTE 2.

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
TYPICAL SECTIONS 2	SHEET 149 OF 370

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2018 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.

2. FINISH GRADE SHOWN ON PLANS ARE BASED ON THE FINAL DECK THICKNESS OF 9 INCHES AFTER COMPLETING THE BRIDGE DECK SURFACE PREPARATION.

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

EARTHWORK

4. THE REMOVAL OF THE EXISTING STRUCTURE WILL BE PAID UNDER ITEM 529.15 REMOVAL OF STRUCTURE. THIS WORK SHALL INCLUDE REMOVAL OF THE ENTIRE PIPE AND ANY PORTIONS OF THE EXISTING HEADWALLS THAT FALL OUTSIDE THE LIMITS OF UNCLASSIFIED CHANNEL EXCAVATION OR COFFERDAM EXCAVATION.

5. CONTACT THE RIVER MANAGEMENT ENGINEER, JARON BORG – (802) 371-8342 – A MINIMUM OF TWO WEEKS PRIOR TO CONSTRUCTION FOR APPROVAL OF STREAM BED MATERIAL AND FOR CONSULTATION REGARDING FINAL GRADING OF THE CHANNEL.

6. WEATHERED ROCK AS IDENTIFIED ON BORING LOGS IS ANTICIPATED TO BE REMOVED BY STANDARD EARTH-EXCAVATING EQUIPMENT. WEATHERED BEDROCK MATERIAL IDENTIFIED WITHIN EXCAVATION LIMITS HAS BEEN QUANTIFIED UNDER RESPECTIVE PAY ITEMS OF ITEM 203.27 UNCLASSIFIED CHANNEL EXCAVATION AND ITEM 208.30 COFFERDAM EXCAVATION, EARTH.

7. THE CONTRACTOR SHALL TAKE INTO ACCOUNT THAT VTRANS COMPLETED A CEMENT STABILIZED RECLAIM PROJECT IN 2010 WITHIN THE LIMITS OF THIS PROJECT. THIS MAY IMPACT THE ASSOCIATED EXCAVATION WORK.

TRAFFIC CONTROL

8. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE-SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING ALTERNATING ONE-WAY TRAFFIC, AND ROAD CLOSURE, RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE, AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. PAYMENT FOR ALL ACTIVITIES AND MATERIALS ASSOCIATED WITH THIS WORK WILL BE INCLUDED IN ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 89).

TEMPORARY BRIDGE AND APPROACH

9. THE ONE-WAY TEMPORARY BRIDGE AS SHOWN ON THE TRAFFIC CONTROL PLANS HAS BEEN LAID OUT BASED ON A 16' RAIL TO RAIL WIDTH FOR THE PURPOSES OF ESTABLISHING ALIGNMENT AND TEMPORARY IMPACTS. THE MINIMUM CLEAR WIDTH SHALL BE AS DEFINED BY SPECIFICATION SECTION 528.

10. THE TEMPORARY BRIDGE APPROACH HAS BEEN ESTABLISHED BASED ON 1:2 EMBANKMENT SLOPES AS SHOWN ON THE TRAFFIC CONTROL PLANS FOR THE PURPOSES OF ESTABLISHING TEMPORARY IMPACT LIMITS. SLOPES AND APPROACH RAILING ARE CONTRACTOR DETERMINED AND ARE NOT SHOWN ON TRAFFIC CONTROL PLANS PROVIDED HEREIN. CONTRACTOR SPECIFIED DETAIL SHALL BE INCLUDED ON THE WORKING DRAWINGS SUBMITTAL PER SPECIFICATION SECTION 528.

11. COORDINATE WORKING DRAWINGS AND TRAFFIC CONTROL DEVICES ON BRIDGE APPROACHES WITH THE SITE -SPECIFIC TRAFFIC CONTROL PLAN (REFERENCE NOTE 7 ABOVE).

TEMPORARY TRAFFIC SIGNAL

12. TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM AND IN COMPLIANCE WITH THE LATEST EDITION OF THE MUTCD.

13. SIGNAL FACES SHALL BE LED AND CONSIST OF 12 INCH LENSES (RED, YELLOW AND GREEN).

14. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY LIGHT THE STOP BAR AREAS. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

15. 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 UTILITY POLES, WIRES, ETC. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIGNAL PHASING AND TIMING. THE CONTRACTOR SHALL SUBMIT A PHASING DIAGRAM AND TIMING SCHEDULE TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL MAKE THE SIGNALS OPERATIONAL ONLY AFTER RECEIVING APPROVAL OF BOTH THE PHASING DIAGRAM AND TIMING SCHEDULE BY THE ENGINEER. DEVELOPMENT OF THE PHASING DIAGRAM AND TIMING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO THE ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM. ADDITIONAL ADJUSTMENTS TO SIGNAL TIMING OR PHASING REQUESTED BY THE ENGINEER SHALL BE COMPLETED WITHIN 48 HOURS OF REQUEST. PAYMENT FOR ADDITIONAL ADJUSTMENTS TO THE SIGNAL TIMING OR PHASING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

17. THE SUBMITTAL FOR ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE IN CONJUNCTION WITH THE SUBMITTAL FOR ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 89) AND SHALL INCLUDE AS A MINIMUM, THE SIGNAL LOCATION, TIMING AND PHASING PLAN, VEHICLE DETECTION SYSTEM AND EMERGENCY VEHICLE PREEMPTION SYSTEM.

STRUCTURAL STEEL

18. ALL STRUCTURAL STEEL WILL BE METALIZED OR GALVANIZED PER SECTION 506 OF THE STANDARD SPECIFICATIONS.

19. ALL WELDING TO THE STRUCTURAL STEEL SHALL BE COMPLETED PRIOR TO METALIZING OR GALVANIZING.

20. UNLESS OTHERWISE NOTED, ALL NEW STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270/M270M GRADE 50 AND SHALL BE PAID FOR UNDER ITEM 506.50 STRUCTURAL STEEL, ROLLED BEAM.

21. STRUCTURAL STEEL MEMBERS DESIGNATED CVN IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01 OF THE STANDARD SPECIFICATIONS.

22. BEAM WEBS, BEARING STIFFENERS SHALL BE PLUMB IN THE FINAL POSITION.

23. FLEMING BRACKETS OR SIMILAR FALSEWORK SHALL BE SPACED AS REQUIRED BY DESIGN BUT SHALL BE LIMITED TO A MAXIMUM SPACING OF 4 FEET. THE DESIGN OF FALSEWORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

24. FLEMING BRACKETS SHOULD EXTEND AS NEAR AS POSSIBLE TO THE BOTTOM FLANGE, BUT IN NO CASE SHALL THE FLEMING BRACKETS BE LESS THAN ¾ OF THE WEB DEPTH IN DEPTH.

CONCRETE

25. THE DECK IS TO BE POURED IN ONE CONTINUOUS POUR WITH A MAXIMUM DURATION OF EIGHT HOURS. IF CIRCUMSTANCES BEYOND THE CONTRACTOR'S CONTROL PREVENT THIS FROM BEING ACCOMPLISHED, A TRANSVERSE CONSTRUCTION JOINT SHALL BE USED BETWEEN ADJACENT POURS. A MINIMUM 96 HOUR DELAY BETWEEN ADJACENT POURS SHALL BE OBSERVED.

26. ALL DECK POURS SHALL BEGIN FROM THE LOW ELEVATION END AND PROCEED TOWARDS THE HIGH ELEVATION END.

27. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1" UNLESS OTHERWISE NOTED.

28. WATER REPELLENT, SILANE, SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES.

29. THE CONCRETE IN THE BRIDGE DECK, CURBS, ABUTMENTS AND WINGWALLS ABOVE THE BRIDGE SEAT ELEVATION SHALL BE ITEM 501.37, "HIGH PERFORMANCE CONCRETE, CLASS PCD". APPROACH SLABS, ABUTMENTS AND WINGWALLS BELOW THE BRIDGE SEAT SHALL BE ITEM 501.38, "HIGH PERFORMANCE CONCRETE PCS". SUB-FOOTING CONCRETE SHALL BE ITEM 541.30, "CONCRETE, CLASS C".

REINFORCING STEEL

30. REINFORCING STEEL IN THE APPROACH SLAB SHALL BE CORROSION PROTECTION LEVEL I, ITEM 507.11 REINFORCING STEEL, LEVEL I (EPOXY COATED) OR AS INDICATED ON THE REINFORCING STEEL SCHEDULE.

31. REINFORCING IN THE ABUTMENTS AND WINGWALL SHALL BE CORROSION PROTECTION LEVEL I, OR LEVEL II AS INDICATED ON THE REINFORCING STEEL SCHEDULE.

32. ALL REINFORCING IN THE DECK AND CURBS SHALL BE CORROSION PROTECTION LEVEL II, ITEM 507.12 REINFORCING STEEL, LEVEL II (CONTINUOUSLY GALVANIZED).

33. CUTTING AND REPAIRING DAMAGED AREAS OF COATED REINFORCING STEEL SHALL BE PERFORMED IN ACCORDANCE WITH SUBSECTION 507.04.

34. REINFORCING STEEL CLEAR COVER REQUIREMENTS ARE STATED ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE NOTED IN THE PLANS:

EXPOSED TO EARTH OR WEATHER	2.0 INCHES
DIRECT EXPOSURE TO DEICING SALTS (HEADWALL FASCIA, CURB, ETC.)	3.0 INCHES
CAST AGAINST EARTH	3.0 INCHES

35. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL, AVAILABLE ON THE AGENCY WEBSITE. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE 507 ITEM.

BEDROCK

36. UPON COMPLETION OF EXCAVATION FOR SUBSTRUCTURES FOUNDED ON BEDROCK AND PRIOR TO PLACING FORMWORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER THAT THEY INTEND TO BEGIN FORMING FOR FOUNDATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER AND THE VTRANS STATE GEOLOGIST. THE GEOLOGIST WILL DETERMINE IF THE BEDROCK IS COMPETENT TO OBTAIN THE REQUIRED NOMINAL BEARING RESISTANCE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 72 HOURS PRIOR TO WHEN THE ANALYSIS WILL BE NEEDED. THE CONTRACTOR IS INFORMED THAT EXCAVATION LIMITS WILL NOT BE CONSIDERED FINAL UNTIL THE ENGINEER AND STATE GEOLOGIST DETERMINE THAT BEDROCK IS COMPETENT.

37. AFTER BEDROCK HAS BEEN EXPOSED AND DETERMINED COMPETENT BY GEOLOGIST, IF ELEVATIONS VARY FROM THE ELEVATIONS SHOWN IN THE PLANS, ADJUSTMENTS TO THE FOOTING ELEVATIONS MAY BE DESIRABLE TO MINIMIZE BEDROCK REMOVAL AND/OR REDUCE SUBFOOTING CONCRETE QUANTITIES. IF THE ACTUAL SITE CONDITIONS ENCOUNTERED REQUIRE LOWERING THE TOP OF FOOTING ELEVATION BY 2-FEET OR MORE, CONTACT THE PROJECT MANAGER IMMEDIATELY TO INQUIRE ABOUT REDESIGN OF THE FOUNDATION. THE CONTRACTOR SHOULD EXPECT THAT A DESIGN CHANGE MAY TAKE UP TO FIVE BUSINESS DAYS TO PROCESS AND PLAN CONSTRUCTION ACTIVITIES ACCORDINGLY.

38. ALL OVERBREAKAGE BEYOND ALLOWANCE SPECIFIED IN 204.06(B)(1) SHALL BE REPLACED WITH COMPETENT CONCRETE AT THE CONTRACTOR'S EXPENSE.

39. ANY EXPOSED SUBFOOTING FACES EXCEEDING 5 FEET IN HEIGHT SHALL BE REINFORCED WITH #5 REINFORCING STEEL BARS SPACED AT 12 INCHES EACH WAY. AN ESTIMATED QUANTITY FOR THESE BARS HAS BEEN INCLUDED IN ITEM 507.11 REINFORCING STEEL, LEVEL I (UNCOATED).

MISCELLANEOUS

40. THE CONTRACTOR SHALL PROVIDE A SITE-SPECIFIC EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH SECTION 653 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. ESTIMATED QUANTITIES FOR EPSC WORK HAVE BEEN INCLUDED IN THE CONTRACT FOR BIDDING PURPOSES. IF THE CONTRACTOR'S EPSC PLAN REQUIRES ITEMS OF WORK THAT ARE NOT INCLUDED IN THE PLANS, THE EXTRA WORK WILL BE PAID FOR AS PART OF ITEM 653.03 MAINTENANCE OF EPSC PLAN (BRIDGE 89).

41. STONE FILL, STREAM BED MATERIAL SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 613 AND 706. CONTRACTOR SHALL ENSURE E-STONE MATERIAL IS SUPPLEMENTED WITH MATERIAL EXCAVATED FROM THE CHANNEL AND/OR THE TAILINGS OF A TOPSOIL SCREENING OPERATION.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214nts.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
PROJECT NOTES

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
1						1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (BRIDGE 89)	201.10	
1150						1150		CY	COMMON EXCAVATION	203.15	
10			110			120		CY	SOLID ROCK EXCAVATION	203.16	
35						35		CY	CHANNEL EXCAVATION OF EARTH	203.25	
			4000			4000		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	
110						110		CY	EARTH BORROW	203.30	
190						190		CY	TRENCH EXCAVATION OF EARTH	204.20	
10						10		CY	TRENCH EXCAVATION OF ROCK	204.21	
1						1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	
			1600			1600		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	
			2850			2850		CY	COFFERDAM EXCAVATION, EARTH	208.30	
			290			290		CY	COFFERDAM EXCAVATION, ROCK	208.35	
			1			1		LS	COFFERDAM (ABUTMENT 1)(BRIDGE 89)	208.40	
			1			1		LS	COFFERDAM (ABUTMENT 2)(BRIDGE 89)	208.40	
690						690		SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.10	
930						930		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	
50						50		CY	AGGREGATE SURFACE COURSE	401.10	
15						15		CWT	EMULSIFIED ASPHALT	404.65	
1						1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	
			130			130		CY	HIGH PERFORMANCE CONCRETE, CLASS PCD	501.37	
			730			730		CY	HIGH PERFORMANCE CONCRETE, CLASS PCS	501.38	
			89500			89500		LB	STRUCTURAL STEEL, ROLLED BEAM (FPQ)	506.50	
			21620			21620		LB	REINFORCING STEEL, LEVEL I (UNCOATED)	507.11	
			90180			90180		LB	REINFORCING STEEL, LEVEL II (CONTINUOUSLY GALVANIZED)	507.12	
			1			1		LS	SHEAR CONNECTORS (1050 - 7/8" X 7")(BRIDGE 89)	508.15	
			50			50		GAL	WATER REPELLENT, SILANE	514.10	
			294			294		LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33	
			1			1		LS	ONE-WAY TEMPORARY BRIDGE (2400 SF - EST.)(BRIDGE 89)	528.10	
			1			1		EACH	REMOVAL OF STRUCTURE (15'-0" X 20'-0" X 172'-0" CGMPP)	529.15	
			10			10		EACH	BEARING DEVICE ASSEMBLY, STEEL REINFORCED ELASTOMERIC PAD	531.17	
			220			220		CY	CONCRETE, CLASS C	541.30	
35						35		LF	18" CPEP	601.0915	
2						2		EACH	18" CPEPES	601.7015	
2						2		EACH	PRECAST REINFORCED CONCRETE CATCH BASIN WITH CAST IRON GRATE	604.20	
10						10		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	
			640			640		CY	STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE IV)	613.06	
32						32		CY	STONE FILL, TYPE I	613.10	
			1950			1950		CY	STONE FILL, TYPE IV	613.13	
155						155		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28	
200						200		LF	BITUMINOUS CONCRETE CURB, TYPE A	616.305	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORK SUMMARY
		FILL AVAILABLE
1150	CY	COMMON EXCAVATION (1150 x 1.0)
1200	CY	UNCLASSIFIED CHANNEL EXCAVATION (4000 x 0.3)
0	CY	STRUCTURE EXCAVATION (0 x 0.3)
942	CY	COFFERDAM EXCAVATION ((2850+290) x 0.3)
8	CY	ROUNDING
3300	CY	TOTAL FILL AVAILABLE
		FILL REQUIRED
127	CY	FACTORED FILL REQUIRED (110 x 1.15)
3	CY	ROUNDING
130	CY	TOTAL FILL REQUIRED
		BORROW OR WASTE
3170	CY	WASTE
		BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY
215	TON	BASE COURSE, TYPE IIS
107	TON	INTERMEDIATE COURSE, TYPE IVS
150	TON	WEARING COURSE, TYPE IVS
472	TON	SUBTOTAL
28	TON	ROUNDING
500	TON	TOTAL

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: WORCESTER
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FILE NAME: z19b214qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
QUANTITY SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 151 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
				2						2		EACH	YIELDING MARKER POSTS	619.17				
				225						225		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20				
				210						210		LF	STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS	621.205				
				2						2		EACH	MANUFACTURED TERMINAL SECTION, TANGENT	621.51				
				4						4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	621.72				
				720						720		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
				115						115		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
				560						560		HR	FLAGGERS	630.15				
								1		1		LS	FIELD OFFICE, ENGINEERS	631.10				
								1		1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
								1		1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
								1200		1200		DL	FIELD OFFICE COMMUNICATIONS (N.A.B.I.)	631.26				
					208					208		HR	EMPLOYEE TRAINEESHIP	634.10				
				1						1		LS	MOBILIZATION/DEMOBILIZATION (BRIDGE 89)	635.11				
				1						1		LS	TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 89)	641.11				
				1250						1250		LF	4 INCH WHITE LINE, WATERBORNE PAINT	646.201				
				810						810		LF	4 INCH YELLOW LINE, WATERBORNE PAINT	646.2111				
				980						980		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
							2110			2110		SY	GEOTEXTILE UNDER STONE FILL	649.31				
						55				55		LB	SEED	651.15				
									3	3		LB	WILDFLOWER SEED	651.16				
						330				330		LB	FERTILIZER	651.18				
						2				2		TON	AGRICULTURAL LIMESTONE	651.20				
						350				350		CY	TOPSOIL	651.35				
						1020				1020		SY	GRUBBING MATERIAL (12 INCH)	651.40				
						1				1		LS	EPSC PLAN (BRIDGE 89)	653.01				
						110				110		HR	MONITORING EPSC PLAN	653.02				
						1				1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.) (BRIDGE 89)	653.03				
						2				2		TON	HAY MULCH	653.10				
						1600				1600		SY	ROLLED EROSION CONTROL PRODUCT, TYPE I	653.20				
						20				20		CY	CHECK DAM, TYPE I	653.25				
						35				35		CY	STABILIZED CONSTRUCTION ENTRANCE	653.35				
						2				2		EACH	FILTER BAG	653.45				
						90				90		LF	SILT FENCE, TYPE I	653.475				
						390				390		LF	SILT FENCE, TYPE II	653.476				
						780				780		LF	BARRIER FENCE	653.50				
						300				300		LF	PROJECT DEMARCATION FENCE	653.55				
						110				110		LF	EROSION LOG	653.60				
									3	3		EACH	EVERGREEN TREES (PINUS STROBUS)(3'-4' HT.)(CONT.)	656.20				
									2	2		EACH	EVERGREEN TREES (TSUGA CANADENSIS)(3'-4' HT.)(CONT.)	656.20				

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
QUANTITY SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 152 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
									2	2		EACH	DECIDUOUS TREES (ACER RUBRUM)(2" - 2.5" CAL.)(B&B)	656.30				
									1	1		EACH	DECIDUOUS TREES (FAGUS GRANDIFOLIA)(2"-2.5" CAL.)(B&B)	656.30				
									2	2		EACH	DECIDUOUS TREES (ALNUS RUGOSA)(3'-4' HT.)(CONT.)	656.30				
									8	8		EACH	DECIDUOUS SHRUBS (ARONIA MELANOCARPA 'VIKING')(2 GALLON)(CONT.)	656.35				
									2	2		EACH	DECIDUOUS SHRUBS (CORNUS RACEMOSA)(2 GALLON)(CONT.)	656.35				
									14	14		EACH	DECIDUOUS SHRUBS (CORNUS AMOMUM)(1 GALLON)(CONT.)	656.35				
									18	18		EACH	DECIDUOUS SHRUBS (CORNUS SERICEA)(1 GALLON)(CONT.)	656.35				
									16	16		MGAL	LANDSCAPE WATERING	656.65				
									14	14		CY	LANDSCAPE BACKFILL, TRUCK MEASUREMENT	656.80				
				1.5						1.5		SF	TRAFFIC SIGN, TYPE A	675.20				
				39						39		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
				3						3		EACH	REMOVING SIGNS	675.50				
				2						2		EACH	DELINEATOR WITH STEEL POST	676.10				
				2						2		EACH	REMOVAL OF EXISTING DELINEATOR AND POST	676.12				
				1						1		EACH	TEMPORARY TRAFFIC SIGNAL SYSTEM	678.40				
							118			118		LF	SPECIAL PROVISION (BRIDGE EXPANSION JOINT SYSTEM)	900.640				
							1			1		LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)(BRIDGE 89)	900.645				
							3560			3560		SF	SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)	900.670				
				500						500		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

N.A.B.I. NOT A BID ITEM

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DESIGNED BY: K.HAMPE
QUANTITY SHEET 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 153 OF 370

HOYLE TANNER

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

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

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

POINT	CODE	DESCRIPTION
	BF	BARRIER FENCE
	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
	PDF	PROJECT DEMARCATION FENCE
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	R.T.& I.	RIGHT, TITLE, AND INTEREST
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
◎	IPNF	IRON PIN FOUND
●	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 VALVE
	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 RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE
CB	CHORD BEARING

UTILITY SYMBOLOGY

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+TELEPHONE
- 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+TELEPHONE
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

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

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

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

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

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

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

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

ARCHEOLOGICAL & HISTORIC

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

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214leg.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
CONVENTIONAL SYMBOLOGY LEGEND

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 154 OF 370

PRIMARY CONTROL

HVCTRL #1
17 HBC
NORTH = 719093.5070
EAST = 1632341.2960
ELEV = 1226.8550

GENERAL LOCATION ELMORE
TO REACH FROM THE JUNCTION OF VERMONT ROUTE 12 AND THE ENTRANCE TO THE STATE PARK IN ELMORE, PROCEED SOUTH ON VERMONT ROUTE 12 FOR 5.4 MI (8.7 KM) TO THE BRIDGE OVER BARNES BROOK AND THE SITE OF THE MARK ON THE LEFT. TO REACH FROM THE JUNCTION OF VERMONT ROUTE 12 AND THE ROAD LEADING TO MAPLE CORNERS IN WORCESTER, PROCEED NORTH ON ROUTE 12 FOR 8.1 MI (13.0 KM) TO THE BRIDGE OVER BARNES BROOK AND THE SITE OF THE MARK ON THE RIGHT. THE MARK IS A USGS BENCHMARK DISK SET FLUSH IN THE CONCRETE BASE OF THE NORTH EAST RAIL OF THE BRIDGE. IT IS LOCATED 16 FT (4.9 M) SOUTHEAST OF THE CENTERLINE OF VERMONT ROUTE 12, 5 FT (1.5 M) NORTH OF A CONCRETE BRIDGE POST, 1 FT (0.3 M) SOUTHWEST OF A FIBERGLASS WITNESS POST, AND 0.5 FT (15.2 CM) EASTERLY FROM THE STEEL GUARD RAIL. OWNERSHIP IS THE STATE OF VERMONT.

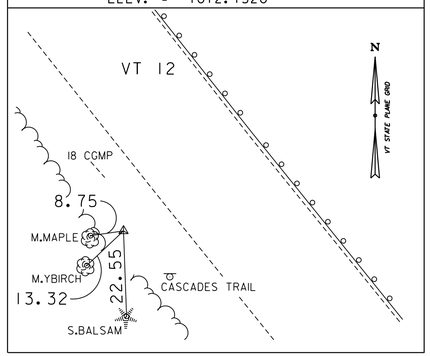
HVCTRL #2
LVT 1
NORTH = 718091.3650
EAST = 1631814.5990
ELEV = 1218.8720

GENERAL LOCATION, ELMORE, VT.
TO REACH FROM THE INTERSECTION OF VT ROUTE 15A (UPPER MAIN STREET) AND VT ROUTE 12 IN MORRISVILLE GO SOUTH ALONG VT ROUTE 12 FOR 4.3 MI (6.9 KM) TO THE ELMORE STATE PARK ENTRANCE ON THE RIGHT. CONTINUE STRAIGHT AHEAD AND GO SOUTH ALONG VT ROUTE 12 FOR 5.6 MI (9.0 KM) TO THE SITE OF THE MARK ON THE RIGHT. TO REACH FROM THE INTERSECTION OF VT ROUTE 12 AND CALAIS ROAD IN WORCESTER GO NORTH ALONG VT ROUTE 12 FOR 7.9 MI (12.7 KM) TO THE SITE OF THE MARK. THE MARK IS A BLANK DISK SET 30 CM (12 INCHES) BELOW GROUND SURFACE IN THE TOP OF A DRIVEN STEEL PIPE. IT IS BEHIND A STEEL BEAM GUARD RAIL AND ABOUT 0.3 M (1.0 FT) SOUTHWEST OF THE CENTERLINE OF A 30 CM (12 INCH) DIAMETER STEEL CULVERT WITH A MARKER POST, 5.5 M (18.0 FT) NORTHWEST OF AND 0.4 M (1.3 FT) LOWER THAN THE CENTERLINE OF VT ROUTE 12, 5.4 M (17.7 FT) EAST OF A PAIR OF 12 CM (5 INCHES) PINES, 37.8 M (124.0 FT) SOUTHWEST OF THE POST AT THE NORTHEAST END OF THE GUARD RAIL AND 38.4 M (126.0 FT) WEST OF AND ACROSS THE ROAD FROM MILE MARKER 0120/0804/0160.

SECONDARY CONTROL

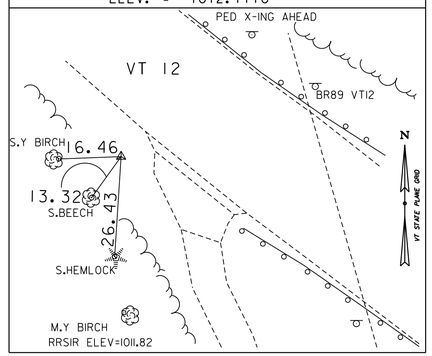
HVCTRL 13

NORTH = 708038.4850
EAST = 1629335.9620
ELEV. = 1072.1520



HVCTRL 15

NORTH = 707466.3460
EAST = 1629901.7890
ELEV. = 1012.7770



[unnamed]

NORTH =
EAST =
ELEV. =

[unnamed]

NORTH =
EAST =
ELEV. =

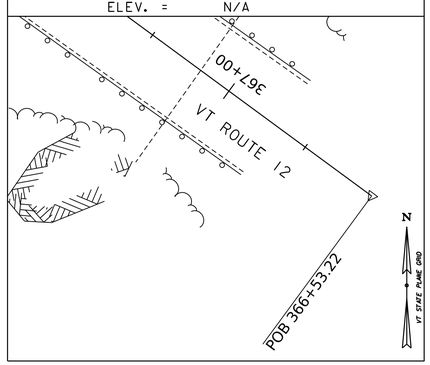
[unnamed]

NORTH =
EAST =
ELEV. =

ALIGNMENT TIES

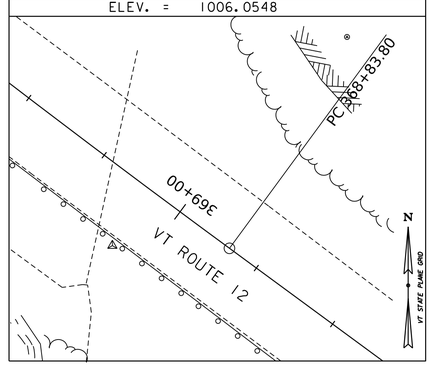
POB 366+53.22

NORTH = 707232.7119
EAST = 1630255.3249
ELEV. = N/A



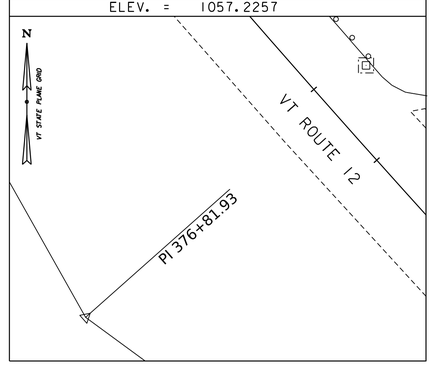
PC 368+83.80

NORTH = 707369.2459
EAST = 1630069.5120
ELEV. = 1006.0548



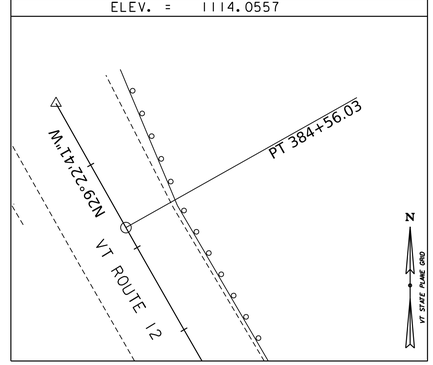
PI 376+81.93

NORTH = 707841.8394
EAST = 1629426.3458
ELEV. = 1057.2257



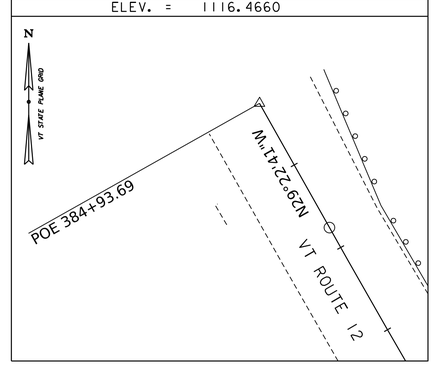
PT 384+56.03

NORTH = 708537.3282
EAST = 1629034.8068
ELEV. = 1114.0557



POE 384+93.69

NORTH = 708570.1404
EAST = 1629016.3346
ELEV. = 1116.4660



TRAVERSE COMPLETED BY R.GILMAN B.HERRING AND H.MCGOWAN ON 7/30/2019

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

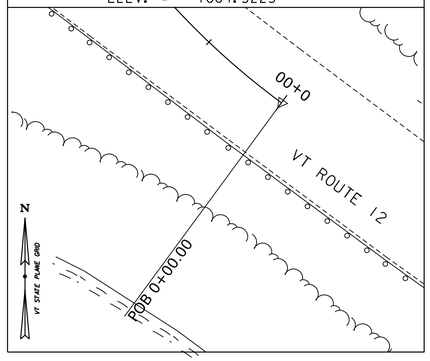
FILE NAME: z19b2141i.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TIE SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 155 OF 370

ALIGNMENT TIES
DETOUR

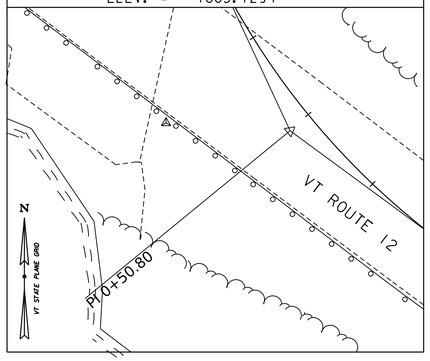
POB 0+00.00

NORTH =	707337.8173
EAST =	1630112.2840
ELEV. =	1004.3223



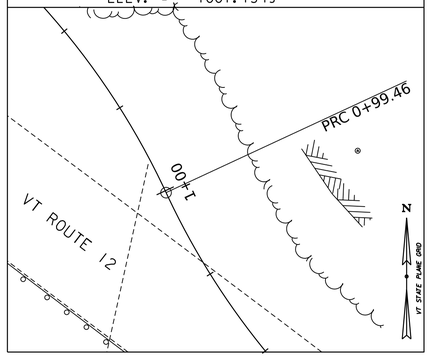
PI 0+50.80

NORTH =	707367.8976
EAST =	1630071.3469
ELEV. =	1005.7294



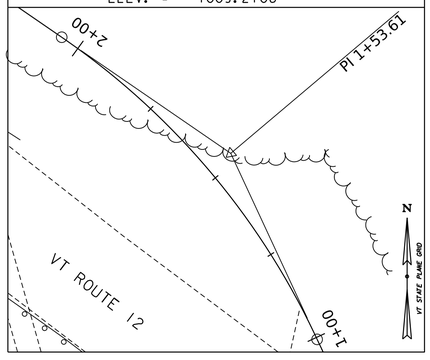
PRC 0+99.46

NORTH =	707413.9711
EAST =	1630049.9484
ELEV. =	1007.1349



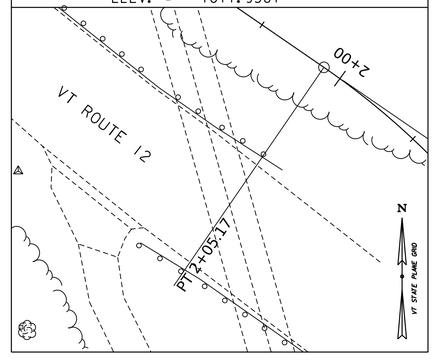
PI 1+53.61

NORTH =	707463.0827
EAST =	1630027.1388
ELEV. =	1009.2706



PT 2+05.17

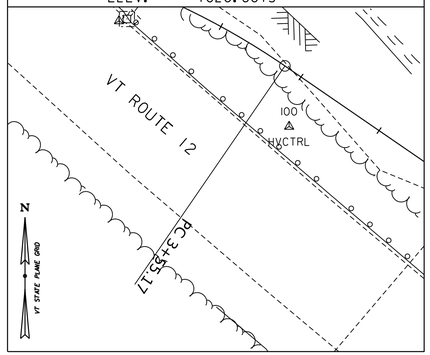
NORTH =	707493.7511
EAST =	1629982.5106
ELEV. =	1011.9561



ALIGNMENT TIES
DETOUR

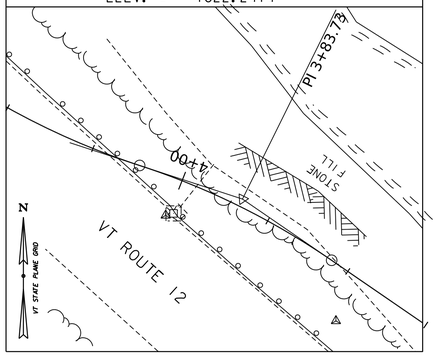
PC 3+55.17

NORTH =	707578.7050
EAST =	1629858.8868
ELEV. =	1020.6013



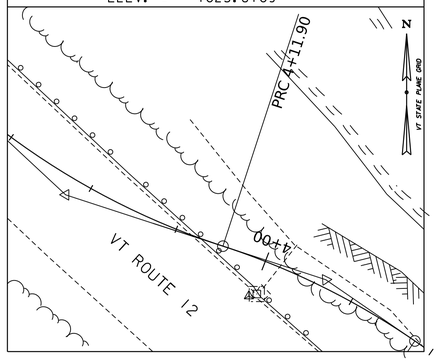
PI 3+83.73

NORTH =	707594.8799
EAST =	1629835.3493
ELEV. =	1022.2474



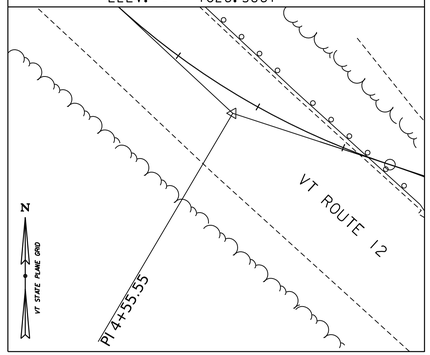
PRC 4+11.90

NORTH =	707603.7438
EAST =	1629808.2001
ELEV. =	1023.8709



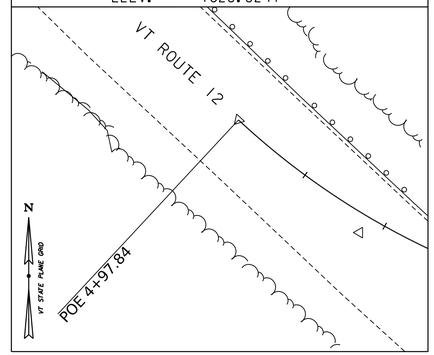
PI 4+55.55

NORTH =	707617.2932
EAST =	1629766.6996
ELEV. =	1026.3867



POE 4+97.84

NORTH =	707647.0386
EAST =	1629734.7450
ELEV. =	1028.8241

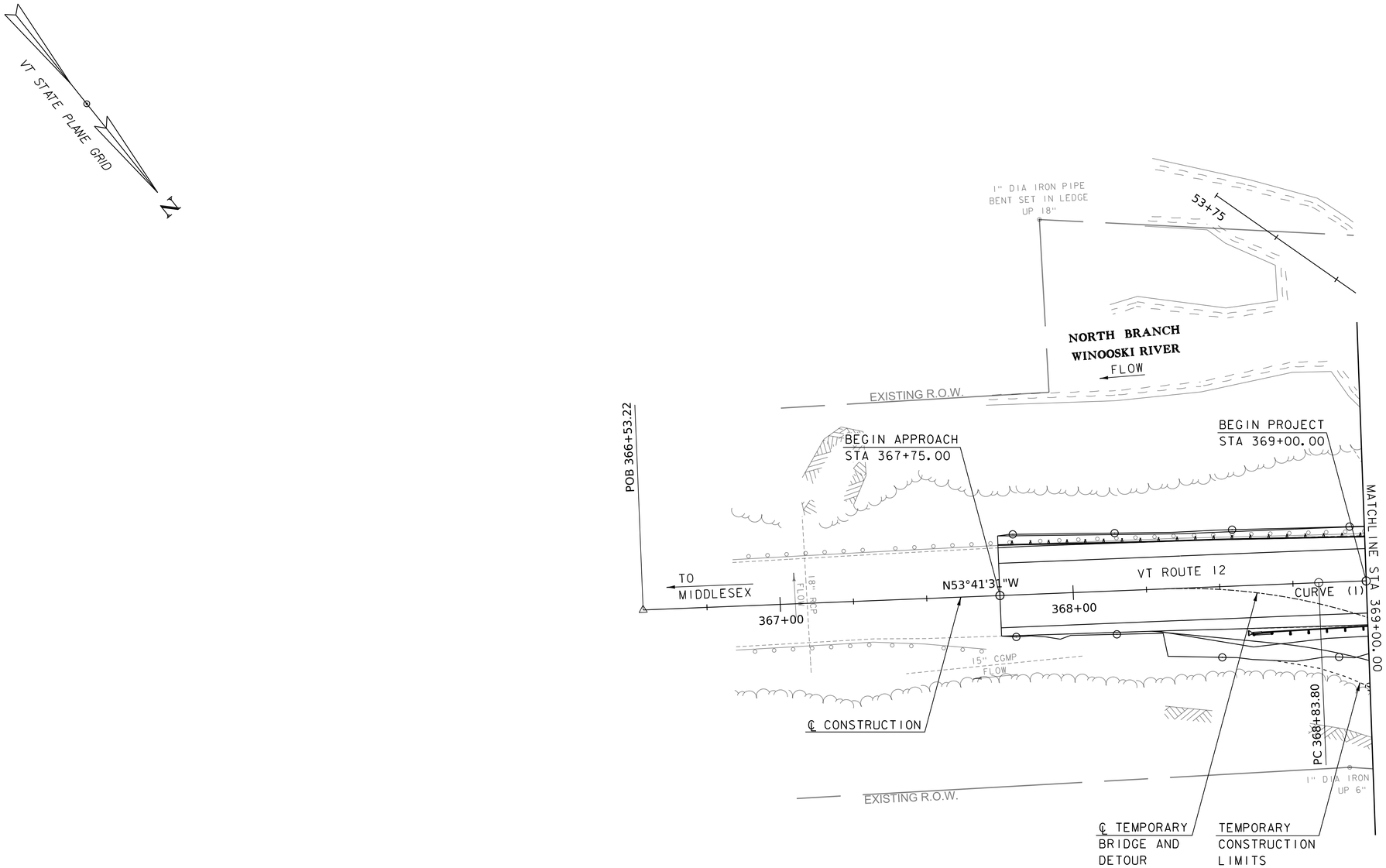


DATUM

VERTICAL	NAVD88
HORIZONTAL	NAD83(2011)
ADJUSTMENT	COMPASS

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME:	z19b214ti.dgn
PROJECT LEADER:	J.OLIN
DESIGNED BY:	N.CENTERBAR
TIE SHEET 2	
PLOT DATE:	25-MAY-2023
DRAWN BY:	P.DUSTIN
CHECKED BY:	S.HAAS
SHEET	156 OF 370



VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 24°18′49"
D = 01°32′47"
R = 3705.00′
T = 798.13′
L = 1572.23′
e = 84.99′

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 367+75.00, LT - STA 370+38.37, LT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 367+75.00, LT - STA 369+17.06, LT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 368+61.00, RT - STA 369+10.97, RT

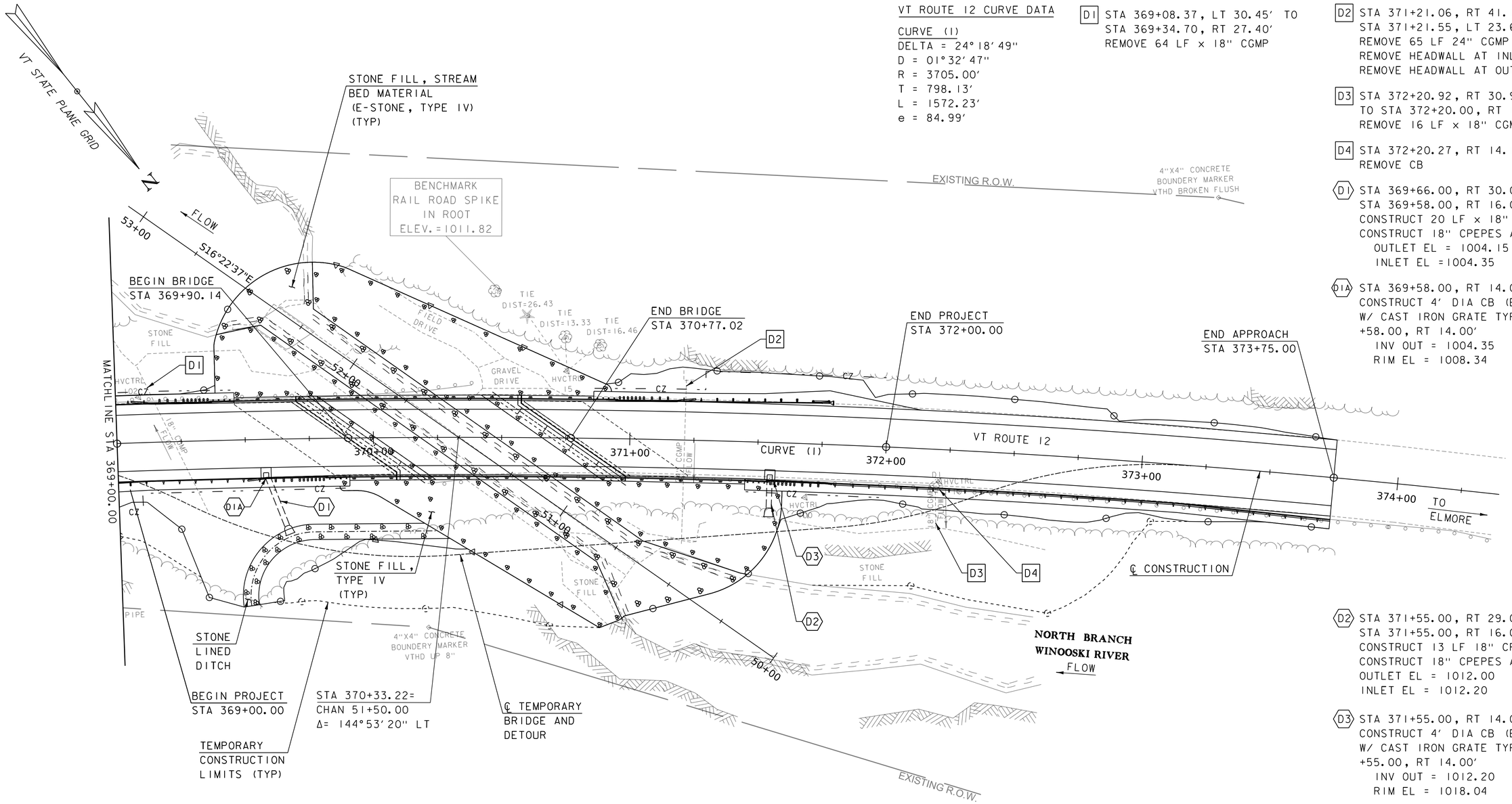
SCALE 1" = 20′-0"
20 0 20

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214bdr_lay.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
LAYOUT SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 157 OF 370



VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 24°18'49"
D = 01°32'47"
R = 3705.00'
T = 798.13'
L = 1572.23'
e = 84.99'

D1 STA 369+08.37, LT 30.45' TO STA 369+34.70, RT 27.40'
REMOVE 64 LF x 18" CGMP

D2 STA 371+21.06, RT 41.15' TO STA 371+21.55, LT 23.61'
REMOVE 65 LF 24" CGMP
REMOVE HEADWALL AT INLET
REMOVE HEADWALL AT OUTLET

D3 STA 372+20.92, RT 30.90' TO STA 372+20.00, RT 15.36'
REMOVE 16 LF x 18" CGMP

D4 STA 372+20.27, RT 14.15'
REMOVE CB

D1 STA 369+66.00, RT 30.00' TO STA 369+58.00, RT 16.00'
CONSTRUCT 20 LF x 18" CPEP
CONSTRUCT 18" CPEPES AT OUTLET
OUTLET EL = 1004.15
INLET EL = 1004.35

D1A STA 369+58.00, RT 14.00'
CONSTRUCT 4' DIA CB (ECCENTRIC) W/ CAST IRON GRATE TYPE D,
+58.00, RT 14.00'
INV OUT = 1004.35
RIM EL = 1008.34

D2 STA 371+55.00, RT 29.00' TO STA 371+55.00, RT 16.00'
CONSTRUCT 13 LF 18" CPEP
CONSTRUCT 18" CPEPES AT OUTLET
OUTLET EL = 1012.00
INLET EL = 1012.20

D3 STA 371+55.00, RT 14.00'
CONSTRUCT 4' DIA CB (ECCENTRIC) W/ CAST IRON GRATE TYPE D,
+55.00, RT 14.00'
INV OUT = 1012.20
RIM EL = 1018.04

EXISTING BRIDGE INFORMATION
15' x 20' CGMPP, 172' LONG
BUILT 1964
3' AVERAGE COVER
177 SQ.FT. WATERWAY AREA

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 370+21.09, RT - STA 373+75.00, RT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 369+11.42, RT - STA 369+61.61, RT
STA 371+14.56, LT - STA 371+27.01, LT
STA 371+74.13, RT - STA 373+75.00, RT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS W/8 FOOT POSTS)
STA 371+74.41, RT - STA 373+75.00, RT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 371+27.47, LT - STA 371+77.11, LT

GUARDRAIL APPROACH SECTION, GALVANIZED TWO RAIL BOX BEAM
STA 369+17.06, LT - STA 369+45.88, LT
STA 369+61.61, RT - STA 369+90.51, RT
STA 370+85.84, LT - STA 371+14.50, LT
STA 371+45.41, RT - STA 371+74.13, RT

BRIDGE RAILING, GALVANIZED TWO RAIL BOX BEAM
STA 369+45.88, LT - STA 370+85.84, LT
STA 369+90.51, RT - STA 371+45.41, RT

BITUMINOUS CONCRETE CURB, TYPE A
STA 371+79.97, RT - STA 373+75.00, RT

CAST-IN-PLACE CONCRETE CURB, TYPE B
STA 369+06.18, LT - STA 369+45.67, LT
STA 369+50.65, RT - STA 369+90.48, RT
STA 370+85.93, LT - STA 371+25.43, LT
STA 371+45.55, RT - STA 371+79.97, RT

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

HOYLE TANNER

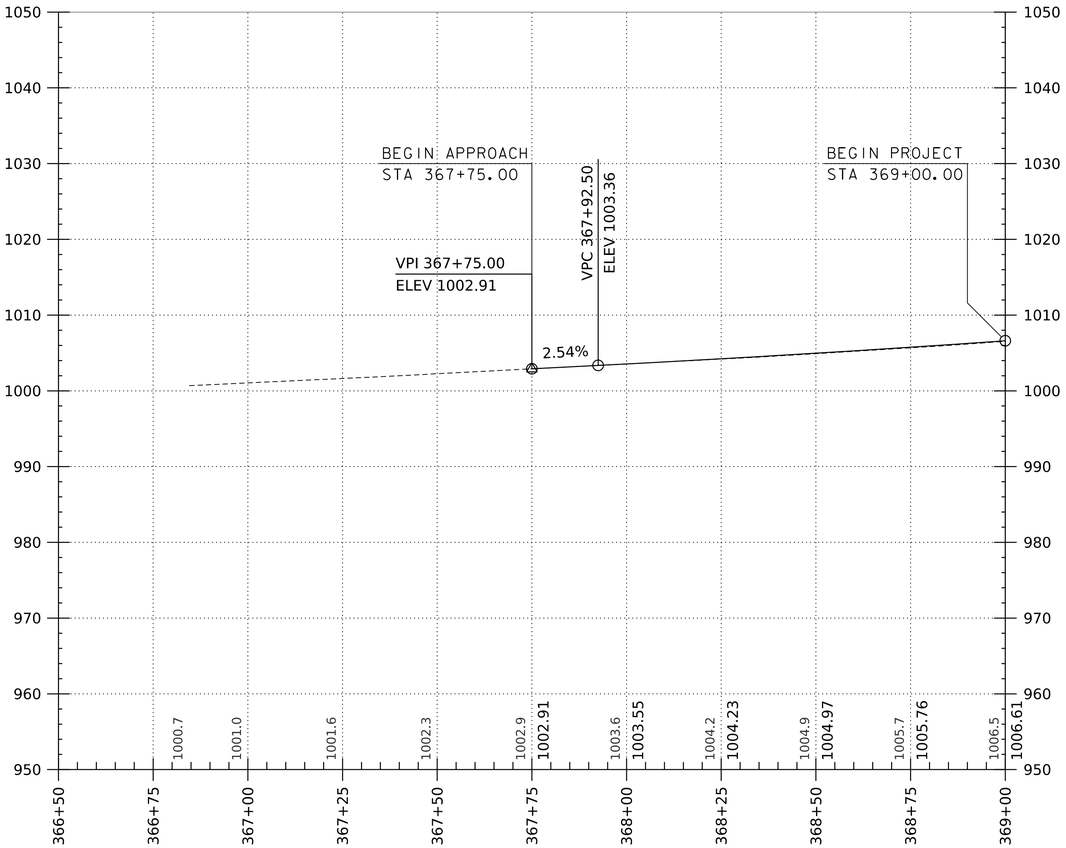
NOTES

1. CONTRACTOR SHALL GRADE STONE FILL TO MAINTAIN DRAINAGE 2' MIN. OFF OF FACE OF WINGWALLS.

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

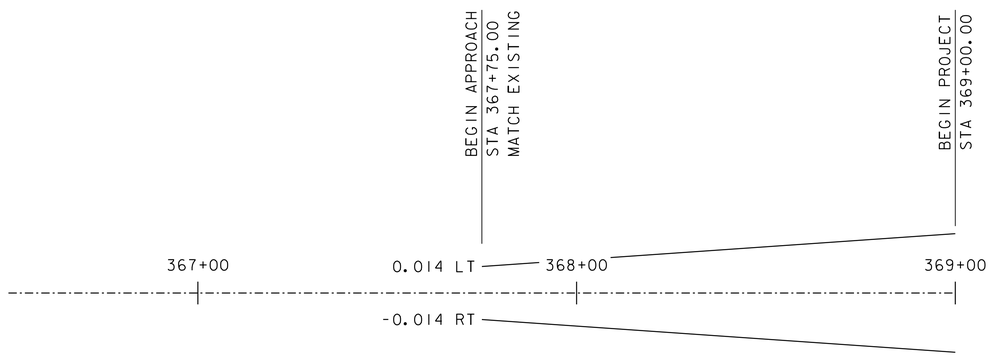
FILE NAME: z19b214bdr_lay.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
LAYOUT SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS



VT ROUTE 12 PROFILE

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



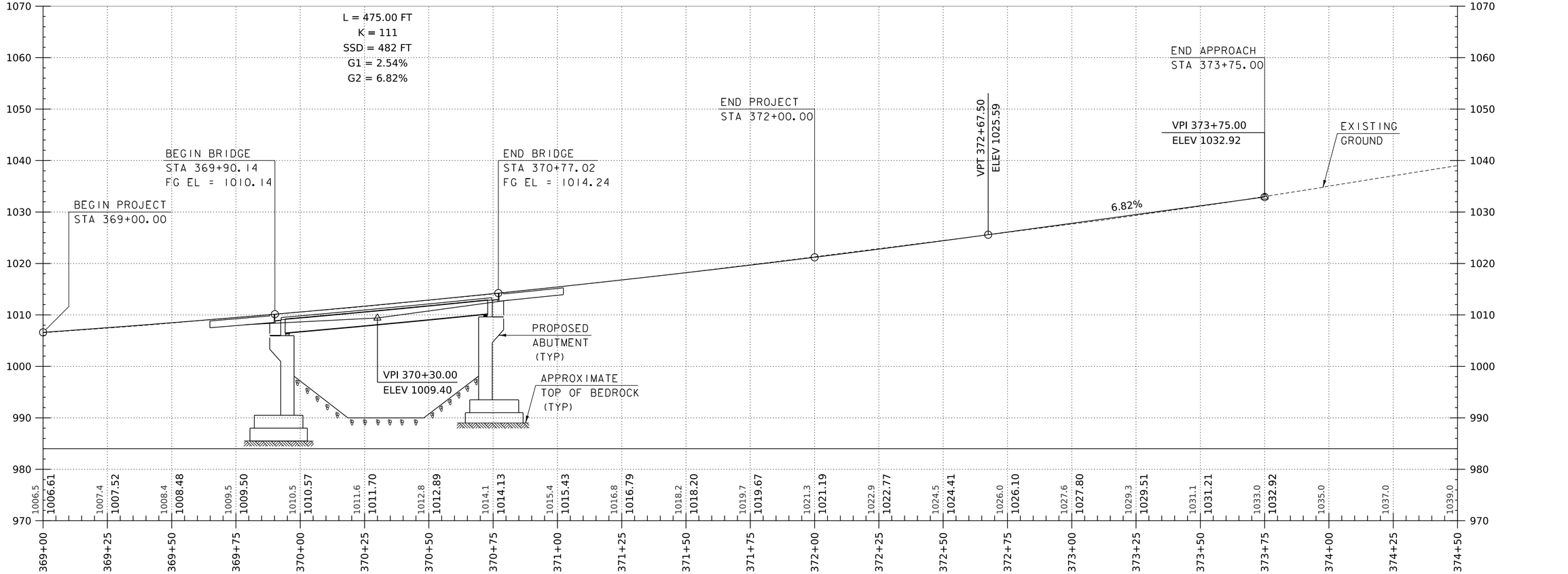
VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

HOYLE TANNER

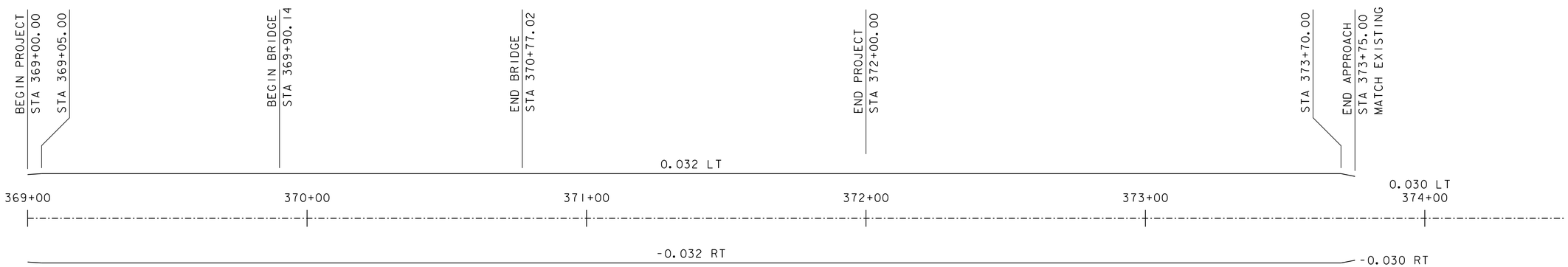
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET 1	SHEET 159 OF 370



VT ROUTE 12 PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

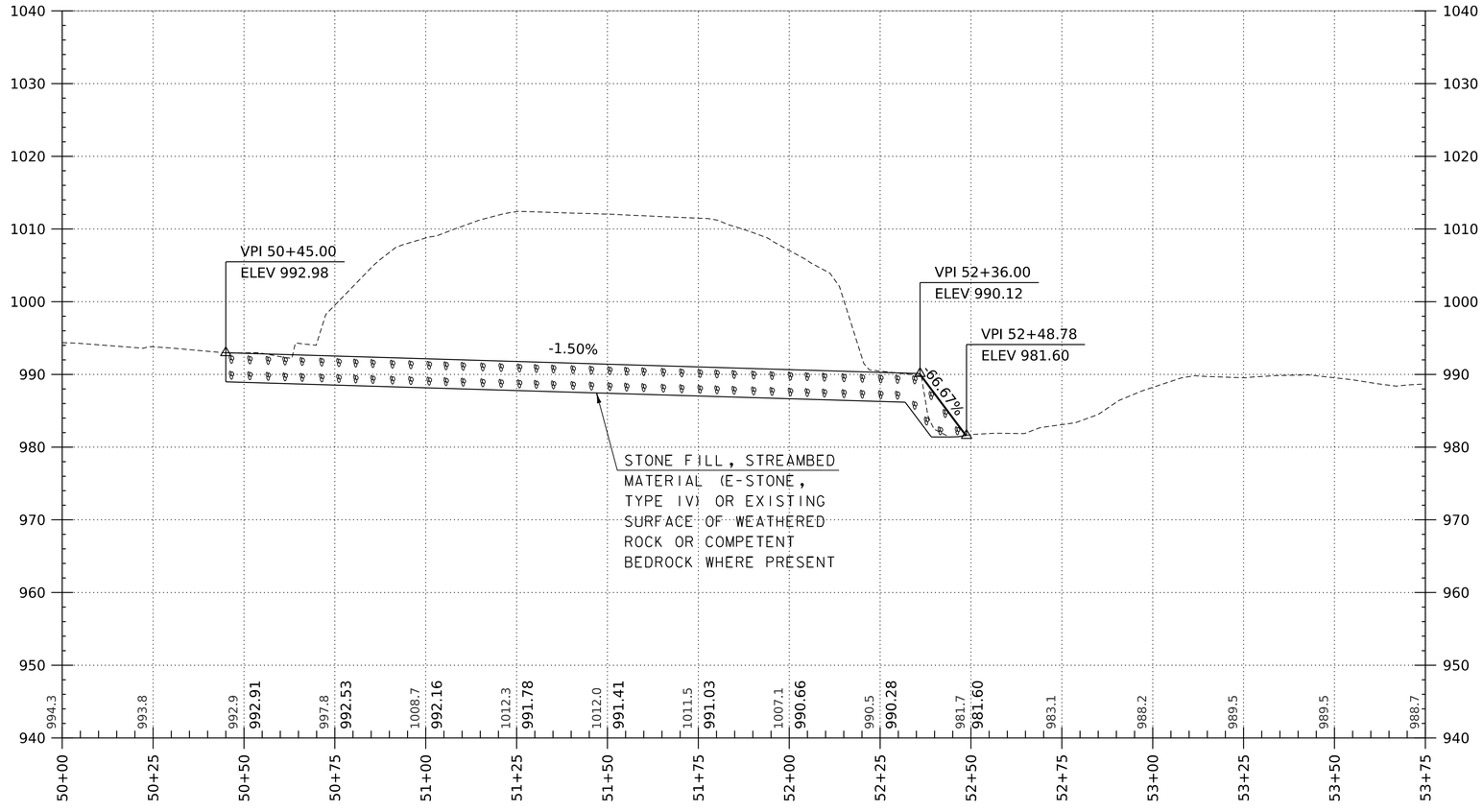


VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET 2	SHEET 160 OF 370



NORTH BRANCH STREAM PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214pro3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.SEMPRINI	CHECKED BY: E.WEINGARTNER
CHANNEL PROFILE SHEET	SHEET 161 OF 370

VT STATE PLANE GRID

N

W20-1a
ROAD WORK AHEAD
STA 337+89, LT & RT

G20-2
END ROAD WORK
STA 342+89, LT

W3-5
SPEED LIMIT 40
STA 342+89, RT

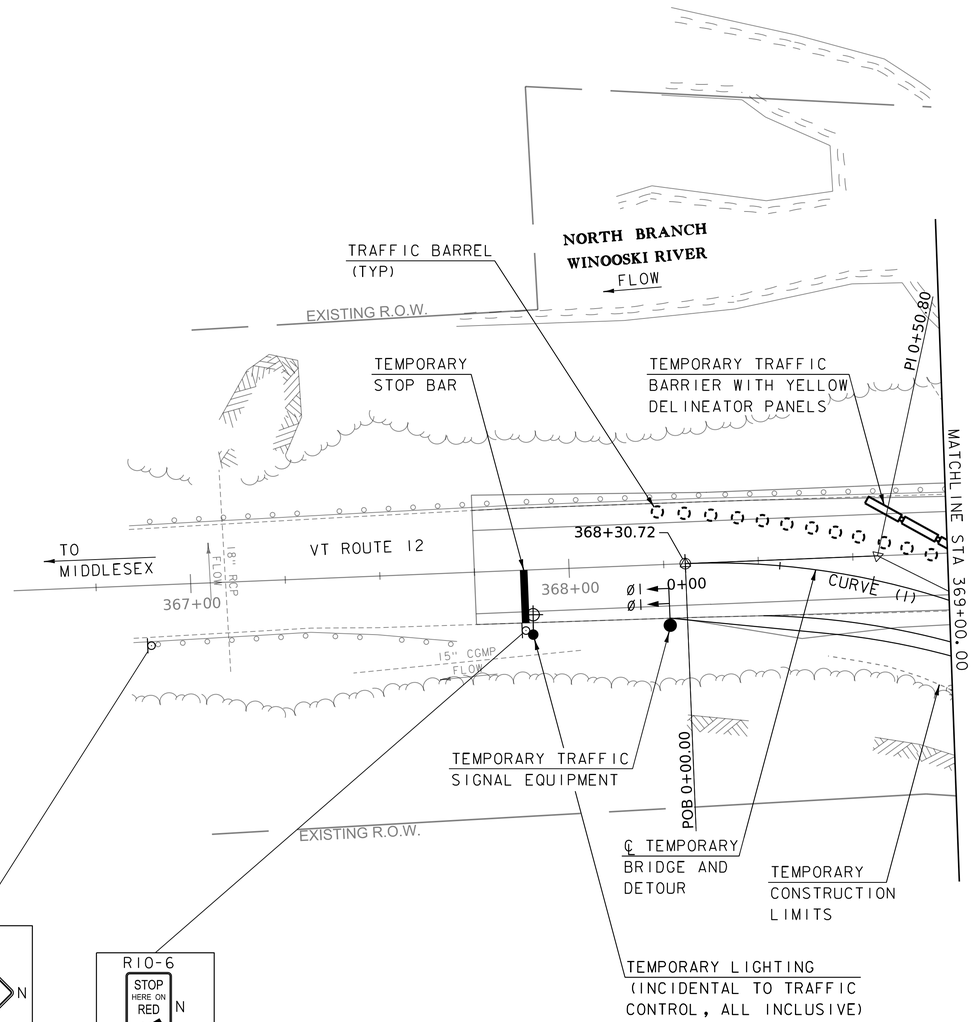
G20-5aP
R2-1
WORK ZONE
SPEED LIMIT 40
FINES DOUBLE
R2-6aP
STA 347+89, RT

R2-1
SPEED LIMIT 50
STA 347+89, LT

W20-4
ONE LANE ROAD AHEAD
STA 352+89, RT

W3-3
1000 FT
W16-2aP
STA 357+89, RT

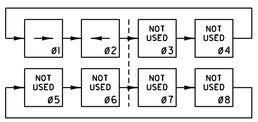
W24-1R
25 MPH
W13-1P
STA 362+89, RT



W11-1
IN LANE
STA 365+39, RT

R10-6
STOP HERE ON RED
STA 367+89, RT

NEMA STD 8Ø CONTROLLER



SIGNAL PHASING		
	Ø1	Ø2
TIMING IN SECONDS	→	←
INITIAL INTERVAL	10	10
VEHICLE EXTENSION	3	3
MAX 1	15.5	15.5
YELLOW	4.5	4.5
ALL RED	2.0	2.0
RECALL	OFF	OFF
DETECTOR MEMORY	L	L
FLASH	RED	RED

MAX 1: ALL TIME PERIODS

NOTES

1. TEMPORARY SIGNAL SHALL REST IN RED FOR Ø1 AND Ø2.
2. TEMPORARY SIGNAL SHALL PROVIDE BICYCLE DETECTION FOR Ø1 AND Ø2.
3. TEMPORARY SIGNAL SHALL BE CAPABLE OF DETECTING SLOW MOVING VEHICLES AND BICYCLES WITHIN THE WORK ZONE TO EXTEND THE ALL RED TIME TO PROVIDE SAFE PASSAGE.

DETOUR ROAD CURVE DATA

CURVE (1)
DELTA = 28°46'47"
D = 28°56'14"
R = 198.00'
T = 50.80'
L = 99.46'
E = 6.41'

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

HOYLE TANNER

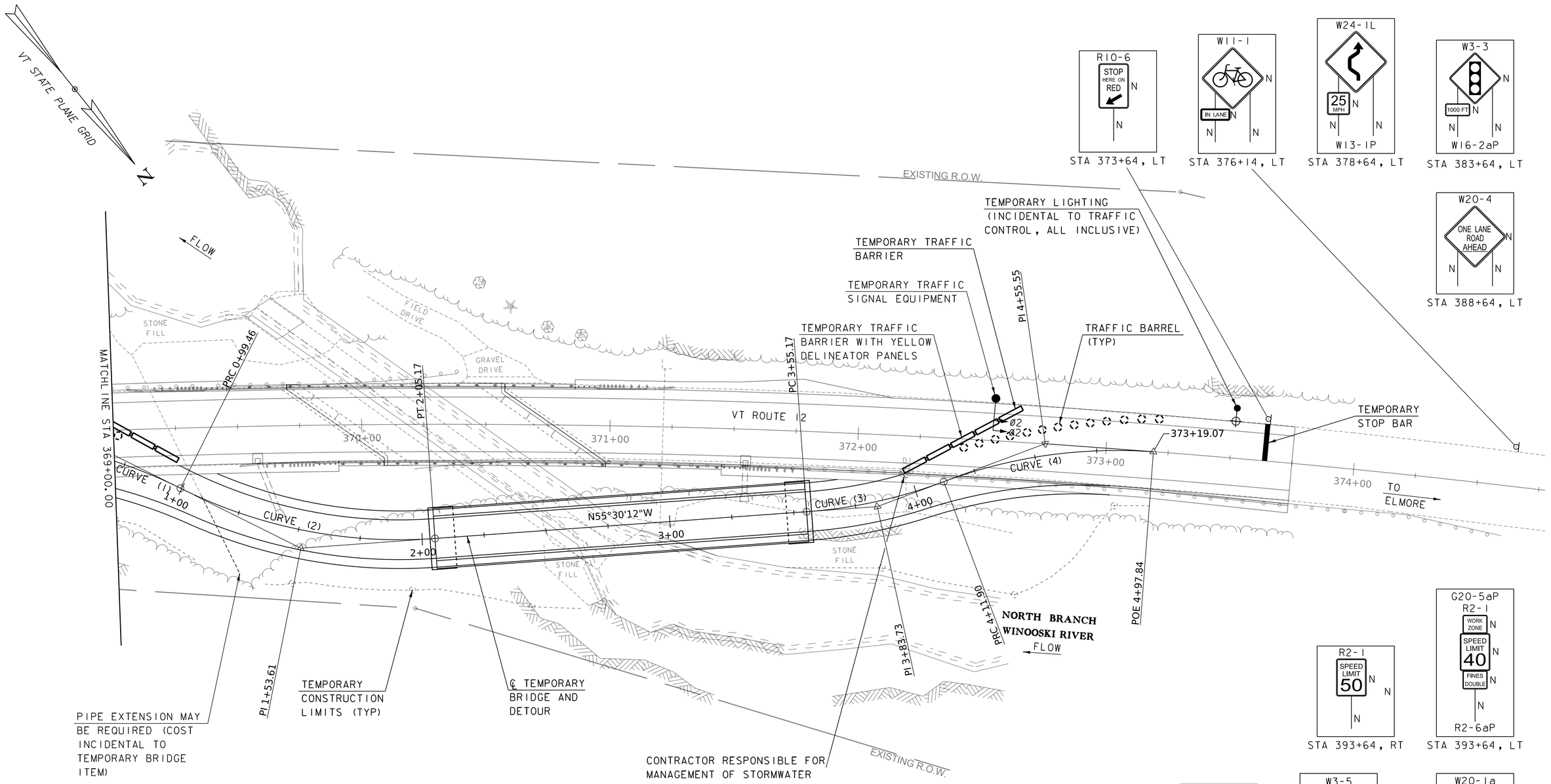
TRAFFIC CONTROL NOTES

1. TRAFFIC CONTROL SHEETS 1 AND 2 ARE CONCEPTUAL. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY TRAFFIC CONTROL PLANS PER 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE.
2. CONTRACTOR SHALL UTILIZE YELLOW TEMPORARY TYPE C TAPE TO CHANGE PASSING ZONE PAVEMENT MARKINGS WITHIN 1,000 FEET OF THE WORK ZONE TO A DOUBLE YELLOW CENTERLINE. CONTRACTOR SHALL ALSO COVER EXISTING SIGNAGE PERTAINING TO THESE PASSING ZONES WITHIN 1,000 FEET OF THE WORK ZONE.

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 162 OF 370



DETOUR ROAD CURVE DATA

CURVE (1)	CURVE (2)	CURVE (3)	CURVE (4)
DELTA = 28°46'47"	DELTA = 30°35'28"	DELTA = 16°24'56"	DELTA = 24°52'05"
D = 28°56'14"	D = 28°56'14"	D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'	R = 198.00'	R = 198.00'
T = 50.80'	T = 54.15'	T = 28.56'	T = 43.66'
L = 99.46'	L = 105.72'	L = 56.73'	L = 85.94'
E = 6.41'	e = 7.27'	E = 2.05'	E = 4.76'

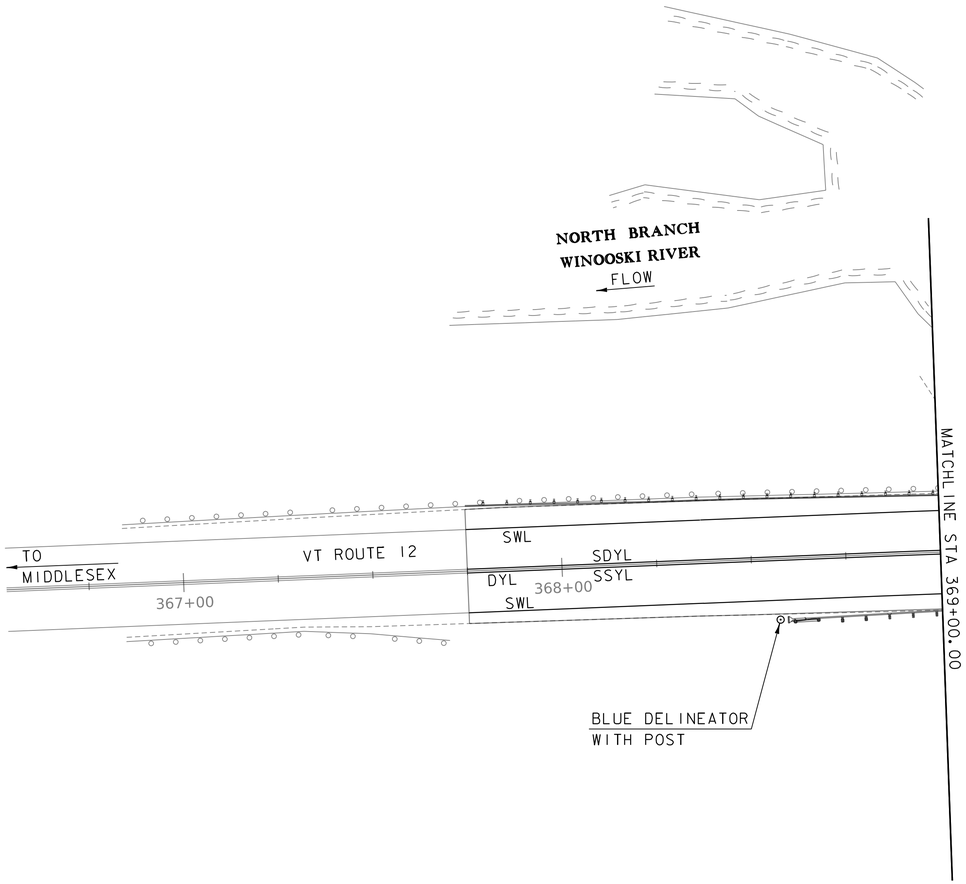
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214bdr_tcp.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
TRAFFIC CONTROL SHEET 2	SHEET 163 OF 370

VT STATE PLANE GRID

N



LEGEND

R	REMOVE
R&S	REMOVE & SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

4" WHITE LINE
STA 367+75 - STA 373+75, LT & RT

4" YELLOW LINE
STA 367+75 - STA 368+00, ℄ (DOUBLE)
STA 368+00 - STA 373+50, ℄ (DASHED)
STA 368+00 - STA 373+50, ℄

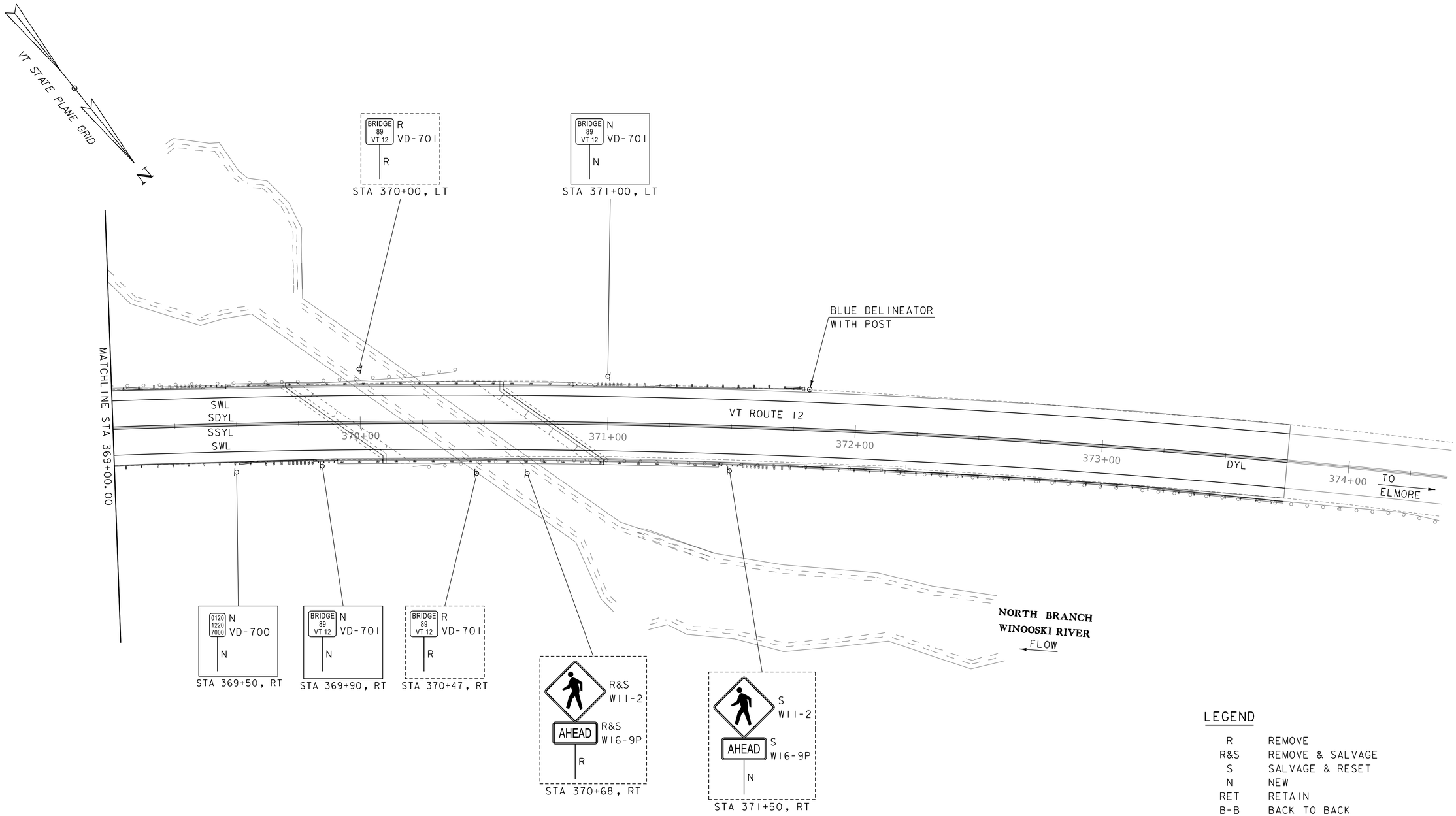
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 164 OF 370



LEGEND

R	REMOVE
R&S	REMOVE & SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 165 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

MILE MARKER, STATION OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																						REMARKS	SIGN DETAIL	
											NO. OF	FLANGED CHANNEL			SQUARE STEEL (in)					TUBULAR ALUMINUM Ø (IN)				TUBULAR STEEL Ø (IN)				W-SHAPE STEEL							
															1.75	2.00	2.50			3.00	4.00	4.0 MOD		3.00	3.50	4.00	5.00	FTG. SIZE							
		EACH	WIDTH (in)	HEIGHT (in)	"A"	"B"	SALV SIGN	SALV TIS	RETAIN	SALVAGE	POST	(LB / FT) 1.12	2.00	3.00	(LB / FT) 1.88	2.42	3.35	ANCHOR	SLEEVE	(LB / FT) 1.30	1.70	1.70	FOUNDATION	(LB / FT) 7.60	9.00	10.80	14.60	24"	30"	WEIGHT	POST SIZE	SIGN FRAME REQUIRED		DETAIL ON SHEET NUMBER	STANDARD SHEET NUMBER
OPTION ITEMS																																			
369+50, RT	0120 1220 7000	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-700		T-44
369+90, RT	BRIDGE 89 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-701		T-42
371+00, LT	BRIDGE 89 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-701		T-42
371+50, RT		1	30.0	30.0			x				1.0					15.0		X	X														W11-2		
371+50, RT	AHEAD	1	24.0	12.0			x				0.0																						W16-9P (MOUNT WITH W11-2)		

	FLANGED CHANNEL 1.12	2.00	3.00	SQUARE STEEL 1.88	2.42	3.35	ANCHOR	SLEEVE	TUB. AL. 1.30	1.70	1.70	FOUNDATION	TUB. STEEL 7.60	9.00	10.80	14.60
Units	FT	FT	FT	FT	FT	FT	XXXXX	EA	LB	LB	LB		LB	LB	LB	LB
Subtotal	.	.	.	24.	15.	.	XXXXX	.	.	.	.		.	.	.	.

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

TOTALS	"A"	"B"	SALV SIGN	SALV TIS	EXIST POST / NO. OF POST	FLANGED CHANNEL	SQUARE STEEL	TUBULAR ALUMINUM	FOUNDATION	TUBULAR STEEL	24"	30"	WEIGHT
Units	SF	SF	EA.	SF	XXXXXXXXXXX	FT	FT	LB	EA.	LB	EA.	EA.	LB
Total	1.2	.	.	.	XXXXXXXXXXX	.	39.	.		.	.	.	.

HOYLE TANNER

PROJECT NAME: WORCESTER	
PROJECT NUMBER: BF 0241(57)	
FILE NAME: z19b214tss.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: Z.ROUSSEL	CHECKED BY: S.HAAS
TRAFFIC SIGN SUMMARY SHEET	SHEET 166 OF 370

SOIL CLASSIFICATION

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

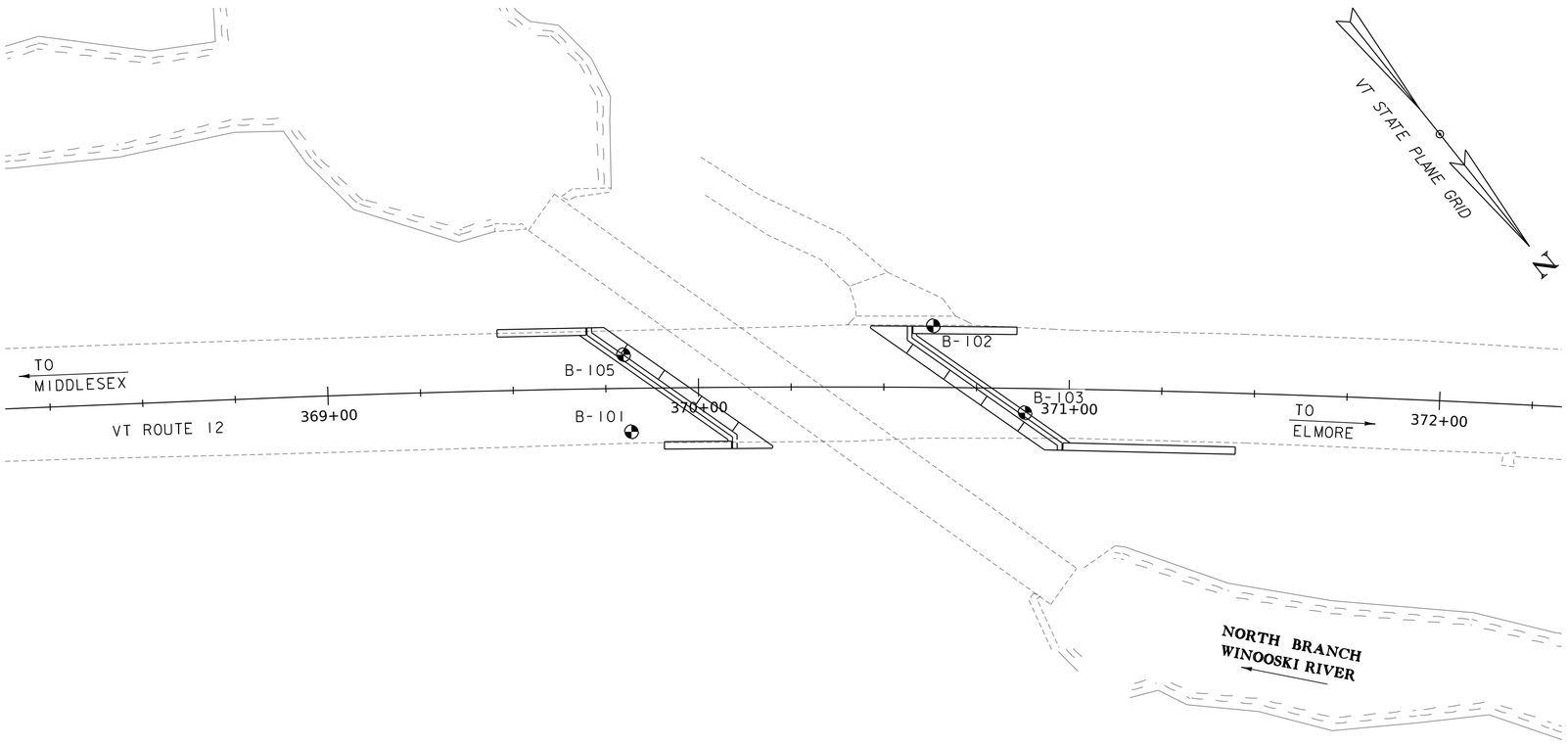
CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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

COMMONLY USED SYMBOLS

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

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



BORING LAYOUT

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB
B-101	369+82	12 RT	707437.54	1629998.53	1009.5	988.5
B-102	370+63	17 LT	707466.06	1629917.08	1014.0	989.5
B-103	370+88	8 RT	707499.80	1629912.40	1014.6	992.1
B-105	369+80	9 LT	707419.98	1629987.25	1009.9	985.9

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.

1. The subsurface explorations shown herein were made between February 2021 and August 2021 and overseen by Haley & Aldrich, Inc.

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

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

GENERAL NOTES

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

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

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

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

HOYLE TANNER

0 20 40
SCALE IN FEET

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

FILE NAME: z19b214bor.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
BORING INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P. DUSTIN
CHECKED BY: A.SPIELER
SHEET 167 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100
Worcester Bridge 89

Boring No.: **B-101**
Page No.: 1 of 2
Pin No.: 19B214
Checked By: Erickson

Boring Crew: Hollauer, Hoecklele, Hollauer
Date Started: 2/24/21 Date Finished: 2/26/21
VTSPG NAD83: N 707437.54 ft E 1629998.53 ft
Station: 369+82 Offset: 12R
Ground Elevation: 1009.5 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig: MOBILE Drill B-53	C_E = 1.56	

Groundwater Observations		
Date	Depth (ft)	Notes
02/26/21	14.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		0.0 ft - 0.5 ft, ASPHALT. Augered to 2.0 ft through frost								
		0.5 ft - 3.0 ft, Frost/frozen soil								
2.5		(FILL) Poorly-graded SAND (SP-SM), Dry, Rec. = 0.2 ft, 2.0 ft, Very dense, augered to 3.0 ft through frost (FILL)				75/2" (100+)				
		(FILL) Silty SAND with Gravel (SM), Dark gray-brown, Dry, Rec. = 0.58 ft, 3.0 ft - 14.0 ft, Very dense, mps 1.5 in. (FILL)				52 (100+)				
5.0		(FILL) Silty SAND with Gravel (SM), Dark gray-brown, Sl. Moist, Rec. = 1.67 ft, 4.0 ft, Very dense, mps 1.5 in. (FILL)				35-23-45-26 (68)				
7.5		(FILL) Same as S3, except medium dense (FILL), Rec. = 0.5 ft, 6.0 ft				6-5-7-4 (12)				
		(FILL) Same as S3, except medium dense (FILL), Rec. = 0.83 ft, 8.0 ft				5-7-9-10 (16)				
10.0		(FILL) Same as S3, except medium dense (FILL), Rec. = 1.0 ft, 10.0 ft				9-5-4-7 (9)				
12.5		Note: 1.5 in gravel in spoon tip, fines washed out., Rec. = 0.2 ft, 12.0 ft				3-4-3-5 (7)				
		Note: Drilling water loss at approximately 14 ft depth., 13.5 ft								
15.0		(FILL) Poorly-graded GRAVEL with Silt and Sand (GP-GM), Brown-gray, Wet, Rec. = 0.67 ft, 14.0 ft - 16.0 ft, Medium dense (FILL)				4-4-11-9 (15)				
17.5		A-2-4, Silty SAND (SM), Brown, Wet, Rec. = 1.0 ft, Loose, mps 2 mm (FLUVIAL DEPOSITS)				5-5-3-3 (8)				
20.0		A-3, Poorly-graded SAND with Gravel (SP), Brown, Rec. = 1.0 ft, Medium dense, mps 0.75 in. (FLUVIAL DEPOSITS)				10-6-7-15 (13)				
		20.8 ft - 21.0 ft, Top of Weathered Rock								
		21.0 ft - 22.0 ft, Top of Competent Rock								
22.5		22.0 ft - 31.5 ft, Gray-green, GRANOFELS, fine-grained, highly fractured. Primary joints dipping at high angles following foliation, spaced very to moderately close, undulating, smooth, tight to open.. Moderately hard, Fresh to slightly weathered, NQ, No staining of fracture surfaces, but rock soft/weathered at fractures 1.2 ft of rock not recovered from R1. (MORETOWN FORMATION)	R1	63 (30)	5 6 6					

Top of Bedrock @ 21.0 ft

BOTTOM OF
FOOTING
EL 988.00

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR89.GPJ_VERMONT AOT.GDT 3/3/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100
Worcester Bridge 89

Boring No.: **B-101**
Page No.: 2 of 2
Pin No.: 19B214
Checked By: Erickson

Boring Crew: Hollauer, Hoecklele, Hollauer
Date Started: 2/24/21 Date Finished: 2/26/21
VTSPG NAD83: N 707437.54 ft E 1629998.53 ft
Station: 369+82 Offset: 12R
Ground Elevation: 1009.5 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig: MOBILE Drill B-53	C_E = 1.56	

Groundwater Observations		
Date	Depth (ft)	Notes
02/26/21	14.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		25.0 ft, Boring reamed out, had to rollerbit through rock core to advance casing. Since soil fell into casing and core socket, the hole was cleaned out and reamed to 26.5 ft.. Unrecovered 1.2 ft of core from R1 rollerbit through. Drill cuttings same as rock.			14 6					
27.5		26.5 ft, Same as R1, except highly to moderately fractured with a water bearing and iron-stained moderately weathered zone form 29.0 to 29.3 ft. Contact at 29.3 ft with hard, moderately weathered, gray and highly iron stained QUARTZITE.. NQ, Primary joints dipping at horizontal angles, spaced extremely to very close spacing, rough, open. (MORETOWN FORMATION) 28.0 ft, Weathering highest at contact.	R2	85 (40)	3 4 3 3					
30.0		Hole stopped @ 31.5 ft								
32.5										
35.0										
37.5										
40.0										
42.5										
45.0										
47.5										

Remarks:
Core hole backfilled with bentonite. Overburden backfilled with drill cuttings and sand. Capped with approximately 1 ft cold patch.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR89.GPJ_VERMONT AOT.GDT 3/3/22

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

FILE NAME: z19b214log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
BORING LOGS I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100
Worcester Bridge 89

Boring No.: **B-102**
Page No.: 1 of 2
Pin No.: 19B214
Checked By: Erickson

Boring Crew: Hollauer, Hoecklele, Hollauer
Date Started: 2/26/21 Date Finished: 3/01/21
VTSPG NAD83: N 707466.06 ft E 1629917.08 ft
Station: 370+63 Offset: 17L
Ground Elevation: 1014.0 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig: MOBILE Drill B-53	C_E = 1.56	

Groundwater Observations

Date	Depth (ft)	Notes
02/26/21	21.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		0.0 ft - 0.5 ft, ASPHALT, augered through frost to 2 ft								
		0.5 ft - 6.0 ft, Frost from 0 to approximately 5 ft								
2.5		(FILL) Poorly-graded SAND (SP-SM), Gray-brown, Dry, 2.0 ft, Very dense, mps 0.15 in., due to high casing blows, decided not to sample from 2 to 4 ft (FILL)				50/2"				
5.0		(FILL) Poorly-graded SAND (SP-SM), Gray-brown, Dry, Rec. = 1.33 ft, 4.0 ft, Dense, mps 0.25 in. (FILL)				32-26-20-27 (46)				
7.5		(FILL) Silty SAND with Gravel (SP), Brown and gray, Dry, Rec. = 1.67 ft, 6.0 ft - 14.0 ft, Very dense, mps 1.5 in. (FILL)				39-29-33-44 (62)				
		(FILL) Same as S3, weathered cobble 8.5 to 9 ft, very dense (FILL), Rec. = 1.0 ft, 8.0 ft				12-44-14-20 (58)				
10.0		(FILL) Same as S3, medium dense, weathered cobble between 10 and 10.5 ft (FILL), Rec. = 0.83 ft, 10.0 ft				21-14-10-8 (24)				
12.5		(FILL) Silty SAND (SP), Gray-brown, Moist, Rec. = 0.83 ft, 12.0 ft, Very dense, mps 0.5 in., cobble fragments from 11 to 12 ft (FILL)				11-14-40-64 (54)				
15.0		(FILL) Silty GRAVEL with Sand (GM), Gray-brown, Wet, Rec. = 1.17 ft, 14.0 ft - 21.2 ft, Medium dense, mps 1.5 in. (FILL)				13-9-7-5 (16)				
17.5		(FILL) Same as S7, except very loose, trace wood in wash water (FILL), Rec. = 0.1 ft, 16.0 ft				3-1-1-5 (2)				
		(FILL) Same as S7, except dense (FILL), Rec. = 0.5 ft, 18.0 ft				8-11-24-9 (35)				
20.0		(FILL) Rock fragments, broken, Rec. = 0.67 ft, 20.0 ft				6-6-100/2"				
22.5		Rock fragments, broken. Roller bit to 25.0 ft (WEATHERED FRACTURE ZONE). Drill cuttings were moderately weathered rock fragments., 21.2 ft - 24.5 ft Rec. = 0.3 ft				50/3"				
		24.5 ft - 25.0 ft, Drill cuttings were competent/fresh rock fragments., Top of Bedrock @ 24.5 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 280767_VTTRANS_WORCESTER-ELMORE BR89.GPJ VERMONT AOT.GDT 3/3/22

BOTTOM OF
FOOTING
EL 991.00

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100
Worcester Bridge 89

Boring No.: **B-102**
Page No.: 2 of 2
Pin No.: 19B214
Checked By: Erickson

Boring Crew: Hollauer, Hoecklele, Hollauer
Date Started: 2/26/21 Date Finished: 3/01/21
VTSPG NAD83: N 707466.06 ft E 1629917.08 ft
Station: 370+63 Offset: 17L
Ground Elevation: 1014.0 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig: MOBILE Drill B-53	C_E = 1.56	

Groundwater Observations

Date	Depth (ft)	Notes
02/26/21	21.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Top of Competent Rock	R1	100 (75)	3					
27.5		25.0 ft - 35.0 ft, Gray-green, GRANOFELS, Hard to moderately hard, fine-grained, slightly fractured, most fracture surfaces iron stained. Primary joints dipping at low angles, spaced extremely close to close, stepped, rough, moderately tight to open.. Hard to moderately hard, NQ, Pyrite crystals in rock. (MORETOWN FORMATION) 28.0 ft, Drillers ran out of water. Water lost from 27 to 29 ft in multiple fracture zones.			4 3 3					
30.0		29.2 ft, QUARTZITE, Core barrel jammed. Hard, slightly to moderately weathered, fine-grained, very highly fractured, fracture surfaces iron stained. Few weathered vug areas in rock.. Hard, Slightly to moderately weathered, NQ	R2 R3	100 (0) 90 (87)	2					
		29.9 ft, Same as R1, no pyrite, slight iron staining. (MORETOWN FORMATION). NQ			4 3					
32.5		32.5 ft, GRANOFELS AND QUARTZITE, Hard to very hard, fresh to slightly weathered, fine-grained. Quartzite white. Slightly fractured to massive. Few fracture surfaces show weathering. Primary joints dipping at horizontal to low angles, spaced moderately close to open, stepped, rough.. Hard to very hard, Fresh to slightly weathered, NQ, Few weathered vug areas. (MORETOWN FORMATION)	R4	87 (87)	2 5 4					
35.0		Hole stopped @ 35.0 ft								
37.5										
40.0										
42.5										
45.0										
47.5										

Remarks:
Core hole backfilled with bentonite. Overburden backfilled with drill cuttings and sand. Capped with approximately 1.5 ft cold patch.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 280767_VTTRANS_WORCESTER-ELMORE BR89.GPJ VERMONT AOT.GDT 3/3/22

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

FILE NAME: z19b214log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
BORING LOGS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 169 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100 BR 89
Worcester, Vermont

Boring No.: **B-103**
Page No.: 1 of 2
Pin No.: 19B214
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/04/21 Date Finished: 8/04/21
VTSPG NAD83: N 707499.80 ft E 1629912.40 ft
Station: 370+88 Offset: 8R
Ground Elevation: 1014.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/04/21	16.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.5 ft								
		(Fill) Poorly-graded SAND with Silt and Gravel (SP-SM), dense, gray-brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.3 ft, 0.5 ft - 3.0 ft				28-23-24-26 (47)		52.2	40.0	7.8
2.5										
		(Fill) Silty SAND with Gravel (SM), medium dense, gray-brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.3 ft, 3.0 ft - 7.0 ft				10-14-12-15 (26)				
5.0		(Fill) Silty SAND with Gravel (SM), medium dense, gray-brown, moist, no structure, no odor, mps 0.75 in., Rec. = 1.6 ft, 5.0 ft				6-11-7-10 (18)		41.6	45.2	13.2
7.5		(Fill) Silty SAND (SM), dense, gray-brown, moist, no structure, no odor, mps 0.75 in., Rec. = 1.75 ft, 7.0 ft - 10.0 ft				15-16-25-49 (41)				
10.0		(Fill) Silty SAND with Gravel (SM), medium dense, gray-brown, moist, no structure, no odor, mps 0.75 in., 10.0 ft - 20.0 ft				7-7-7-7 (14)		48.8	37.6	13.6
12.5										
15.0		(Fill) Poorly-graded SAND with Gravel (SP), loose, gray-brown, wet, no structure, no odor, mps 0.75 in., Rec. = 1.1 ft, 15.0 ft				3-4-5-30 (9)		43.9	45.8	10.3
17.5										
20.0		Broken rock fragments (Weathered Bedrock), 20.0 ft - 22.5 ft Rec. = 0.5 ft				3-4-11-50/0.1' (15)				

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200787_VTTRANS_PH2 BR 89.GPJ VERMONT AOT.GDT 3/23/22

BOTTOM OF
FOOTING
EL 993.50

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100 BR 89
Worcester, Vermont

Boring No.: **B-103**
Page No.: 2 of 2
Pin No.: 19B214
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/04/21 Date Finished: 8/04/21
VTSPG NAD83: N 707499.80 ft E 1629912.40 ft
Station: 370+88 Offset: 8R
Ground Elevation: 1014.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/04/21	16.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
22.5		Casing advanced and had refusal at 22.5 ft on possible competent rock. Advanced rollerbit to 24 ft, 22.5 ft - 24.0 ft				Top of Bedrock @ 22.5 ft				
25.0		24.0 ft - 29.0 ft, Green-gray, GRANOFELS, aphanitic, moderately hard, slightly to moderately weathered. Joints dipping at high to vertical angles, close, smooth, tight. No discernible secondary joint set. Poor Rock, NQ, RMR=34 (MORETOWN FORMATION)	C1	78 (47)	1 1 1.5 1.5 1.5					
27.5										
30.0		29.0 ft - 34.0 ft, Green-gray, GRANOFELS, aphanitic, moderately hard, slightly to moderately weathered. Joints dipping at high to vertical angles, close to moderate, smooth, tight to open. No discernible secondary joint set. Poor Rock, NQ, RMR=39 (MORETOWN FORMATION)	C2	97 (63)	1 1 1 1.5 1.5					
32.5										
35.0		Remarks: Boring backfilled with cuttings, cold patch at 1.1 ft. AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.								
37.5		37.0 ft Hole stopped @ 34.0 ft								
40.0										
42.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200787_VTTRANS_PH2 BR 89.GPJ VERMONT AOT.GDT 3/23/22

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

FILE NAME: z19b214log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
BORING LOGS 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 170 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100 BR 89
Worcester, Vermont

Boring No.: **B-105**
Page No.: 1 of 2
Pin No.: 19B214
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/04/21 Date Finished: 8/04/21
VTSPG NAD83: N 707419.98 ft E 1629987.25 ft
Station: 369+80 Offset: 9L
Ground Elevation: 1009.9 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/04/21	16.7	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.4 ft								
		(Fill) Silty SAND with Gravel (SM), very dense, gray-brown, dry, no structure, no odor, mps 0.75 in., 0.4 ft - 7.0 ft Rec. = 1.5 ft				22-24-52-50/0.3" (76)				
2.5		(Fill) Silty SAND with Gravel (SM), very dense, gray-brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.5 ft, 3.0 ft				12-19-32-18 (51)		51.0	36.5	12.5
5.0		(Fill) Silty SAND with Gravel (SM), dense, gray-brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.6 ft, 5.0 ft				23-22-14-9 (36)				
7.5		(Fill) Well-graded SAND with Silt and Gravel (SW-SM), loose, brown, dry, no structure, no odor, mps 2 mm, Rec. = 1.5 ft, 7.0 ft - 10.0 ft				6-5-3-5 (8)		40.3	49.2	10.5
10.0		(Fill) Silty SAND (SM), medium dense, brown, moist, no structure, no odor, mps 0.5 in., Rec. = 1.3 ft, 10.0 ft - 16.6 ft				7-11-4-7 (15)		16.3	66.9	16.8
12.5		Note: Drilling action indicated a cobble from 14.4 to 14.9 ft., 14.4 ft								
15.0						7-11-50-23 (61)		52.5	37.7	9.8
17.5		A-3, Well-graded SAND with Silt and Gravel (SW-SM), very dense, gray-brown, wet, no structure, no odor, mps 0.75 in. (Fluvial Deposits), 16.6 ft - 19.5 ft								
20.0		Sample retrieved pieces of weathered bedrock. (Weathered Bedrock), 19.5 ft - 24.0 ft Rec. = 0.75 ft				7-16-19-30 (35)				

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
FOOTING
EL 988.00

BORING LOG 20076?_VTTRANS_PH 2 BR 89.GPJ VERMONT AOT.GDT 3/3/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241057-100 BR 89
Worcester, Vermont

Boring No.: **B-105**
Page No.: 2 of 2
Pin No.: 19B214
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/04/21 Date Finished: 8/04/21
VTSPG NAD83: N 707419.98 ft E 1629987.25 ft
Station: 369+80 Offset: 9L
Ground Elevation: 1009.9 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/04/21	16.7	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
22.5										
25.0		24.0 ft - 29.0 ft, Gray, GRANOFELS, aphanitic to fine grained, moderately hard, slightly to highly weathered. Joints dipping at high angles following foliations, close, undulating, smooth, tight to open, highly weathered zone from 27.4 to 28.0 ft. Poor Rock, NQ, RMR=33 (MORETOWN FORMATION)	C1	77 (53)	1.5 1.5 1.5 1 1.5	Top of Bedrock @ 24.0 ft				
27.5										
30.0		29.0 ft - 34.0 ft, Gray-green, SCHIST and QUARTZITE, aphanitic to fine grained, soft to moderately hard, moderately to highly weathered. Joints vertical, open. Very Poor Rock, NQ, RMR=12 (MORETOWN FORMATION)	C2	70 (0)	1.5 1.5 2 2 2					
32.5										
35.0		34.0 ft - 36.0 ft, Similar to C2. Very Poor Rock, NQ, RMR=17 (MORETOWN FORMATION)	C3	29 (0)	2 1					
37.5		36.0 ft - 41.0 ft, Gray, SCHIST, aphanitic, soft to moderately hard, slightly weathered. Joints vertical, close, tight. Poor Rock, NQ, RMR=37 (MORETOWN FORMATION)	C4	100 (80)	1 1 1 1 1.5					
40.0										
42.5		Hole stopped @ 41.0 ft								

Remarks:
Boring backfilled with cuttings, cold patch at 1.2 ft, 7.5 ft off guardrail.

AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_PH 2 BR 89.GPJ VERMONT AOT.GDT 3/3/22

NOTES

1. BOTTOM OF SUBFOOTOING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

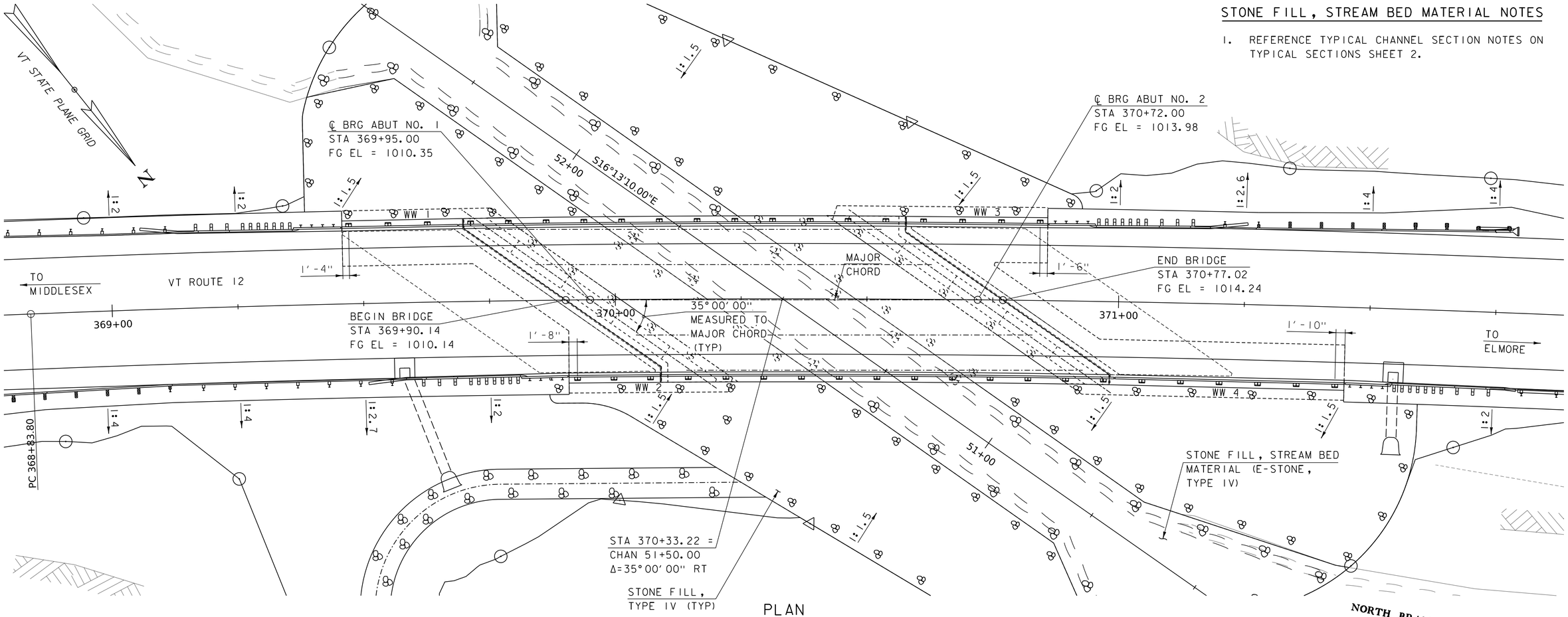
PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
BORING LOGS 4

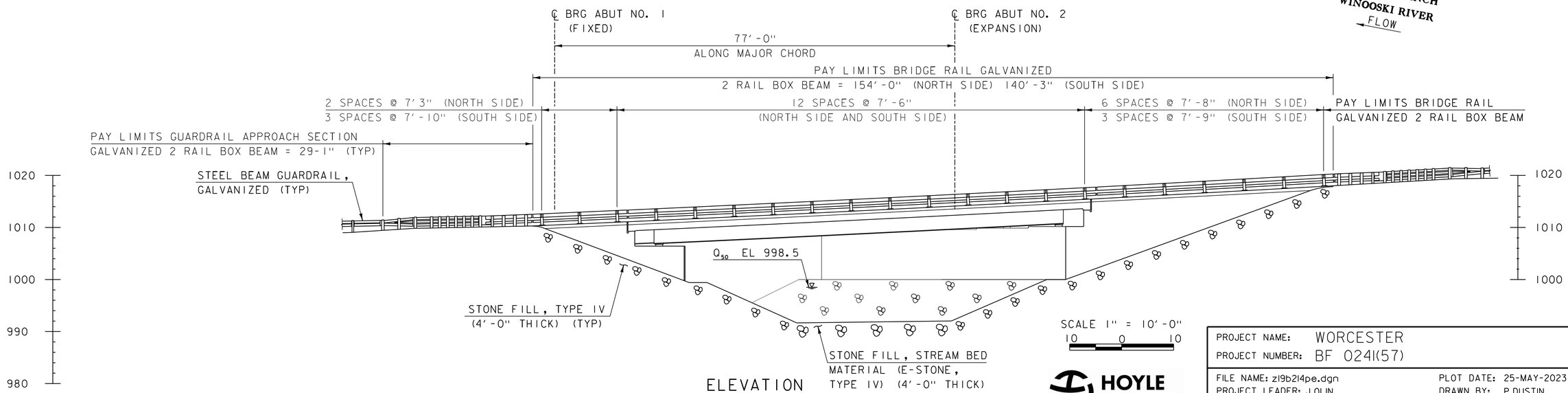
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER

STONE FILL, STREAM BED MATERIAL NOTES

1. REFERENCE TYPICAL CHANNEL SECTION NOTES ON TYPICAL SECTIONS SHEET 2.



PLAN



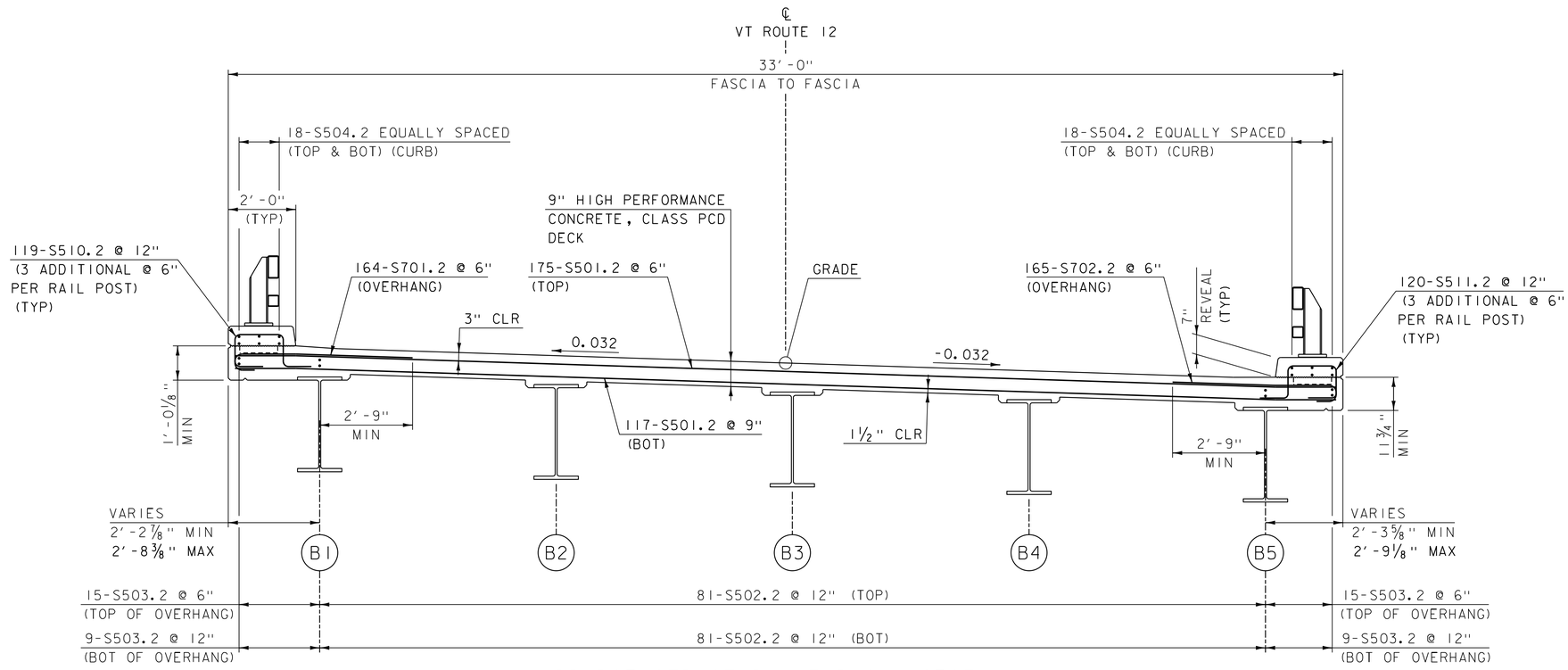
ELEVATION

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214pe.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.SEMPRINI	CHECKED BY: E.WEINGARTNER
PLAN AND ELEVATION	SHEET 172 OF 370



BRIDGE STRUCTURAL TYPICAL SECTION

SCALE: ½" = 1′-0"

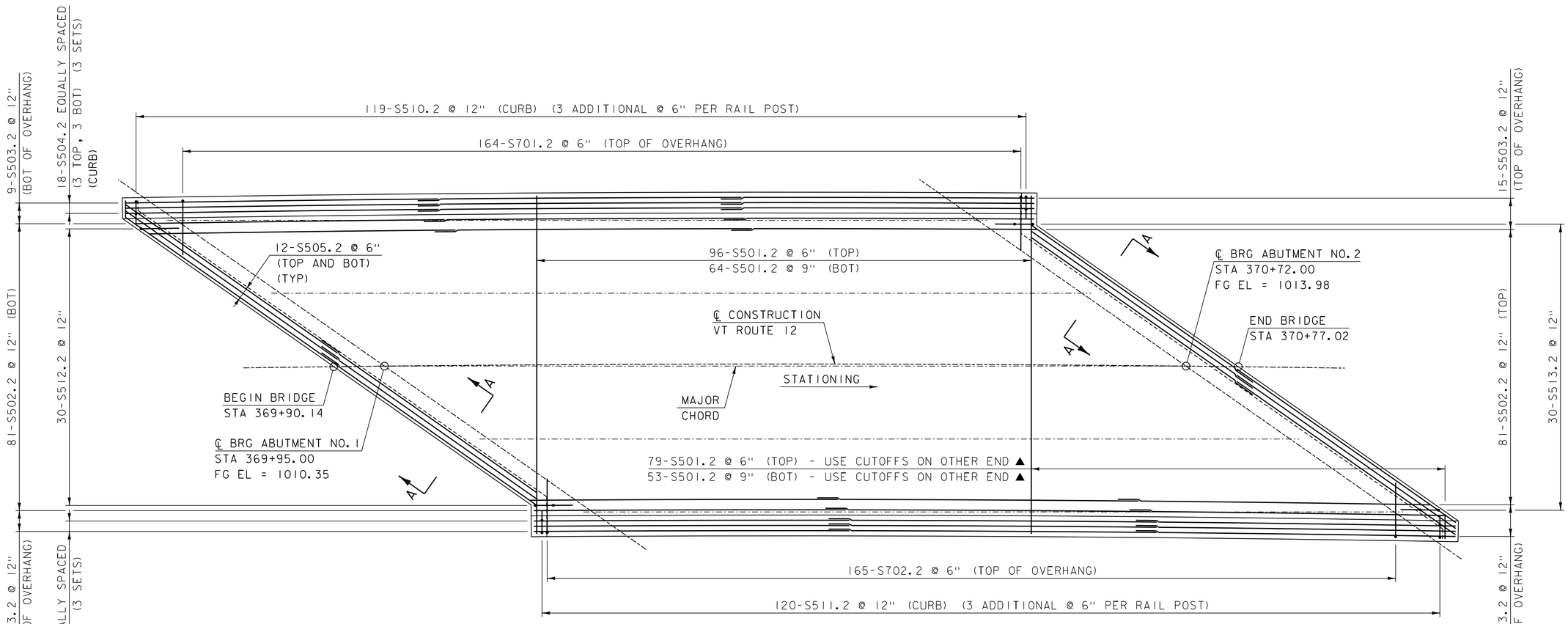
LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

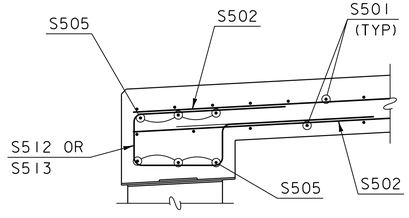
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214supl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
BRIDGE STRUCTURAL TYPICAL SECTION	SHEET 173 OF 370



DECK REINFORCING PLAN

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



SECTION A-A

SCALE: 1" = 1'-0"

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

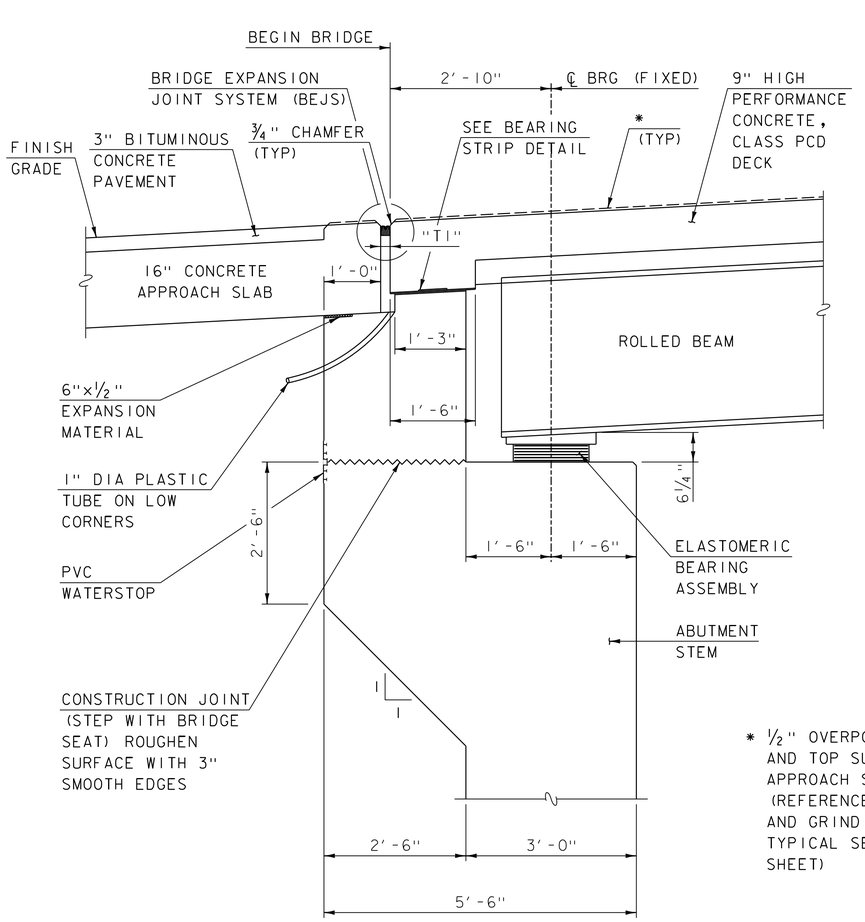
NOTES

1. MAINTAIN 3" CLEAR COVER UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214sup2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
DECK REINFORCING PLAN

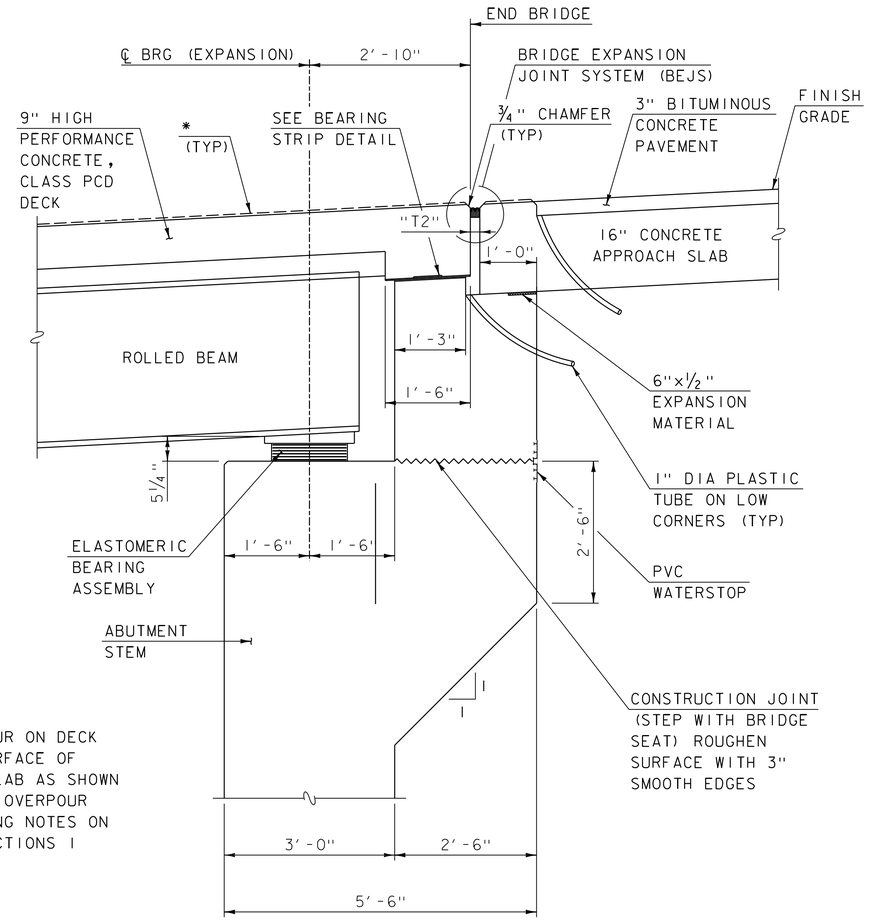
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 174 OF 370



* ½" OVERPOUR ON DECK AND TOP SURFACE OF APPROACH SLAB AS SHOWN (REFERENCE OVERPOUR AND GRINDING NOTES ON TYPICAL SECTIONS 1 SHEET)

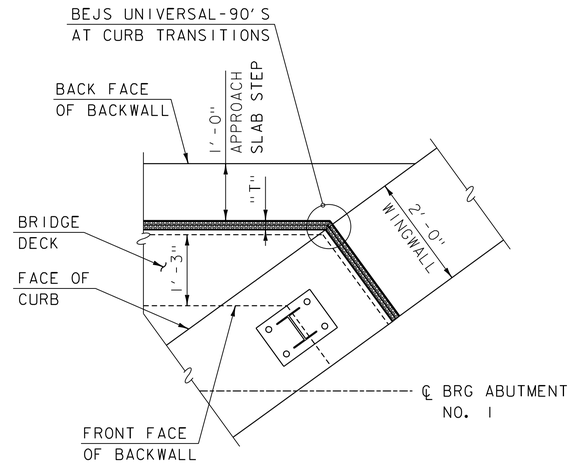
ABUTMENT NO. 1 BRIDGE END DETAIL

SCALE: ¾" = 1'-0"



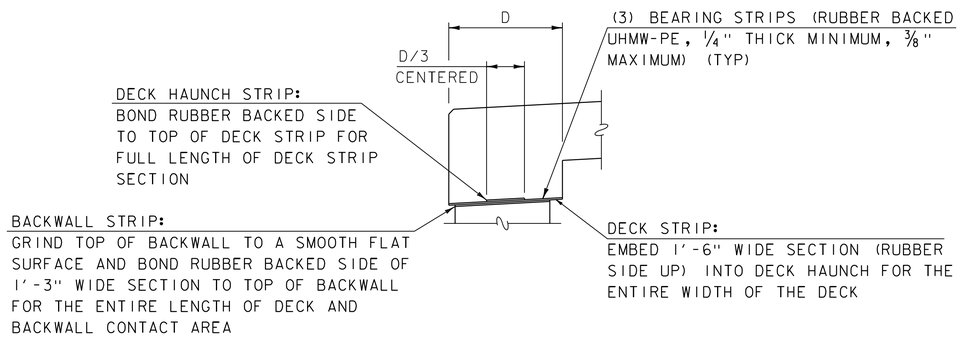
ABUTMENT NO. 2 BRIDGE END DETAIL

SCALE: ¾" = 1'-0"



TYPICAL BRIDGE EXPANSION JOINT SYSTEM (BEJS) DETAIL AT FACE OF CURB

(ABUTMENT NO. 2 SIMILAR)
SCALE: ¾" = 1'-0"



BEARING STRIP DETAIL

(ALL COSTS INCIDENTAL TO ITEM 501.37 HIGH PERFORMANCE CONCRETE, CLASS PCD)
SCALE: 1" = 1'-0"

TEMPERATURE SETTING TABLE

TEMPERATURE (DEG)	ABUTMENT NO. 1 "T1" (IN)	ABUTMENT NO. 2 "T2" (IN)
45	2.00	2.00
60	1.99	1.97
75	1.98	1.93
90	1.97	1.90
105	1.96	1.86

EXPANSION JOINT NOTES

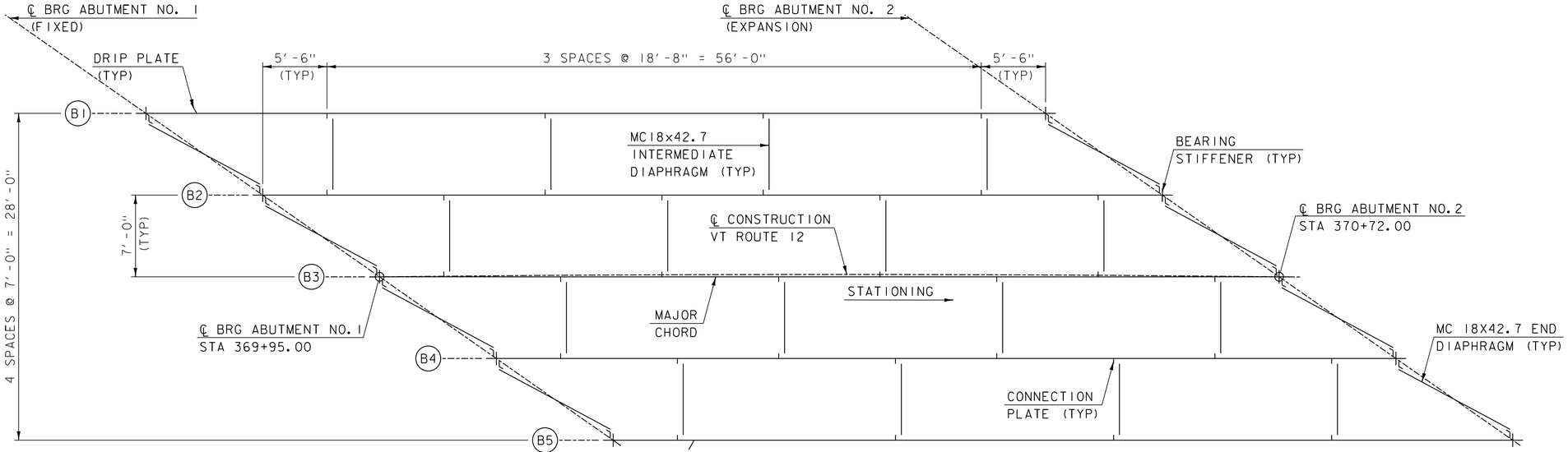
1. REFERENCE SPECIAL PROVISION SECTION - BRIDGE EXPANSION JOINT SYSTEM.
2. BRIDGE EXPANSION JOINT SYSTEM SHALL HAVE A 2" MINUMUM NOMINAL WIDTH AND A MINIMUM SEAL DEPTH OF 2½". CONTRACTOR SHALL CONFIRM JOINT OPENING, NOMINAL WIDTH AND DEPTH WITH MANUFACTURER BASED ON ANTICIPATED INSTALLATION TEMPERATURE PRIOR TO ORDERING AND INSTALLATION.
3. THE SEAL IS TO REMAIN ¾" FROM THE FINISHED SURFACE AROUND ALL CURB BENDS.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

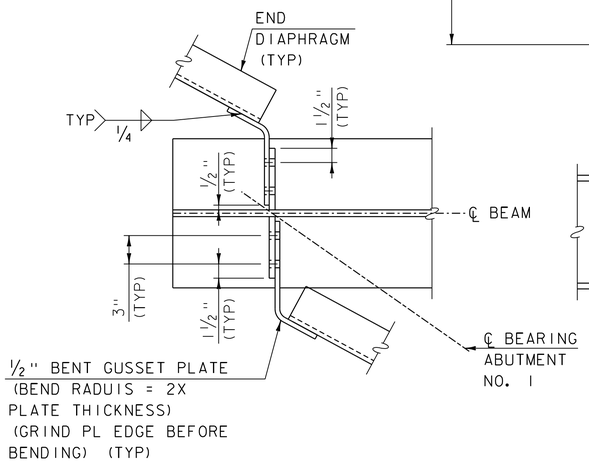
FILE NAME: z19b214sup3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
BRIDGE END DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 175 OF 370



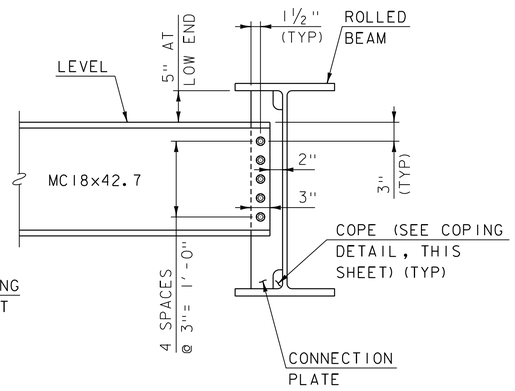
FRAMING PLAN

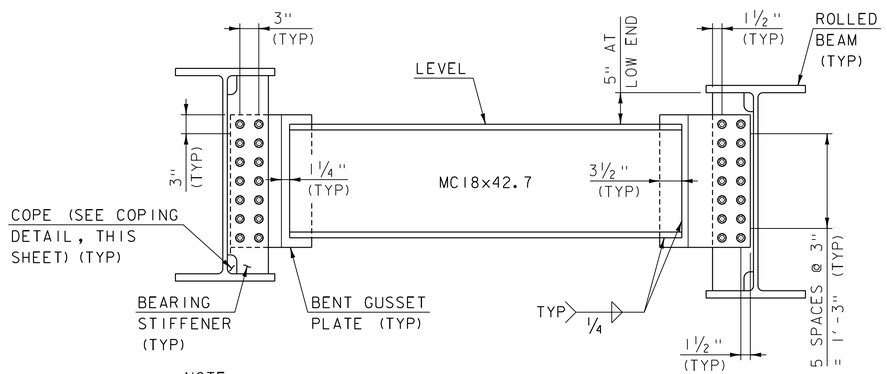
SCALE: 3/16" = 1'-0"



END DIAPHRAGM PLAN

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



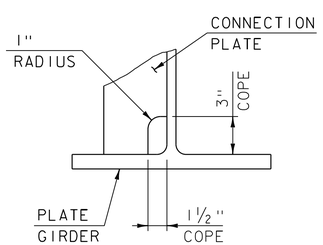


NOTE
MINIMUM WELD LENGTH = 3". SEE "WELD TERMINATION AND COPING DETAILS FOR STEEL MEMBERS" ON STANDARD DRAWING S-601.

END DIAPHRAGM ELEVATION

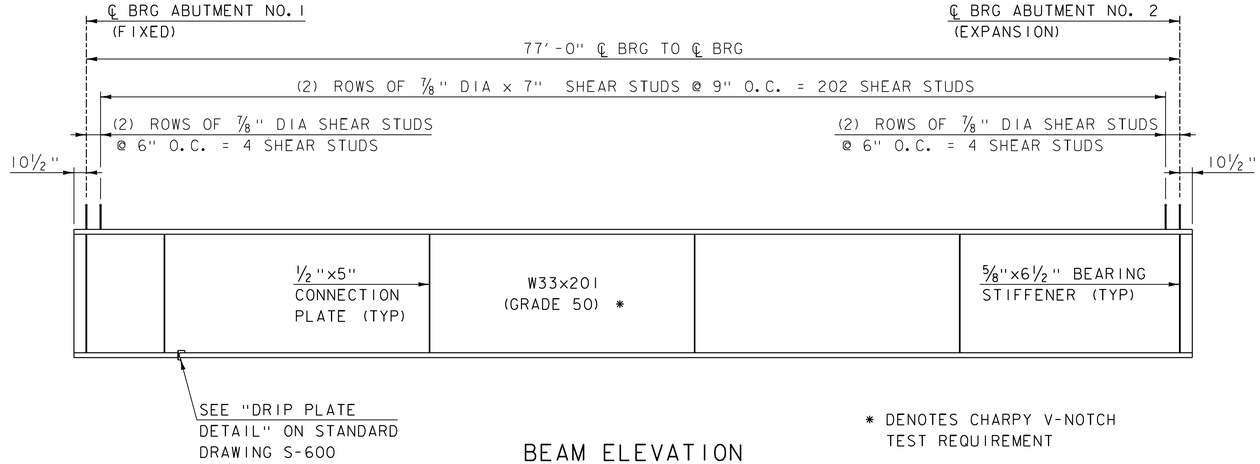
INTERMEDIATE DIAPHRAGM

SCALE: 1" = 1'-0"



COPING DETAIL

NOT TO SCALE



BEAM ELEVATION

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

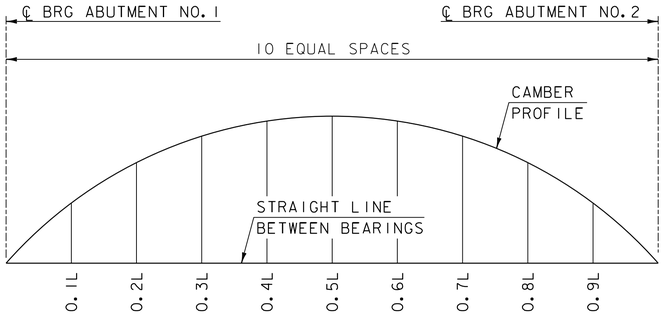
* DENOTES CHARPY V-NOTCH TEST REQUIREMENT

NOTES

1. FOR DRIP PLATE DETAIL, SEE STANDARD DRAWING S-600.
2. FOR ADDITIONAL DIAPHRAGM, WELD TERMINATION/COPING AND CONNECTION/BEARING PLATE DETAILS, SEE STANDARD DRAWING S-601.

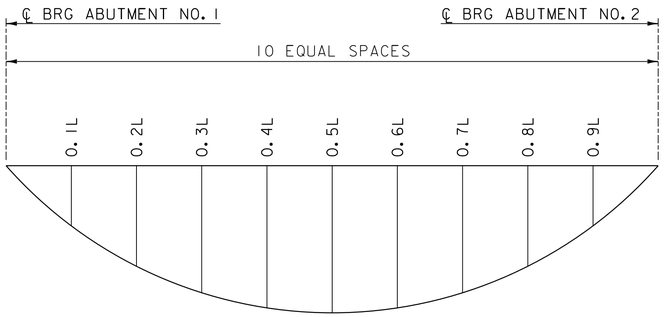
HOYLE TANNER

PROJECT NAME: WORCESTER	
PROJECT NUMBER: BF 0241(57)	
FILE NAME: z19b2l4sup4.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
FRAMING PLAN AND BEAM ELEVATION	SHEET 176 OF 370



CAMBER DIAGRAM

NOT TO SCALE



DEAD LOAD DEFLECTION DIAGRAM

NOT TO SCALE

CAMBER AND DEAD LOAD DEFLECTION TABLE AT TENTH POINTS (INCHES)

	POINT ON BEAM	℄ BRG ABUT NO. 1	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG ABUT NO. 2
BEAMS 1 & 5	STEEL DL	0.000	0.171	0.324	0.444	0.520	0.545	0.519	0.442	0.323	0.171	0.000
	CONCRETE DL	0.000	0.633	1.197	1.638	1.917	2.011	1.914	1.632	1.192	0.630	0.000
	SUPERIMPOSED DL	0.000	0.039	0.075	0.103	0.120	0.126	0.121	0.103	0.076	0.041	0.000
	TOTAL DEFLECTION	0.000	0.843	1.596	2.185	2.557	2.683	2.553	2.178	1.591	0.841	0.000
	RESIDUAL CAMBER	0.000	0.360	0.640	0.840	0.960	1.000	0.960	0.840	0.640	0.360	0.000
	TOTAL CAMBER	0.000	1.203	2.236	3.025	3.517	3.683	3.513	3.018	2.231	1.201	0.000

CAMBER AND DEAD LOAD DEFLECTION TABLE AT TENTH POINTS (INCHES)

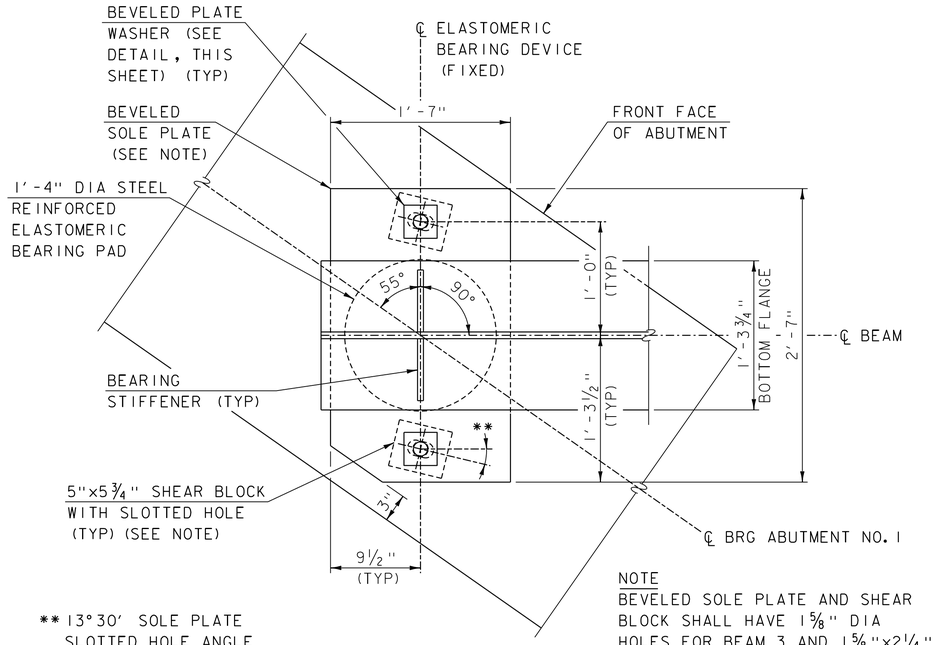
	POINT ON BEAM	℄ BRG ABUT NO. 1	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG ABUT NO. 2
BEAMS 2 - 4	STEEL DL	0.000	0.159	0.301	0.412	0.483	0.507	0.483	0.413	0.302	0.160	0.000
	CONCRETE DL	0.000	0.599	1.132	1.550	1.814	1.904	1.814	1.550	1.133	0.600	0.000
	SUPERIMPOSED DL	0.000	0.018	0.036	0.053	0.066	0.074	0.074	0.066	0.050	0.028	0.000
	TOTAL DEFLECTION	0.000	0.776	1.470	2.015	2.362	2.485	2.371	2.029	1.486	0.788	0.000
	RESIDUAL CAMBER	0.000	0.360	0.640	0.840	0.960	1.000	0.960	0.840	0.640	0.360	0.000
	TOTAL CAMBER	0.000	1.136	2.110	2.855	3.322	3.485	3.331	2.869	2.126	1.148	0.000

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214sup5.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
CAMBER AND DEAD LOAD DEFLECTION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 177 OF 370



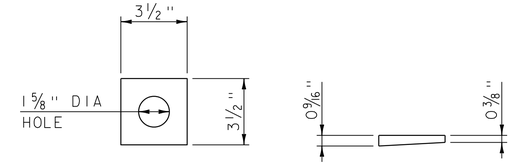
** 13°30' SOLE PLATE SLOTTED HOLE ANGLE (BEAMS 1, 2, 4, AND 5) (TYP)

PLAN

SCALE: 1½" = 1'-0"

NOTE

BEVELED SOLE PLATE AND SHEAR BLOCK SHALL HAVE 1⅝" DIA HOLES FOR BEAM 3 AND 1⅝"x2¼" SLOTTED HOLES FOR BEAMS 1, 2, 4 AND 5.



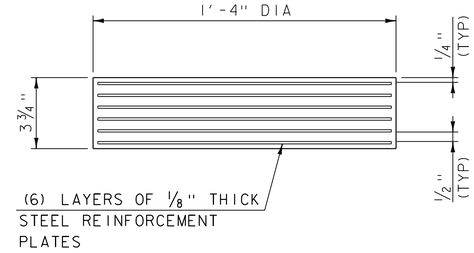
BEVELED PLATE WASHER DETAIL

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 OPPOSITE HAND)

SCALE: 3" = 1'-0"

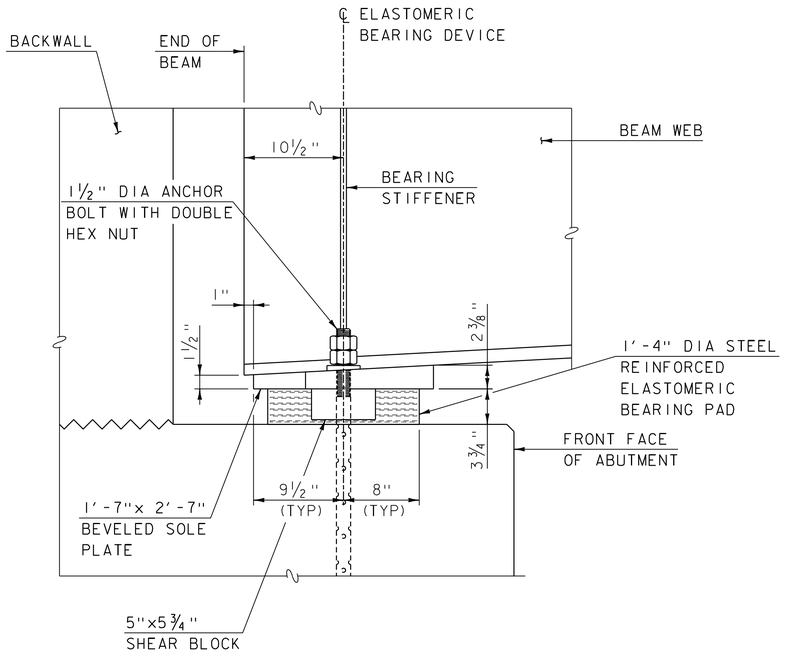
DESIGN CRITERIA (SERVICE LIMIT STATE)

AASHTO METHOD A
DEAD LOAD = 62.4 KIPS
LIVE LOAD = 87.1 KIPS
DESIGN MOVEMENT = 0.20 INCHES AT ABUTMENT NO. 1
1.10 INCHES AT ABUTMENT NO. 2



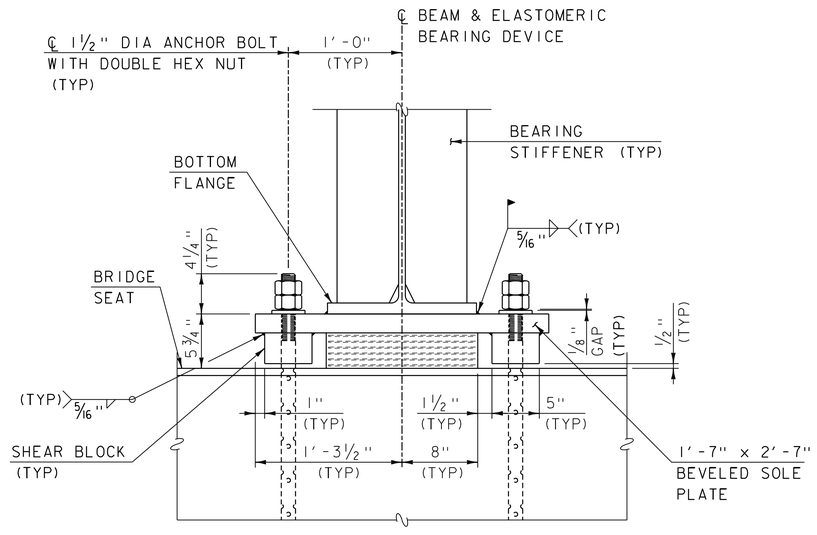
ELASTOMERIC BEARING PAD SECTION

SCALE: 3" = 1'-0"



SIDE ELEVATION

SCALE: 1½" = 1'-0"



FRONT ELEVATION

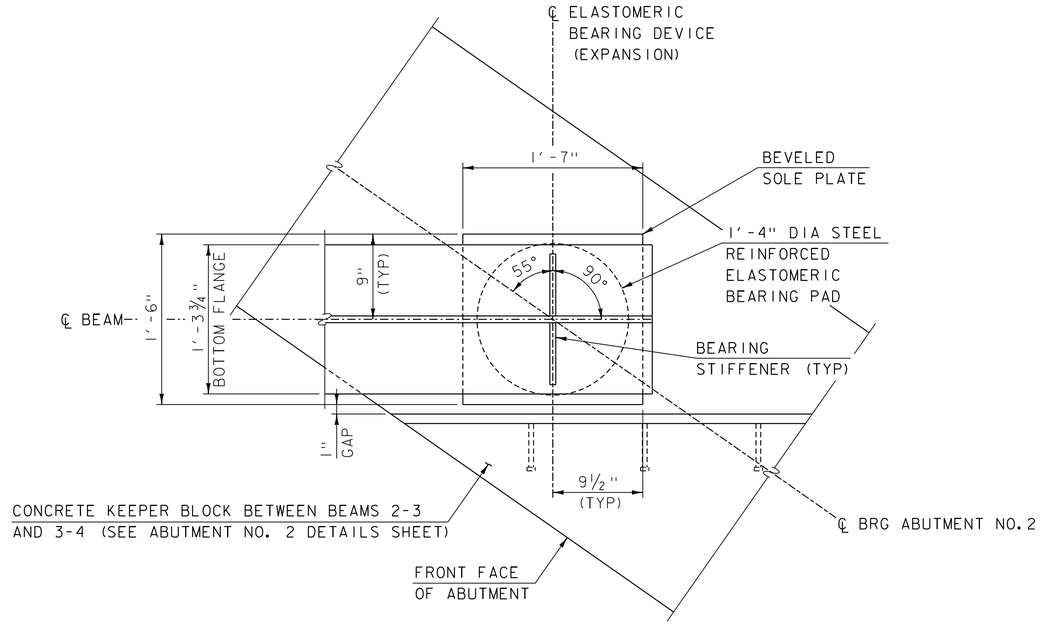
SCALE: 1½" = 1'-0"

ELASTOMERIC BEARING NOTES

1. BEARINGS SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF STANDARD SPECIFICATIONS SECTION 531 AND 731.
2. ALL REINFORCEMENT BETWEEN LAYERS OF ELASTOMER SHALL BE STEEL AASHTO M270 GRADE 36. ALL INTERNAL STEEL PLATES SHALL BE BLAST CLEANED AND FREE OF COATINGS, RUST AND MILL SCALE. THE PLATES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. STEEL REINFORCED ELASTOMERIC BEARINGS SHALL HAVE A MINIMUM OF ¼" EDGE SEAL OF ELASTOMER INTEGRAL WITH BEARING OVER ALL INTERNAL SURFACES.
4. THE STEEL REINFORCED ELASTOMERIC BEARING PADS SHALL BE VULCANIZED TO THE STEEL SOLE PLATES. THE STEEL SURFACES TO BE BONDED TO THE PAD SHALL NOT BE GALVANIZED OR METALIZED.
5. THE ELASTOMER WAS DESIGNED WITH A SHEAR MODULUS OF 110 PSI.
6. THE ELASTOMER SHALL MEET THE REQUIREMENTS OFLOW TEMPERATURE ZONE D, GRADE 4.
7. THE CONCRETE UNDER THE BEARING DEVICE SHALL BE LEVEL.
8. ANCHOR BOLTS SHALL BE EMBEDED A MINIMUM OF 20". ANCHOR RODS, NUTS AND WASHER SHALL MEET THE REQUIREMENTS OF SUBSECTION 714.08. SOLE PLATES SHALL BE SET WITH ANCHOR RODS CENTERED IN SLOTTED HOLES.
9. BEAMS SHALL BE ERECTED WHEN THE STEEL TEMPERATURE IS BETWEEN 25° AND 65°. IF THE BEAMS ARE ERECTED AT OTHER STEEL TEMPERATURES AND THE ABUTMENT NO. 2 BEARING PAD SHEAR DEFLECTION EXCEEDS ¼", THE BEAMS SHALL BE JACKED FROM THE GROUND IN FRONT OF ABUTMENT NO. 2 AND THE BEARINGS RECENTERED AND RESET TO PLUMB (UNDEFORMED SHAPE) AT 45° +/- 10°.
10. THE BEAM BOTTOM FLANGE SHALL NOT BE FIELD WELDED TO THE TOP OF THE STEEL SOLE PLATE UNTIL AFTER THE CONCRETE DECK AND CURBS ARE POURED, THE BRIDGE RAIL IS INSTALLED AND THE BEARING IS IN ITS FINAL POSITION.
11. BEAM 3 ANCHOR BOLT NUTS SHALL BE HAND TIGHTENED. BEAM 1, 2, 4 AND 5 ANCHOR BOLT NUTS SHALL BE HAND TIGHTENED AND BACKED OFF ⅛". DOUBLE NUT THE ANCHOR BOLTS. TOP NUT SHALL BE WRENCH TIGHT TO PREVENT NUT REMOVAL.
12. ALL HORIZONTAL DIMENSIONS SHOWN AT 45° ARE FINAL CONDITION DIMENSIONS.

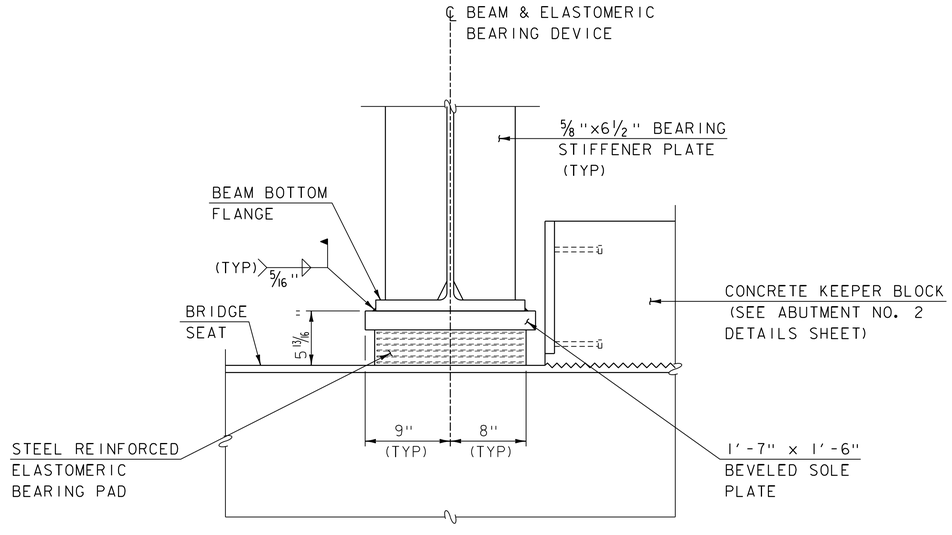
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214sup6.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
ABUTMENT NO. 1 ELASTOMERIC BEARING DETAILS	SHEET 178 OF 370



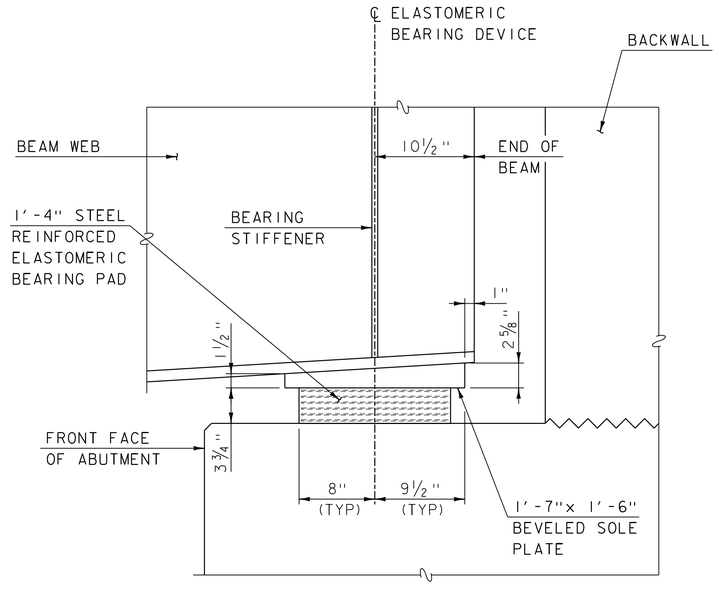
PLAN

SCALE: 1½" = 1'-0"



FRONT ELEVATION

SCALE: 1½" = 1'-0"



SIDE ELEVATION

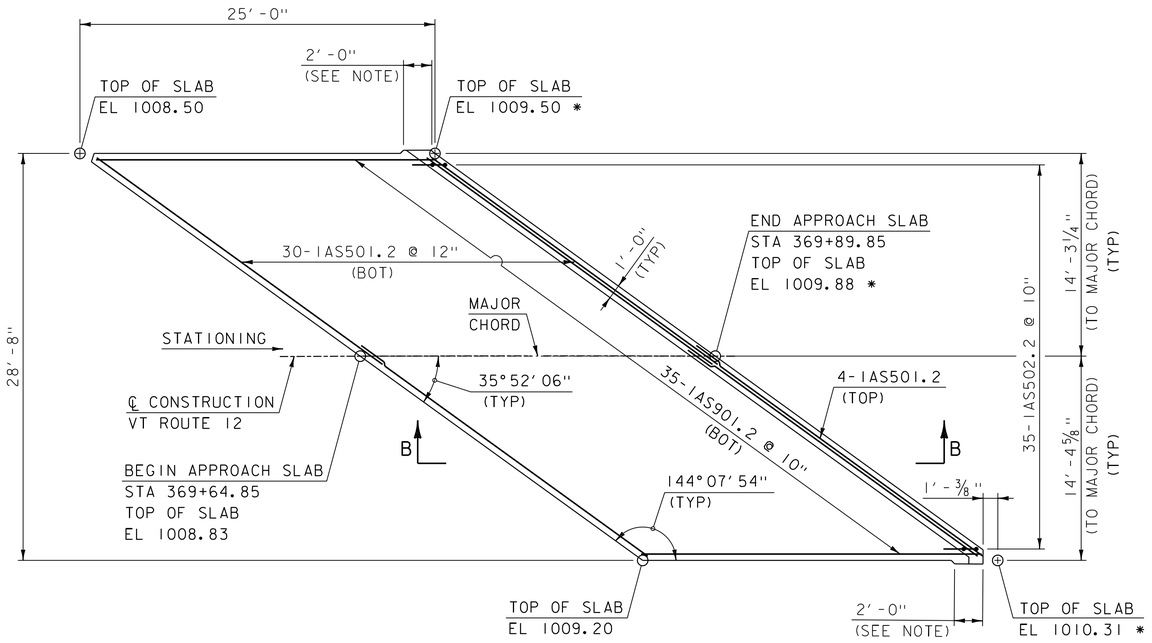
(CONCRETE KEEPER BLOCK NOT SHOWN FOR CLARITY)
SCALE: 1½" = 1'-0"

NOTES

1. REFERENCE ELASTOMERIC BEARING DETAILS SHEET 1 FOR NOTES AND BEARING CRITERIA.

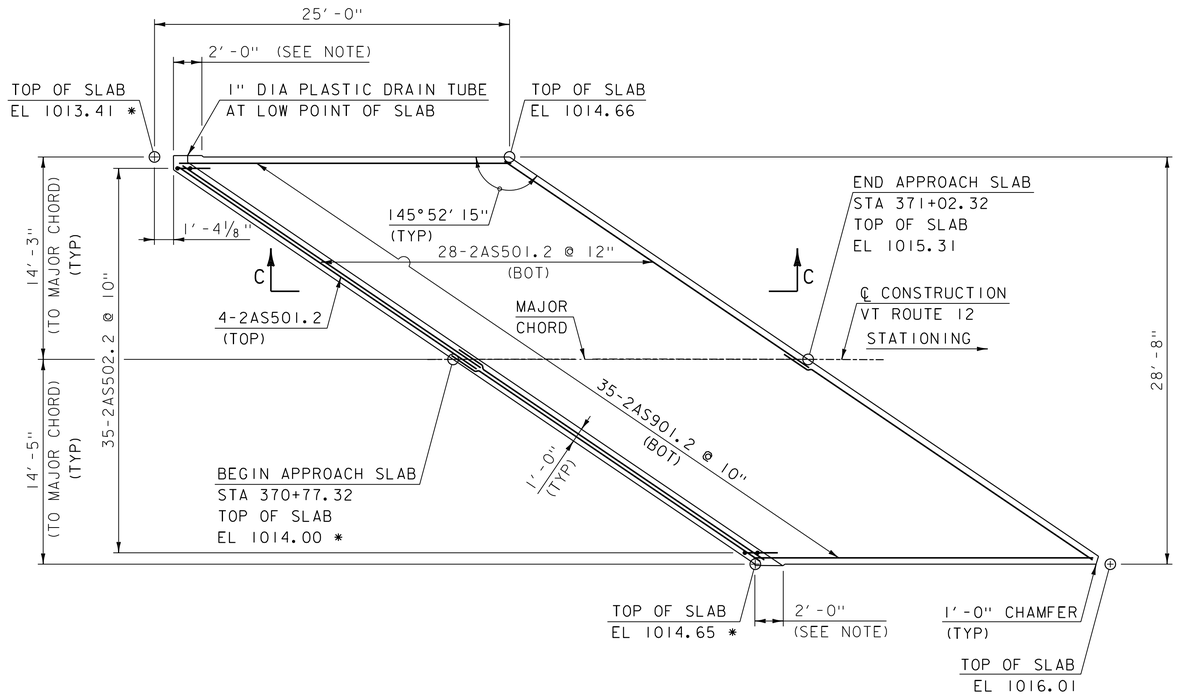
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(57)
FILE NAME: z19b214sup6.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
ABUTMENT NO. 2 ELASTOMERIC BEARING DETAILS	SHEET 179 OF 370



APPROACH SLAB NO. 1 PLAN

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

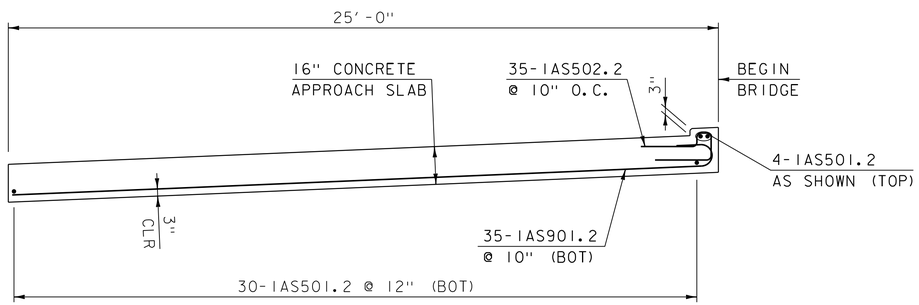


APPROACH SLAB NO. 2 PLAN

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

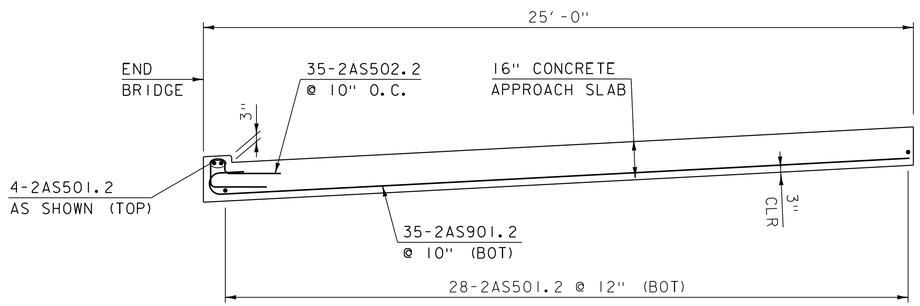
NOTE
POUR APPROACH SLAB FLUSH TO WINGWALL AS SHOWN.

* ELEVATIONS SHOWN DO NOT ACCOUNT FOR 3" STEP AT END OF SLAB AS SHOWN BELOW OR THE 1/2" OVERPOUR (REFERENCE BRIDGE END DETAILS)



SECTION A-A

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



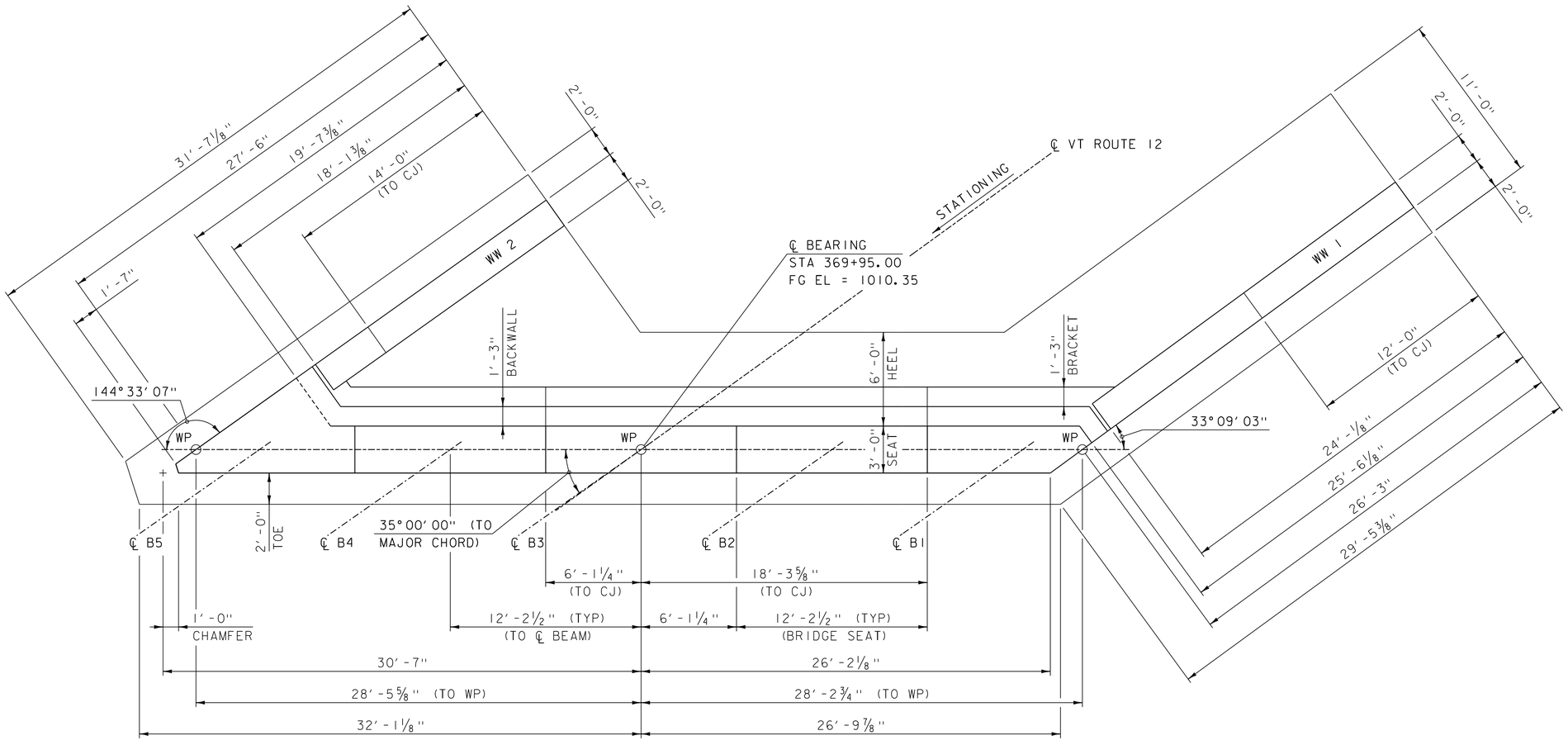
SECTION B-B

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214app.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
APPROACH SLAB DETAILS	SHEET 180 OF 370

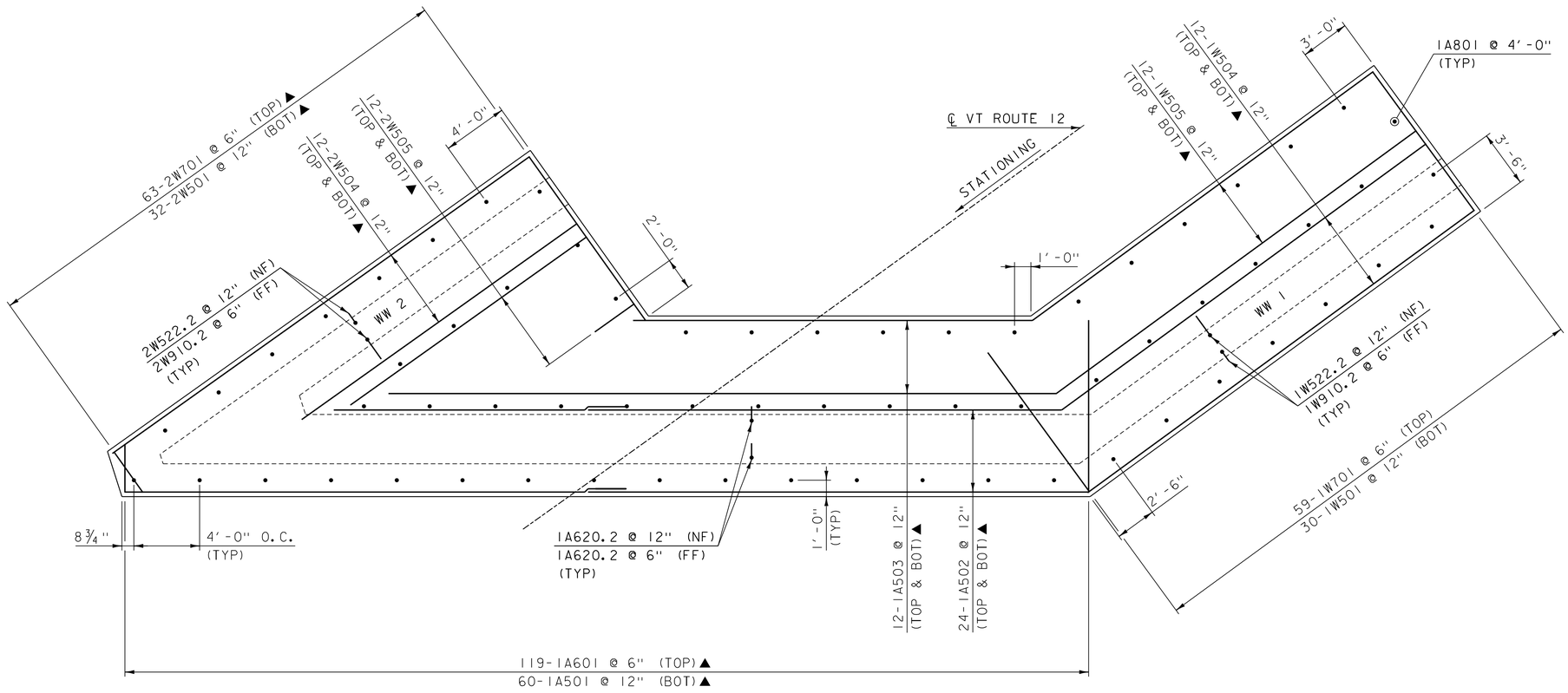


ABUTMENT NO. 1 PLAN

SCALE: 1/4″ = 1′-0″

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214subl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
ABUTMENT NO. 1 PLAN	SHEET 181 OF 370



ABUTMENT NO. 1 FOOTING REINFORCING PLAN

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2''
#6	2'-7''
#7	3'-0''
#9	4'-2''

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

NOTES

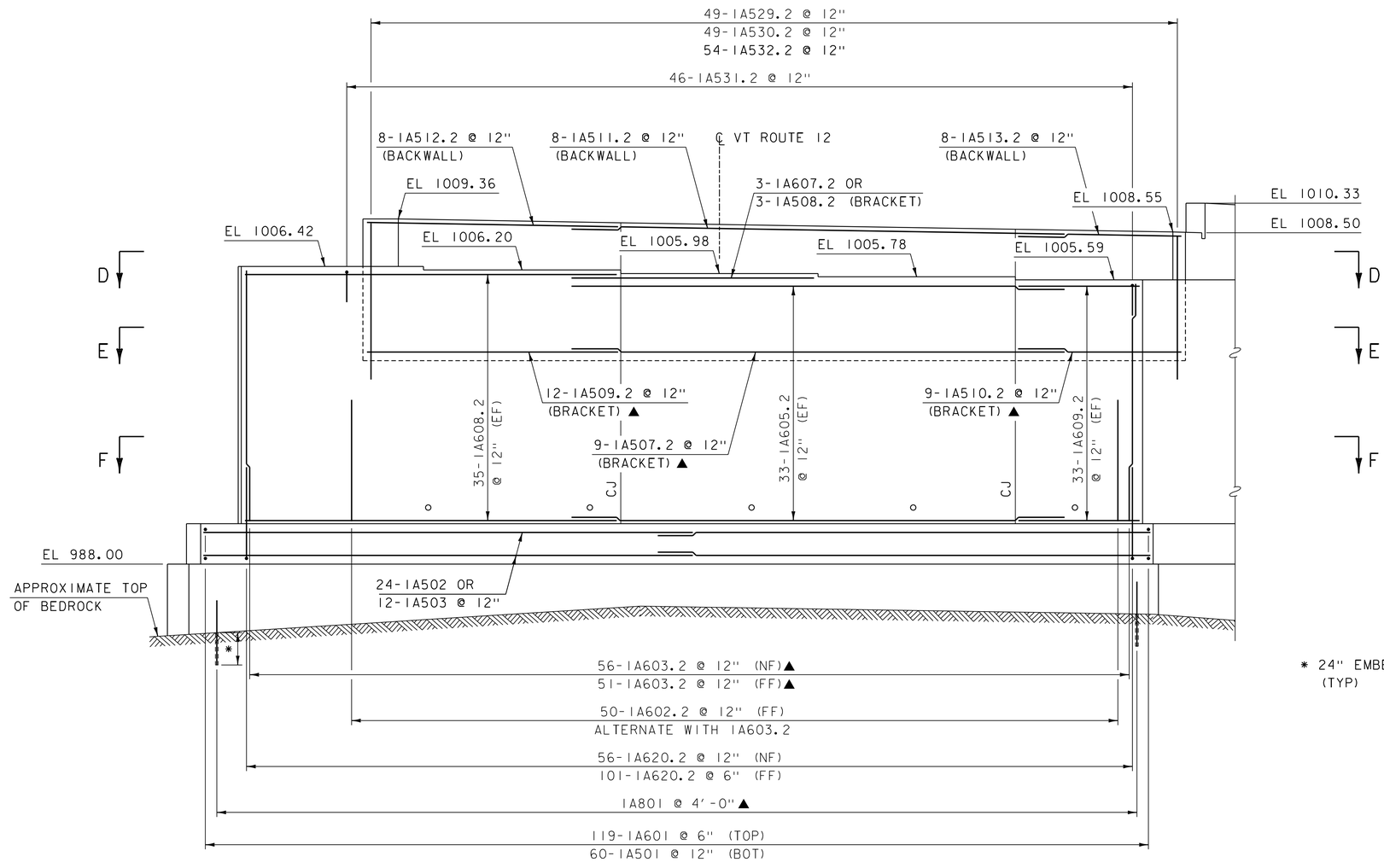
1. 3" CLEAR UNLESS SPECIFIED ON PLANS.
2. SUBFOOTING GEOMETRY SHALL BE DETERMINED IN THE FIELD ONCE COMPETENT BEDROCK HAS BEEN EXPOSED.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

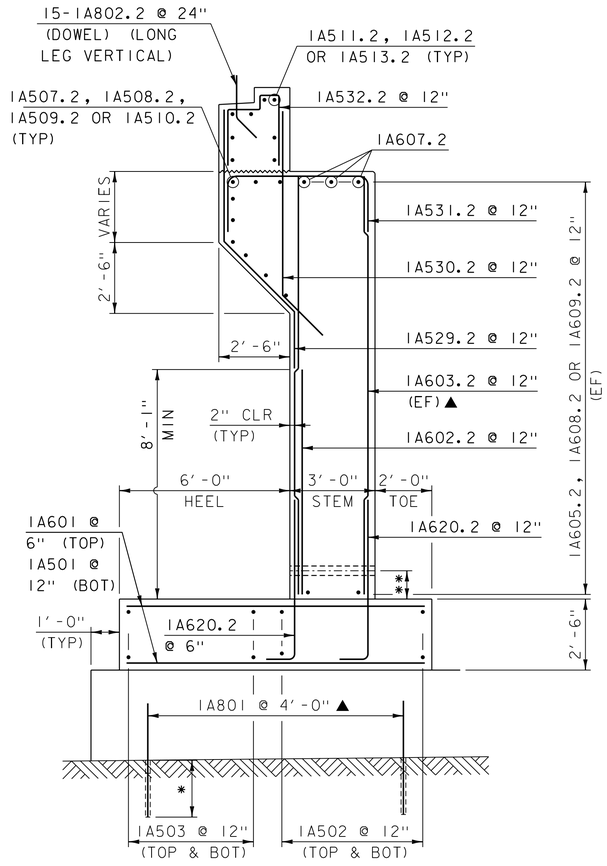
FILE NAME: z19b214sub2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
ABUTMENT NO. 1 FOOTING

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 182 OF 370



ABUTMENT NO. 1 ELEVATION

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



ABUTMENT NO. 1 TYPICAL SECTION

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

* 24" EMBEDMENT (TYP)

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 1 FOOTING REINFORCING SHEET. FOR WINGWALL DETAILS SEE ABUTMENT NO. 1 WINGWALL SHEET. FOR SECTIONS D-D, E-E AND F-F, SEE ABUTMENT NO. 1 DETAILS SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

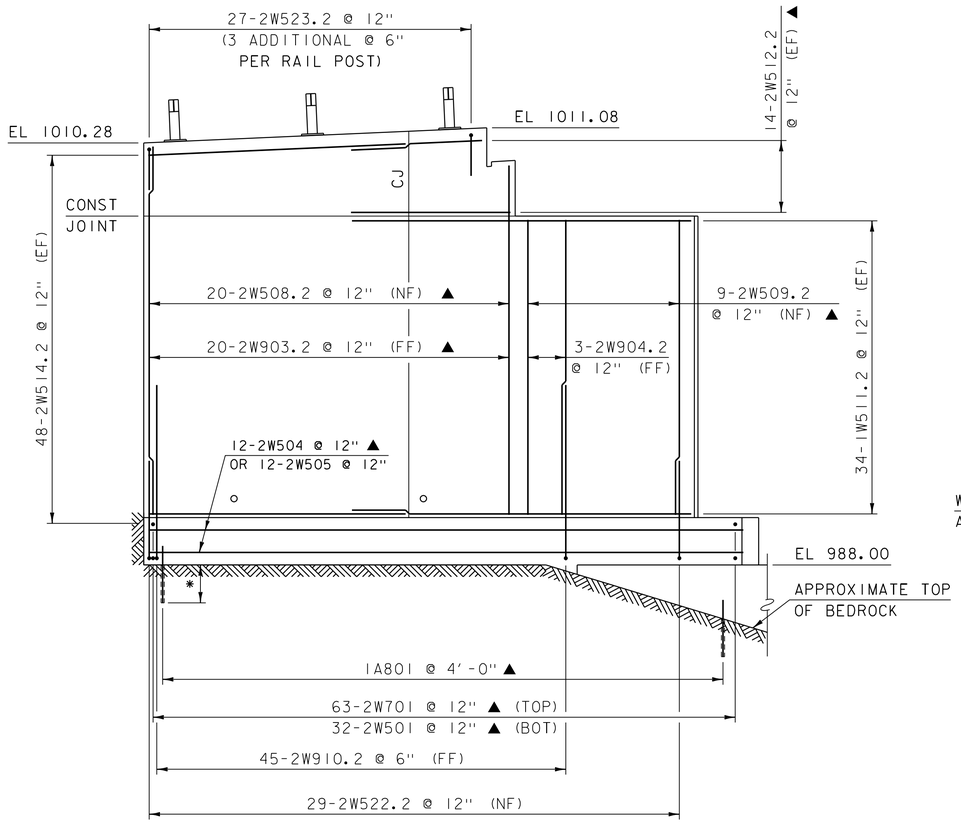
NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

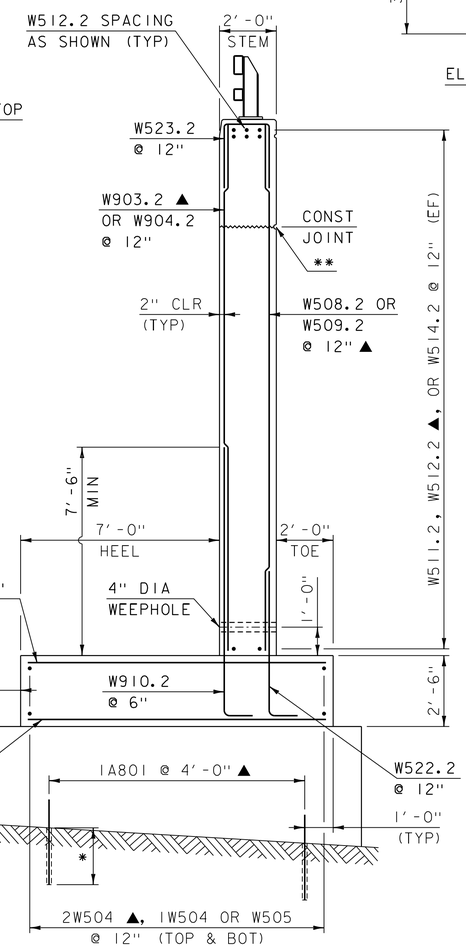
FILE NAME: z19b214subl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
ABUTMENT NO.1 ELEVATION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 183 OF 370



WINGWALL NO. 2 ELEVATION

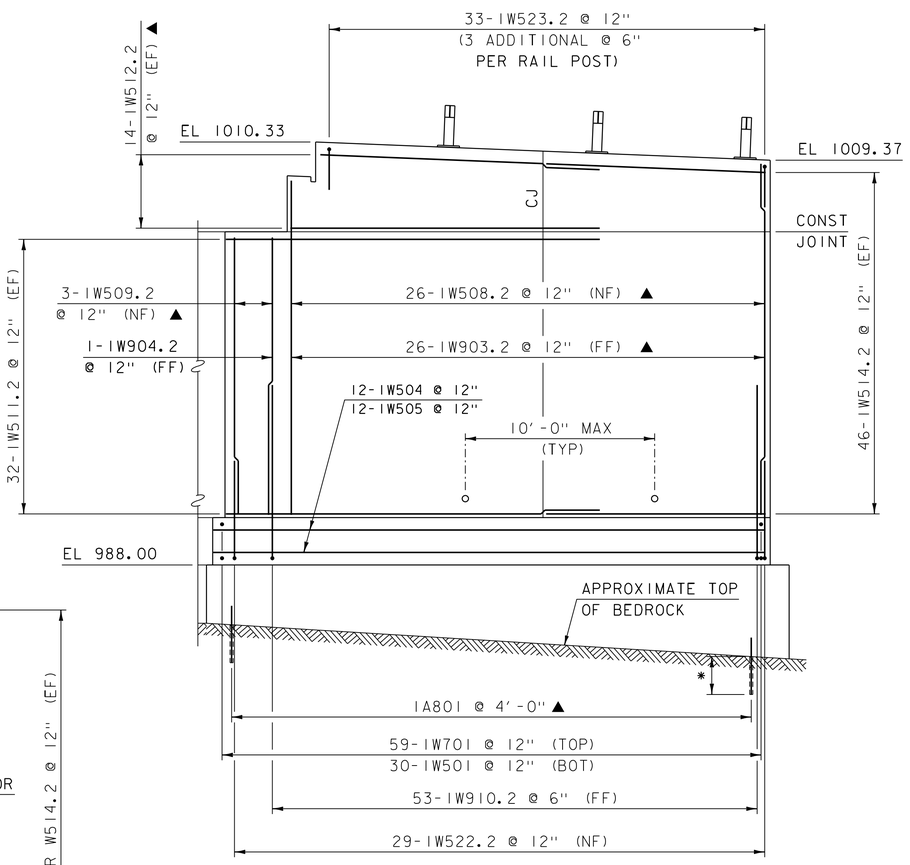
SCALE: 1/4" = 1'-0"



* 2'-0" MIN
DRILL AND GROUT
**SCORE MARK
(SEE STANDARD S-500)

WINGWALL TYPICAL SECTION

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



WINGWALL NO. 1 ELEVATION

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 1 FOOTING REINFORCING SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

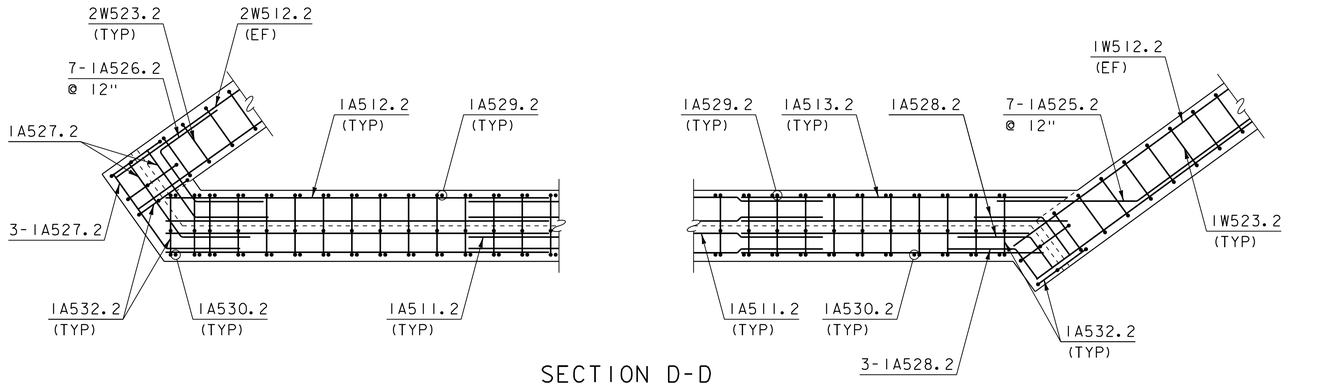
LEGEND

NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

HOYLE TANNER

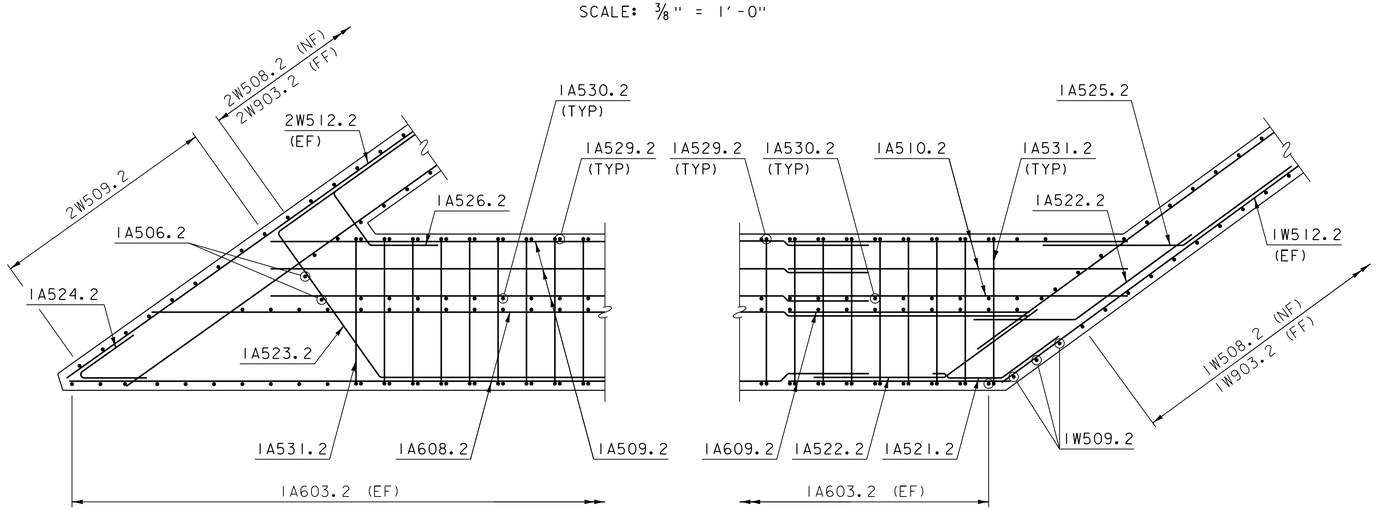
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214sub3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
ABUTMENT NO.1WINGWALLS	SHEET 184 OF 370



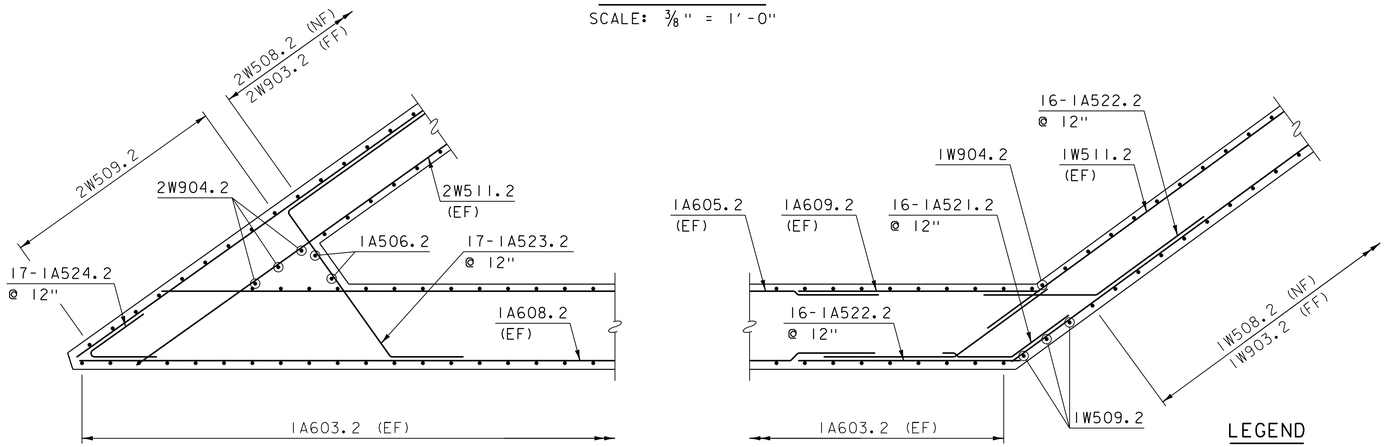
SECTION D-D

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



SECTION E-E

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



SECTION F-F

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

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
----- ABOVE SECTION CUT

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

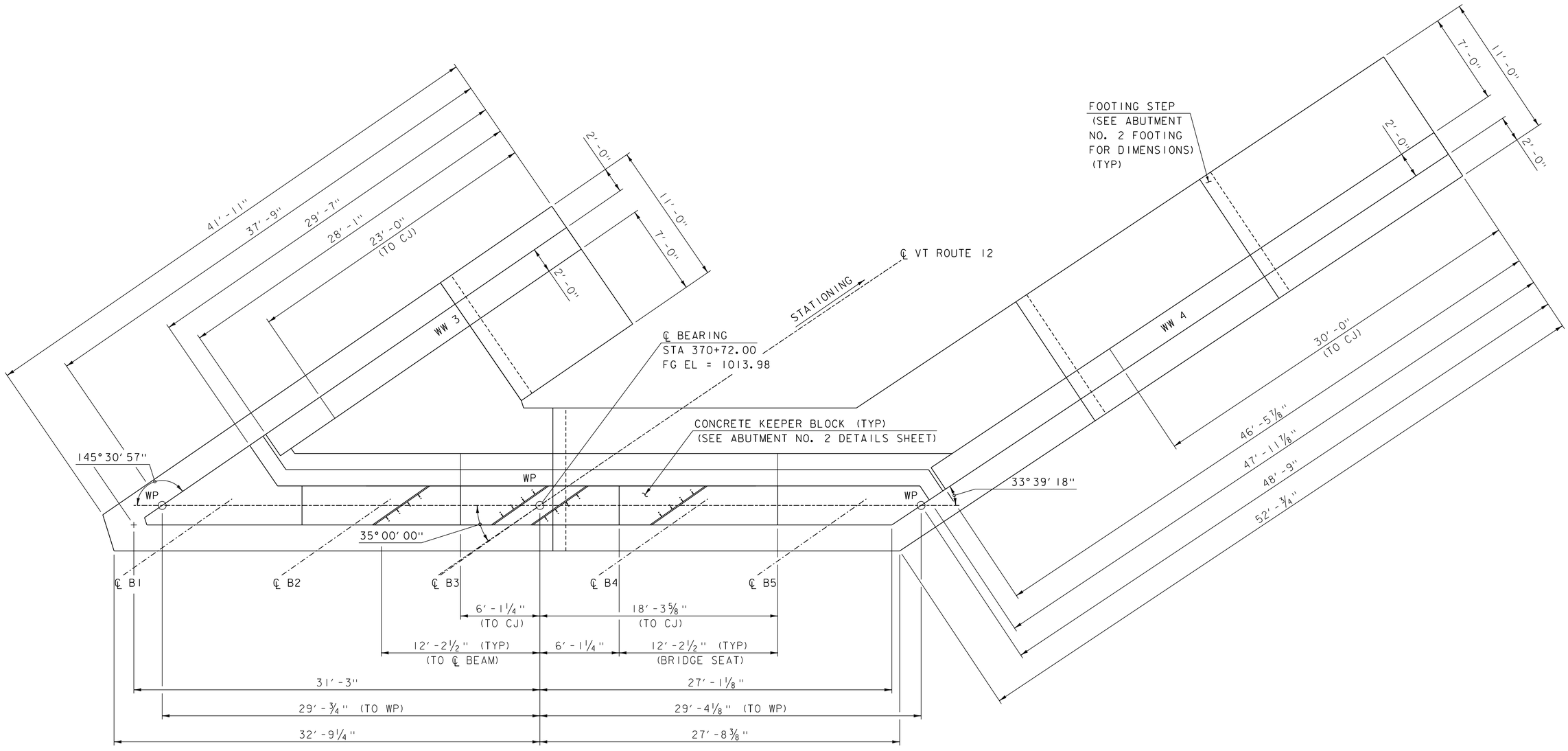
1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR LOCATION OF SECTIONS D-D, E-E ANF F-F, SEE ABUTMENT NO. 1 ELEVATION SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b2l4sub4.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
ABUTMENT NO.1DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 185 OF 370



ABUTMENT NO. 2 PLAN

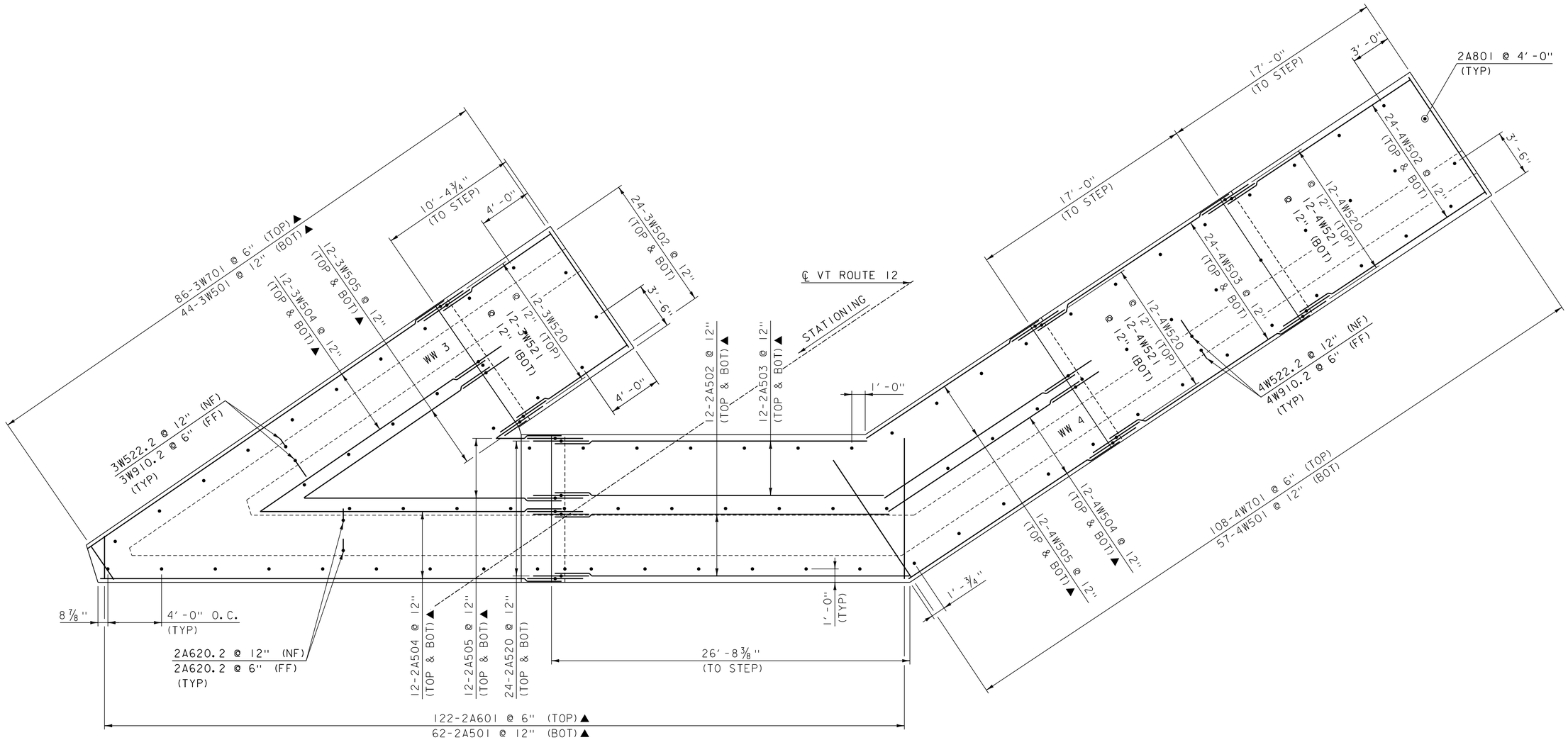
SCALE: 1/4" = 1'-0"

NOTES

1. FOR KEEPER BLOCK DETAILS, SEE ABUTMENT NO. 2 DETAILS SHEET.

HOYLE TANNER

PROJECT NAME: WORCESTER	
PROJECT NUMBER: BF 0241(57)	
FILE NAME: z19b214sub5.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
ABUTMENT NO. 2 PLAN	SHEET 186 OF 370



ABUTMENT NO. 2 FOOTING REINFORCING PLAN

SCALE: ¼" = 1'-0"

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

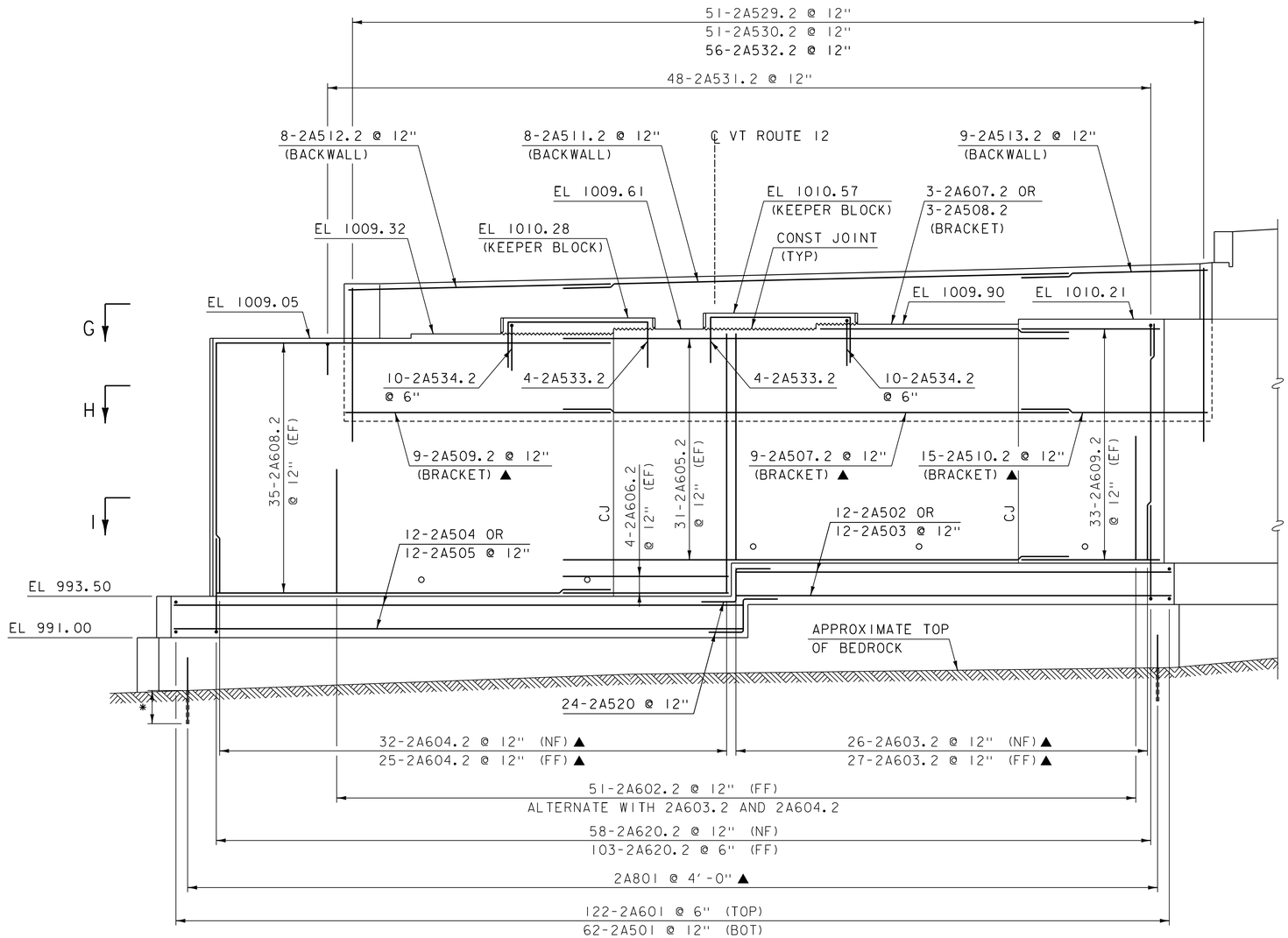
NOTES

1. 3" CLEAR UNLESS SPECIFIED ON PLANS.
2. SUBFOOTING GEOMETRY SHALL BE DETERMINED IN THE FIELD ONCE COMPETENT BEDROCK HAS BEEN EXPOSED.

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

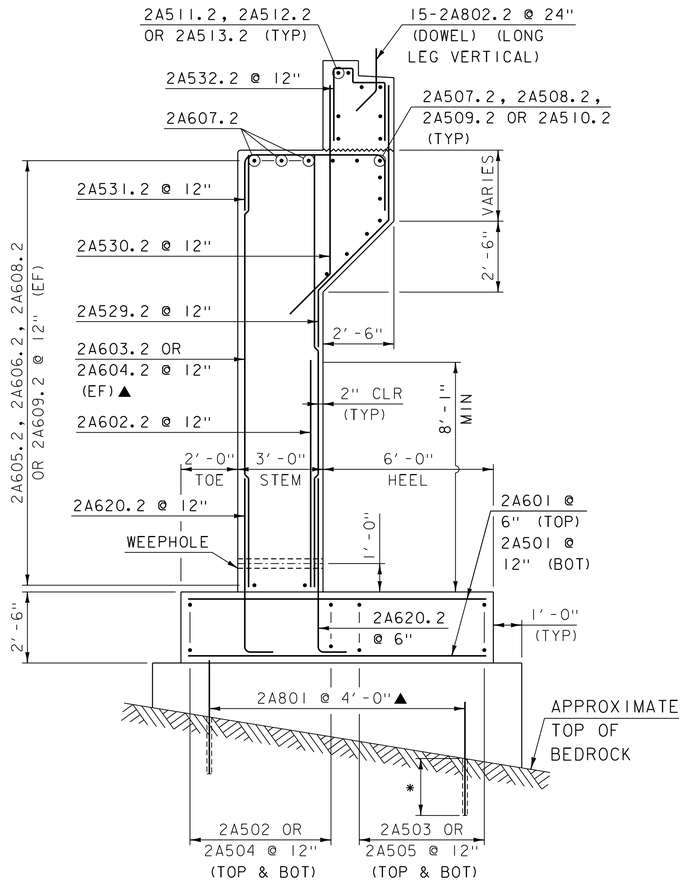
FILE NAME: z19b214sub6.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
ABUTMENT NO. 2 FOOTING

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 187 OF 370



ABUTMENT NO.2 ELEVATION

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



* 24" EMBEDMENT (TYP)

ABUTMENT NO.2 TYPICAL SECTION

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

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 2 FOOTING REINFORCING SHEET. FOR WINGWALL DETAILS SEE ABUTMENT NO.2 WINGWALL SHEET. FOR KEEPER BLOCK DETAILS, SEE ABUTMENT NO. 2 DETAILS SHEET. FOR SECTIONS G-G, H-H AND I-I, SEE ABUTMENT NO. 2 DETAILS SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

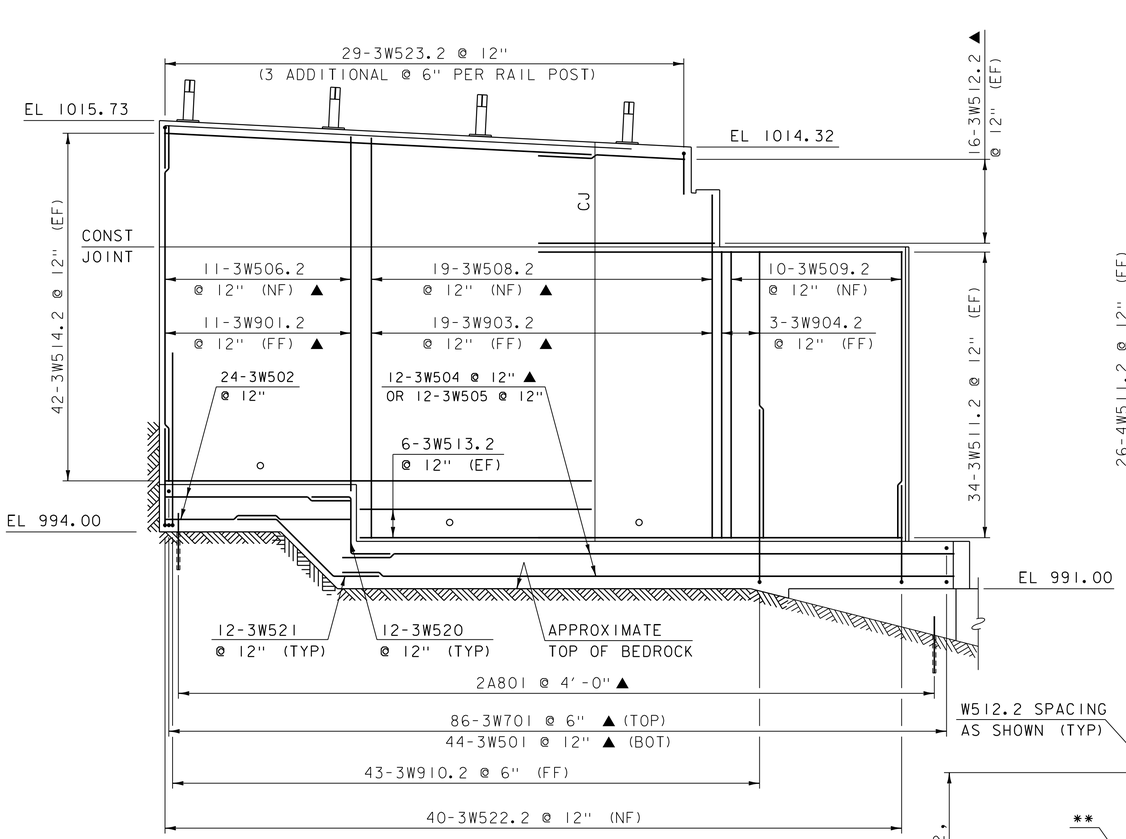
NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

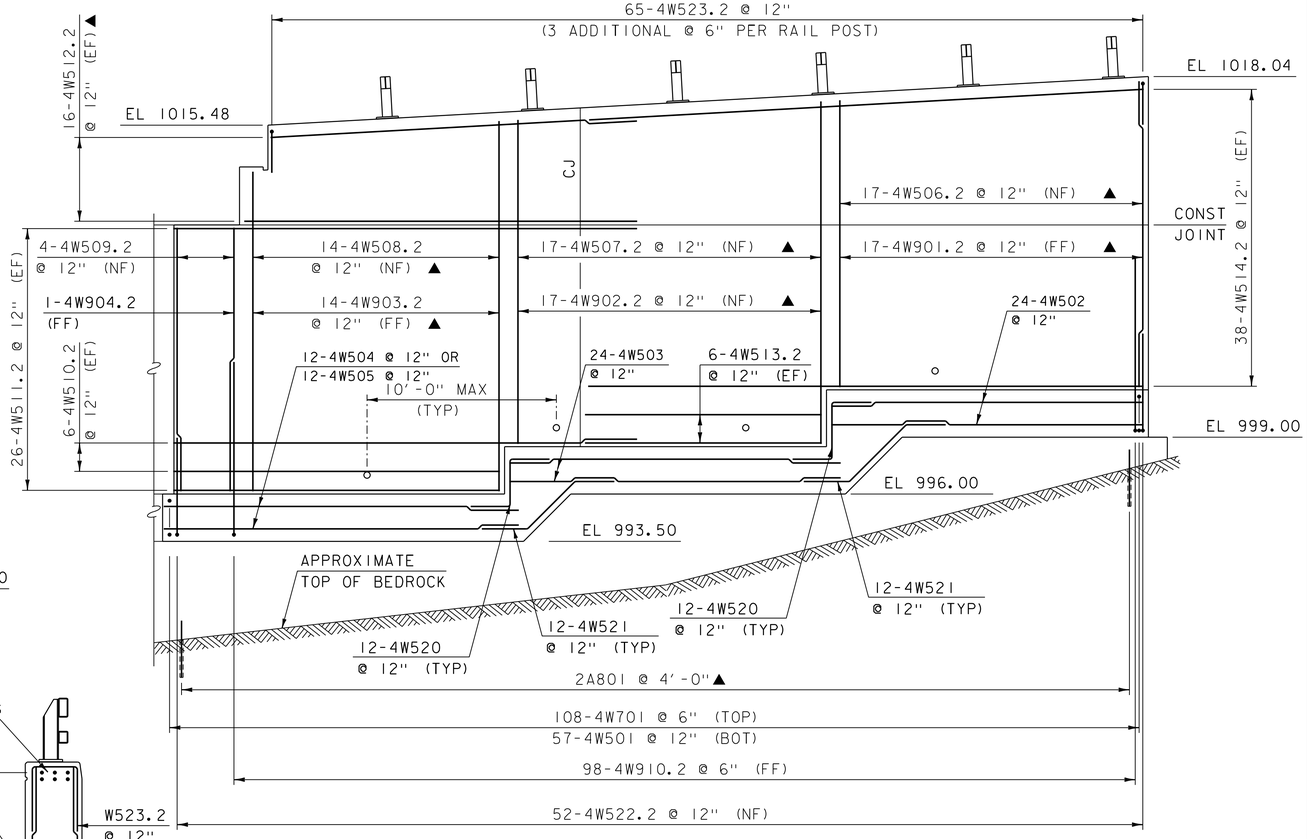
FILE NAME: z19b214sub5.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
ABUTMENT NO. 2 ELEVATION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 188 OF 370



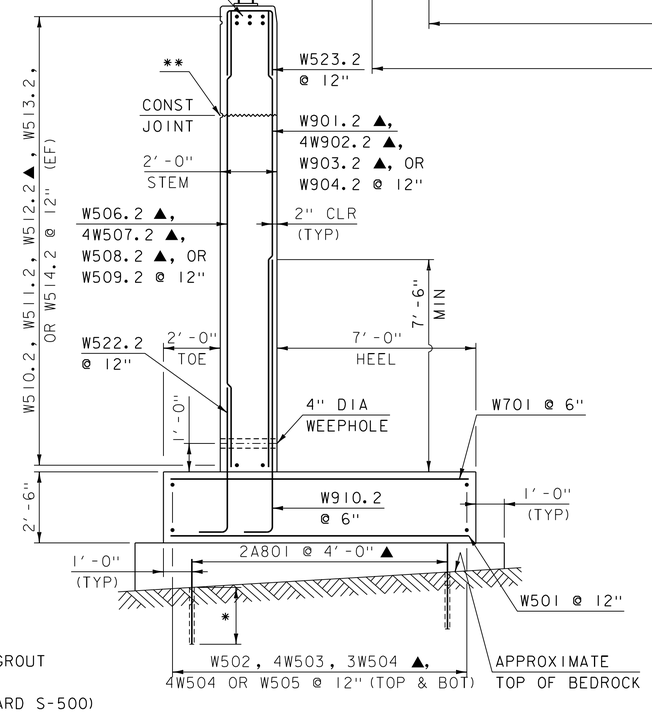
WINGWALL NO. 3 ELEVATION

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



WINGWALL NO. 4 ELEVATION

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



* 2'-0" MIN DRILL AND GROUT
** SCORE MARK (SEE STANDARD S-500)

WINGWALL TYPICAL SECTION

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

NOTES

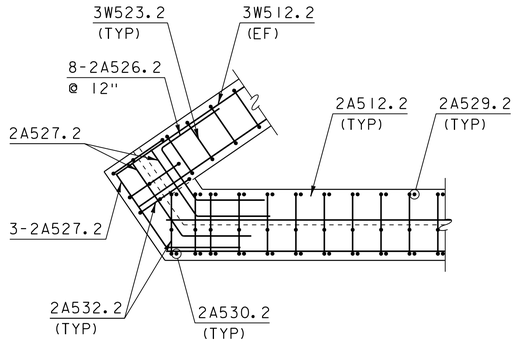
1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 2 FOOTING REINFORCING SHEET.
3. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

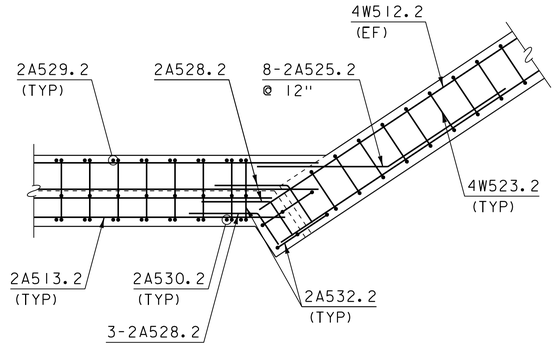
HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214sub7.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
ABUTMENT NO. 2 WINGWALLS

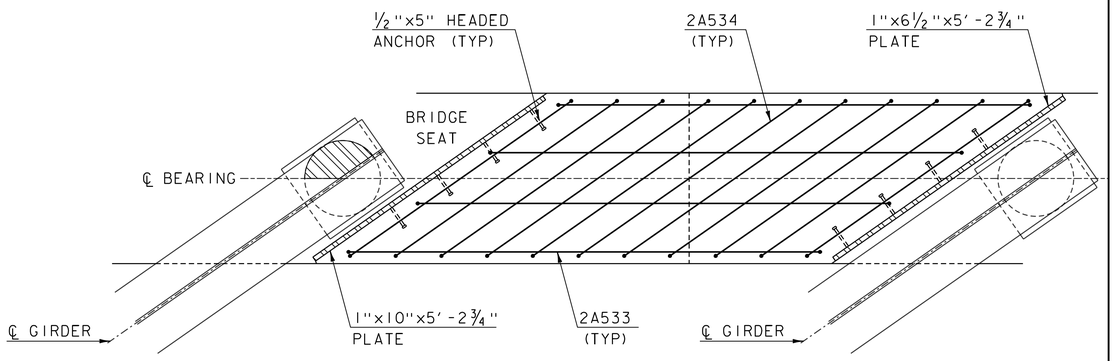
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 189 OF 370



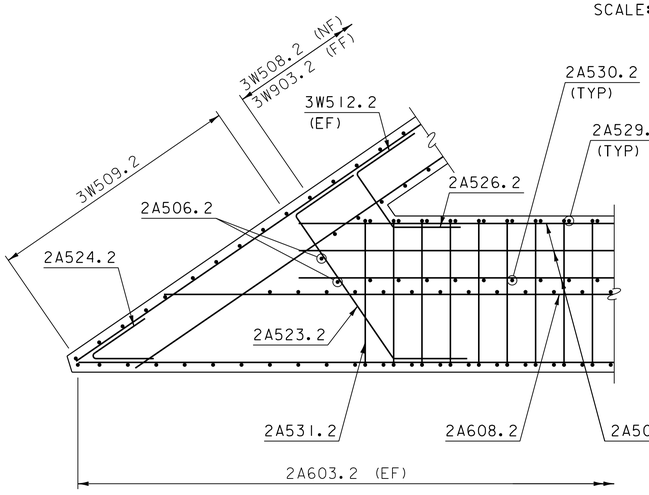


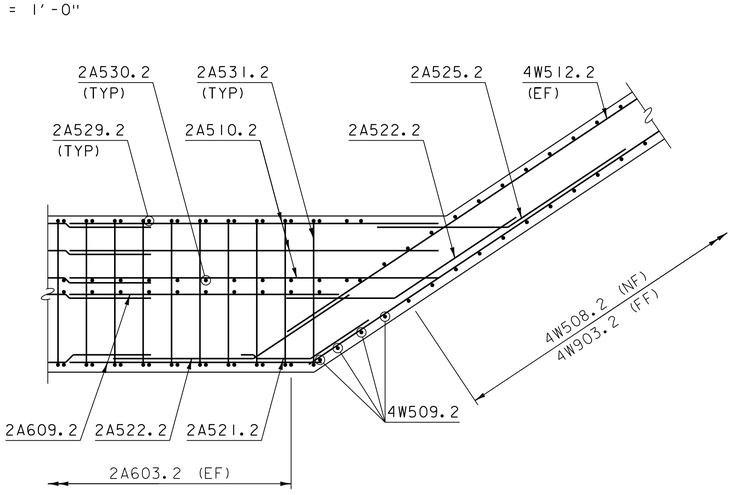
SECTION G-G

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



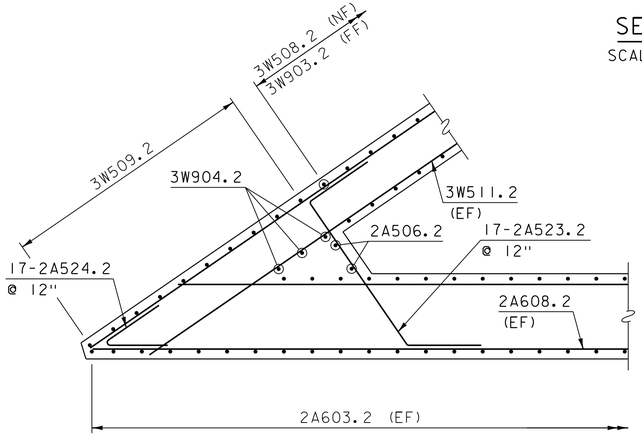
PLAN

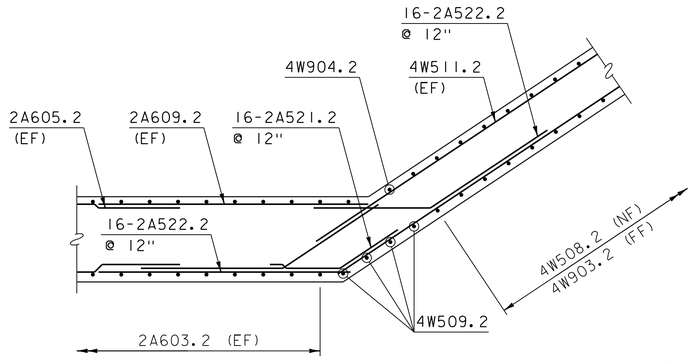




SECTION H-H

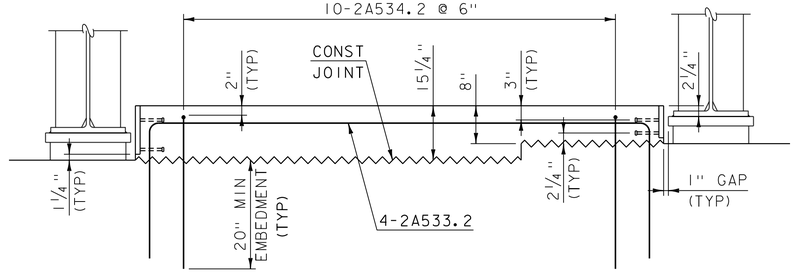
SCALE: 3/8" = 1'-0"





SECTION I-I

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



ELEVATION

NOTES

1. KEEPER BLOCKS SHALL BE CAST BEFORE BEAMS ARE SET.
2. STEEL PLATES EMBEDED IN KEEPER BLOCK SHALL BE HOT-DIPPED GALVANIZED.

CONCRETE KEEPER BLOCK DETAILS

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR LOCATION OF SECTIONS G-G, H-H AND I-I, SEE ABUTMENT NO. 2 ELEVATION SHEET.

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
----- ABOVE SECTION CUT

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

FILE NAME: zI9b2I4sub8.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
ABUTMENT NO. 2 DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 190 OF 370

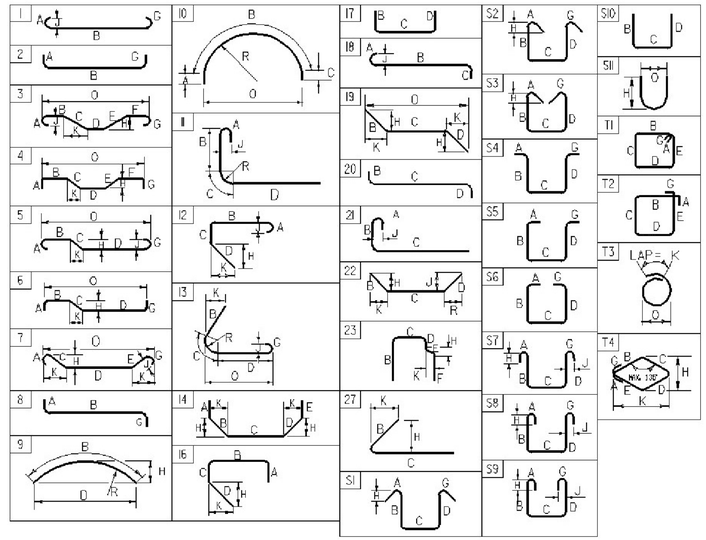
STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	DECK																
▲	292	5	32'- 6"	S501.2	STR	32'- 6"											
	162	5	30'- 4"	S502.2	STR	30'- 4"											
✳	48	5	33'- 0"	S503.2	STR	33'- 0"											
	36	5	33'- 0"	S504.2	STR	33'- 0"											
	24	5	26'- 0"	S505.2	STR	26'- 0"											
	119	5	5'- 3"	S510.2	S5	0'- 10"	1'- 1"	1'- 5"	1'- 1"			0'- 10"					
	120	5	5'- 1"	S511.2	S5	0'- 10"	1'- 0"	1'- 5"	1'- 0"			0'- 10"					
	30	5	6'- 11"	S512.2	S2	2'- 0"	0'- 7"	1'- 11"	0'- 5"			2'- 0"	0'- 1"	<>			
	30	5	7'- 2"	S513.2	S2	2'- 0"	0'- 9"	1'- 11"	0'- 6"			2'- 0"	0'- 1"				
	164	7	5'- 11"	S701.2	1	0'- 10"	5'- 1"										
	165	7	6'- 2"	S702.2	3	0'- 10"	3'- 0"	---	---	2'- 4"	---	---	0'- 1"				
	APPROACH SLAB NO. 1																
	34	5	25'- 3"	1AS501.2	STR	25'- 3"											
	35	5	6'- 0"	1AS502.2	S5	2'- 0"	1'- 0"	0'- 6"	0'- 6"			2'- 0"					
	35	9	25'- 5"	1AS901.2	1	1'- 4"	24'- 1"										
	APPROACH SLAB NO. 2																
	32	5	26'- 3"	2AS501.2	STR	26'- 3"											
	35	5	5'- 11"	2AS502.2	S5	2'- 0"	0'- 11"	0'- 6"	0'- 6"			2'- 0"					
	35	9	25'- 5"	2AS901.2	1	1'- 4"	24'- 1"										
	ABUTMENT NO. 1																
✳	60	5	10'- 6"	1A501	STR	10'- 6"											
▲	24	5	30'- 6"	1A502	STR	30'- 6"											
▲	12	5	40'- 8"	1A503	STR	40'- 8"											
▲	2	5	18'- 0"	1A506.2	STR	18'- 0"											
	9	5	30'- 6"	1A507.2	STR	30'- 6"											
	3	5	15'- 0"	1A508.2	STR	15'- 0"											
▲	12	5	16'- 0"	1A509.2	STR	16'- 0"											
▲	9	5	12'- 0"	1A510.2	STR	12'- 0"											
	8	5	30'- 6"	1A511.2	STR	30'- 6"											
	8	5	13'- 6"	1A512.2	STR	13'- 6"											
▲	8	5	11'- 6"	1A513.2	STR	11'- 6"											
	16	5	5'- 0"	1A521.2	19		2'- 6"	2'- 6"	---				1'- 6"		2'- 0"		
	32	5	8'- 8"	1A522.2	19		4'- 4"	4'- 4"	---				2'- 7"		3'- 6"		
	17	5	11'- 6"	1A523.2	12		2'- 6"	6'- 6"	2'- 6"				1'- 5"		2'- 0"		
	17	5	5'- 0"	1A524.2	27		2'- 6"	2'- 6"					2'- 1"		1'- 8"		
	7	5	9'- 8"	1A525.2	19		5'- 4"	4'- 4"	---				3'- 2"		4'- 4"		
	7	5	7'- 2"	1A526.2	12		2'- 6"	2'- 2"	2'- 6"				1'- 5"		2'- 0"		
▲	5	5	5'- 10"	1A527.2	19		3'- 4"	2'- 6"	---				2'- 9"		1'- 11"		
▲	5	5	4'- 0"	1A528.2	19		1'- 6"	2'- 6"	---				1'- 3"		0'- 11"		
▲	49	5	10'- 11"	1A529.2	19		5'- 5"	3'- 6"	2'- 0"								
▲	49	5	9'- 6"	1A530.2	19		7'- 6"	2'- 0"	---								
	46	5	10'- 0"	1A531.2	S10		2'- 6"	5'- 0"	2'- 6"								
	54	5	7'- 1"	1A532.2	23		2'- 6"	0'- 10"	0'- 7"	1'- 3"	1'- 11"		---		1'- 3"		
	119	6	10'- 6"	1A601	STR	10'- 6"											
▲	50	6	10'- 0"	1A602.2	STR	10'- 0"											
▲	107	6	18'- 0"	1A603.2	STR	18'- 0"											
	33	6	30'- 6"	1A605.2	STR	30'- 6"											
	3	6	15'- 0"	1A607.2	STR	15'- 0"											
▲	35	6	23'- 0"	1A608.2	STR	23'- 0"											
▲	33	6	8'- 6"	1A609.2	STR	8'- 6"											
	157	6	6'- 9"	1A620.2	2	1'- 0"	5'- 9"					---					
	61	8	4'- 0"	1A801	STR	4'- 0"											
	15	8	2'- 6"	1A802.2	19		1'- 1"	1'- 5"					0'- 9"		0'- 10"		
	WINGWALL 1																
	30	5	10'- 6"	1W501	STR	10'- 6"											
▲	12	5	29'- 2"	1W504	STR	29'- 2"											
▲	12	5	27'- 2"	1W505	STR	27'- 2"											
▲	26	5	21'- 10"	1W508.2	STR	21'- 10"											
▲	3	5	17'- 2"	1W509.2	STR	17'- 2"											
	32	5	19'- 9"	1W511.2	STR	19'- 9"											
▲	14	5	16'- 3"	1W512.2	STR	16'- 3"											
	46	5	11'- 7"	1W514.2	STR	11'- 7"											
	29	5	6'- 1"	1W522.2	2	0'- 10"	5'- 3"					---					
	33	5	6'- 1"	1W523.2	17		2'- 3"	1'- 7"	2'- 3"								
	59	7	10'- 6"	1W701	STR	10'- 6"											
▲	26	9	21'- 10"	1W903.2	STR	21'- 10"											
▲	1	9	17'- 2"	1W904.2	STR	17'- 2"											
	53	9	11'- 4"	1W910.2	2	1'- 7"	9'- 9"					---					
	WINGWALL 2																
	32	5	12'- 3"	2W501	STR	12'- 3"											
	12	5	31'- 5"	2W504	STR	31'- 5"											
▲	12	5	17'- 8"	2W505	STR	17'- 8"											
▲	20	5	22'- 7"	2W508.2	STR	22'- 7"											
▲	9	5	18'- 0"	2W509.2	STR	18'- 0"											
	34	5	17'- 11"	2W511.2	STR	17'- 11"											
▲	14	5	8'- 5"	2W512.2	STR	8'- 5"											
	48	5	13'- 7"	2W514.2	STR	13'- 7"											
	29	5	6'- 1"	2W522.2	2	0'- 10"	5'- 3"					---					
	27	5	6'- 1"	2W523.2	17		2'- 3"	1'- 7"	2'- 3"								
	63	7	12'- 3"	2W701	STR	12'- 3"											
▲	20	9	22'- 7"	2W903.2	STR	22'- 7"											
▲	3	9	18'- 0"	2W904.2	STR	18'- 0"											
	45	9	11'- 4"	2W910.2	2	1'- 7"	9'- 9"					---					
	ABUTMENT NO. 2																
	62	5	10'- 6"	2A501	STR	10'- 6"											
▲	12	5	26'- 5"	2A502	STR	26'- 5"											
▲	12	5	24'- 6"	2A503	STR	24'- 6"											
▲	12	5	34'- 7"	2A504	STR	34'- 7"											
▲	12	5	19'- 2"	2A505	STR	19'- 2"											
▲	2	5	17'- 7"	2A506.2	STR	17'- 7"											
	9	5	30'- 6"	2A507.2	STR	30'- 6"											
	3	5	27'- 3"	2A508.2	STR	27'- 3"											
▲	9	5	16'- 0"	2A509.2	STR	16'- 0"											
▲	15	5	13'- 0"	2A510.2	STR	13'- 0"											
	8	5	30'- 6"	2A511.2	STR	30'- 6"											
	8	5	13'- 10"	2A512.2	STR	13'- 10"											
▲	8	5	13'- 0"	2A513.2	STR	13'- 0"											
	24	5	6'- 2"	2A520.2	20		2'- 1"	2'- 0"	2'- 1"								
	16	5	5'- 0"	2A521.2	19		2'- 6"	2'- 6"					1'- 5"		2'- 1"		
	32	5	9'- 0"	2A522.2	19		4'- 6"	4'- 6"					2'- 6"		3'- 9"		
	17	5	11'- 5"	2A523.2	12		2'- 6"	6'- 5"	2'- 6"				1'- 5"		2'- 1"		
	17	5	5'- 0"	2A524.2	27		2'- 6"	2'- 6"					2'- 2"		1'- 8"		
	8	5	10'- 0"	2A525.2	19		5'- 6"	4'- 6"					2'- 6"		3'- 9"		
	8	5	7'- 3"	2A526.2	12		2'- 6"	2'- 3"	2'- 6"				1'- 5"		2'- 1"		
▲	5	5	5'- 10"	2A527.2	19		3'- 4"	2'- 6"					2'- 9"		1'- 11"		
▲	5	5	4'- 0"	2A528.2	19		1'- 6"	2'- 6"					1'- 3"		0'- 10"		
▲	51	5	12'- 0"	2A529.2	19		6'- 6"	3'- 6"	2'- 0"								
▲	51	5	10'- 6"	2A530.2	19		8'- 6"	2'- 0"									
	48	5	10'- 0"	2A531.2	S10		2'- 6"	5'- 0"	2'- 6"								
	56	5	7'- 3"	2A532.2	23		2'- 7"	0'- 10"	0'- 7"	1'- 3"	2'- 0"		---		1'- 3"		
	8	5	13'- 11"	2A533.2	17		2'- 9"	8'- 5"	2'- 9"								
	20	5	9'- 11"	2A534.2	17		2'- 10"	4'- 3"	2'- 10"								
	122	6	10'- 6"	2A601	STR	10'- 6"											
▲	51	6	10'- 0"	2A602.2	STR	10'- 0"											
▲	53	6	16'- 9"	2A603.2	STR	16'- 9"											
▲	57	6	18'- 2"	2A604.2	STR	18'- 2"											
	31	6	30'- 6"	2A605.2	STR	30'- 6"											
	4	6	10'- 0"	2A606.2	STR	10'- 0"											
	3	6	15'- 0"	2A607.2	STR	15'- 0"											
▲	35	6	23'- 9"	2A608.2	STR	23'- 9"											
▲	33	6	9'- 6"	2A609.2	STR	9'- 6"											
	161	6	6'- 9"	2A620.2	2	1'- 0"	5'- 9"					---					
	85	8	4'- 0"	2A801	STR	4'- 0"											
	15	8	2'- 6"	2A802.2	19		1'- 1"	1'- 5"									

~ NOTES ~

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



ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION		
		DIAMETER INCHES	AREA INCHES 2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.04	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.14
#9	3.400	1.13	1.00	3.54
#10	4.3	1.270	1.27	3.990
#11	5.31	1.410	1.56	4.430
#14	7.65	1.69	2.25	5.32
#18	13.60	2.26	4.00	7.09

~ REINFORCING STEEL CORROSION RESISTANCE LEVEL ~

THE REINFORCING STEEL MARKS IN THIS SCHEDULE INDICATE THE REQUIRED BAR CORROSION RESISTANCE LEVEL. CORROSION RESISTANCE LEVEL IS DENOTED WITH A .2 FOR LEVEL TWO SUFFIX OR .3 FOR LEVEL THREE SUFFIX. .1 FOR LEVEL ONE IS TO BE OMITTED. THE BAR MATERIAL TYPE AND BAR STEEL GRADE PROVIDED FOR EACH CORROSION LEVEL WILL BE RECORDED ON THE PLAN SET PI SHEET FOR AS-BUILT RECORD PLAN ARCHIVES.

<> INDICATES DIMENSION IN OPPOSITE DIRECTION OF WHAT IS SHOWN IN THE BEND DIAGRAM

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

FILE NAME: z19b214reinf.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
REINFORCING STEEL SCHEDULE I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER
SHEET 191 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
WINGWALL 3																	
	44	5	10'- 6"	3W501	STR	10'- 6"											
	24	5	9'- 10"	3W502	STR	9'- 10"											
▲	12	5	32'- 4"	3W504	STR	32'- 4"											
▲	12	5	16'- 11"	3W505	STR	16'- 11"											
▲	11	5	21'- 3"	3W506.2	STR	21'- 3"											
▲	19	5	23'- 7"	3W508.2	STR	23'- 7"											
▲	10	5	17'- 7"	3W509.2	STR	17'- 7"											
	34	5	19'- 3"	3W511.2	STR	19'- 3"											
▲	16	5	9'- 4"	3W512.2	STR	9'- 4"											
	6	5	12'- 3"	3W513.2	STR	12'- 3"											
	42	5	22'- 7"	3W514.2	STR	22'- 7"											
	12	5	7'- 2"	3W520.2	20		2'- 1"	3'- 0"	2'- 1"								
	12	5	8'- 5"	3W521.2	19		2'- 1"	4'- 3"	2'- 1"								
	40	5	6'- 1"	3W522.2	2	0'- 10"	5'- 3"					---					
	29	5	6'- 1"	3W523.2	17		2'- 3"	1'- 7"	2'- 3"								
	86	7	10'- 6"	3W701	STR	10'- 6"											
▲	11	9	21'- 3"	3W901.2	STR	21'- 3"											
▲	19	9	23'- 7"	3W903.2	STR	23'- 7"											
▲	3	9	17'- 7"	3W904.2	STR	17'- 7"											
	43	9	11'- 4"	3W910.2	2	1'- 7"	9'- 9"					---					
WINGWALL 4																	
	57	5	10'- 6"	4W501	STR	10'- 6"											
	24	5	16'- 6"	4W502	STR	16'- 6"											
	24	5	17'- 6"	4W503	STR	17'- 6"											
▲	12	5	18'- 9"	4W504	STR	18'- 9"											
▲	12	5	16'- 11"	4W505	STR	16'- 11"											
▲	17	5	18'- 7"	4W506.2	STR	18'- 7"											
▲	17	5	20'- 6"	4W507.2	STR	20'- 6"											
▲	14	5	22'- 6"	4W508.2	STR	22'- 6"											
▲	4	5	16'- 9"	4W509.2	STR	16'- 9"											
	6	5	17'- 3"	4W510.2	STR	17'- 3"											
	26	5	24'- 6"	4W511.2	STR	24'- 6"											
▲	16	5	20'- 9"	4W512.2	STR	20'- 9"											
	6	5	12'- 6"	4W513.2	STR	12'- 6"											
▲	38	5	29'- 4"	4W514.2	STR	29'- 4"											
	24	5	7'- 2"	4W520.2	20		2'- 1"	3'- 0"	2'- 1"								
	24	5	8'- 5"	4W521.2	19		2'- 1"	4'- 3"	2'- 1"								
	52	5	6'- 1"	4W522.2	2	0'- 10"	5'- 3"					---					
	65	5	6'- 1"	4W523.2	17		2'- 3"	1'- 7"	2'- 3"								
	108	7	10'- 6"	4W701	STR	10'- 6"											
▲	17	9	18'- 7"	4W901.2	STR	18'- 7"											
▲	17	9	20'- 6"	4W902.2	STR	20'- 6"											
▲	14	9	22'- 6"	4W903.2	STR	22'- 6"											
▲	1	9	16'- 9"	4W904.2	STR	16'- 9"											
	98	9	11'- 4"	4W910.2	2	1'- 7"	9'- 9"					---					

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O

~ NOTES ~

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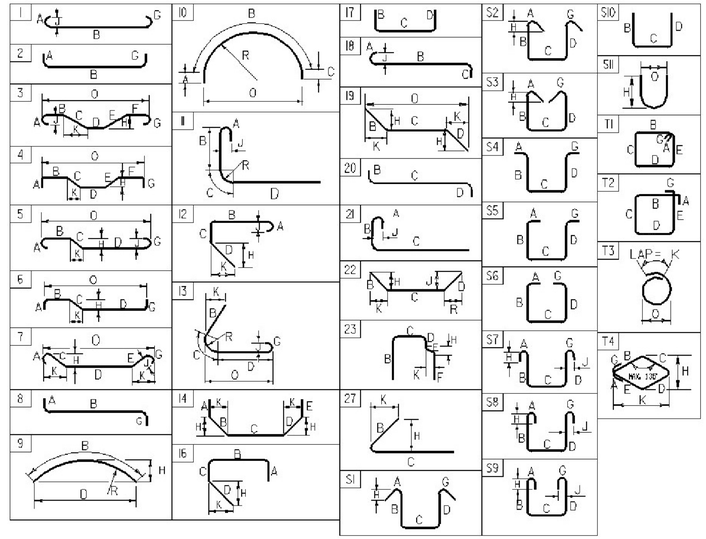

ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION		
		DIAMETER INCHES	AREA INCHES 2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
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#7	2.04	0.875	0.60	2.749
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#9	3.400	1.13	1.00	3.54
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#14	7.65	1.69	2.25	5.32
#18	13.60	2.26	4.00	7.09

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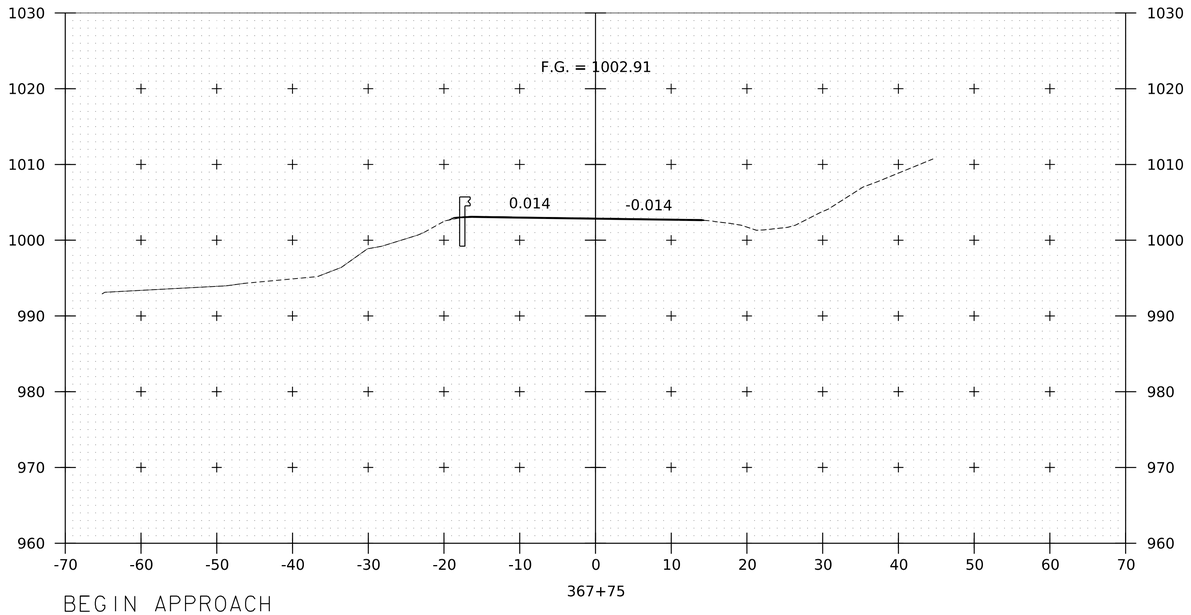
<> INDICATES DIMENSION IN OPPOSITE DIRECTION OF WHAT IS SHOWN IN THE BEND DIAGRAM

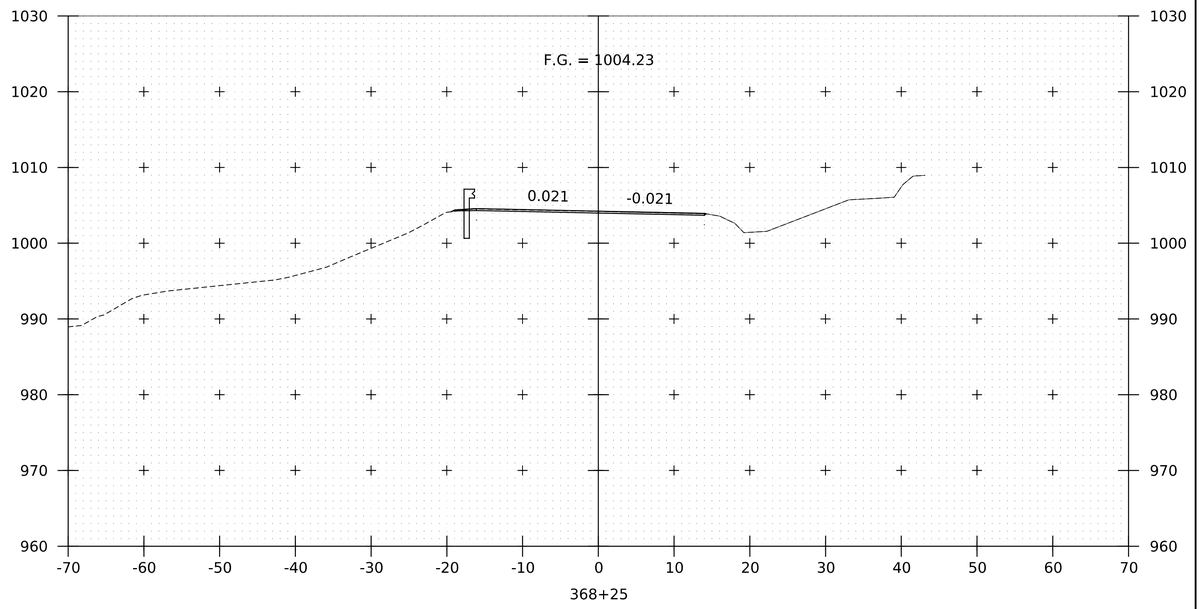
HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 024I(57)

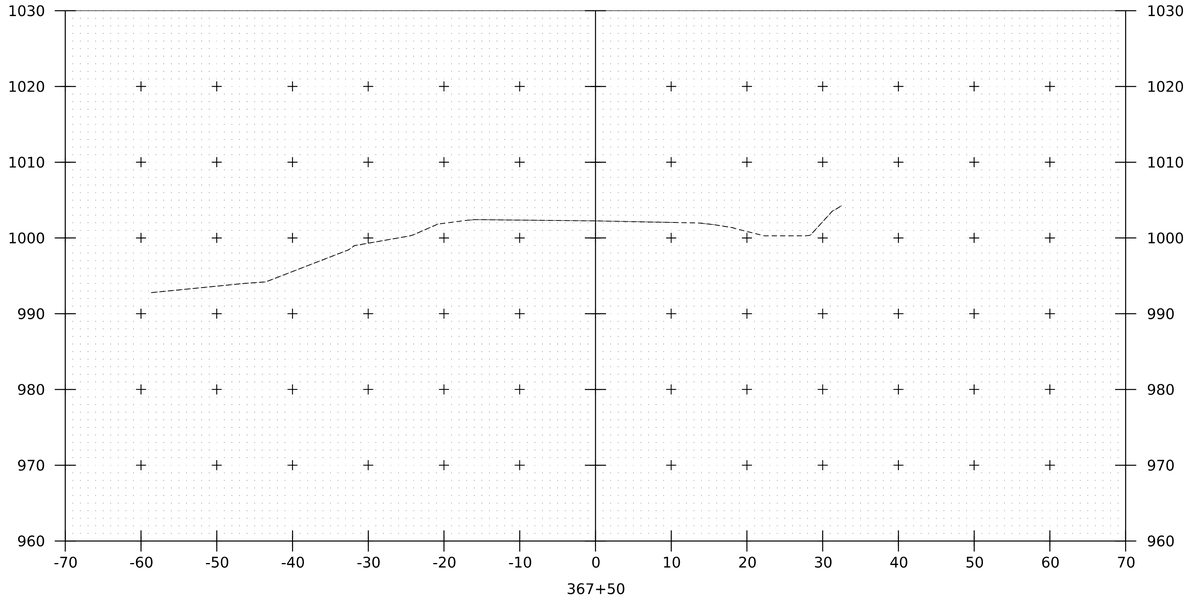
FILE NAME: z19b214reinf.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: K.HAMPE
REINFORCING STEEL SCHEDULE 2

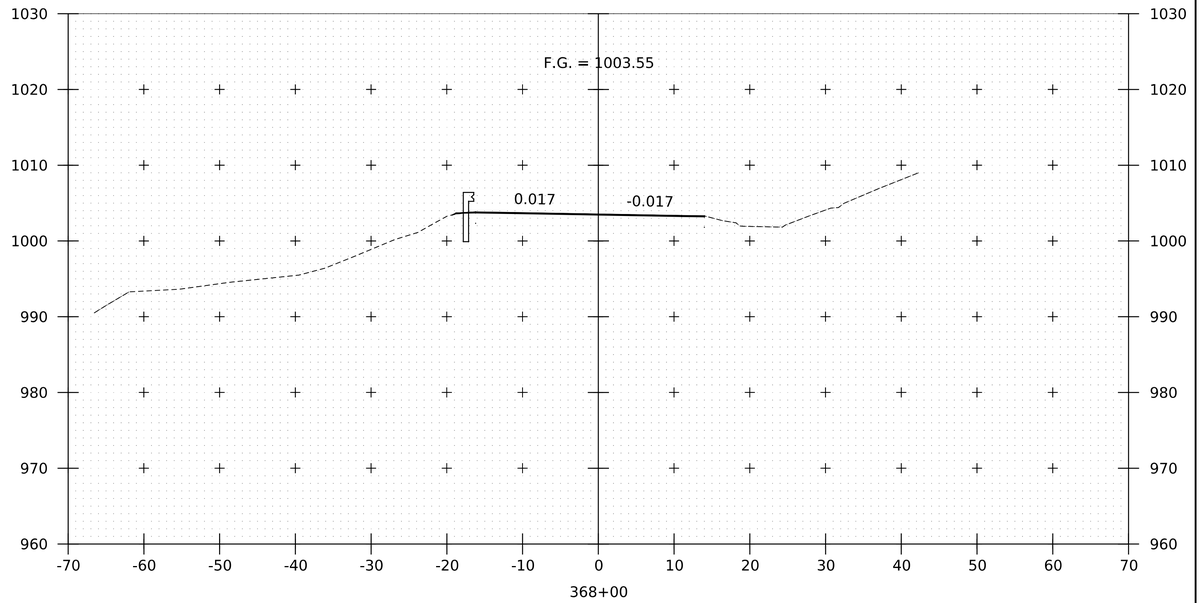
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: A.SPIELER





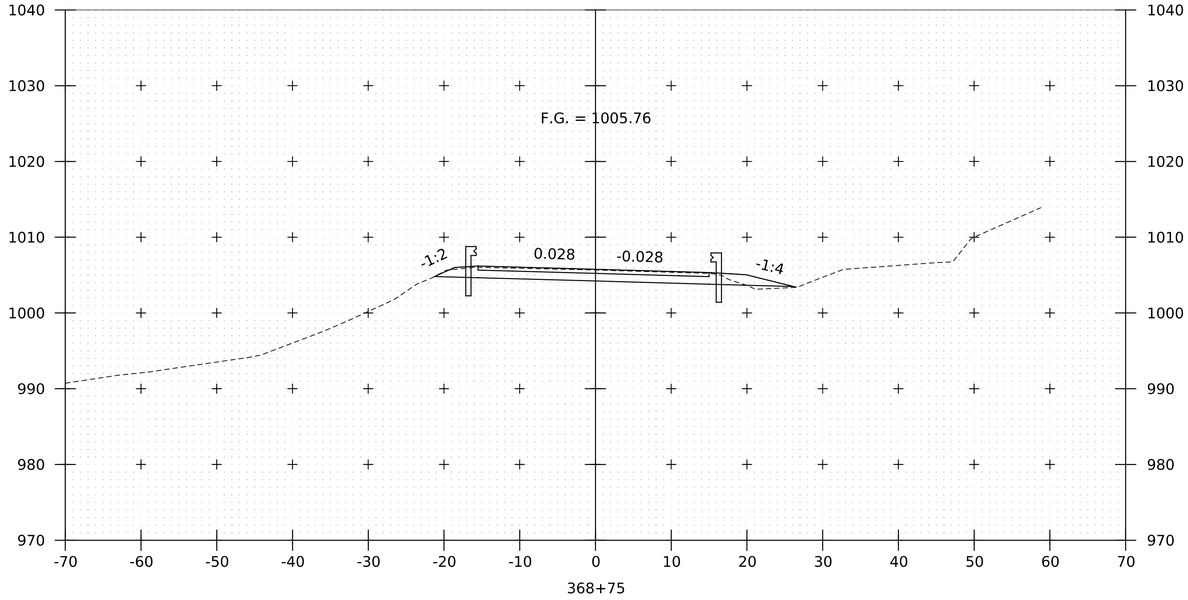
BEGIN APPROACH
STA 367+75.00
MATCH EXISTING

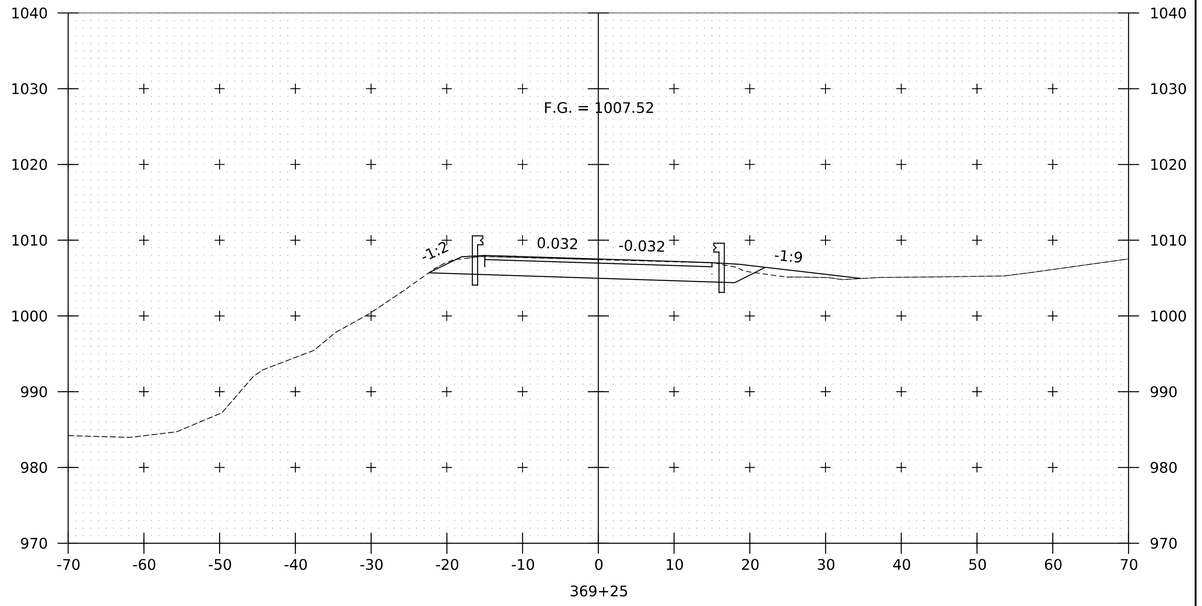


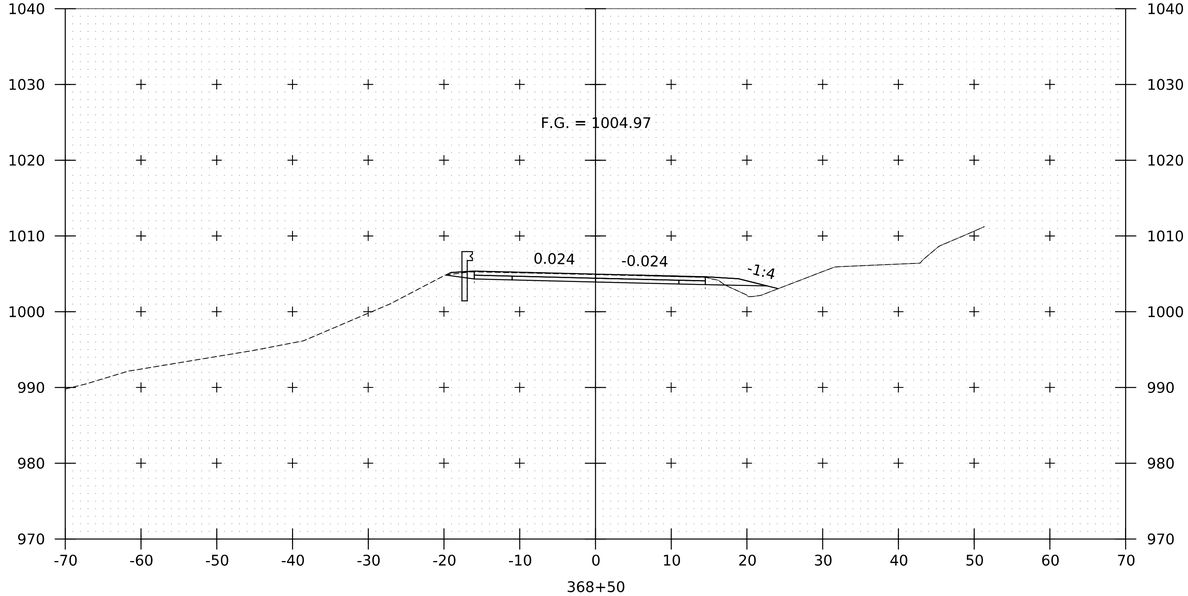


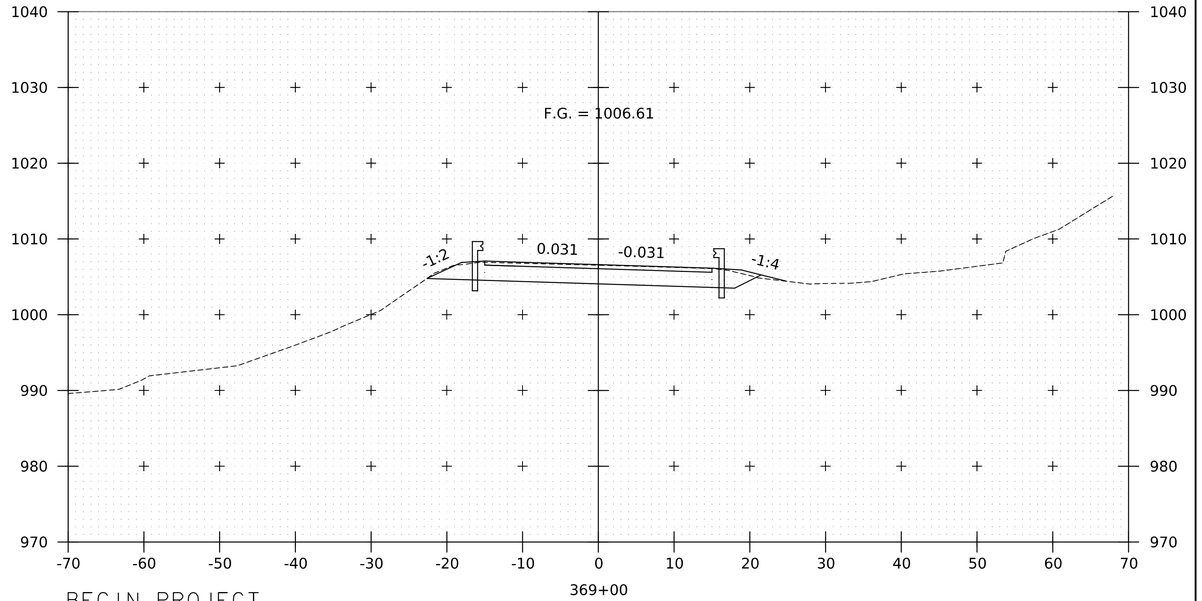
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 1	SHEET 193 OF 370





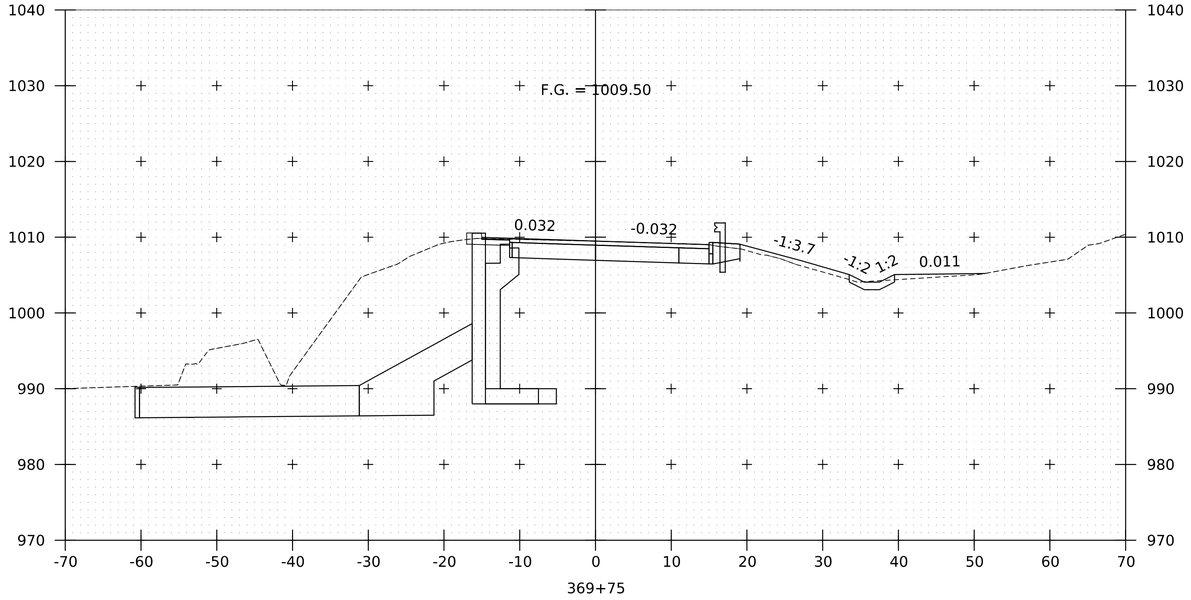


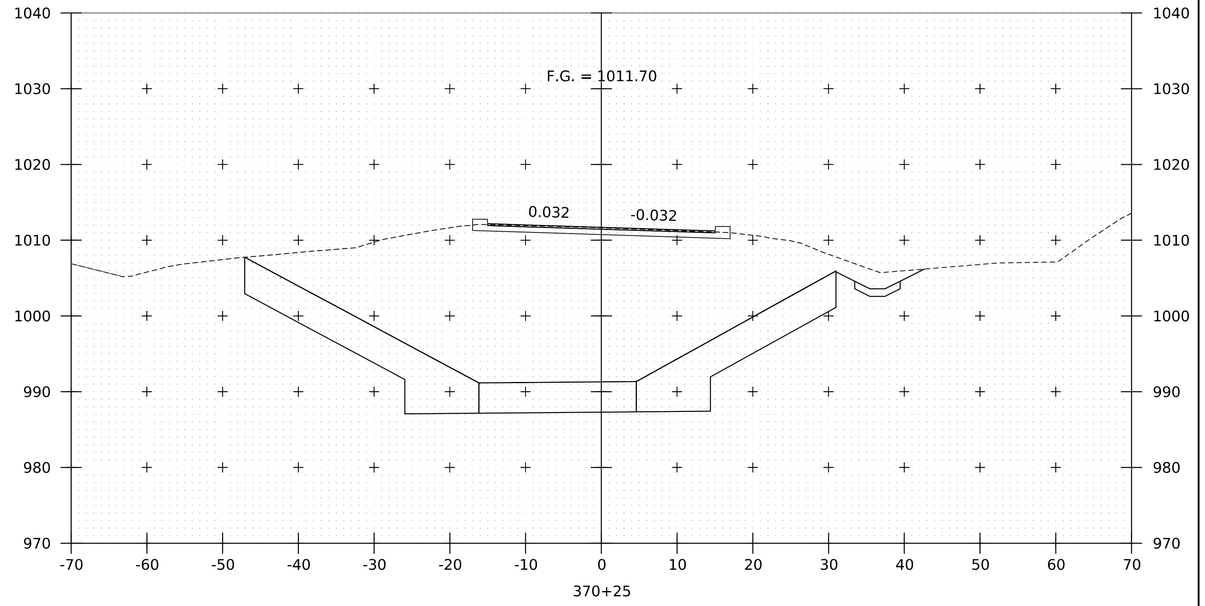


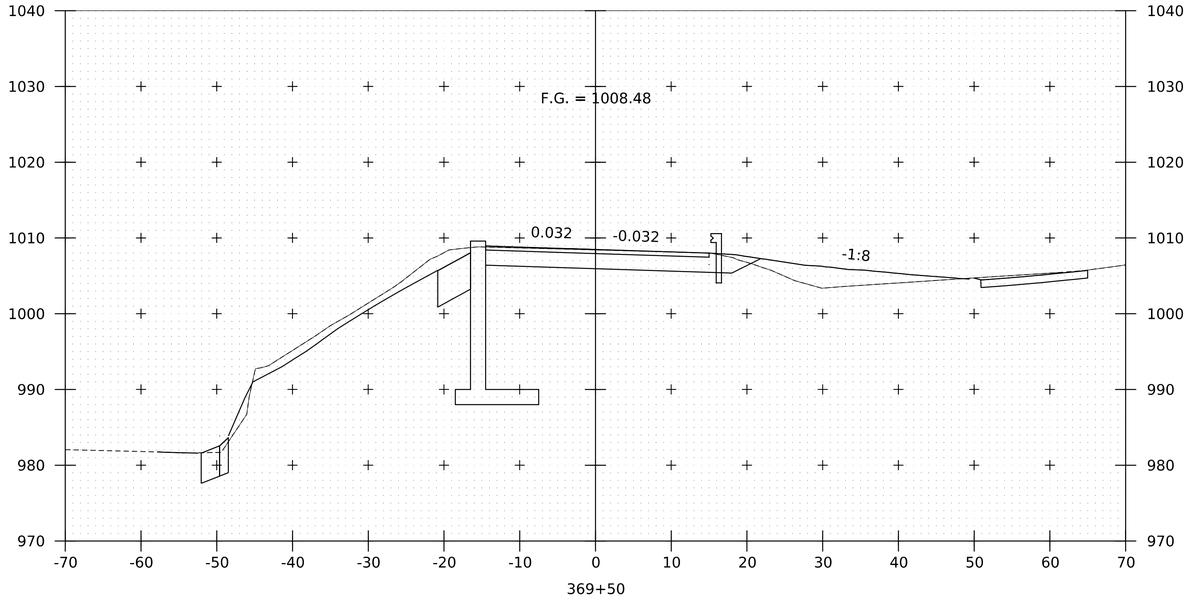
BEGIN PROJECT
STA 369+00.00

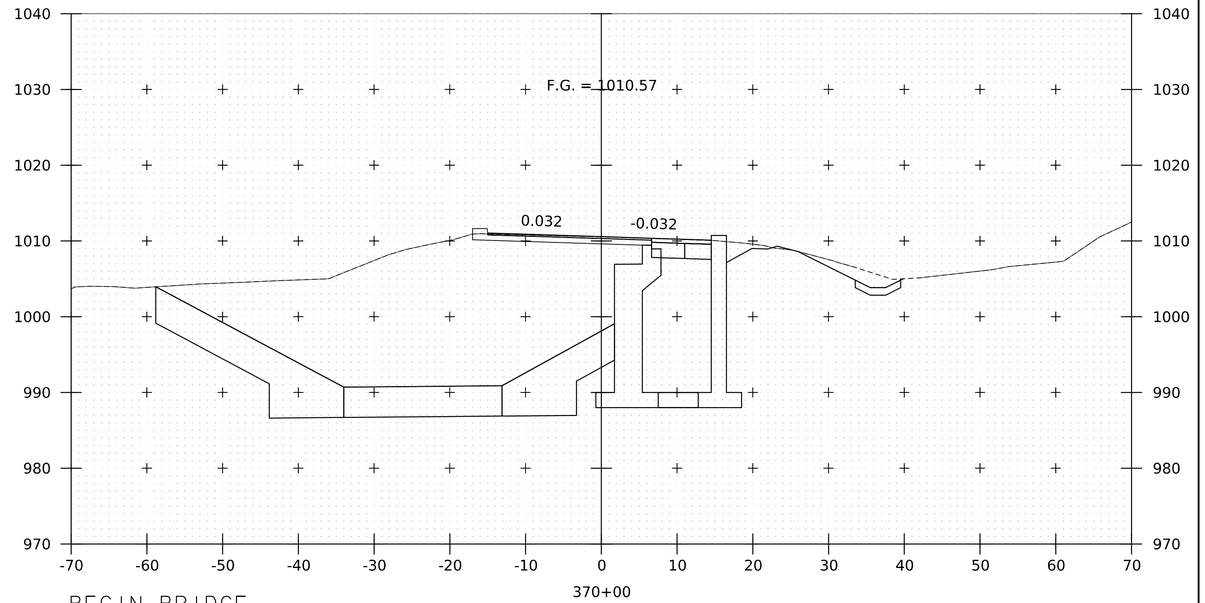
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(57)
FILE NAME: z19b2l4xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 2	SHEET 194 OF 370





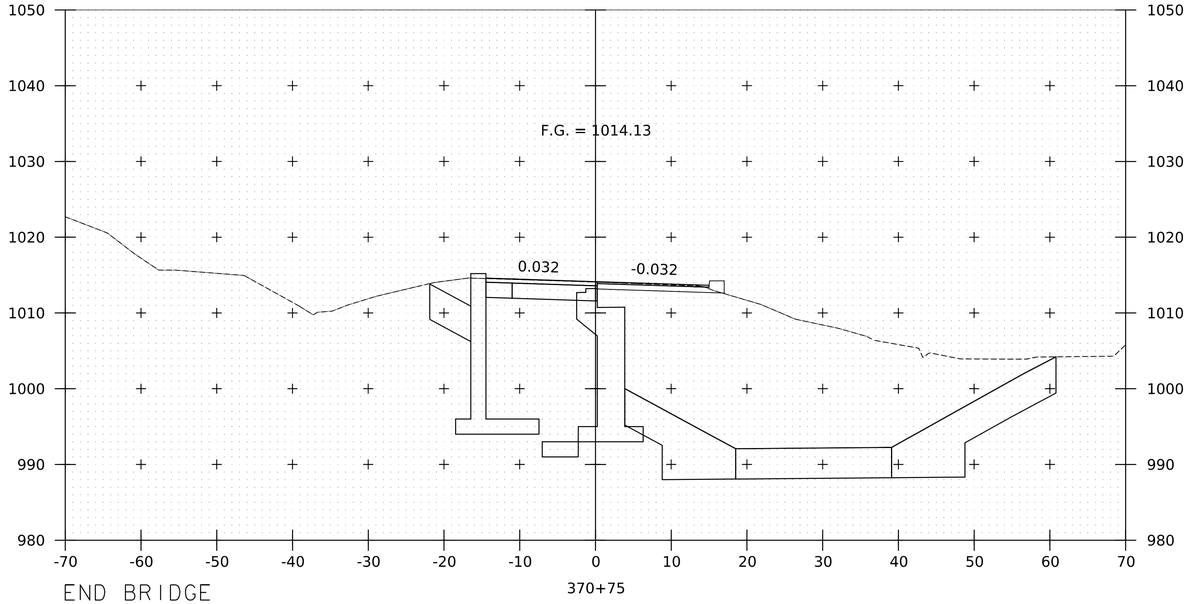




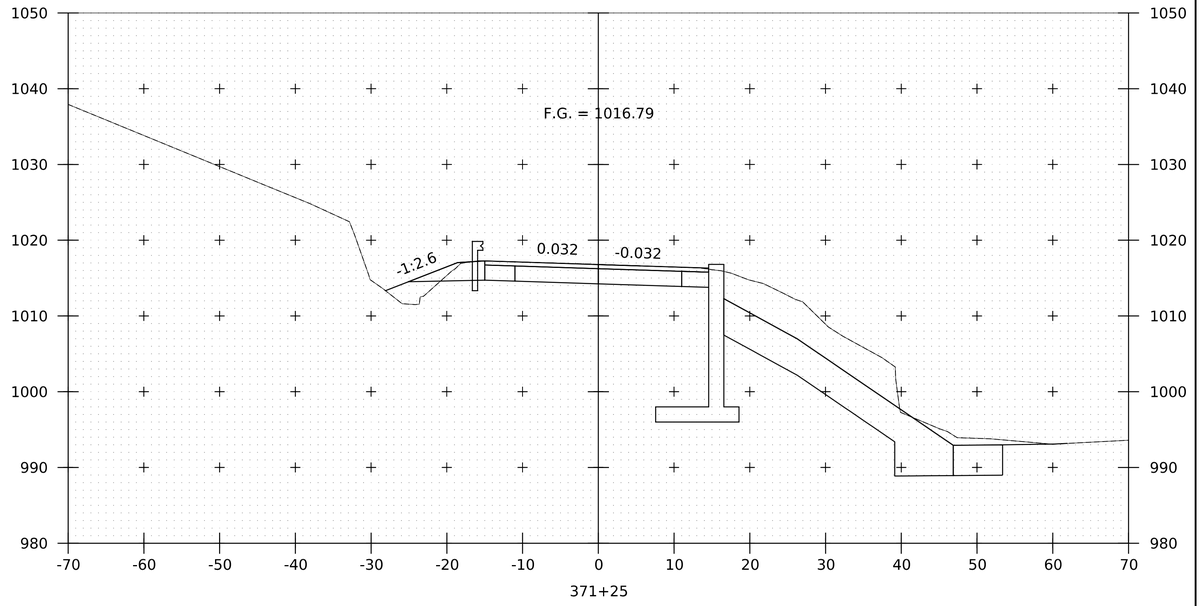
BEGIN BRIDGE
STA 369+90.14

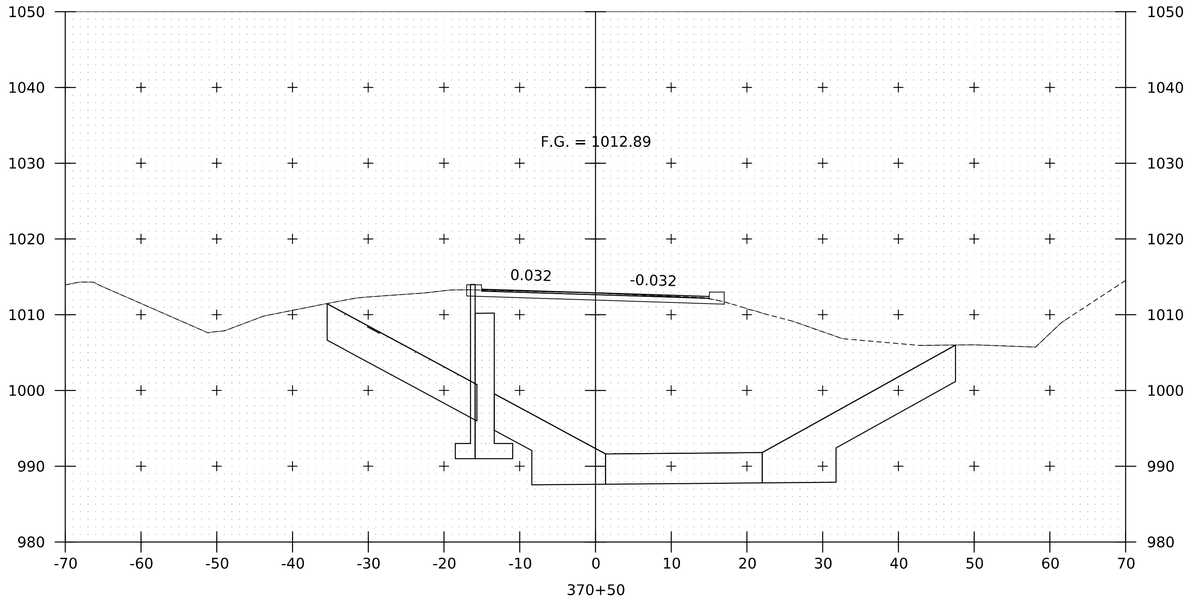
HOYLE TANNER

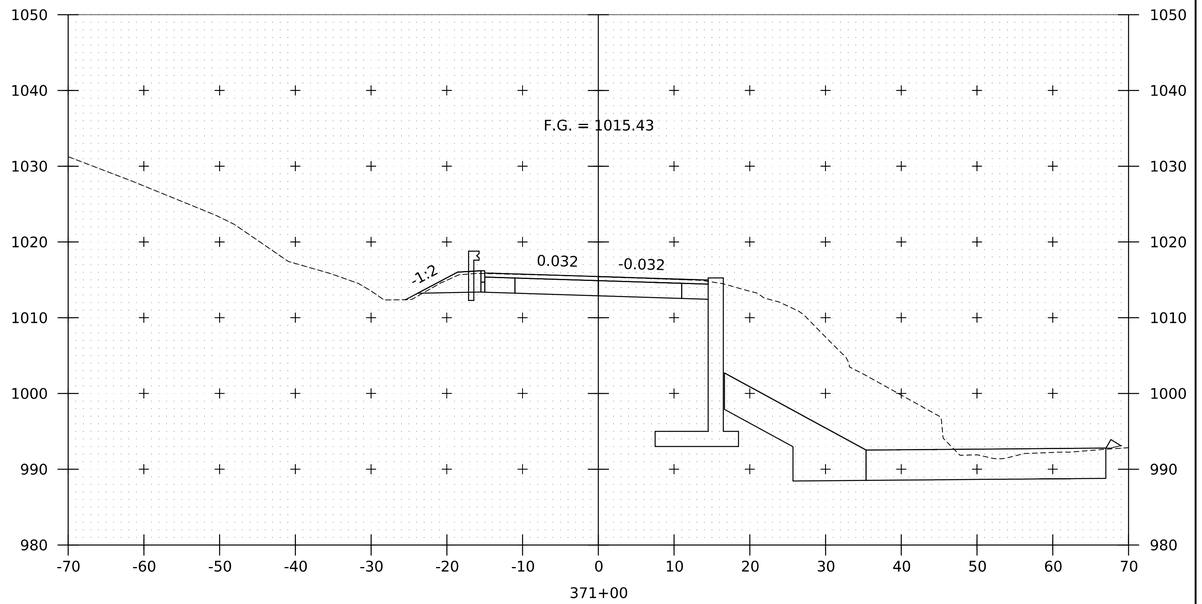
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 3	SHEET 195 OF 370



END BRIDGE
STA 370+77.02

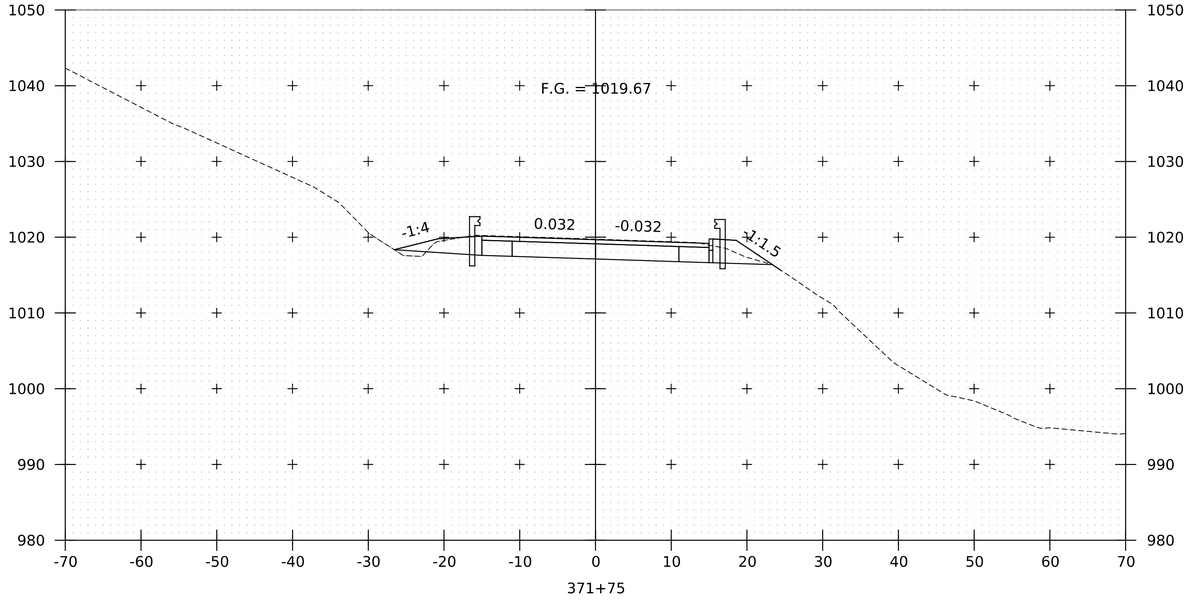


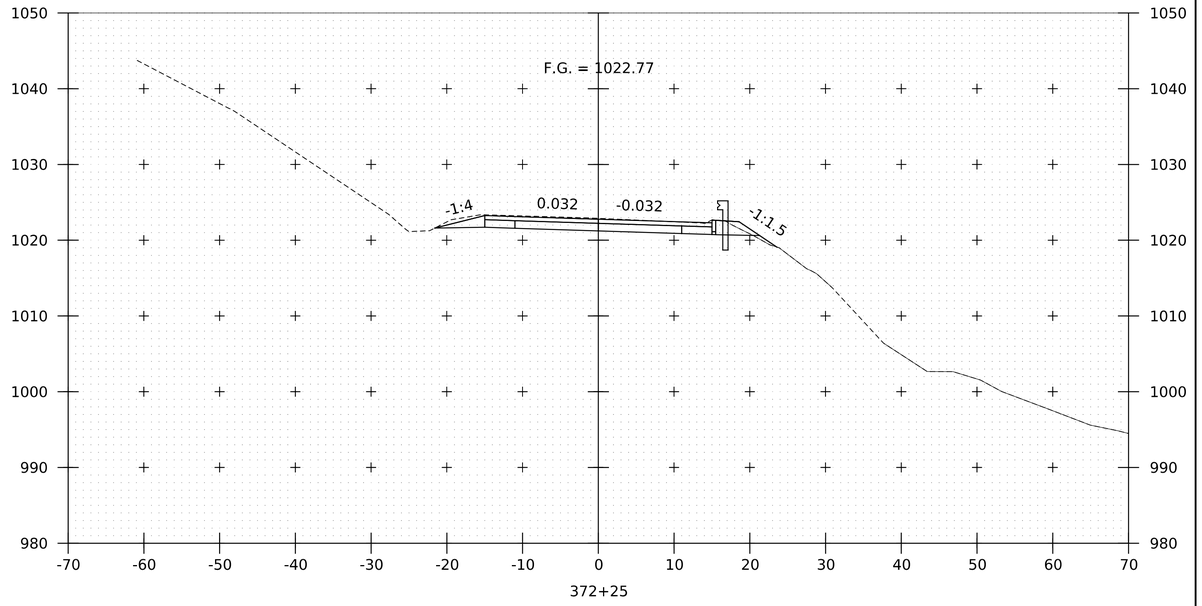


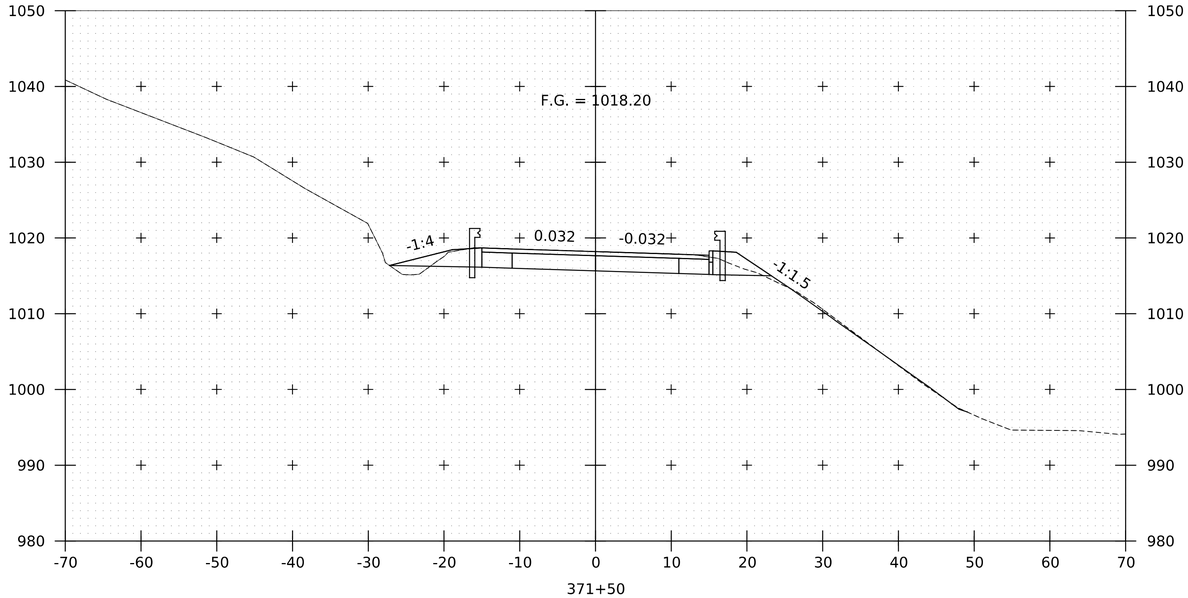


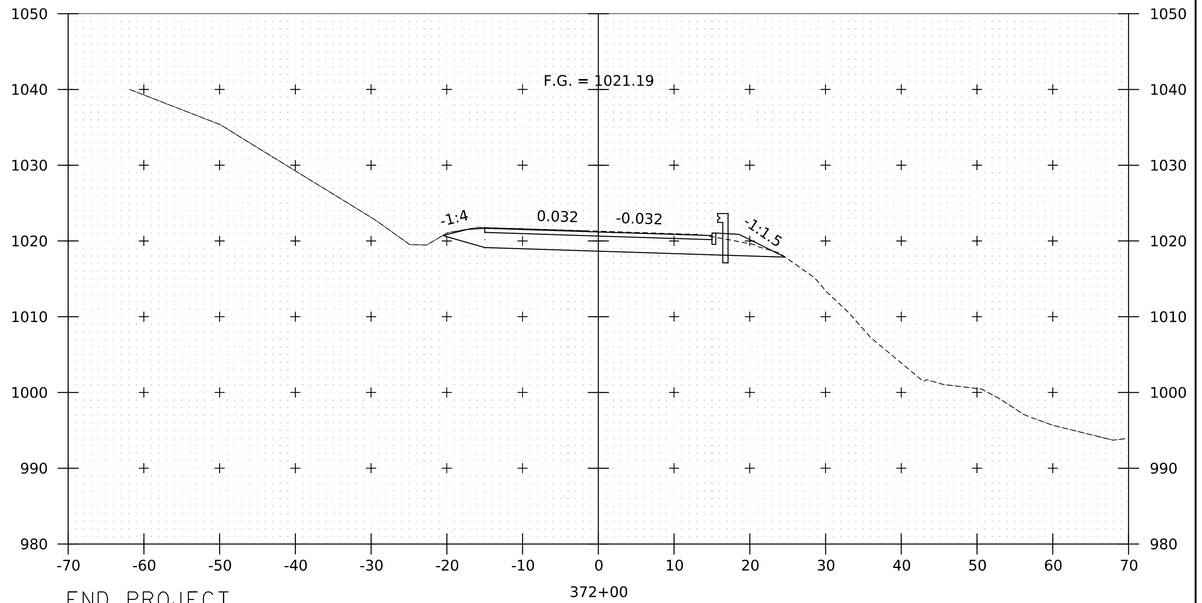
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 4	SHEET 196 OF 370





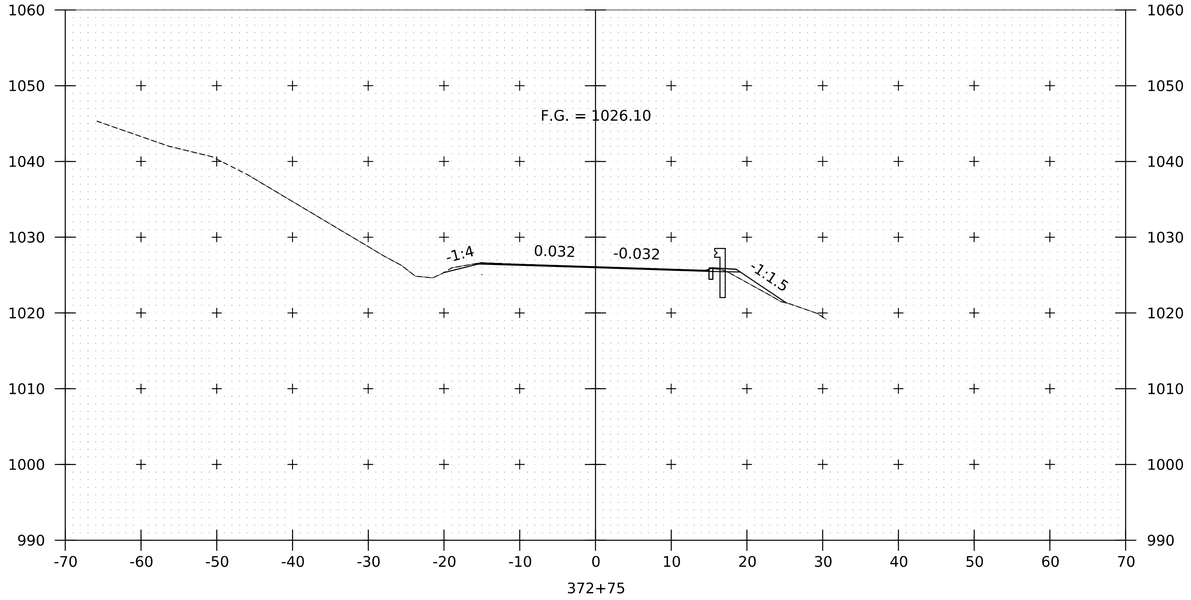


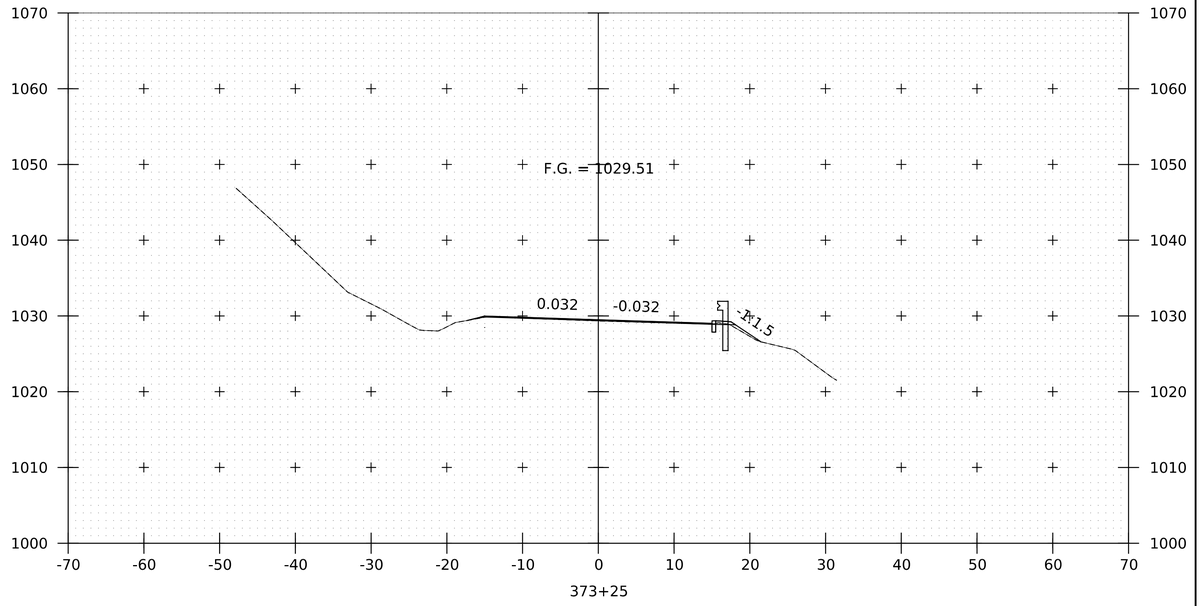


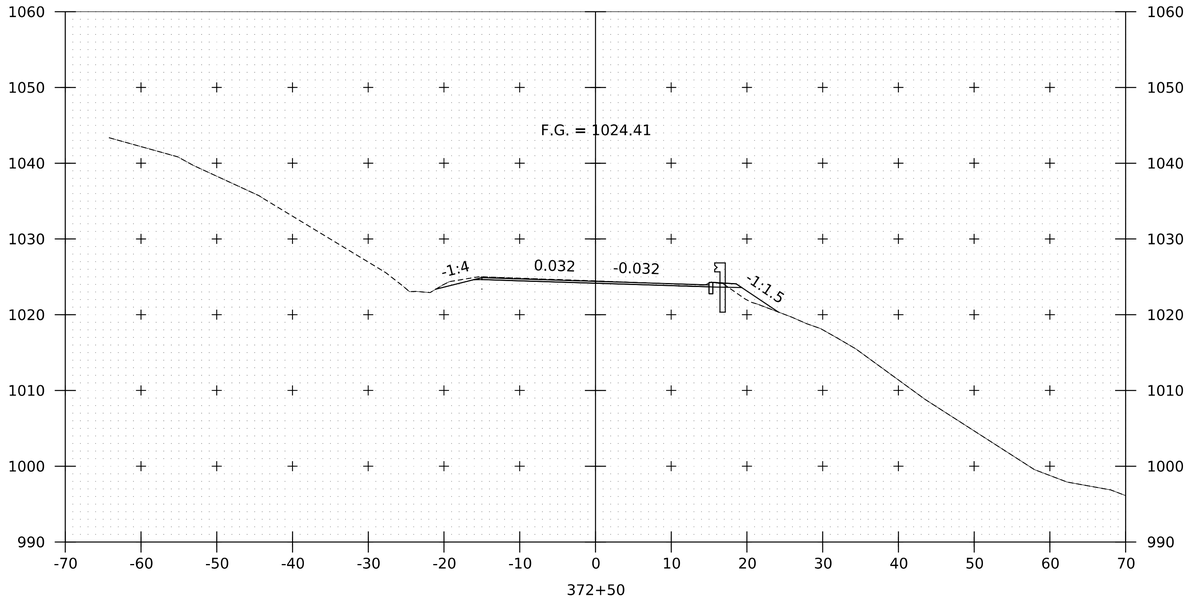
END PROJECT
STA 372+00.00

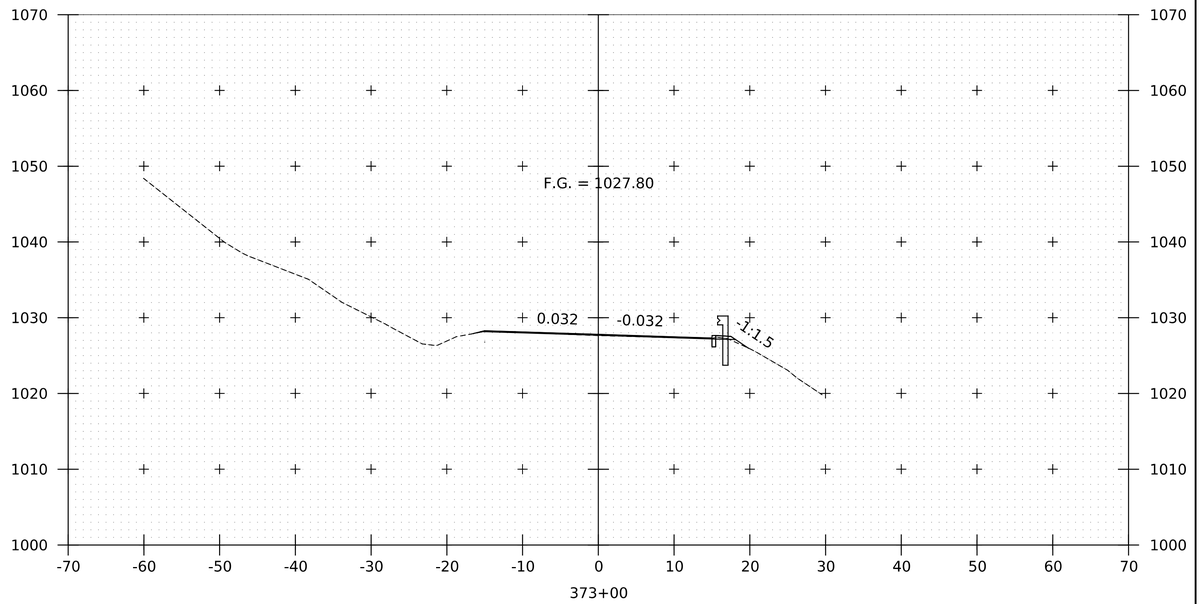
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 5	SHEET 197 OF 370



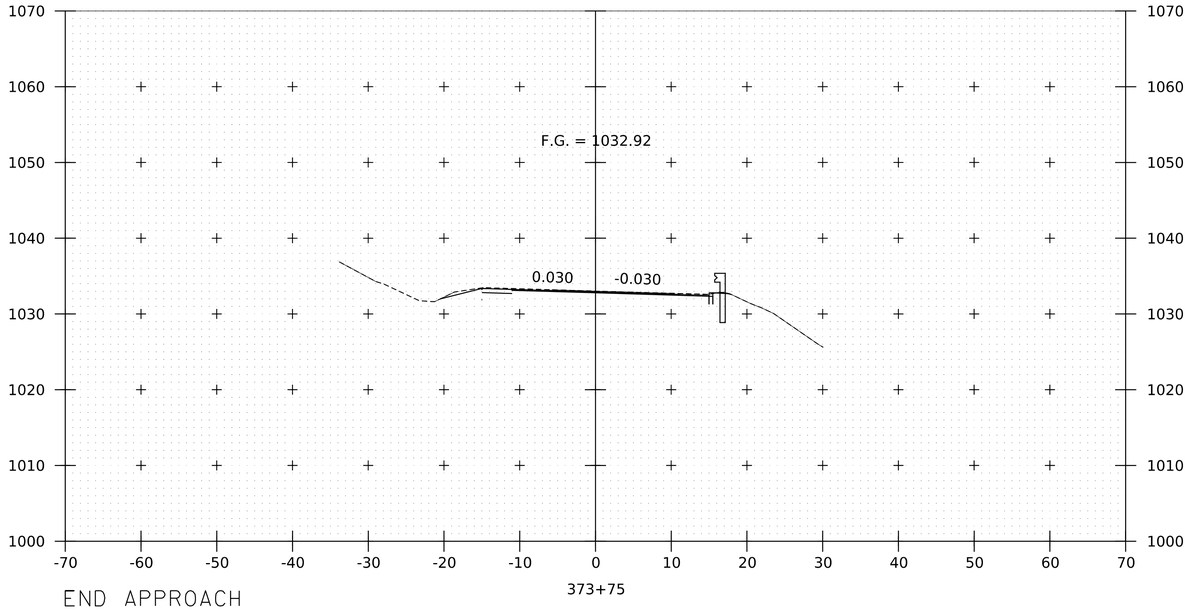






HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 6	SHEET 198 OF 370



END APPROACH
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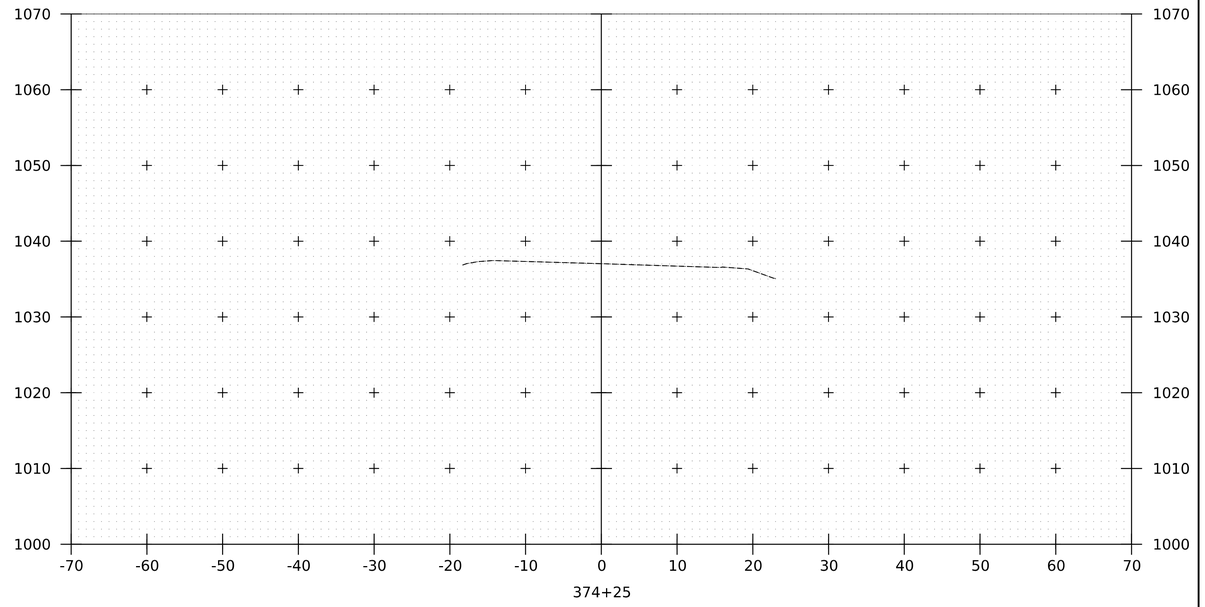
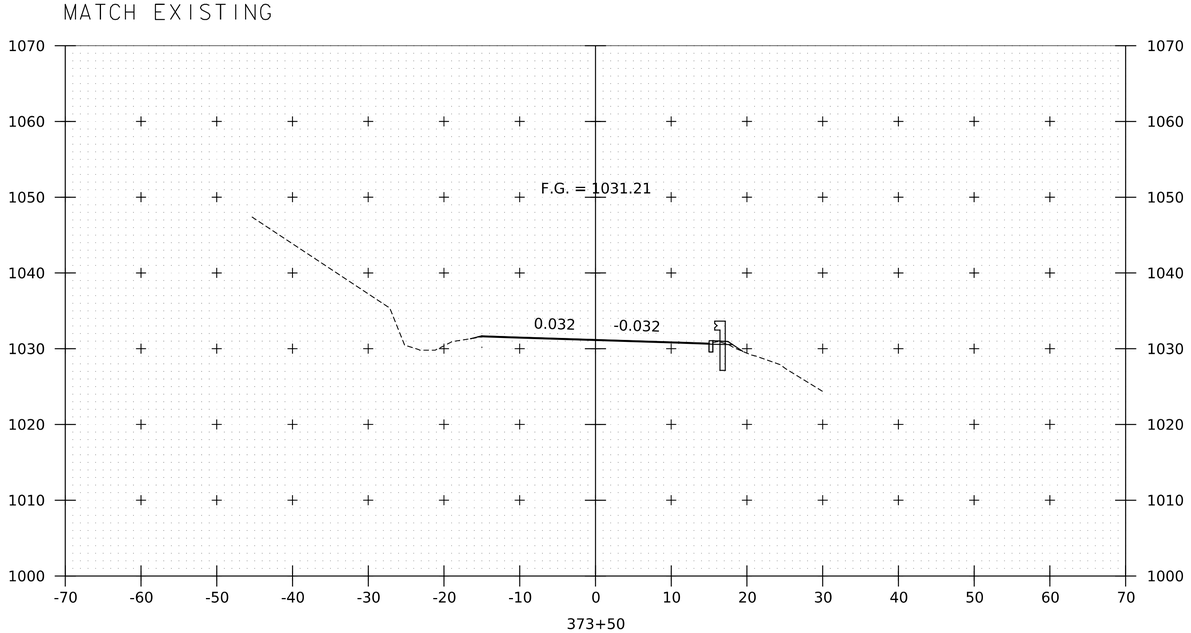
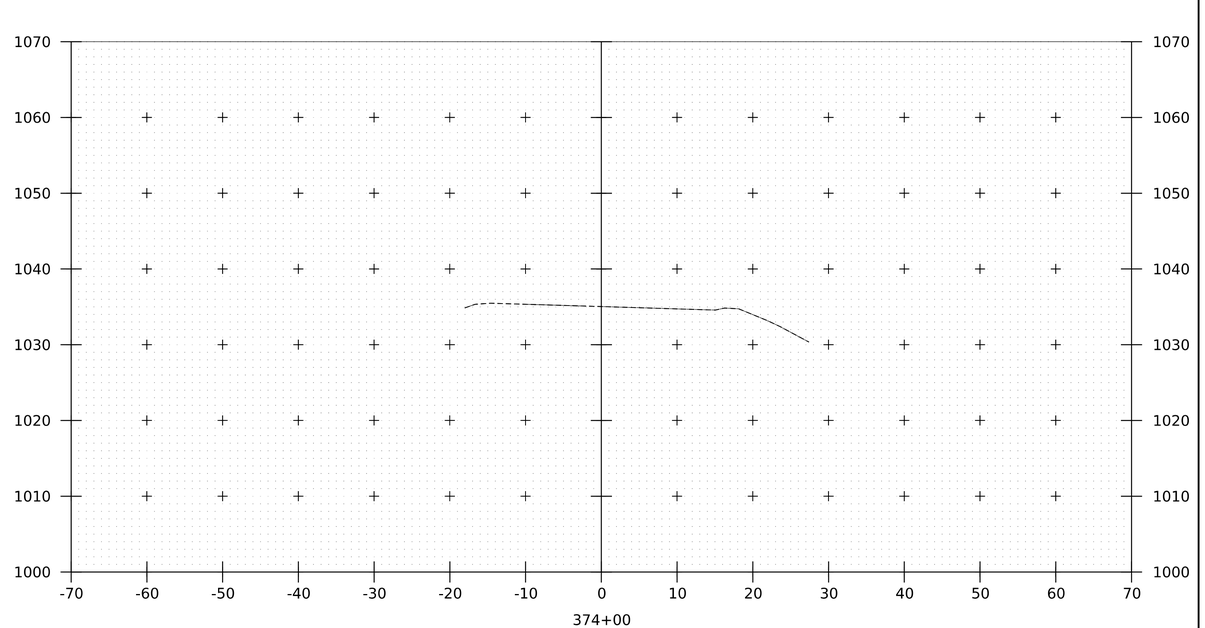
MATCH EXISTING

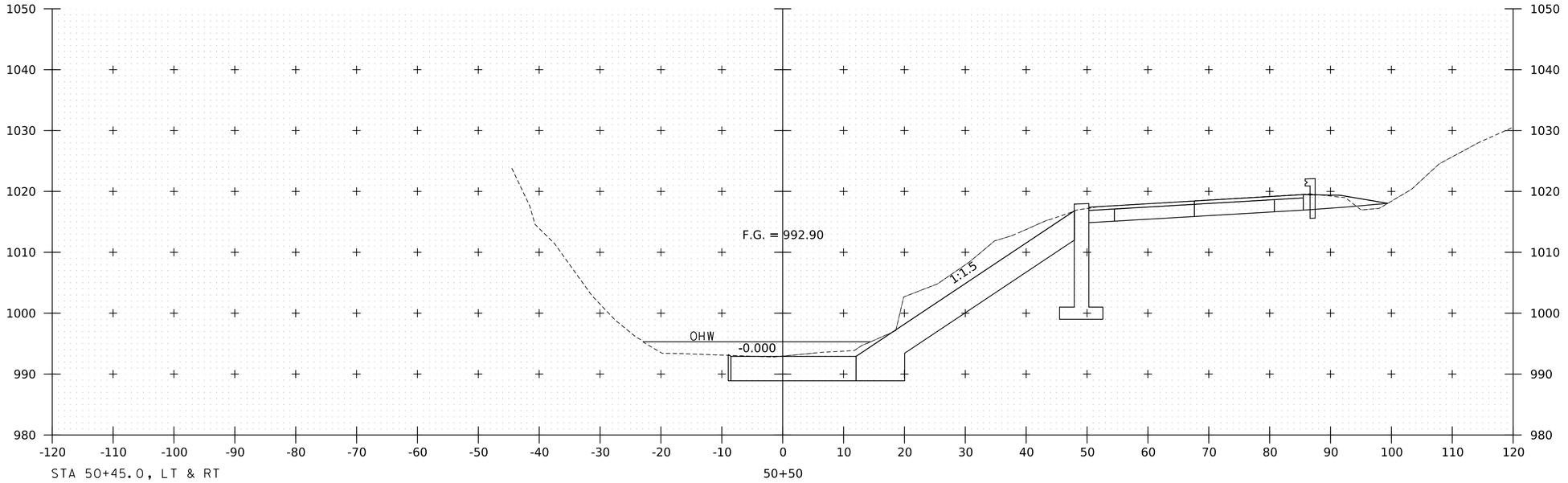






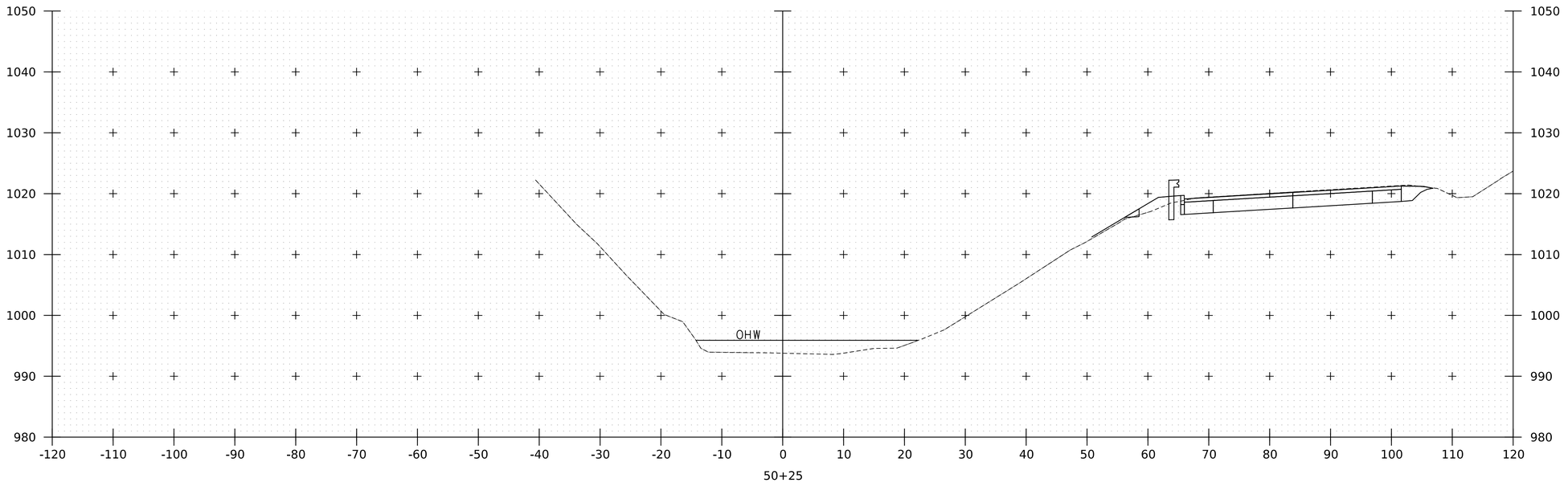
HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 7	SHEET 199 OF 370



50+50

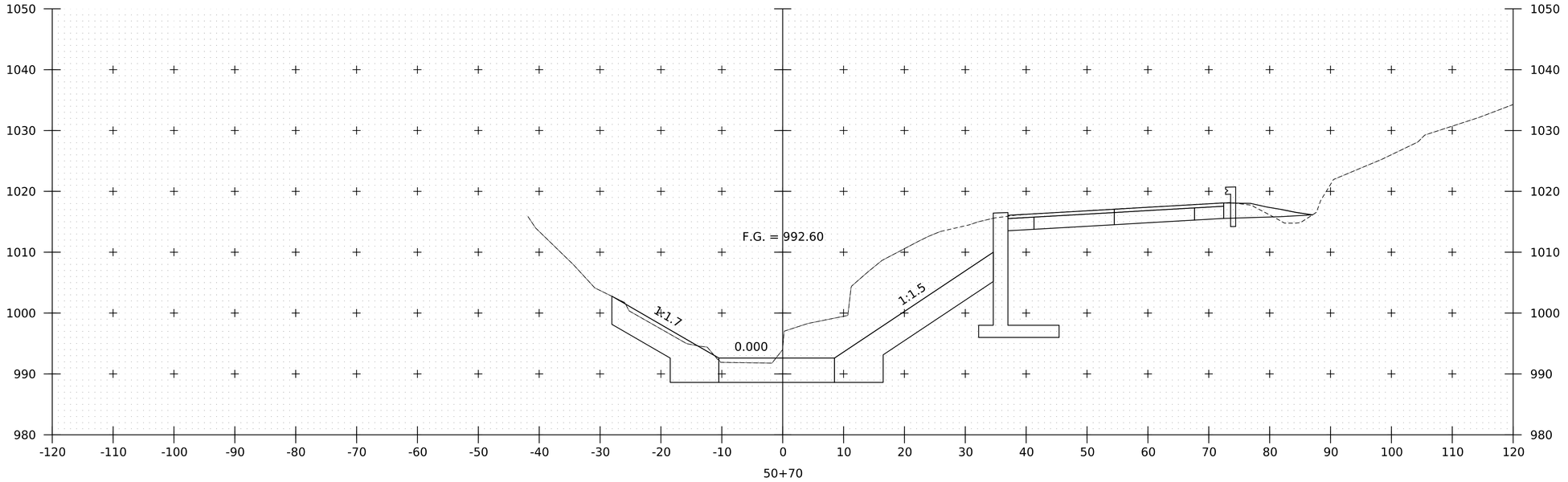
STA 50+45.0, LT & RT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE IV)
GRUBBING MATERIAL

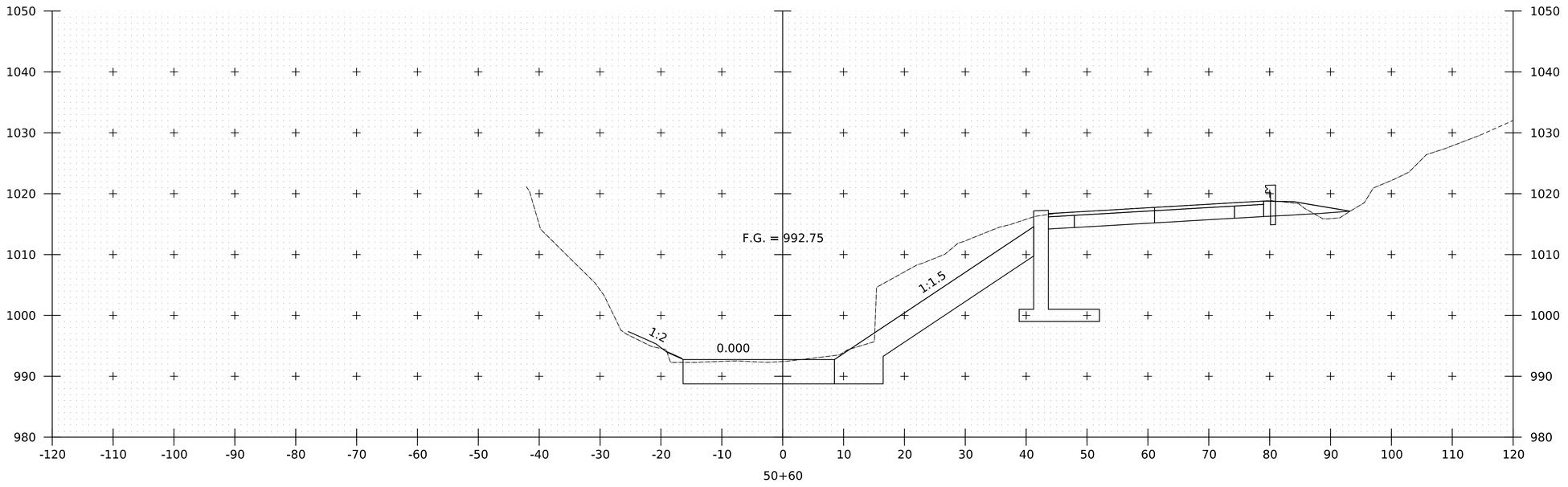


50+25

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS I	SHEET 200 OF 370

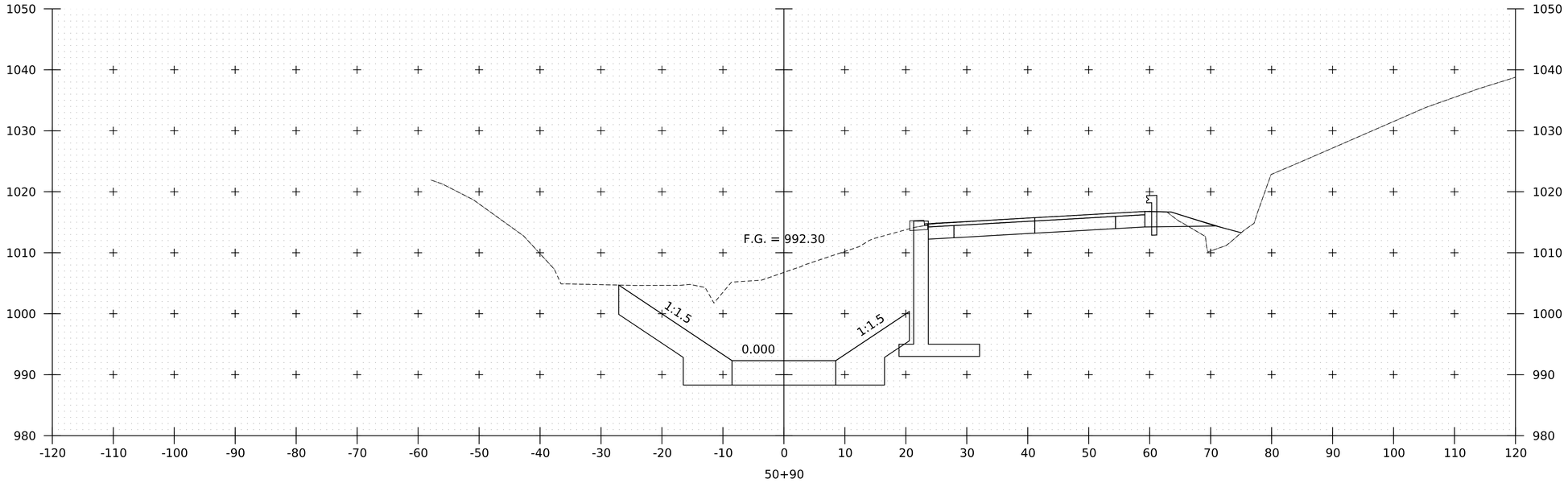


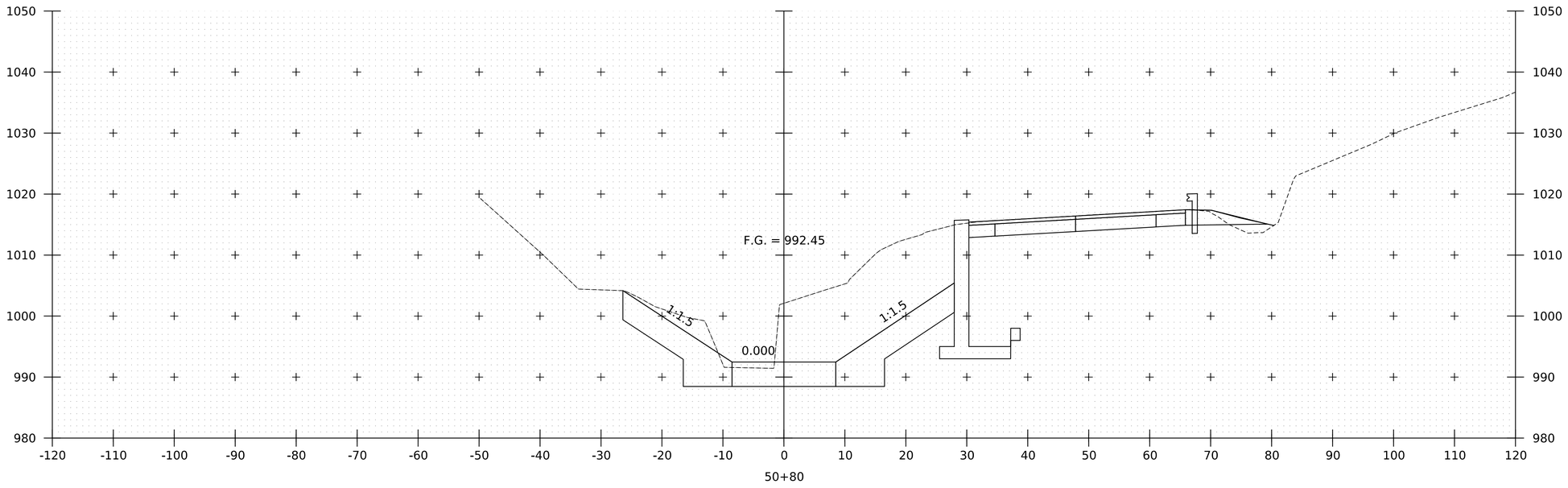


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 2	SHEET 201 OF 370

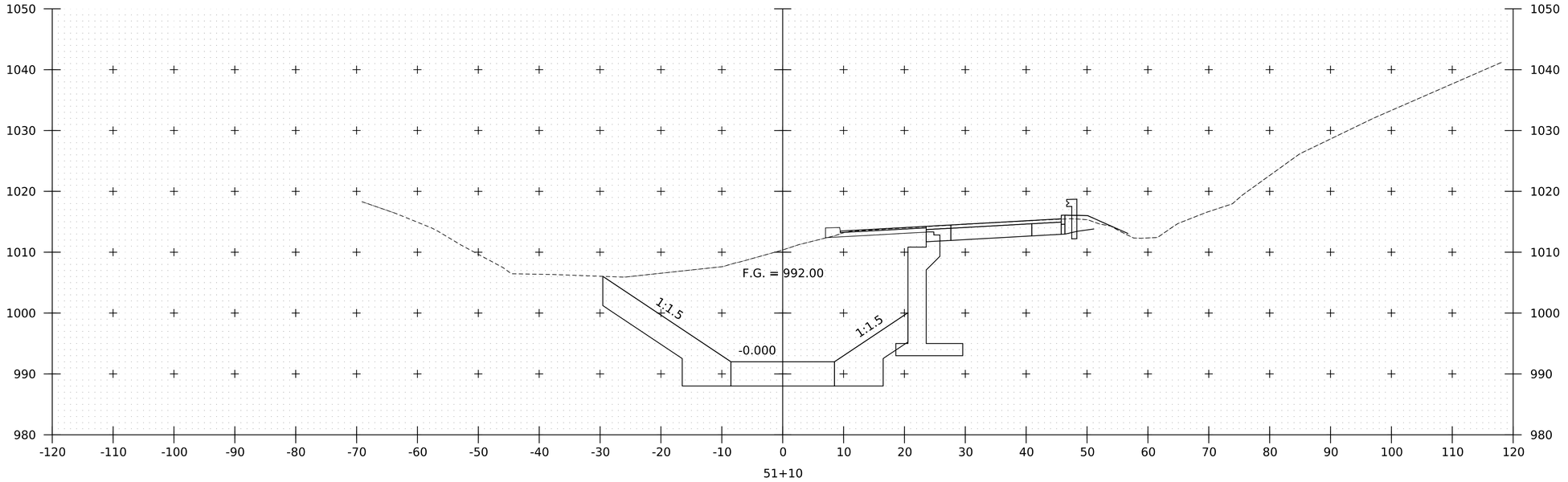


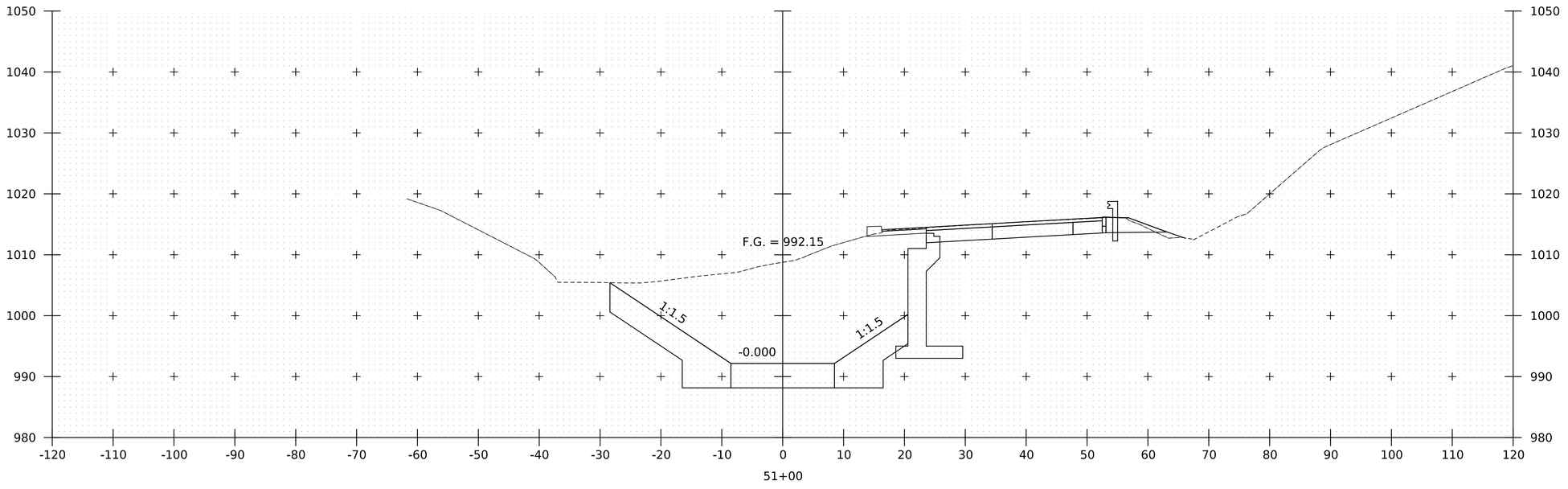


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 3	SHEET 202 OF 370

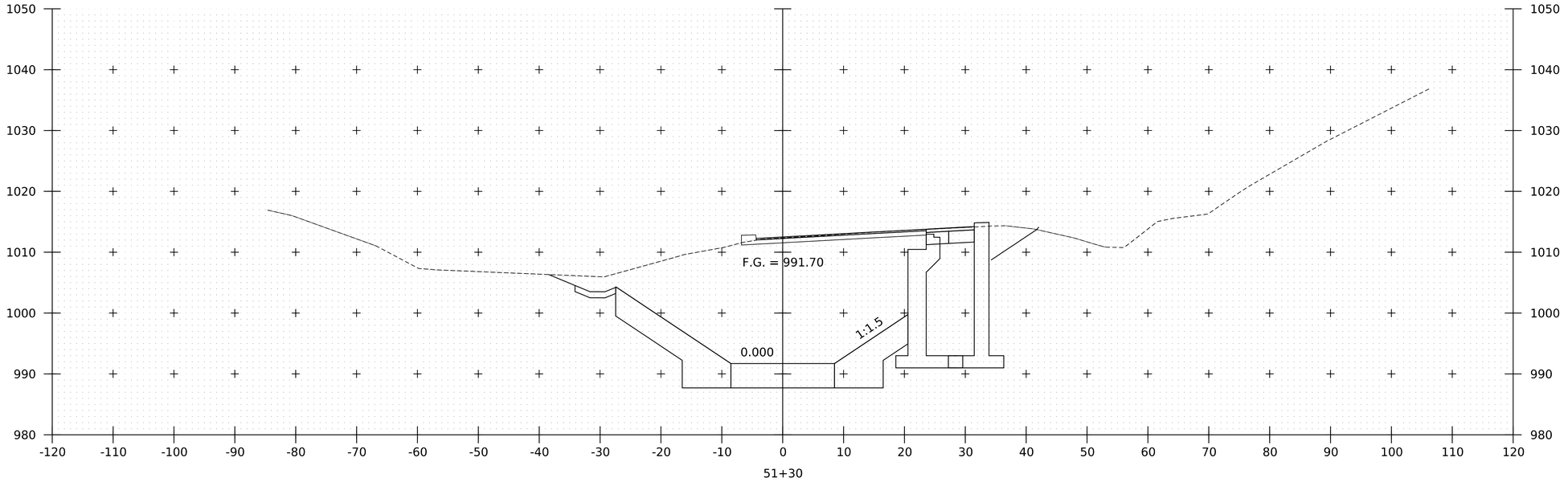


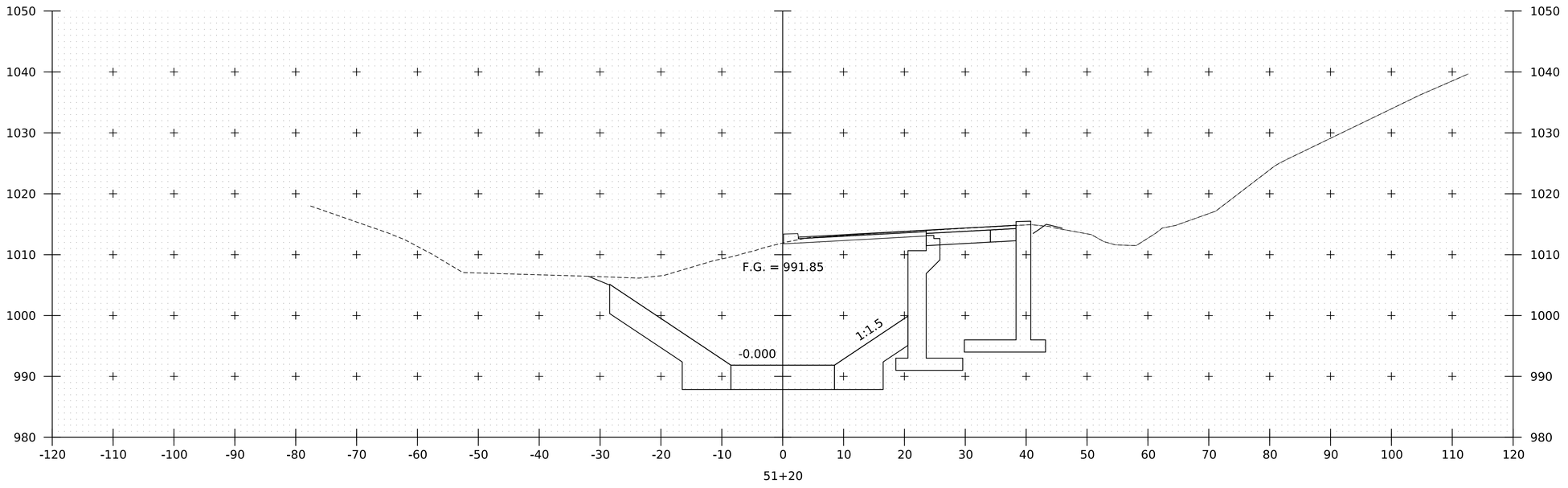


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 4	SHEET 203 OF 370

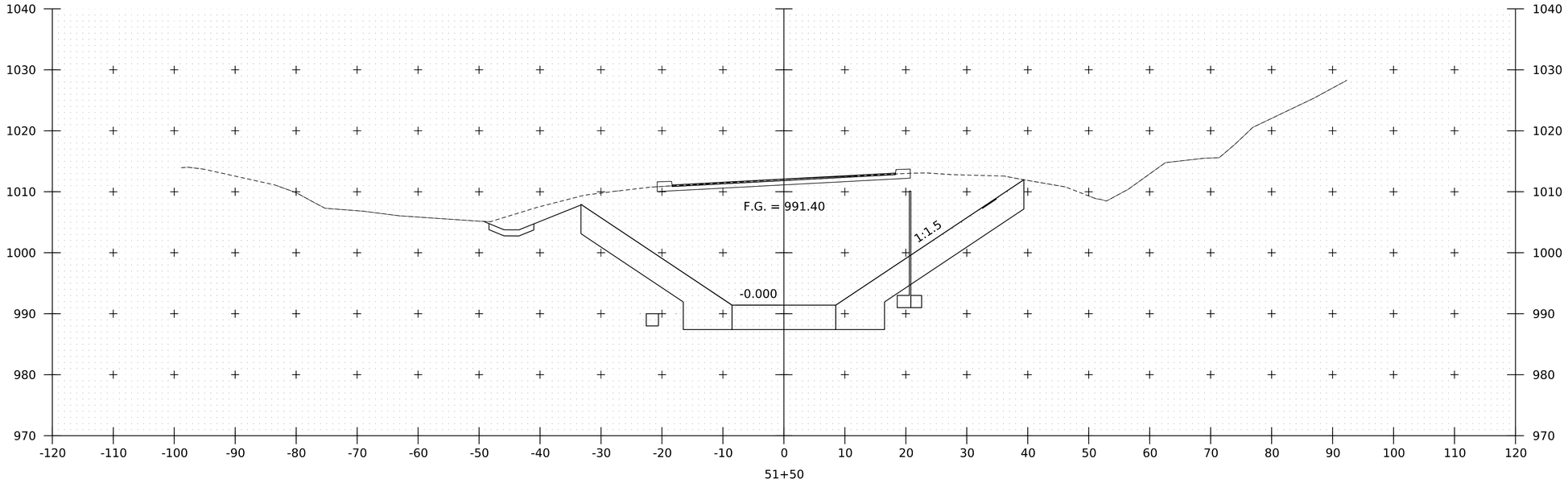


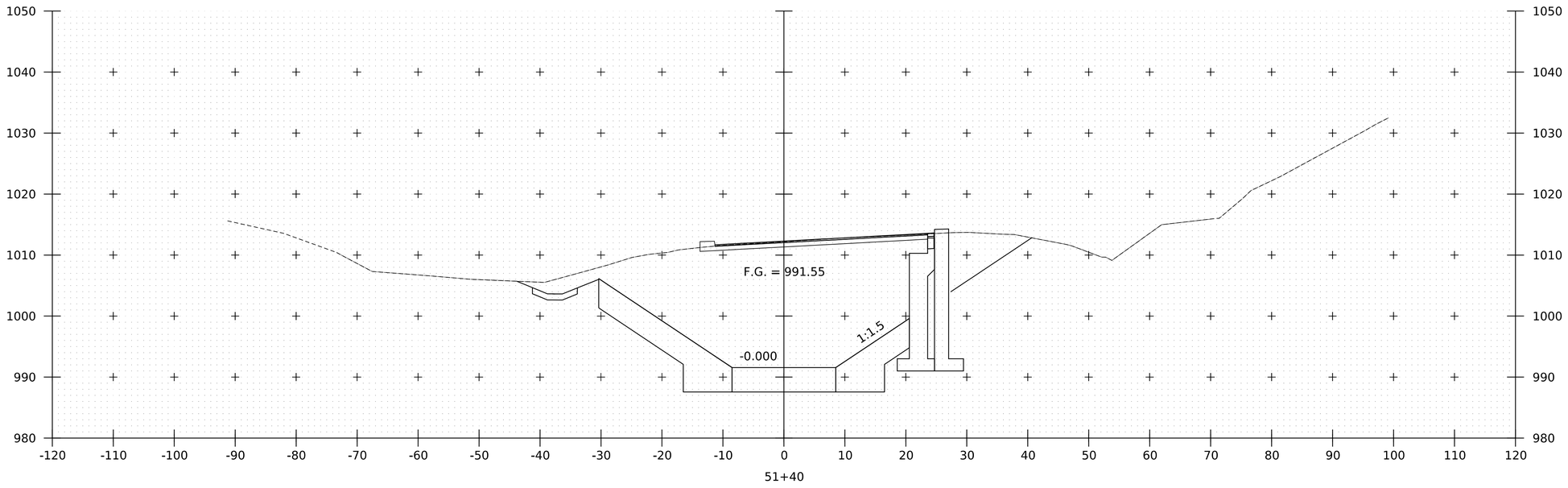


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 5	SHEET 204 OF 370

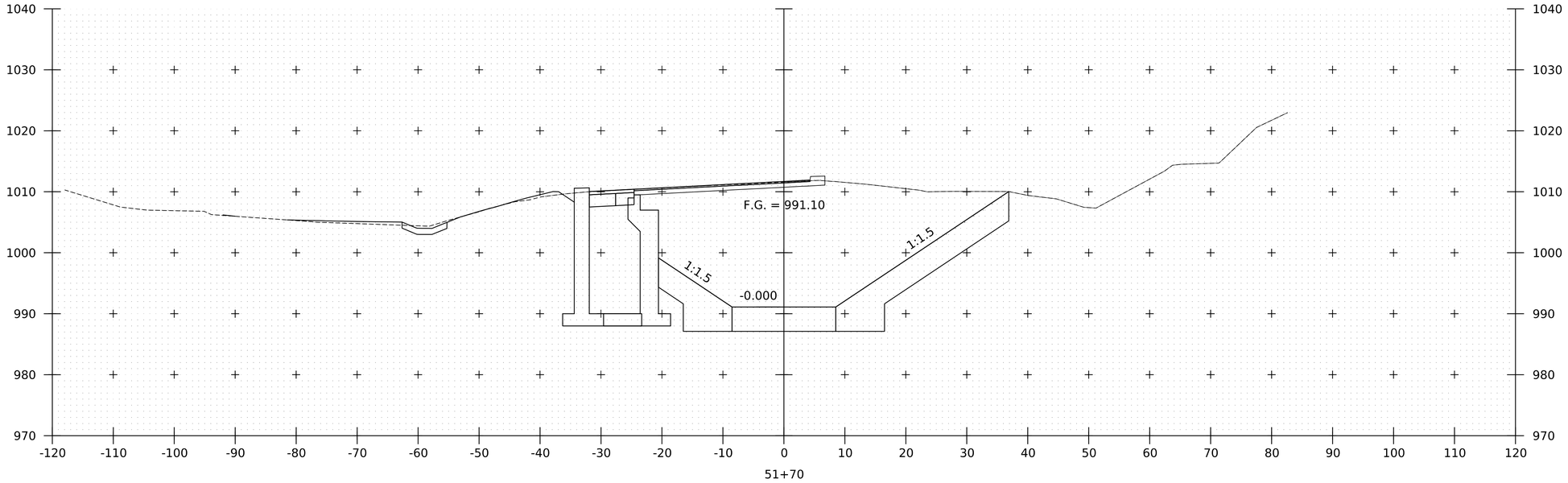


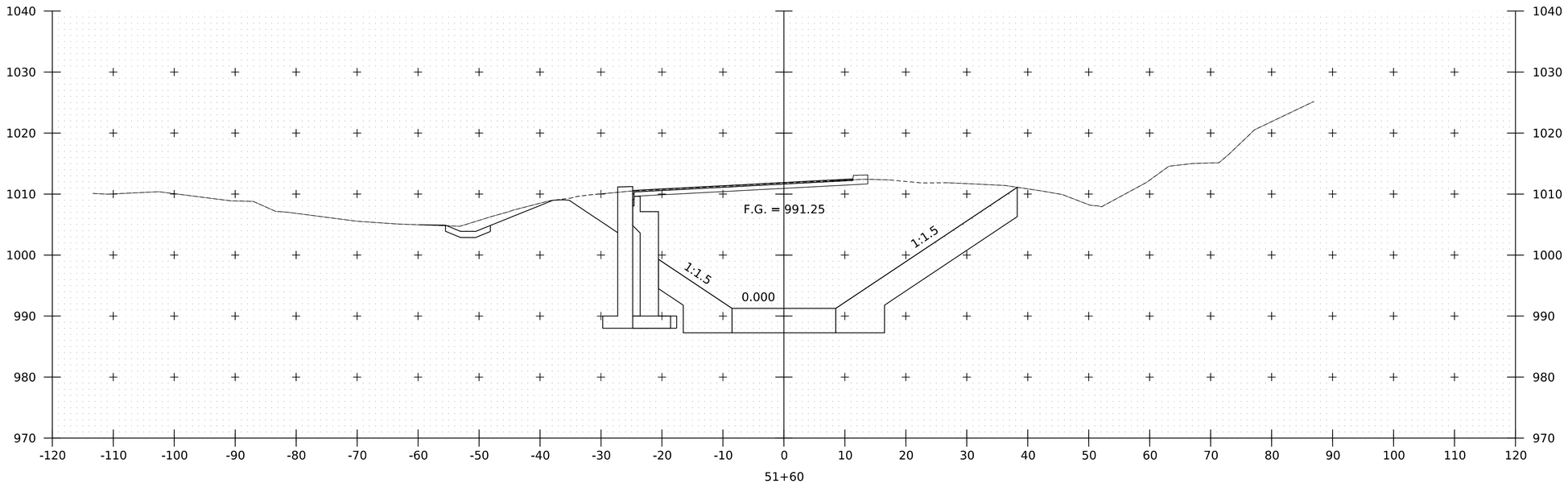


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 6	SHEET 205 OF 370

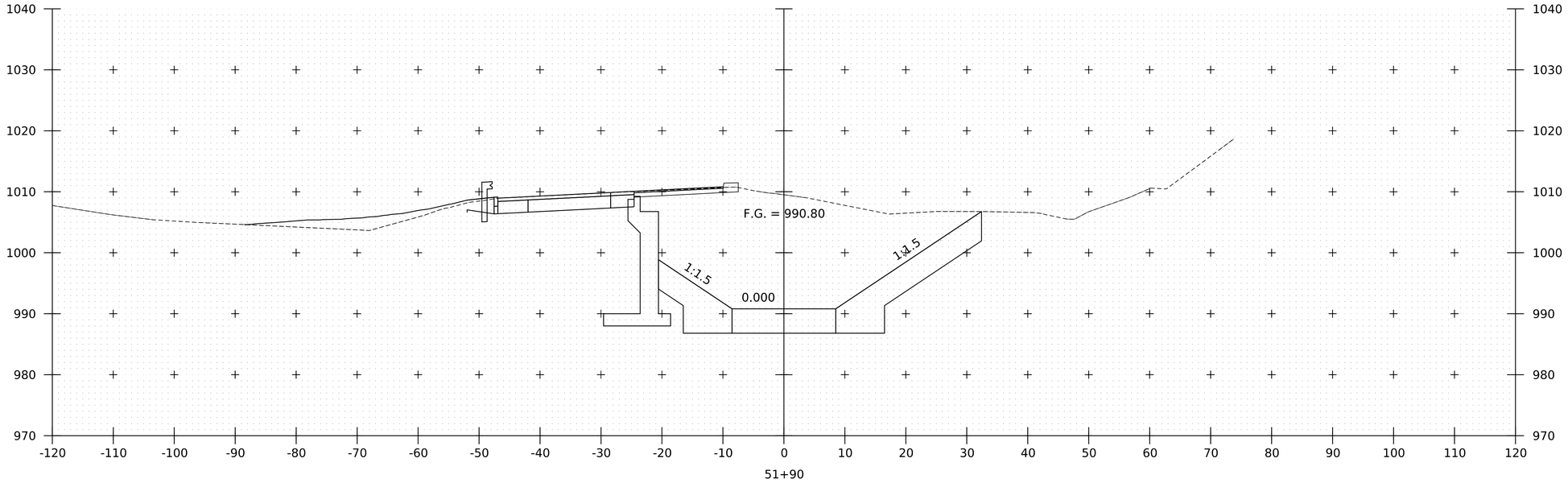


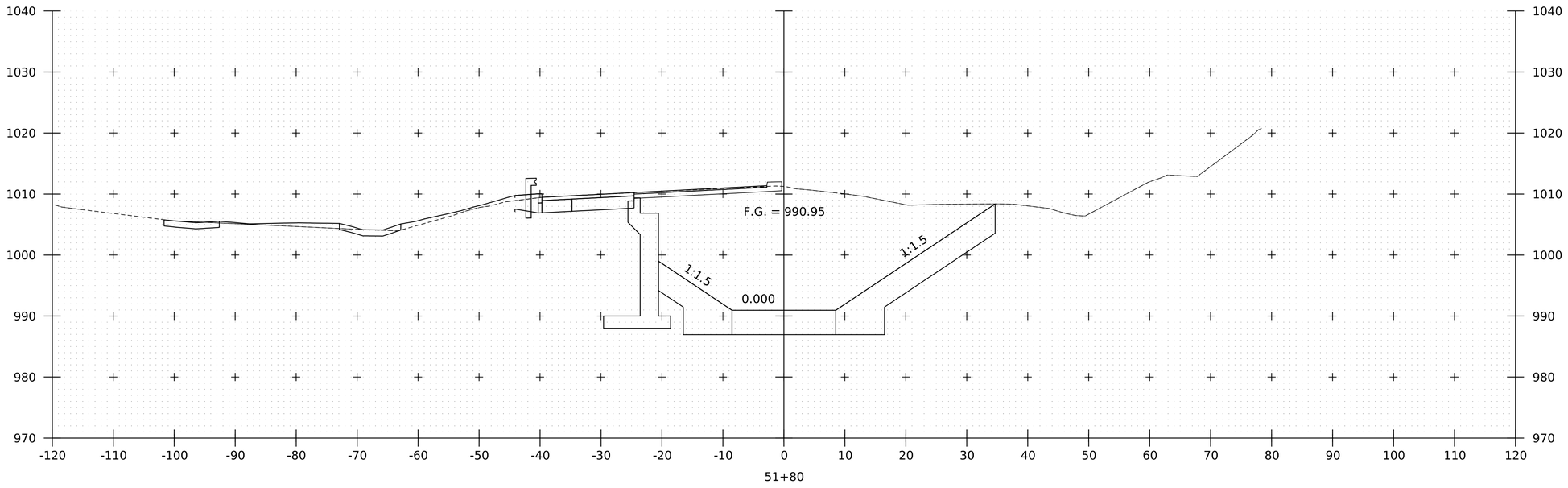


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 7	SHEET 206 OF 370

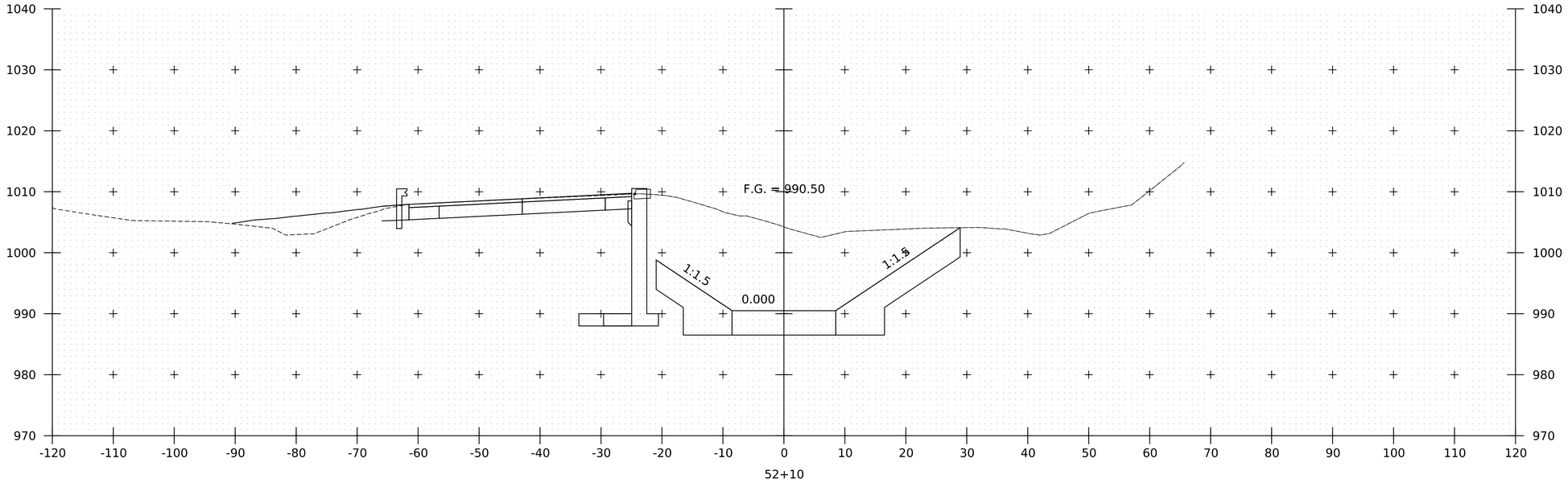


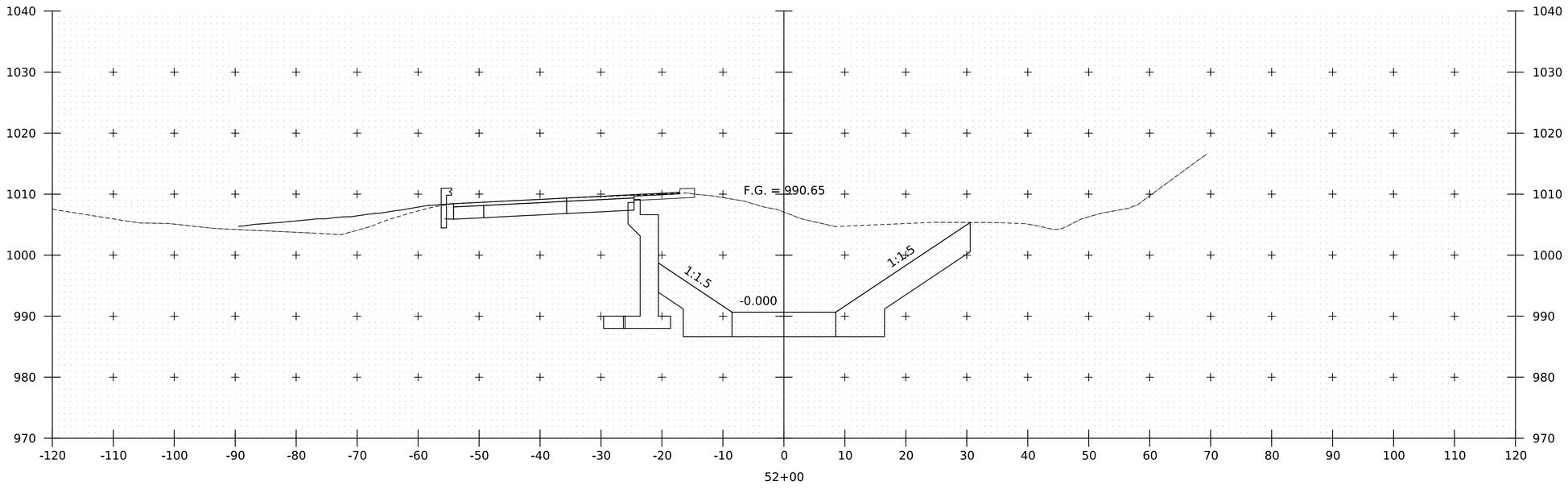


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 8	SHEET 207 OF 370

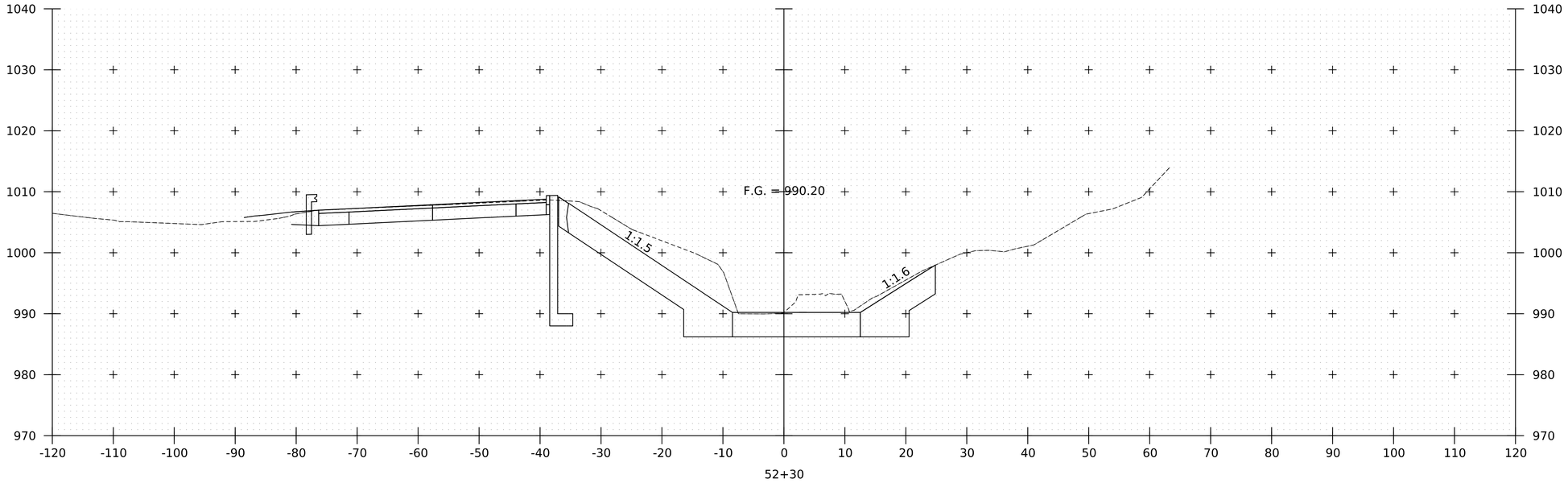


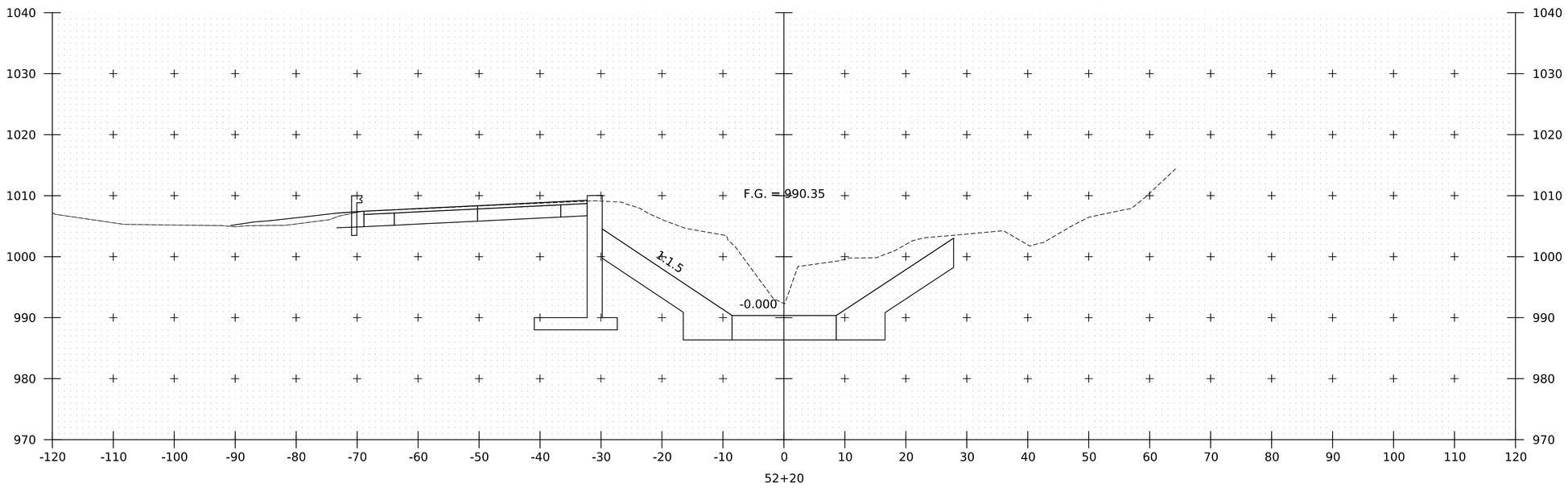


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 9	SHEET 208 OF 370

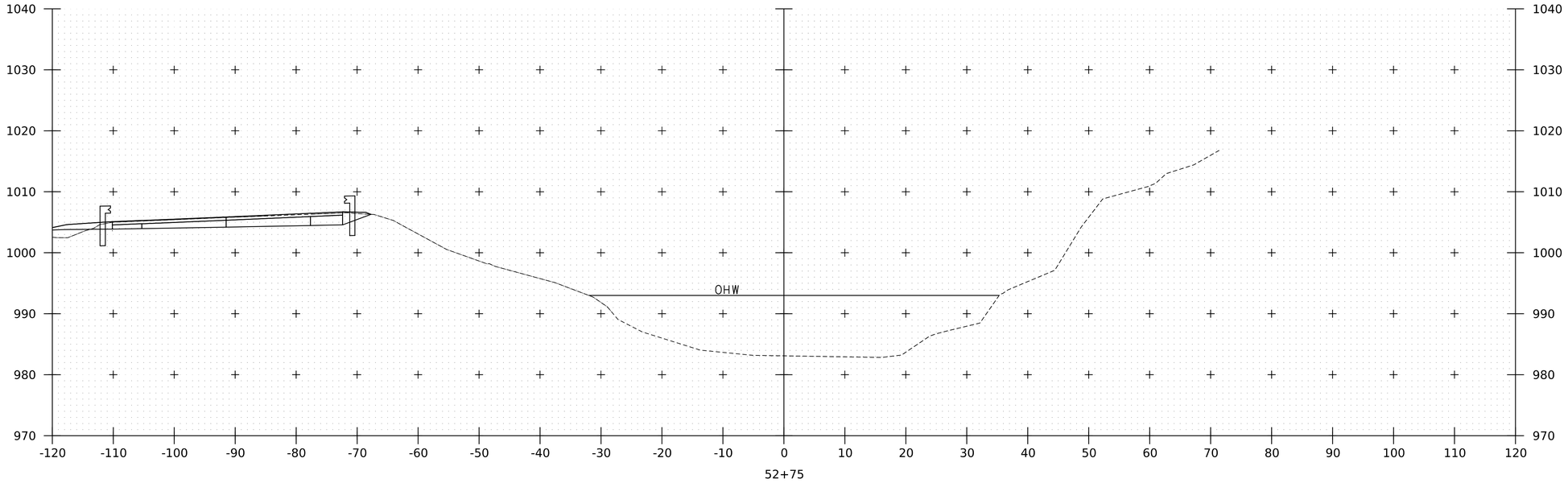


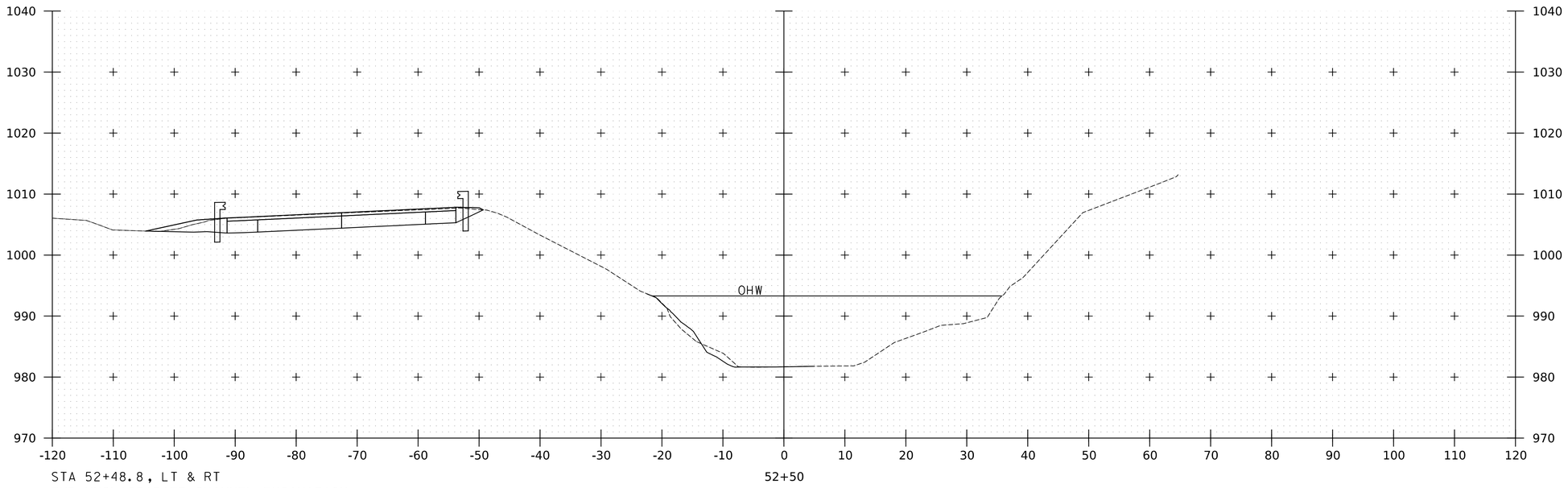


HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS 10	SHEET 209 OF 370





STA 52+48.8, LT & RT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE IV)
GRUBBING MATERIAL

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 024I(57)
FILE NAME: z19b214xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: K.HAMPE	CHECKED BY: A.SPIELER
CHANNEL CROSS SECTIONS II	SHEET 210 OF 370

EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THIS PROJECT INVOLVES REMOVAL AND REPLACEMENT OF BRIDGE NO. 89 WITH A NEW A STEEL BEAM BRIDGE ON CONCRETE ABUTMENTS WITH FOOTINGS FOUNDED ON BEDROCK CONVEYING NORTH BRANCH OF WINOOSKI RIVER IN WORCESTER, VT. BRIDGE NO. 89 IS LOCATED ON VT ROUTE 12 APPROXIMATELY 5.3 MILES NORTH OF THE JUNCTION WITH CALAIS ROAD. THE EXISTING STRUCTURE IS A CORRUGATED GALVANIZED METAL PLATE PIPE WHICH WILL BE ENTIRELY REPLACED IN THE APPROXIMATE SAME LOCATION. THE PROJECT ALSO INCLUDES RELOCATING THE RIVER CHANNEL TO THE WEST.

CONSTRUCTION WILL ALSO INCLUDE 0.057 MILES OF ROADWAY RECONSTRUCTION. TRAFFIC CONTROL DURING CONSTRUCTION WILL CONSIST OF A TEMPORARY BRIDGE INCLUDING TEMPORARY PAVED ROADWAY APPROACHES WITH EMBANKMENTS AND SIDESLOPES UPSTREAM OF BRIDGE NO. 89.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST ONE CONSTRUCTION SEASON.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 1.07 ACRES.

THE MAXIMUM CONCURRENT EARTH DISTURBANCE USED TO SCORE THIS PROJECT IN APPENDIX A RISK ASSESSMENT IS 1.07 ACRES.

THIS PROJECT REQUIRES COVERAGE UNDER GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES FOR LOW RISK PROJECTS.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

THE MAJOR COMPONENTS OF THE PROJECT AND A PROPOSED GENERAL SEQUENCE IS AS FOLLOWS:

CONSTRUCTION OF THE PROJECT WILL BE BROKEN INTO FOUR MAIN PHASES THAT CONSIST OF INSTALLING THE TEMPORARY BRIDGE AND APPROACHES, REMOVING AND REPLACING BR. 89, RECONSTRUCTING THE NEW ROADWAY APPROACHES BETWEEN THE TEMPORARY BRIDGE APPROACHES, AND THEN FINAL ROADWAY RECONSTRUCTION, SITE GRADING, AND CLEANUP TASKS.

PHASE 1
- ESTABLISH PERIMETER CONTROLS AND MARK PROJECT BOUNDARIES
- INSTALL SEDIMENT CONTROL MEASURES
- CLEARING
- CONSTRUCT TEMPORARY BRIDGE AND APPROACHES WHILE MAINTAINING TRAFFIC ON VT ROUTE 12
- STABILIZE TEMPORARY DETOUR SIDE SLOPES
- SHIFT TRAFFIC ONTO TEMPORARY BRIDGE AND APPROACHES

PHASE 2
- INSTALL COFFERDAMS AND OTHER TEMPORARY STREAM DIVERSION STRUCTURES NEEDED FOR CHANNEL AND STRUCTURE EXCAVATION
- EXCAVATE FOR CHANNEL RELOCATION AND ABUTMENT AND WINGWALL CONSTRUCTION WHILE MAINTAINING WATER FLOW THROUGH EXISTING CULVERT OR OTHER STRUCTURES
- CONSTRUCT ABUTMENTS AND WINGWALLS
- REMOVE COFFERDAMS AND OTHER TEMPORARY STREAM DIVERSION STRUCTURES
- REMOVE EXISTING CORRUGATED GALVANIZED METAL PLATE PIPE
- BUILD FINAL CHANNEL RELOCATION EMBANKMENTS
- PLACE E-STONE AND STONE FILL
- CONSTRUCT SUPERSTRUCTURE AND APPROACH SLABS

PHASE 3
- INSTALL OR ADJUST SEDIMENT CONTROL MEASURES
- CONSTRUCT ROADWAY EMBANKMENTS AND STABILIZE SIDE SLOPES
- INSTALL NEW DRAINAGE STRUCTURES AND PLACE ROADWAY SUBBASE
- INSTALL PERMANENT STABILZATION MEASURES WHERE POSSIBLE
- PAVE ROADWAY BETWEEN THE TEMPORARY BRIDGE APPROACHES
- SWITCH TRAFFIC TO NEW ROADWAY AND BRIDGE

PHASE 4
- REMOVE TEMPORARY BRIDGE AND APPROACHES
- RE-ESTABLISH REMAINING PORTIONS OF THE ROADWAY EMBANKMENTS AND SHAPE FINAL SLOPES
- PAVE REMAINING ROADWAY
- INSTALL REMAINING PERMANENT STABILIZATION MEASURES

4. SITE DESCRIPTION
4.1 VEGETATED BUFFERS

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

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. SILT FENCE OR BARRIER FENCE WILL BE PLACED IN APPROPRIATE LOCATIONS AS SHOWN ON THE CONSTRUCTION SITE PLANS.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES (1) STREAM CROSSING, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THERE ARE NO WETLANDS OR WETLAND BUFFERS BEING IMPACTED WITHIN THE PROJECT LIMITS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE PROJECT AREA IS GENERALLY FOREST LAND.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF MOWED ROADSIDE GRASS, HERBACIOUS VEGETATION, SHRUBS, AND HARDWOODS. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:
STETSON LOAM, 25% TO 60% SLOPES, “K FACTOR” = 0.12
TUNBRIDGE-LYMAN COMPLEX VERY ROCKY, 35% TO 60% SLOPES, “K FACTOR” = 0.33

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

4.7 OTHER SENSITIVE RESOURCES

THE PROJECT IS LOCATED WITHIN THE NORTHERN LONG-EARED BAT RANGE. POTENTIAL ROOSTING TREES IDENTIFIED ON THESE PLANS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 656.11 TREE PROTECTION. ANY TREE CUTTING OF GREATER THAN OR EQUAL TO 3 INCHES, WILL ADHERE TO TIME OF YEAR RESTRICTIONS. THE CONTRACTOR SHALL REFERENCE NOTICE TO BIDDERS AND PERMIT RESTRICTIONS FOR TIME OF YEAR RESTRICTIONS ON TREE CLEARING.

THE PROJECT AREA IS IDENTIFIED AS A HIGHEST PRIORITY WILDLIFE CROSSING, HIGHEST PRIORITY SURFACE WATER AND RIPARIAN AREA.

THERE ARE NO OTHER RARE, THREATENED, OR ENDANGERED SPECIES, HISTORIC OR SECTION 4(F) RESOURCES IDENTIFIED WITHIN THE PROJECT VICINITY.

5. DRAINAGE
5.1 RECEIVING WATERS

NORTH BRANCH OF WINOOSKI RIVER IS THE ONLY WATER SOURCE ON THE PROJECT SITE. THE RIVER IS CLASSIFIED AS A STEP-POOL SYSTEM WITH BOTH BEDROCK AND COBBLE SUBSTRATE. THE STREAM BANKS ARE ARMORED UPSTREAM OF BRIDGE NO. 89. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 8.9 MILES^2.

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF A BRIDGE PROJECT BEING LOCATED DIRECTLY OVER THE RECEIVING WATER, THERE ARE NO DISCRETE DISCHARGE POINTS. ALL WATER FROM THE PROJECT AREA DRAINS TOWARD THE BROOK AND ENTERS THE RECEIVING WATER IN MULTIPLE LOCATIONS IN THE AREAS DIRECTLY ADJACENT TO THE BRIDGE.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

THE PROJECT DOES HAVE CURBS ON THE BRIDGE AND IN FRONT OF THE BRIDGE APPROACH RAIL. THE ROAD IS SUPERELEVATED AND STORMWATER WILL FLOW SOUTH ALONG THE EAST BRIDGE CURB TO A DROPINLET AT THE END OF THE CURBING. FROM THE DROP INLET THE WATER FLOW THROUGH A CULVERT AND OUTLETS ONTO STONE FILL UPLAND OF THE STREAM. IN AREAS NOT CURBED, RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES BEFORE REACHING THE RECEIVING WATER.

THERE IS A DRY NATURAL DITCH THAT APPEARS TO CONVEY STORMWATER FROM THE SOUTHEAST HILL SIDE TO A CULVERT THAT RUNS UNDER VT12 AND OULTETS ONTO STONE FILL UPLAND OF THE STREAM.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION’S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

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

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.

6.3 STABILIZE DISTURBED AREAS
6.3.1 ACCESS POINTS/ENTRANCE/EXITS

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

STABILIZED CONSTRUCTION ENTRANCES ARE ANTICIPATED ON THIS PROJECT AND SHALL BE LOCATED AS SHOWN ON THIS EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

SURFACE ROUGHENING OF EXPOSED SLOPES, SEEDING OF TEMPORARY SLOPES AND STOCKPILES, AND STANDARD MULCHING PRACTICES DESCRIBED IN SPECIFICATION SECTION 653.07 SHALL BE UTILIZED TO TEMPORARILY STABILIZE DISTURBED AREAS.

6.3.3 PERMANENT STABILIZATION 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, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH.

E-STONE TYPE IV AND STONE FILL TYPE IV SHALL BE USED TO ARMOR THE STREAMBED AND CHANNEL AND WINGWALL SLOPES.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.SEMPRINI
EPSC NARRATIVE 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER

6.4 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 LOCATED WITHIN A VERTICAL SAG CURVE WITH THE WEST APPROACH DRAINING TOWARDS THE PROJECT AREA AND THE EAST APPROACH DRAINING AWAY FROM THE PROJECT AREA. RUNOFF FROM THESE AREAS MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA. VT ROUTE 12 IS SUPERELEVATED TO SHEETFLOW RUNOFF OVERLAND ON THE NORTH SIDE OF VT ROUTE 12. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

SILT FENCE SHALL BE INSTALLED ALONG THE CONTOURS AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF RECEIVING WATERS.

6.6 SLOW DOWN CHANNELIZED RUNOFF

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

TEMPORARY STONE CHECK DAMS SHALL BE INSTALLED AS SHOWN ON THE PLANS.

7. CONSTRUCT PERMANENT CONTROLS

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

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED TO BE NEEDED AS DESIGNED.

8. DEWATERING

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. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN THE COFFERDAM AND LIMITS OF UNCLASSIFIED EXCAVATION IS ANTICIPATED. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12" OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRADIENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1" THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT'S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC 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.

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.SEMPRINI
EPSC NARRATIVE 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER

VT STATE PLANE GRID

N

50' RIPARIAN BUFFER

VERMONT LAND TRUST, INC.

1" DIA IRON PIPE
BENT SET IN LEDGE
UP 18"

STETSON LOAM
25% - 60% SLOPES
WELL DRAINED
K = 0.32

NORTH BRANCH
WINOOSKI RIVER
FLOW

EXISTING R.O.W.

T&E

SHRUBS
HARDWOODS

50' RIPARIAN BUFFER

VT ROUTE 12

MATCHLINE STA 369+00.00

TO
MIDDLESEX

18" RCP
FLOW

367+00

368+00

15" CCMP
FLOW

℄ CONSTRUCTION

SHRUBS
HARDWOODS

1" DIA IRON
UP 6"

EXISTING R.O.W.

TUNBRIDGE-LYMAN COMPLEX
35% - 60% SLOPES
WELL DRAINED

VERMONT LAND TRUST, INC.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC EXISTING SITE PLAN 1	SHEET 213 OF 370

VT STATE PLANE GRID

N

50' RIPARIAN BUFFER

VERMONT LAND TRUST, INC.

STETSON LOAM
25% - 60% SLOPES
WELL DRAINED
K = 0.32

EXISTING R.O.W.

4"X4" CONCRETE BOUNDERY MARKER VTHD BROKEN FLUSH

SHRUBS
HARDWOODS

OHW

T&E

FLOW

STONE FILL

FIELD DRIVE

SIGN VD-701 (BR 89 VT-12)

GRAVEL DRIVE

HVCTRL 102

HVCTRL 15

18" CMP FLOW

MATCHLINE STA 369+00.00

370+00

371+00

372+00

373+00

374+00

TO ELMORE

VT ROUTE 12

24" CMP FLOW

SIGN VD-701 (BR 89 VT-12)

SIGN WN-2

HVCTRL 100

18" CMP FLOW

HVCTRL 101

STONE FILL

℄ CONSTRUCTION

SHRUBS
HARDWOODS

PIPE

4"X4" CONCRETE BOUNDERY MARKER VTHD UP 8"

MHO

NORTH BRANCH
WINOOSKI RIVER
FLOW

TUNBRIDGE-LYMAN COMPLEX
35% - 60% SLOPES
WELL DRAINED

TUNBRIDGE-LYMAN COMPLEX
15% - 35% SLOPES
WELL DRAINED

50' RIPARIAN BUFFER

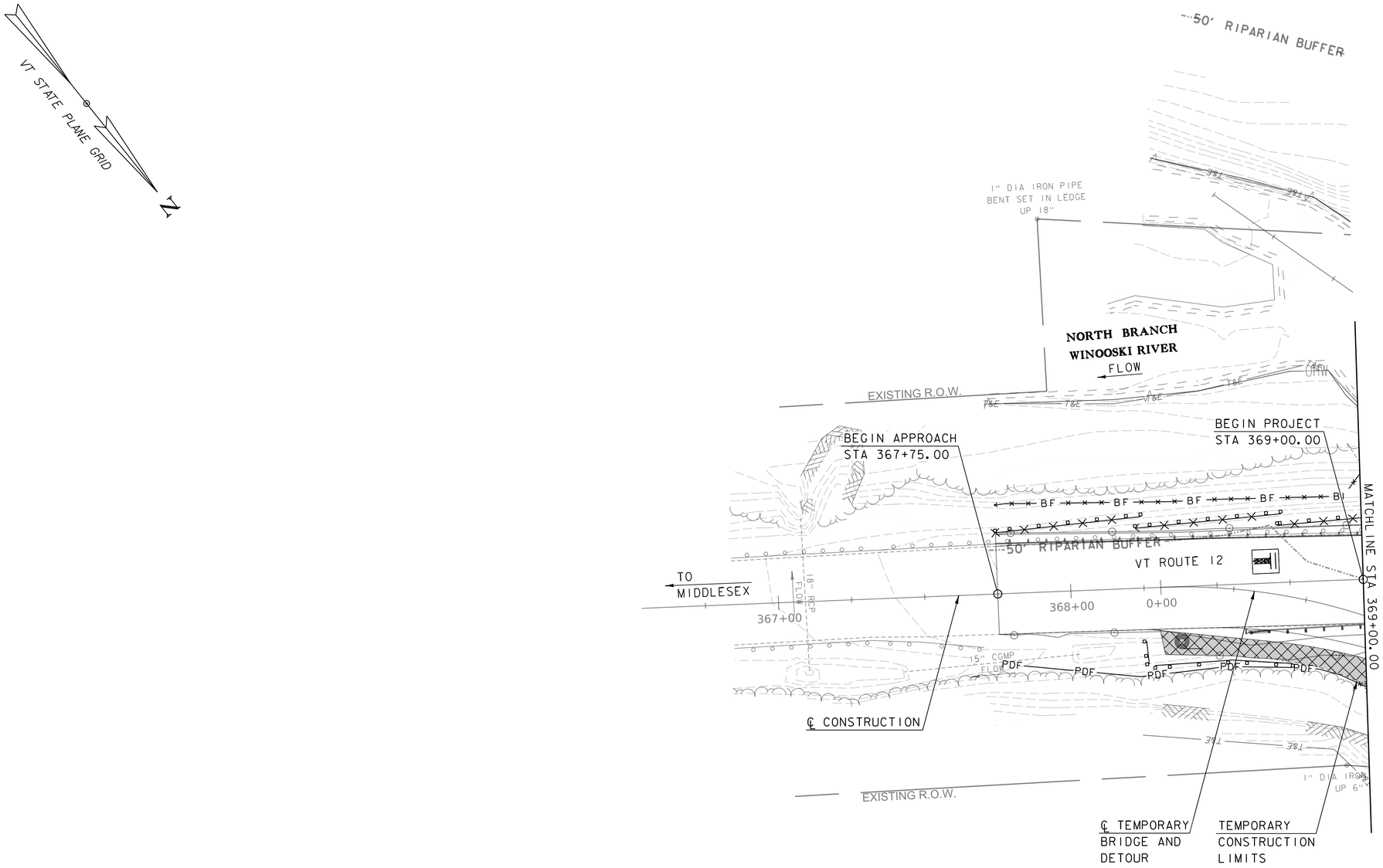
EXISTING R.O.W.

VERMONT LAND TRUST, INC.

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

HOYLE TANNER

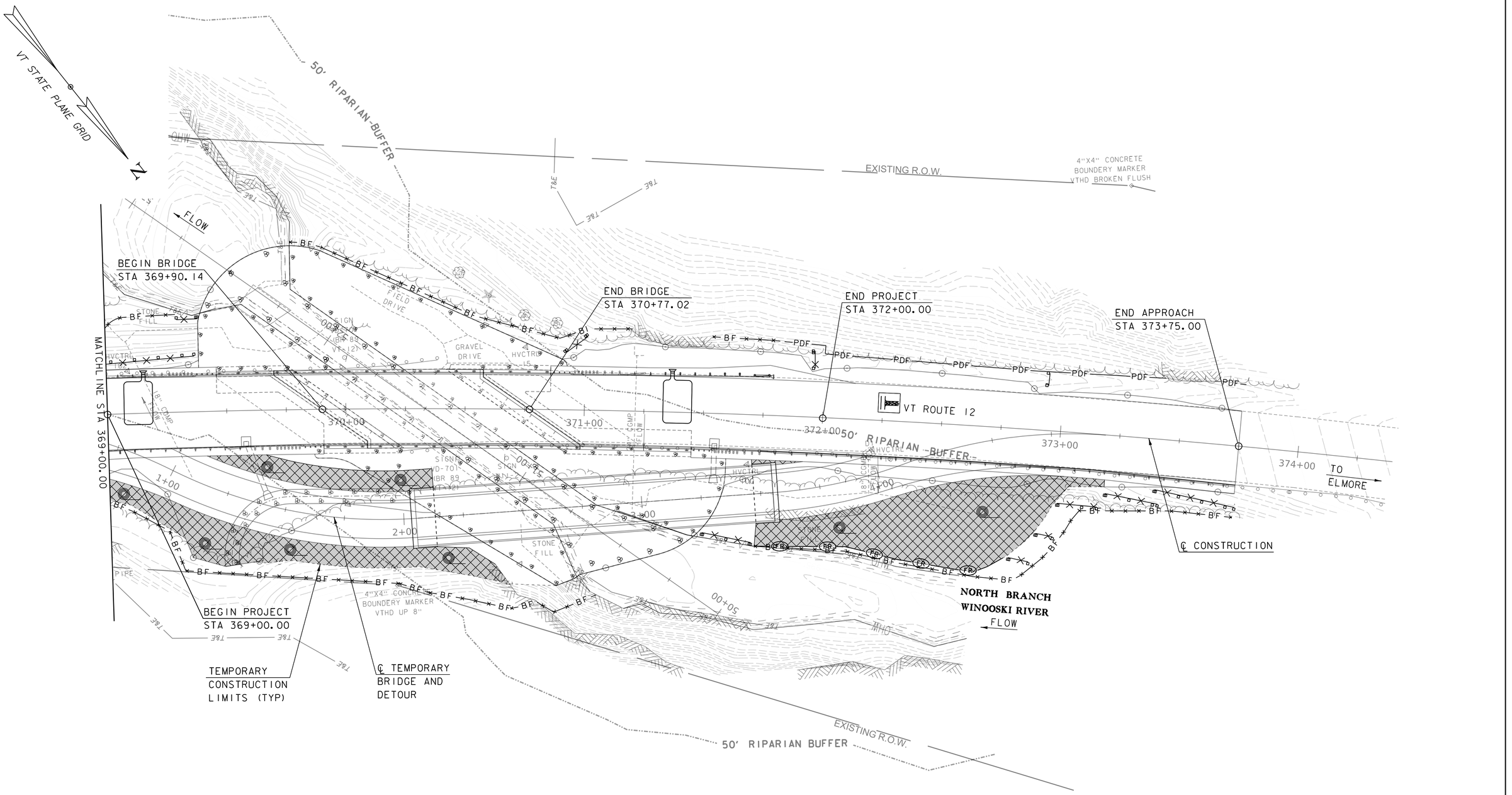
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC EXISTING SITE PLAN 2	SHEET 214 OF 370



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

HOYLE TANNER

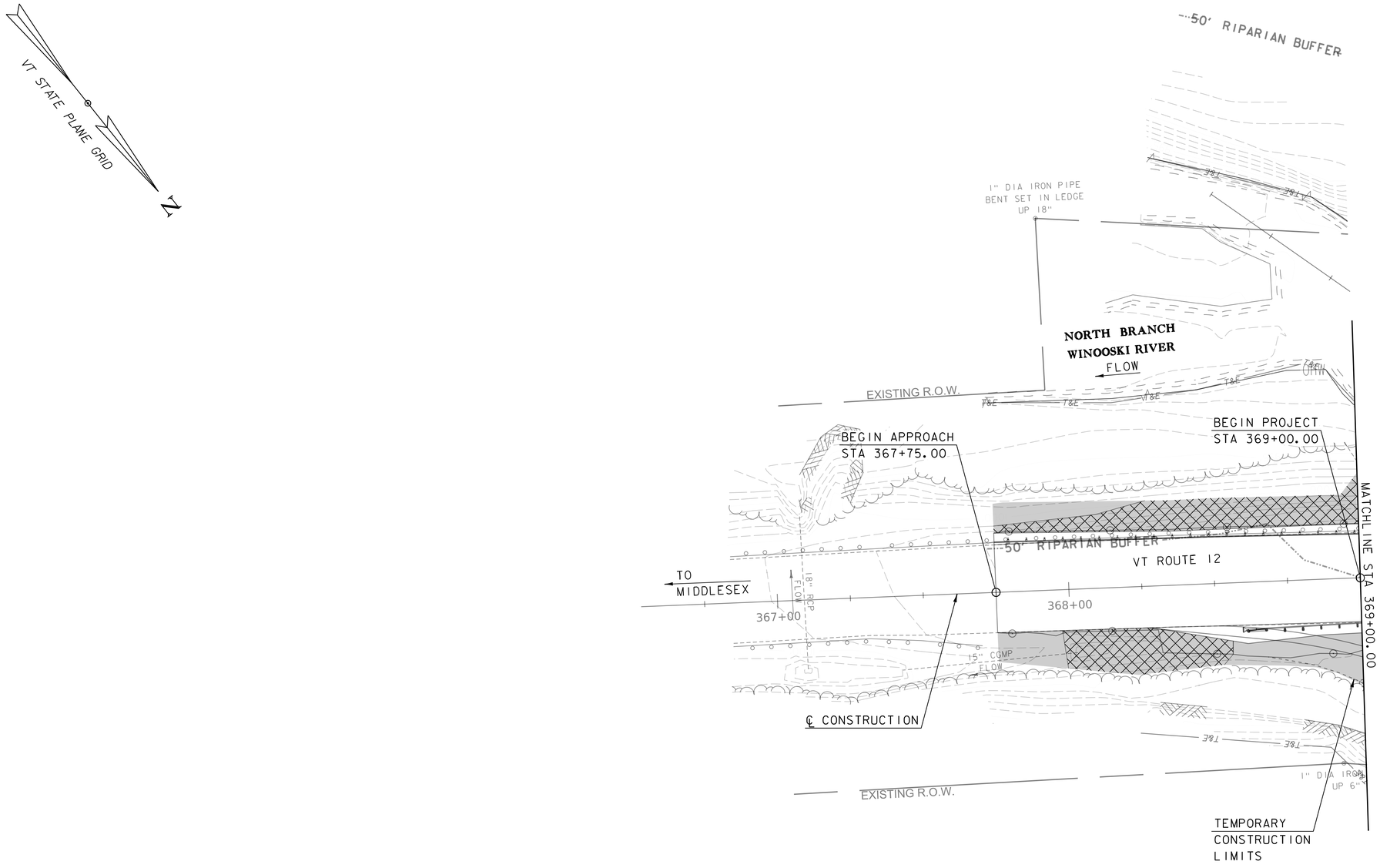
PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: E.WEINGARTNER
EPSC CONSTRUCTION SITE PLAN 1	SHEET 215 OF 370



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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b2l4bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC CONSTRUCTION SITE PLAN 2	SHEET 216 OF 370



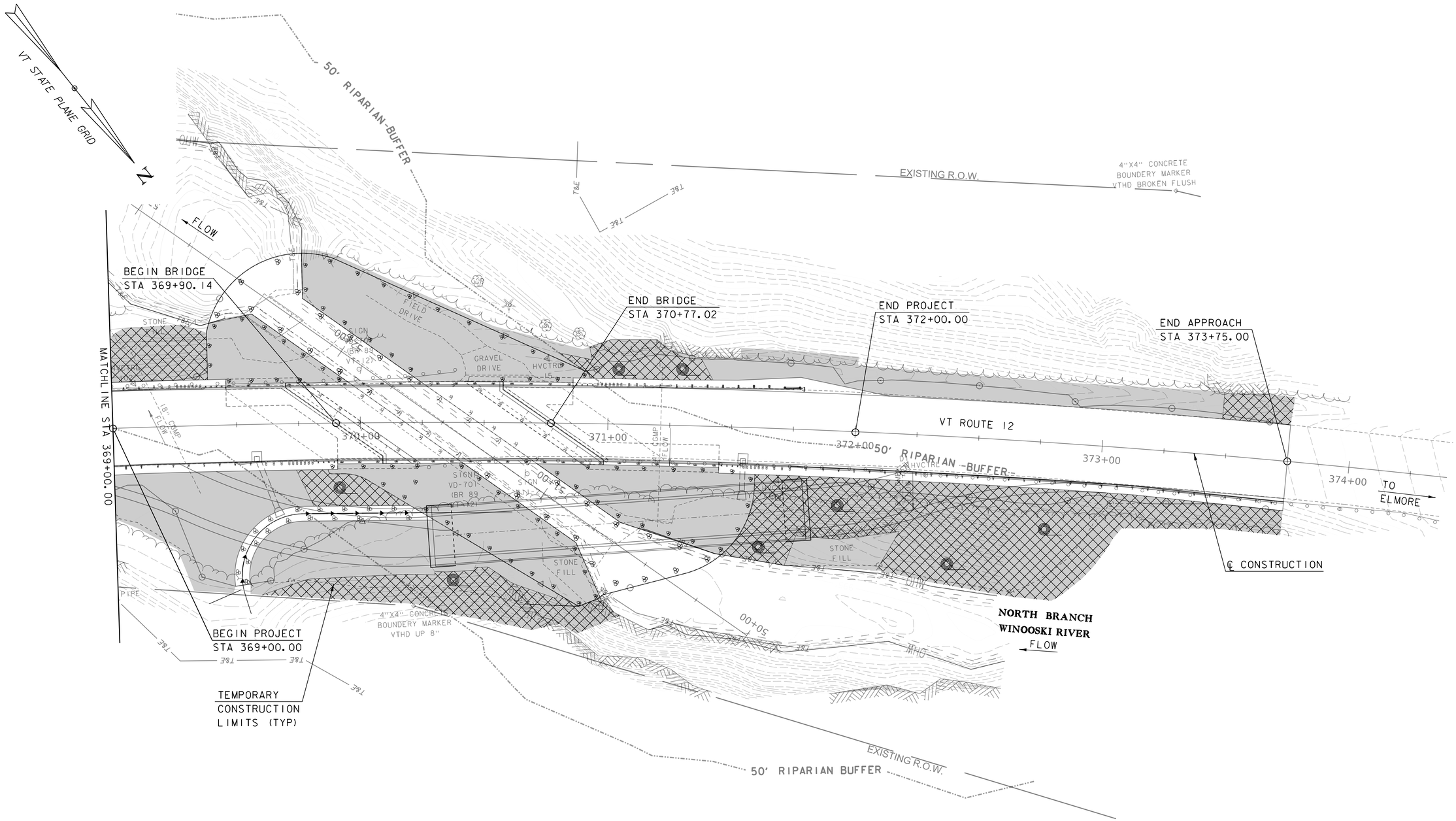
NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME: z19b214bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: E.WEINGARTNER
EPSC FINAL SITE PLAN 1	SHEET 217 OF 370



NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)

FILE NAME: z19b2l4bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC FINAL SITE PLAN 2	SHEET 218 OF 370

VAOT LOW GROW/FINE FESCUE MIX						
	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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						
	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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

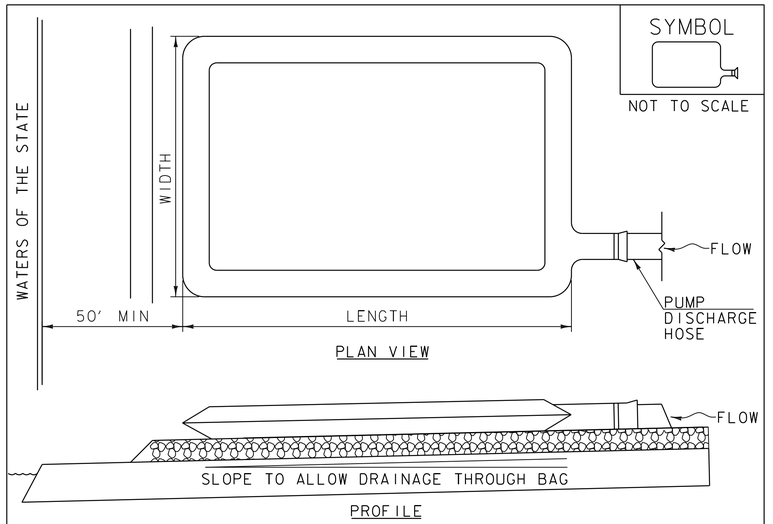
1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT 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. 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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

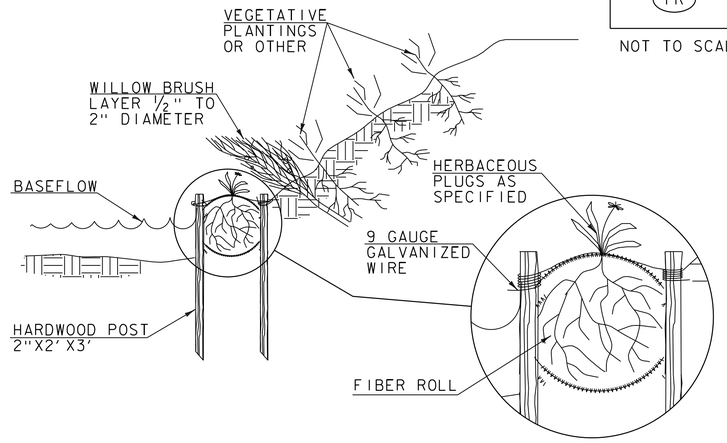
FILE NAME: z19b214ero_dt1.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC DETAILS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
SHEET 219 OF 370

SYMBOL

FR

NOT TO SCALE



CONSTRUCTION SPECIFICATIONS

1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4" TRENCH ON SLOPE CONTOURS
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2"X2" POSTS PLACED ON BOTH SIDES FO THE ROLL AND SPACED LATERALLY ON 2' TO 4' CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL, IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL, WITH 9 GAUGE GALVANIZED WIRE OR 1/8" DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. PLANTWITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.

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

FIBER ROLL (EROSION LOG)

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 EROSION LOG (PAY ITEM 653.60)

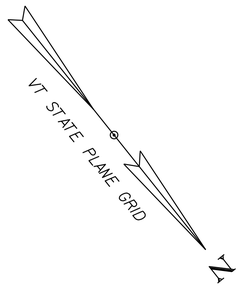
REVISIONS	
MARCH 21, 2008	WHF
JANUARY 13, 2009	WHF

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214ero_dtl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC DETAILS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
SHEET 220 OF 370



LEGEND

- AOT RURAL AREA MIX
- WILDFLOWER SEED

WILDFLOWER SEED

WILDFLOWER SEED TO BE PAID FOR UNDER 651.16 WILDFLOWER SEED. APPLICATION RATES VARY BY SEED MIX. WILDFLOWER SEED TO BE ONE OF THE FOLLOWING, OR APPROVED EQUAL:

-VERMONT NATIVE WILDFLOWER & GRASS MIX
SUPPLIER: VERMONT WETLAND PLANT SUPPLY. APPLICATION RATE: 18 LBS/ACRE.

-NEW ENGLAND WILDFLOWER MIX
SUPPLIER: NEW ENGLAND WETLAND PLANTS, INC. APPLICATION RATE: 23 LBS/ACRE.

-PA NEW ENGLAND PROVINCE UPL MEADOW MIX
SUPPLIER: ERNST CONSERVATION SEEDS, INC. APPLICATION RATE: 20 LBS/ACRE WITH 30 LBS/ACRE OF A COVER CROP. FOR A COVER CROP USE EITHER GRAIN OATS (1 JAN TO 31 JUL) OR GRAIN RYE (1 AUG TO 31 DEC).

NOTES

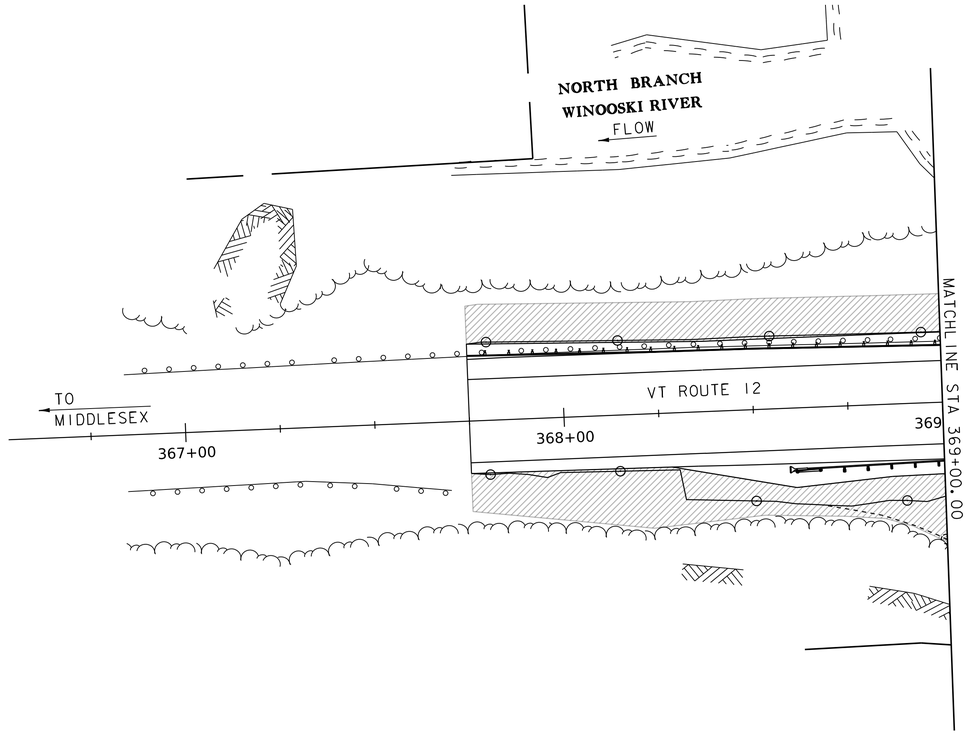
1. SEEDED AREAS SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION SUBSECTION 651.07 PROTECTION. IF WETLANDS OR WETLAND BUFFERS ARE PRESENT, STRAW MULCH SHALL BE USE INSTEAD OF HAY MULCH.

2. IF AREAS WITHIN PDF OR BARRIER FENCE ARE NOT DISTURBED, THEY SHOULD REMAIN VEGETATED, AND ADDITIONAL REVEGETATION IS NOT REQUIRED.

3. PROVIDING SUFFICIENT MOISTURE IS CRITICAL DURING THE ENTIRE PLANT ESTABLISHMENT PERIOD. WATERING TO BE PAID FOR UNDER 656.65 LANDSCAPE WATERING.

4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 1 WEEK PRIOR TO PLANTING OPERATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER, VTRANS LANDSCAPE ARCHITECT, AND LANDSCAPE INSPECTOR WHO WILL CONFIRM PLANTING LOCATIONS BASED ON THE PREPARED SITE.

KEY	QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
TREES - EVERGREEN						
PS	3	*Pinus strobus*	White pine	3-4' height, natural	CONT.	15' O.C.
TC	2	*Tsuga canadensis*	Eastern Hemlock	3-4' height, natural	CONT.	15' O.C.
TREES - DECIDUOUS						
AR	2	*Acer rubrum*	Red Maple	2"-2 1/2" CAL.	B&B	25' O.C.
AL	2	*Alnus rugosa*	Speckled Alder	3-4' height, natural	CONT.	12' O.C.
FG	1	*Fagus grandifolia*	American Beech	2"-2 1/2" CAL.	B&B	30' O.C.
SHRUBS - DECIDUOUS						
AV	8	*Aronia melanocarpa* 'Viking'	'Viking' Black chokeberry	2 GAL	CONT.	6' O.C.
CA	14	*Cornus amomum*	Silky Dogwood	1 GAL	CONT.	8' O.C.
CR	2	*Cornus racemosa*	Gray dogwood	2 GAL	CONT.	12' O.C.
CS	18	*Cornus sericea*	Red Twig Dogwood	1 GAL	CONT.	8' O.C.



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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214bdr_lds.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.DONAHUE
LANDSCAPE PLAN 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: J.OLIN
SHEET 221 OF 370

LEGEND

AOT RURAL AREA MIX

WILDFLOWER SEED

VT STATE PLANE GRID

N

FLOW

MATCHLINE STA 369+00.00

369+00

370+00

371+00

372+00

373+00

374+00

VT ROUTE 12

TO ELMORE

CZ

TC

CR

FG

PS

AR

AL

AV

TB

CS

CA

NORTH BRANCH WINOOSKI RIVER

FLOW

SCALE 1" = 20'-0"

20 0 20

HOYLE TANNER

PROJECT NAME: WORCESTER

PROJECT NUMBER: BF 0241(57)

FILE NAME: z19b214bdr_lds.dgn

PROJECT LEADER: J.OLIN

DESIGNED BY: B.DONAHUE

LANDSCAPE PLAN 2

PLOT DATE: 25-MAY-2023

DRAWN BY: P.DUSTIN

CHECKED BY: J.OLIN

SHEET 222 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 1	SHEET 223 OF 370

Replace this sheet

HOYLE TANNER

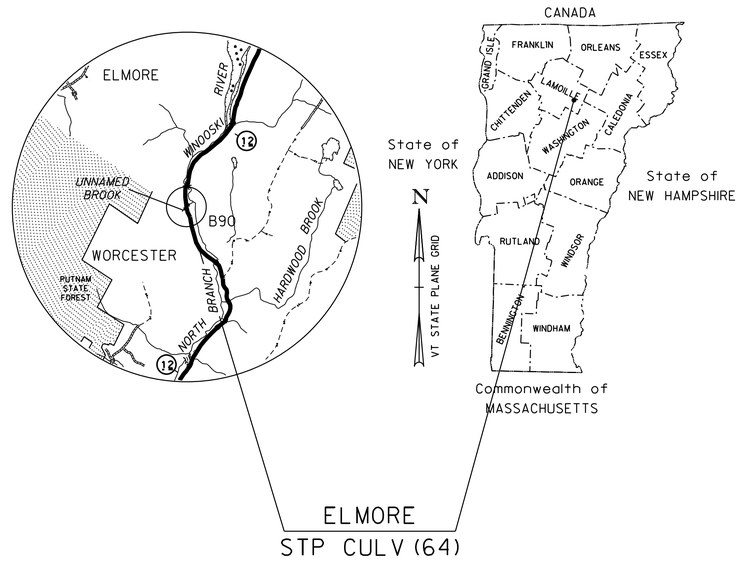
PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 2	SHEET 224 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. DETAIL SHEET	SHEET 225 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

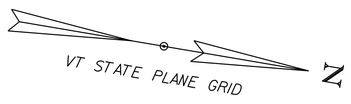
TOWN OF ELMORE
COUNTY OF LAMOILLE

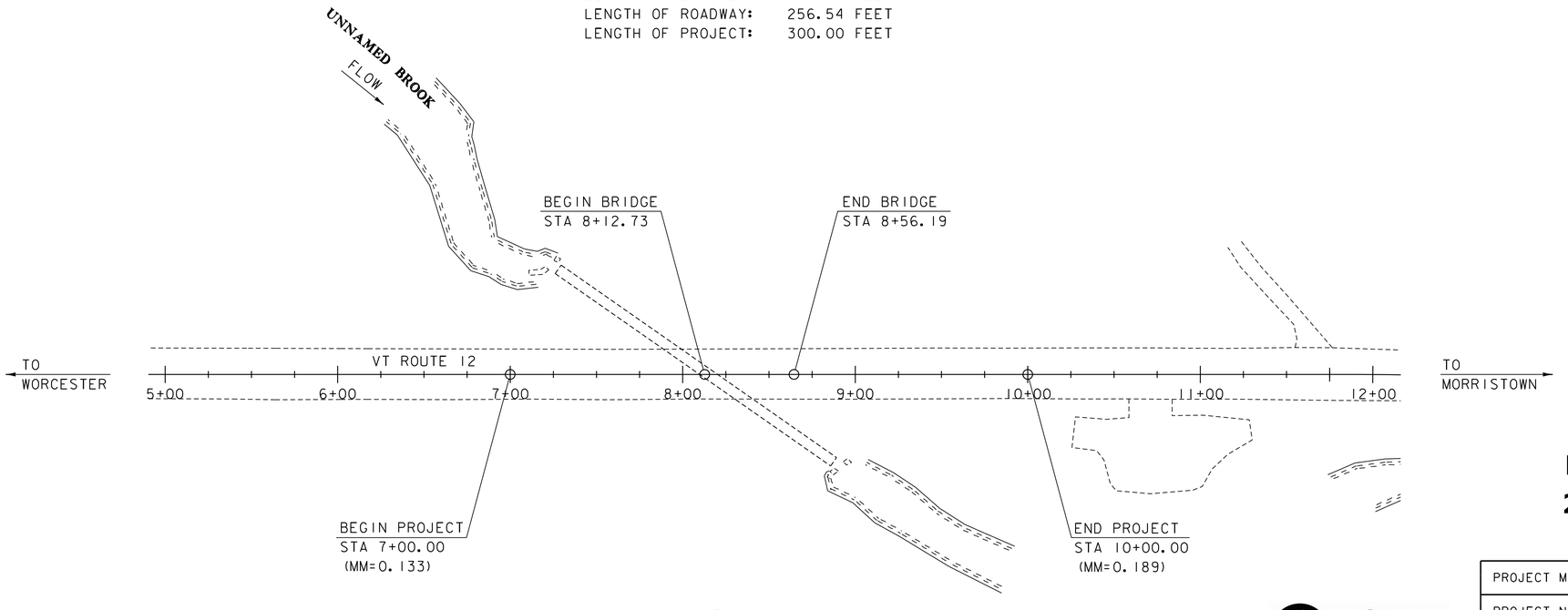
ROUTE NO: VERMONT ROUTE 12 (MAJOR COLLECTOR) BRIDGE NO: 90

PROJECT LOCATION: VT ROUTE 12, BRIDGE 90, APPROXIMATELY 11.0 MILES SOUTH OF THE JUNCTION WITH VT ROUTE 15A, IN THE TOWN OF ELMORE.

PROJECT DESCRIPTION: EXISTING CULVERT REPLACEMENT WITH STEEL GIRDER BRIDGE WITH ASSOCIATED ROADWAY IMPROVEMENTS.

LENGTH OF BRIDGE: 43.46 FEET
LENGTH OF ROADWAY: 256.54 FEET
LENGTH OF PROJECT: 300.00 FEET





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

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 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 :	R. GILMAN AND H. MCGOWAN
SURVEYED DATE :	8/6/2019
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83 (2011)

FINAL PLANS
25-MAY-2023

HOYLE TANNER

PROJECT MANAGER :	LAURA STONE
PROJECT NAME :	ELMORE
PROJECT NUMBER :	STP CULV(64)
SHEET 226 OF 370 SHEETS	

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version
LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE SEET 2 FOR INDEX OF SHEETS

STANDARDS LIST

SEE SHEET 2 FOR LIST OF STANDARDS

DETAIL SHEETS

SEE SHEET 2 FOR DETAIL SHEETS

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 12/16/21

DRAINAGE AREA : 1.19 sq. mi.
CHARACTER OF TERRAIN : Mountainous
STREAM CHARACTERISTICS : Sinous with narrow floodplain
NATURE OF STREAMBED : Gravel with sand substrate

PEAK FLOW DATA - ANNUAL EXCEEDANCE PROBABILITY (AEP)

43% =	89 cfs	2% =	300 cfs
10% =	180 cfs	1% =	360 cfs
4% =	240 cfs	0.2% =	540 cfs

DATE OF FLOOD OF RECORD Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ 2% AEP = 6.0 fps +/-
ICE CONDITIONS : Low to Moderate
DEBRIS: Moderate to High
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Unknown
IS ORDINARY RISE RAPID? Unknown
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes
IF YES, DESCRIBE: North Branch Winooski

WATERSHED STORAGE: 2.8%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Round Corrugated Metal Plate Pipe
YEAR BUILT: 1964
CLEAR SPAN(NORMAL TO STREAM): 6.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 6.0 ft.
WATERWAY OF FULL OPENING: 28.3 sq. ft.
DISPOSITION OF STRUCTURE: Replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See Borings

WATER SURFACE ELEVATIONS AT:

43% AEP =	1165.7 ft.	VELOCITY =	9.7 fps
10% AEP =	1167.7 ft.	"	11.7 fps
4% AEP =	1169.3 ft.	"	12.5 fps
2% AEP =	1171.6 ft.	"	13.0 fps
1% AEP =	1174.0 ft.	"	14.0 fps

LONG TERM STREAMBED CHANGES: Unknown

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

UPSTREAM STRUCTURE

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

DOWNSTREAM STRUCTURE

TOWN:	Worcester	DISTANCE:	1.1 mi.
HIGHWAY # :	VT-12	STRUCTURE #:	89
CLEAR SPAN:	15.0 ft.	CLEAR HEIGHT:	Unknown
YEAR BUILT:	1964	FULL WATERWAY:	Unknown
STRUCTURE TYPE:	CGMPP		

PROPOSED STRUCTURE

STRUCTURE TYPE: Single Span

CLEAR SPAN(NORMAL TO STREAM): 37.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 16.97 ft.
WATERWAY OF FULL OPENING: 541.0 sq. ft. +/-

WATER SURFACE ELEVATIONS AT:

43% AEP =	1161.8 ft.	VELOCITY=	6.1 fps
10% AEP =	1162.4 ft.	"	8.0 fps
4% AEP =	1162.8 ft.	"	8.7 fps
2% AEP =	1163.1 ft.	"	9.1 fps
1% AEP =	1163.5 ft.	"	9.5 fps

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

BRIDGE LOW CHORD ELEVATION: 1176.77 ft.
FREEBOARD: @ 2% AEP = 13.67 ft.

SCOUR: 6' minimum scour depth (or to ledge)

REQUIRED CHANNEL PROTECTION: Stone Fill Type III *

PERMIT INFORMATION

AVERAGE DAILY FLOW:	-	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	-	-
ORDINARY HIGH WATER:	-	-

TEMPORARY BRIDGE MINIMUM HYDRAULIC REQUIREMENTS

STRUCTURE TYPE: TBD
CLEAR SPAN (NORMAL TO STREAM): 11.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 6.0 ft.
WATERWAY AREA OF FULL OPENING: 66.0 sq. ft.

ADDITIONAL INFORMATION

* E-Stone Type III to be use for all in channel work.

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TWO-WAY ALTERNATING TRAFFIC ON A TEMPORARY BRIDGE.
2. INSTALL AND MAINTAIN TRAFFIC SIGNALS.
3. SIDEWALKS ARE NOT NECESSARY
4. THE APPROACHES FOR THE TEMPORARY BRIDGE SHALL BE PAVED.

DESIGN VALUES

1.	DESIGN LIVE LOAD		HL-93
2.	FUTURE PAVEMENT	d_p:	3.0 INCH
3.	DESIGN SPAN	L:	40.00 FT
4.	MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5.	PRESTRESSING STRAND	f_y:	---
6.	PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7.	PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8.	HIGH PERFORMANCE CONCRETE, CLASS PCD	f'_c:	4.0 KSI
9.	HIGH PERFORMANCE CONCRETE, CLASS PCS	f'_c:	3.5 KSI
10.	CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	---
11.	CONCRETE, CLASS C	f'_c:	---
12.	REINFORCING STEEL	f_y:	60 KSI
13.	STRUCTURAL STEEL AASHTO M270	f_y:	50 KSI
14.	NOMINAL BEARING RESISTANCE OF SOIL	q_n:	---
15.	SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
16.	NOMINAL BEARING RESISTANCE OF ROCK	q_n:	36.0 KSF
17.	ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
18.	PILE RESISTANCE FACTOR	ϕ:	---
19.	LATERAL PILE DEFLECTION	Δ:	---
20.	BASIC WIND SPEED	V_{3s}:	---
21.	MINIMUM GROUND SNOW LOAD	p_g:	---
22.	SEISMIC DATA	PGA: --- S_s:	---
		S_1:	---
23.			
24.			---
25.			---
26.			---

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY	4.44	2.55					
POSTING							
OPERATING	5.75	3.31	5.37	3.19	4.13	3.80	4.41
COMMENTS:							

BITUMINOUS CONCRETE PAVEMENT SUPERPAVE MIXTURE DESIGN CRITERIA	
DESIGN LANE / DESIGN LIFE ESAL	137,640
DESIGN NUMBER OF GYRATIONS	50
PERFORMANCE GRADE ASPHALT BINDER	SEE TABLE 406.03F

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2023	1100	170	62	4.6	55
2043	1200	180	62	7	95

20 year ESAL for flexible pavement from 2023 to 2043 : 222000
40 year ESAL for flexible pavement from 2023 to 2063 : 525000
Design Speed : 50 mph

AS BUILT "REBAR" DETAIL

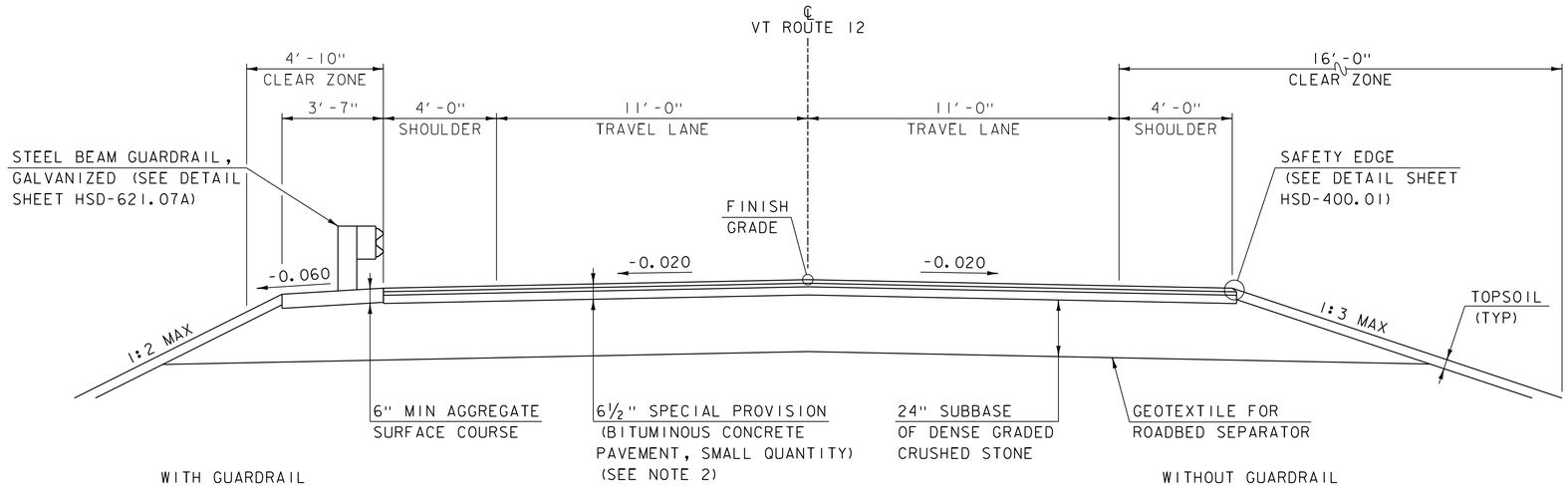
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

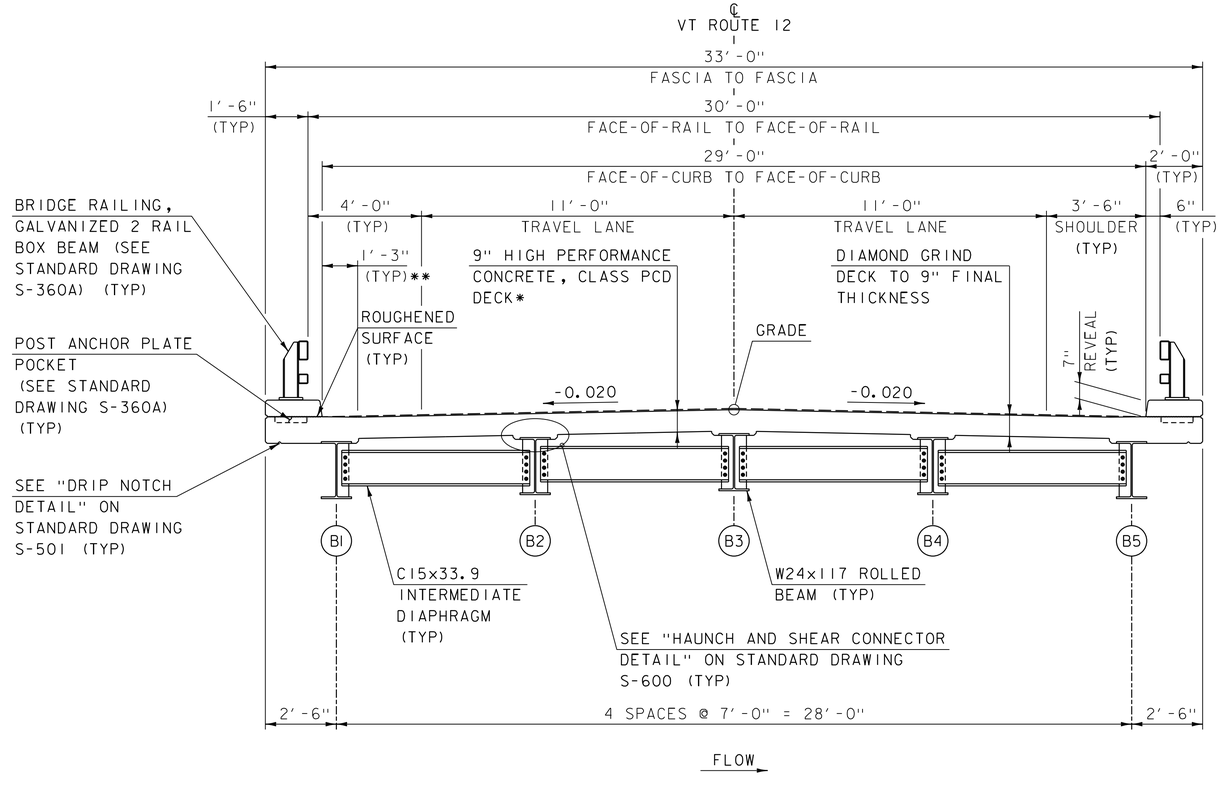
FILE NAME: z18b003pi.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
PRELIMINARY INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 227 OF 370



PROPOSED VT ROUTE 12 TYPICAL SECTION

SCALE: ⅜" = 1′-0"



TYPICAL BRIDGE SECTION

SCALE: ⅜" = 1′-0"

* DECK SHALL BE OVERPOURED TO A DEPTH OF 9½" AND DIAMOND GROUND TO THE FINAL THICKNESS OF 9" AS SHOWN IN THE PLANS. SEE SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION).

** FINISH DECK TO FINAL GRADE OR TRANSITION OVERPOUR TO 0" AT FACE OF CURB. IF ANY OVERPOUR IS TRANSITIONED, IT SHALL BE COMPLETELY REMOVED BY GRINDING.

MATERIAL TOLERANCES
(IF USED ON PROJECT)

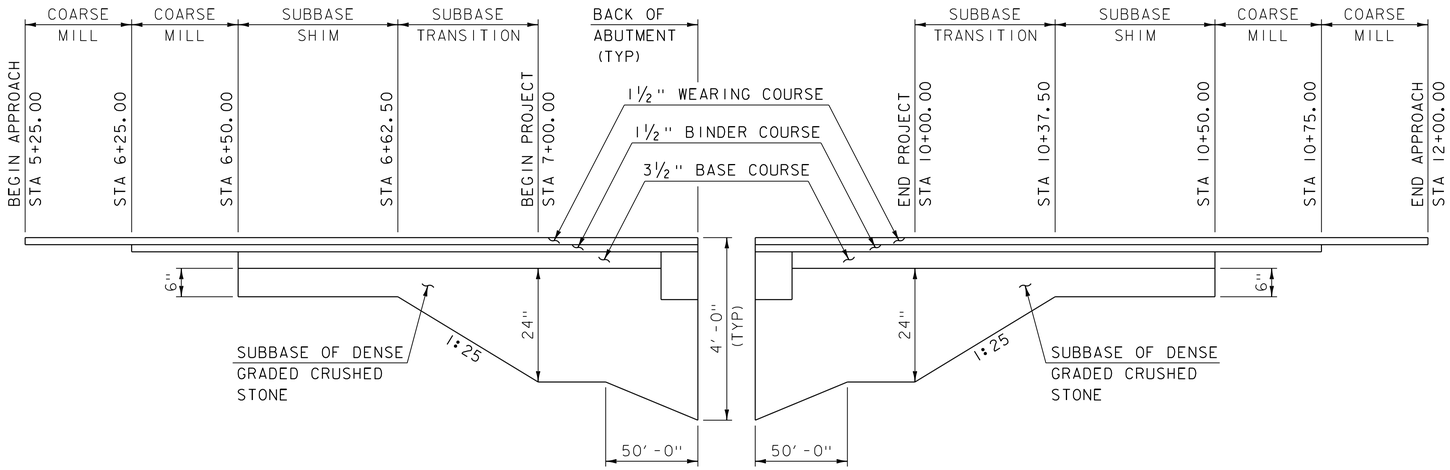
SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- ¼"
- AGGREGATE SURFACE COURSE	+/- ½"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

NOTES

1. ROADWAY TYPICAL SECTION IS A GENERAL REPRESENTATION OF TYPICAL ROADWAY MATERIALS AND SLOPES. REFER TO THE LAYOUT SHEETS FOR LOCATION OF GUARDRAIL AND SLOPE TIE IN LOCATIONS.
2. 6½" BITUMINOUS CONCRETE PAVEMENT SHALL CONSIST OF THE FOLLOWING:
   - 1½" TYPE IVS WEARING COURSE OVER
   - 1½" TYPE IVS BINDER COURSE
   - 3½" TYPE IIS BASE COURSE

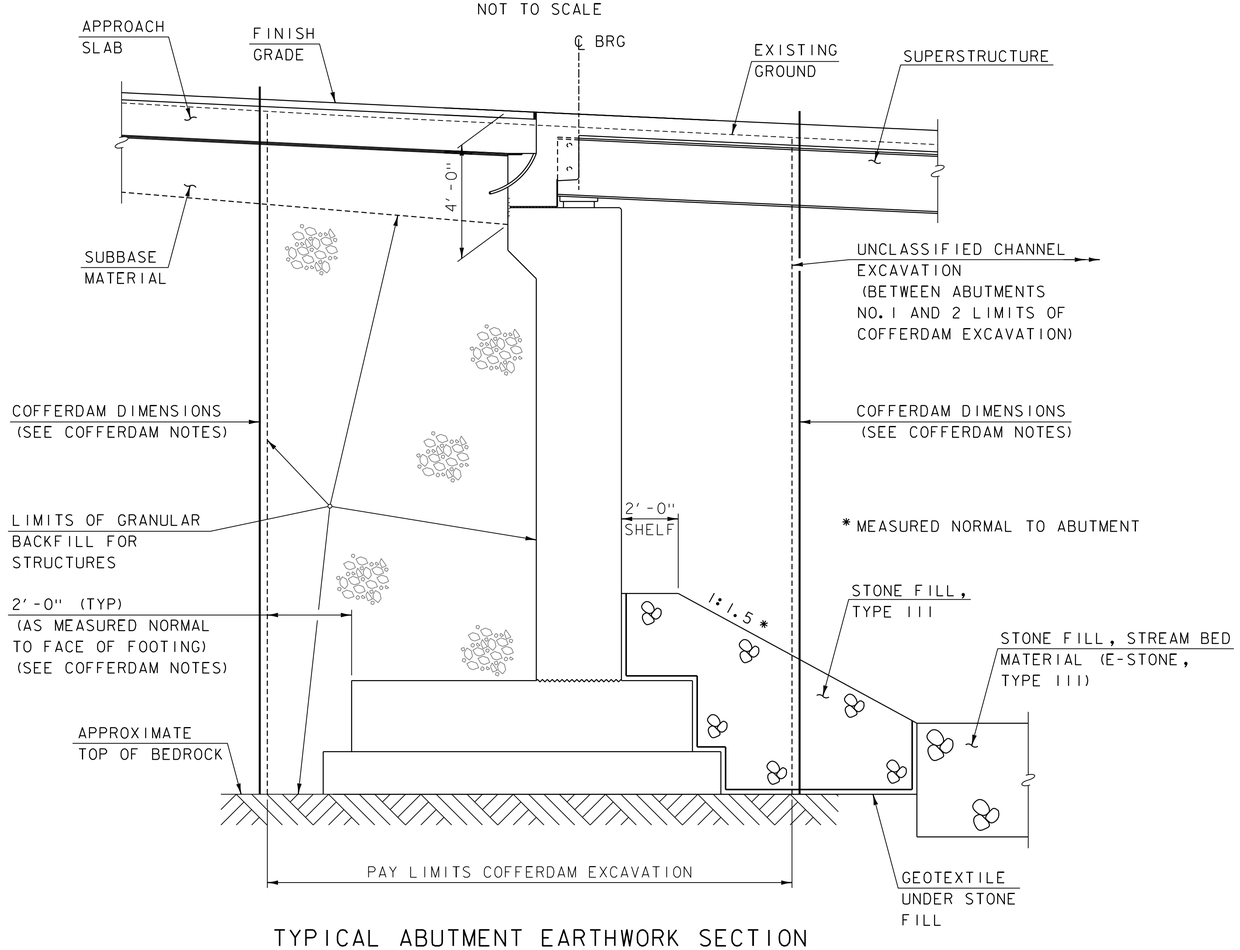
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
TYPICAL SECTIONS 1	SHEET 228 OF 370



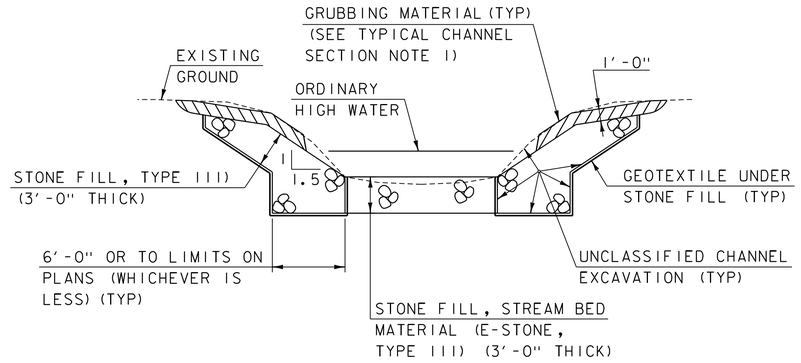
VT ROUTE 12 MATERIAL TRANSITION DETAIL

NOT TO SCALE



TYPICAL ABUTMENT EARTHWORK SECTION

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 SIMILAR)
NOT TO SCALE



TYPICAL CHANNEL SECTION

NOT TO SCALE

TYPICAL CHANNEL SECTION NOTES

1. GRUBBING MATERIAL SHALL BE PLACED UNDERNEATH STRUCTURES WHERE THERE IS MORE THAN 6 FEET VERTICALLY FROM ORDINARY HIGH WATER (OHW) TO THE BOTTOM OF SUPERSTRUCTURE AND MORE THAN 6 FEET HORIZONTALLY FROM OHW LINE TO FRONT FACE OF ABUTMENT. THIS MATERIAL SHALL START JUST ABOVE THE OHW ELEVATION AND TERMINATE 3 FEET HORIZONTALLY FROM THE FRONT FACE OF THE ABUTMENT. THIS MATERIAL SHALL NOT BE PLACED UNDERNEATH DOWNSPOUTS. SEE THE CHANNEL SECTIONS FOR ADDITIONAL DETAILING.

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

3. COORDINATE WITH ENGINEER AND VTRANS HYDRAULICS ENGINEER WHERE BEDROCK IS FOUND WITHIN EXCAVATED AREA. EXCAVATION OF BEDROCK OR SUITABLE NATIVE MATERIAL THAT MATCHES PROPOSED E-STONE MAY NOT BE REQUIRED TO BE REMOVED BELOW THE FINISHED STREAMBED ELEVATION WHEN FOUND. SOME ROCK EXCAVATION MAY BE REQUIRED TO KEY-IN NEW FILL MATERIAL. ENGINEER AND VTRANS HYDRAULICS ENGINEER TO CONFIRM CHANNEL PROFILE AND CHANNEL EXCAVATION LIMITS.

COFFERDAM NOTES

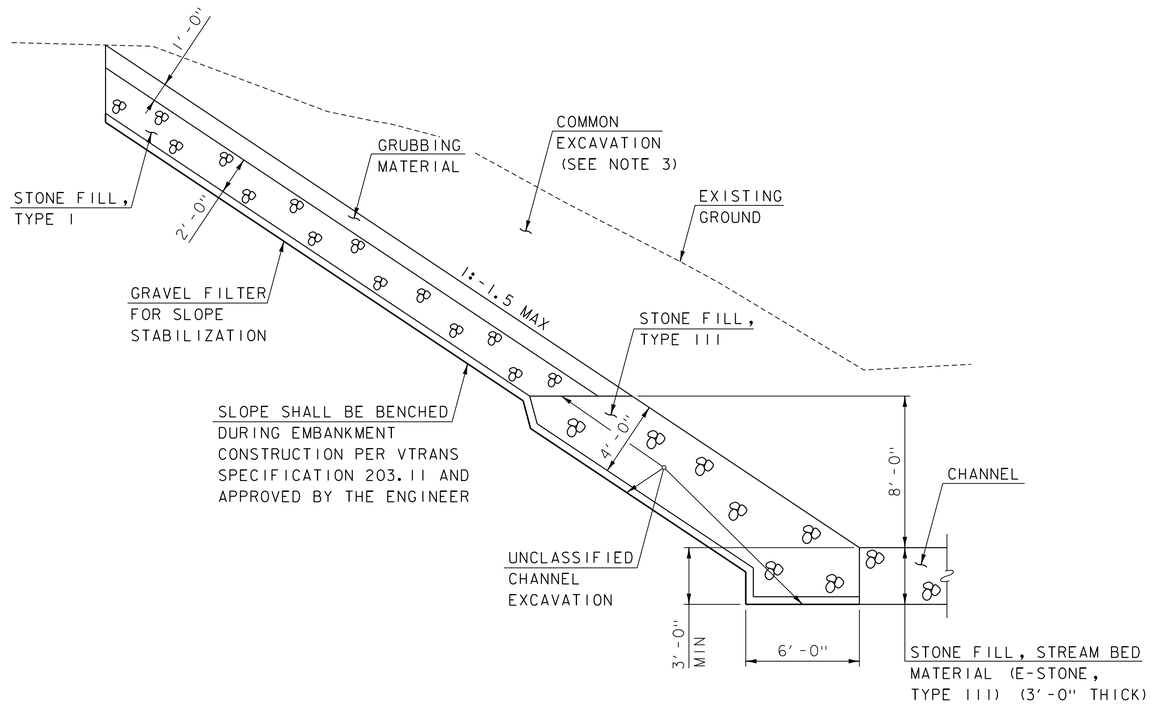
1. COFFERDAM DIMENSIONS TO BE DETERMINED BY THE CONTRACTOR.

2. THE PAY LIMITS OF EITHER "COFFERDAM EXCAVATION, EARTH" AND "COFFERDAM EXCAVATION, ROCK" SHALL BE 2'-0" OUTSIDE THE PERIMETER OF THE FOOTING AND FROM BOTTOM OF EXCAVATION UP TO THE EXISTING GROUND OR BOTTOM OF SUBBASE, WHICHEVER IS LOWER.

3. IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN THE INDICATED COFFERDAM EXCAVATION PAY LIMITS, PAYMENT FOR ALL UNCLASSIFIED CHANNEL EXCAVATION, INCLUDING THAT PORTION WHICH IS INSIDE THE COFFERDAM BUT OUTSIDE THE COFFERDAM PAY LIMITS, WILL BE MADE AT THE CONTRACT UNIT PRICE FOR UNCLASSIFIED CHANNEL EXCAVATION. NO MEASUREMENT AND PAYMENT WILL BE MADE FOR COFFERDAM EXCAVATION AND GRANULAR BACKFILL FOR STRUCTURES OUTSIDE THE PAY LIMITS DEFINED IN NOTE 2.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
TYPICAL SECTIONS 2	SHEET 229 OF 370



NOTES

1. COORDINATE WITH ENGINEER AND VTRANS GEOLOGIST IF BEDROCK IS FOUND WITHIN EXCAVATED AREA. EXCAVATION OF LEDGE WILL NOT BE REQUIRED EXCEPT AS NECESSARY TO KEY IN STONE FILL.
2. REFER TO TYPICAL CHANNEL SECTION FOR ADDITIONAL INFORMATION.
3. COMMON EXCAVATION SHALL BE USED FOR AREAS OUTSIDE OF LIMITS OF UNCLASSIFIED CHANNEL EXCAVATION AND STRUCTURE EXCAVATION.

TYPICAL SLOPE SECTION
(CHANNEL STATION 41+00 TO 42+60 LT)

NOT TO SCALE

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
TYPICAL SECTIONS 3	SHEET 230 OF 370

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2018 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.

2. FINISH GRADE SHOWN ON PLANS ARE BASED ON THE FINAL DECK THICKNESS OF 9 INCHES AFTER COMPLETING THE BRIDGE DECK SURFACE PREPARATION.

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

EARTHWORK

4. THE REMOVAL OF THE EXISTING STRUCTURE WILL BE PAID UNDER ITEM 529.15 REMOVAL OF STRUCTURE. THIS WORK SHALL INCLUDE REMOVAL OF THE ENTIRE PIPE AND ANY PORTIONS OF THE EXISTING HEADWALLS THAT FALL OUTSIDE THE LIMITS OF UNCLASSIFIED CHANNEL EXCAVATION OR COFFERDAM EXCAVATION.

5. CONTACT THE RIVER MANAGEMENT ENGINEER, JARON BORG – (802) 371-8342 – A MINIMUM OF TWO WEEKS PRIOR TO CONSTRUCTION FOR APPROVAL OF STREAM BED MATERIAL AND FOR CONSULTATION REGARDING FINAL GRADING OF THE CHANNEL.

6. WEATHERED ROCK AS IDENTIFIED ON BORING LOGS IS ANTICIPATED TO BE REMOVED BY STANDARD EARTH-EXCAVATING EQUIPMENT. WEATHERED BEDROCK MATERIAL IDENTIFIED WITHIN EXCAVATION LIMITS HAS BEEN QUANTIFIED UNDER RESPECTIVE PAY ITEMS OF ITEM 203.27 UNCLASSIFIED CHANNEL EXCAVATION, ITEM 208.30 COFFERDAM EXCAVATION, EARTH.

7. THE CONTRACTOR SHALL TAKE INTO ACCOUNT THAT VTRANS COMPLETED A CEMENT STABILIZED RECLAIM PROJECT IN 2010 WITHIN THE LIMITS OF THIS PROJECT. THIS MAY IMPACT THE ASSOCIATED EXCAVATION WORK.

TRAFFIC CONTROL

8. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE-SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING ALTERNATING ONE-WAY TRAFFIC, AND ROAD CLOSURE, RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE, AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. PAYMENT FOR ALL ACTIVITIES AND MATERIALS ASSOCIATED WITH THIS WORK WILL BE INCLUDED IN ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 90).

TEMPORARY BRIDGE AND APPROACH

9. THE ONE-WAY TEMPORARY BRIDGE AS SHOWN ON THE TRAFFIC CONTROL PLANS HAS BEEN LAID OUT BASED ON A 16' RAIL TO RAIL WIDTH FOR THE PURPOSES OF ESTABLISHING ALIGNMENT AND TEMPORARY IMPACTS. THE MINIMUM CLEAR WIDTH SHALL BE AS DEFINED BY SPECIFICATION SECTION 528.

10. THE TEMPORARY BRIDGE APPROACH HAS BEEN ESTABLISHED BASED ON 1:2 EMBANKMENT SLOPES AS SHOWN ON THE TRAFFIC CONTROL PLANS FOR THE PURPOSES OF ESTABLISHING TEMPORARY IMPACT LIMITS. SLOPES AND APPROACH RAILING ARE CONTRACTOR DETERMINED AND ARE NOT SHOWN ON TRAFFIC CONTROL PLANS PROVIDED HEREIN. CONTRACTOR SPECIFIED DETAIL SHALL BE INCLUDED ON THE WORKING DRAWINGS SUBMITTAL PER SPECIFICATION SECTION 528.

11. COORDINATE WORKING DRAWINGS AND TRAFFIC CONTROL DEVICES ON BRIDGE APPROACHES WITH THE SITE -SPECIFIC TRAFFIC CONTROL PLAN (REFERENCE NOTE 7 ABOVE).

TEMPORARY TRAFFIC SIGNAL

12. TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM AND IN COMPLIANCE WITH THE LATEST EDITION OF THE MUTCD.

13. SIGNAL FACES SHALL BE LED AND CONSIST OF 12 INCH LENSES (RED, YELLOW AND GREEN).

14. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY LIGHT THE STOP BAR AREAS. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

15. 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 UTLITY POLES, WIRES, ETC. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIGNAL PHASING AND TIMING. THE CONTRACTOR SHALL SUBMIT A PHASING DIAGRAM AND TIMING SCHEDULE TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL MAKE THE SIGNALS OPERATIONAL ONLY AFTER RECEIVING APPROVAL OF BOTH THE PHASING DIAGRAM AND TIMING SCHEDULE BY THE ENGINEER. DEVELOPMENT OF THE PHASING DIAGRAM AND TIMING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO THE ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM. ADDITIONAL ADJUSTMENTS TO SIGNAL TIMING OR PHASING REQUESTED BY THE ENGINEER SHALL BE COMPLETED WITHIN 48 HOURS OF REQUEST. PAYMENT FOR ADDITIONAL ADJUSTMENTS TO THE SIGNAL TIMING OR PHASING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

17. THE SUBMITTAL FOR ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE IN CONJUNCTION WITH THE SUBMITTAL FOR ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 90) AND SHALL INCLUDE AS A MINIMUM, THE SIGNAL LOCATION, TIMING AND PHASING PLAN, VEHICLE DETECTION SYSTEM AND EMERGENCY VEHICLE PREEMPTION SYSTEM.

STRUCTURAL STEEL

18. ALL STRUCTURAL STEEL WILL BE GALVANIZED PER SECTION 506 OF THE STANDARD SPECIFICATIONS.

19. ALL WELDING TO THE STRUCTURAL STEEL SHALL BE COMPLETED PRIOR TO METALIZING OR GALVANIZING.

20. UNLESS OTHERWISE NOTED, ALL NEW STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270/M270M GRADE 50 AND SHALL BE PAID FOR UNDER ITEM 506.50 STRUCTURAL STEEL, ROLLED BEAM.

21. STRUCTURAL STEEL MEMBERS DESIGNATED CVN IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01 OF THE STANDARD SPECIFICATIONS.

22. BEAM WEBS, BEARING STIFFENERS SHALL BE PLUMB IN THE FINAL POSITION.

23. FLEMING BRACKETS OR SIMILAR FALSEWORK SHALL BE SPACED AS REQUIRED BY DESIGN BUT SHALL BE LIMITED TO A MAXIMUM SPACING OF 4 FEET. THE DESIGN OF FALSEWORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

24. FLEMING BRACKETS SHOULD EXTEND AS NEAR AS POSSIBLE TO THE BOTTOM FLANGE, BUT IN NO CASE SHALL THE FLEMING BRACKETS BE LESS THAN ¾ OF THE WEB DEPTH IN DEPTH.

CONCRETE

25. THE DECK IS TO BE POURED IN ONE CONTINUOUS POUR WITH A MAXIMUM DURATION OF EIGHT HOURS. IF CIRCUMSTANCES BEYOND THE CONTRACTOR'S CONTROL PREVENT THIS FROM BEING ACCOMPLISHED, A TRANSVERSE CONSTRUCTION JOINT SHALL BE USED BETWEEN ADJACENT POURS. A MINIMUM 96 HOUR DELAY BETWEEN ADJACENT POURS SHALL BE OBSERVED.

26. ALL DECK POURS SHALL BEGIN FROM THE LOW ELEVATION END AND PROCEED TOWARDS THE HIGH ELEVATION END.

27. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1" UNLESS OTHERWISE NOTED.

28. WATER REPELLENT, SILANE, SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES, EXCEPT THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES.

29. THE CONCRETE IN THE BRIDGE DECK, CURBS AND ABUTMENTS ABOVE THE BRIDGE SEAT ELEVATION SHALL BE ITEM 501.37, "HIGH PERFORMANCE CONCRETE, CLASS PCD". APPROACH SLABS, ABUTMENTS BELOW THE BRIDGE SEAT AND WINGWALLS SHALL BE ITEM 501.38, "HIGH PERFORMANCE CONCRETE PCS". SUB-FOOTING CONCRETE SHALL BE ITEM 541.30, "CONCRETE, CLASS C".

REINFORCING STEEL

30. ALL REINFORCING STEEL IN THE APPROACH SLAB SHALL BE CORROSION PROTECTION LEVEL I, ITEM 507.11 REINFORCING STEEL, LEVEL I (EPOXY COATED).

31. REINFORCING IN THE ABUTMENTS AND WINGWALL SHALL BE CORROSION PROTECTION LEVEL I, OR LEVEL II AS INDICATED ON THE REINFORCING STEEL SCHEDULE.

32. ALL REINFORCING IN THE DECK AND CURBS SHALL BE CORROSION PROTECTION LEVEL II, ITEM 507.12 REINFORCING STEEL, LEVEL II (CONTINUOUSLY GALVANIZED).

33. CUTTING AND REPAIRING DAMAGED AREAS OF COATED REINFORCING STEEL SHALL BE PERFORMED IN ACCORDANCE WITH SUBSECTION 507.04.

34. REINFORCING STEEL CLEAR COVER REQUIREMENTS ARE STATED ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE NOTED IN THE PLANS:

EXPOSED TO EARTH OR WEATHER	2.0 INCHES
DIRECT EXPOSURE TO DEICING SALTS (HEADWALL FASCIA, CURB, ETC.)	3.0 INCHES
CAST AGAINST EARTH	3.0 INCHES

35. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL, AVAILABLE ON THE AGENCY WEBSITE. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE 507 ITEM.

BEDROCK

36. UPON COMPLETION OF EXCAVATION FOR SUBSTRUCTURES FOUNDED ON BEDROCK AND PRIOR TO PLACING FORMWORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER THAT THEY INTEND TO BEGIN FORMING FOR FOUNDATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER AND THE VTRANS STATE GEOLOGIST. THE GEOLOGIST WILL DETERMINE IF THE BEDROCK IS COMPETENT TO OBTAIN THE REQUIRED NOMINAL BEARING RESISTANCE. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 72 HOURS PRIOR TO WHEN THE ANALYSIS WILL BE NEEDED. THE CONTRACTOR IS INFORMED THAT EXCAVATION LIMITS WILL NOT BE CONSIDERED FINAL UNTIL THE ENGINEER AND STATE GEOLOGIST DETERMINE THAT BEDROCK IS COMPETENT.

37. AFTER BEDROCK HAS BEEN EXPOSED AND DETERMINED COMPETENT BY GEOLOGIST, IF ELEVATIONS VARY FROM THE ELEVATIONS SHOWN IN THE PLANS, ADJUSTMENTS TO THE FOOTING ELEVATIONS MAY BE DESIRABLE TO MINIMIZE BEDROCK REMOVAL AND/OR REDUCE SUBFOOTING CONCRETE QUANTITIES. IF THE ACTUAL SITE CONDITIONS ENCOUNTERED REQUIRE LOWERING THE TOP OF FOOTING ELEVATION BY 2-FEET OR MORE, CONTACT THE PROJECT MANAGER IMMEDIATELY TO INQUIRE ABOUT REDESIGN OF THE FOUNDATION. THE CONTRACTOR SHOULD EXPECT THAT A DESIGN CHANGE MAY TAKE UP TO FIVE BUSINESS DAYS TO PROCESS AND PLAN CONSTRUCTION ACTIVITIES ACCORDINGLY.

38. ALL OVERBREAKAGE BEYOND ALLOWANCE SPECIFIED IN 204.06(B)(1) SHALL BE REPLACED WITH COMPETENT CONCRETE AT THE CONTRACTOR'S EXPENSE.

39. ANY EXPOSED SUBFOOTING FACES EXCEEDING 5 FEET IN HEIGHT SHALL BE REINFORCED WITH #5 REINFORCING STEEL BARS SPACED AT 12 INCHES EACH WAY. AN ESTIMATED QUANTITY FOR THESE BARS HAS BEEN INCLUDED IN ITEM 507.11, REINFORCING STEEL, LEVEL I (UNCOATED).

MISCELLANEOUS

40. THE CONTRACTOR SHALL PROVIDE A SITE-SPECIFIC EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH SECTION 653 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. ESTIMATED QUANTITIES FOR EPSC WORK HAVE BEEN INCLUDED IN THE CONTRACT FOR BIDDING PURPOSES. IF THE CONTRACTOR'S EPSC PLAN REQUIRES ITEMS OF WORK THAT ARE NOT INCLUDED IN THE PLANS, THE EXTRA WORK WILL BE PAID FOR AS PART OF ITEM 653.03 MAINTENANCE OF EPSC PLAN (BRIDGE 90).

41. STONE FILL, STREAM BED MATERIAL SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 613 AND 706. CONTRACTOR SHALL ENSURE E-STONE MATERIAL IS SUPPLEMENTED WITH MATERIAL EXCAVATED FROM THE CHANNEL AND/OR THE TAILINGS OF A TOPSOIL SCREENING OPERATION.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003nts.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
PROJECT NOTES

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
1						1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (BRIDGE 90)	201.10	
1290						1290		CY	COMMON EXCAVATION	203.15	
10			80			90		CY	SOLID ROCK EXCAVATION	203.16	
			5230			5230		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	
40						40		CY	EARTH BORROW	203.30	
30						30		CY	TRENCH EXCAVATION OF EARTH	204.20	
1						1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	
			1070			1070		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	
			2520			2520		CY	COFFERDAM EXCAVATION, EARTH	208.30	
			260			260		CY	COFFERDAM EXCAVATION, ROCK	208.35	
			1			1		LS	COFFERDAM (ABUTMENT 1)(BRIDGE 90)	208.40	
			1			1		LS	COFFERDAM (ABUTMENT 2)(BRIDGE 90)	208.40	
1000						1000		SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.10	
1080						1080		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	
70						70		CY	AGGREGATE SURFACE COURSE	401.10	
20						20		CWT	EMULSIFIED ASPHALT	404.65	
25						25		SY	HAND-PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES	406.38	
1						1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	
			70			70		CY	HIGH PERFORMANCE CONCRETE, CLASS PCD	501.37	
			580			580		CY	HIGH PERFORMANCE CONCRETE, CLASS PCS	501.38	
			27000			27000		LB	STRUCTURAL STEEL, ROLLED BEAM (FPQ)	506.50	
			18390			18390		LB	REINFORCING STEEL, LEVEL I (UNCOATED)	507.11	
			6210			6210		LB	REINFORCING STEEL, LEVEL I (EPOXY COATED)	507.11	
			59790			59790		LB	REINFORCING STEEL, LEVEL II (CONTINUOUSLY GALVANIZED)	507.12	
			1			1		LS	SHEAR CONNECTORS (410 - 7/8" X 7")(BRIDGE 90)	508.15	
			45			45		GAL	WATER REPELLENT, SILANE	514.10	
			67			67		LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10	
			67			67		LF	JOINT SEALER, HOT POURED	524.11	
			90			90		LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33	
			1			1		LS	ONE-WAY TEMPORARY BRIDGE (2400 SF - EST.)(BRIDGE 90)	528.10	
			1			1		EACH	REMOVAL OF STRUCTURE (6'-0" X 208'-0" CGMPP)	529.15	
			10			10		EACH	BEARING DEVICE ASSEMBLY, STEEL REINFORCED ELASTOMERIC PAD	531.17	
			230			230		CY	CONCRETE, CLASS C	541.30	
10						10		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	
			470			470		CY	STONE FILL, STREAM BED MATERIAL (E-STONE TYPE III)	613.06	
10			500			510		CY	STONE FILL, TYPE I	613.10	
			1725			1725		CY	STONE FILL, TYPE III	613.12	
160						160		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28	
2						2		EACH	REMOVING AND RESETTING PROPERTY MARKERS	619.20	
487.5						487.5		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORK SUMMARY
		FILL AVAILABLE
1290	CY	COMMON EXCAVATION (1290 x 1.0)
1569	CY	UNCLASSIFIED CHANNEL EXCAVATION (5230 x 0.3)
0	CY	STRUCTURE EXCAVATION (0 x 0.3)
834	CY	COFFERDAM EXCAVATION ((2520+260) x 0.3)
7	CY	ROUNDING
3700	CY	TOTAL FILL AVAILABLE
		FILL REQUIRED
46	CY	FACTORED FILL REQUIRED (40 x 1.15)
4	CY	ROUNDING
50	CY	TOTAL FILL REQUIRED
		BORROW OR WASTE
3650	CY	WASTE
		BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY
235	TON	BASE COURSE, TYPE IIS
115	TON	INTERMEDIATE COURSE, TYPE IVS
178	TON	WEARING COURSE, TYPE IVS
528	TON	SUBTOTAL
22	TON	ROUNDING
550	TON	TOTAL

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
QUANTITY SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 232 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES											TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
					1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
					5						5		EACH	MANUFACTURED TERMINAL SECTION, TANGENT	621.51				
					4						4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	621.72				
					640						640		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
					115						115		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
					560						560		HR	FLAGGERS	630.15				
									1		1		LS	FIELD OFFICE, ENGINEERS	631.10				
									1		1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
									1		1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
									1200		1200		DL	FIELD OFFICE COMMUNICATIONS (N.A.B.I.)	631.26				
						208					208		HR	EMPLOYEE TRAINEESHIP	634.10				
					1						1		LS	MOBILIZATION/DEMOBILIZATION (BRIDGE 90)	635.11				
					1						1		LS	TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 90)	641.11				
					1360						1360		LF	4 INCH WHITE LINE, WATERBORNE PAINT	646.201				
					1360						1360		LF	4 INCH YELLOW LINE, WATERBORNE PAINT	646.2111				
					1270						1270		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
								3060			3060		SY	GEOTEXTILE UNDER STONE FILL	649.31				
							60				60		LB	SEED	651.15				
							370				370		LB	FERTILIZER	651.18				
							2.5				2.5		TON	AGRICULTURAL LIMESTONE	651.20				
							400				400		CY	TOPSOIL	651.35				
							2110				2110		SY	GRUBBING MATERIAL (12 INCH)	651.40				
							1				1		LS	EPSC PLAN (BRIDGE 90)	653.01				
							110				110		HR	MONITORING EPSC PLAN	653.02				
							1				1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.) (BRIDGE 90)	653.03				
							2				2		TON	HAY MULCH	653.10				
							1100				1100		SY	ROLLED EROSION CONTROL PRODUCT, TYPE I	653.20				
							20				20		CY	CHECK DAM, TYPE I	653.25				
							35				35		CY	STABILIZED CONSTRUCTION ENTRANCE	653.35				
							2				2		EACH	FILTER BAG	653.45				
							240				240		LF	SILT FENCE, TYPE I	653.475				
							390				390		LF	SILT FENCE, TYPE II	653.476				
							880				880		LF	BARRIER FENCE	653.50				
							540				540		LF	PROJECT DEMARCATION FENCE	653.55				
										5	5		EACH	EVERGREEN TREES (ABIES BALSAMEA)(3'-4' HT.)(CONT.)	656.20				
										7	7		EACH	EVERGREEN TREES (PICEA GLAUCA)(3'-4' HT.)(CONT.)	656.20				
										5	5		EACH	EVERGREEN TREES (TSUGA CANADENSIS)(3'-4' HT.)(CONT.)	656.20				
										3	3		EACH	DECIDUOUS TREES (ACER RUBRUM)(5'-6' HT.)(CONT.)	656.30				
										3	3		EACH	DECIDUOUS TREES (ACER SACCHARUM)(5'-6' HT.)(CONT.)	656.30				
										5	5		EACH	DECIDUOUS TREES (ALNUS RUGOSA)(3'-4' HT.)(CONT.)	656.30				
										2	2		EACH	DECIDUOUS TREES (FAGUS GRANDIFOLIA)(5'-6' HT.)(CONT.)	656.30				

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
QUANTITY SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 233 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
									19	19		EACH	DECIDUOUS SHRUBS (CORNUS SERICEA)(1 GALLON)(CONT.)	656.35				
									7	7		EACH	DECIDUOUS SHRUBS (SPIRAEA TOMENTOSA)(1 GALLON)(CONT.)	656.35				
									8	8		EACH	DECIDUOUS SHRUBS (CORNUS AMOMUM)(1 GALLON)(CONT.)	656.35				
									7	7		EACH	DECIDUOUS SHRUBS (SALIX DISCOLOR)(1 GALLON)(CONT.)	656.35				
									7	7		EACH	DECIDUOUS SHRUBS (SALIX SERICEA)(1 GALLON)(CONT.)	656.35				
									28	28		MGAL	LANDSCAPE WATERING	656.65				
									13	13		CY	LANDSCAPE BACKFILL, TRUCK MEASUREMENT	656.80				
				1.5						1.5		SF	TRAFFIC SIGN, TYPE A	675.20				
				69						69		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
				5						5		EACH	REMOVING SIGNS	675.50				
				1						1		EACH	RESETTING SIGNS	675.60				
				5						5		EACH	DELINEATOR WITH STEEL POST	676.10				
				3						3		EACH	REMOVAL OF EXISTING DELINEATOR AND POST	676.12				
				1						1		EACH	TEMPORARY TRAFFIC SIGNAL SYSTEM	678.40				
				2						2		EACH	SPECIAL PROVISION (DRIVEWAY ASSISTANCE DEVICE)	900.620				
							1			1		LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)(BRIDGE 90)	900.645				
							1			1		LS	SPECIAL PROVISION (CONSTRUCTION VIBRATION MONITORING)	900.645				
							1740			1740		SF	SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)	900.670				
				550						550		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

N.A.B.I. NOT A BID ITEM

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QUANTITY SHEET 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 234 OF 370

HOYLE TANNER

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

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

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

POINT	CODE	DESCRIPTION
	BF	BARRIER FENCE
	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
	PDF	PROJECT DEMARCATION FENCE
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	R.T.& I.	RIGHT, TITLE, AND INTEREST
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
◎	IPNF	IRON PIN FOUND
●	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 VALVE
	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 RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE
CB	CHORD BEARING

UTILITY SYMBOLOGY

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+TELEPHONE
- 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+TELEPHONE
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

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

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

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

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

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

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

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

ARCHEOLOGICAL & HISTORIC

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

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

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

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003leg.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
CONVENTIONAL SYMBOLOGY LEGEND

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 235 OF 370

PRIMARY CONTROL

HVCTRL #1
17 HBC
NORTH = 719093.5070
EAST = 1632341.2960
ELEV = 1226.8550

GENERAL LOCATION ELMORE VT
TO REACH FROM THE JUNCTION OF VERMONT ROUTE 12 AND THE ENTRANCE TO THE STATE PARK IN ELMORE, PROCEED SOUTH ON VERMONT ROUTE 12 FOR 5.4 MI (8.7 KM) TO THE BRIDGE OVER BARNES BROOK AND THE SITE OF THE MARK ON THE LEFT. TO REACH FROM THE JUNCTION OF VERMONT ROUTE 12 AND THE ROAD LEADING TO MAPLE CORNERS IN WORCESTER, PROCEED NORTH ON ROUTE 12 FOR 8.1 MI (13.0 KM) TO THE BRIDGE OVER BARNES BROOK AND THE SITE OF THE MARK ON THE RIGHT. THE MARK IS A USGS BENCHMARK DISK SET FLUSH IN THE CONCRETE BASE OF THE NORTH EAST RAIL OF THE BRIDGE. IT IS LOCATED 16 FT (4.9 M) SOUTHEAST OF THE CENTERLINE OF VERMONT ROUTE 12, 5 FT (1.5 M) NORTH OF A CONCRETE BRIDGE POST, 1 FT (0.3 M) SOUTHWEST OF A FIBERGLASS WITNESS POST, AND 0.5 FT (15.2 CM) EASTERLY FROM THE STEEL GUARD RAIL. OWNERSHIP IS THE STATE OF VERMONT.

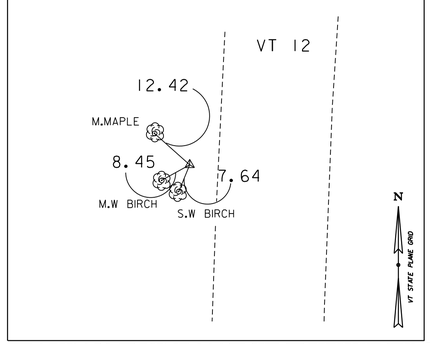
HVCTRL #2
LVT 1
NORTH = 718091.3650
EAST = 1631814.5990
ELEV = 1218.8720

GENERAL LOCATION, ELMORE, VT.
TO REACH FROM THE INTERSECTION OF VT ROUTE 15A (UPPER MAIN STREET) AND VT ROUTE 12 IN MORRISVILLE GO SOUTH ALONG VT ROUTE 12 FOR 4.3 MI (6.9 KM) TO THE ELMORE STATE PARK ENTRANCE ON THE RIGHT. CONTINUE STRAIGHT AHEAD AND GO SOUTH ALONG VT ROUTE 12 FOR 5.6 MI (9.0 KM) TO THE SITE OF THE MARK ON THE RIGHT. TO REACH FROM THE INTERSECTION OF VT ROUTE 12 AND CALAIS ROAD IN WORCESTER GO NORTH ALONG VT ROUTE 12 FOR 7.9 MI (12.7 KM) TO THE SITE OF THE MARK. THE MARK IS A BLANK DISK SET 30 CM (12 INCHES) BELOW GROUND SURFACE IN THE TOP OF A DRIVEN STEEL PIPE. IT IS BEHIND A STEEL BEAM GUARD RAIL AND ABOUT 0.3 M (1.0 FT) SOUTHWEST OF THE CENTERLINE OF A 30 CM (12 INCH) DIAMETER STEEL CULVERT WITH A MARKER POST, 5.5 M (18.0 FT) NORTHWEST OF AND 0.4 M (1.3 FT) LOWER THAN THE CENTERLINE OF VT ROUTE 12, 5.4 M (17.7 FT) EAST OF A PAIR OF 12 CM (5 INCHES) PINES, 37.8 M (124.0 FT) SOUTHWEST OF THE POST AT THE NORTHEAST END OF THE GUARD RAIL AND 38.4 M (126.0 FT) WEST OF AND ACROSS THE ROAD FROM MILE MARKER 0120/0804/0160.

SECONDARY CONTROL

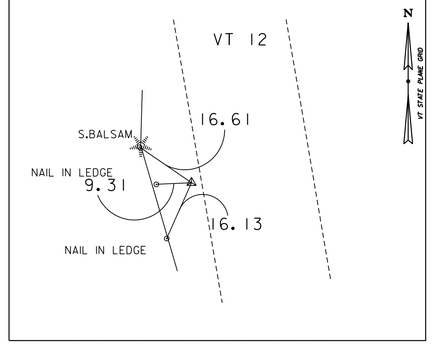
HVCTRL 9

NORTH = 713016.3410
EAST = 1628061.9460
ELEV. = 1171.9500



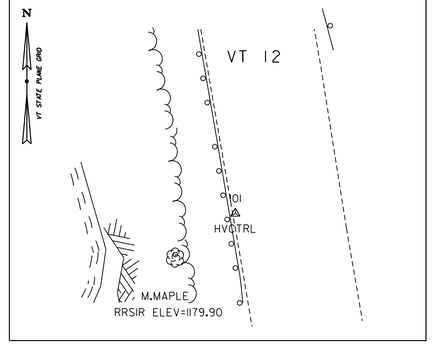
HVCTRL 10

NORTH = 711623.9960
EAST = 1628259.5270
ELEV. = 1199.5710



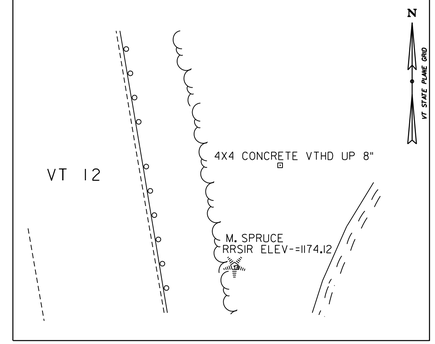
BM 1175

NORTH = 712126.5100
EAST = 1628159.9099
ELEV. = 1179.9041



BM 1527

NORTH = 712364.0452
EAST = 1628186.9537
ELEV. = 1174.1212



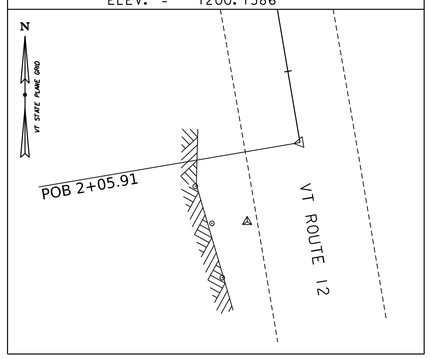
NORTH =
EAST =
ELEV. =

* TRAVERSE COMPLETED BY R.GILMAN B.HERRING AND H.MCGOWAN ON 7/30/2019

ALIGNMENT TIES VT ROUTE 12

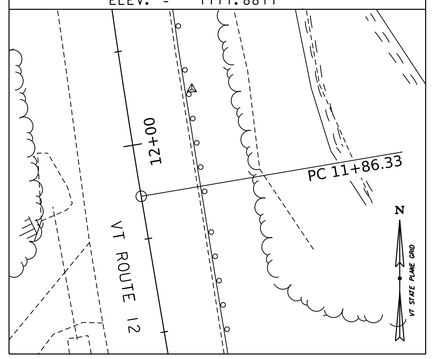
POB 2+05.91

NORTH = 711644.9334
EAST = 1628273.4800
ELEV. = 1200.1386



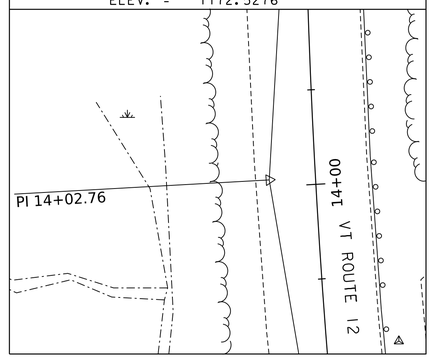
PC 11+86.33

NORTH = 712611.5098
EAST = 1628109.2822
ELEV. = 1171.8811



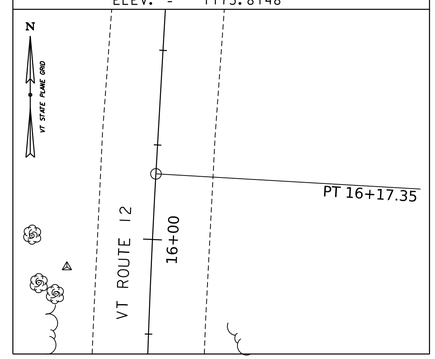
PI 14+02.76

NORTH = 712824.8812
EAST = 1628073.0356
ELEV. = 1172.5276



PT 16+17.35

NORTH = 713040.9528
EAST = 1628085.4541
ELEV. = 1173.8148



NORTH =
EAST =
ELEV. =

DATUM
VERTICAL NAVD88
HORIZONTAL NAD83(2011)
ADJUSTMENT COMPASS

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV (64)

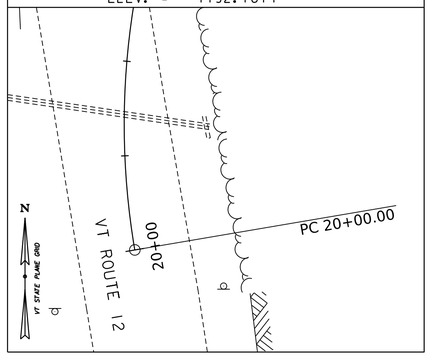
FILE NAME: z18b003ti.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TIE SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 236 OF 370

ALIGNMENT TIES
DETOUR

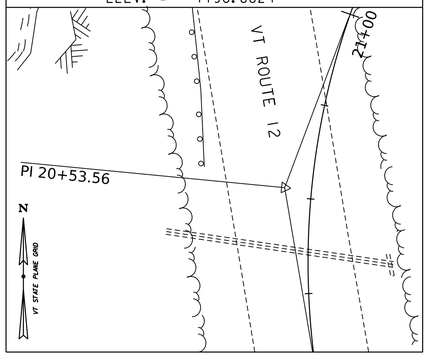
PC 20+00.00

NORTH =	712011.1779
EAST =	1628211.2640
ELEV. =	1192.7614



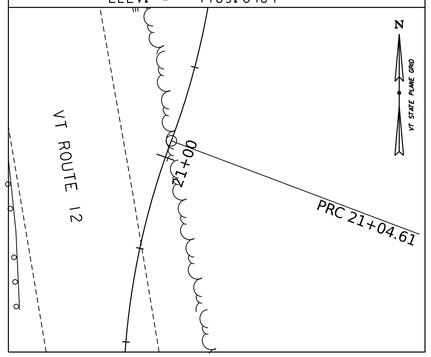
PI 20+53.56

NORTH =	712063.9775
EAST =	1628202.2946
ELEV. =	1190.8824



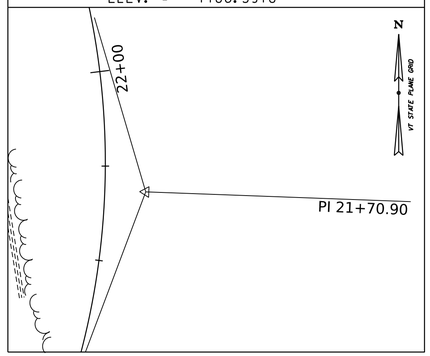
PRC 21+04.61

NORTH =	712114.0993
EAST =	1628221.1640
ELEV. =	1189.0484



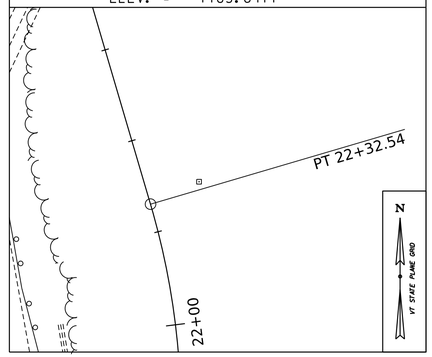
PI 21+70.90

NORTH =	712176.1391
EAST =	1628244.5200
ELEV. =	1186.3978



PT 22+32.54

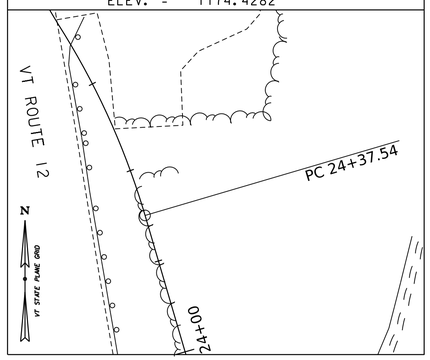
NORTH =	712239.7355
EAST =	1628225.8130
ELEV. =	1183.6477



ALIGNMENT TIES
DETOUR

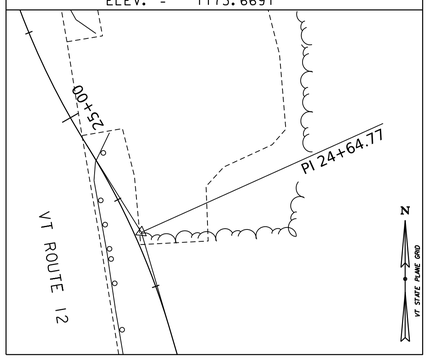
PC 24+37.54

NORTH =	712436.4035
EAST =	1628167.9625
ELEV. =	1174.4282



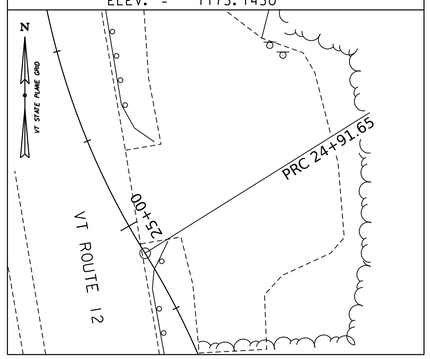
PI 24+64.77

NORTH =	712462.5194
EAST =	1628160.2805
ELEV. =	1173.6691



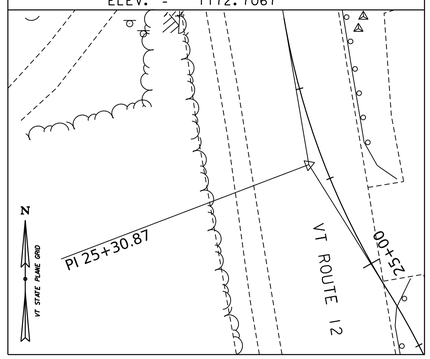
PRC 24+91.65

NORTH =	712485.5931
EAST =	1628145.8355
ELEV. =	1173.1430



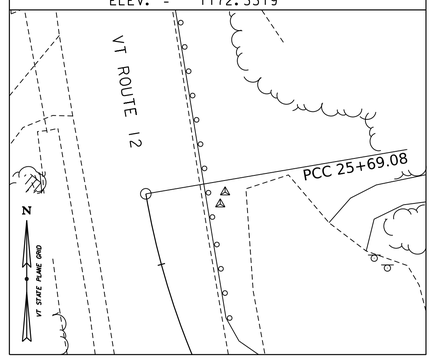
PI 25+30.87

NORTH =	712518.8340
EAST =	1628125.0256
ELEV. =	1172.7067



PCC 25+69.08

NORTH =	712557.4975
EAST =	1628118.4576
ELEV. =	1172.3319



DATUM

VERTICAL NAVD88

HORIZONTAL NAD83(2011)

ADJUSTMENT COMPASS

HOYLE TANNER

PROJECT NAME: ELMORE

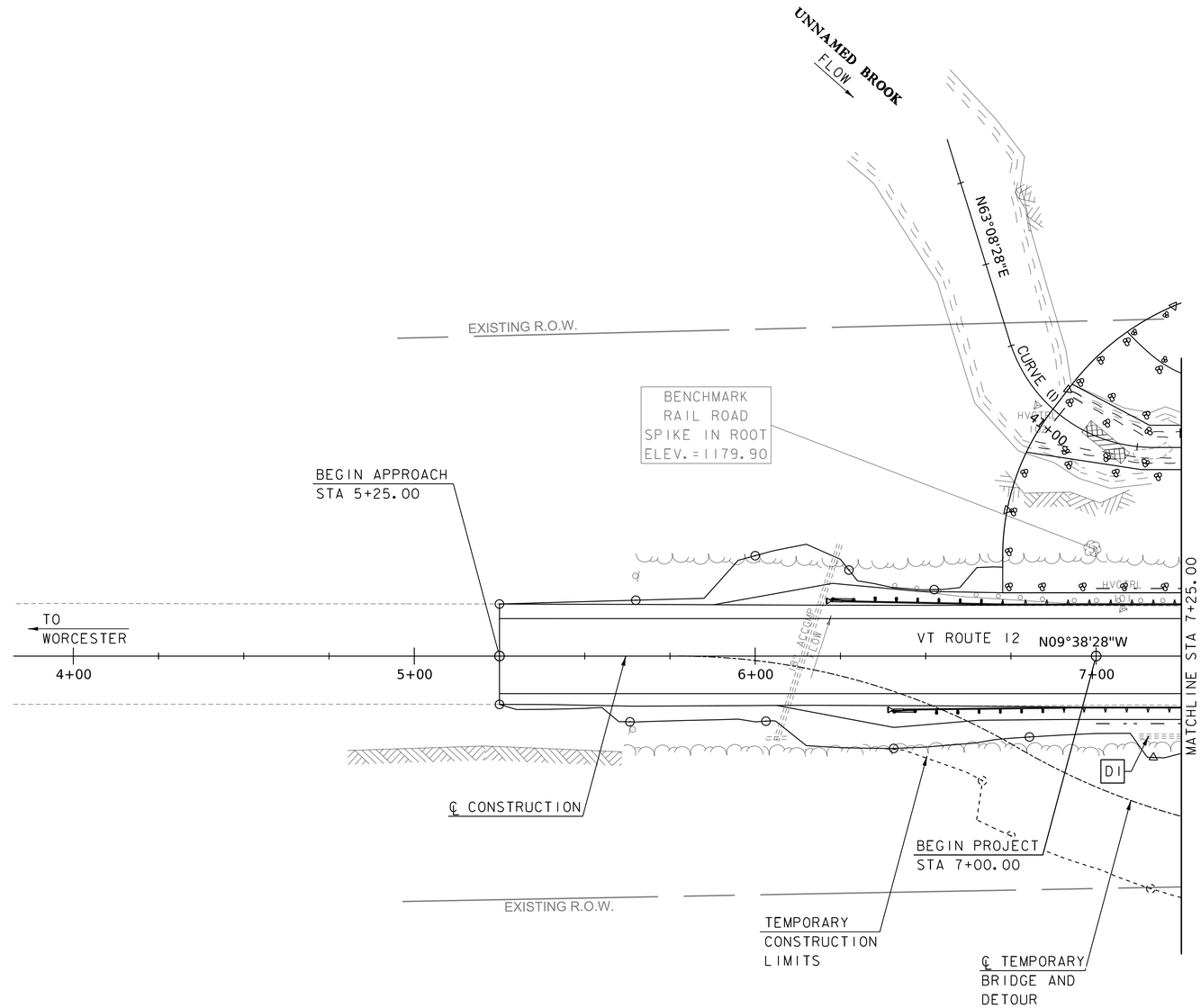
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003ti.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TIE SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 237 OF 370

VT STATE PLANE GRID

N



UNNAMED BROOK CURVE DATA

CURVE (1)
DELTA = 72°46'56"
D = 130°13'04"
R = 44.00'
T = 32.43'
L = 55.89'
E = 10.66'

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 6+39.91, LT - STA 8+40.74, LT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 6+72.58, LT - STA 7+74.80, LT
STA 6+90.58, RT - STA 7+92.81, RT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 6+22.72, LT - STA 6+72.58, LT
STA 6+40.72, RT - STA 6+90.58, RT

D1 STA 7+72.99, RT 23.89'
TO STA 7+12.38, RT
23.46'
REMOVE 61 LF x 15" CGMP

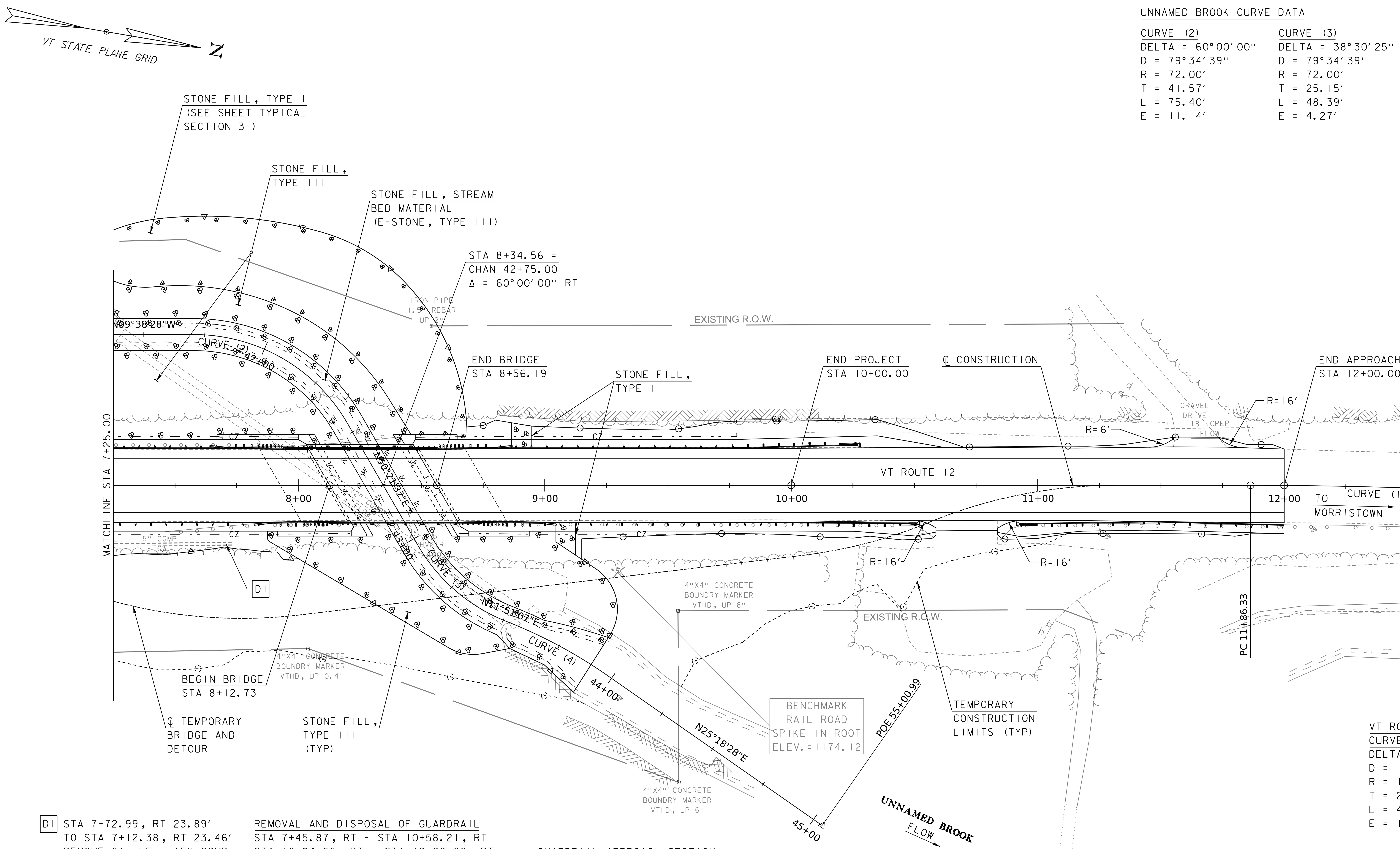
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: STP CULV(64)	
FILE NAME: z18b003bdr_lay.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
LAYOUT SHEET 1	SHEET 238 OF 370

UNNAMED BROOK CURVE DATA

CURVE (2)	CURVE (3)	CURVE (4)
DELTA = 60°00′00"	DELTA = 38°30′25"	DELTA = 13°27′21"
D = 79°34′39"	D = 79°34′39"	D = 28°38′52"
R = 72.00′	R = 72.00′	R = 200.00′
T = 41.57′	T = 25.15′	T = 23.59′
L = 75.40′	L = 48.39′	L = 46.97′
E = 11.14′	E = 4.27′	E = 1.39′



VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 12°55′50"
D = 3°00′00"
R = 1909.86′
T = 216.43′
L = 431.02′
E = 12.22′

D1 STA 7+72.99, RT 23.89′
TO STA 7+12.38, RT 23.46′
REMOVE 61 LF x 15" CGMP

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 7+45.87, RT - STA 10+58.21, RT
STA 10+84.66, RT - STA 12+00.00, RT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 8+76.10, LT - STA 9+76.30, LT
STA 8+94.08, RT - STA 10+00.52, RT
STA 11+43.10, RT - STA 12+00.00, RT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 9+76.30, LT - STA 10+26.16, LT
STA 10+00.52, RT - STA 10+50.39, RT
STA 10+93.24, RT - STA 11+43.10, RT

GUARDRAIL APPROACH SECTION, GALVANIZED TWO RAIL BOX BEAM
STA 7+74.80, LT - STA 8+03.70, LT
STA 7+92.81, RT - STA 8+21.71, RT
STA 8+47.20, LT - STA 8+76.10, LT
STA 8+65.18, RT - STA 8+94.08, RT

BRIDGE RAILING, GALVANIZED TWO RAIL BOX BEAM
STA 8+03.70, LT - STA 8+47.20, LT
STA 8+21.71, RT - STA 8+65.18, RT

CONSTRUCT 4′ PAVED DRIVE APRON
STA 10+50 - STA 10+95, RT
STA 11+45 - STA 11+85, LT

CAST-IN-PLACE CONCRETE CURB, TYPE B
STA 7+62.33, LT - STA 8+02.05, LT
STA 7+80.34, RT - STA 8+18.80, RT
STA 8+48.11, LT - STA 8+86.55, LT
STA 8+64.85, RT - STA 9+04.57, RT

EXISTING BRIDGE INFORMATION
72" CGMPP, 208′ LONG
BUILT 1964
18′ AVERAGE COVER
220 SQ.FT. WATERWAY AREA

NOTES

1. CONTRACTOR SHALL GRADE STONE FILL TO MAINTAIN DRAINAGE 2′ MINIMUM OFF OF FACE OF WINGWALLS.

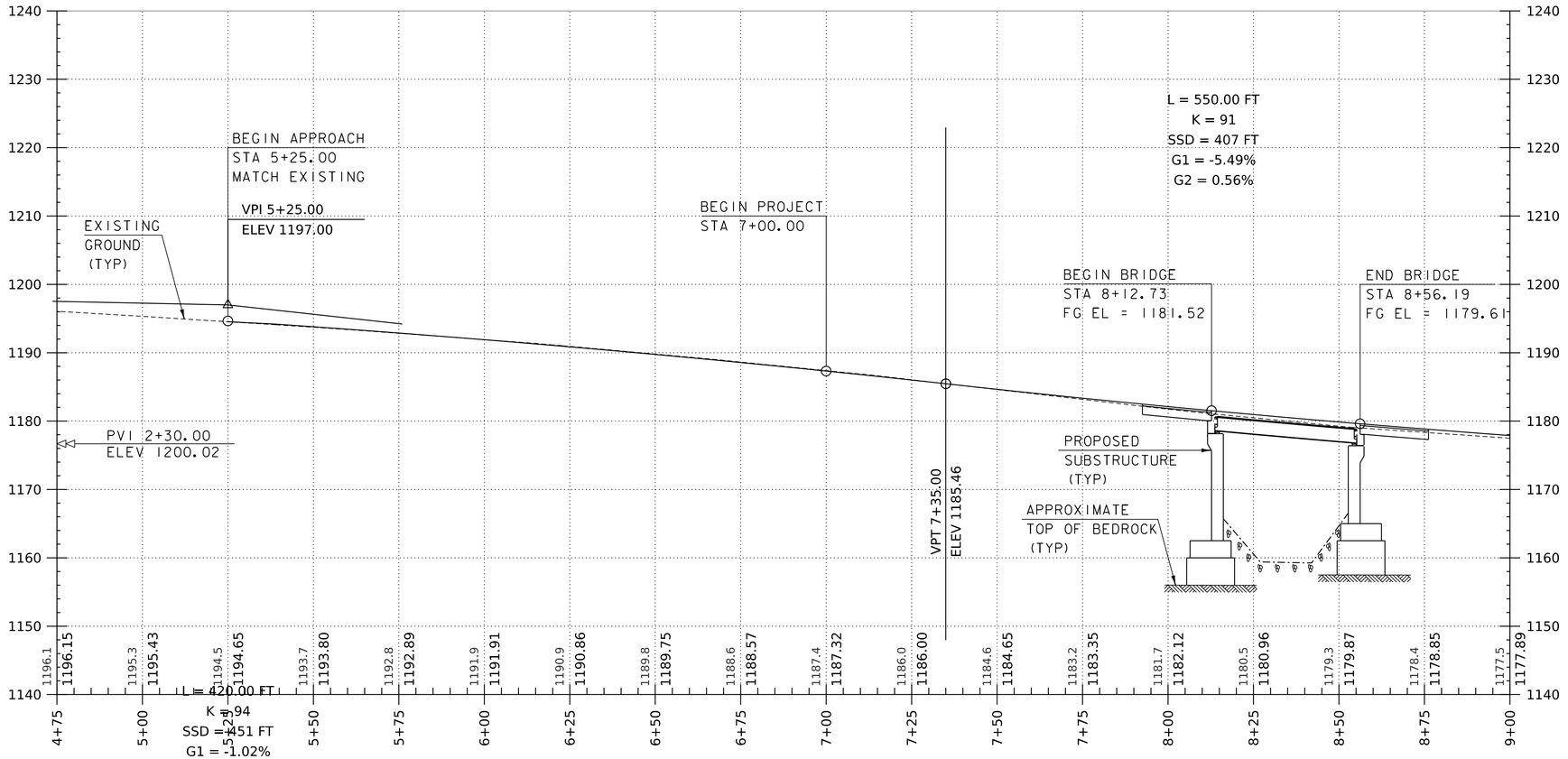
SCALE 1" = 20′-0"
20 0 20

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003bdr_lay.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
LAYOUT SHEET 2

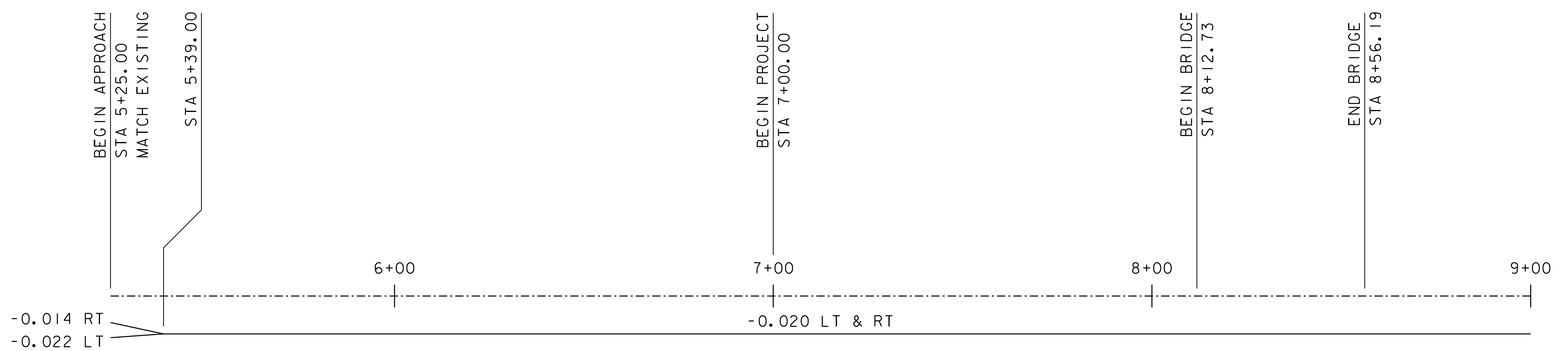
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 239 OF 370



VT ROUTE 12 PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

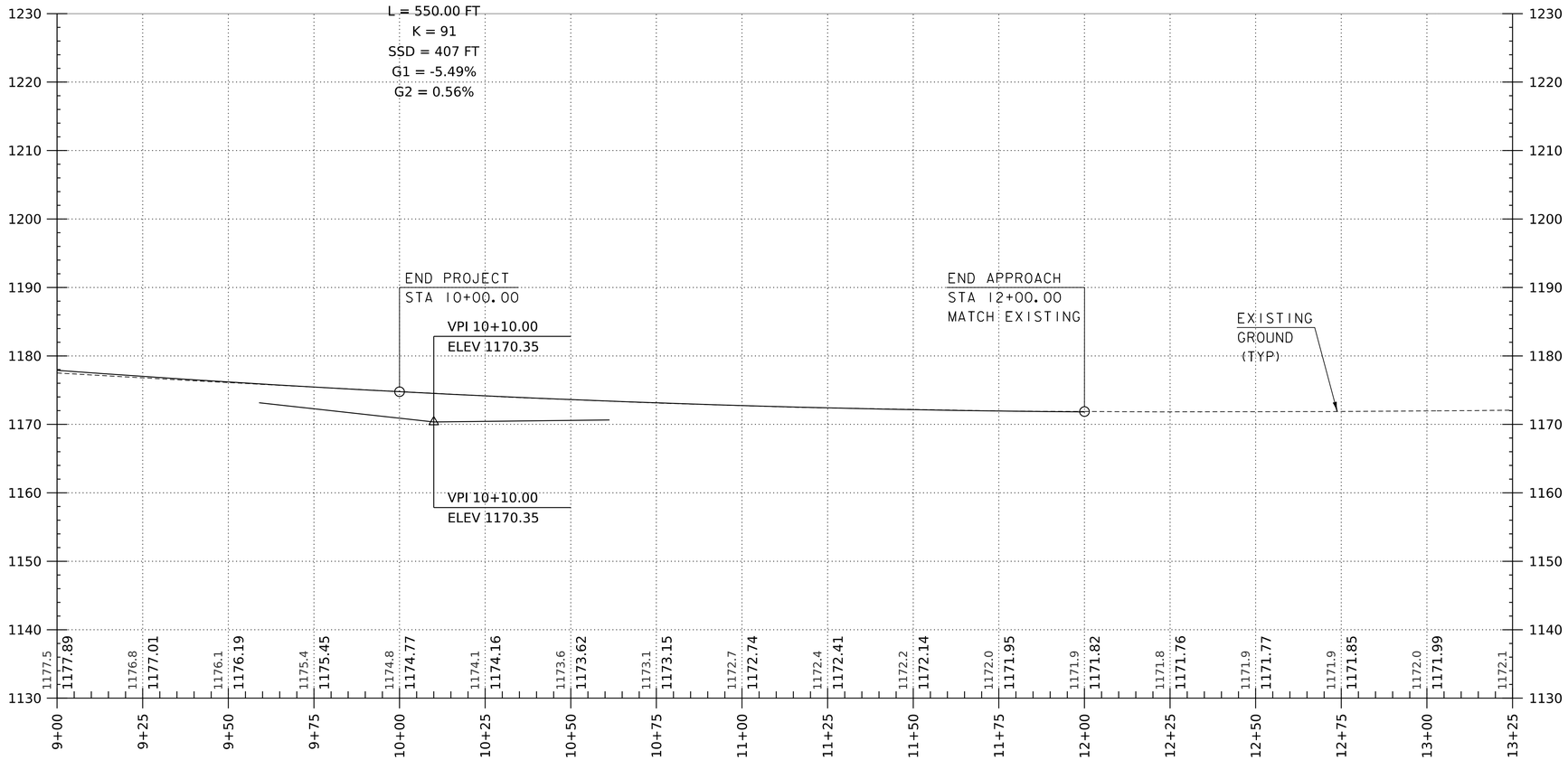


VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

HOYLE TANNER

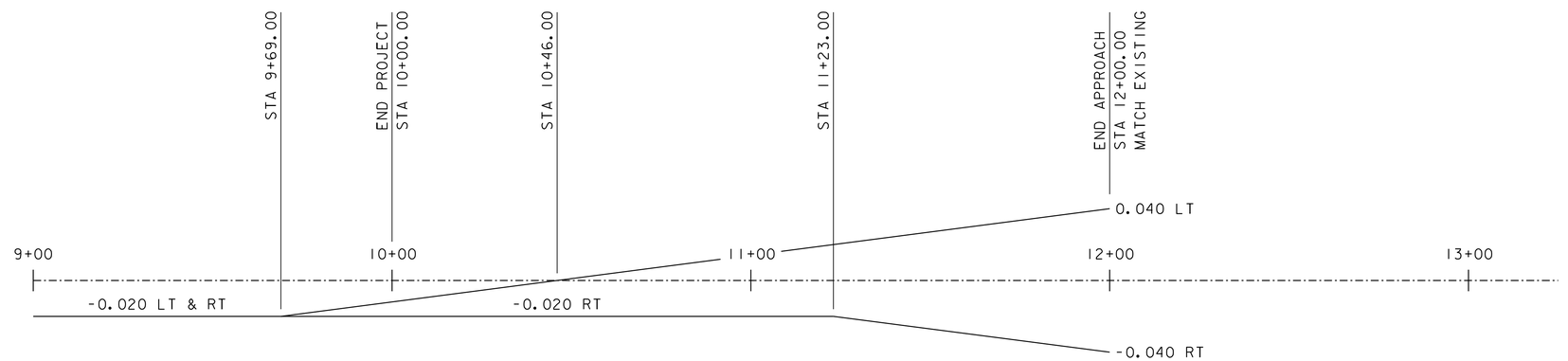
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET 1	SHEET 240 OF 370



VT ROUTE 12 PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

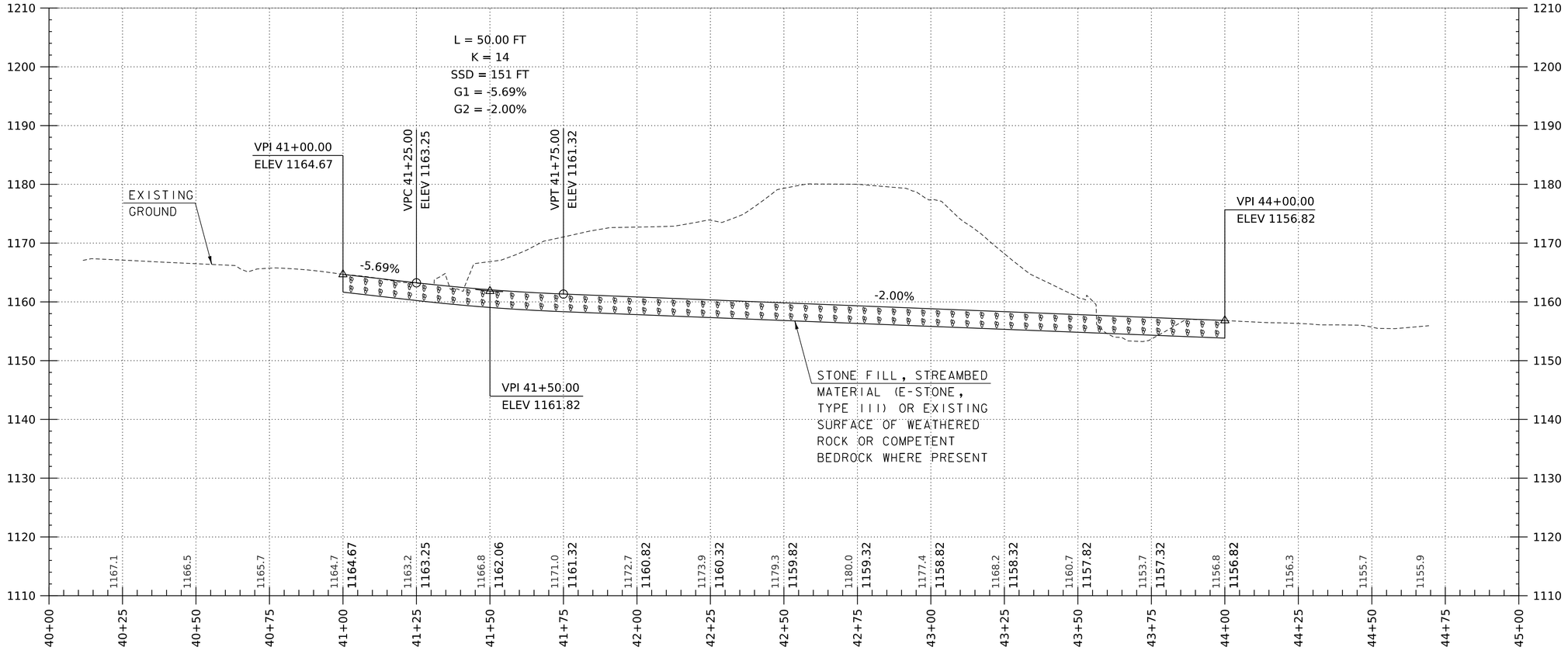


VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04 FT/FT

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET 2	SHEET 241 OF 370



UNNAMED BROOK PROFILE

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

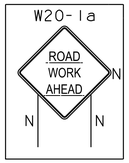
NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

HOYLE TANNER

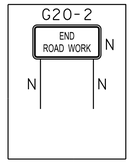
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: zl8b003pro3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.SEMPRINI	CHECKED BY: E.WEINGARTNER
CHANNEL PROFILE SHEET	SHEET 242 OF 370

VT STATE PLANE GRID

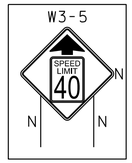
N



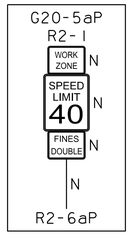
STA -24+65, LT & RT
(500' SOUTH OF W3-5)



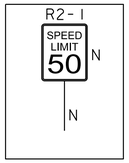
STA -19+65, LT



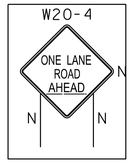
STA -19+65, RT
(500' SOUTH OF R2-1, RT)



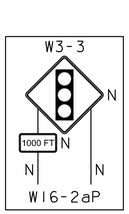
STA -14+65, RT
(500' SOUTH OF W20-4)



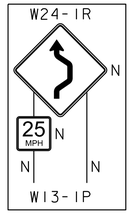
STA -14+65, LT
(OPPOSITE R2-1 40 MPH)



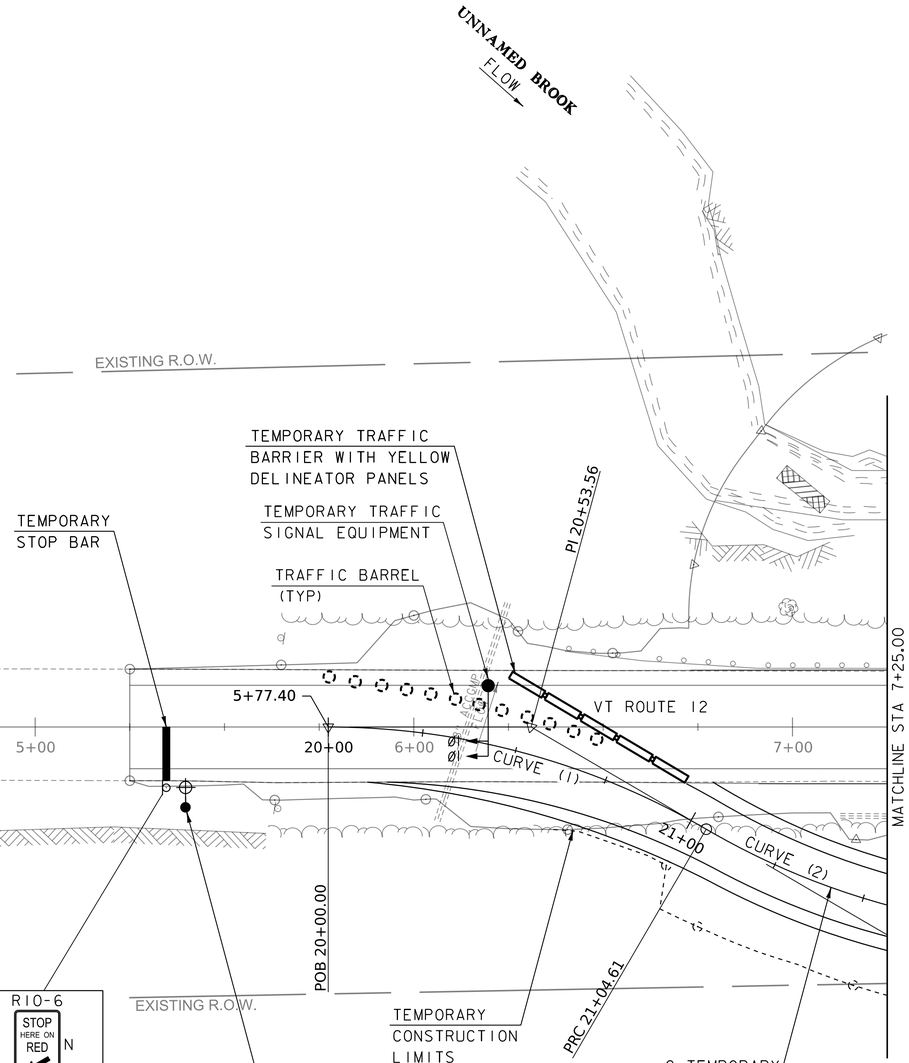
STA -9+65, RT
(500' SOUTH OF W3-3)

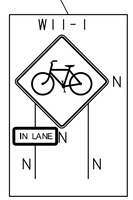


STA -4+65, RT

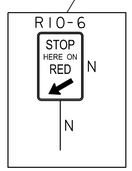


STA 0+35, RT



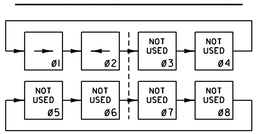


STA 2+85, RT



STA 5+35, RT

NEMA STD 8Ø CONTROLLER



SIGNAL PHASING		
	Ø1	Ø2
TIMING IN SECONDS	→	←
INITIAL INTERVAL	10	10
VEHICLE EXTENSION	3	3
MAX 1	12.5	12.5
YELLOW	4.5	4.5
ALL RED	23	23
RECALL	MIN	MIN
DETECTOR MEMORY	L	L
FLASH	RED	RED

MAX 1: ALL TIME PERIODS

NOTES

1. TEMPORARY SIGNAL SHALL PROVIDE MIN RECALL FOR Ø1 AND Ø2 AS THE DAD DO NOT PROVIDE DETECTION.
2. TEMPORARY SIGNAL SHALL PROVIDE BICYCLE DETECTION FOR Ø1 AND Ø2.
3. TEMPORARY SIGNAL SHALL BE CAPABLE OF DETECTING SLOW MOVING VEHICLES AND BICYCLES WITHIN THE WORK ZONE TO EXTEND THE ALL RED TIME TO PROVIDE SAFE PASSAGE.

DETOUR ROAD CURVE DATA

CURVE (1)	CURVE (2)
DELTA = 30°16'15"	DELTA = 37°01'16"
D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'
T = 53.56'	T = 66.29'
L = 104.61'	L = 127.94'
E = 7.12'	E = 10.80'

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

HOYLE TANNER

TRAFFIC CONTROL NOTES

1. TRAFFIC CONTROL SHEETS 1 AND 2 ARE CONCEPTUAL. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY TRAFFIC CONTROL PLANS PER 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE.

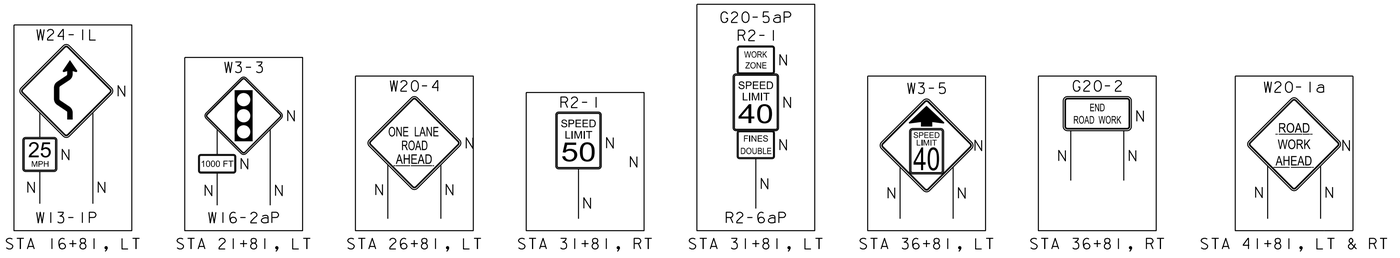
PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

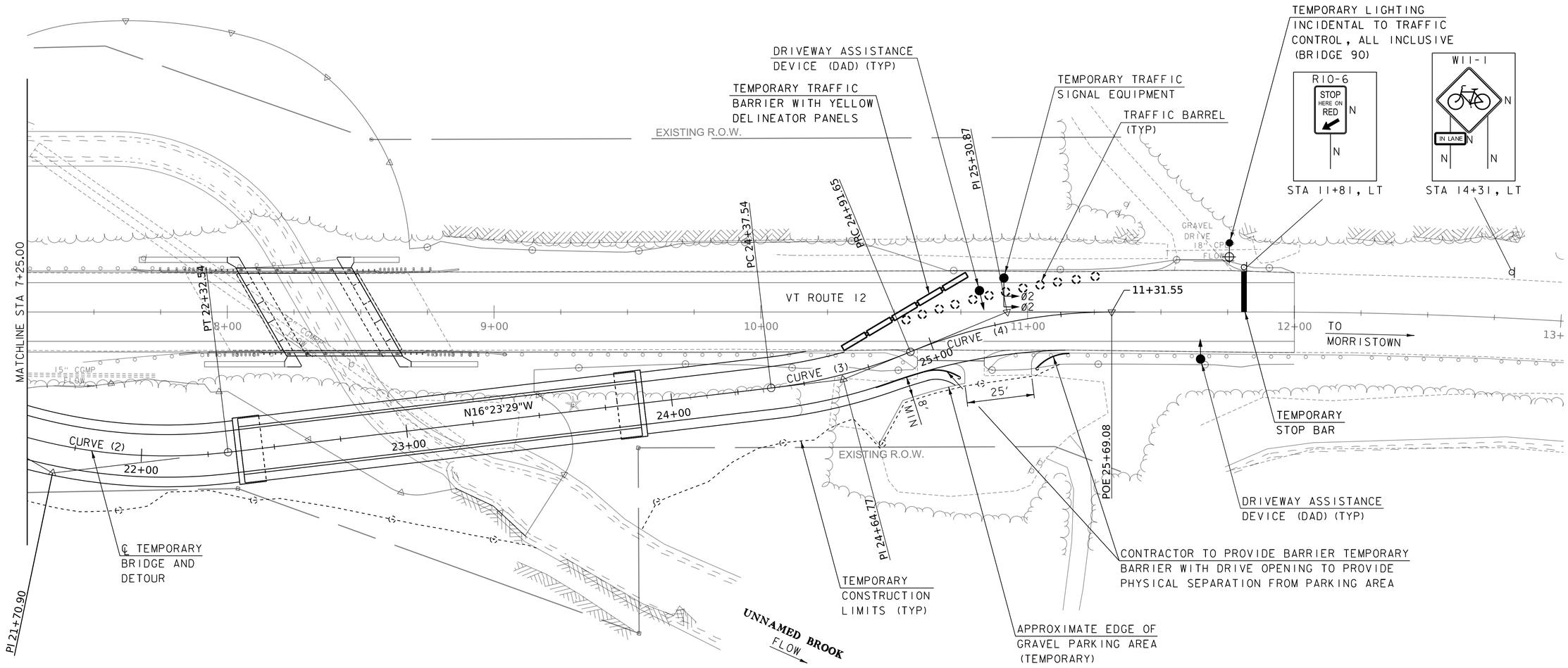
FILE NAME: z18b003bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS

VT STATE PLANE GRID

N





DETOUR ROAD CURVE DATA

CURVE (2)	CURVE (3)	CURVE (4)
DELTA = 37°01'16"	DELTA = 37°01'16"	DELTA = 22°24'25"
D = 28°56'14"	D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'	R = 198.00'
T = 66.29'	T = 66.29'	T = 39.22'
L = 127.94'	L = 127.94'	L = 77.43'
E = 10.80'	E = 10.80'	E = 3.85'

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

HOYLE TANNER

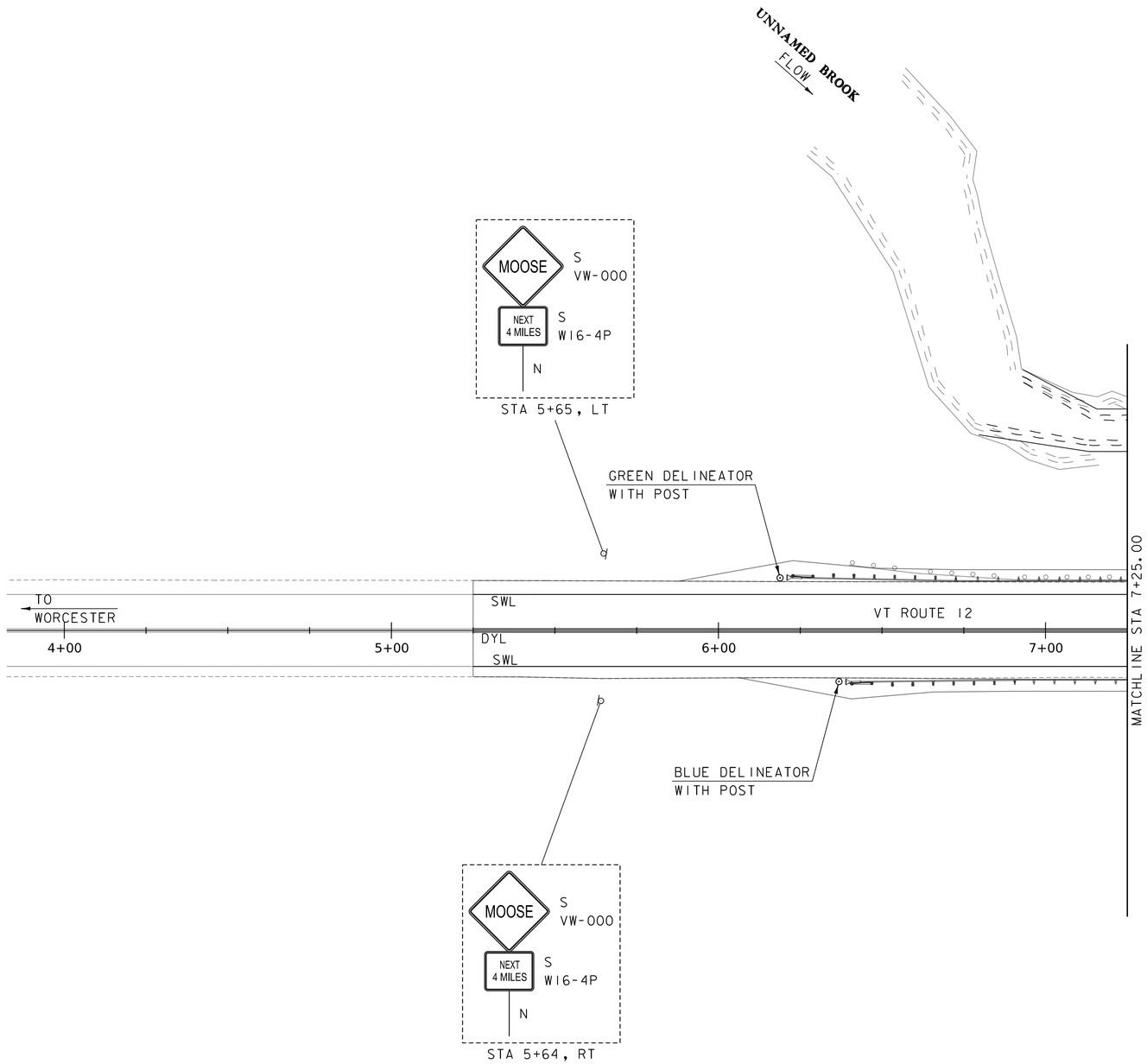
PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 244 OF 370

VT STATE PLANE GRID

N



LEGEND

R	REMOVE
R&S	REMOVE & SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

4" WHITE LINE
STA 5+25 - STA 12+00, LT & RT

4" YELLOW LINE
STA 5+25 - STA 12+00, ℄ (DOUBLE)

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

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 245 OF 370

VT STATE PLANE GRID

N

BRIDGE 90 VT 12 R VD-701 R
STA 7+69, LT

BRIDGE 90 VT 12 N VD-701 N
STA 8+75, LT

0120 0804 0002 N VD-700 N
STA 10+56, LT

C.C. PUTNAM STATE FOREST WORCESTER BLOCK RET
VRC RET
RET
STA 11+37, LT

BLUE DELINEATOR WITH POST

MATCHLINE STA 7+25.00

SWL

DYL

SWL

VT ROUTE 12

8+00 9+00 10+00 11+00 12+00

TO MORRISTOWN

BRIDGE 90 VT 12 N VD-701 N
STA 7+75, RT

BRIDGE 90 VT 12 R VD-701 R
STA 8+47, RT

UNNAMED BROOK
FLOW

S RL-100
S RS-034
S
S M6-1
N
STA 9+75, RT

GREEN DELINEATOR WITH POST

BLUE DELINEATOR WITH POST

RET VRC RET RET
STA 11+05, RT

LEGEND

R	REMOVE
R&S	REMOVE & SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

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

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 246 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

MILE MARKER, STATION OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																							REMARKS	SIGN DETAIL	
		EACH	WIDTH (in)	HEIGHT (in)	"A"	"B"	SALV SIGN	SALV TIS	RETAIN	SALVAGE	NO. OF POST	FLANGED CHANNEL (LB / FT)			SQUARE STEEL (in) (LB / FT)			ANCHOR	SLEEVE	TUBULAR ALUMINUM Ø (IN) (LB / FT)			FOUNDATION	TUBULAR STEEL Ø (IN) (LB / FT)				W-SHAPE STEEL							DETAIL ON SHEET NUMBER	STANDARD SHEET NUMBER
															1.75	2.00	2.50			3.00	4.00	4.0 MOD		3.00	3.50	4.00	5.00	FTG. SIZE		WEIGHT	POST SIZE	SIGN FRAME REQUIRED			
												1.12	2.00	3.00	1.88	2.42	3.35			1.30	1.70	1.70		7.60	9.00	10.80	14.60	24"	30"						
OPTION ITEMS																																			
5+64, RT	NEXT 4 MILES	1	24.0	12.0			X				1.0					15.0		X	X														W16-4P, USE SALVAGED SIGN		
5+64, RT	MOOSE	1	30.0	30.0			X				0.0																						VW-000, USE SALVAGED SIGN, MOUNT WITH W16-4P		
5+65, LT	NEXT 4 MILES	1	24.0	12.0			X				1.0					15.0		X	X														W16-4P, USE SALVAGED SIGN		
5+65, LT	MOOSE	1	30.0	30.0			X				0.0																						VW-000, USE SALVAGED SIGN, MOUNT WITH W16-4P		
7+75, RT	BRIDGE 90 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-701		T-42
8+75, LT	BRIDGE 90 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-701		T-42
9+75, RT		1	24.0	24.0			X				1.0						15.0	X	X														RL-100, USE SALVAGED SIGN		
9+75, RT	P	1	24.0	24.0			X				0.0																						RS-034, USE SALVAGED SIGN, MOUNT WITH RL-100		
9+75, RT	NORTH BRANCH CASCADES TRAIL	1	12.0	24.0			X				0.0																						USE SALVAGED SIGN, MOUNT WITH RL-100		
9+75, RT		1	12.0	24.0			X				0.0																						M6-1, USE SALVAGED SIGN, MOUNT WITH RL-100		
10+56, LT	0120 0804 0002	1	6.0	10.0	0.4						1.0				8.0			X	X														VD-700		T-44
												FT .	FT .	FT .	FT 24.	FT 30.	FT 15.	XXXXX XXXXX XXXXX XXXXX	EA .	LB .	LB .	LB .		LB .	LB .	LB .	LB .								
TOTALS					SF 1.2	SF .	EA. .	SF .	XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX		FT .			FT 69.					LB .			EA.	LB .				EA. .	EA. .	LB .							

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

HOYLE TANNER

PROJECT NAME: WORCESTER
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003tss.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN SUMMARY SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 247 OF 370

SOIL CLASSIFICATION

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

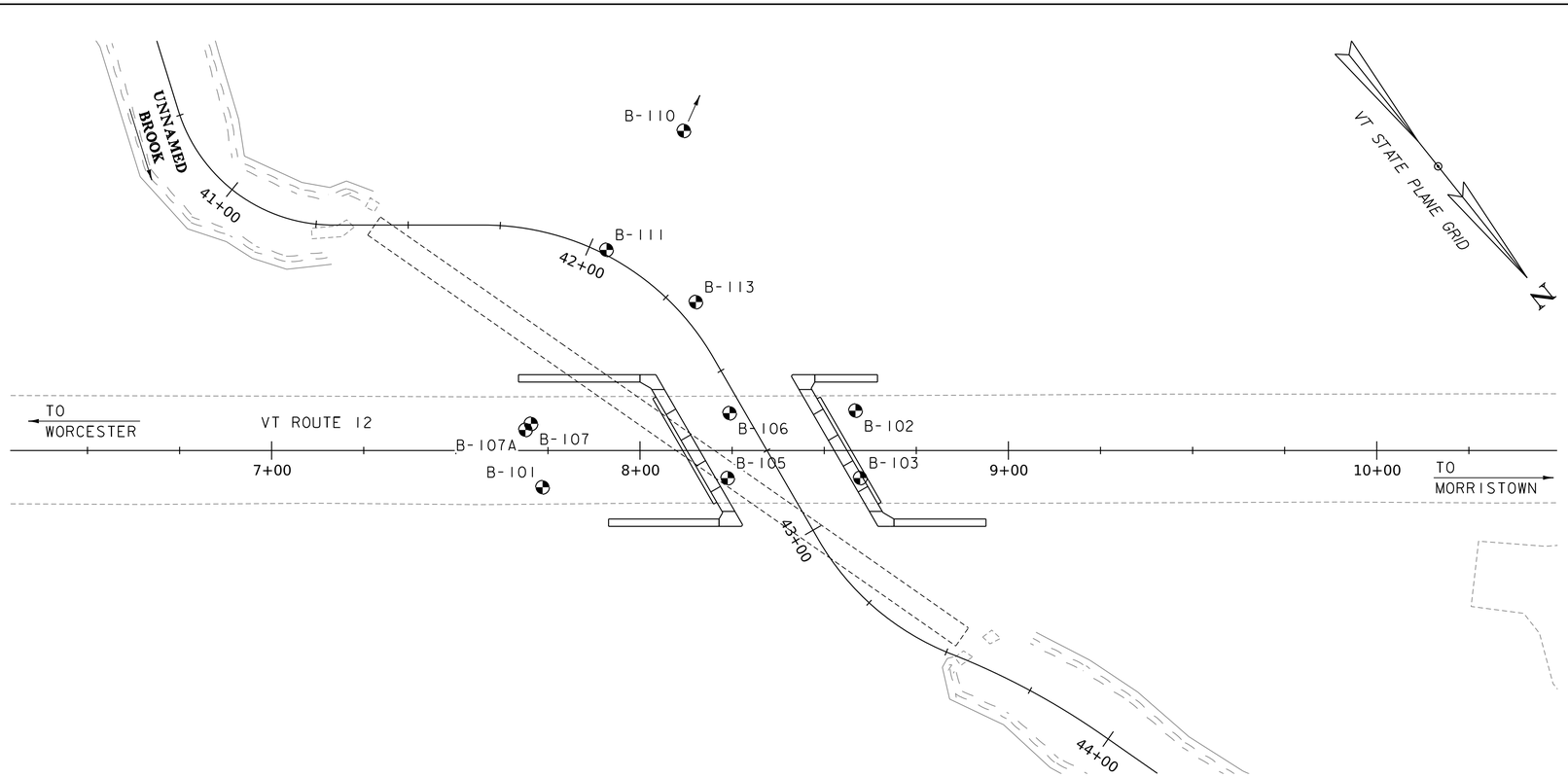
CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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

COMMONLY USED SYMBOLS

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

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



BORING LAYOUT

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB	HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB
B-101	7+74	10 RT	712206.21	1628188.26	1183.0	1168.8	B-107	7+69	7 LT	712200.23	1628171.81	1183.2	---
B-102	8+59	11 LT	712286.49	1628153.53	1179.0	1160.0	B-107A	7+69	6 LT	712199.04	1628173.69	1183.1	1163.50
B-103	8+60	7 RT	712290.81	1628171.34	1178.6	1156.9	B-110	8+72	254 LT	712258.96	1627911.41	1211.7	1177.2
B-105	8+23	7 RT	712255.35	1628177.40	1180.3	1157.5	B-111	7+89	55 LT	712212.54	1628121.82	1173.1	1157.1
B-106	8+24	10 LT	712252.91	1628159.93	1180.2	1159.0	B-113	8+15	40 LT	712238.83	1628131.71	1173.1	1157.7

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.

1. The subsurface explorations shown herein were made between March 2021 and August 2021 and overseen by Haley & Aldrich, Inc.

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

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

GENERAL NOTES

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

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

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

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

HOYLE TANNER

0 20 40
SCALE IN FEET

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003bor.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P. DUSTIN
CHECKED BY: O.KRAUSS
SHEET 248 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100
Elmore Bridge 90

Boring No.: **B-101**
Page No.: 1 of 2
Pin No.: 18B003
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 3/04/21 Date Finished: 3/05/21
VTSPG NAD83:
Station: 007+64 Offset: 11 ft Right
Ground Elevation:

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig:	MOBILE Drill B-53	C_E = 1.55

Groundwater Observations

Date	Depth (ft)	Notes
	10.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Asphalt Pavement, 0.0 ft - 0.8 ft								
		Note: Frost present from approximately ground surface to 5 ft								
2.5		(Fill) Silty SAND (SM), medium dense, gray-brown, dry, no structure, no odor, Rec. = 0.1 ft				50/1"				
		COBBLE, 3.8 ft - 4.0 ft								
5.0		(Fill) Poorly-graded SAND with Gravel (SP), dense, gray-brown, dry, no structure, no odor, Rec. = 0.83 ft				11-18-16-22 (34)				
		(Fill) Poorly-graded GRAVEL with Silt and Sand (GP-GM), dense, gray-brown, moist, no structure, no odor, Rec. = 1.67 ft				36-28-22-27 (50)	6.7	53.2	35.0	11.8
7.5		Highly weathered rock/cobbly layer, 7.5 ft - 8.0 ft								
		A-2-4, Silty SAND (SM), very loose, dark brown, wet, no structure, no odor, trace organics/roots, Rec. = 0.83 ft (Fluvial Deposits)				3-2-1-1 (3)				
10.0		A-2-4, Silty SAND with Gravel (SM), very loose, dark brown, wet, no structure, no odor, Rec. = 1.0 ft (Fluvial Deposits)				3-2-2-5 (4)	23.5	30.0	47.9	22.2
		(WEATHERED ROCK), Rec. = 1.5 ft				13-27-105 (132)				
12.5		Highly to completely WEATHERED ROCK, 13.0 ft - 14.2 ft, Top of Weathered Rock								
		Rec. = 0.67 ft				4-4-11-9 (15)				
15.0		Casing advanced and had refusal at 14.2 ft on possible competent rock. Wash water had Quartzite and weathered rock and trace silt. Advanced roller bit to 17 ft., 14.2 ft - 17.0 ft								
		Rec. = 1.0 ft				5-5-3-3 (8)				
17.5		17.0 ft - 21.6 ft, Gray-green to brown, GRANOFELS, Medium hard to moderately hard, fine-grained, moderately to highly weathered. Fracture surfaces iron stained. Primary joints dipping at low to moderate angles, spaced extremely close to close, undulating, smooth, moderately open to open. Fractures infilled with silt. Very Poor Rock, NQ, RMR = 15 (MORETOWN FORMATION)	R1	75 (0)	3 3 3 1 5					
20.0										
22.5		21.6 ft - 23.6 ft, Gray-green, GRANOFELS, Moderately hard, fine-grained, moderately weathered. Primary joints dipping at high angles, spaced close, undulating, smooth to rough, moderately open to open. Very Poor Rock, NQ (MORETOWN FORMATION)	R2	50 (0)	1 5					
			R3	95 (95)	3	Top of Bedrock @ 23.6 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
FOOTING
EL 1163.00

BORING LOG 20076?_VTTRANS_WORCESTER-ELMORE BR90.GPJ VERMONT AOT.GDT 12/5/21

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100
Elmore Bridge 90

Boring No.: **B-101**
Page No.: 2 of 2
Pin No.: 18B003
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 3/04/21 Date Finished: 3/05/21
VTSPG NAD83:
Station: 007+64 Offset: 11 ft Right
Ground Elevation:

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig:	MOBILE Drill B-53	C_E = 1.55

Groundwater Observations

Date	Depth (ft)	Notes
	10.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
27.5		23.6 ft - 28.6 ft, Gray-green, GRANOFELS, Moderately hard to hard, fine-grained, massive, moderately weathered. Primary joints dipping at high angles following foliations, spaced moderately close, Good Rock, NQ, RMR = 67 (MORETOWN FORMATION)			8 3 3 3					
30.0		28.6 ft - 33.6 ft, Gray-green, GRANOFELS, Moderately hard to hard, fine-grained, massive, moderately weathered. Primary joints dipping at high angles following foliations, spaced moderately close, Fair Rock, NQ, RMR = 46 (MORETOWN FORMATION)	R4	105 (85)	3 3 3 3 3					
32.5		Hole stopped @ 33.6 ft								
35.0		Remarks: Boring backfilled with bentonite, cuttings, and sand with cold patch cap.								
37.5		AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed								
40.0										
42.5										
45.0										
47.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 20076?_VTTRANS_WORCESTER-ELMORE BR90.GPJ VERMONT AOT.GDT 12/5/21

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 249 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100
Elmore Bridge 90

Boring No.: **B-102**
Page No.: 1 of 2
Pin No.: 18B003
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 3/02/21 Date Finished: 3/04/21
VTSPG NAD83:
Station: 008+59 Offset: 12 ft Left
Ground Elevation:

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig: MOBILE Drill B-53	C_E = 1.55	

Groundwater Observations

Date	Depth (ft)	Notes
	9.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Asphalt Pavement, 0.0 ft - 0.5 ft								
		Note: due to deep frost (approximately 5 ft), drill sampling was started at 4 ft. Auger spoils samples were taken at 1 ft and 3 ft. (Fill) Silty SAND (SM), gray, dry, no structure, no odor, collected from auger spoils								
2.5		(Fill) Silty SAND with Gravel (SM), dense, gray, dry, no structure, no odor, Rec. = 1.0 ft				21-16-26-41 (42)				
5.0		(Fill) Poorly-graded SAND (SP), very dense, black, moist, no structure, no odor, Rec. = 1.33 ft				14-15-100/5"				
7.5		(Fill) Highly to completely WEATHERED ROCK, medium dense, gray-green, dry, no structure, no odor, Rec. = 1.0 ft				10-12-18-12 (30)	4.0	70.2	19.1	10.6
10.0		Similar, except contains 1 inch thick layer of poorly graded sand, very dense, moist, Rec. = 1.17 ft				6-7-52-24 (59)				
12.5		(Fill) Highly to completely WEATHERED ROCK, medium dense, gray-brown, moist, no structure, no odor, Rec. = 1.5 ft				18-7-10-7 (17)	21.3	22.5	51.4	26.1
15.0		(Fill) Silty SAND with Gravel (SM), loose, brown, moist, occasional mottling in silt, no odor, Rec. = 0.83 ft				5-3-2-1 (5)	32.2	30.4	47.7	22.0
		A-2-4, Silty SAND (SM), loose, dark brown, wet, no structure, no odor, trace organics/roots, Rec. = 1.0 ft (Fluvial Deposits)				2-1-8-12 (9)				
17.5		Highly to completely WEATHERED ROCK. Casing refusal at 17.7 ft., 17.0 ft - 19.0 ft, Top of Weathered Rock								
20.0		19.0 ft - 23.3 ft, Gray, green, dull white, GRANOFELS and QUARTZITE, soft to medium hard, fine-grained, moderately to highly weathered. Fracture surfaces iron stained. Primary joints dipping at vertical angles, spaced extremely close to very close, smooth, wavy, open. Very Poor Rock, NQ, RMR = 15 (MORETOWN FORMATION)	R1	42 (0)	4 3 3 3 3	Top of Bedrock @ 19.0 ft				
22.5			R2	95 (50)	3					

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF WW 3
FOOTING
EL 1166.50

BOTTOM OF
ABUTMENT NO. 2
FOOTING
EL 1164.00

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR90.GPJ VERMONT AOT.GDT 12/5/21

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100
Elmore Bridge 90

Boring No.: **B-102**
Page No.: 2 of 2
Pin No.: 18B003
Checked By: Erickson

Boring Crew: Hollauer, Hoeckele, Hollauer
Date Started: 3/02/21 Date Finished: 3/04/21
VTSPG NAD83:
Station: 008+59 Offset: 12 ft Left
Ground Elevation:

	Casing	Sampler
Type:	WB	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24	30 in.
Hammer/Rod Type:	Auto	
Rig: MOBILE Drill B-53	C_E = 1.55	

Groundwater Observations

Date	Depth (ft)	Notes
	9.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
27.5		23.3 ft - 28.3 ft, Gray and green, GRANOFELS, Medium hard to moderately hard, fine-grained, moderately weathered. Fracture surfaces iron stained. Primary joints dipping at vertical to high angles, spaced very close to close, smooth, wavy, moderately open to open. Secondary joints dipping horizontal, spaced moderately close, rough, undulating, open. Fair Rock, NQ, RMR = 42 (MORETOWN FORMATION)			3 4 3 3					
30.0		28.3 ft - 33.3 ft, Gray and green, GRANOFELS, hard, fine-grained, moderately weathered. Fracture surfaces iron stained. Primary joints dipping at vertical to high angles, spaced very close to close, smooth, wavy, moderately open to open. Secondary joints dipping horizontal, spaced moderately close, rough, undulating, open. Poor Rock, NQ, RMR = 31 (MORETOWN FORMATION)	R3	100 (25)	4 3 3 3					
32.5		Hole stopped @ 33.3 ft								
35.0										
37.5										
40.0										
42.5										
45.0										
47.5										

Remarks:
Core hole backfilled with bentonite. Boring backfilled with cuttings and sand. Cold patch cap approximately 6 in. in thickness.

AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_WORCESTER-ELMORE BR90.GPJ VERMONT AOT.GDT 12/5/21

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 250 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: B-103
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/09/21 Date Finished: 8/09/21
VTSPG NAD83: N 712290.81 ft E 1628171.34 ft
Station: 008+60 Offset: 7R
Ground Elevation: 1178.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/09/21	11.36	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.8 ft								
		(Fill) Silty SAND with Gravel (SM), dense, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.25 ft, 0.8 ft - 10.0 ft				26-23-23-13 (46)		49.0	35.0	16.0
2.5										
5.0		(Fill) Silty SAND with Gravel (SM), medium dense, gray-brown, dry, no structure, no odor, mps 1.1 in., Rec. = 1.7 ft, 5.0 ft				8-8-6-8 (14)		50.2	30.6	19.2
7.5		Note: Drill action indicates possible cobble at 8 ft., 8.0 ft								
10.0		(Fill) Silty GRAVEL with Sand (GM), medium dense, gray, wet, no structure, no odor, mps 1.25 in., Rec. = 1.4 ft, 10.0 ft - 13.1 ft				7-7-5-6 (12)		60.1	25.8	14.1
12.5		A-1-b, Silty SAND with Gravel (SM), very loose, brown, wet, no structure, no odor, mps 0.5 in. (Fluvial Deposits), 13.1 ft - 21.7 ft								
15.0		Rec. = 1.6 ft				2-2-2-2 (4)		37.8	47.2	15.0
17.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200787_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 1/1/021

BOTTOM OF
FOOTING
EL 1159.00

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: B-103
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/09/21 Date Finished: 8/09/21
VTSPG NAD83: N 712290.81 ft E 1628171.34 ft
Station: 008+60 Offset: 7R
Ground Elevation: 1178.6 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/09/21	11.36	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-1-b, Silty SAND with Gravel (SM), very loose, brown, wet, no structure, no odor, mps 1.25 in. (Fluvial Deposits), Rec. = 0.7 ft, 20.0 ft				2-1-2-22 (3)				
22.5		Top of Bedrock @ 21.7 ft								
25.0		23.0 ft - 28.0 ft, Gray-green, GRANOFELS, aphanitic to fine grained, soft to moderate, slightly to completely weathered. Primary joint set is dipping vertical, very close, smooth, discolored to decomposed, open. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C1	66 (0)	2.5 1.5 4.5 1.5 1.5					
27.5		28.0 ft - 31.0 ft, Gray-green, GRANOFELS, aphanitic to fine grained, moderately hard, slightly weathered. Primary joint set is dipping vertical, very close to close, smooth, fresh to discolored, open. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C2	52 (0)	1.5 1.5 1.5					
30.0		31.0 ft - 33.0 ft, Gray-green, GRANOFELS, aphanitic to fine grained, moderately hard, slightly weathered. Primary joint set is dipping vertical, very close to close, smooth, fresh to discolored, open. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C3	63 (0)	1.5 1.5					
32.5		Hole stopped @ 33.0 ft								
35.0		Remarks: AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.								
37.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200787_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 1/1/021

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 251 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-105**
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/05/21 Date Finished: 8/05/21
VTSPG NAD83: N 712255.35 ft E 1628177.40 ft
Station: 008+23 Offset: 7R
Ground Elevation: 1180.3 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/05/21	15.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 1.0 ft								
2.5		(Fill) Silty SAND with Gravel (SM), medium dense, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.4 ft, 1.0 ft - 3.0 ft				15-11-15-14 (26)				
		(Fill) Poorly-graded SAND with Silt (SP-SM), medium dense, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.1 ft, 3.0 ft - 5.0 ft				10-11-10-7 (21)				
5.0		(Fill) Well-graded GRAVEL with Silt and Sand (GW-GM), medium dense, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.6 ft, 5.0 ft - 10.0 ft				9-6-10-8 (16)		67.6	20.8	11.6
7.5		(Fill) Well-graded GRAVEL with Silt and Sand (GW-GM), medium dense, brown, dry, no structure, no odor, mps 0.75 in., Rec. = 1.1 ft, 7.0 ft				7-15-5-5 (20)				
10.0		A-1-a, Well-graded GRAVEL with Silt and Sand (GW-GM), very loose, gray-brown, dry, no structure, no odor, mps 0.75 in. (Fluvial Deposits), Rec. = 0.6 ft, 10.0 ft - 20.0 ft				1-1-1-1 (2)		65.9	23.2	10.9
12.5		A-1-a, Well-graded GRAVEL with Silt and Sand (GW-GM), loose, gray-brown, dry, no structure, no odor, mps 0.75 in. (Fluvial Deposits), Rec. = 1.0 ft, 12.0 ft				3-3-6-6 (9)				
15.0		A-1-a, Well-graded GRAVEL with Silt and Sand (GW-GM), medium dense, gray-brown, dry, no structure, no odor, mps 0.75 in. (Fluvial Deposits), Rec. = 1.5 ft, 15.0 ft				7-7-6-4 (13)		62.5	27.0	10.5
17.5		Note: Lost circulation, no water return., 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BOTTOM OF
FOOTING
EL 1160.50

BORING LOG 200707_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 1/1/021

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-105**
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/05/21 Date Finished: 8/05/21
VTSPG NAD83: N 712255.35 ft E 1628177.40 ft
Station: 008+23 Offset: 7R
Ground Elevation: 1180.3 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/05/21	15.4	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
22.5		A-1-b, Silty GRAVEL with Sand (GM), very dense, gray-brown, wet, no structure, no odor, mps 0.75 in. (Fluvial Deposits), Rec. = 1.2 ft, 20.0 ft - 22.8 ft				11-36-50/0.1' (86+)		54.9	27.7	17.4
		Top of Bedrock @ 22.8 ft								
25.0		23.0 ft - 26.0 ft, Gray-green, GRANOFELS, aphanitic, moderately hard, slightly weathered. Primary joint set is dipping vertical, very close, smooth, fresh to discolored, tight to open. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C1	100 (0)	1.5 1 1					
27.5		26.0 ft - 30.0 ft, Similar to C1. Poor Rock, NQ, RMR=31 (MORETOWN FORMATION)	C2	73 (56)	1.5 1 1 1					
30.0		30.0 ft - 35.0 ft, Gray-green, GRANOFELS, aphanitic, moderately hard, slightly to moderately weathered. Primary joint set is dipping vertical, very close, smooth, fresh to discolored, tight to open. No discernible secondary joint set. Poor Rock, NQ, RMR=26 (MORETOWN FORMATION)	C3	53 (8)	1 1 1.5 1.5 1					
32.5										
35.0		Hole stopped @ 35.0 ft								
37.5										

Remarks:
Boring backfilled with cuttings and 6-in. of cold patch at surface.

AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200707_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 1/1/021

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 4

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 252 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: B-106
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/09/21 Date Finished: 8/09/21
VTSPG NAD83: N 712252.91 ft E 1628159.93 ft
Station: 008+24 Offset: 10L
Ground Elevation: 1180.2 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/09/21	14.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.8 ft								
		Rec. = 1.75 ft				10-18-20-30 (38)				
2.5		(Fill) Silty SAND with Gravel (SM), dense, gray-brown, dry, no structure, no odor, mps 0.75 in., 0.8 ft - 10.0 ft								
5.0		(Fill) Silty SAND with Gravel (SM), medium dense, brown, dry, no structure, no odor, mps 1.25 in., Rec. = 1.4 ft, 5.0 ft				6-6-8-10 (14)				
7.5										
10.0		(Fill) Poorly-graded GRAVEL with Silt and Sand (GP-GM), medium dense, gray, moist, no structure, no odor, mps 1.0 in., Rec. = 1.1 ft, 10.0 ft - 13.8 ft				5-7-7-7 (14)		66.0	23.7	10.3
12.5										
		Note: Auger refusal at 14.0 ft., 13.8 ft - 21.2 ft								
15.0		Note: Split-spoon recovered weathered bedrock for Sample S4. (Weathered Bedrock), Rec. = 0.6 ft, 15.0 ft				6-8-4-5 (12)				
17.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 90.GPJ VERMONT AOT.GDT 1/10/21

BOTTOM OF
FOOTING
EL 1158.00

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: B-106
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/09/21 Date Finished: 8/09/21
VTSPG NAD83: N 712252.91 ft E 1628159.93 ft
Station: 008+24 Offset: 10L
Ground Elevation: 1180.2 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/09/21	14.1	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Note: Split-spoon recovered weathered bedrock for Sample S5. (Weathered Bedrock), Rec. = 0.6 ft, 20.0 ft				1-20-50/0.2' (70+)				
22.5		Top of Bedrock @ 21.2 ft								
25.0		23.0 ft - 27.0 ft, Gray-green, GRANOFELS, aphanitic to fine grained, aphanitic to fine grained, soft to moderately hard, slightly to highly weathered. Primary joint set with vertical dipping joints, very close to close, smooth, discolored, open, minor silt infilling. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C1	46 (0)	1 1.5 1.5					
		26.0 ft, Note: Lost circulation, no water return from 23.0 to 25.1 ft and 25.4 to 33.0 ft.			2					
27.5		27.0 ft - 28.0 ft, Gray-green, GRANOFELS, aphanitic to fine grained, moderately hard, slightly weathered. Primary joint set with vertical dipping joints, very close to close, smooth, discolored, tight to open. No discernible secondary joint set. Poor Rock, NQ, RMR=21 (MORETOWN FORMATION)	C2	158 (0)	1					
		28.0 ft - 33.0 ft, Gray-green, GRANOFELS, aphanitic to fine grained, moderately hard, fresh to slightly weathered. Primary joint set with vertical dipping joints, close to moderate, rough, fresh to discolored, tight to open. No discernible secondary joint set. Poor Rock, NQ, RMR=36 (MORETOWN FORMATION)	C3	100 (72)	1.5 1.5 1 1 1					
30.0										
32.5		Hole stopped @ 33.0 ft								
35.0		Remarks: AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.								
37.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 90.GPJ VERMONT AOT.GDT 1/10/21

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 5

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-107**
Page No.: 1 of 1
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/10/21 Date Finished: 8/10/21
VTSPG NAD83: N 712200.23 ft E 1628171.81 ft
Station: 007+69 Offset: 7L
Ground Elevation: 1183.2 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.9 ft					
2.5		(Fill) Silty SAND with Gravel (SM), medium dense, brown, dry, no structure, no odor, mps 0.75 in., 0.9 ft - 3.0 ft Rec. = 1.25 ft	13-13-14-15 (27)		49.0	37.5	13.5
5.0		(Fill) Silty GRAVEL with Sand (GM), very dense, gray, dry, no structure, no odor, mps 1.0 in., Rec. = 1.25 ft, 3.0 ft - 5.0 ft	35-42-16-16 (58)		60.5	25.2	14.3
		(Fill) Silty SAND with Gravel (SM), very dense, gray, dry, no structure, no odor, mps 1.0 in., Rec. = 1.0 ft, 5.0 ft - 7.0 ft Note: Used two separate cutting heads through boulder from 6.2 to 7.0 ft. Boring terminated at 7.0 ft still in boulder. Boring moved 2 ft east for attempt B-107A., 6.2 ft	10-15-50/0.2' (65+)		48.4	30.0	21.6
7.5		Hole stopped @ 7.0 ft					
10.0							
12.5							

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 1/1/021

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-107A**
Page No.: 1 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/10/21 Date Finished: 8/10/21
VTSPG NAD83: N 712199.04 ft E 1628173.69 ft
Station: 007+69 Offset: 6L
Ground Elevation: 1183.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/10/21	12.3	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate min/ft/in	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Note: See Boring BR 90 B-107 for overburden conditions from ground surface to 7.0 ft., 0.0 ft - 10.0 ft								
2.5										
5.0										
7.5										
10.0		(Fill) Poorly-graded SAND with Silt and Gravel (SP-SM), loose, brown, wet, no structure, no odor, mps 0.75 in., Rec. = 1.3 ft, 10.0 ft - 11.6 ft				4-4-4-4 (8)				
12.5		A-2-4, Silty SAND with Gravel (SM), loose, brown, wet, occasional gravel layers, no odor, mps 1.0 in. (Fluvial Deposits), 11.6 ft - 15.4 ft Rec. = 1.0 ft				3-3-3-4 (6)		29.2	48.9	21.9
15.0		Rec. = 1.5 ft				8-15-17-21 (32)				
17.5		Note: Split-spoon recovered pieces of weathered bedrock for sample S3. (Weathered Bedrock), 15.4 ft - 19.6 ft								

Notes:
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3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 1/1/021

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 6

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 254 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-107A**
Page No.: 2 of 2
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/10/21 Date Finished: 8/10/21
VTSPG NAD83: N 712199.04 ft E 1628173.69 ft
Station: 007+69 Offset: 6L
Ground Elevation: 1183.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/10/21	12.3	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate min/ft/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
						Top of Bedrock @ 19.6 ft				
20.0		20.0 ft - 24.0 ft, Gray and white, GRANOFELS and QUARTZITE, aphanitic to fine grained, soft, slightly to highly weathered. Primary joint set dipping vertical, very close to close, smooth, discolored, tight. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C1	25 (0)	1 1.5 1.5 1.5					
22.5		24.0 ft - 25.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, soft to moderately hard, slightly weathered. Primary joint set dipping high angle to vertical, close, smooth, discolored, tight. No discernible secondary joint set. Poor Rock, NQ, RMR=29 (MORETOWN FORMATION)	C2	117 (75)	2					
25.0		25.0 ft - 30.0 ft, Gray and green, GRANOFELS and QUARTZITE, aphanitic to fine grained, soft to moderately hard, slightly weathered. Primary joint set dipping high angle to vertical, close to moderate, smooth, discolored, tight to open. No discernible secondary joint set. Poor Rock, NQ, RMR=36 (MORETOWN FORMATION)	C3	95 (63)	1.5 1.5 1 1 1					
27.5										
30.0		Hole stopped @ 30.0 ft								
32.5										
35.0										
37.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 230767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 1/1/021

BOTTOM OF
FOOTING
EL 1160.50

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-110**
Page No.: 1 of 3
Pin No.: 18B003
Checked By: TJE

Boring Crew: C. Johnson, J. Fletcher
Date Started: 8/05/21 Date Finished: 8/06/21
VTSPG NAD83: N 712258.96 ft E 1627911.41 ft
Station: 008+72 Offset: 254L
Ground Elevation: 1211.7 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 TRuck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/06/21	14.9	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate min/ft/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-8, ORGANIC SOIL with Sand (OL/OH), stiff, brown, dry, no structure, no odor, trace wood, mps 0.5 in. (Topsoil), Rec. = 1.1 ft, 0.0 ft - 2.7 ft				4-3-7-5 (10)				
2.5		2.7 ft - 15.0 ft								
5.0		A-4, Silty SAND (SM), dense, gray-brown, dry, no structure, no odor, mps 1.25 in. (Glaciofluvial Deposits), Rec. = 1.4 ft, 5.0 ft				11-20-19-13 (39)		13.3	47.5	39.2
7.5		Cobble present from 6.2 to 6.4 ft, 6.2 ft								
10.0		A-4, Silty SAND (SM), dense, gray-brown, dry, infrequent gravel layers, no odor, mps 0.5 in. (Glaciofluvial Deposits), Rec. = 1.4 ft, 10.0 ft				21-24-30-36 (54)				
12.5										
15.0		A-4, Sandy SILT (ML), very dense, brown, wet, infrequent gravel layers, no odor, mps 0.5 in. (Glaciofluvial Deposits), Rec. = 1.3 ft, 15.0 ft - 20.0 ft				20-28-39-50 (67)		9.5	32.4	58.1
17.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 230767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 30/3/22

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 7

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 255 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-110**
Page No.: 2 of 3
Pin No.: 18B003
Checked By: TJE

Boring Crew: C. Johnson, J. Fletcher
Date Started: 8/05/21 Date Finished: 8/06/21
VTSPG NAD83: N 712258.96 ft E 1627911.41 ft
Station: 008+72 Offset: 254L
Ground Elevation: 1211.7 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 TRuck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/06/21	14.9	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
20.0		A-4, SILT with Sand (ML), dense, gray-brown, wet, no structure, no odor, mps 0.4 mm (Glaciofluvial Deposits), Rec. = 1.4 ft, 20.0 ft - 23.7 ft				13-19-25-43 (44)		2.7	17.3	80.0
22.5		23.7 ft - 29.9 ft								
25.0		A-4, Sandy SILT (ML), very dense, gray, wet, stratified, no odor, mps 0.5 in. (Glaciofluvial Deposits), Rec. = 1.25 ft, 25.0 ft				22-24-43-50/.3" (67)		11.9	32.6	55.5
27.5										
30.0		29.9 ft - 34.5 ft, Note: Drill action indicates strata change at 29.9 ft. Rec. = 0.25 ft30.0 ft, Note: Sample S7 contained 1-in. diameter rock fragment (Weathered Bedrock)				50/0.2'				
32.5										
35.0		34.5 ft - 39.5 ft, Gray-green, GRANOFELS, aphanitic, moderately hard, slightly weathered. Joints dipping at high to vertical angles, very close to close, smooth, planar, tight to open, no infilling. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C1	70 (0)	3 2 3 3	Top of Bedrock @ 34.5 ft				
37.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 90.GPJ VERMONT AOT.GDT 3/3/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-110**
Page No.: 3 of 3
Pin No.: 18B003
Checked By: TJE

Boring Crew: C. Johnson, J. Fletcher
Date Started: 8/05/21 Date Finished: 8/06/21
VTSPG NAD83: N 712258.96 ft E 1627911.41 ft
Station: 008+72 Offset: 254L
Ground Elevation: 1211.7 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 TRuck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/06/21	14.9	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
					3.5					
40.0		39.5 ft - 43.2 ft, Gray and green, GRANOFELS, aphanitic, moderately hard, slightly to moderately weathered. Primary joint set dipping at high to vertical, very close to close, smooth, planar, tight to open, no infilling. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C2	77 (18)	3.5 1.5 2.5 4.5					
42.5		43.2 ft - 44.5 ft, Similar to C2. Poor Rock, NQ, RMR=36 (MORETOWN FORMATION)	C3	100 (60)	3					
45.0		Hole stopped @ 44.5 ft								
47.5										
50.0										
52.5										
55.0										

Remarks:
Borehole backfilled with cuttings.

AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 90.GPJ VERMONT AOT.GDT 3/3/22

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 8

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 256 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-111**
Page No.: 1 of 2
Pin No.: 18B003
Checked By: TJE

Boring Crew: C. Johnson, H. Hollauer
Date Started: 8/20/21 Date Finished: 8/20/21
VTSPG NAD83: N 712212.54 ft E 1628121.82 ft
Station: 7+89 Offset: 55L
Ground Elevation: 1173.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig: Diedrich D-50 Track	C_E = 1.48	

Groundwater Observations

Date	Depth (ft)	Notes
08/20/21	8.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-8, Silty SAND (SM), very loose, medium brown, moist, no structure, no odor, trace roots (Topsoil), Rec. = 0.7 ft, 0.0 ft - 0.2 ft				1-50/2"				
		(Wood) tree roots, 0.2 ft - 0.4 ft								
2.5		Broken fragments of fine-grained GRANOFELS, medium, gray, dry (Weathered Rock), 0.4 ft - 16.0 ft Note: Advanced solid-stem auger to 5.0 ft, possible fractured weathered rock from 0.7 to 5.0 ft., 0.7 ft Note: Adjacent outcrops have vertical joints, dry, 1.0 ft								
5.0		Mix of 40% very weathered GRANOFELS fragments, medium gray with Sand and Silt, medium brown, dry, no structure, no odor, possible weathered and fractured rock, fragments break with finger pressure (Weathered Rock), Rec. = 1.0 ft, 5.0 ft				3-3-5-16 (8)		54.1	32.1	13.8
7.5										
10.0		Completely to extremely weathered GRANOFELS, dense, medium gray, wet, sample has features and structure or rock with one vertical fracture, breaks apart with little finger pressure (Weathered Rock), Rec. = 1.5 ft, 10.0 ft				24-15-23-27 (38)		58.3	27.8	13.9
12.5										
15.0		Similar to S3. (Weathered Rock) Note: Rollerbit to 16.0 ft., Rec. = 0.2 ft, 15.0 ft				50/3"				
		16.0 ft - 17.8 ft, Gray and green, GRANOFELS, fine grained, soft to medium, moderately to highly weathered. Primary joint set is dipping high angle to vertical, extremely close to very close, smooth, fresh to discolored, tight, no infilling. No discernible secondary joint set. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C1	80 (0)	3 5	Top of Bedrock @ 16.0 ft				
17.5		17.8 ft - 21.8 ft, C2: Similar to C1, slightly more competent in quality. Poor Rock, NQ, RMR=26 (MORETOWN FORMATION)	C2	100 (12.5)	8 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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 3/3/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-111**
Page No.: 2 of 2
Pin No.: 18B003
Checked By: TJE

Boring Crew: C. Johnson, H. Hollauer
Date Started: 8/20/21 Date Finished: 8/20/21
VTSPG NAD83: N 712212.54 ft E 1628121.82 ft
Station: 7+89 Offset: 55L
Ground Elevation: 1173.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig: Diedrich D-50 Track	C_E = 1.48	

Groundwater Observations

Date	Depth (ft)	Notes
08/20/21	8.5	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
					4 5					
22.5		21.8 ft - 25.8 ft, C3: Similar to C2. Very Poor Rock, NQ, RMR=20 (MORETOWN FORMATION)	C3	100 (25)	4 5 5 5					
25.0		Hole stopped @ 25.8 ft								
27.5		Remarks: AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.								
30.0										
32.5										
35.0										
37.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 3/3/22

NOTES

1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 9

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 257 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-113**
Page No.: 1 of 2
Pin No.: 18B003
Checked By: TJE

Boring Crew: C. Johnson, H. Hollauer
Date Started: 8/20/21 Date Finished: 8/20/21
VTSPG NAD83: N 712238.83 ft E 1628131.71 ft
Station: 8+15 Offset: 40L
Ground Elevation: 1173.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:		Auto
Rig: Diedrich D-50 Track		C_E = 1.48

Groundwater Observations

Date	Depth (ft)	Notes

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-8, Silty SAND (SM), very loose, medium brown, moist, no structure, no odor, trace roots (Topsoil), Rec. = 1.5 ft, 0.0 ft - 0.25 ft				5-8-8-11 (16)				
2.5		0.25 ft - 15.4 ft								
5.0		Fragments to particles of fine-grained GRANOFELS, medium dense, medium gray, dry (Weathered Rock), Rec. = 0.8 ft, 5.0 ft				4-7-9-5 (16)		68.8	21.7	9.5
7.5										
10.0		Highly to extremely weathered GRANOFELS, medium dense, medium gray, dry, infilled with medium brown fine sand, sample has features and structure or rock, but breaks apart with little finger pressure (Weathered Rock), Rec. = 1.5 ft, 10.0 ft				24-9-12-18 (21)		52.8	32.9	14.3
12.5										
15.0		Similar to S3, Rec. = 0.4 ft, 15.0 ft				50/5"				
		15.4 ft - 29.0 ft, Note: Advanced rollerbit to 19.5 ft.				Top of Bedrock @ 15.4 ft				
17.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 30/3/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
CULV064-100 BR 90
Elmore, Vermont

Boring No.: **B-113**
Page No.: 2 of 2
Pin No.: 18B003
Checked By: TJE

Boring Crew: C. Johnson, H. Hollauer
Date Started: 8/20/21 Date Finished: 8/20/21
VTSPG NAD83: N 712238.83 ft E 1628131.71 ft
Station: 8+15 Offset: 40L
Ground Elevation: 1173.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:		Auto
Rig: Diedrich D-50 Track		C_E = 1.48

Groundwater Observations

Date	Depth (ft)	Notes

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (ROD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
20.0		19.5 ft, Green and gray, GRANOFELS, fine grained, soft to medium, highly weathered. Primary joint set is dipping high angle to vertical, extremely close to very close, smooth, fresh to discolored, tight to open, no infilling. No discernible secondary joint set. Core Run is highly fractured. Structure includes pinstripe quartzite banding. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C1	75 (0)	5 4 2					
22.5		22.5 ft, Similar to C1, except medium hard. Secondary joint set present with horizontal and low angle joints. Highly fractured rock in core run. Very Poor Rock, NQ, RMR=15 (MORETOWN FORMATION)	C2	83 (0)	4 2					
25.0		24.0 ft, Green and gray, GRANOFELS, fine grained, medium, moderately to highly weathered. Primary joint set is dipping high angle to vertical, very close to close, smooth, fresh to discolored, tight to open, no infilling. No discernible secondary joint set. Core run is highly fractured. Structure includes pinstripe quartzite banding. Poor Rock, NQ, RMR=26 (MORETOWN FORMATION)	C3	114 (22)	6 6 11					
27.5		27.0 ft, Similar to C3. Poor Rock, NQ, RMR=26 (MORETOWN FORMATION)	C4	75 (0)	5 3					
		28.5 ft, Note: Lost significant drill water from 23 to 29 ft depth.			3					
30.0		Hole stopped @ 29.0 ft								
32.5		Remarks: AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.								
35.0										
37.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH2 BR 90.GPJ VERMONT AOT.GDT 30/3/22

NOTES

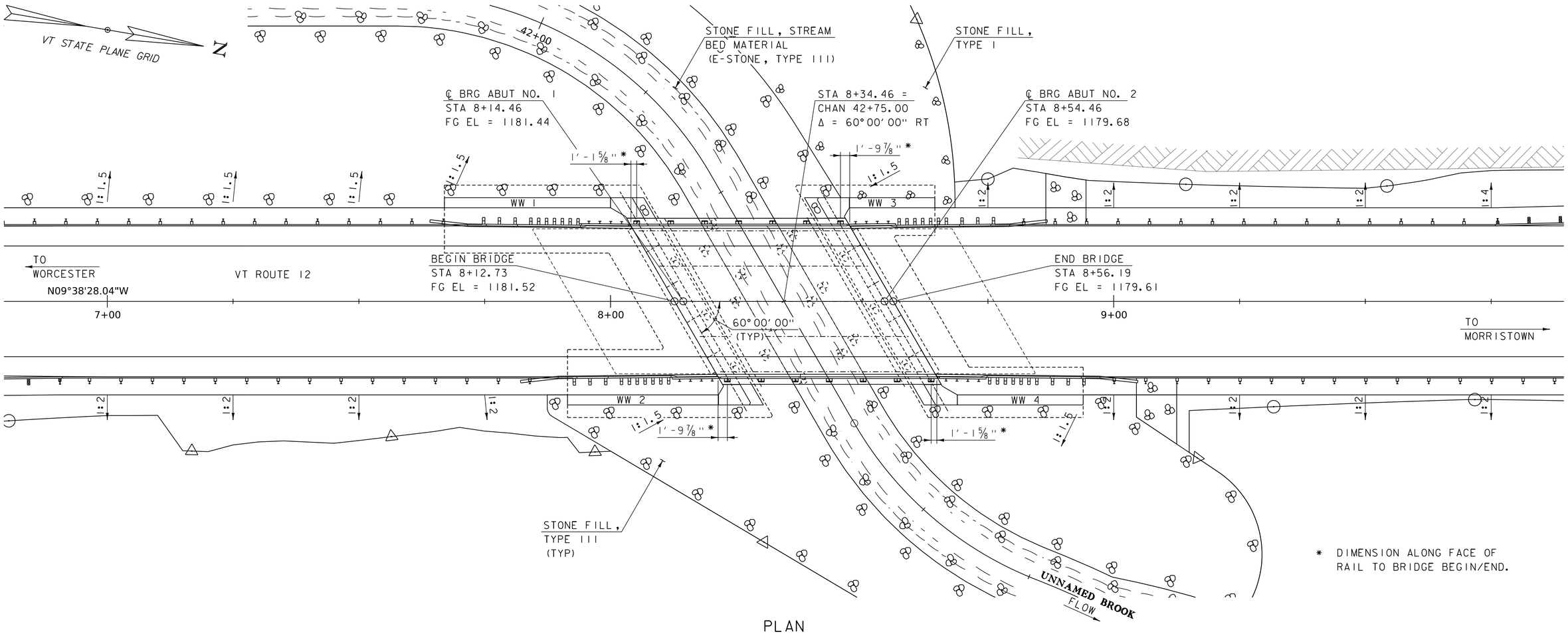
1. BOTTOM OF SUBFOOTING SHALL GENERALLY BE THE TOP OF BEDROCK ELEVATION. THIS SHALL BE FIELD CONFIRMED BY THE ENGINEER AND VTRANS STATE GEOLOGIST. REFERENCE PROJECT NOTES SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

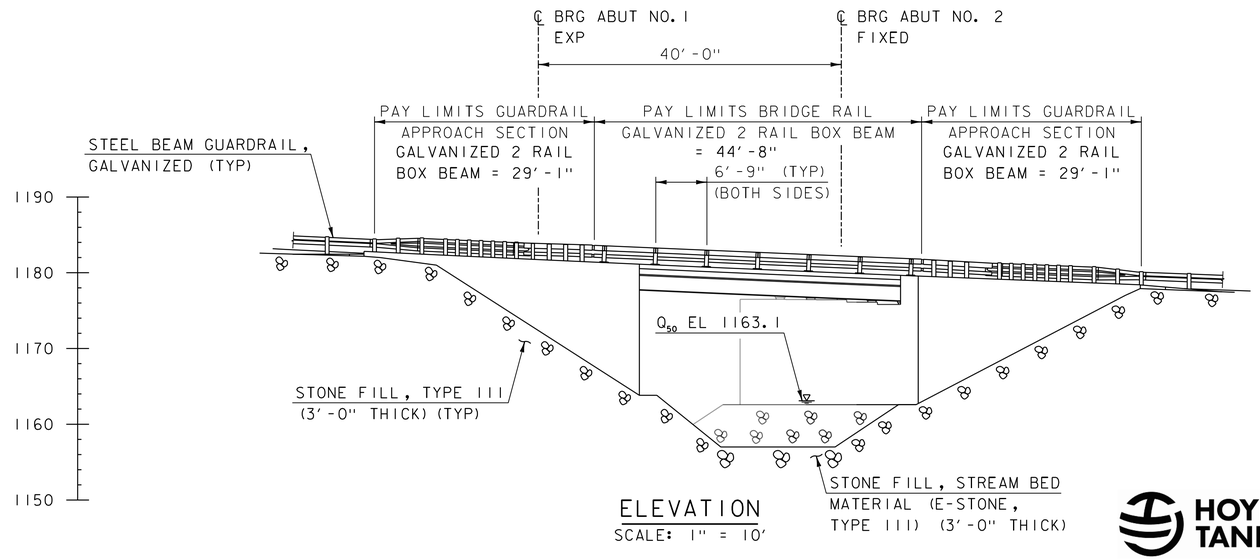
FILE NAME: z18b003log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
BORING LOGS 10

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 258 OF 370



PLAN

SCALE: 1" = 10'



ELEVATION

SCALE: 1" = 10'

* DIMENSION ALONG FACE OF RAIL TO BRIDGE BEGIN/END.

1190

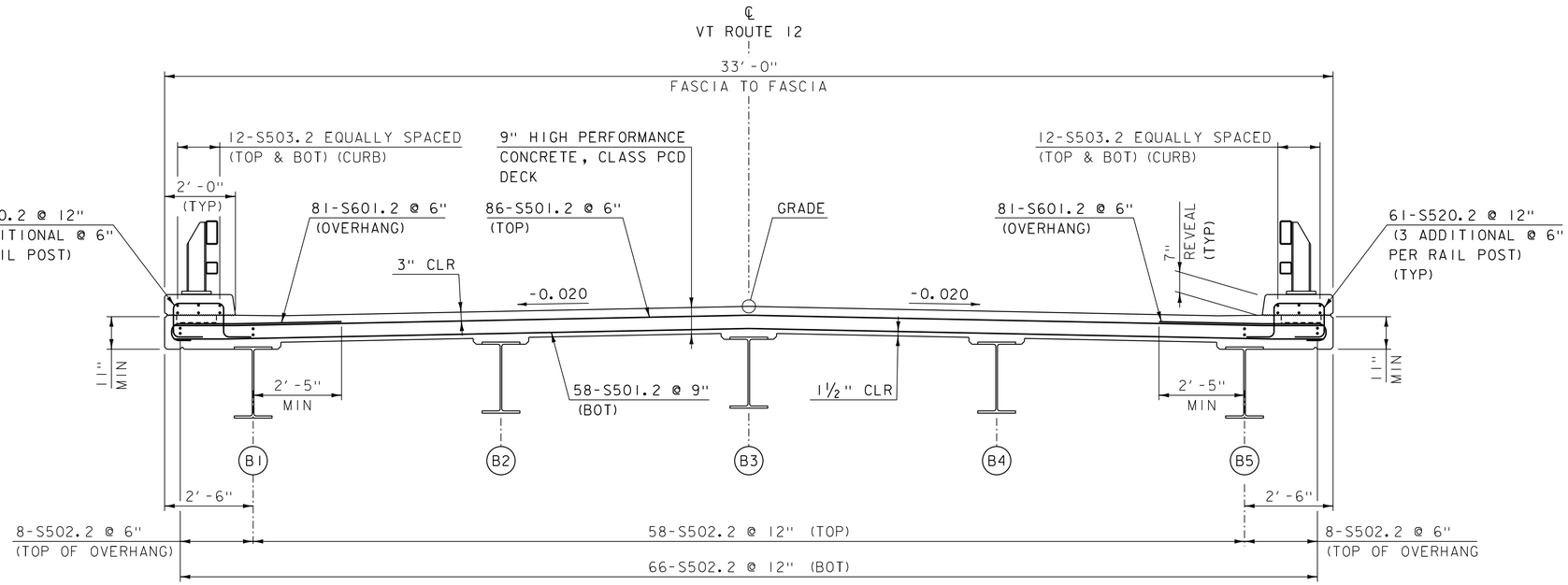
1180

STONE FILL, STREAM BED MATERIAL NOTES

1. REFERENCE TYPICAL CHANNEL SECTION NOTES ON TYPICAL SECTIONS SHEET 2.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003pe.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.SEMPRINI	CHECKED BY: E.WEINGARTNER
PLAN AND ELEVATION	SHEET 259 OF 370



BRIDGE STRUCTURAL TYPICAL SECTION

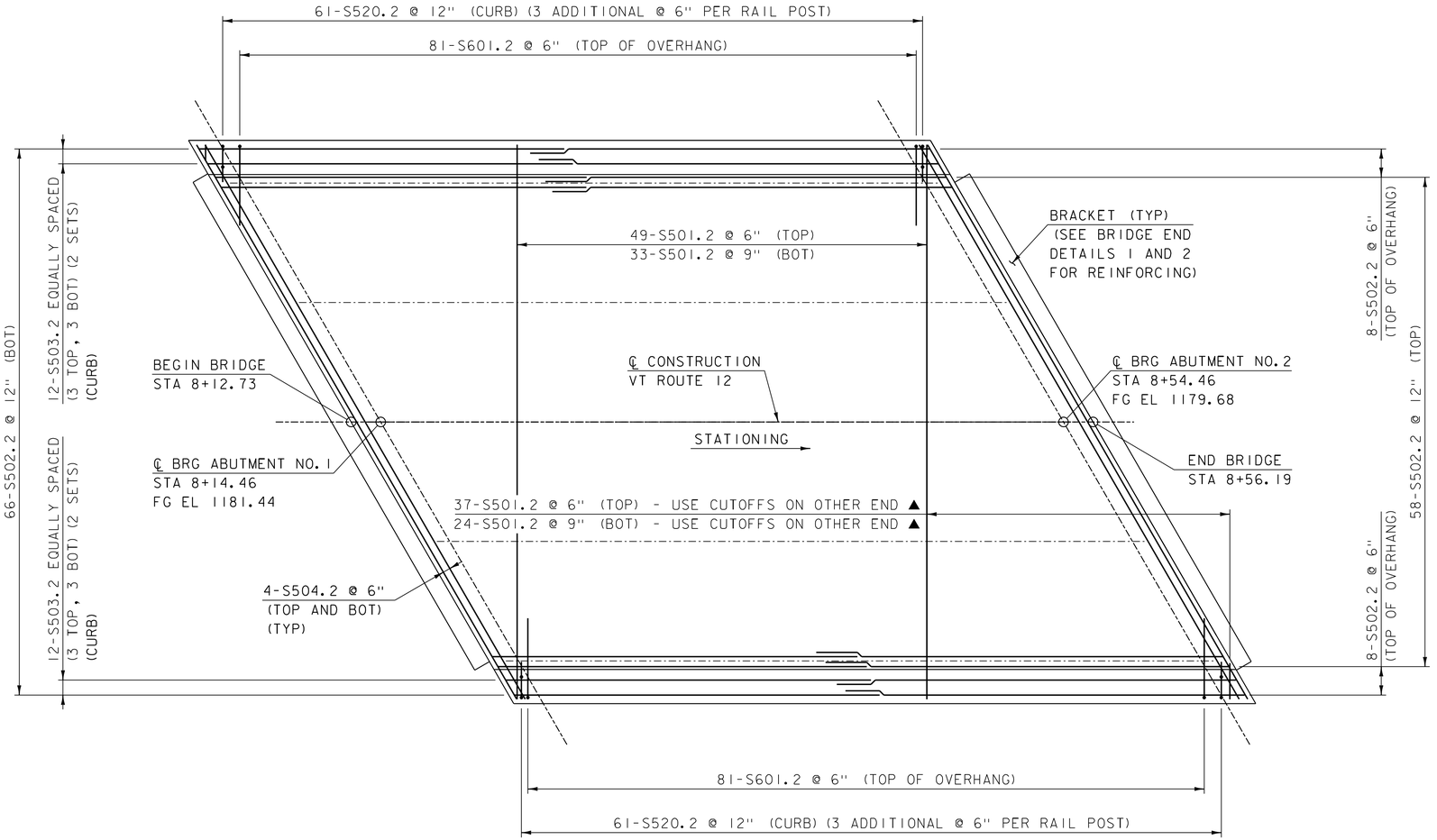
SCALE: ½" = 1′-0"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003supl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
BRIDGE STRUCTURAL TYPICAL SECTION	SHEET 260 OF 370



DECK REINFORCING PLAN

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

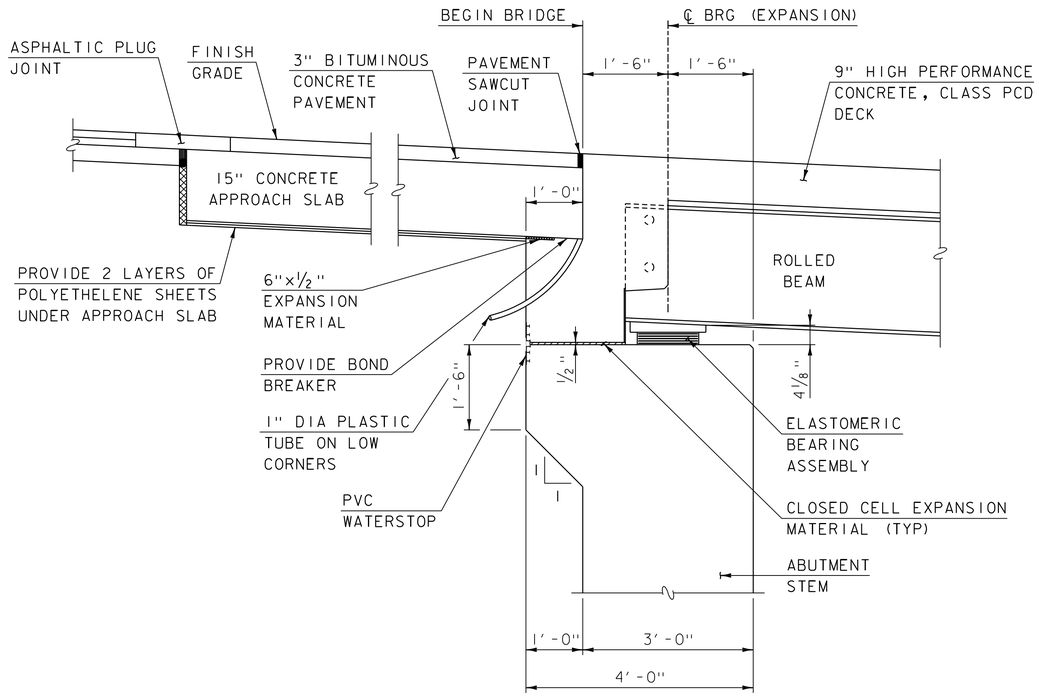
NOTES

1. MAINTAIN 3" CLEAR COVER UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

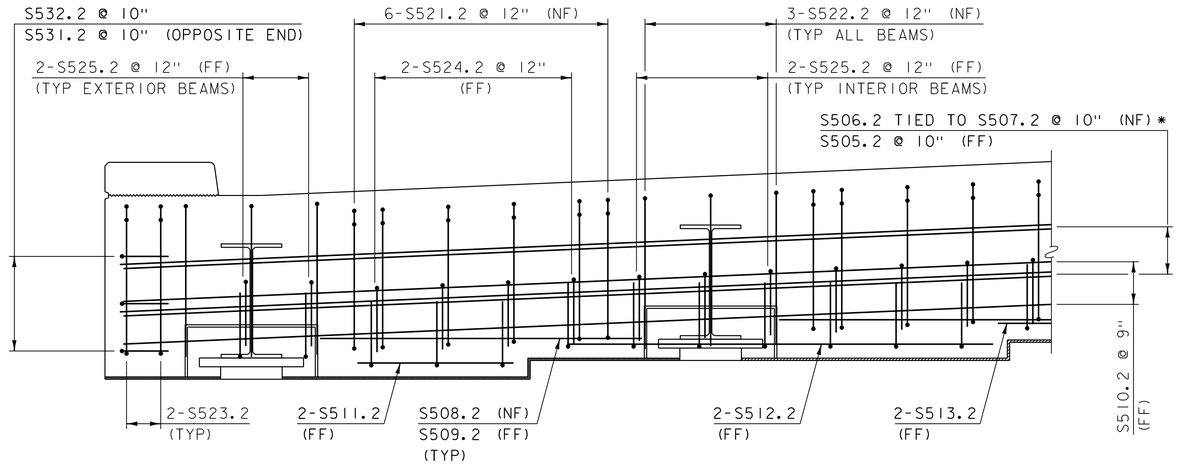
FILE NAME: z18b003sup2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
DECK REINFORCING PLAN

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 261 OF 370



ABUTMENT NO. 1 BRIDGE END DETAIL

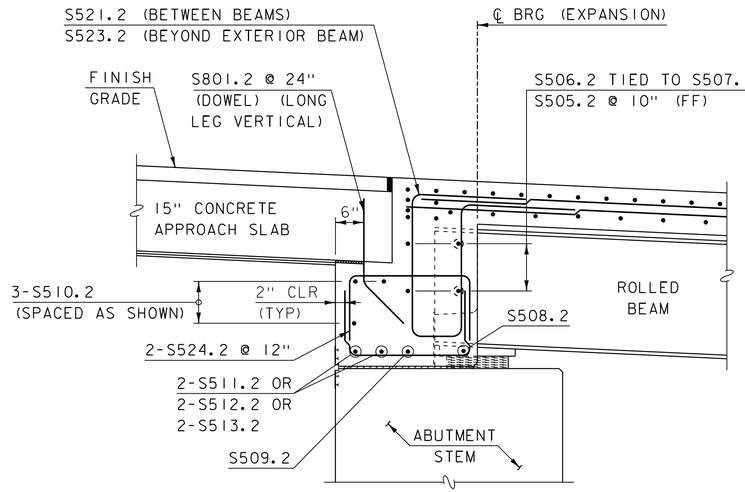
SCALE: ¾" = 1'-0"



ABUTMENT NO. 1
BRIDGE END REINFORCING PARTIAL ELEVATION

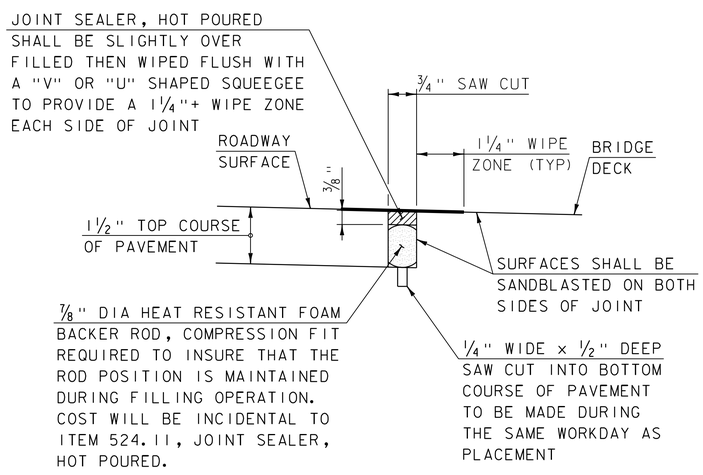
SCALE: ¾" = 1'-0"

* LAP SPLICE S507.2 TO S506.2 BEYOND BEAM 3



ABUTMENT NO. 1
BRIDGE END REINFORCING DETAIL

SCALE: ¾" = 1'-0"



SAW CUT JOINT DETAIL

NOT TO SCALE

NOTES

1. JOINTS SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. JOINTS SHALL BE CLEANED PRIOR TO APPLYING THE JOINT SEALER.
2. SAW CUT JOINT WILL BE PAID OR UNDER ITEM 524.11, JOINT SEALER, HOT POURED.

NOTES

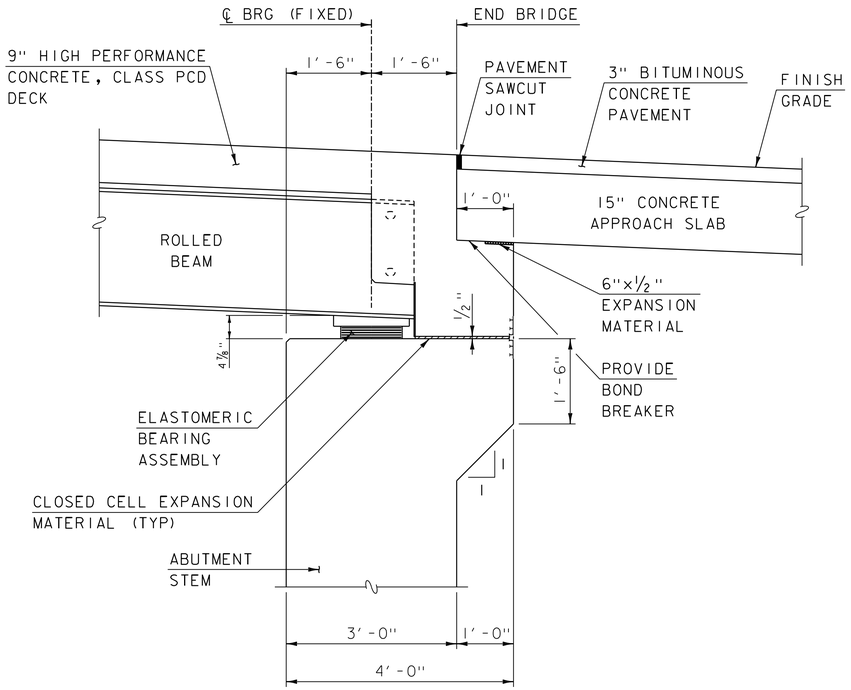
1. FOR ASPHALTIC PLUG JOINT DETAIL, SEE STANDARD DRAWING S-400.
2. MAINTAIN 3" CLEAR COVER UNLESS OTHERWISE SPECIFIED ON THE PLANS.

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

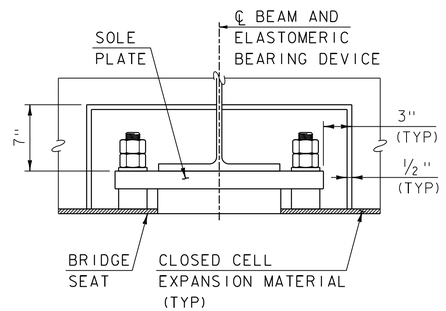
HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: STP CULV(64)	
FILE NAME: z18b003sup3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
BRIDGE END DETAILS 1	SHEET 262 OF 370



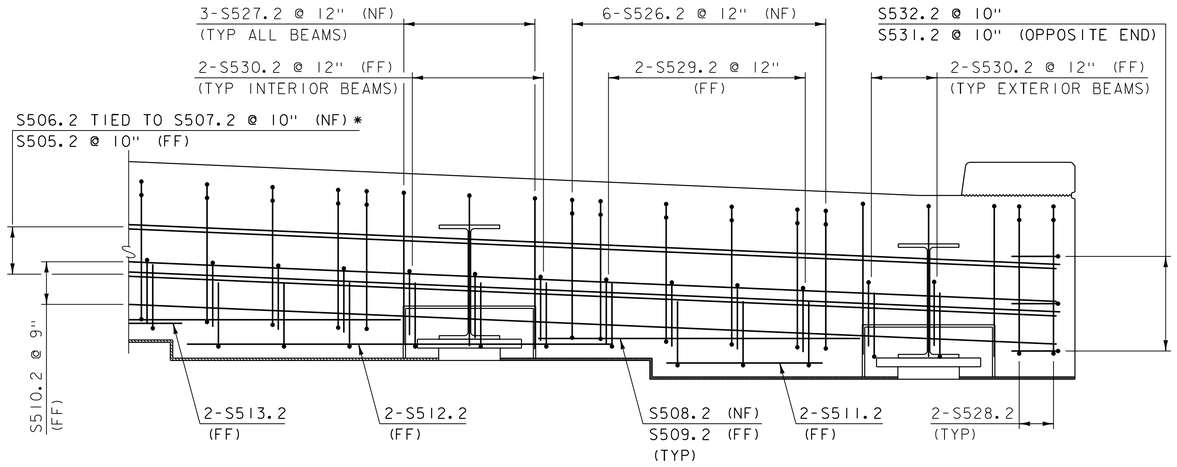
ABUTMENT NO. 2 BRIDGE END DETAIL

SCALE: ¾" = 1'-0"



CURTAIN WALL BEARING BOXOUT

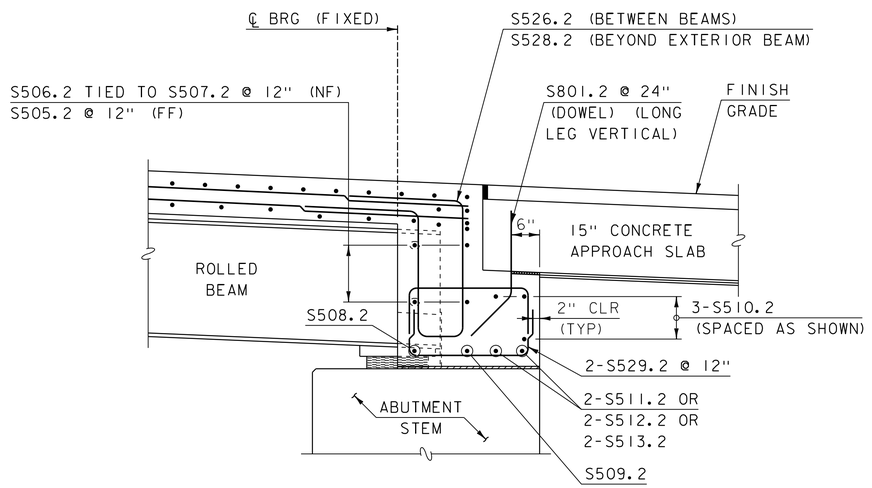
NOT TO SCALE



ABUTMENT NO. 2
BRIDGE END REINFORCING PARTIAL ELEVATION

SCALE: ¾" = 1'-0"

* LAP SPLICE S507.2 TO S506.2 BEYOND BEAM 3



ABUTMENT NO. 2
BRIDGE END REINFORCING DETAIL

SCALE: ¾" = 1'-0"

NOTES

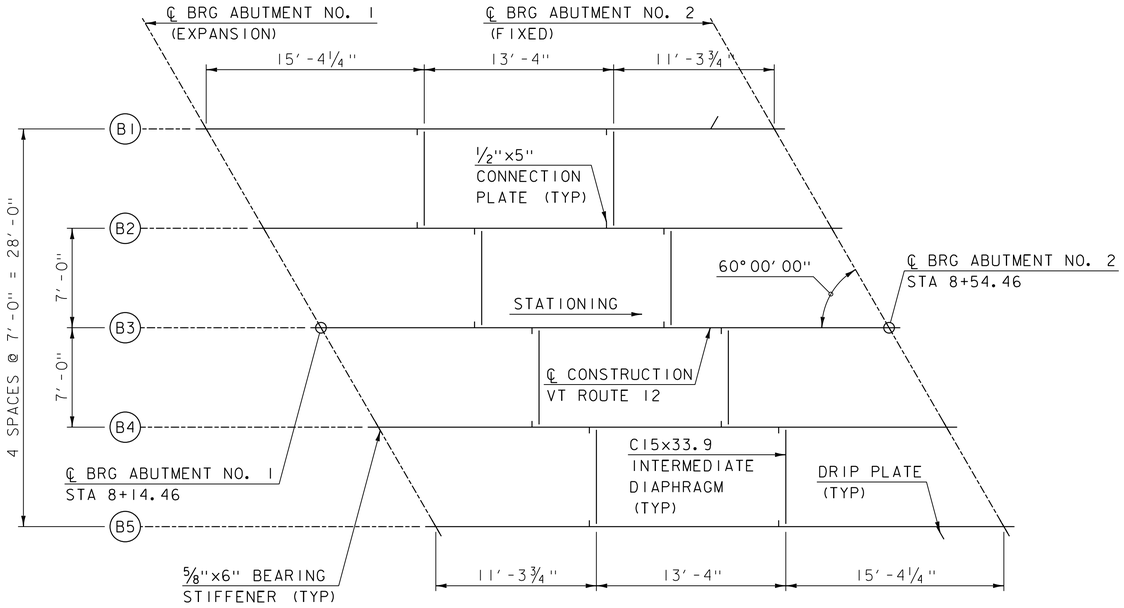
1. MAINTAIN 3" CLEAR COVER UNLESS OTHERWISE SPECIFIED ON THE PLANS.

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

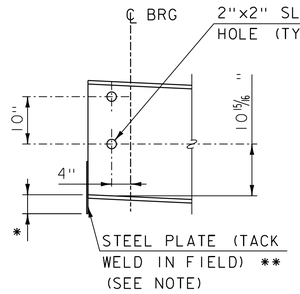
HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: STP CULV(64)	
FILE NAME: zl8b003sup3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
BRIDGE END DETAILS 2	SHEET 263 OF 370



FRAMING PLAN

SCALE: 3/16″ = 1′-0″



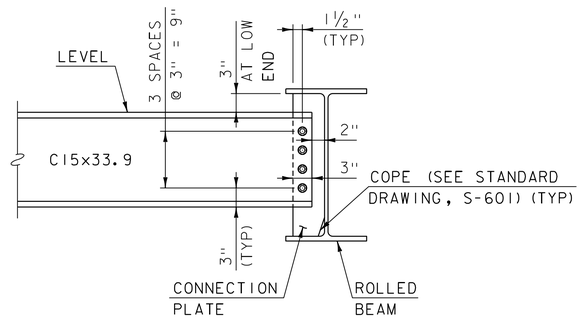
* 4⅝″ AT ABUTMENT NO. 1
3⅝″ AT ABUTMENT NO. 2

** ¼″×11⅝″×2′-5″ AT ABUTMENT NO. 1
¼″×10⅝″×2′-5″ AT ABUTMENT NO. 2

NOTE
INCIDENTAL TO ITEM 506.50 STRUCTURAL STEEL, ROLLED BEAM. REFERENCE ELASTOMERIC BEARING DETAILS SHEET.

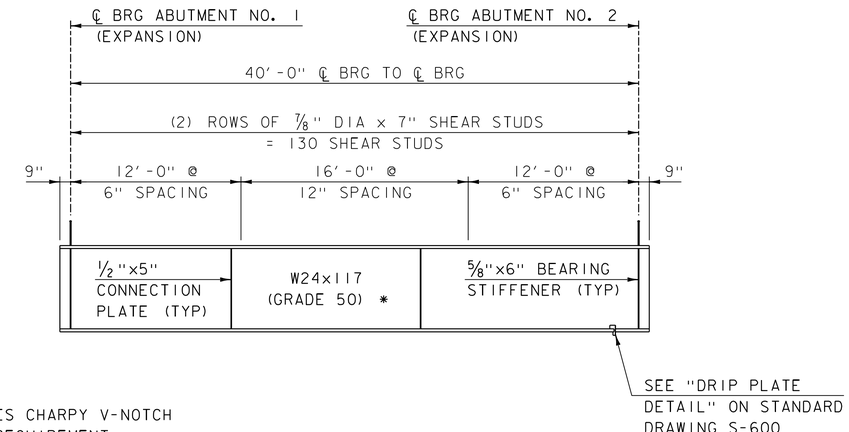
BEAM END DETAIL

SCALE: ¾″ = 1′-0″



INTERMEDIATE DIAPHRAGM

SCALE: 1″ = 1′-0″



* DENOTES CHARPY V-NOTCH TEST REQUIREMENT

BEAM ELEVATION

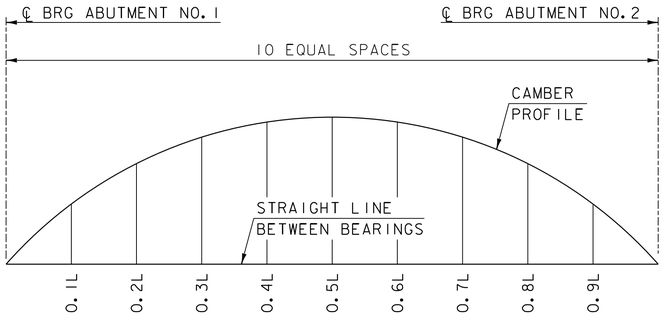
SCALE: 3/16″ = 1′-0″

NOTES

1. TEMPORARY LATERAL BRACING IS REQUIRED AT THE END OF BEAMS DURING PLACEMENT OF THE DECK FORMS AND CONCRETE. DETAILS AND CALCULATIONS SHALL BE PREPARED AND SUBMITTED IN ACCORDANCE WITH CONSTRUCTION DRAWINGS IN ACCORDANCE WITH SECTION 105.03. TEMPORARY LATERAL BRACING SHALL BE REMOVED AFTER CONCRETE IS SET.
2. FOR DRIP PLATE DETAIL, SEE STANDARD DRAWING S-600.
3. FOR ADDITIONAL DIAPHRAGM, WELD TERMINATION/COPING AND CONNECTION/BEARING PLATE DETAILS, SEE STANDARD DRAWING S-601.

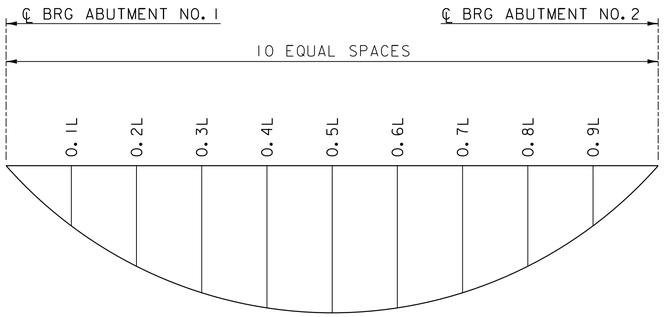
HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: STP CULV(64)	
FILE NAME: z18b003sup4.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
FRAMING PLAN AND BEAM ELEVATION	SHEET 264 OF 370



CAMBER DIAGRAM

NOT TO SCALE



DEAD LOAD DEFLECTION DIAGRAM

NOT TO SCALE

CAMBER AND DEAD LOAD DEFLECTION TABLE AT TENTH POINTS (INCHES)

BEAMS 1 & 5	℄ BRG ABUT NO. 1	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG ABUT NO. 2
STEEL DL	0.000	0.022	0.042	0.058	0.068	0.072	0.068	0.058	0.042	0.022	0.000
CONCRETE DL	0.000	0.126	0.239	0.327	0.382	0.402	0.382	0.327	0.239	0.126	0.000
SUPERIMPOSED DL	0.000	0.007	0.013	0.018	0.021	0.022	0.021	0.018	0.013	0.007	0.000
TOTAL DEFLECTION	0.000	0.155	0.294	0.403	0.471	0.496	0.471	0.403	0.294	0.155	0.000
RESIDUAL CAMBER	0.000	0.360	0.640	0.840	0.960	1.000	0.960	0.840	0.640	0.360	0.000
TOTAL CAMBER	0.000	0.515	0.934	1.243	1.431	1.496	1.431	1.243	0.934	0.515	0.000

CAMBER AND DEAD LOAD DEFLECTION TABLE AT TENTH POINTS (INCHES)

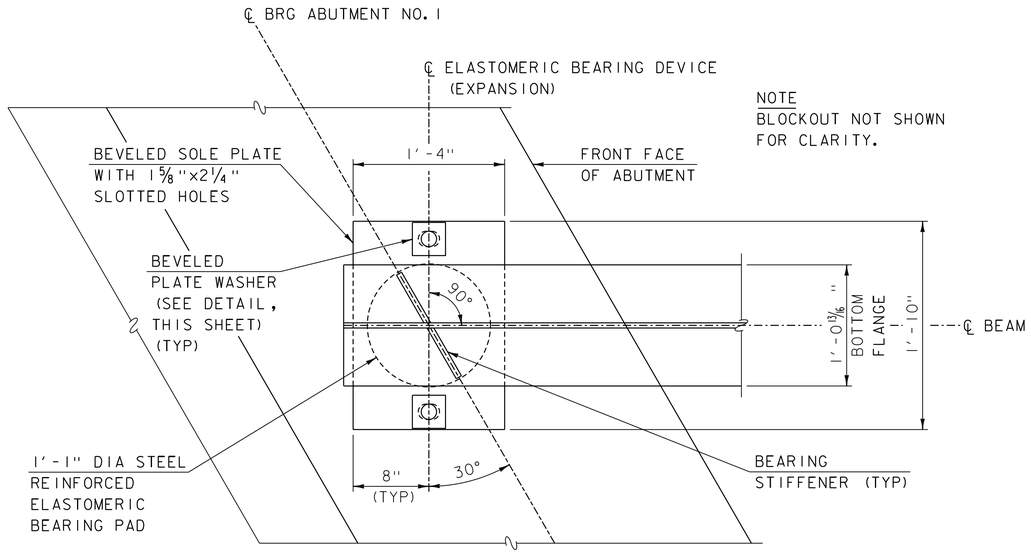
BEAMS 2 - 4	℄ BRG ABUT NO. 1	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG ABUT NO. 2
STEEL DL	0.000	0.024	0.045	0.062	0.073	0.076	0.073	0.062	0.045	0.024	0.000
CONCRETE DL	0.000	0.146	0.277	0.379	0.444	0.466	0.444	0.379	0.277	0.146	0.000
SUPERIMPOSED DL	0.000	0.006	0.013	0.017	0.020	0.021	0.020	0.017	0.013	0.006	0.000
TOTAL DEFLECTION	0.000	0.176	0.335	0.458	0.537	0.563	0.537	0.458	0.335	0.176	0.000
RESIDUAL CAMBER	0.000	0.360	0.640	0.840	0.960	1.000	0.960	0.840	0.640	0.360	0.000
TOTAL CAMBER	0.000	0.536	0.975	1.298	1.497	1.563	1.497	1.298	0.975	0.536	0.000

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

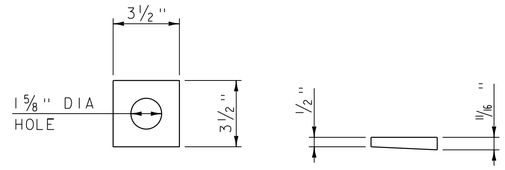
FILE NAME: zl8b003sup5.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
CAMBER AND DEAD LOAD DEFLECTION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 265 OF 370



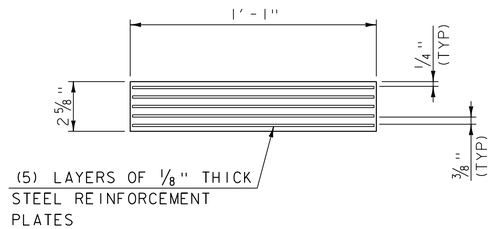
PLAN

SCALE: 1½" = 1'-0"



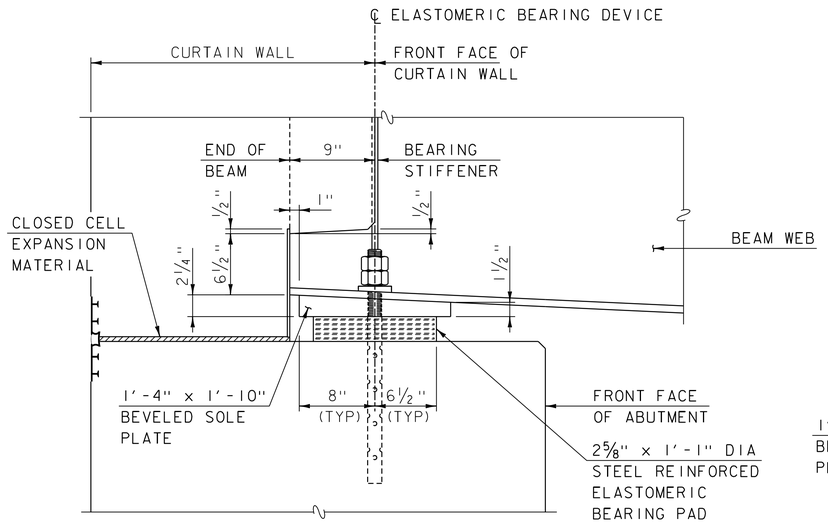
BEVELED PLATE WASHER DETAIL

(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 SIMILAR)
SCALE: 3" = 1'-0"



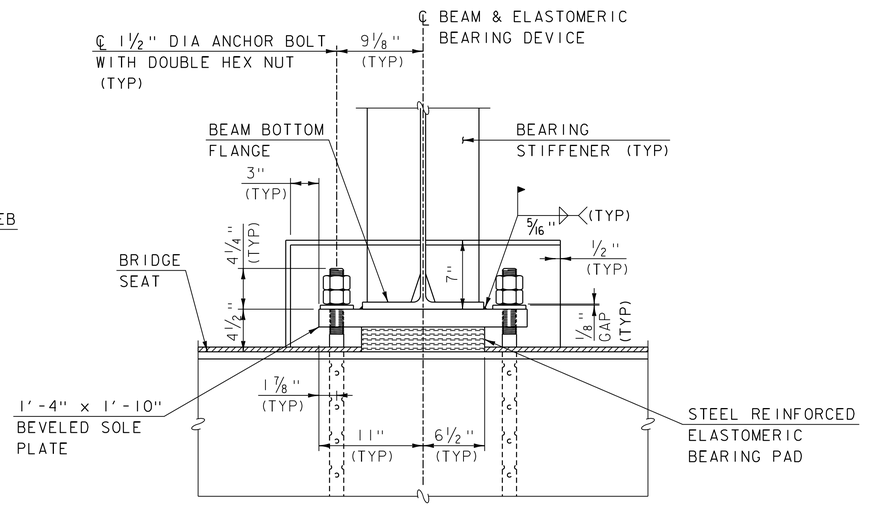
ELASTOMERIC BEARING PAD SECTION

SCALE: 3" = 1'-0"



SIDE ELEVATION

SCALE: 1½" = 1'-0"



FRONT ELEVATION

SCALE: 1½" = 1'-0"

ELASTOMERIC BEARING NOTES

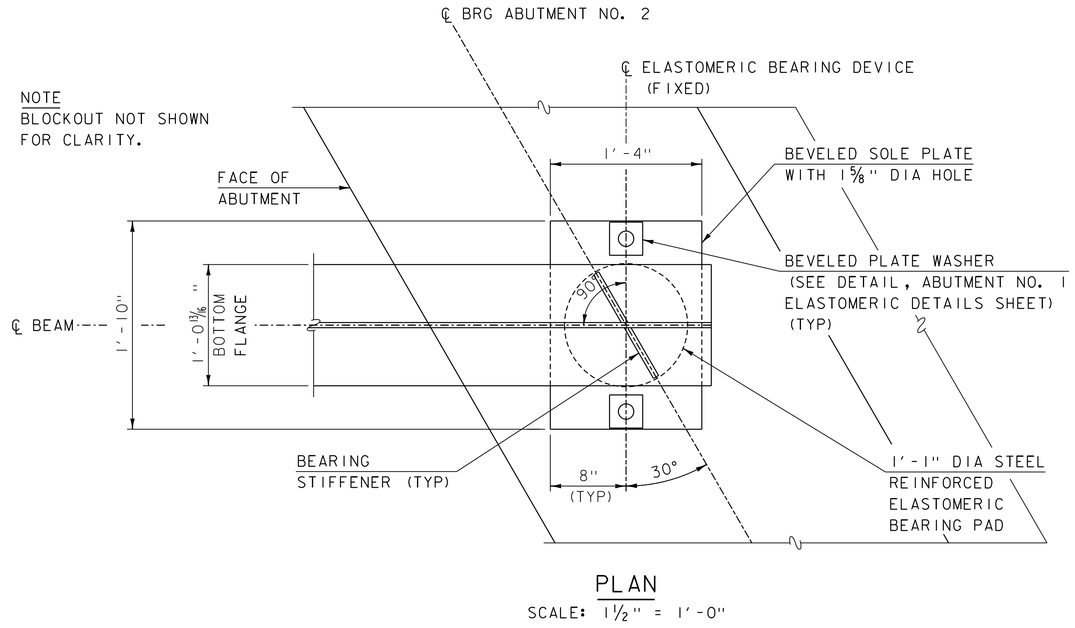
1. BEARINGS SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF STANDARD SPECIFICATIONS SECTION 531 AND 731.
2. ALL REINFORCEMENT BETWEEN LAYERS OF ELASTOMER SHALL BE STEEL AASHTO M270 GRADE 36. ALL INTERNAL STEEL PLATES SHALL BE BLAST CLEANED AND FREE OF COATINGS, RUST AND MILL SCALE. THE PLATES SHALL BE FREE OF SHARP EDGES AND BURRS.
3. STEEL REINFORCED ELASTOMERIC BEARINGS SHALL HAVE A MINIMUM OF ¼" EDGE SEAL OF ELASTOMER INTEGRAL WITH BEARING OVER ALL INTERNAL SURFACES.
4. THE STEEL REINFORCED ELASTOMERIC BEARING PADS SHALL BE VULCANIZED TO THE STEEL SOLE PLATES. THE STEEL SURFACES TO BE BONDED TO THE PAD SHALL NOT BE GALVANIZED OR METALIZED.
5. THE ELASTOMER WAS DESIGNED WITH A SHEAR MODULUS OF 110 PSI.
6. THE ELASTOMER SHALL MEET THE REQUIREMENTS OF LOW TEMPERATURE ZONE D, GRADE 4.
7. THE CONCRETE UNDER THE BEARING DEVICE SHALL BE LEVEL.
8. ANCHOR BOLTS SHALL BE EMBEDED A MINIMUM OF 15". ANCHOR RODS, NUTS AND WASHER SHALL MEET THE REQUIREMENTS OF SUBSECTION 714.08. SOLE PLATES SHALL BE SET WITH ANCHOR RODS CENTERED IN SLOTTED HOLES.
9. BEAMS SHALL BE ERECTED WHEN THE STEEL TEMPERATURE IS BETWEEN 25° AND 65°. IF THE BEAMS ARE ERECTED AT OTHER STEEL TEMPERATURES AND THE ABUTMENT NO. 1 BEARING PAD SHEAR DEFLECTION EXCEEDS ⅛", THE BEAMS SHALL BE JACKED FROM THE GROUND IN FRONT OF ABUTMENT NO. 1 AND THE BEARINGS RECENTERED AND RESET TO PLUMB (UNDEFORMED SHAPE) AT 45° +/- 10°.
10. THE BEAM BOTTOM FLANGE SHALL NOT BE FIELD WELDED TO THE TOP OF THE STEEL SOLE PLATE UNTIL AFTER THE CONCRETE DECK, CURTAIN WALL AND CURBS ARE POURED, THE BRIDGE RAIL IS INSTALLED AND THE BEARING IS IN ITS FINAL POSITION.
11. ABUTMENT NO. 1 ANCHOR BOLT NUTS SHALL BE HAND TIGHTENED AND BACKED OFF ⅛". DOUBLE NUT THE ANCHOR BOLTS. TOP NUT SHALL BE WRENCH TIGHT TO PREVENT NUT REMOVAL.
12. ABUTMENT NO. 2 ANCHOR BOLT NUTS SHALL BE HAND TIGHTENED. DOUBLE NUT THE ANCHOR BOLTS. TOP NUT SHALL BE WRENCH TIGHT TO PREVENT NUT REMOVAL.
13. ALL HORIZONTAL DIMENSIONS SHOWN AT 45° ARE FINAL CONDITION DIMENSIONS.
14. FOR PLAN VIEW OF CONCRETE CURTAIN WALL AROUND BEARING DEVICE DETAIL, SEE ELASTOMERIC BEARING DETAILS 2 SHEET.

DESIGN CRITERIA (SERVICE LIMIT STATE)

AASHTO METHOD A
DEAD LOAD = 25.6 KIPS
LIVE LOAD = 59.2 KIPS
LONGITUDINAL MOVEMENT = 0.57 INCHES

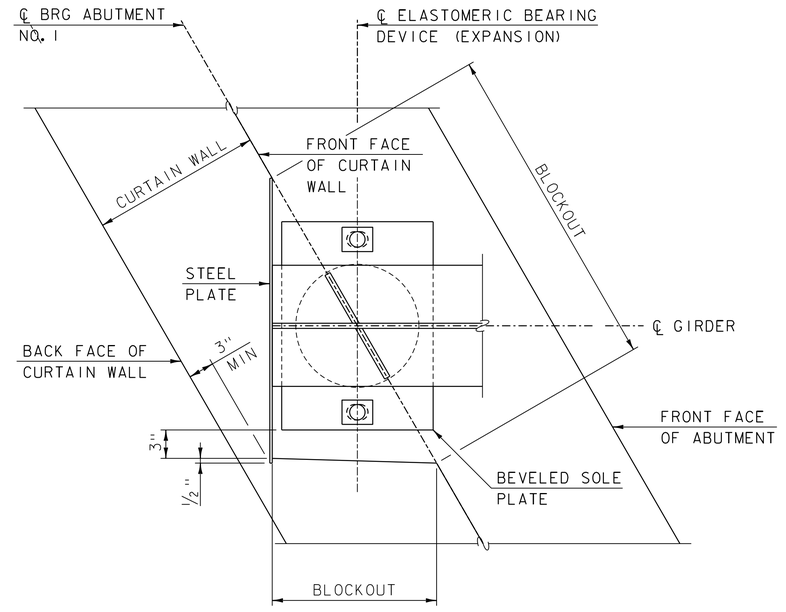
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003sup6.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
ABUTMENT NO. 1 ELASTOMERIC BEARING DETAILS	SHEET 266 OF 370



PLAN

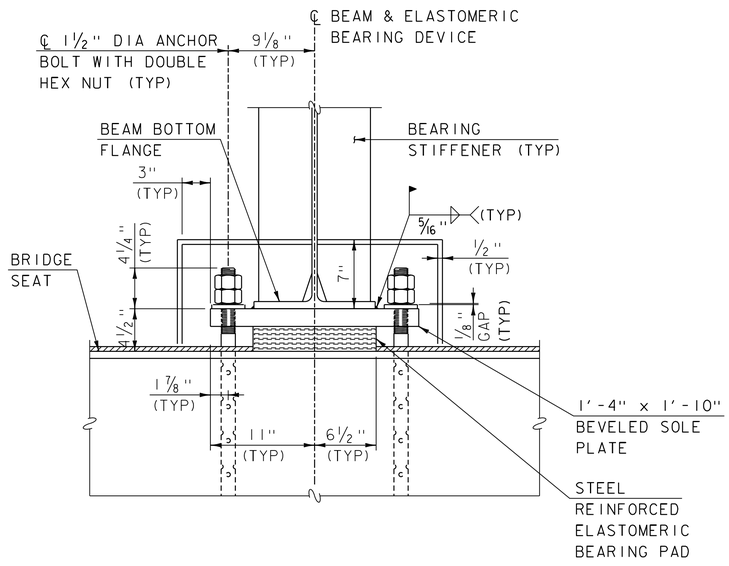
SCALE: 1½" = 1'-0"



CONCRETE CURTAIN WALL AROUND BEARING DEVICE

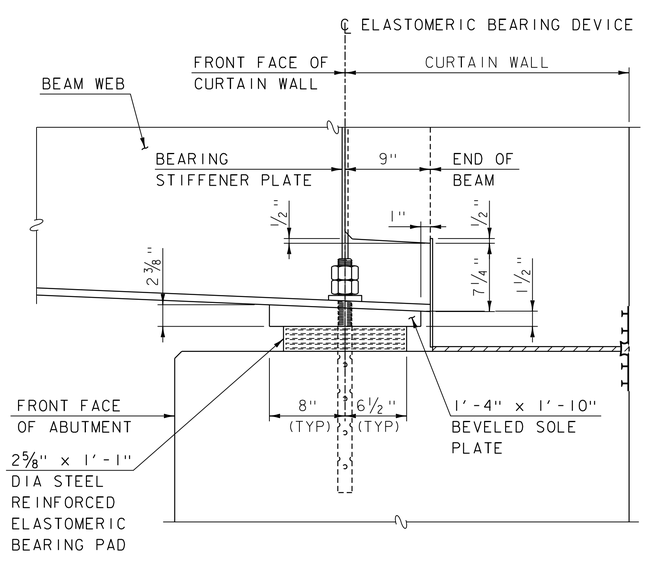
(ABUTMENT NO. 1 SHOWN, ABUTMENT NO. 2 OPPOSITE HAND)

SCALE: 1½" = 1'-0"



FRONT ELEVATION

SCALE: 1½" = 1'-0"



SIDE ELEVATION

SCALE: 1½" = 1'-0"

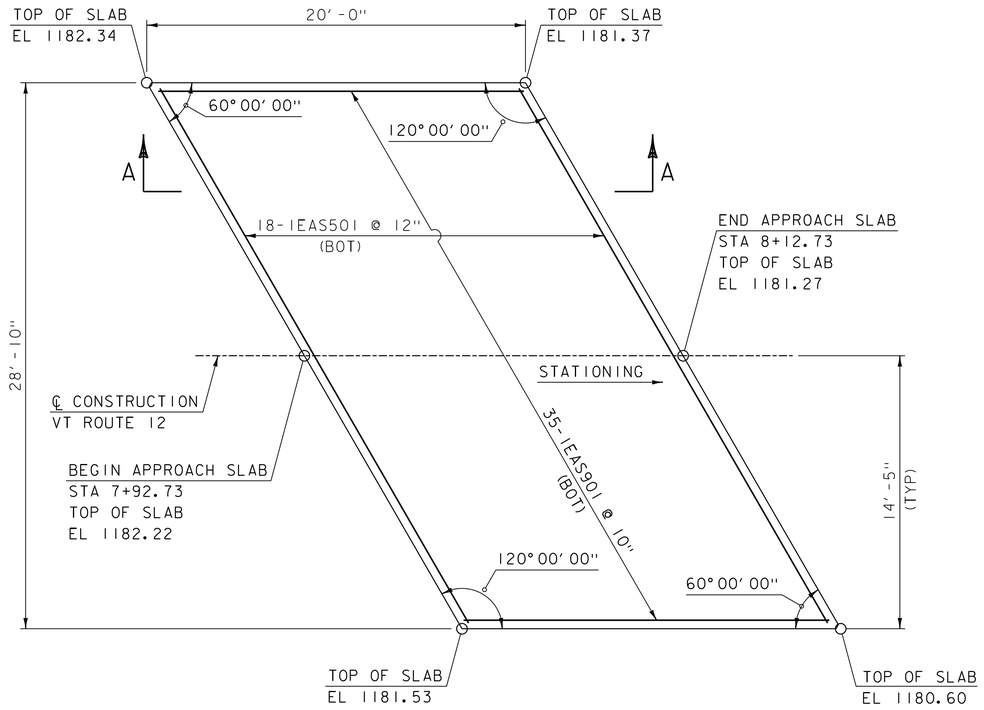
NOTES

1. REFERENCE ELASTOMERIC BEARING DETAILS SHEET 1 FOR NOTES AND BEARING CRITERIA.

HOYLE TANNER

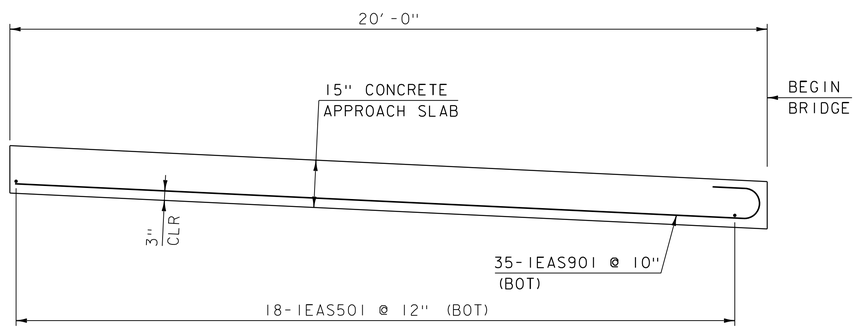
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003sup6.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS

ABUTMENT NO. 2 ELASTOMERIC BEARING DETAILS SHEET 267 OF 370



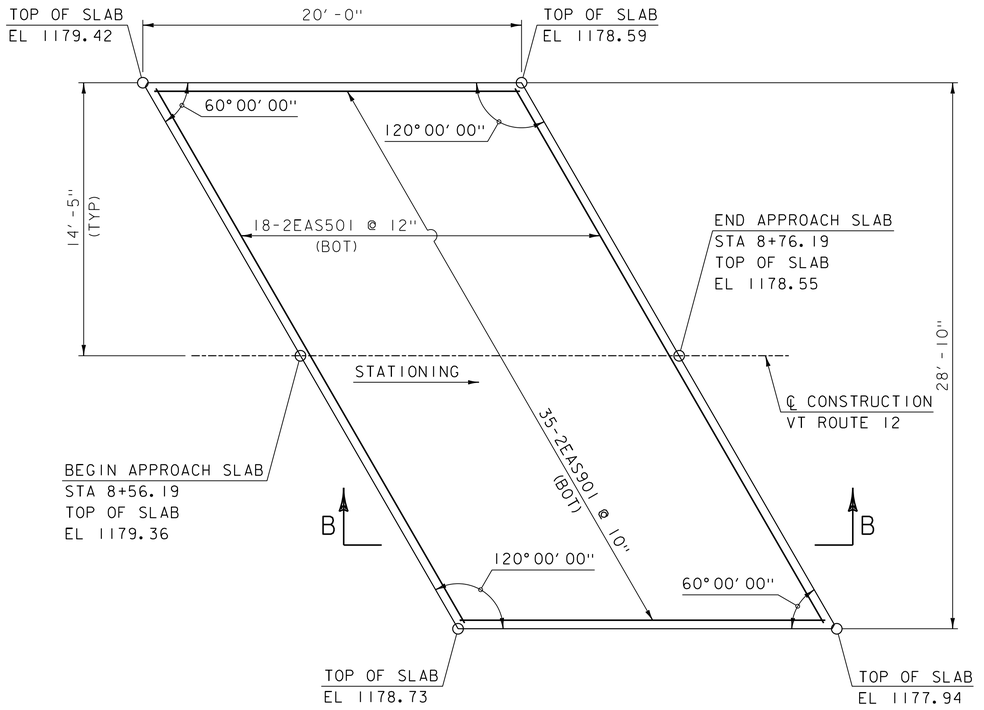
APPROACH SLAB NO. 1 PLAN

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



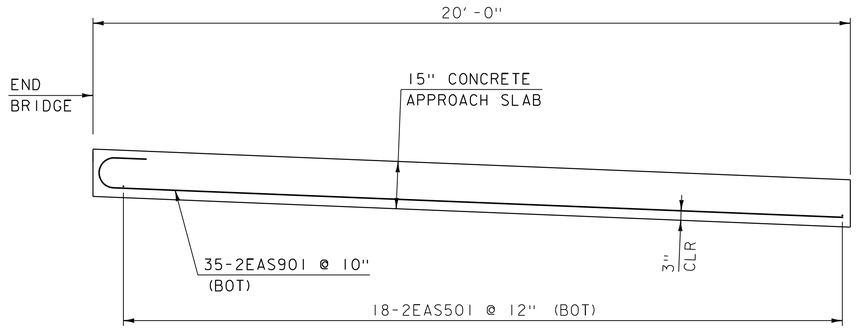
SECTION A-A

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



APPROACH SLAB NO. 2 PLAN

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

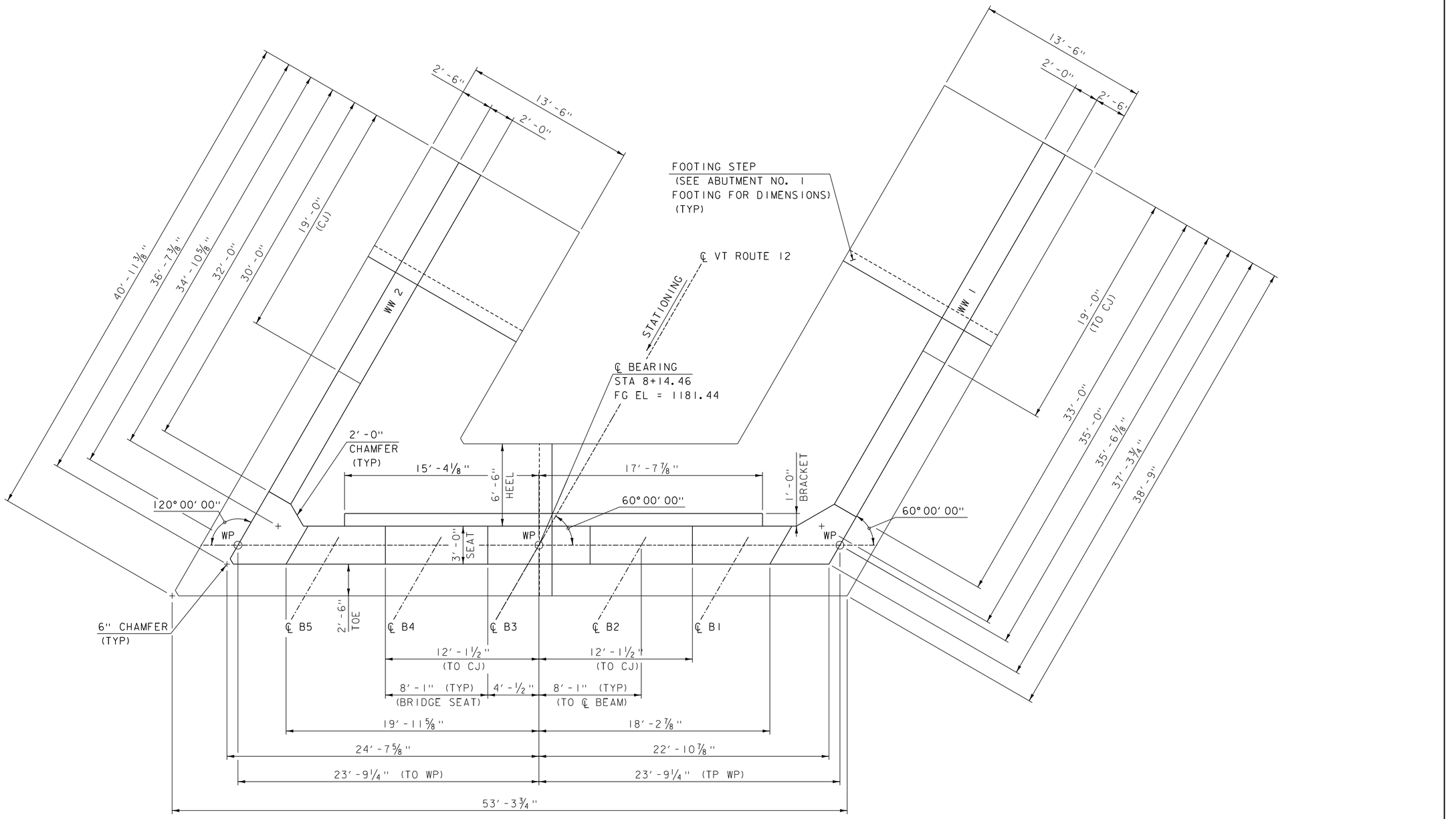


SECTION B-B

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003app.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
APPROACH SLAB DETAILS	SHEET 268 OF 370

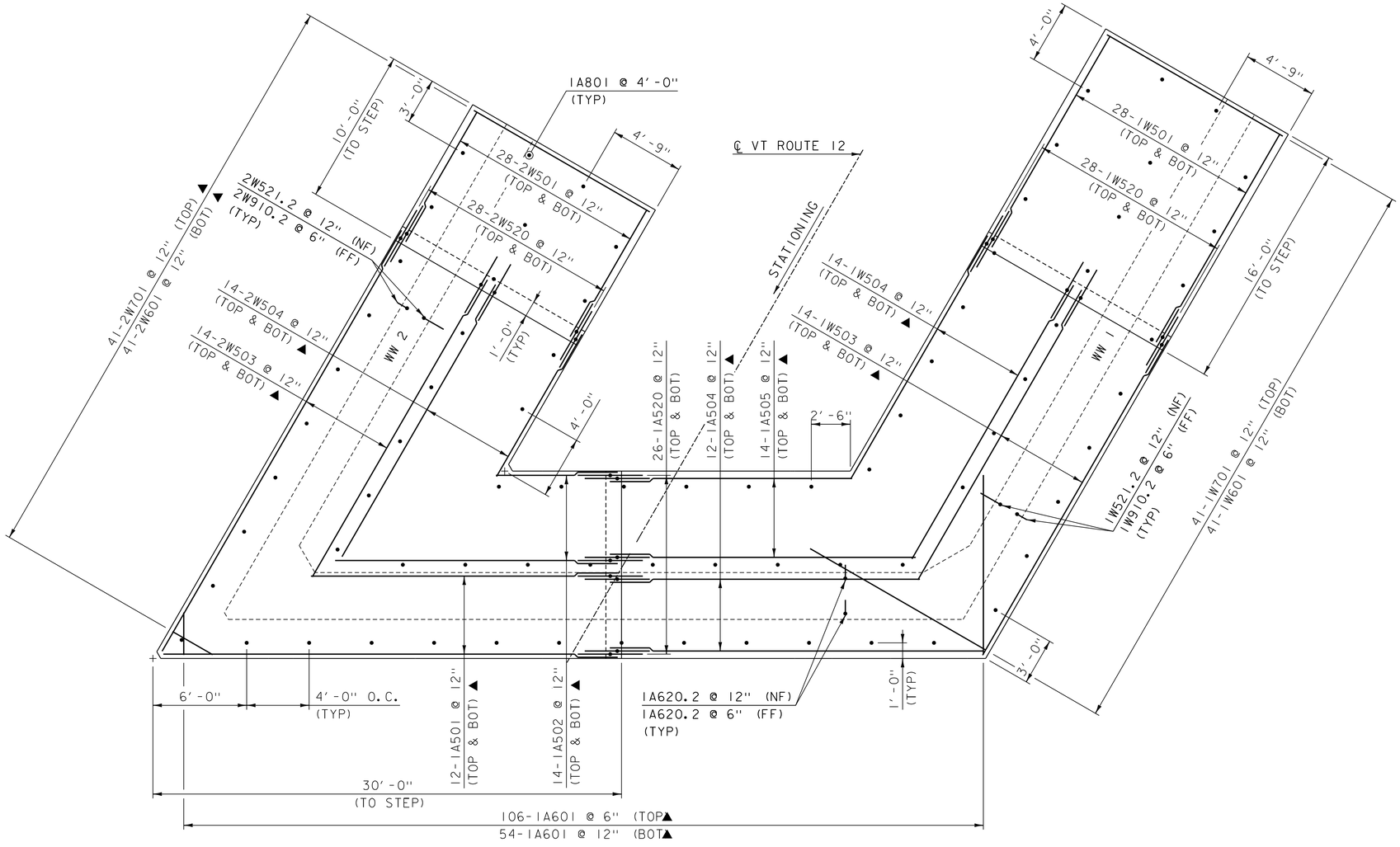


ABUTMENT NO. 1 PLAN

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003subl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
ABUTMENT NO. 1 PLAN	SHEET 269 OF 370



ABUTMENT NO. 1 FOOTING PLAN

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

NOTES

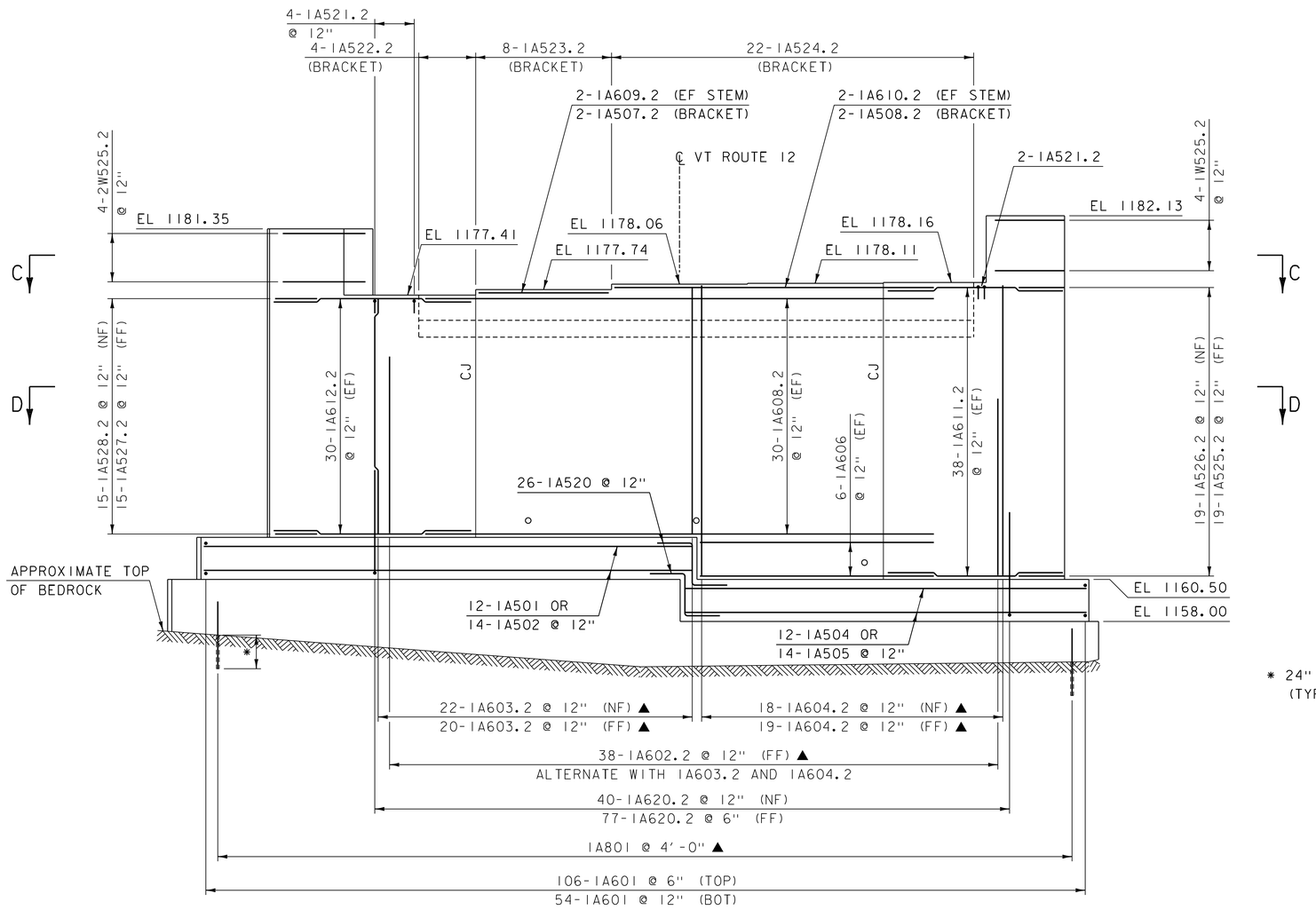
1. 3" CLEAR UNLESS SPECIFIED ON PLANS.
2. SUBFOOTING GEOMETRY SHALL BE DETERMINED IN THE FIELD ONCE COMPETENT BEDROCK HAS BEEN EXPOSED.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

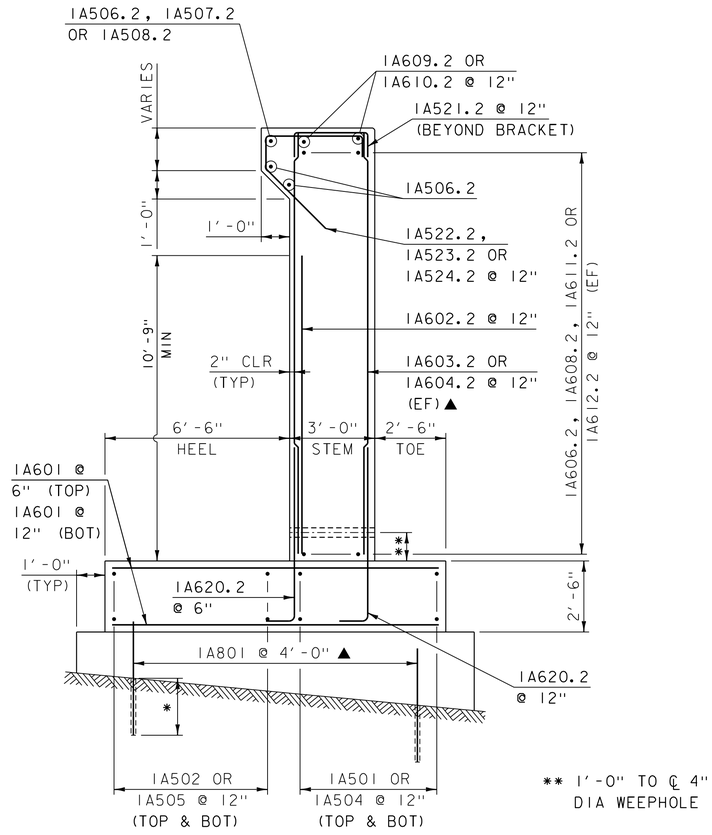
FILE NAME: z18b003sub2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO.1 FOOTING

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 270 OF 370



ABUTMENT NO. 1 ELEVATION

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



ABUTMENT NO. 1 TYPICAL SECTION

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

* 24" EMBEDMENT (TYP)

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

NOTES

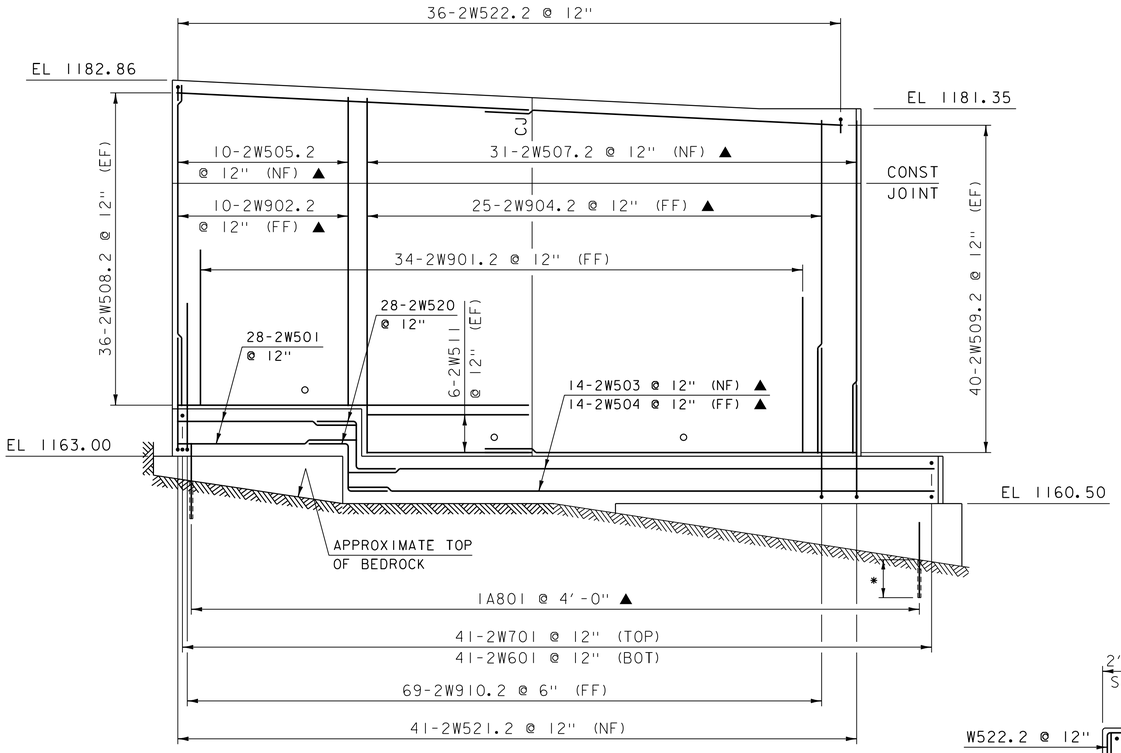
1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 1 FOOTING REINFORCING SHEET. FOR WINGWALL DETAILS SEE ABUTMENT NO. 1 WINGWALL SHEET. FOR SECTIONS C-C AND D-D, SEE ABUTMENT NO. 1 DETAILS SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

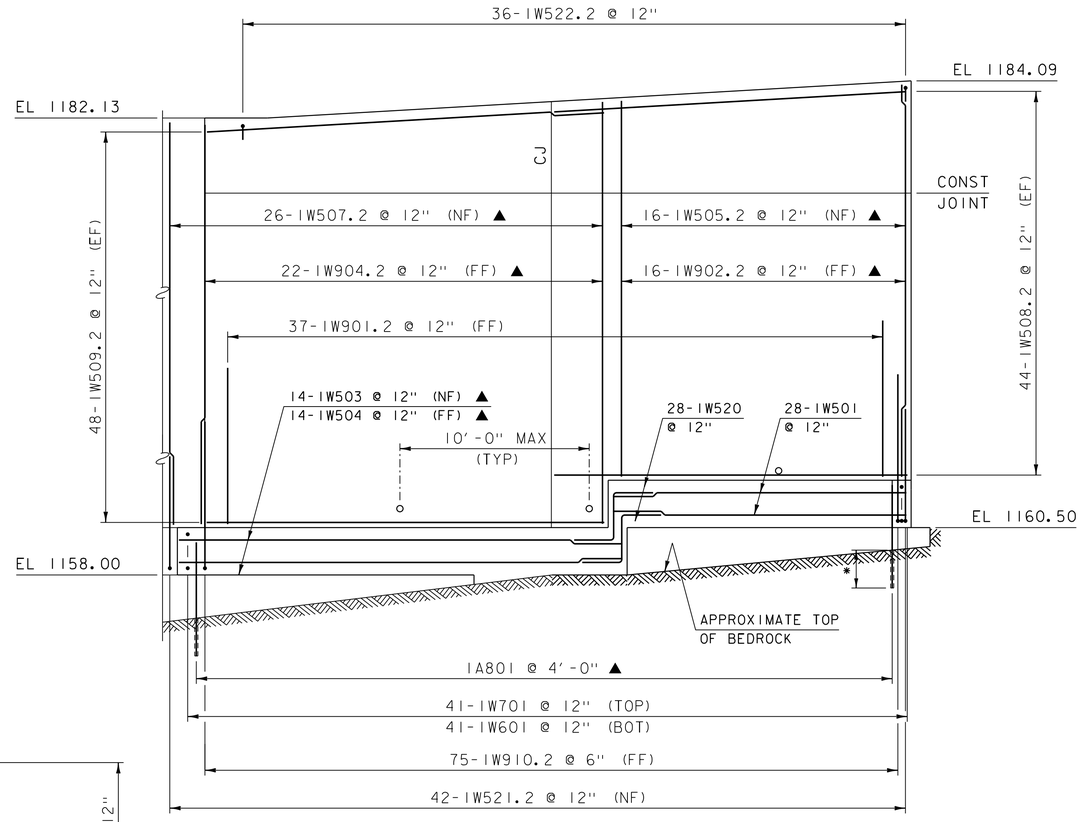
FILE NAME: z18b003subl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO.1 ELEVATION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 271 OF 370



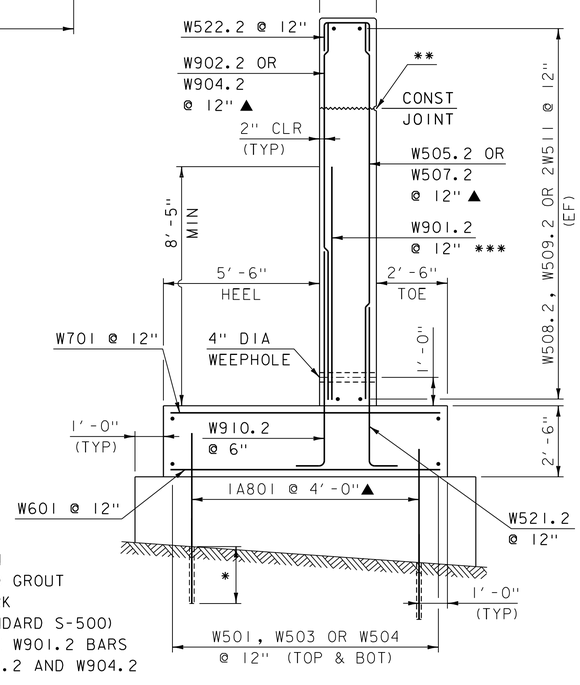
WINGWALL NO. 2 ELEVATION

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



WINGWALL NO. 1 ELEVATION

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



* 2'-0" MIN DRILL AND GROUT

** SCORE MARK (SEE STANDARD S-500)

*** ALTERNATE W901.2 BARS WITH W902.2 AND W904.2 BARS

WINGWALL TYPICAL SECTION

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 1 FOOTING REINFORCING SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

LEGEND

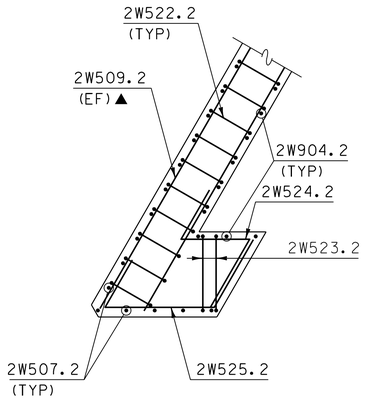
NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

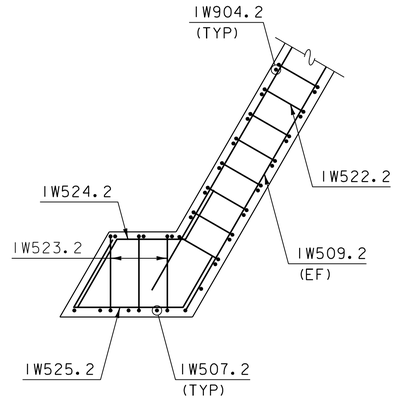
HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003sub3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 1 WINGWALLS

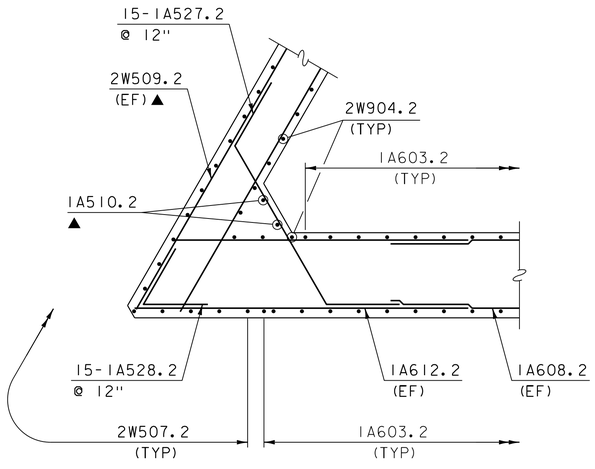
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 272 OF 370

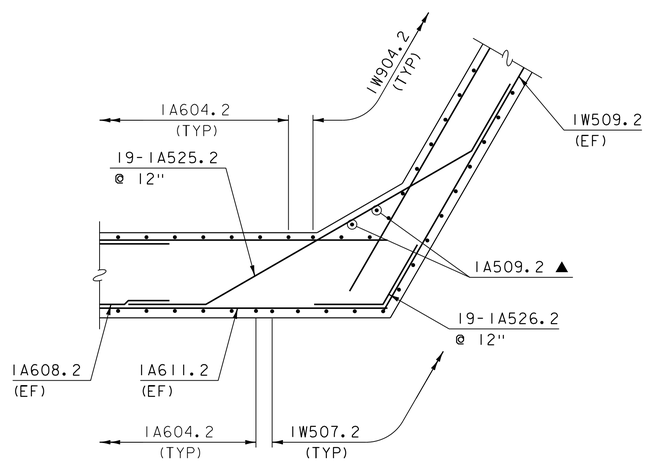




SECTION C-C

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





SECTION D-D

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR LOCATION OF SECTIONS C-C AND D-D, SEE ABUTMENT NO. 1 ELEVATION SHEET.

LEGEND

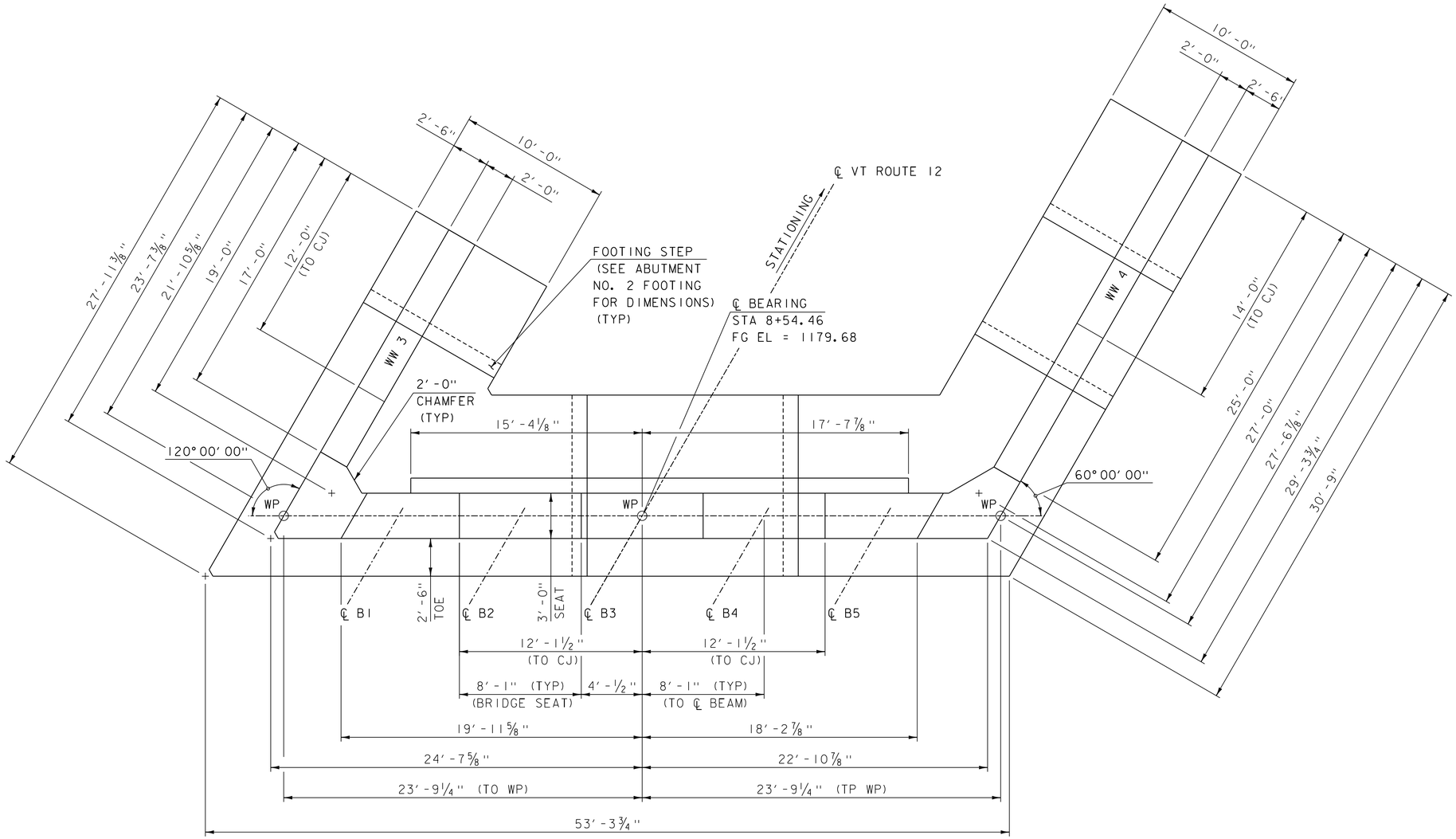
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003sub4.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 1 DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 273 OF 370



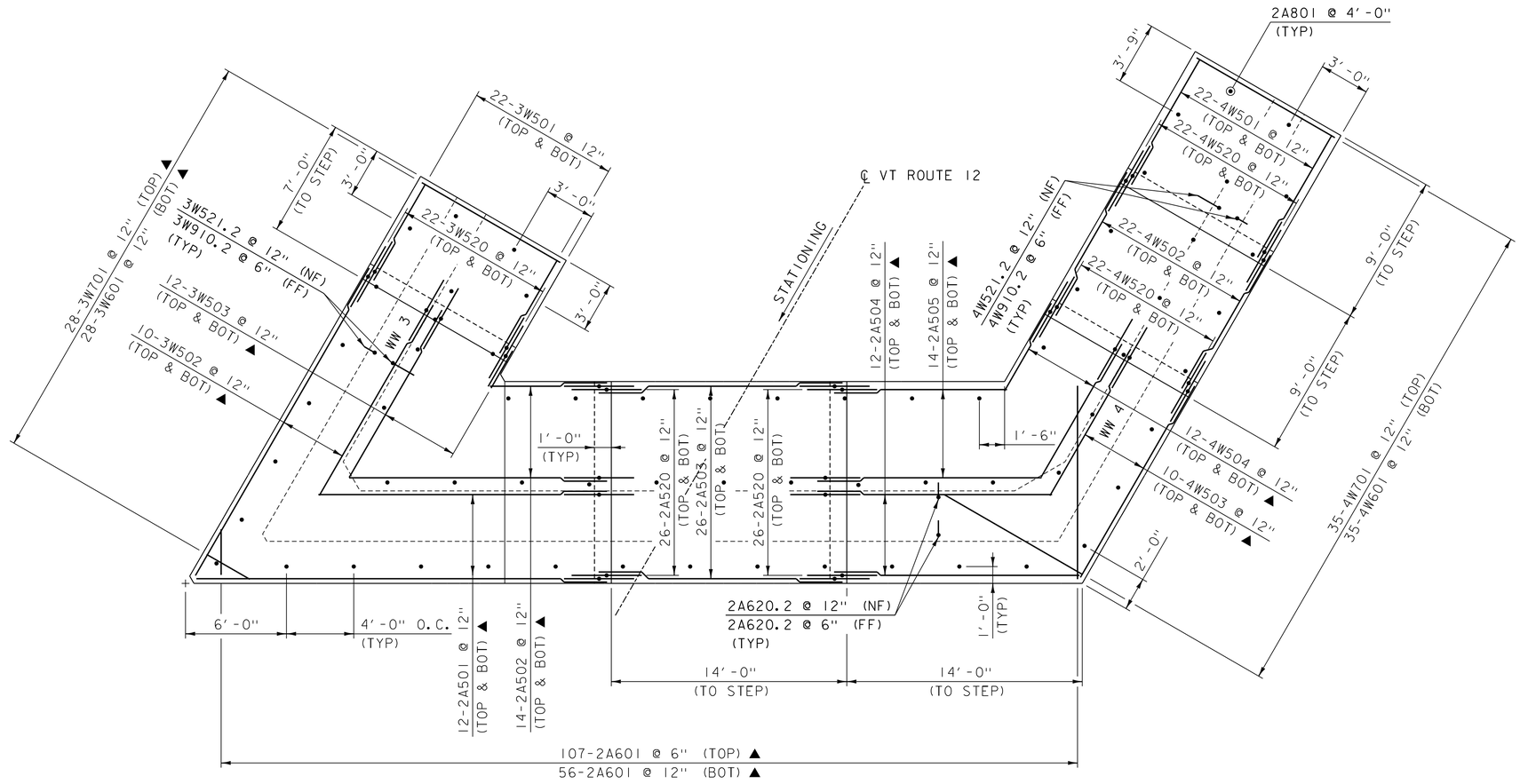
ABUTMENT NO. 2 PLAN

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: zl8b003sub5.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
ABUTMENT NO. 2 PLAN	SHEET 274 OF 370



ABUTMENT NO. 2 FOOTING PLAN

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

NOTES

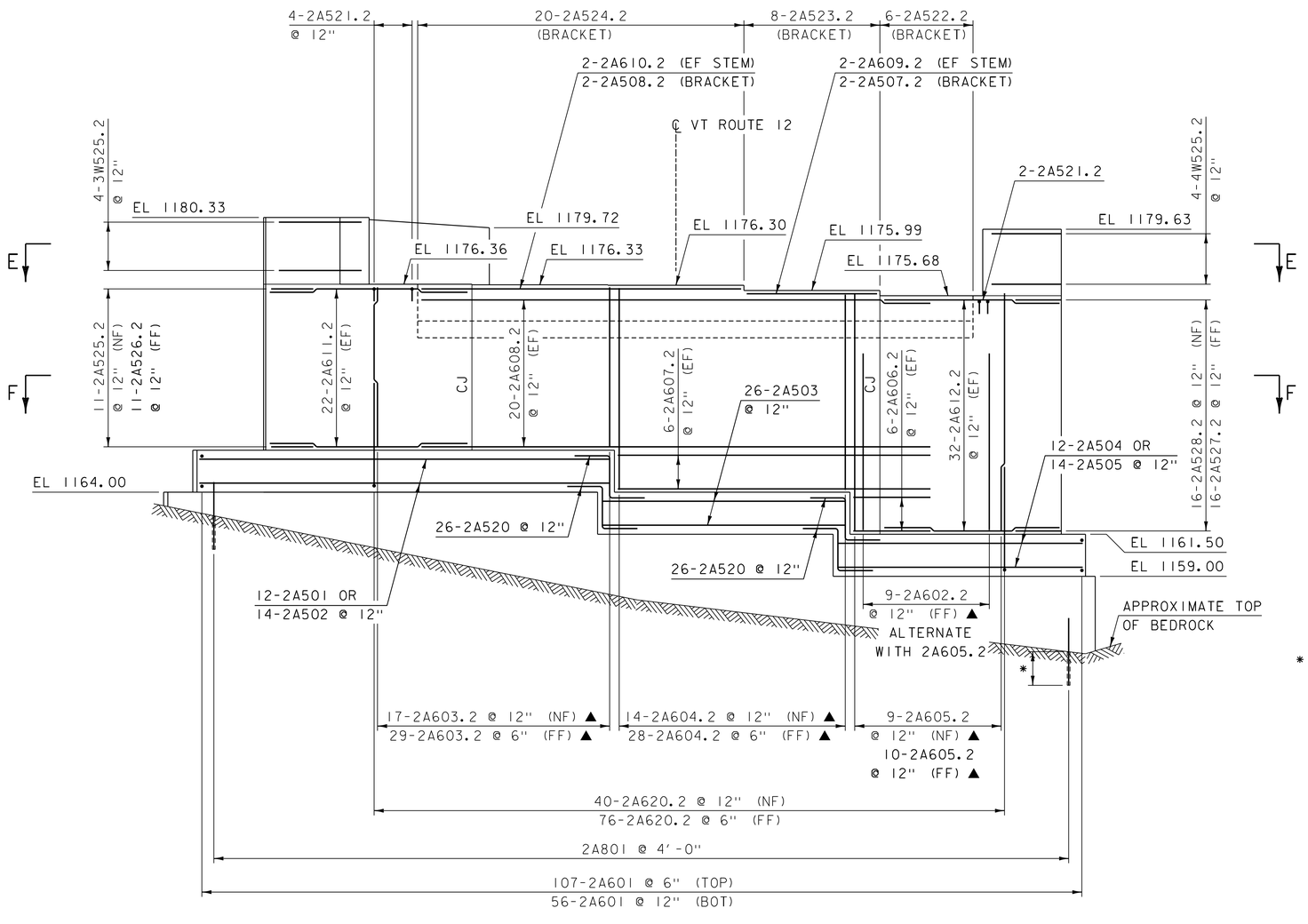
1. 3" CLEAR UNLESS SPECIFIED ON PLANS.
2. SUBFOOTING GEOMETRY SHALL BE DETERMINED IN THE FIELD ONCE COMPETENT BEDROCK HAS BEEN EXPOSED.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003sub6.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 2 FOOTING

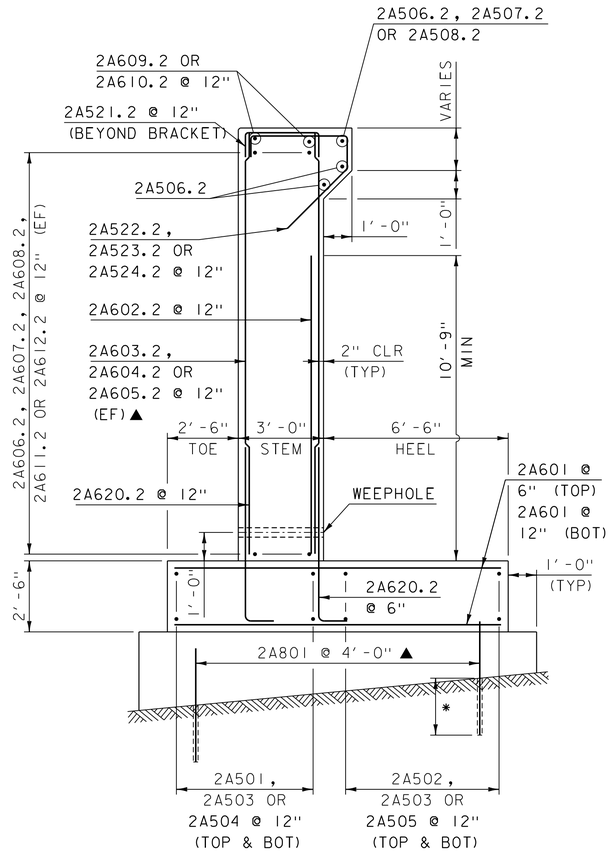
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 275 OF 370



ABUTMENT NO. 2 ELEVATION

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

* 24" EMBEDMENT (TYP)



ABUTMENT NO. 2 TYPICAL SECTION

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

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 2 FOOTING REINFORCING SHEET. FOR WINGWALL DETAILS SEE ABUTMENT NO.2 WINGWALL SHEET. FOR KEEPER BLOCK DETAILS, SEE ABUTMENT NO. 2 DETAILS SHEET. FOR SECTIONS E-E AND F-F SEE ABUTMENT NO. 2 DETAILS SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

LEGEND

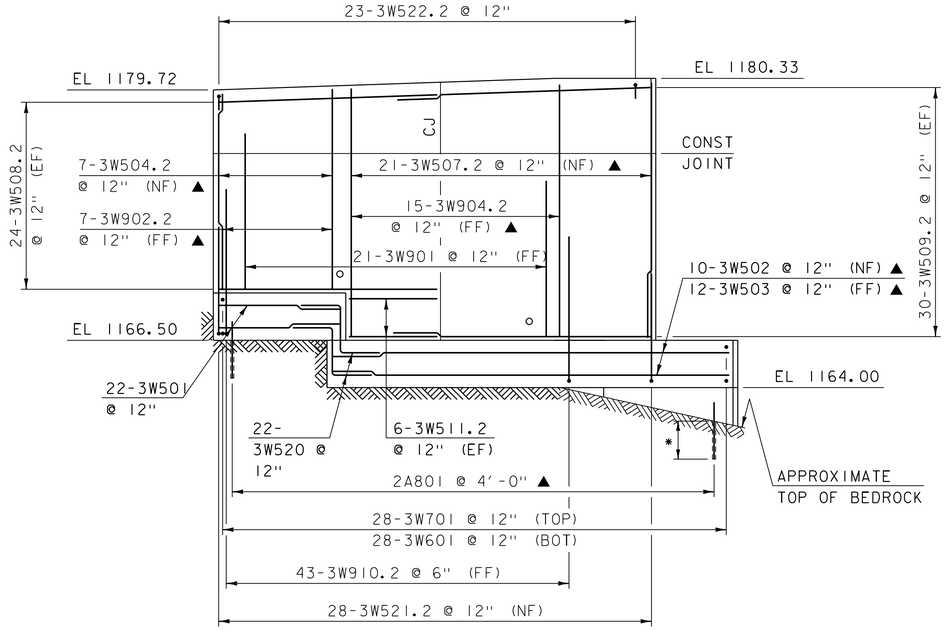
NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

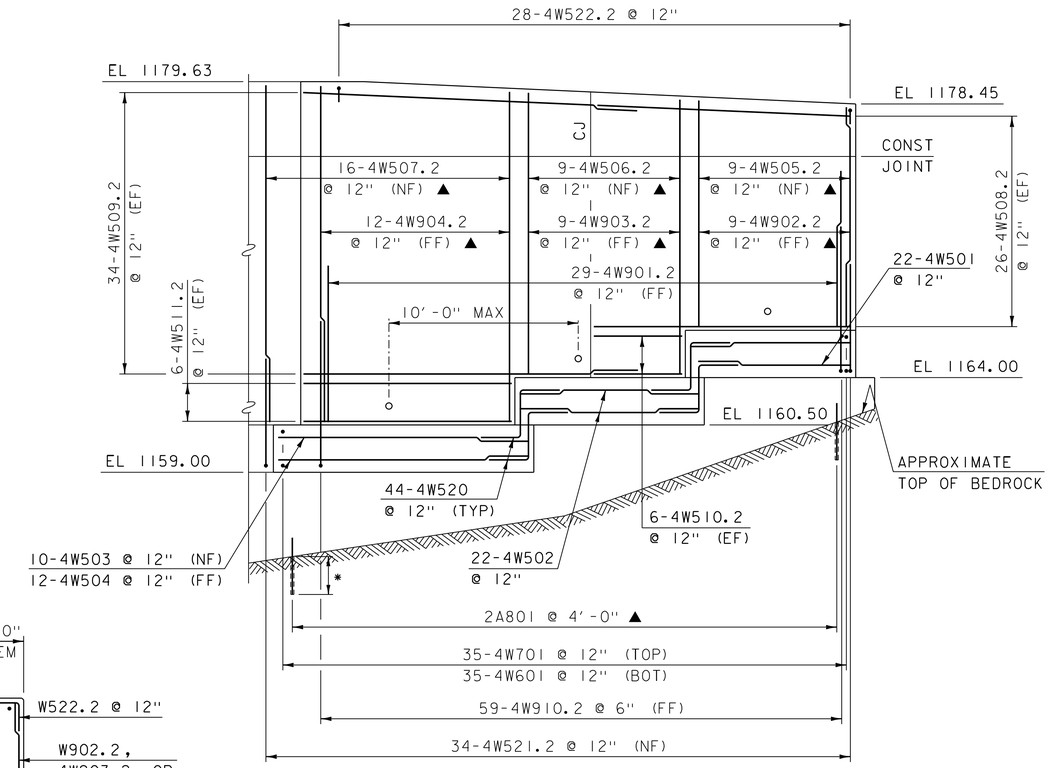
FILE NAME: zl8b003sub5.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 2 ELEVATION

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 276 OF 370



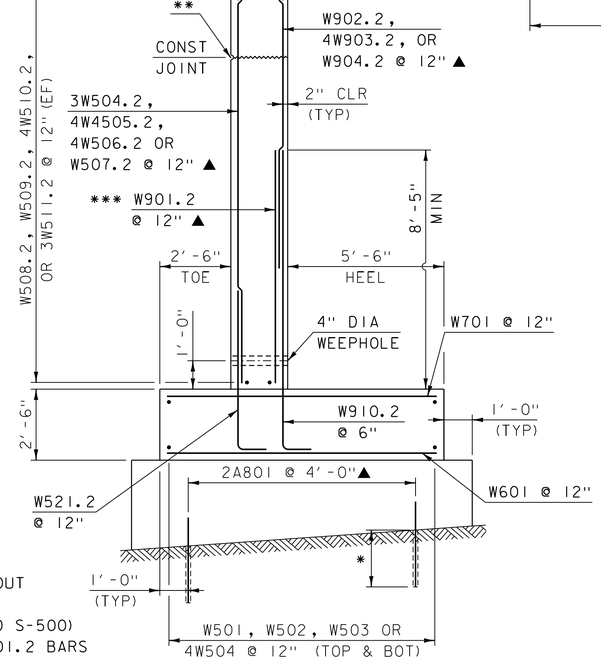
WINGWALL NO. 3 ELEVATION

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



WINGWALL NO. 4 ELEVATION

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



* 2'-0" MIN DRILL AND GROUT
** SCORE MARK (SEE STANDARD S-500)
*** ALTERNATE W901.2 BARS WITH W902.2, W902.3 AND W904.2 BARS

WINGWALL TYPICAL SECTION

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR FOOTING REINFORCING SEE ABUTMENT NO. 2 FOOTING REINFORCING SHEET.
3. VERTICAL CONTRACTION JOINTS WHERE SHOWN ON ELEVATIONS SHALL INCLUDE SCORE MARKS (SEE STANDARD S-500) AT BOTH FACES OF WALL.
4. SUBFOOTING SHALL HAVE A ROUGHENED SURFACE. SUBFOOTING SHALL HAVE A MINIMUM THICKNESS OF 6".

LEGEND

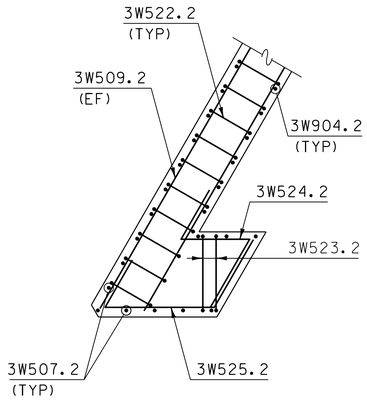
NF= NEAR FACE
FF= FAR FACE
EF= EACH FACE
▲= CUT TO FIT IN FIELD
CJ= CONTRACTION JOINT

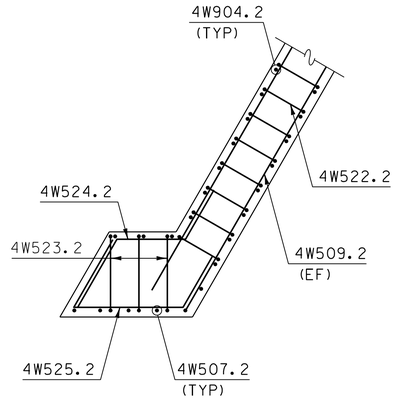
HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003sub7.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 2 WINGWALLS

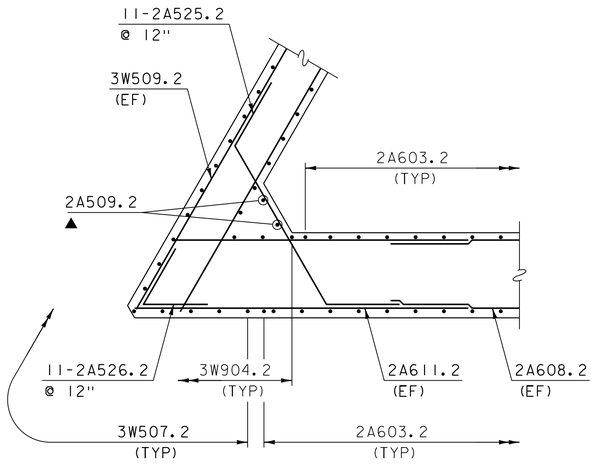
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 277 OF 370

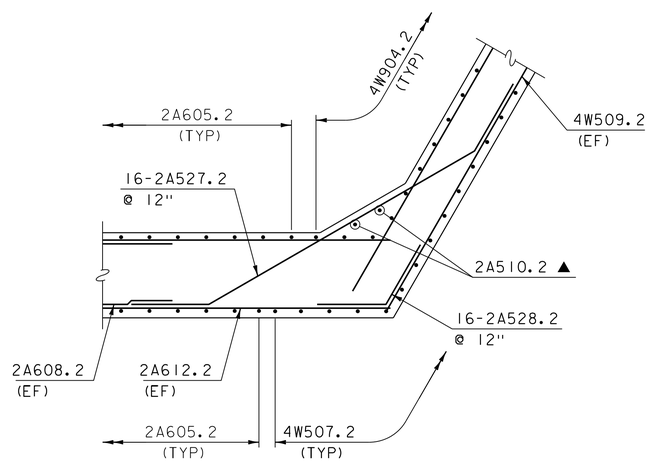




SECTION E-E

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





SECTION F-F

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

REINFORCING LAP LENGTHS	
BAR SIZE	LAP LENGTH
#5	2'-2"
#6	2'-7"
#7	3'-0"
#9	4'-2"

NOTES

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. FOR LOCATION OF SECTIONS E-E AND F-F, SEE ABUTMENT NO. 2 ELEVATION SHEET.

LEGEND

NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003sub8.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
ABUTMENT NO. 2 DETAILS

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 278 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

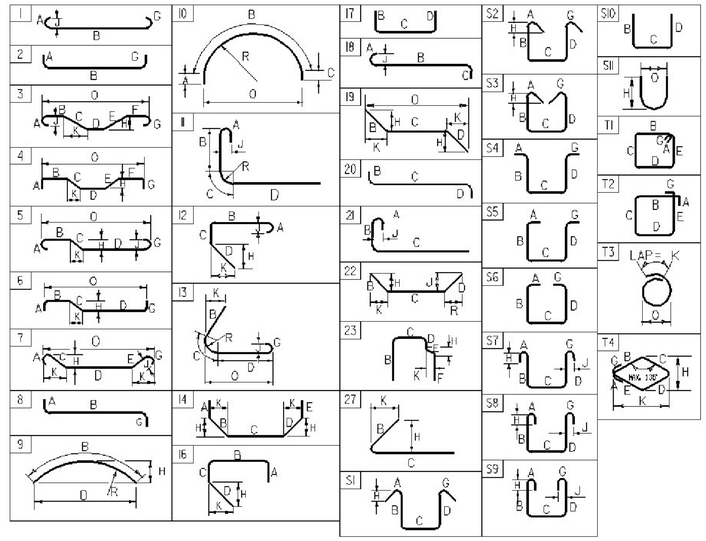
REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
DECK																	
▲	143	5	32'- 6"	S501.2	STR	32'- 6"											
	140	5	22'- 6"	S502.2	STR	22'- 6"											
	24	5	22'- 6"	S503.2	STR	22'- 6"											
	8	5	37'- 6"	S504.2	STR	37'- 6"											
	4	5	37'- 6"	S505.2	STR	37'- 6"											
	4	5	21'- 0"	S506.2	STR	21'- 0"											
	4	5	18'- 8"	S507.2	STR	18'- 8"											
	8	5	5'- 6"	S508.2	STR	5'- 6"											
✳	8	5	7'- 6"	S509.2	STR	7'- 6"											
	6	5	32'- 6"	S510.2	STR	32'- 6"											
	4	5	2'- 9"	S511.2	STR	2'- 9"											
	4	5	7'- 6"	S512.2	STR	7'- 6"											
	4	5	21'- 2"	S513.2	STR	21'- 2"											
	122	5	5'- 1"	S520.2	S5	0'- 10"	1'- 0"	1'- 5"	1'- 0"				0'- 10"				
	24	5	9'- 8"	S521.2	S2	2'- 0"	2'- 6"	0'- 11"	2'- 3"				2'- 0"	0'- 1"			
	15	5	4'- 8"	S522.2	27		2'- 0"	2'- 8"							0'- 1"		
	4	5	10'- 0"	S523.2	S2	2'- 0"	2'- 8"	0'- 11"	2'- 5"				2'- 0"	0'- 1"			
	32	5	4'- 5"	S524.2	S10		1'- 2"	2'- 1"	1'- 2"								
	26	5	3'- 7"	S525.2	S10		1'- 2"	1'- 3"	1'- 2"								
	24	5	9'- 7"	S526.2	S2	2'- 0"	2'- 5"	0'- 11"	2'- 3"				2'- 0"	0'- 1"	<>		
	15	5	4'- 4"	S527.2	19		2'- 0"	2'- 4"	---						0'- 1"		
	4	5	9'- 11"	S528.2	S2	2'- 0"	2'- 7"	0'- 11"	2'- 5"				2'- 0"	0'- 1"	<>		
	32	5	3'- 9"	S529.2	S10		0'- 10"	2'- 1"	0'- 10"								
	26	5	2'- 11"	S530.2	S10		0'- 10"	1'- 3"	0'- 10"								
	6	5	4'- 6"	S531.2	27		1'- 0"	3'- 6"					0'- 10"		0'- 6"		
	6	5	2'- 0"	S532.2	19		1'- 0"	1'- 0"	---				0'- 10"		0'- 6"		
	162	6	5'- 5"	S601.2	3	0'- 8"	1'- 9"	---	---	3'- 0"	---	---	0'- 1"				
	28	8	2'- 6"	S801.2	19		1'- 1"	1'- 5"	---				0'- 9"		0'- 10"		
APPROACH SLAB NO. 1																	
	18	5	32'- 8"	1EAS501	STR	32'- 8"											
	35	9	20'- 11"	1EAS901	1	1'- 4"	19'- 7"										
APPROACH SLAB NO. 2																	
✳	18	5	32'- 8"	2EAS501	STR	32'- 8"											
	35	9	20'- 11"	2EAS901	1	1'- 4"	19'- 7"										
ABUTMENT NO. 1																	
	12	5	29'- 1"	1A501	STR	29'- 1"											
	14	5	18'- 1"	1A502	STR	18'- 1"											
	12	5	23'- 11"	1A504	STR	23'- 11"											
	14	5	19'- 7"	1A505.2	STR	19'- 7"											
	3	5	32'- 8"	1A506.2	STR	32'- 8"											
	1	5	7'- 9"	1A507.2	STR	7'- 9"											
	1	5	21'- 4"	1A508.2	STR	21'- 4"											
▲	2	5	19'- 3"	1A509.2	STR	19'- 3"											
▲	2	5	16'- 0"	1A510.2	STR	16'- 0"											
	26	5	6'- 8"	1A520.2	20		2'- 1"	2'- 6"	2'- 1"								
	6	5	4'- 3"	1A521.2	17		0'- 10"	2'- 7"	0'- 10"								
	4	5	8'- 7"	1A522.2	16	0'- 10"	3'- 7"	1'- 2"	3'- 0"					2'- 1"		2'- 1"	
	8	5	8'- 11"	1A523.2	16	0'- 10"	3'- 7"	1'- 6"	3'- 0"					2'- 1"		2'- 1"	
	22	5	9'- 3"	1A524.2	16	0'- 10"	3'- 7"	1'- 10"	3'- 0"					2'- 1"		2'- 1"	
	19	5	16'- 4"	1A525.2	22		2'- 6"	11'- 4"	2'- 6"					1'- 3"	1'- 3"	2'- 2"	2'- 2"
	19	5	5'- 0"	1A526.2	27		2'- 6"	2'- 6"						2'- 2"		1'- 3"	<>
	15	5	11'- 9"	1A527.2	22		2'- 6"	6'- 9"	2'- 6"					2'- 2"	2'- 2"	1'- 3"	1'- 3"
	15	5	5'- 0"	1A528.2	27		2'- 6"	2'- 6"						2'- 2"		1'- 3"	
	160	6	11'- 6"	1A601	STR	11'- 6"											
	38	6	12'- 6"	1A602.2	STR	12'- 6"											
▲	42	6	16'- 8"	1A603.2	STR	16'- 8"											
▲	37	6	19'- 3"	1A604.2	STR	19'- 3"											
	6	6	13'- 11"	1A606.2	STR	13'- 11"											
	30	6	30'- 3"	1A608.2	STR	30'- 3"											
	2	6	7'- 9"	1A609.2	STR	7'- 9"											
	2	6	19'- 0"	1A610.2	STR	19'- 0"											
	38	6	10'- 5"	1A611.2	STR	10'- 5"											
	30	6	11'- 9"	1A612.2	STR	11'- 9"											
	117	6	7'- 3"	1A620.2	2	1'- 0"	6'- 3"										
	71	8	4'- 0"	1A801	STR	4'- 0"											

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
WINGWALL 1																	
	28	5	15'- 6"	1W501	STR	15'- 6"											
	14	5	23'- 5"	1W503	STR	23'- 5"											
	14	5	20'- 3"	1W504	STR	20'- 3"											
▲	16	5	22'- 7"	1W505.2	STR	22'- 7"											
▲	26	5	24'- 2"	1W507.2	STR	24'- 2"											
	44	5	18'- 7"	1W508.2	STR	18'- 7"											
	48	5	21'- 0"	1W509.2	STR	21'- 0"											
	28	5	6'- 8"	1W520.2	20		2'- 1"	2'- 6"	2'- 1"								
	42	5	6'- 7"	1W521.2	2	0'- 10"	5'- 9"					---					
	36	5	3'- 3"	1W522.2	17		0'- 10"	1'- 7"	0'- 10"								
	3	5	4'- 2"	1W523.2	17		0'- 10"	2'- 6"	0'- 10"								
	4	5	7'- 11"	1W524.2	19		2'- 9"	2'- 5"	2'- 9"						1'- 5"		
	4	5	9'- 6"	1W525.2	22		2'- 9"	4'- 0"	2'- 9"						1'- 5"	1'- 5"	<>
	41	6	13'- 0"	1W601	STR	13'- 0"											
✳	41	7	13'- 0"	1W701	STR	13'- 0"											
	37	9	10'- 3"	1W901.2	STR	10'- 3"											
▲	16	9	22'- 7"	1W902.2	STR	22'- 7"											
▲	22	9	24'- 2"	1W904.2	STR	24'- 2"											
	75	9	9'- 4"	1W910.2	2	1'- 7"	7'- 9"										
WINGWALL 2																	
	28	5	9'- 6"	2W501	STR	9'- 6"											
	14	5	31'- 0"	2W503	STR	31'- 0"											
	14	5	20'- 0"	2W504	STR	20'- 0"											
▲	10	5	18'- 11"	2W505.2	STR	18'- 11"											
▲	31	5	20'- 11"	2W507.2	STR	20'- 11"											
	36	5	18'- 7"	2W508.2	STR	18'- 7"											
	40	5	19'- 7"	2W509.2	STR	19'- 7"											
	6	5	8'- 7"	2W511.2	STR	8'- 7"											
	28	5	6'- 8"	2W520.2	20		2'- 1"	2'- 6"	2'- 1"								
	41	5	6'- 7"	2W521.2	2	0'- 10"	5'- 9"					---					
	36	5	3'- 3"	2W522.2	17		0'- 10"	1'- 7"	0'- 10"								
	2	5	4'- 2"	2W523.2	17		0'- 10"	2'- 6"	0'- 10"								
	4	5	7'- 11"	2W524.2	19		2'- 9"	2'- 5"	2'- 9"						1'- 5"		<>
	4	5	9'- 6"	2W525.2	22		2'- 9"	4'- 0"	2'- 9"						1'- 5"	1'- 5"	<>
	41	6	13'- 0"	2W601	STR	13'- 0"											
	41	7	13'- 0"	2W701	STR	13'- 0"											
	34	9	10'- 3"	2W901.2	STR	10'- 3"											
▲	10	9	18'- 11"	2W902.2	STR	18'- 11"											
▲	25	9	20'- 11"	2W904.2	STR	20'- 11"											
	69	9	9'- 4"	2W910.2	2	1'- 7"	7'- 9"										

~ NOTES ~

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



ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION		
		DIAMETER INCHES	AREA INCHES 2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.04	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.14
#9	3.400	1.13	1.00	3.54
#10	4.3	1.270	1.27	3.990
#11	5.31	1.410	1.56	4.430
#14	7.65	1.69	2.25	5.32
#18	13.60	2.26	4.00	7.09

~ REINFORCING STEEL CORROSION RESISTANCE LEVEL ~

THE REINFORCING STEEL MARKS IN THIS SCHEDULE INDICATE THE REQUIRED BAR CORROSION RESISTANCE LEVEL. CORROSION RESISTANCE LEVEL IS DENOTED WITH A .2 FOR LEVEL TWO SUFFIX OR .3 FOR LEVEL THREE SUFFIX. .1 FOR LEVEL ONE IS TO BE OMITTED. THE BAR MATERIAL TYPE AND BAR STEEL GRADE PROVIDED FOR EACH CORROSION LEVEL WILL BE RECORDED ON THE PLAN SET PI SHEET FOR AS-BUILT RECORD PLAN ARCHIVES.

<> INDICATES DIMENSION IN OPPOSITE DIRECTION OF WHAT IS SHOWN IN THE BEND DIAGRAM

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003reinf.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
REINFORCING STEEL SCHEDULE I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 279 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

ABUTMENT NO. 2

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	12	5	24'- 5"	2A501	STR	24'- 5"											
	14	5	15'- 3"	2A502	STR	15'- 3"											
	26	5	14'- 6"	2A503	STR	14'- 6"											
	12	5	14'- 7"	2A504	STR	14'- 7"											
	14	5	12'- 4"	2A505	STR	12'- 4"											
	3	5	32'- 8"	2A506.2	STR	32'- 8"											
	2	5	7'- 9"	2A507.2	STR	7'- 9"											
	2	5	21'- 4"	2A508.2	STR	21'- 4"											
▲	2	5	11'- 6"	2A509.2	STR	11'- 6"											
▲	2	5	15'- 10"	2A510.2	STR	15'- 10"											
	52	5	6'- 8"	2A520.2	20		2'- 1"	2'- 6"	2'- 1"								
	6	5	4'- 3"	2A521.2	17		0'- 10"	2'- 7"	0'- 10"								
	6	5	8'- 7"	2A522.2	16	0'- 10"	3'- 7"	1'- 2"	3'- 0"				2'- 1"		2'- 1"		
	8	5	8'- 11"	2A523.2	16	0'- 10"	3'- 7"	1'- 6"	3'- 0"				2'- 1"		2'- 1"		
	20	5	9'- 3"	2A524.2	16	0'- 10"	3'- 7"	1'- 10"	3'- 0"				2'- 1"		2'- 1"		
	11	5	11'- 9"	2A525.2	22		2'- 6"	6'- 9"	2'- 6"				2'- 2"	2'- 2"	1'- 3"	1'- 3"	
	11	5	5'- 0"	2A526.2	27		2'- 6"	2'- 6"					2'- 2"		1'- 3"		
	16	5	16'- 4"	2A527.2	22		2'- 6"	11'- 4"	2'- 6"				1'- 3"	1'- 3"	2'- 2"	2'- 2"	
	16	5	5'- 0"	2A528.2	27		2'- 6"	2'- 6"					2'- 2"		1'- 3"	<>	
	163	6	11'- 6"	2A601	STR	11'- 6"											
	9	6	12'- 6"	2A602.2	STR	12'- 6"											
▲	46	6	11'- 6"	2A603.2	STR	11'- 6"											
▲	42	6	14'- 0"	2A604.2	STR	14'- 0"											
▲	19	6	16'- 2"	2A605.2	STR	16'- 2"											
	6	6	4'- 7"	2A606.2	STR	4'- 7"											
	6	6	18'- 7"	2A607.2	STR	18'- 7"											
	20	6	30'- 3"	2A608.2	STR	30'- 3"											
	2	6	7'- 9"	2A609.2	STR	7'- 9"											
	2	6	19'- 0"	2A610.2	STR	19'- 0"											
	22	6	11'- 9"	2A611.2	STR	11'- 9"											
	32	6	10'- 5"	2A612.2	STR	10'- 5"											
	116	6	7'- 3"	2A620.2	2	1'- 0"	6'- 3"										
	60	8	4'- 0"	2A801	STR	4'- 0"											

WINGWALL 3

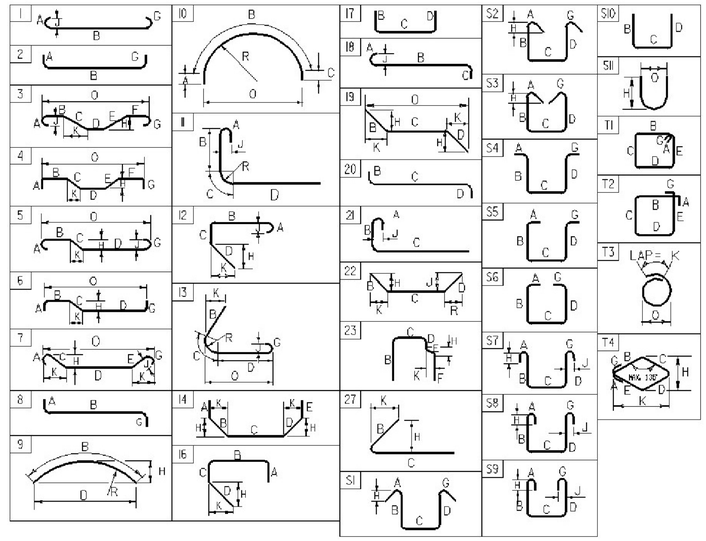
ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	22	5	6'- 6"	3W501	STR	6'- 6"											
	10	5	21'- 0"	3W502	STR	21'- 0"											
	12	5	11'- 4"	3W503	STR	11'- 4"											
▲	7	5	12'- 7"	3W504.2	STR	12'- 7"											
▲	21	5	15'- 6"	3W507.2	STR	15'- 6"											
	24	5	11'- 7"	3W508.2	STR	11'- 7"											
	30	5	13'- 7"	3W509.2	STR	13'- 7"											
	6	5	4'- 8"	3W511.2	STR	4'- 8"											
	22	5	6'- 8"	3W520.2	20		2'- 1"	2'- 6"	2'- 1"								
	28	5	6'- 7"	3W521.2	2	0'- 10"	5'- 9"					---					
	23	5	3'- 3"	3W522.2	17		0'- 10"	1'- 7"	0'- 10"								
	2	5	4'- 2"	3W523.2	17		0'- 10"	2'- 6"	0'- 10"								
	4	5	7'- 11"	3W524.2	19		2'- 9"	2'- 5"	2'- 9"				2'- 5"		1'- 5"		<>
	4	5	9'- 6"	3W525.2	22		2'- 9"	4'- 0"	2'- 9"				2'- 5"	2'- 5"	1'- 5"	1'- 5"	<>
	28	6	9'- 6"	3W601	STR	9'- 6"											
	28	7	9'- 6"	3W701	STR	9'- 6"											
	21	9	10'- 3"	3W901.2	STR	10'- 3"											
▲	7	9	12'- 7"	3W902.2	STR	12'- 7"											
▲	15	9	15'- 6"	3W904.2	STR	15'- 6"											
	43	9	9'- 4"	3W910.2	2	1'- 7"	7'- 9"										

WINGWALL 4

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	22	5	8'- 6"	4W501	STR	8'- 6"											
	22	5	9'- 6"	4W502	STR	9'- 6"											
	10	5	13'- 3"	4W503	STR	13'- 3"											
	12	5	9'- 3"	4W504	STR	9'- 3"											
▲	9	5	14'- 0"	4W505.2	STR	14'- 0"											
▲	9	2	16'- 7"	4W506.2	STR	16'- 7"											
▲	16	5	19'- 9"	4W507.2	STR	19'- 9"											
	26	5	13'- 7"	4W508.2	STR	13'- 7"											
	34	5	17'- 8"	4W509.2	STR	17'- 8"											
	6	5	4'- 8"	4W510.2	STR	4'- 8"											
	6	5	11'- 0"	4W511.2	STR	11'- 0"											
	44	5	6'- 8"	4W520.2	20		2'- 1"	2'- 6"	2'- 1"								
	34	5	6'- 7"	4W521.2	2	0'- 10"	5'- 9"					---					
	28	5	3'- 3"	4W522.2	17		0'- 10"	1'- 7"	0'- 10"								
	3	5	4'- 2"	4W523.2	17		0'- 10"	2'- 6"	0'- 10"								
	4	5	7'- 11"	4W524.2	19		2'- 9"	2'- 5"	2'- 9"				2'- 5"		1'- 5"		<>
	4	5	9'- 6"	4W525.2	22		2'- 9"	4'- 0"	2'- 9"				2'- 5"	2'- 5"	1'- 5"	1'- 5"	
	35	6	9'- 6"	4W601	STR	9'- 6"											
	35	7	9'- 6"	4W701	STR	9'- 6"											
	29	9	10'- 3"	4W901.2	STR	10'- 3"											
▲	9	9	14'- 0"	4W902.2	STR	14'- 0"											
▲	9	9	16'- 7"	4W903.2	STR	16'- 7"											
▲	12	9	19'- 9"	4W904.2	STR	19'- 9"											
	59	9	9'- 4"	4W910.2	2	1'- 7"	7'- 9"										

~ NOTES ~

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



ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION DIAMETER INCHES	AREA INCHES 2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.04	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.14
#9	3.400	1.13	1.00	3.54
#10	4.3	1.270	1.27	3.990
#11	5.31	1.410	1.56	4.430
#14	7.65	1.69	2.25	5.32
#18	13.60	2.26	4.00	7.09

~ REINFORCING STEEL CORROSION RESISTANCE LEVEL ~

THE REINFORCING STEEL MARKS IN THIS SCHEDULE INDICATE THE REQUIRED BAR CORROSION RESISTANCE LEVEL. CORROSION RESISTANCE LEVEL IS DENOTED WITH A .2 FOR LEVEL TWO SUFFIX OR .3 FOR LEVEL THREE SUFFIX. .1 FOR LEVEL ONE IS TO BE OMITTED. THE BAR MATERIAL TYPE AND BAR STEEL GRADE PROVIDED FOR EACH CORROSION LEVEL WILL BE RECORDED ON THE PLAN SET PI SHEET FOR AS-BUILT RECORD PLAN ARCHIVES.

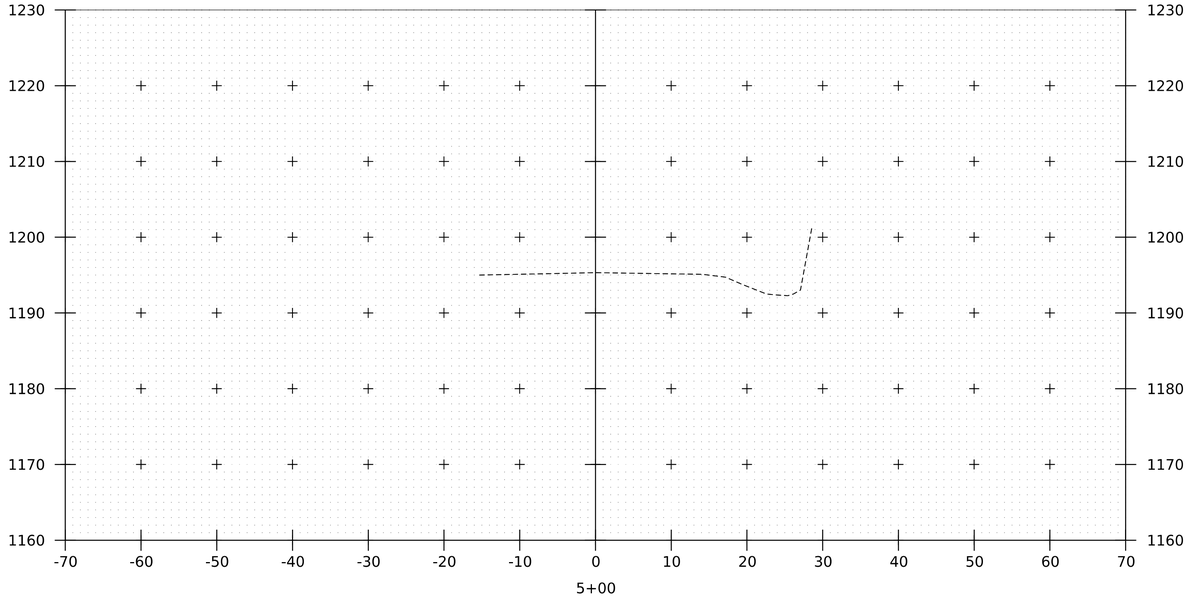
<> INDICATES DIMENSION IN OPPOSITE DIRECTION OF WHAT IS SHOWN IN THE BEND DIAGRAM

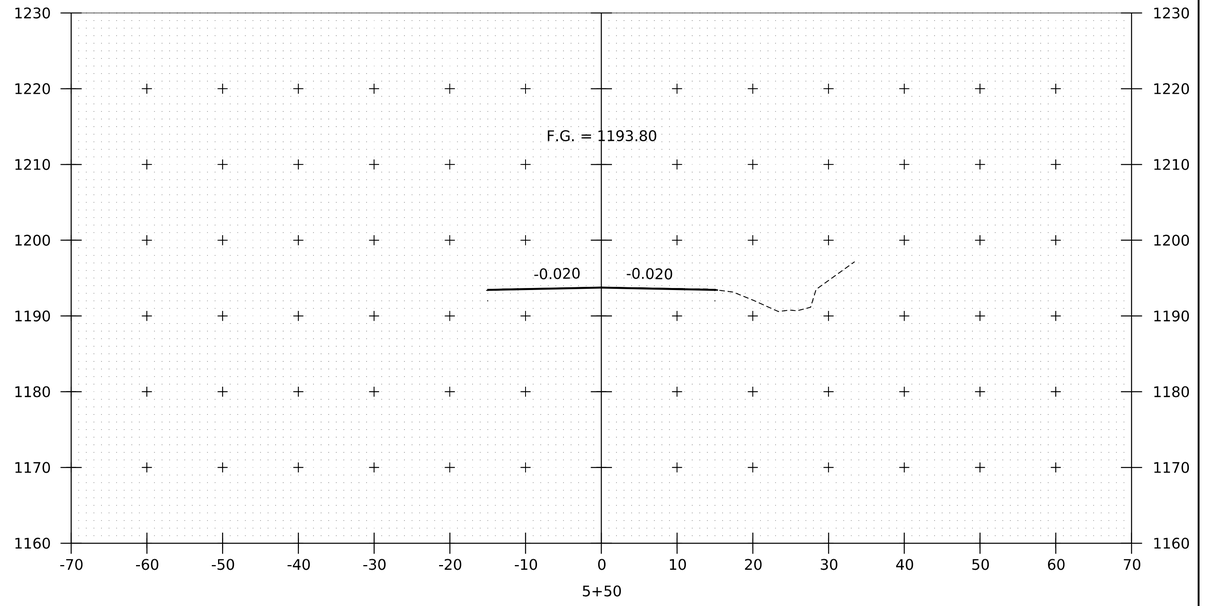
HOYLE TANNER

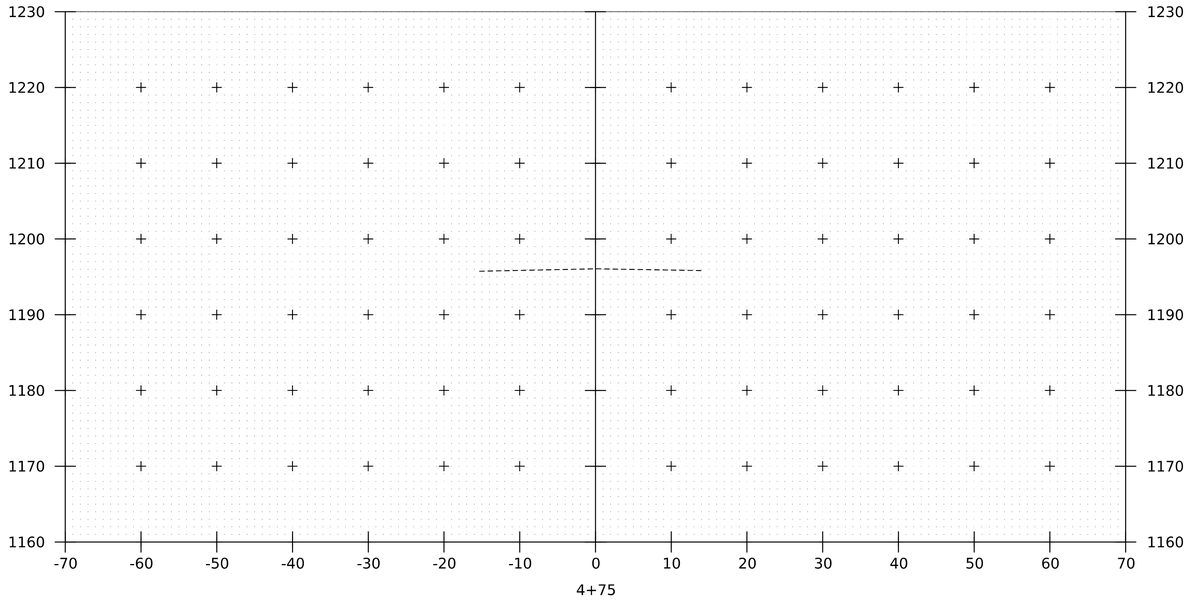
PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

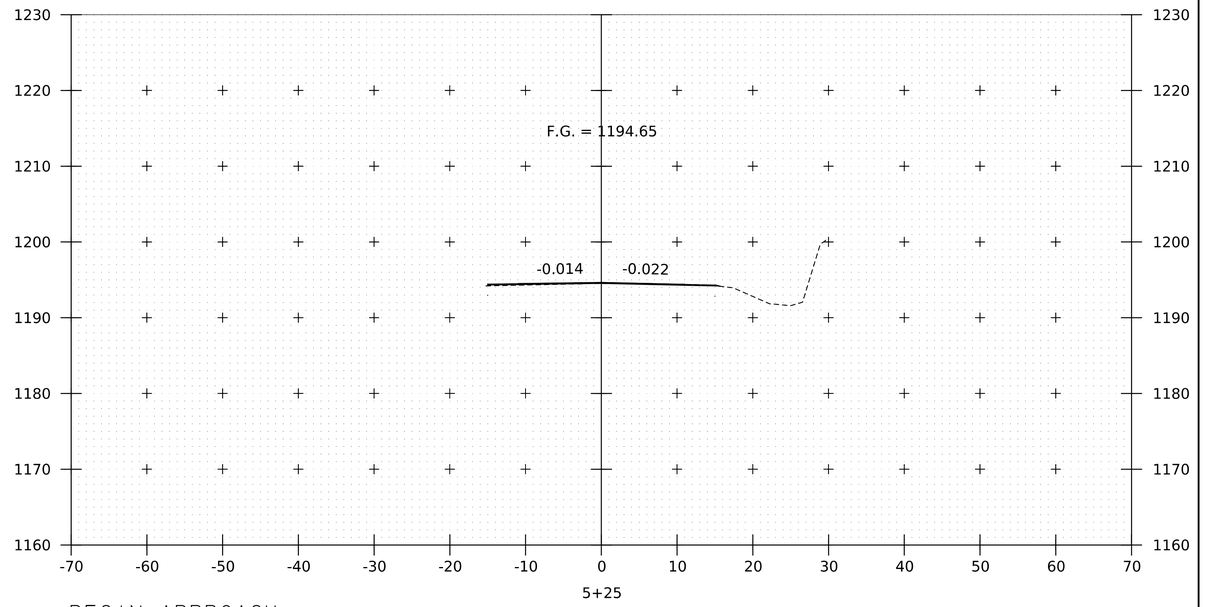
FILE NAME: z18b003reinf.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
REINFORCING STEEL SCHEDULE 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 280 OF 370









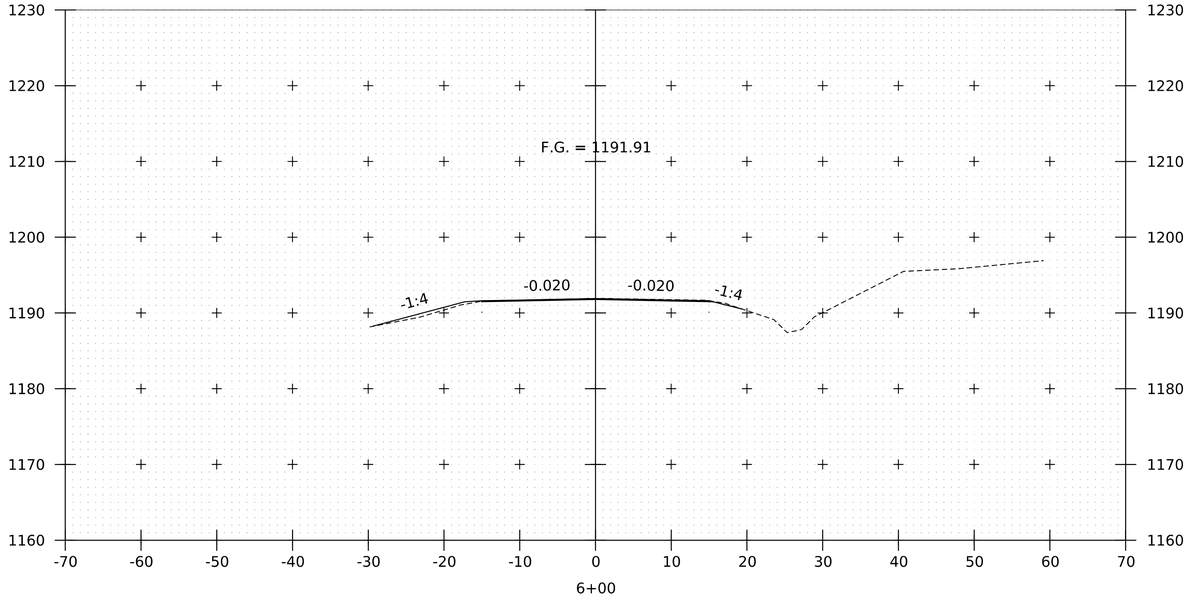
BEGIN APPROACH
STA 5+25.00
MATCH EXISTING

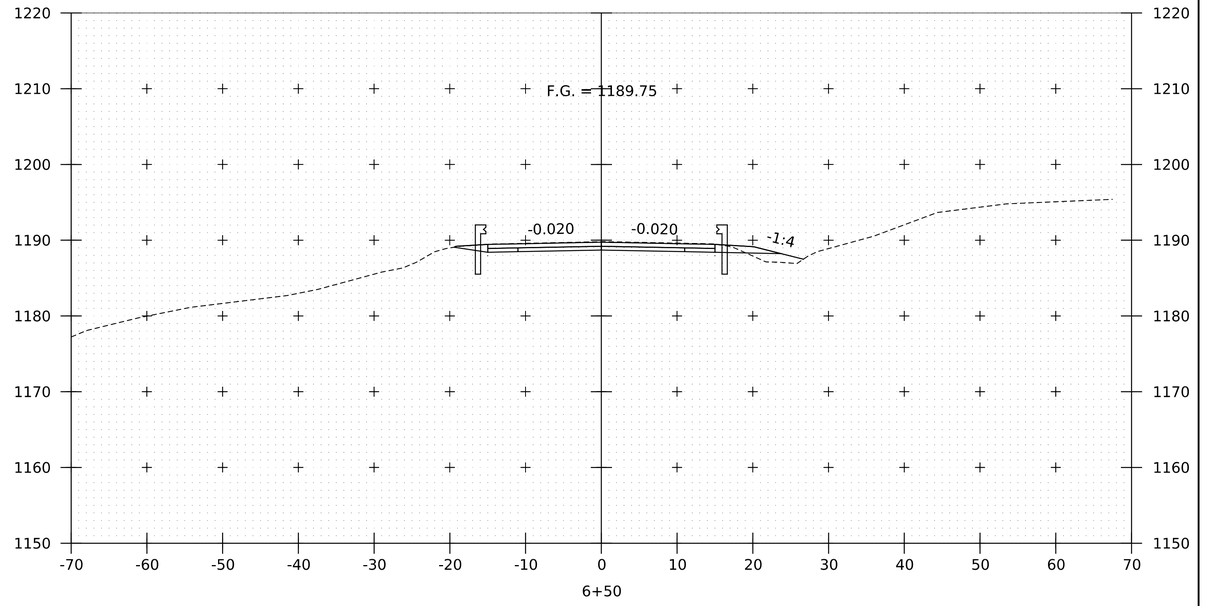
HOYLE TANNER

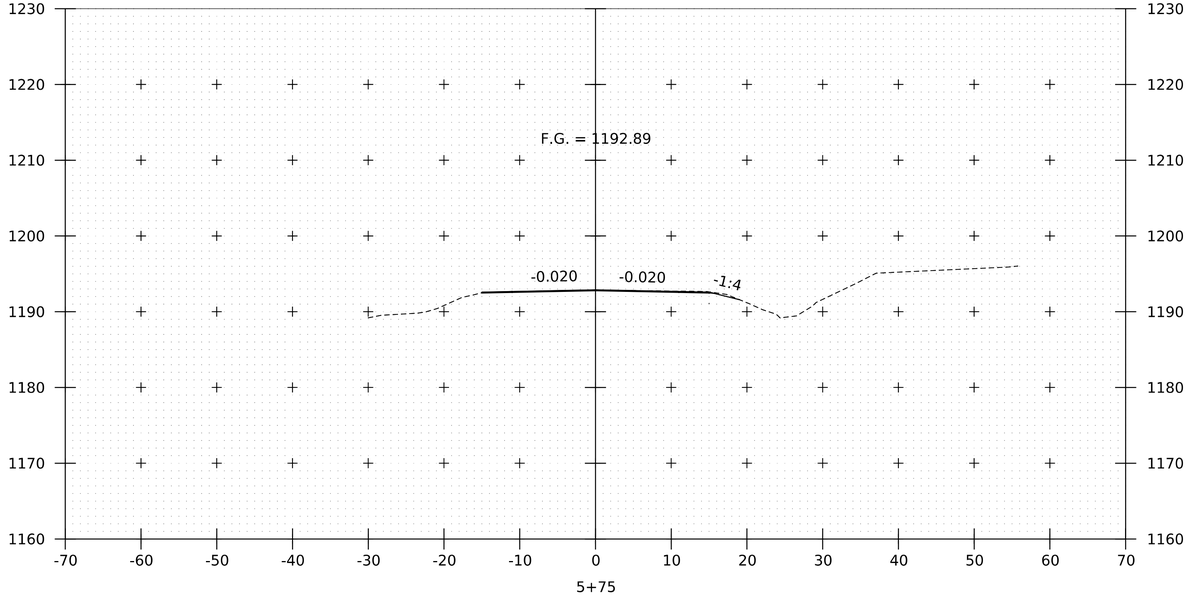
PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

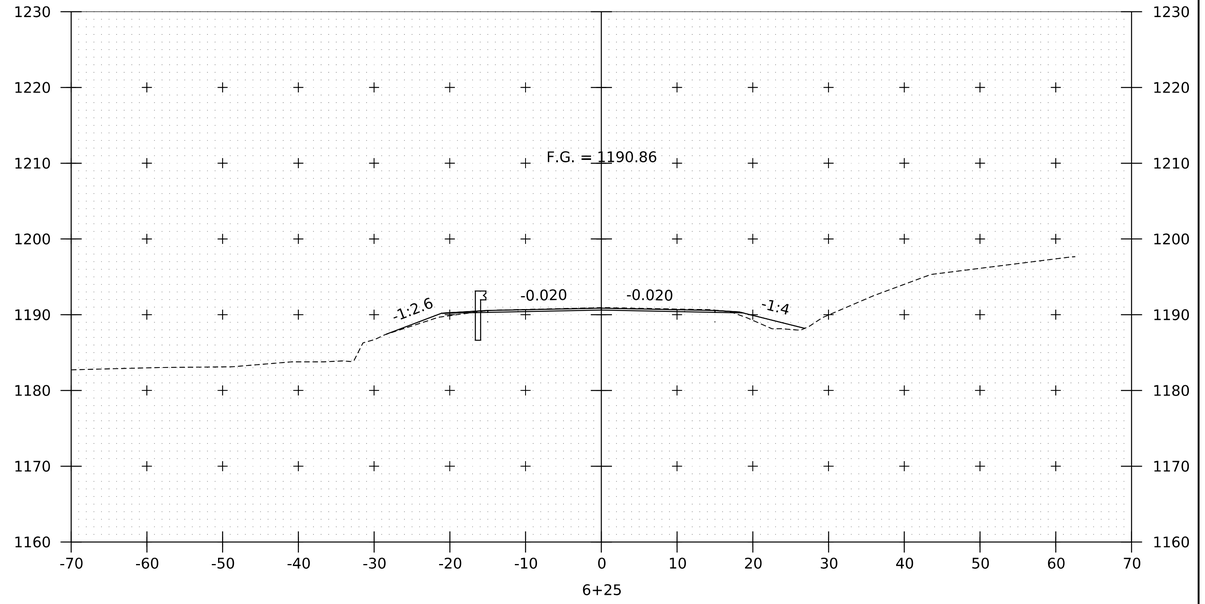
FILE NAME: z18b003xsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
VT ROUTE 12 CROSS SECTIONS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: K.PRESTON
CHECKED BY: S.HAAS
SHEET 281 OF 370



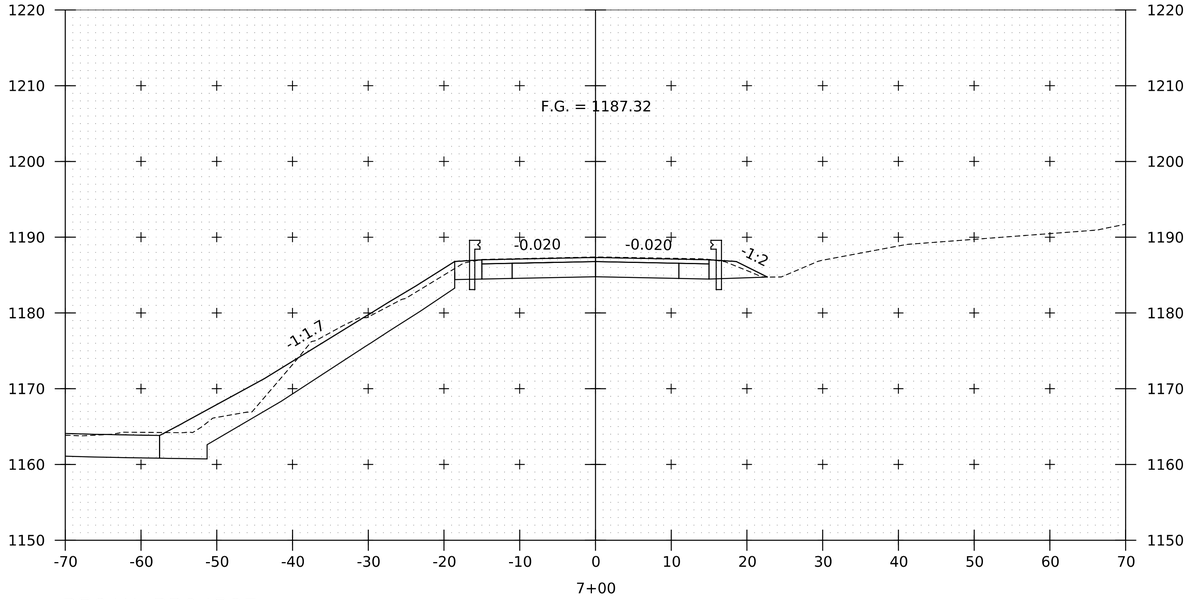




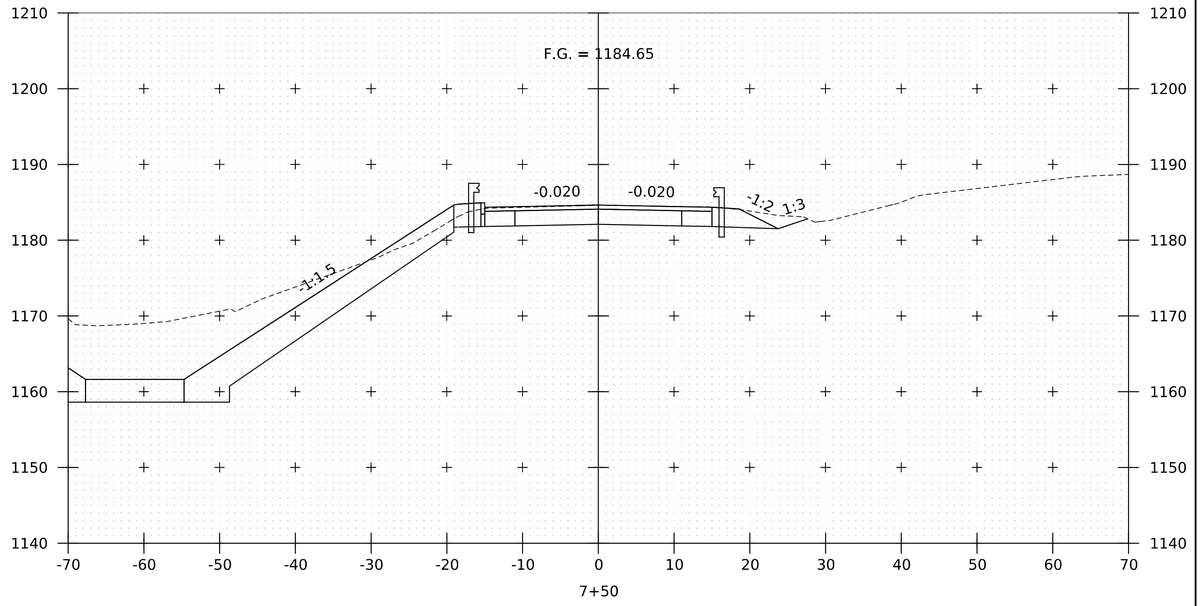


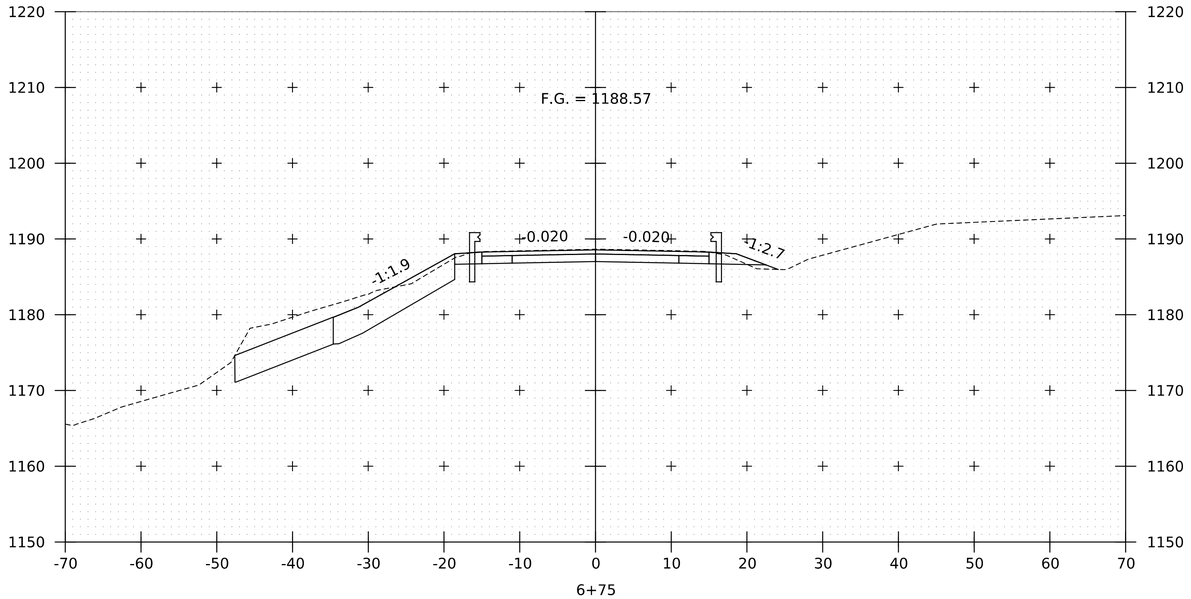
HOYLE TANNER

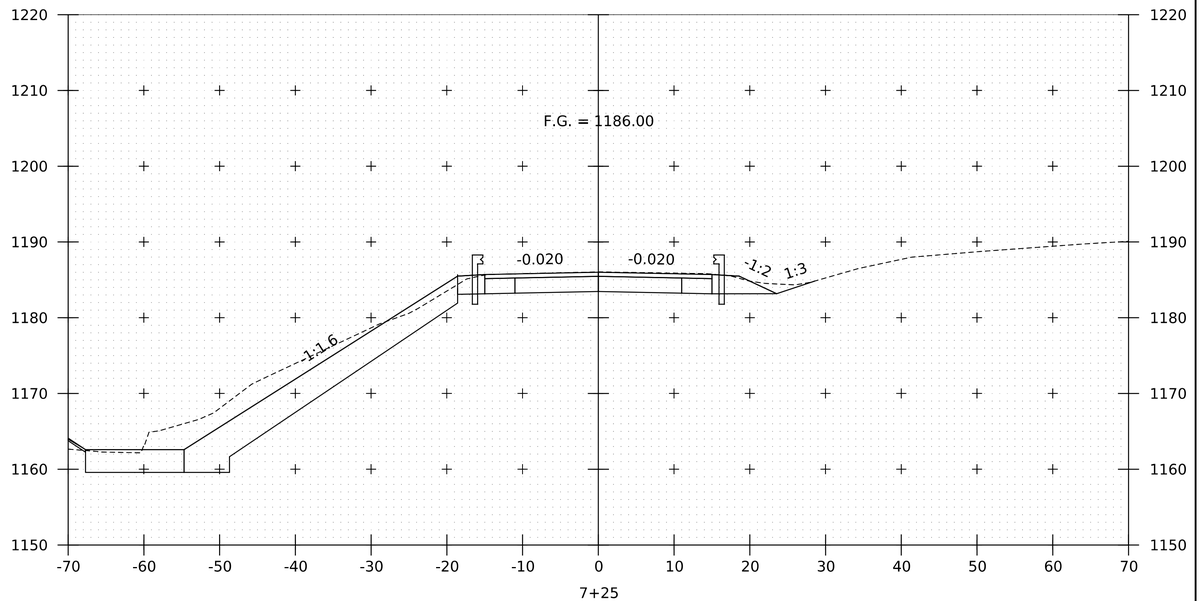
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 2	SHEET 282 OF 370



BEGIN PROJECT
STA 7+00.00





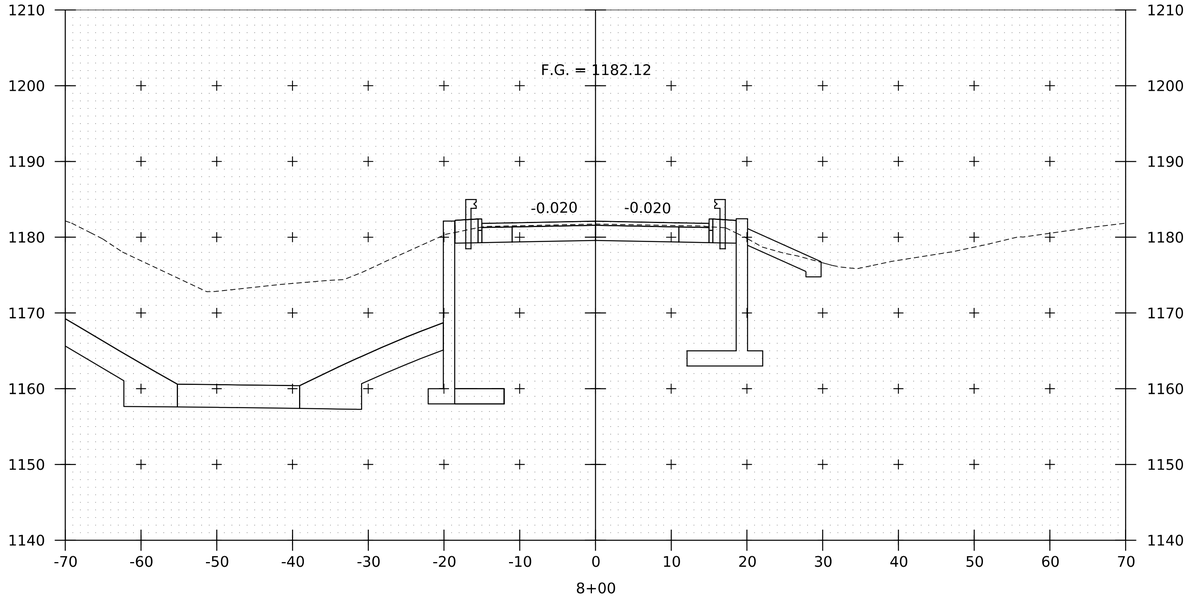


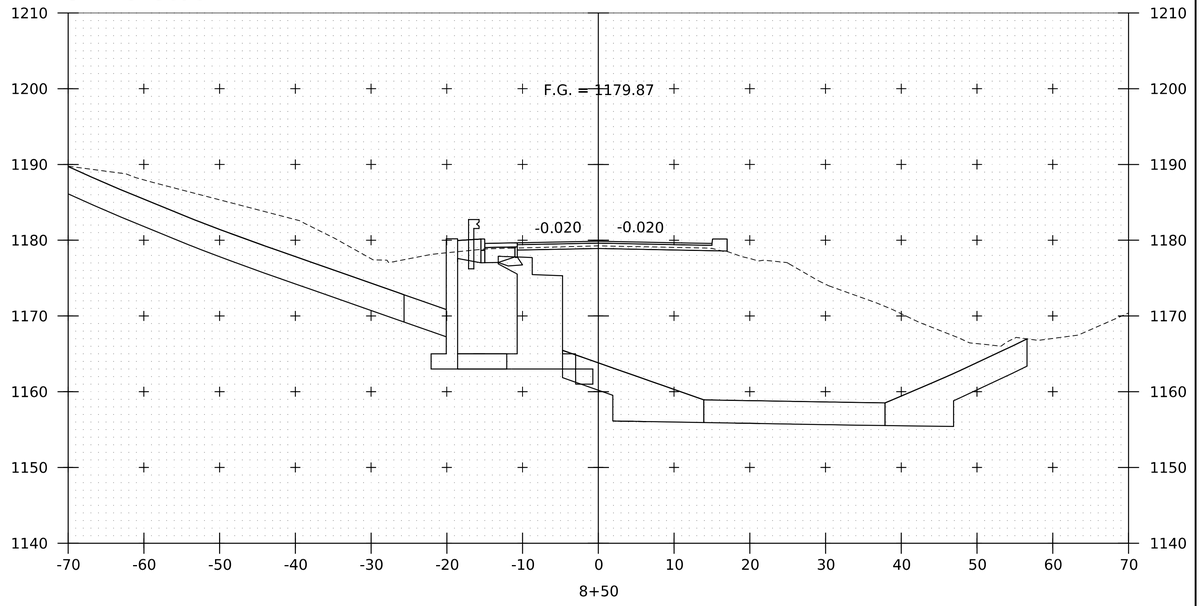
HOYLE TANNER

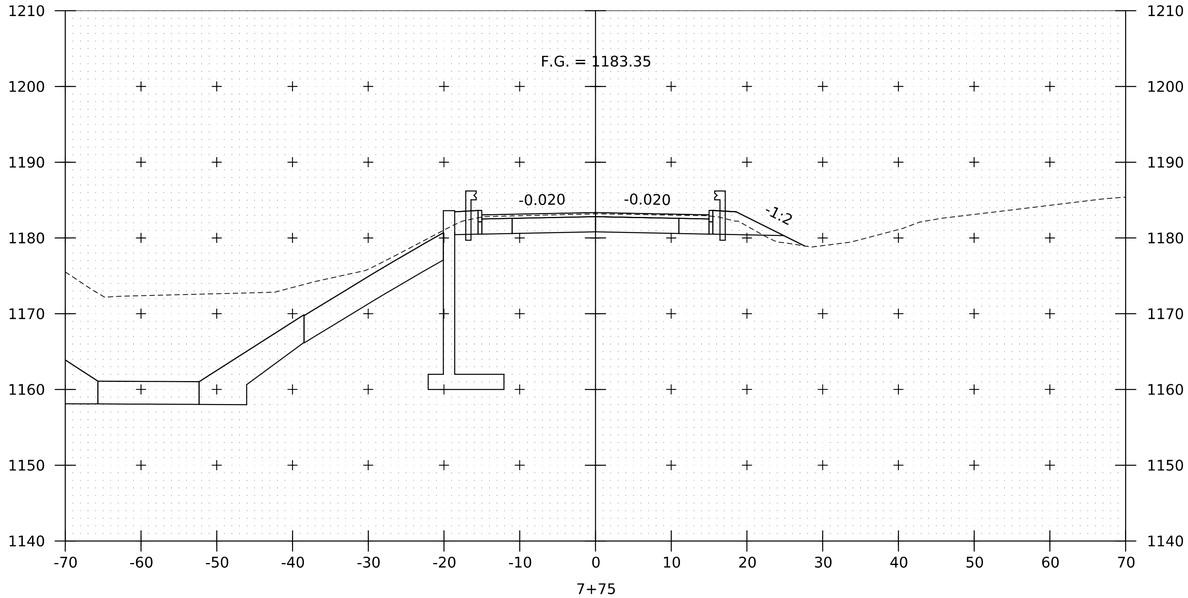
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

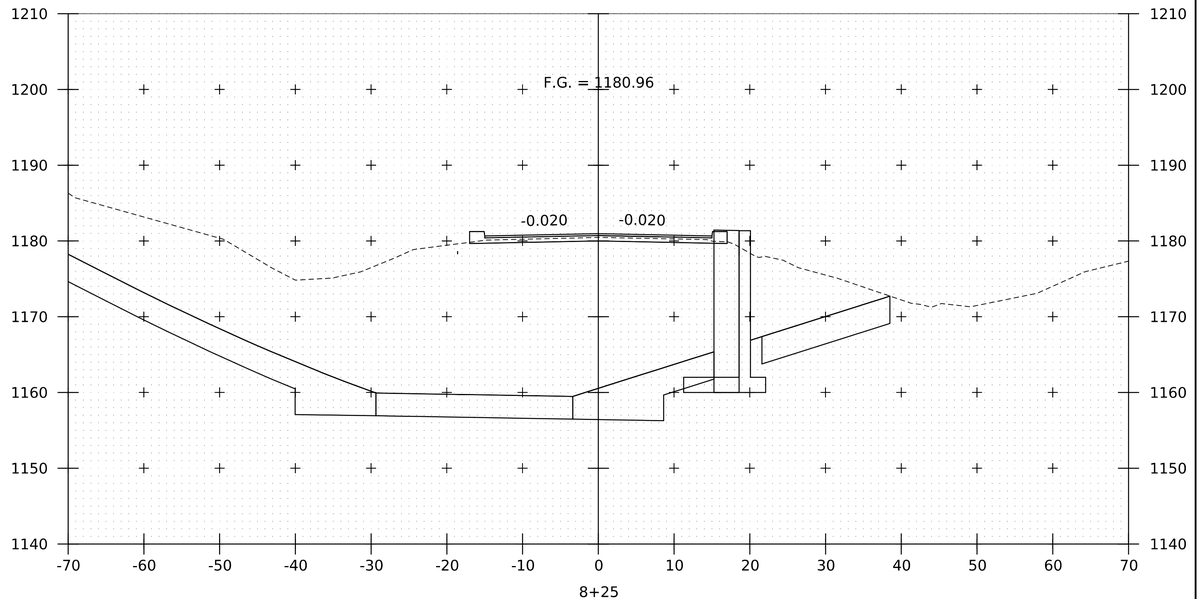
FILE NAME: z18b003xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 3	SHEET 283 OF 370

END BRIDGE
STA 8+56.19





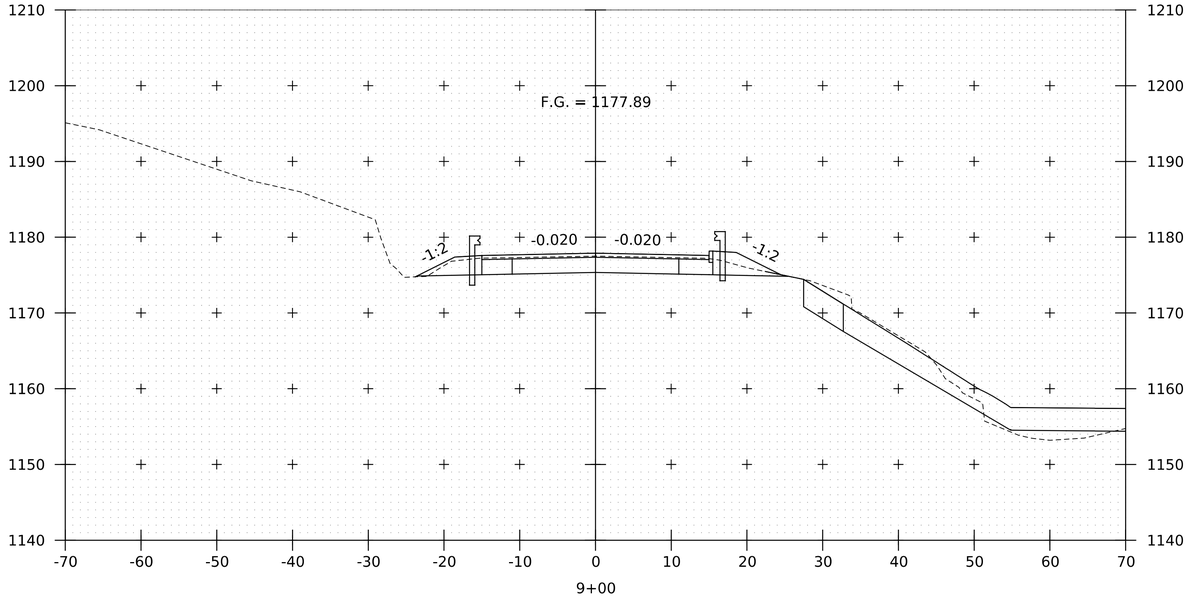


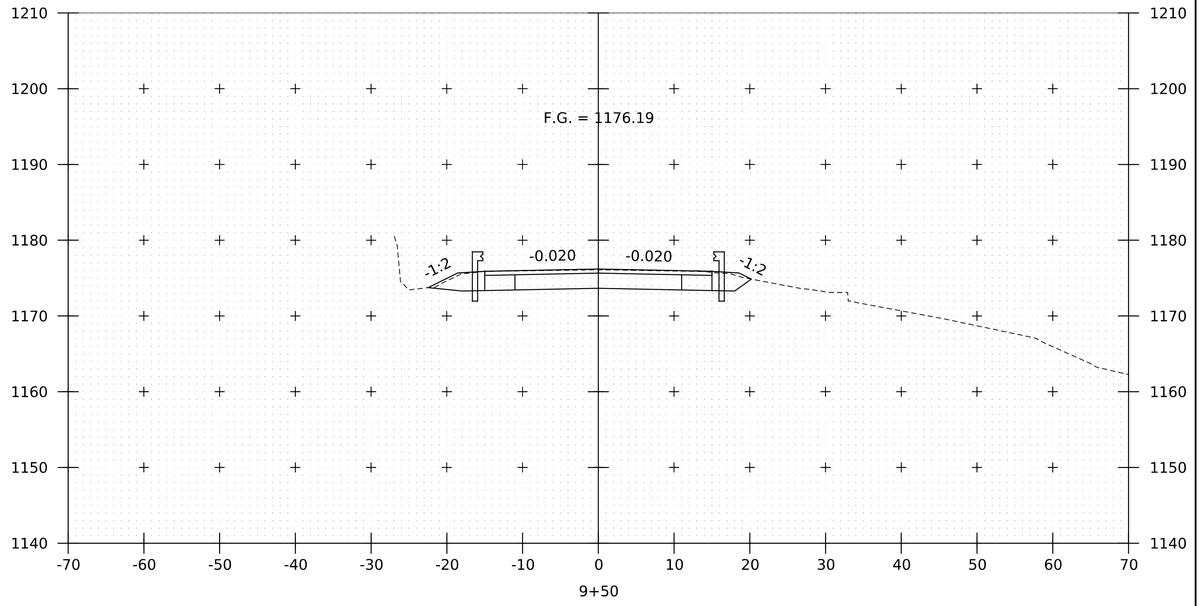


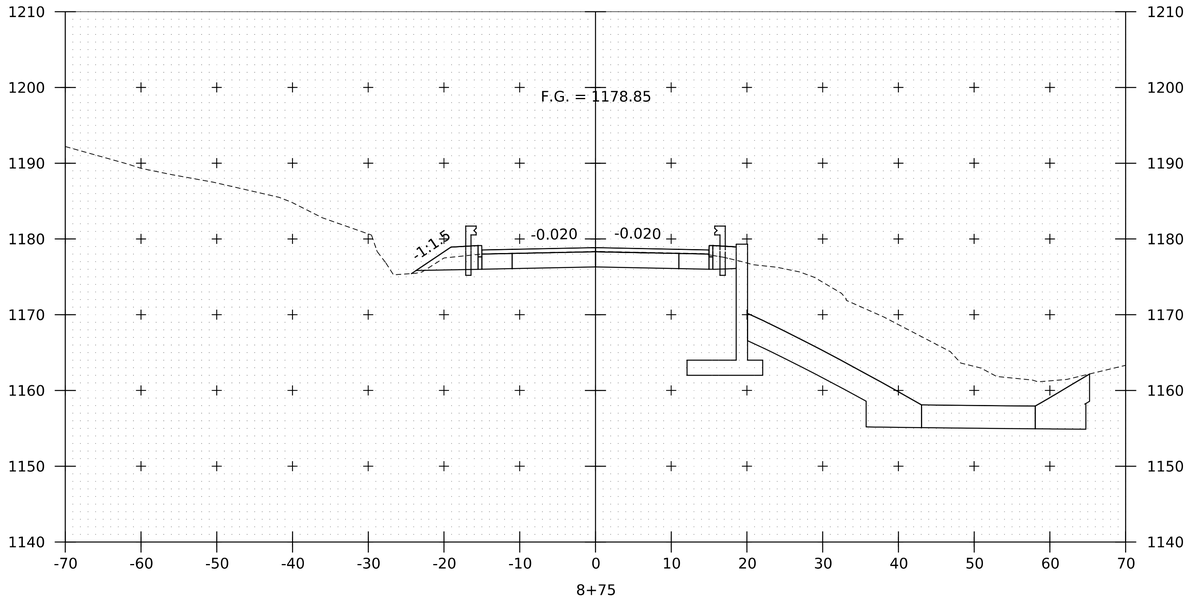
BEGIN BRIDGE
STA 8+12.73

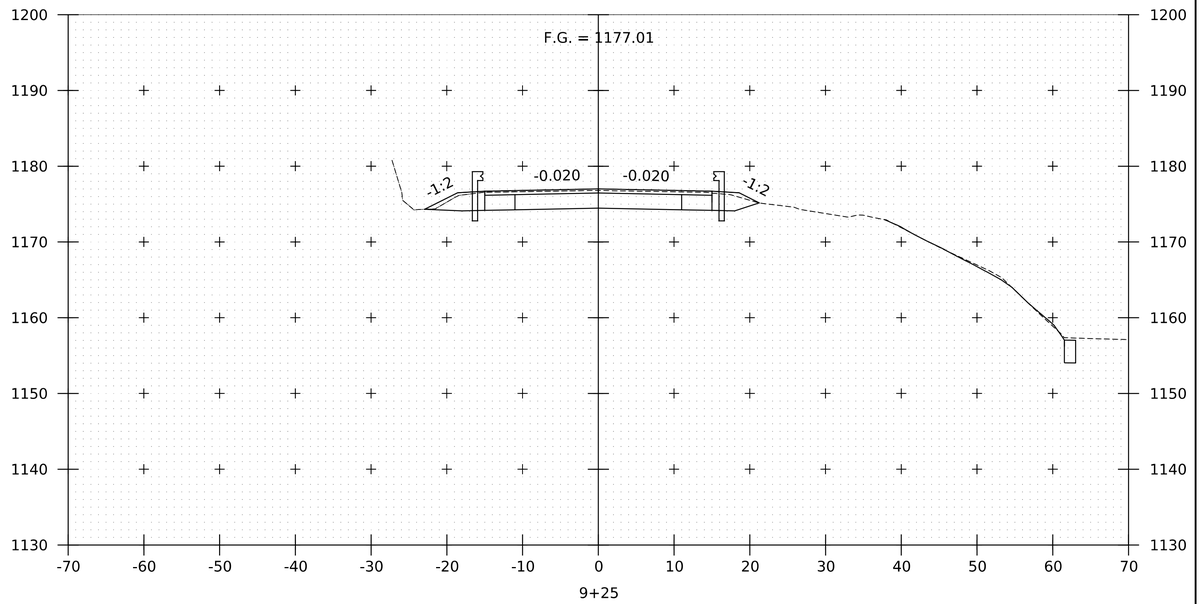
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 4	SHEET 284 OF 370



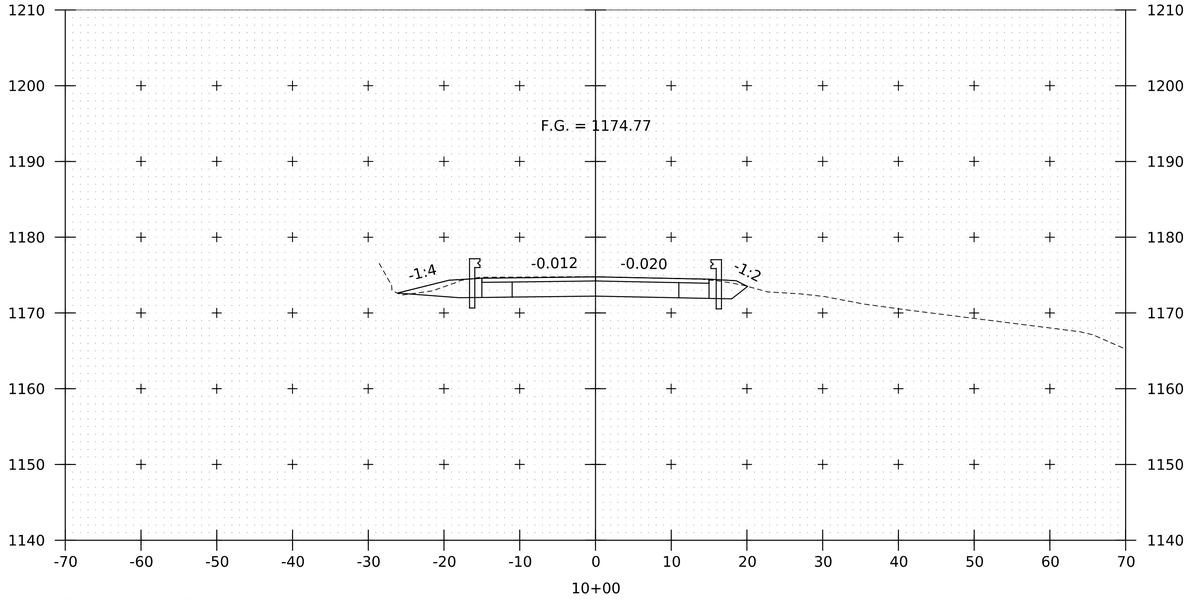




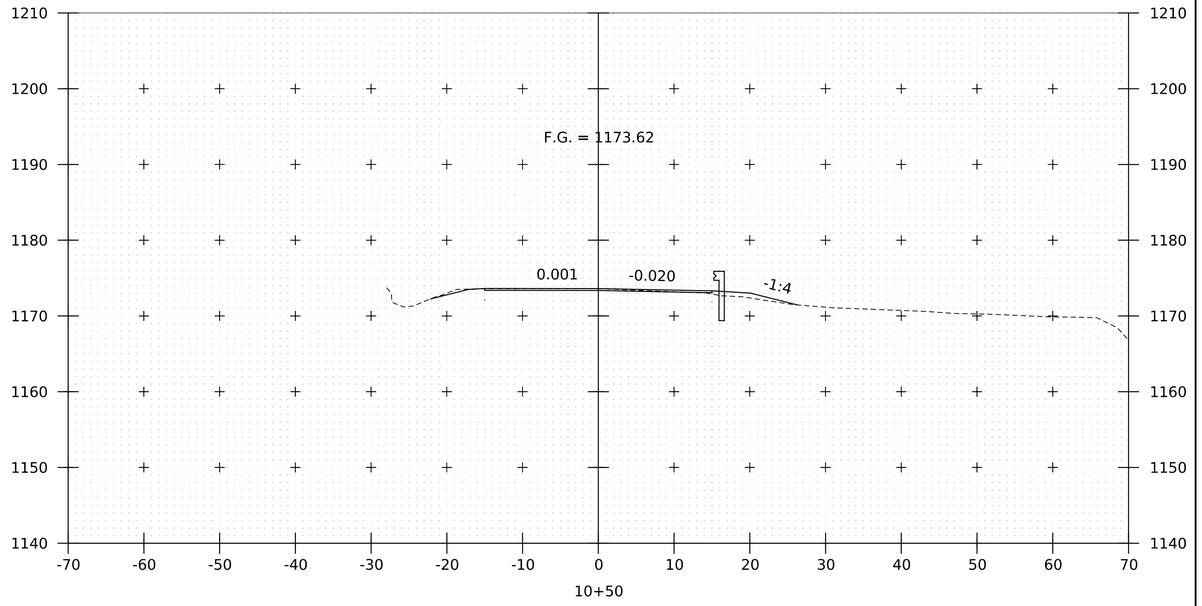


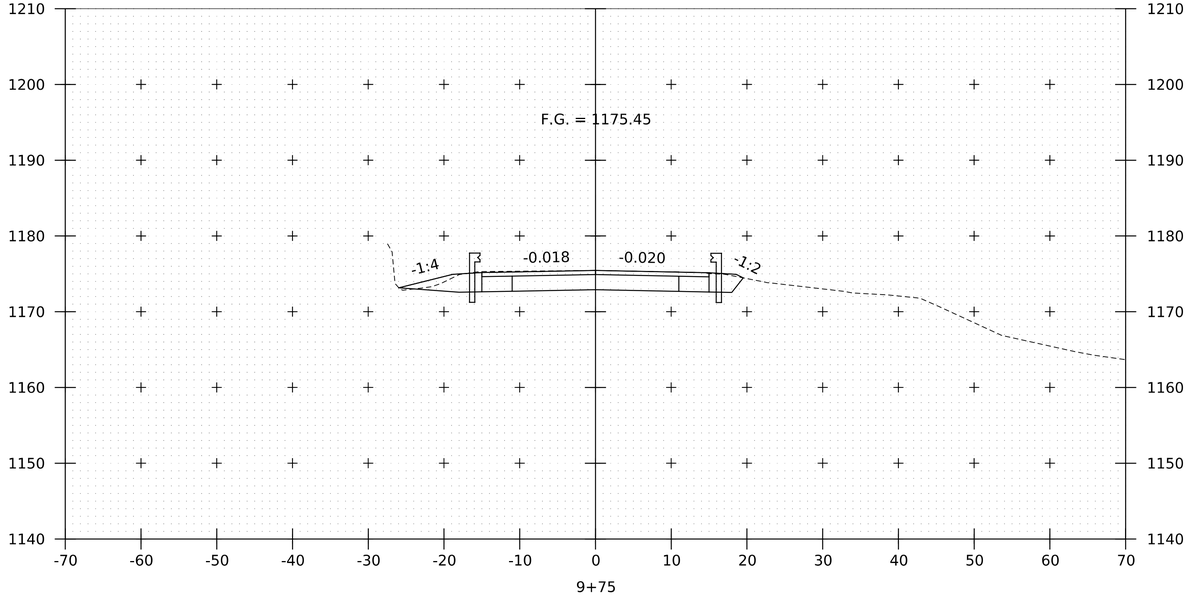
HOYLE TANNER

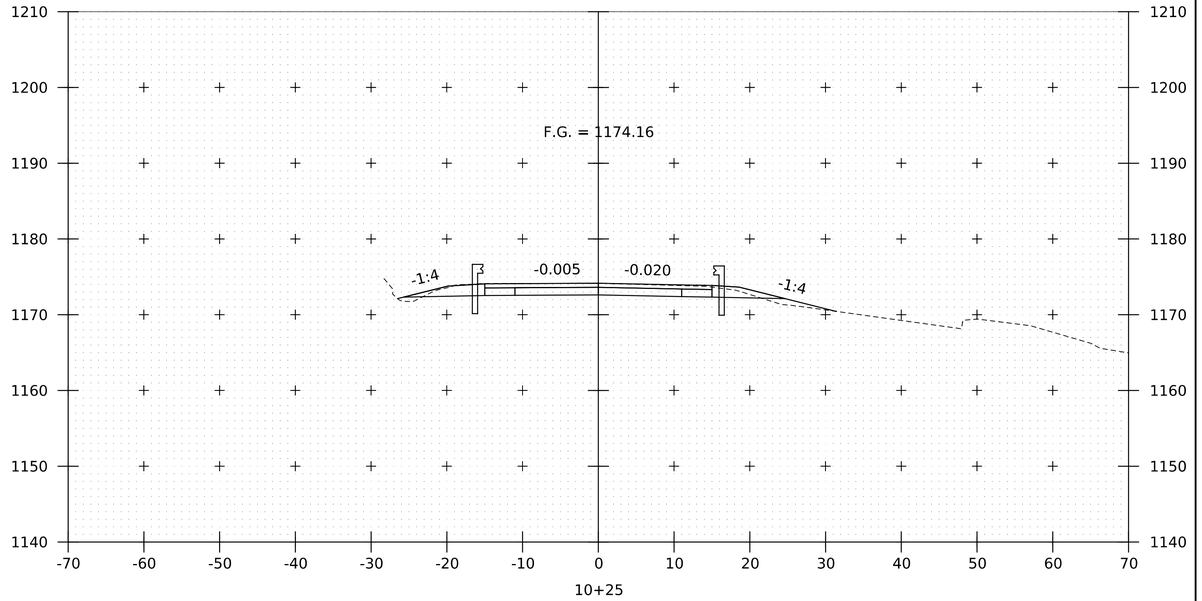
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 5	SHEET 285 OF 370



END PROJECT
STA 10+00.00



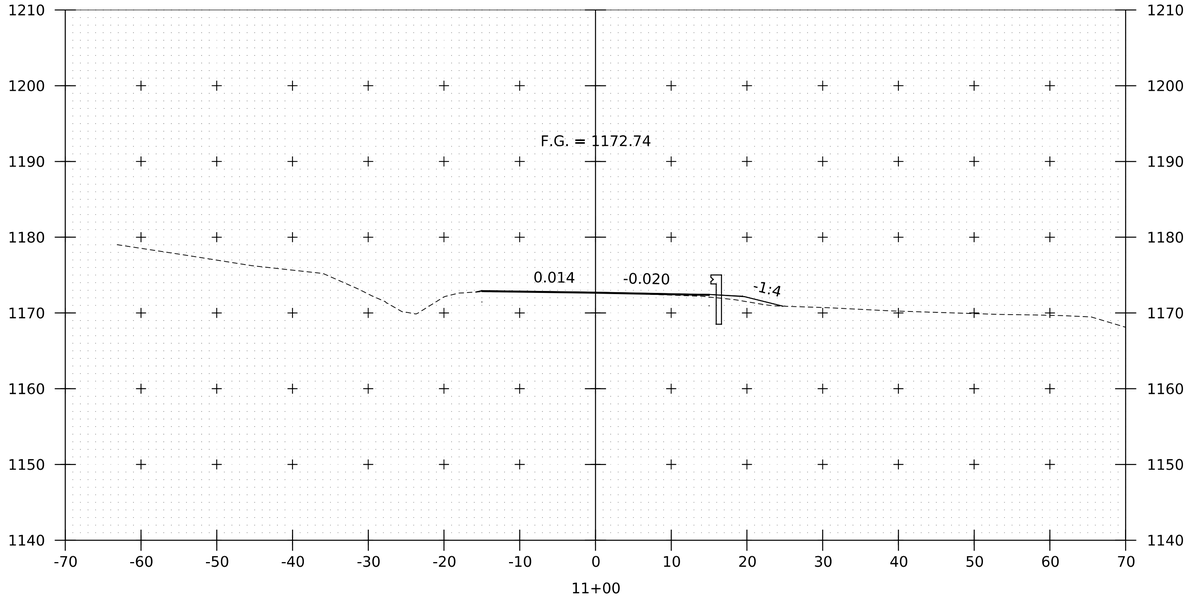


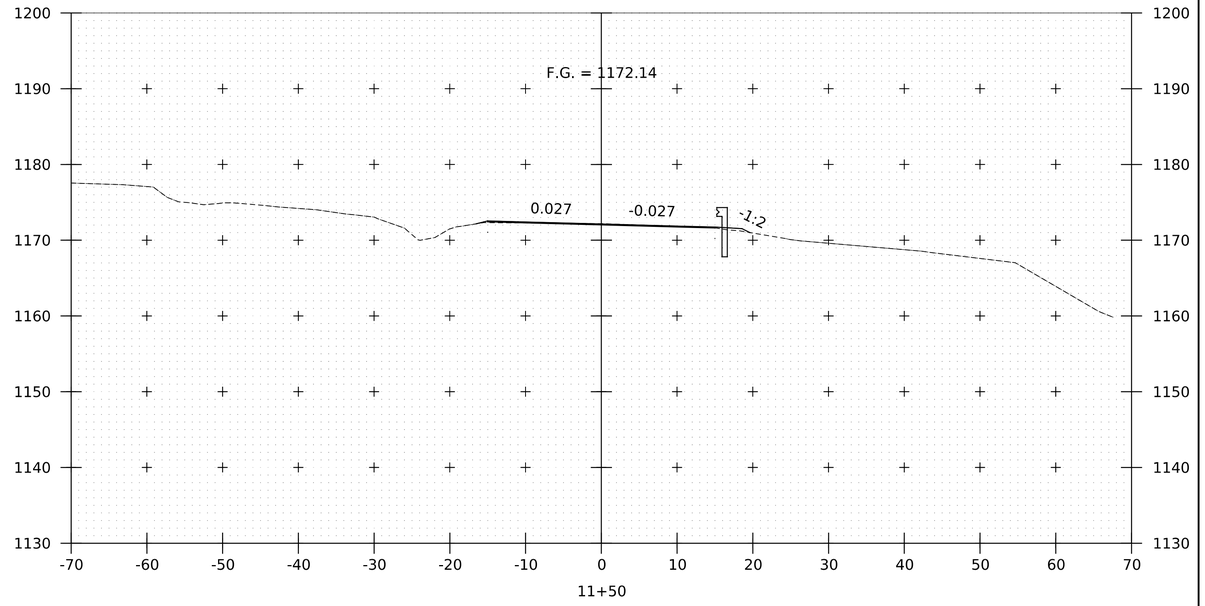


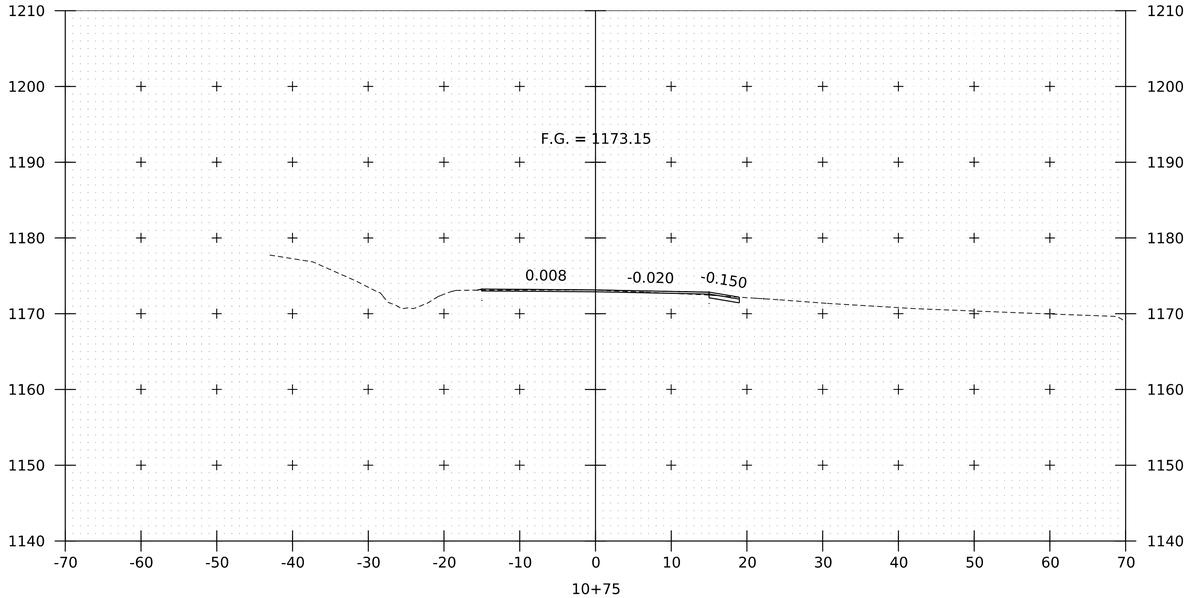
HOYLE TANNER

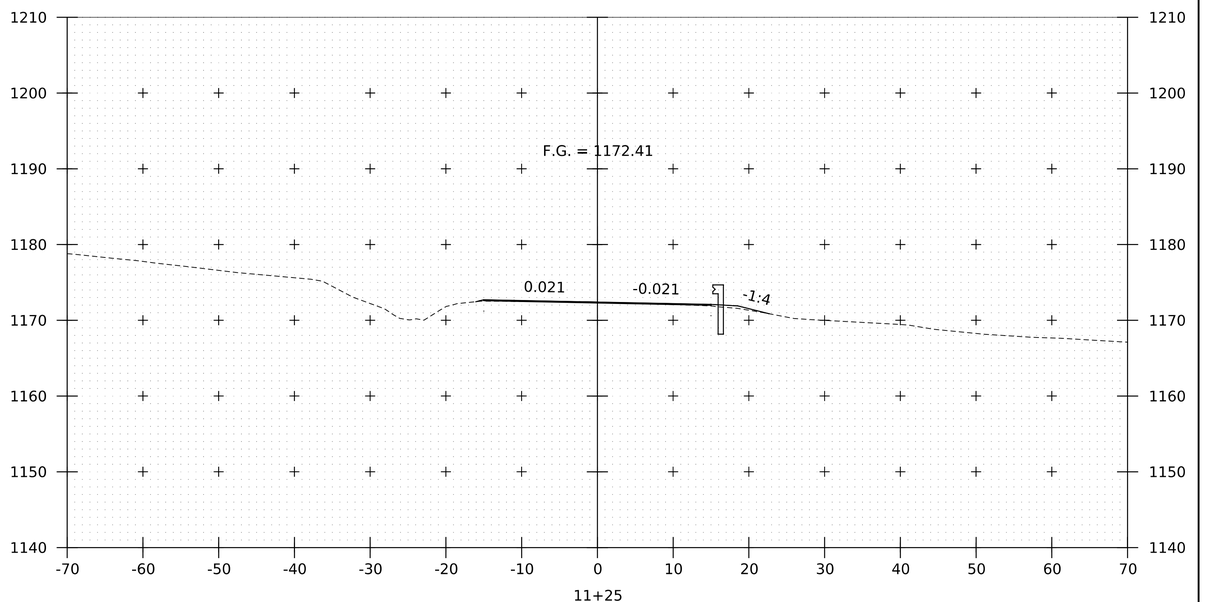
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: z18b003xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 6	SHEET 286 OF 370



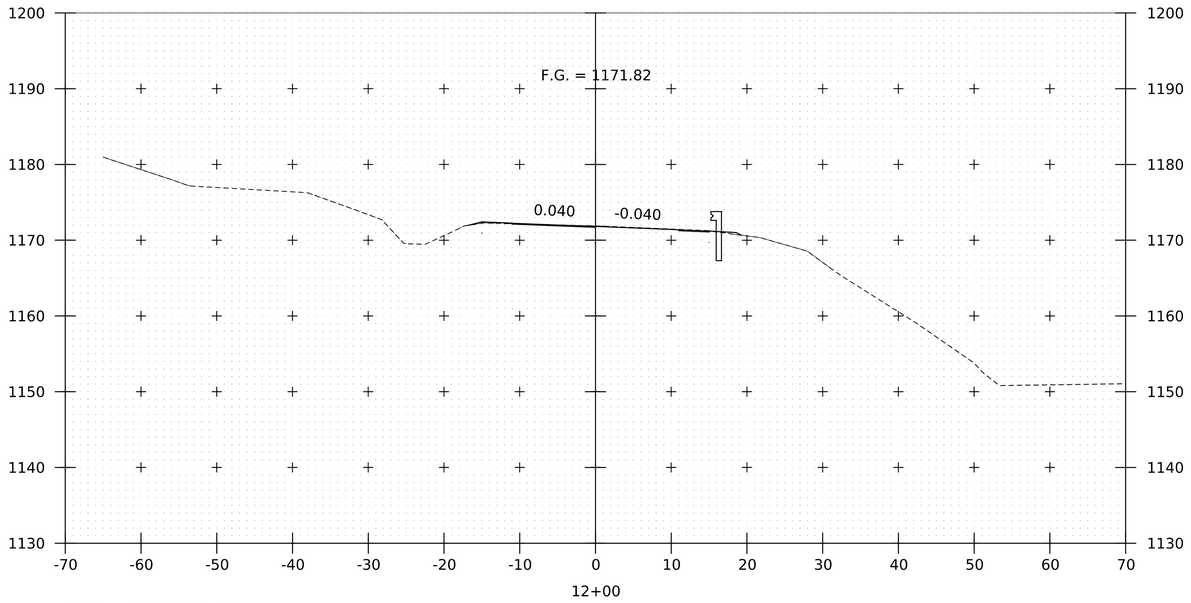


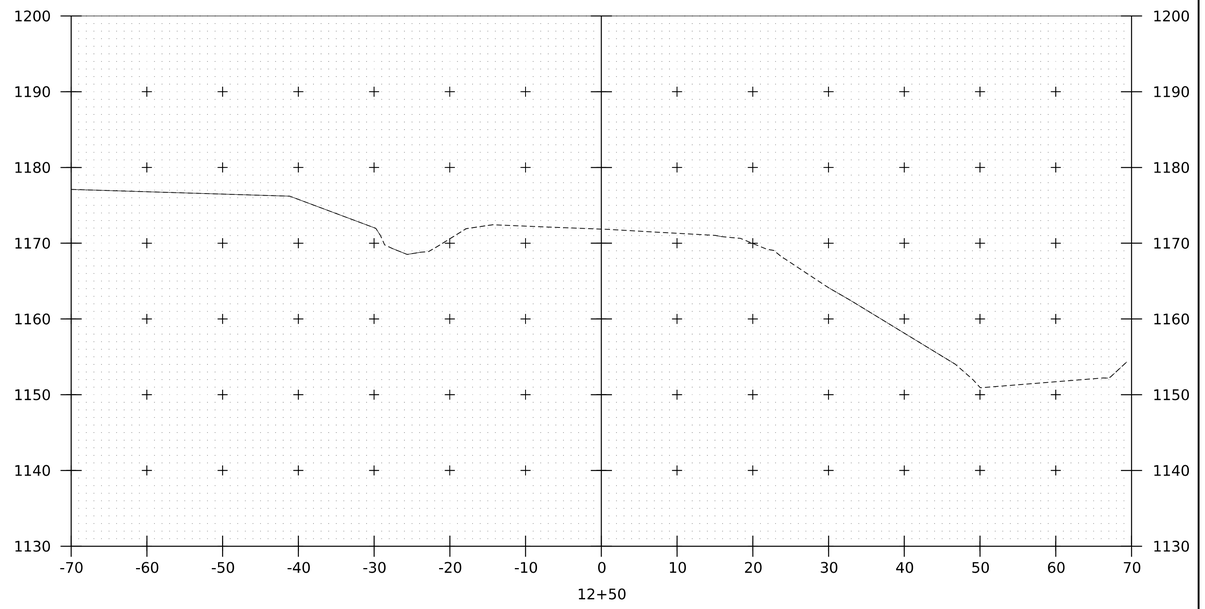




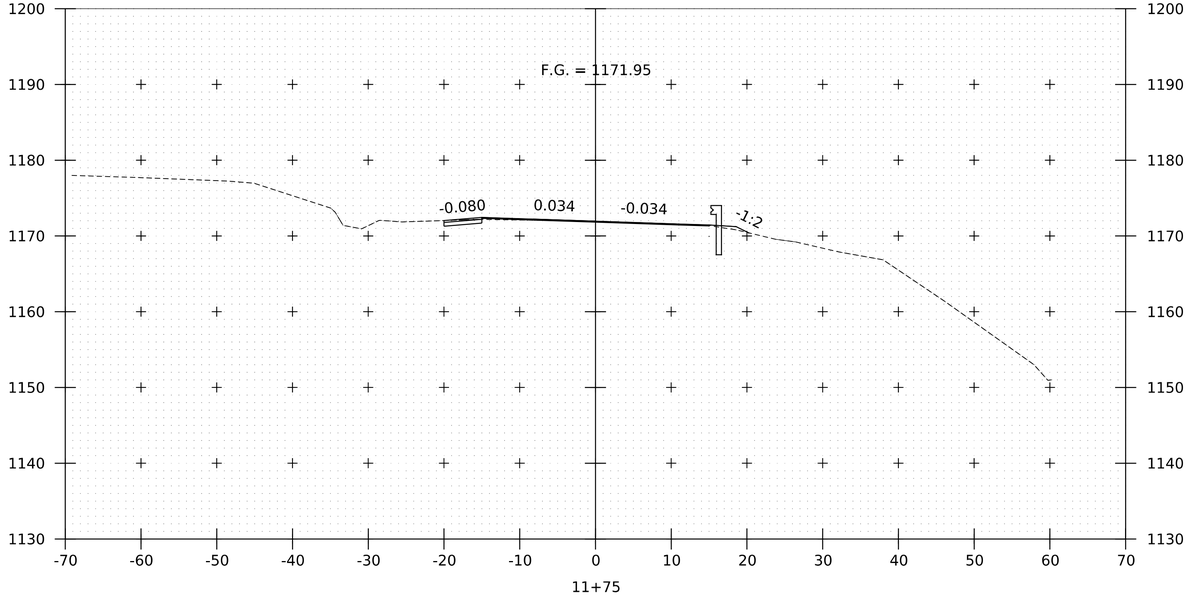
HOYLE TANNER

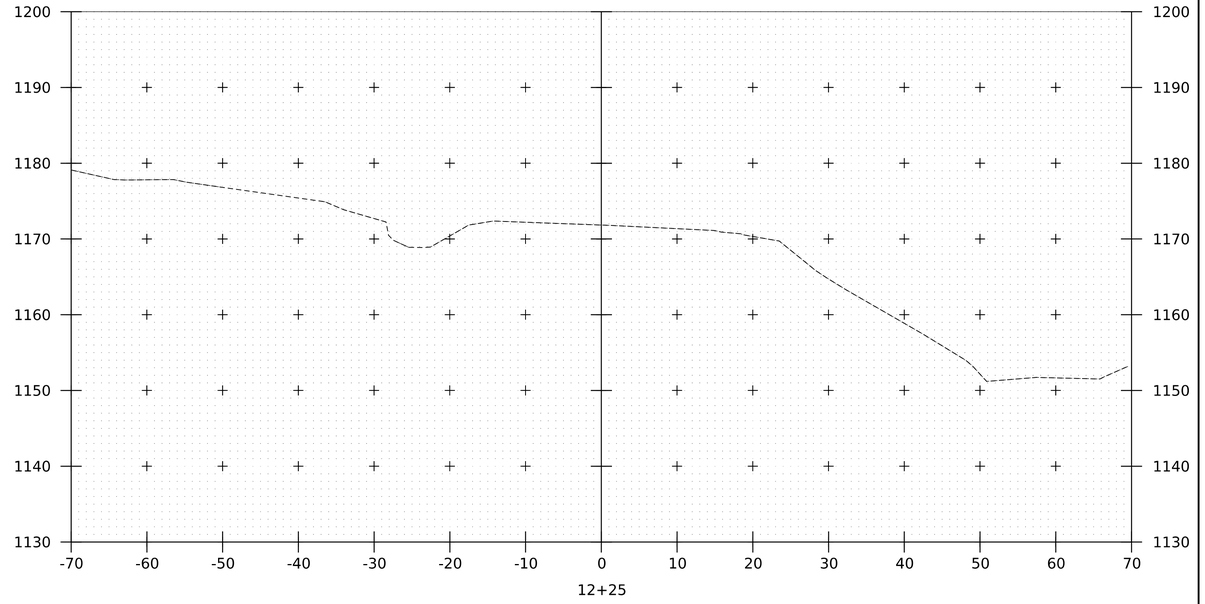
PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 7	SHEET 287 OF 370





END APPROACH
STA 12+00.00
MATCH EXISTING

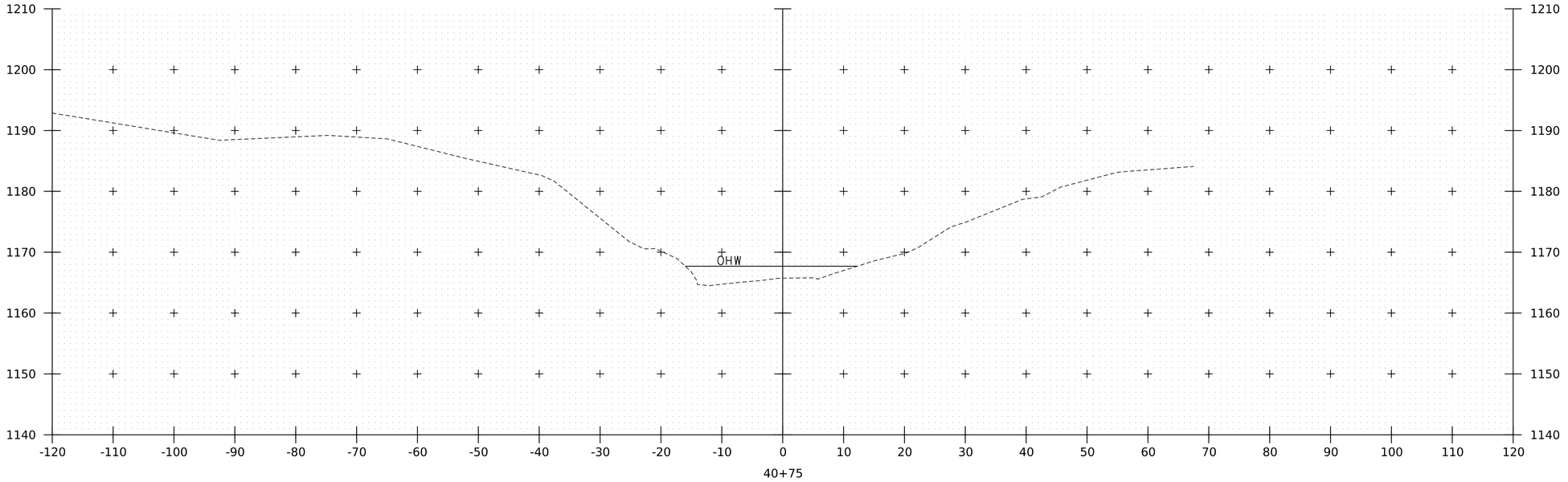




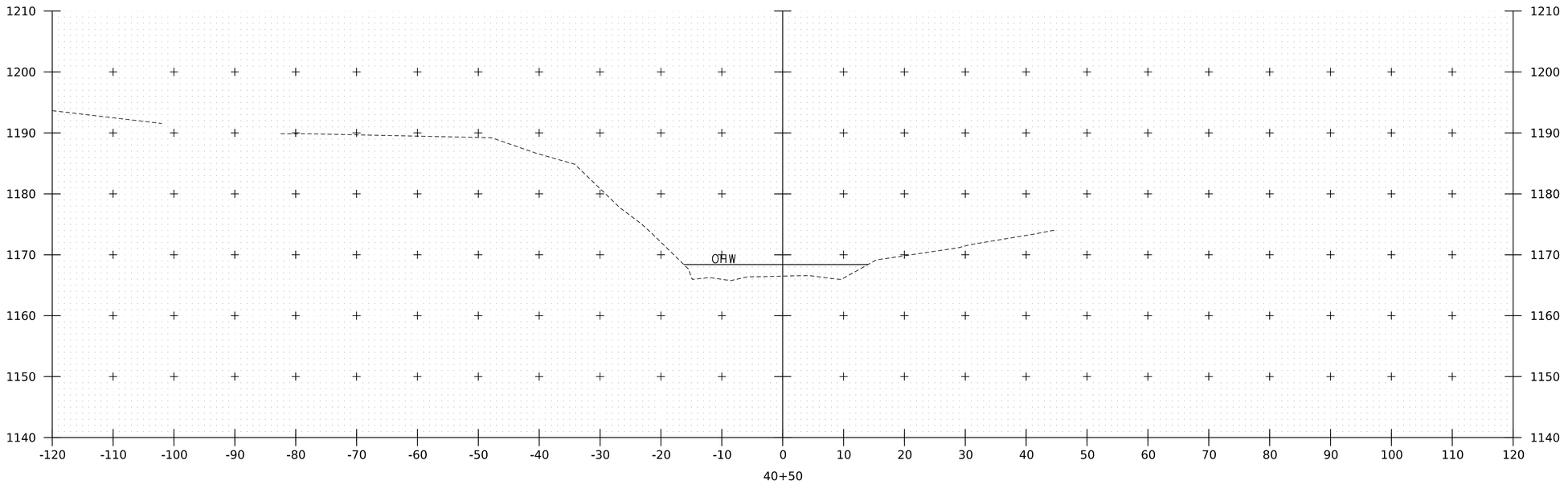
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: z18b003xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 8	SHEET 288 OF 370



40+75

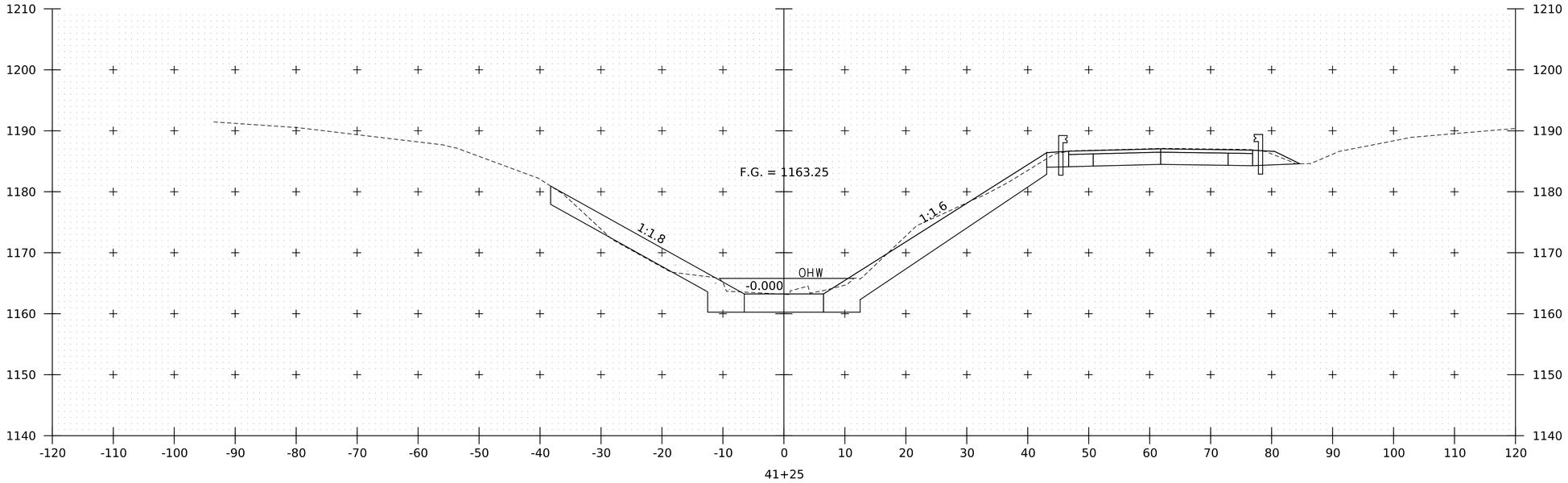


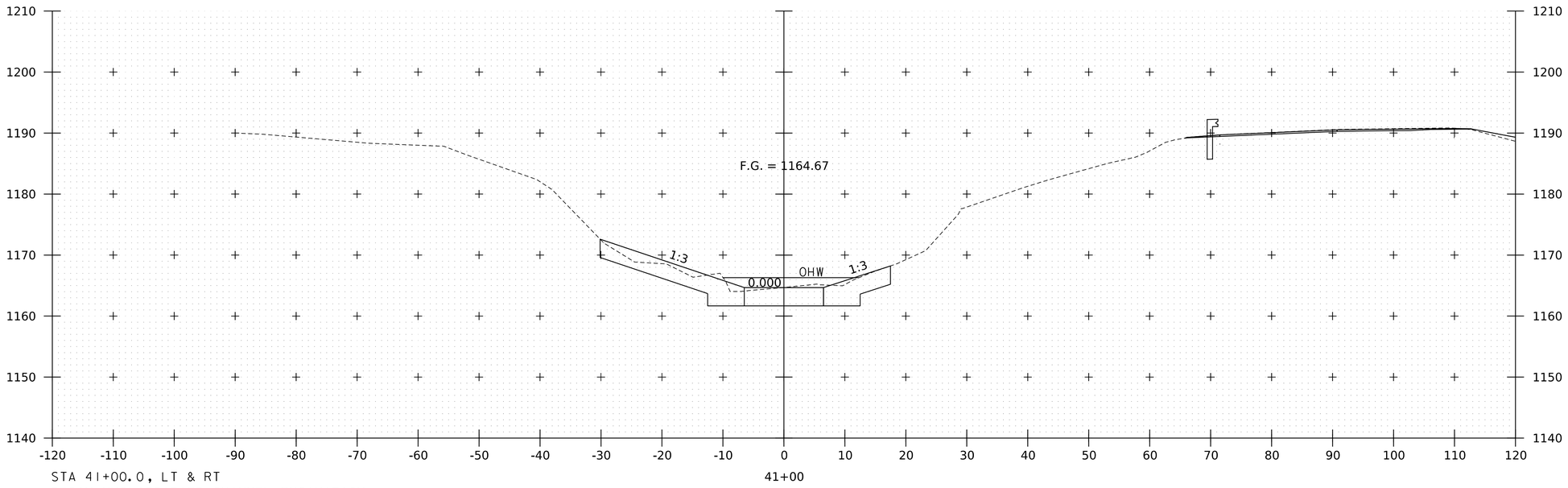
40+50

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS I	SHEET 289 OF 370





STA 41+00.0, LT & RT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE III)
GRUBBING MATERIAL

NOTES

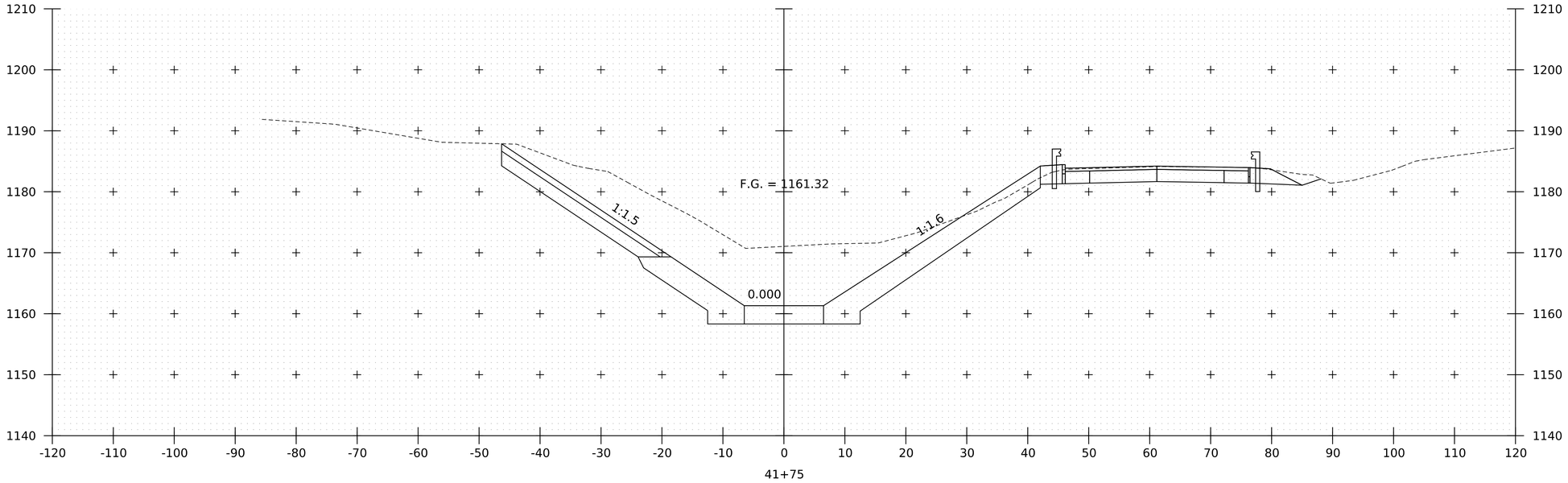
1. REFERENCE TYPCIAL SLOPE SECTION ON TYPICAL SECTIONS SHEET 3 FOR CHANNEL STATIONS 41+00 LT TO 42+60 LT.

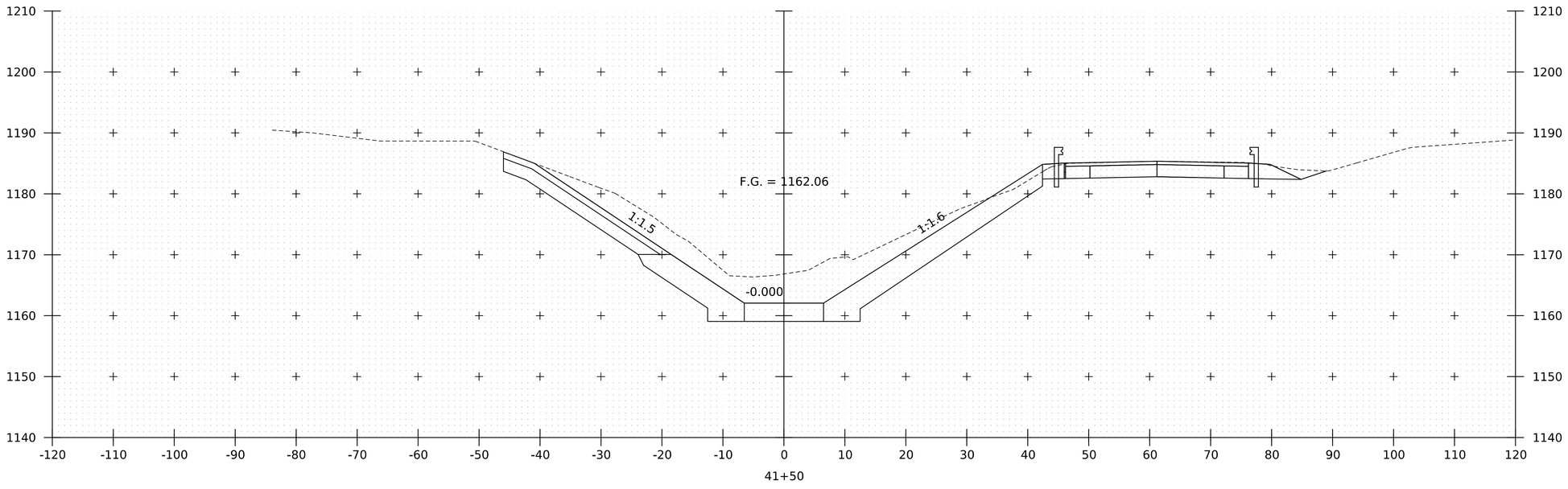
HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: zl8b003xs3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
CHANNEL CROSS SECTIONS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 290 OF 370



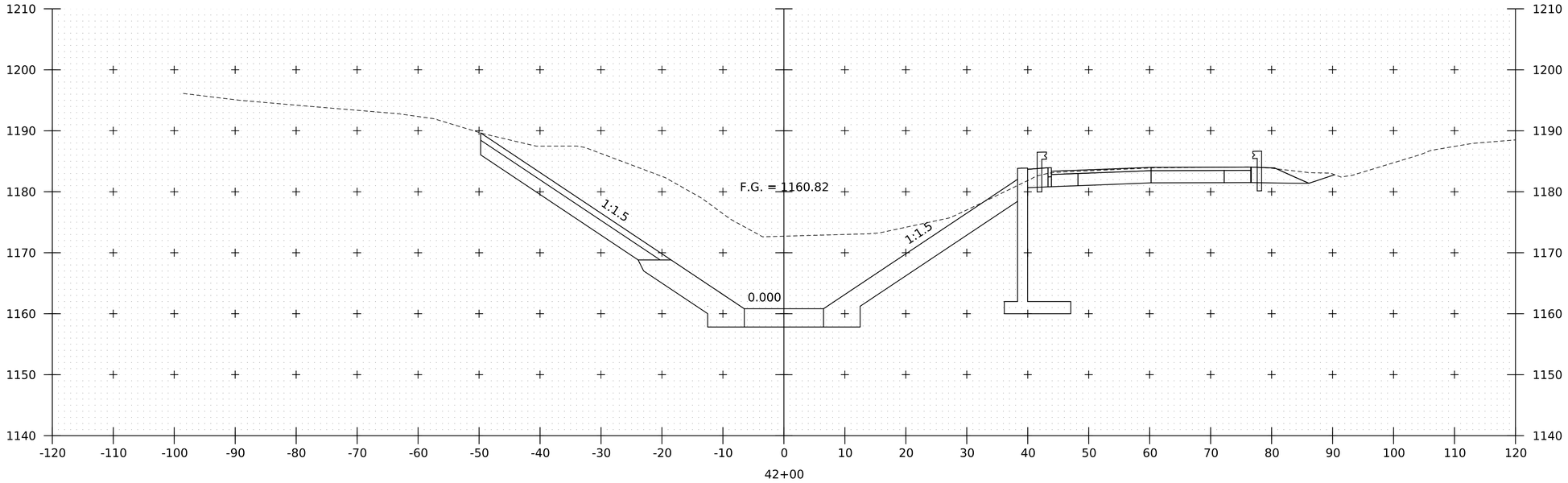


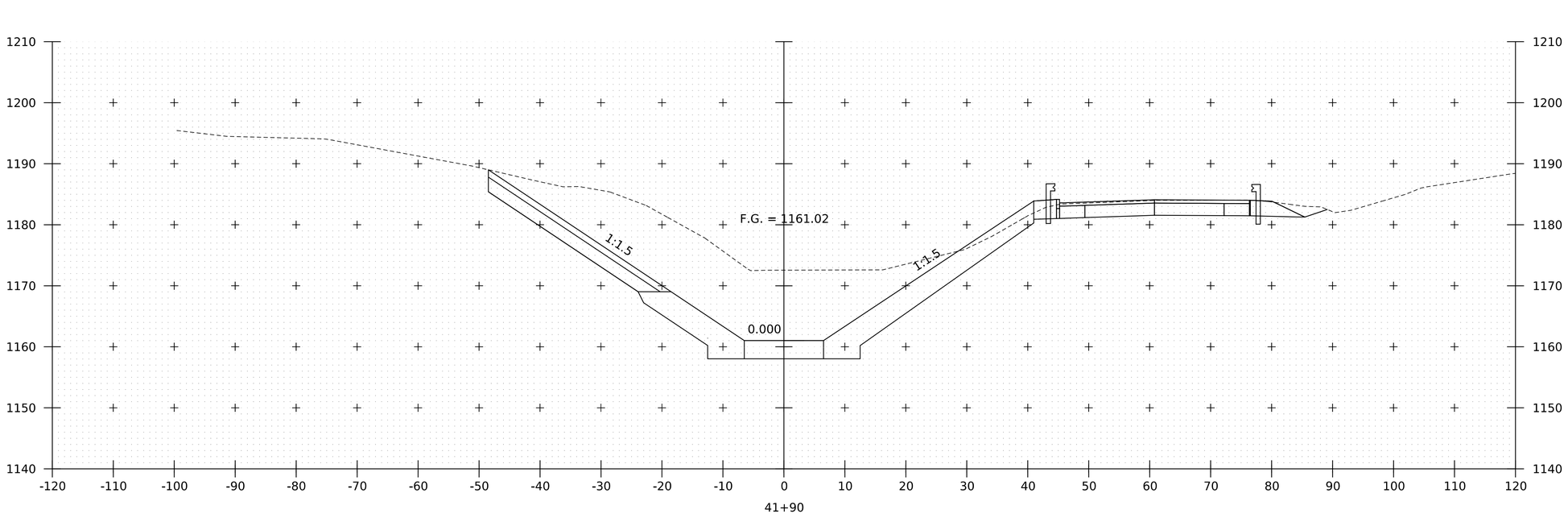
NOTES

1. REFERENCE TYPCIAL SLOPE SECTION ON TYPICAL SECTIONS SHEET 3 FOR CHANNEL STATIONS 41+00 LT TO 42+60 LT.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 3	SHEET 291 OF 370



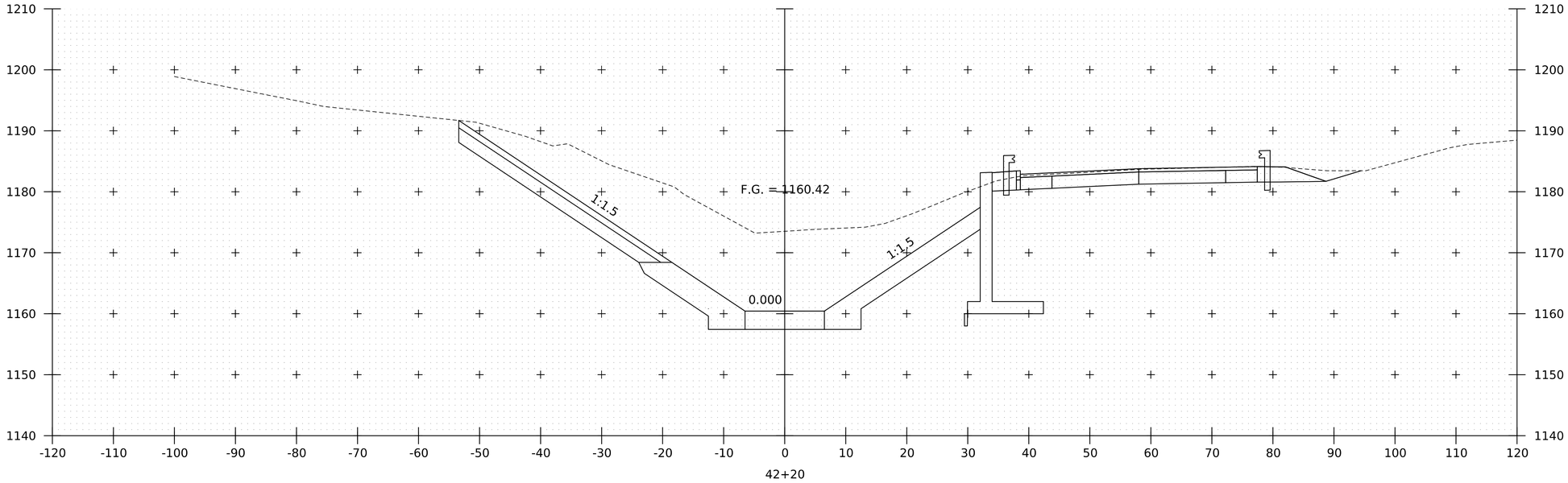


NOTES

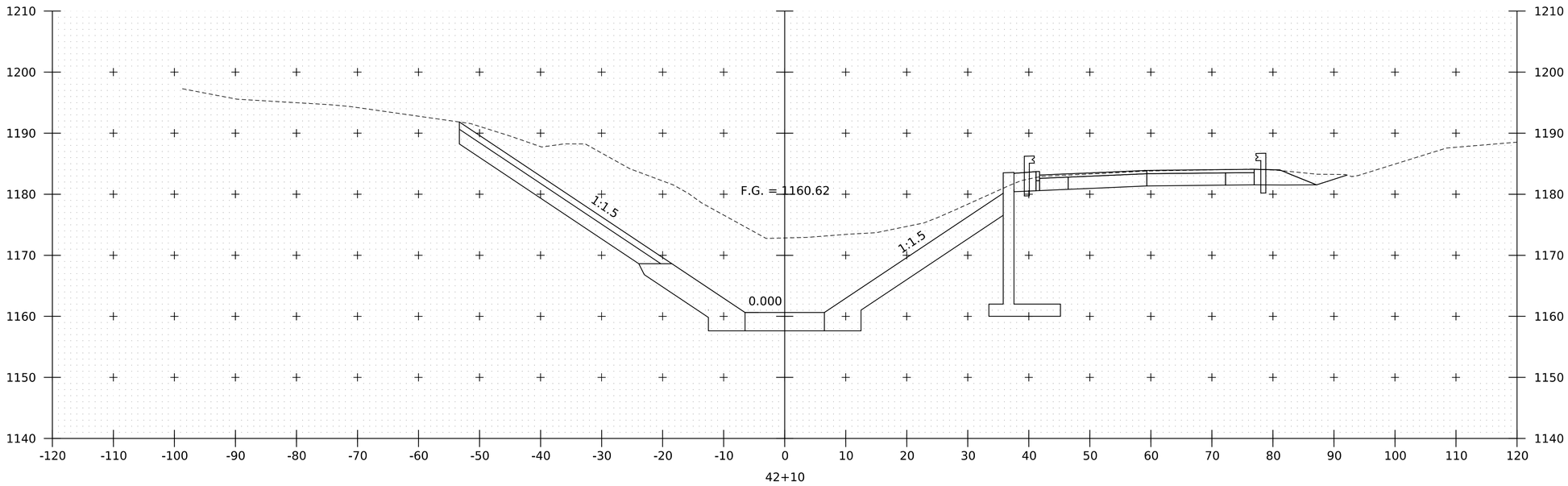
1. REFERENCE TYPCIAL SLOPE SECTION ON TYPICAL SECTIONS SHEET 3 FOR CHANNEL STATIONS 41+00 LT TO 42+60 LT.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 4	SHEET 292 OF 370



42+20



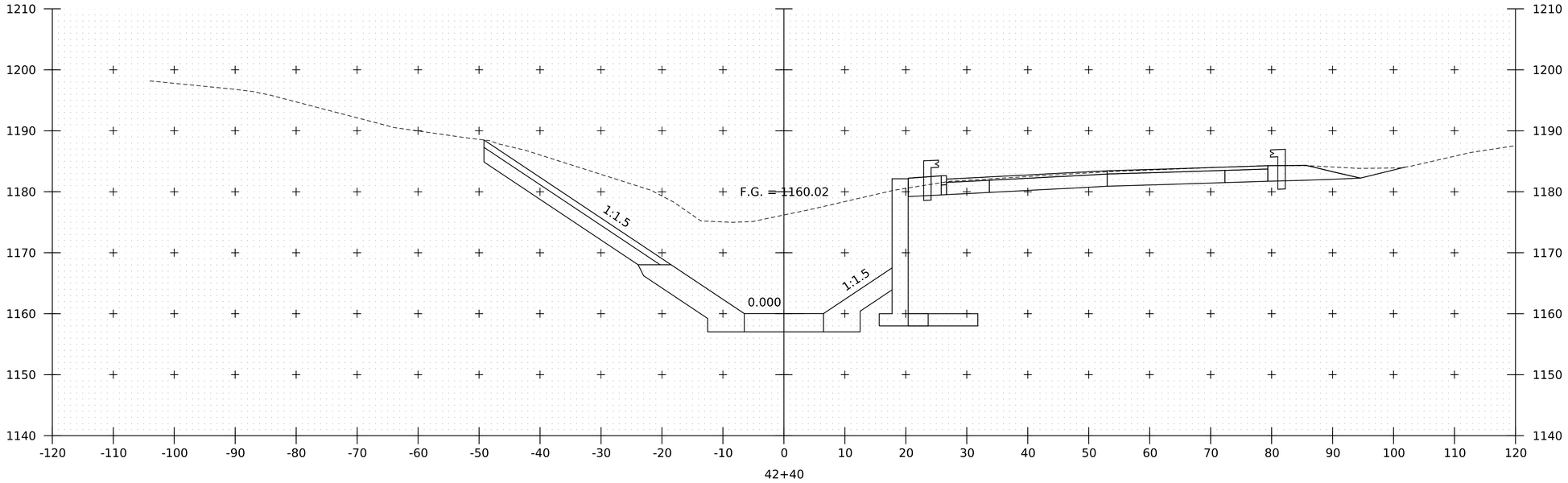
42+10

NOTES

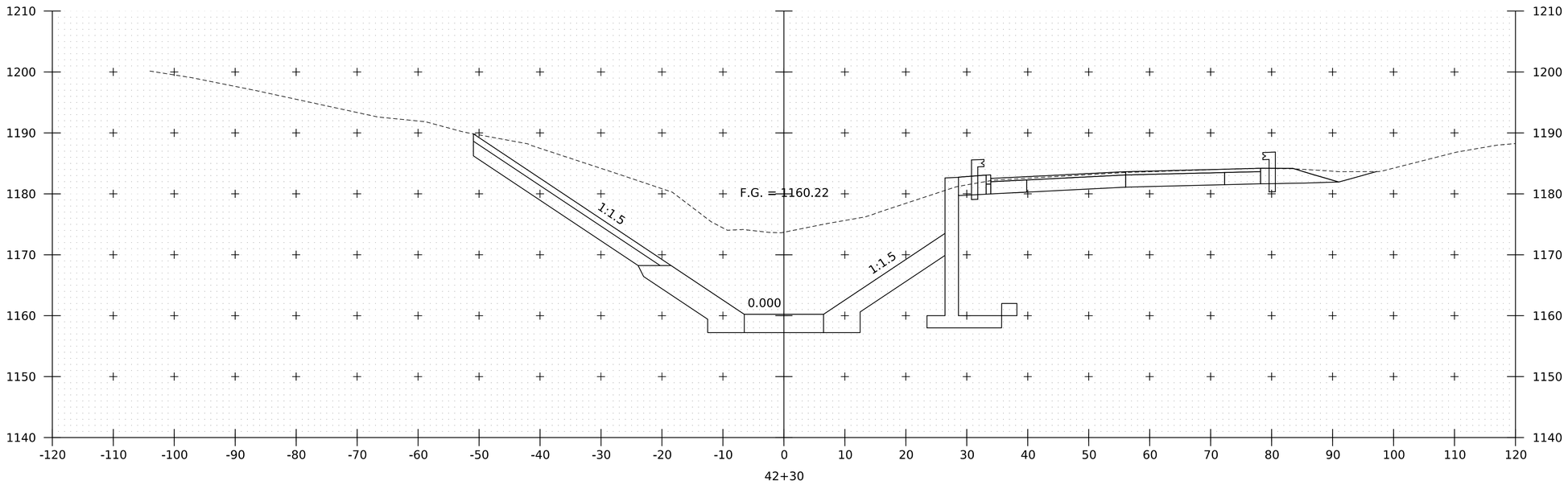
1. REFERENCE TYPCIAL SLOPE SECTION ON TYPICAL SECTIONS SHEET 3 FOR CHANNEL STATIONS 41+00 LT TO 42+60 LT.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 5	SHEET 293 OF 370



42+40



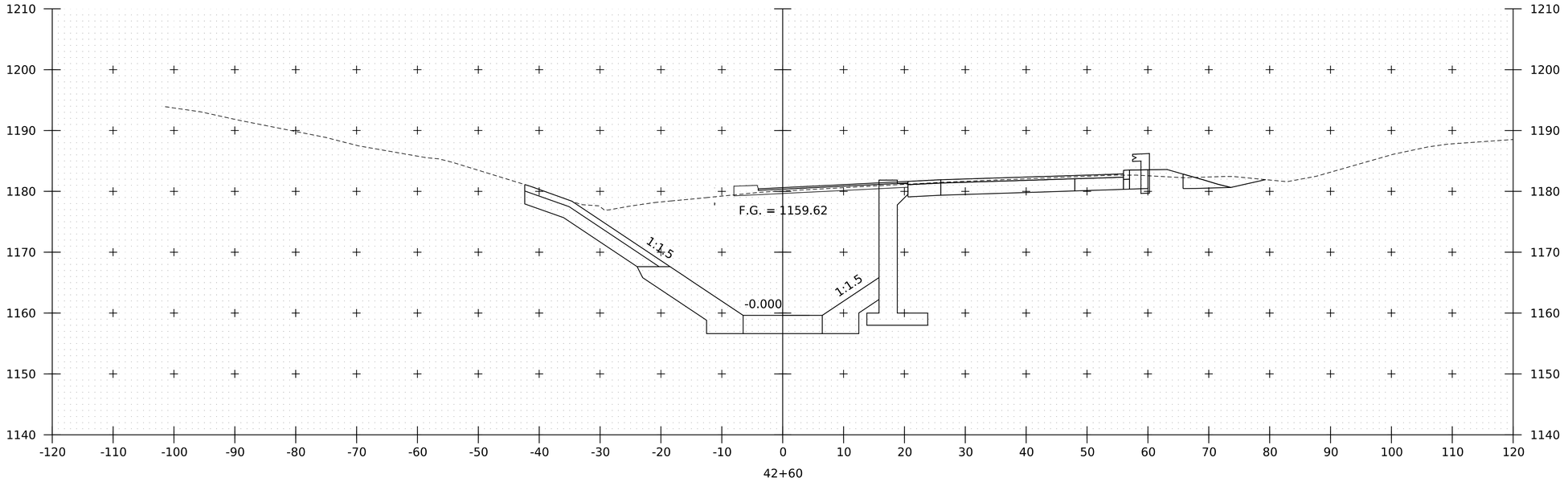
42+30

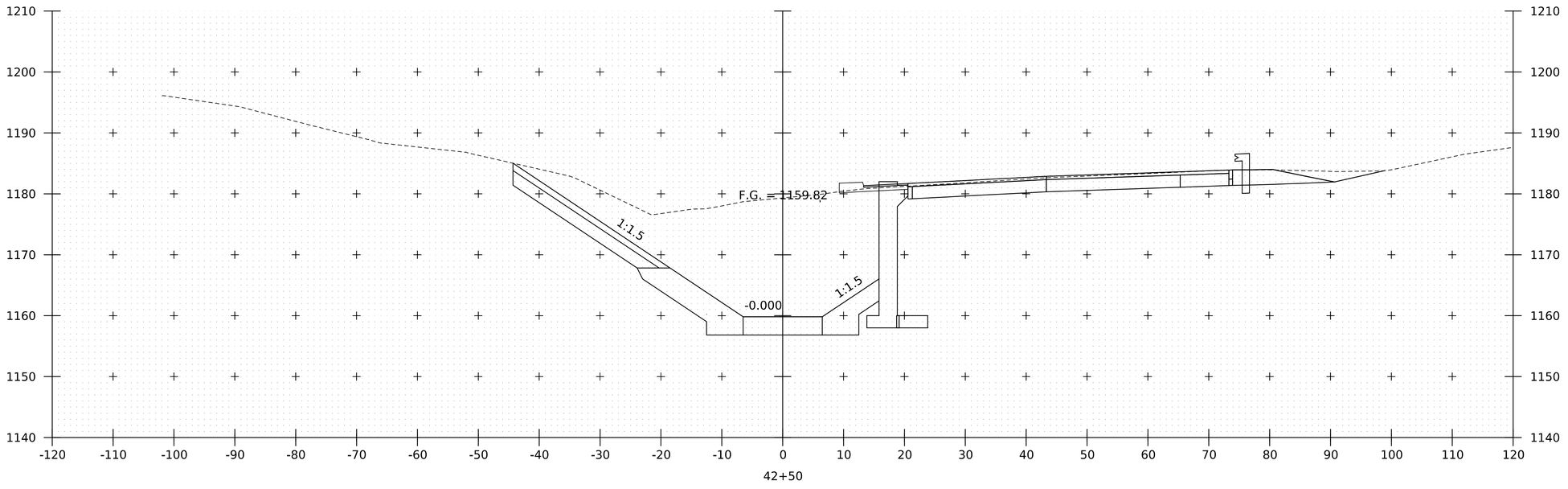
NOTES

1. REFERENCE TYPCIAL SLOPE SECTION ON TYPICAL SECTIONS SHEET 3 FOR CHANNEL STATIONS 41+00 LT TO 42+60 LT.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 6	SHEET 294 OF 370



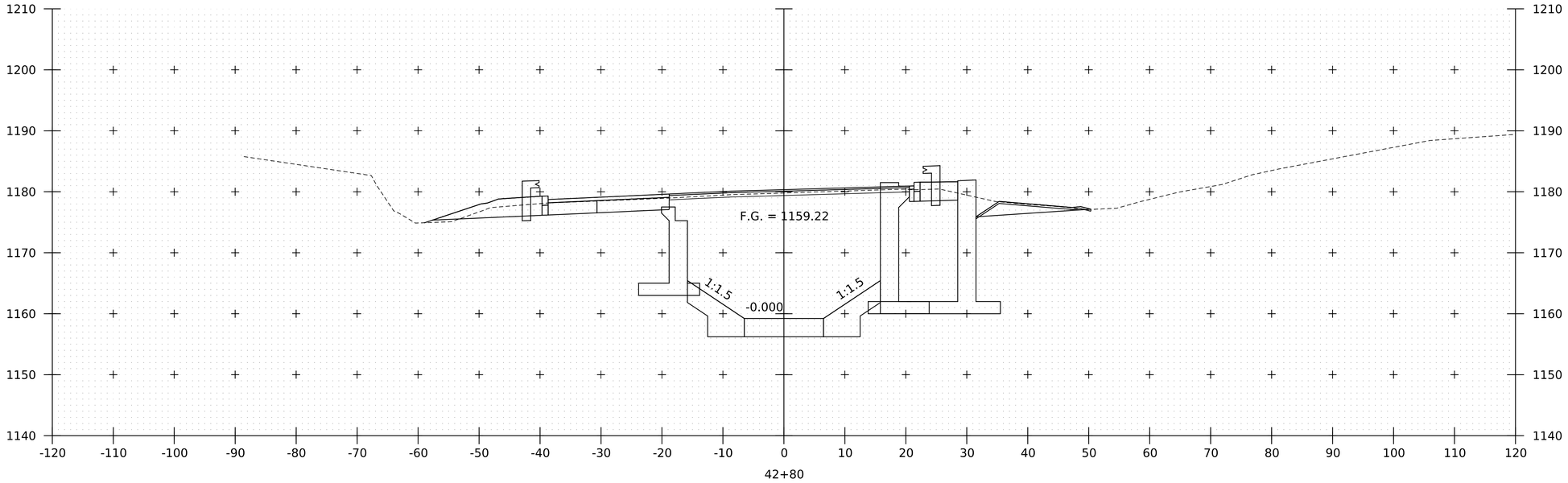


NOTES

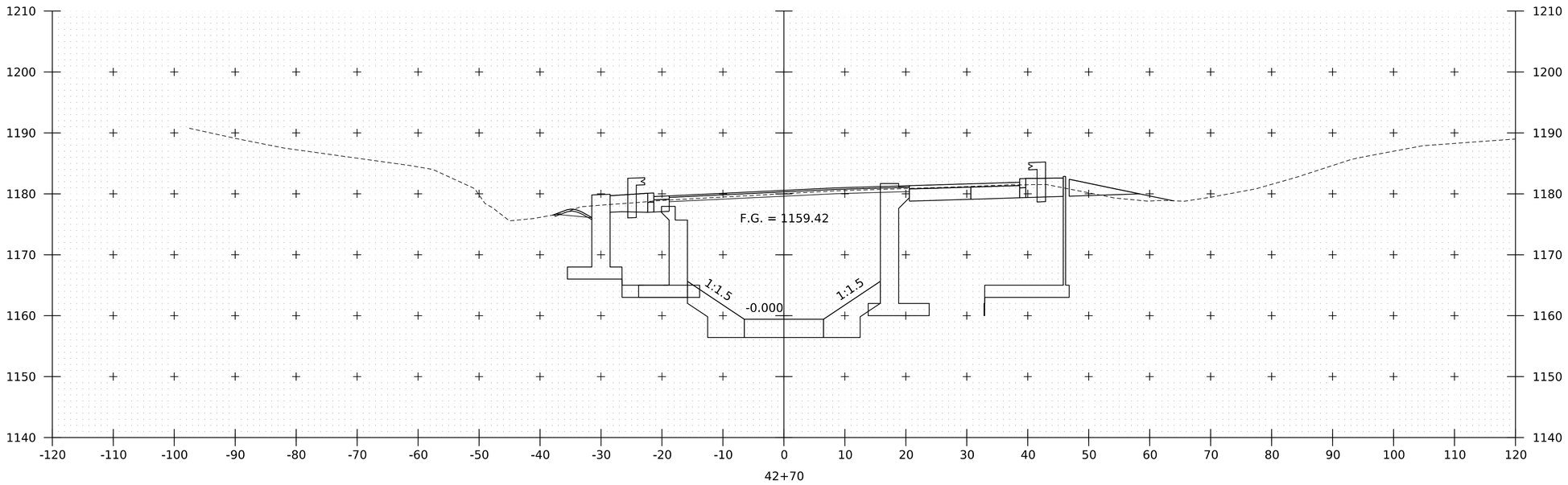
1. REFERENCE TYPCIAL SLOPE SECTION ON TYPICAL SECTIONS SHEET 3 FOR CHANNEL STATIONS 41+00 LT TO 42+60 LT.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 7	SHEET 295 OF 370



42+80

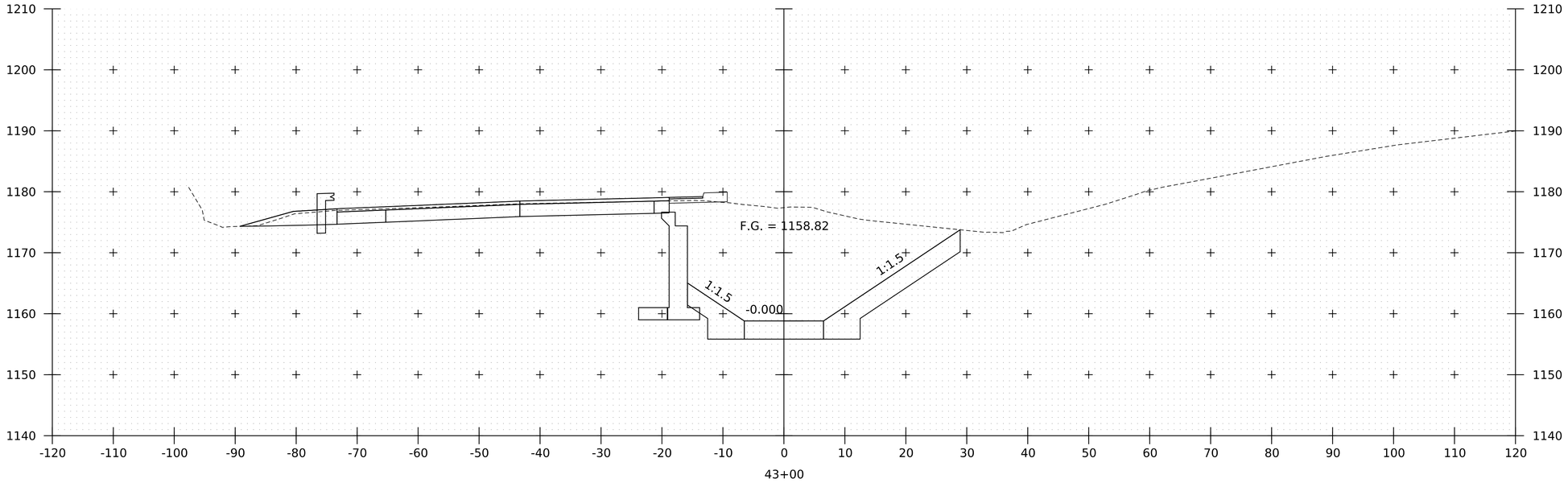


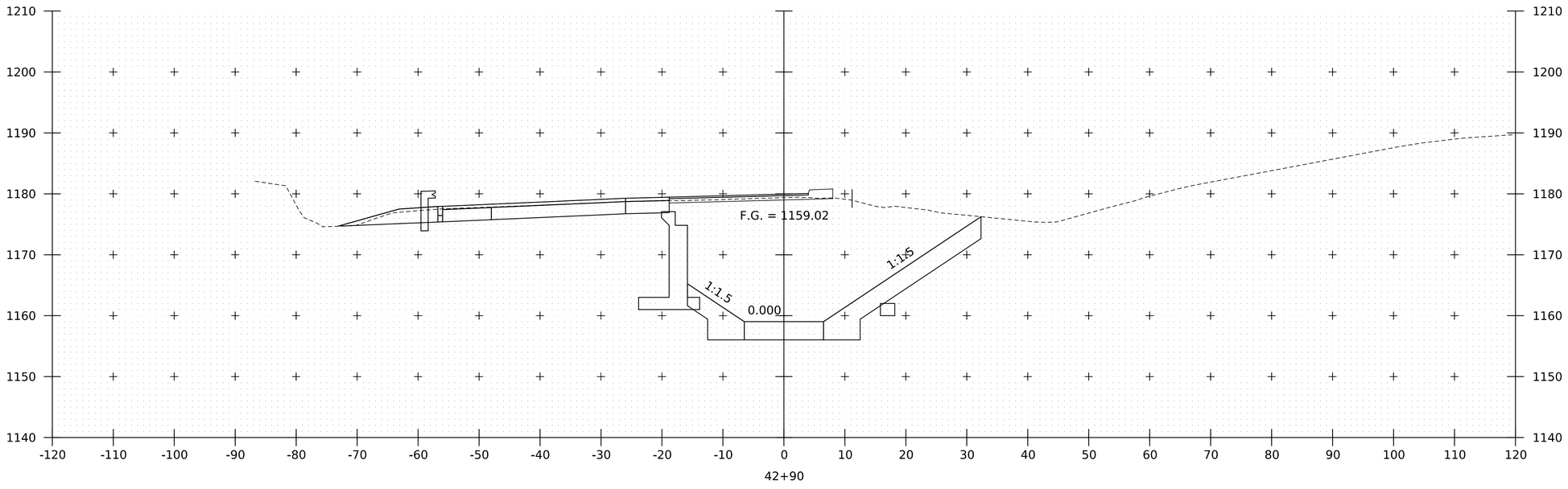
42+70

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

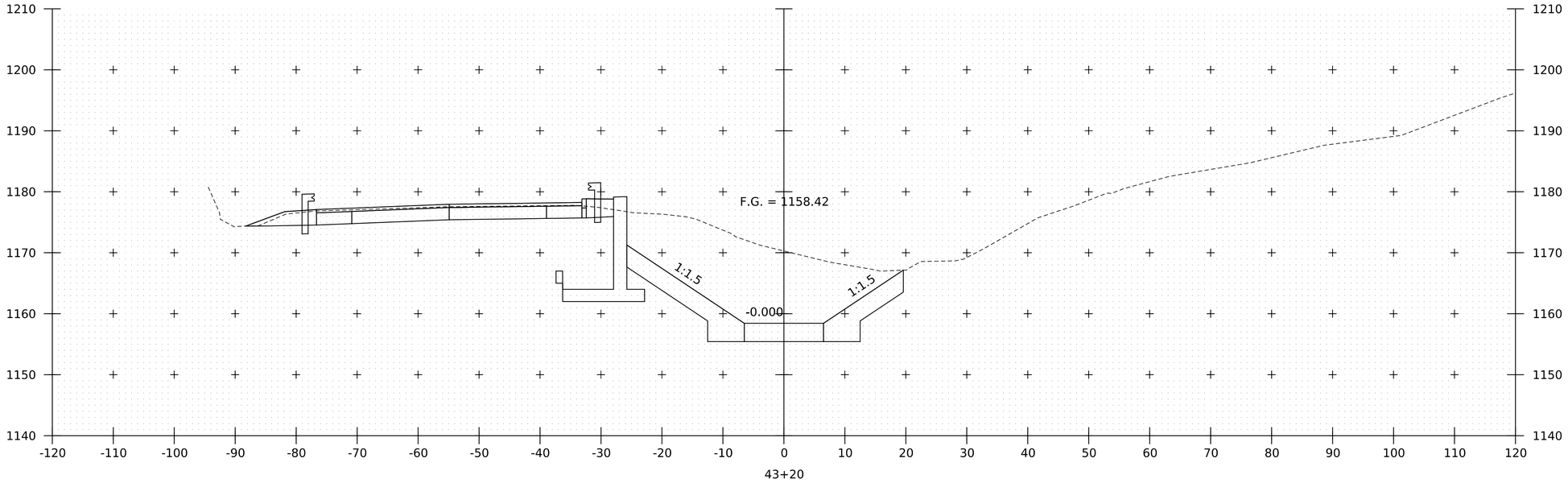
FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 8	SHEET 296 OF 370

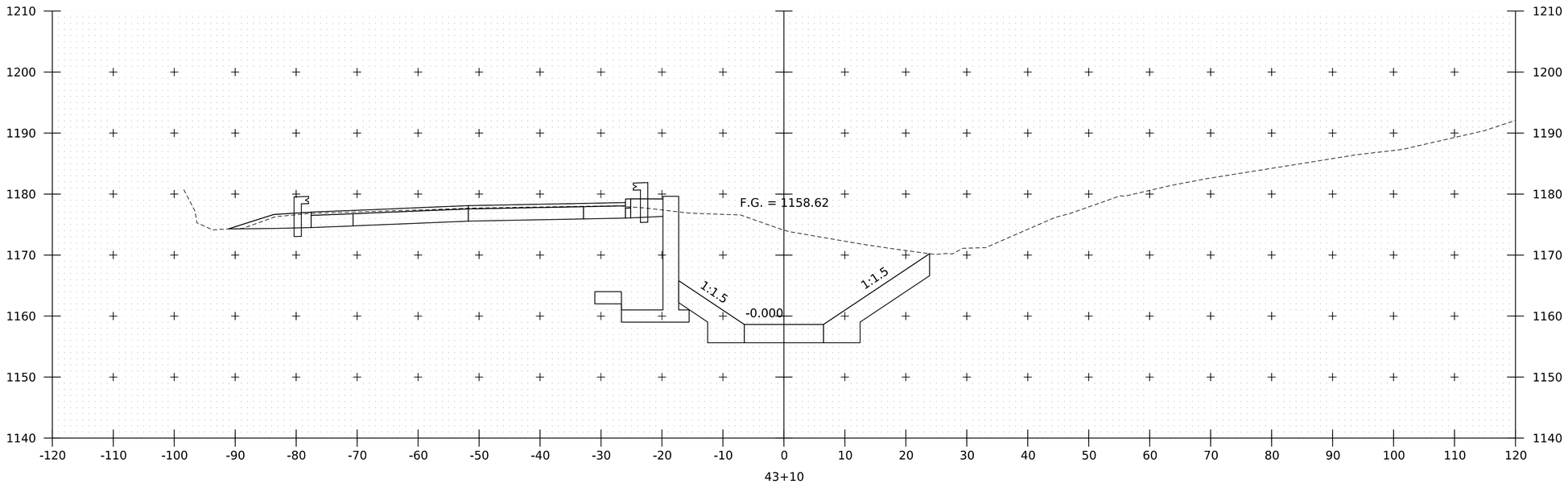




HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 9	SHEET 297 OF 370

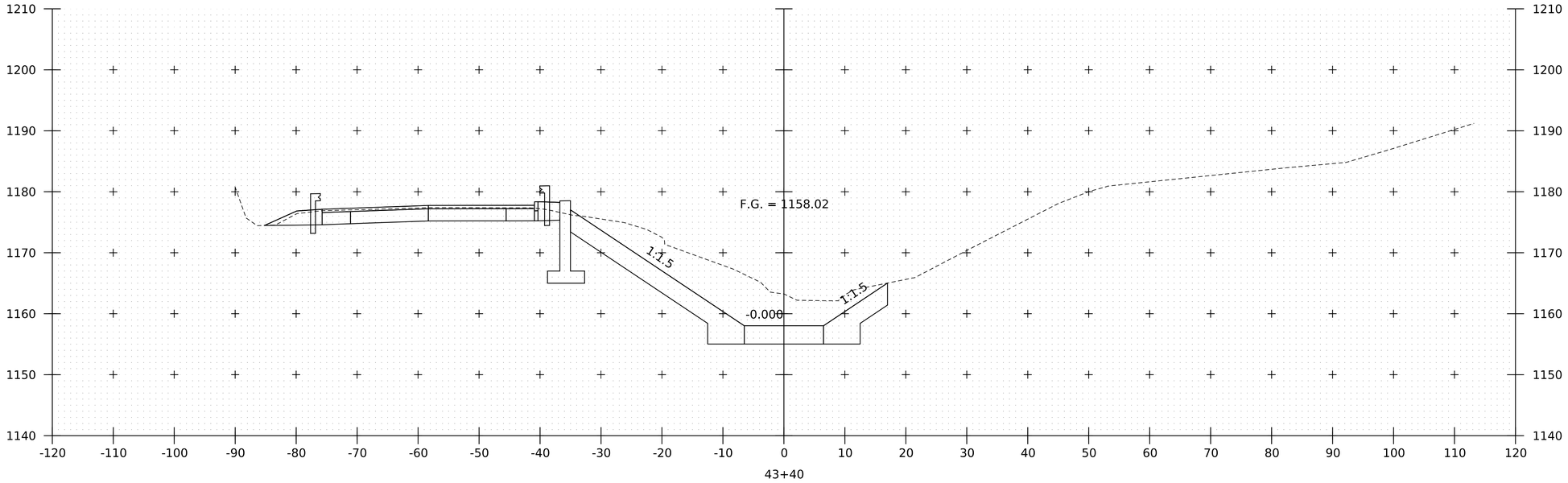


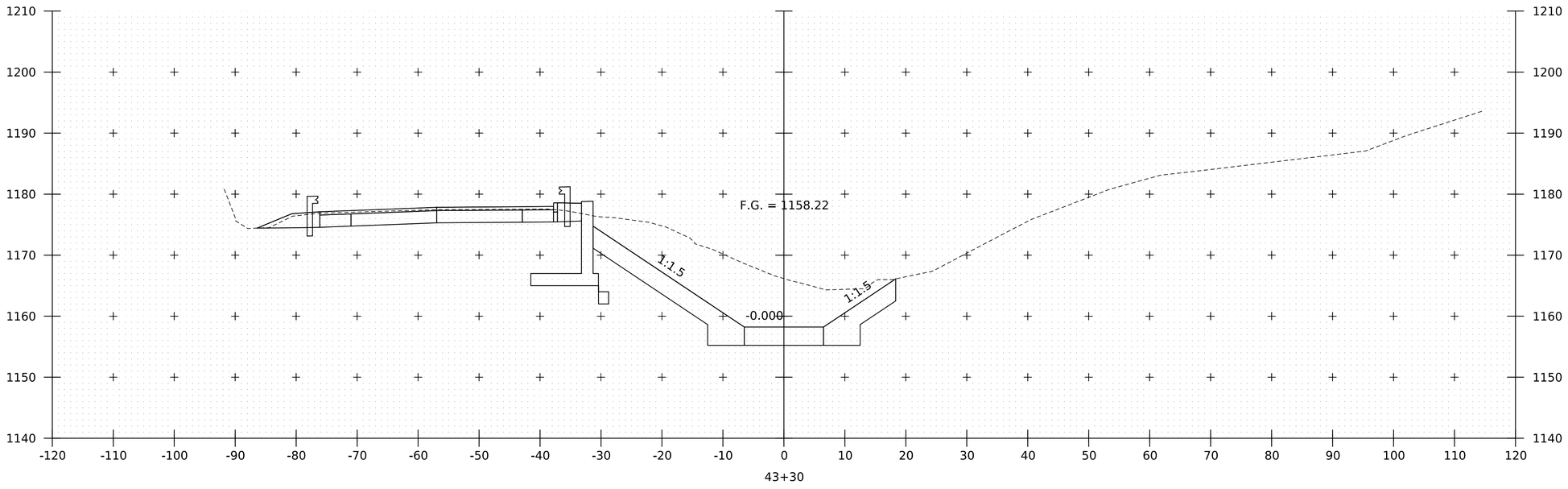


HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 10	SHEET 298 OF 370

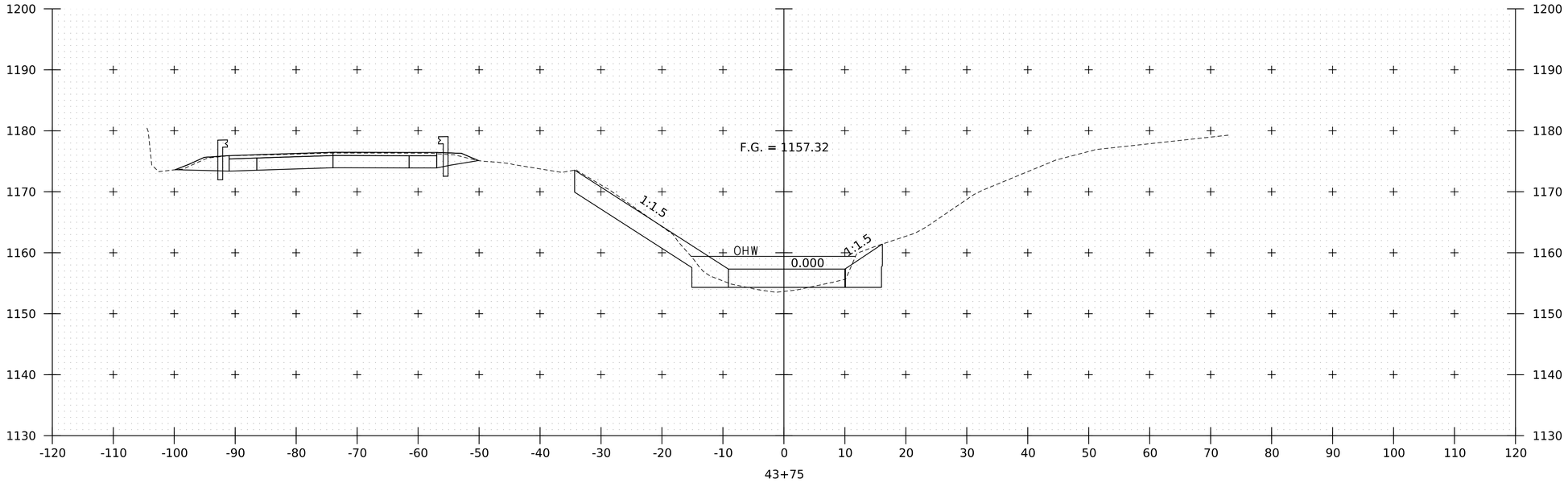


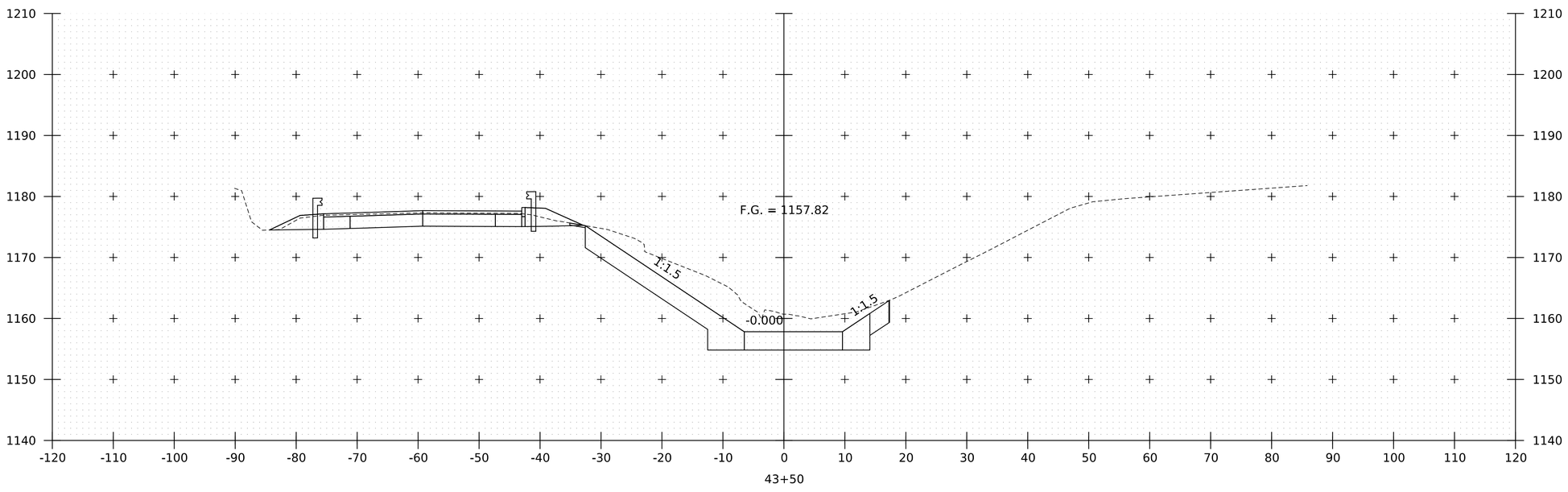


HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS II	SHEET 299 OF 370

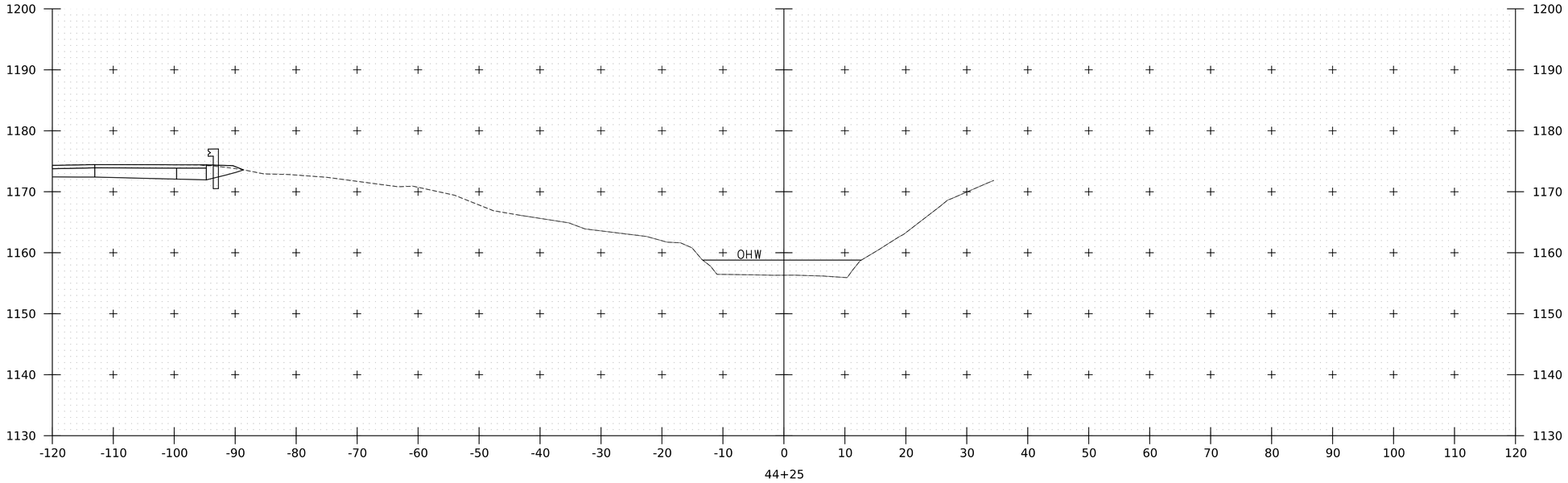


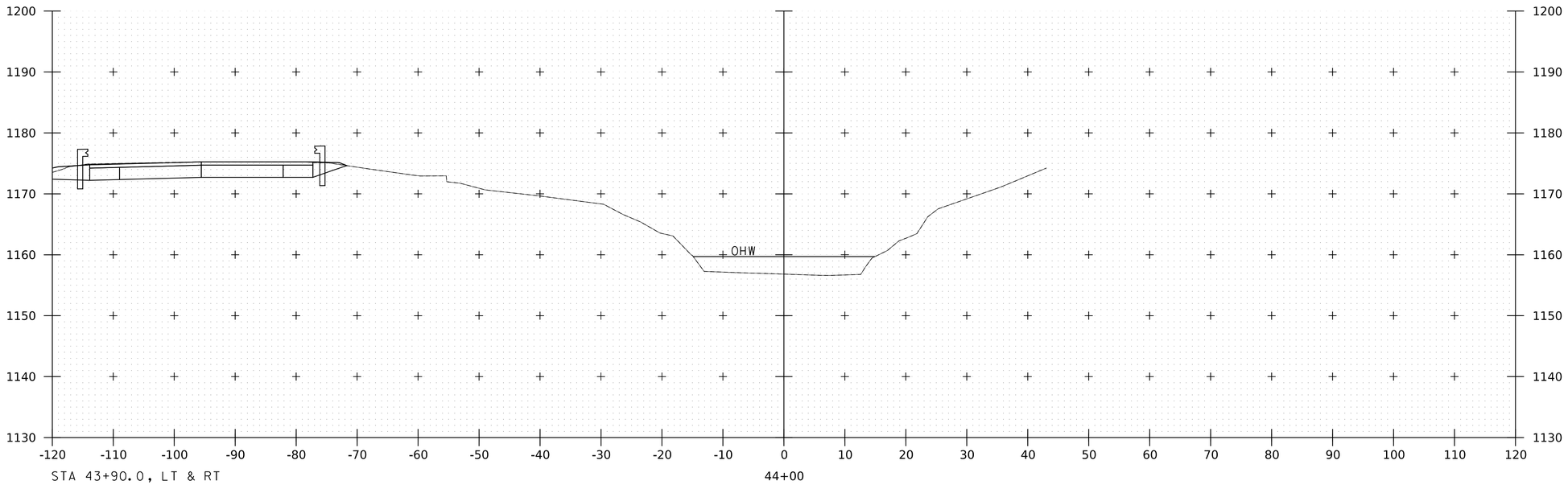


HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: zl8b003xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.SCHORN	CHECKED BY: O.KRAUSS
CHANNEL CROSS SECTIONS 12	SHEET 300 OF 370





STA 43+90.0, LT & RT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE III)
GRUBBING MATERIAL

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: zl8b003xs3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.SCHORN
CHANNEL CROSS SECTIONS 13

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: O.KRAUSS
SHEET 301 OF 370

EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THIS PROJECT INVOLVES REMOVAL AND REPLACEMENT OF BRIDGE NO. 90 WITH A NEW A STEEL BEAM BRIDGE ON SEMI-INTEGRAL CONCRETE ABUTMENTS WITH FOOTINGS FOUNDED ON BEDROCK CONVEYING UNNAMED BROOK IN ELMORE, VT. THIS PROJECT ALSO INCLUDES RELOCATING THE BROOK CHANNEL TO THE NORTH. BRIDGE NO. 90 IS LOCATED ON VT ROUTE 12 APPROXIMATELY 11 MILES SOUTH OF THE JUNCTION WITH VT ROUTE 15A. THE EXISTING STRUCTURE IS A CORRUGATED GALVANIZED METAL PLATE PIPE WHICH WILL BE ENTIRELY REPLACED IN THE LOCATION OF RELOCATED CHANNEL.

CONSTRUCTION WILL ALSO INCLUDE 0.057 MILES OF ROADWAY RECONSTRUCTION. TRAFFIC CONTROL DURING CONSTRUCTION WILL CONSIST OF A TEMPORARY BRIDGE INCLUDING TEMPORARY PAVED ROADWAY APPROACHES WITH EMBANKMENTS AND SIDESLOPES DOWNSTREAM OF BRIDGE NO. 90.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST ONE CONSTRUCTION SEASON.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 1.58 ACRES.

THE MAXIMUM CONCURRENT EARTH DISTURBANCE USED TO SCORE THIS PROJECT IN APPENDIX A RISK ASSESSMENT IS 1.58 ACRES.

THIS PROJECT REQUIRES COVERAGE UNDER GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES FOR LOW RISK PROJECTS.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

THE MAJOR COMPONENTS OF THE PROJECT AND A PROPOSED GENERAL SEQUENCE IS AS FOLLOWS:

CONSTRUCTION OF THE PROJECT WILL BE BROKEN INTO FIVE MAIN PHASES THAT CONSIST OF INSTALLING THE TEMPORARY BRIDGE AND APPROACHES, REMOVING AND REPLACING BR. 90, RECONSTRUCTING THE NEW ROADWAY APPROACHES BETWEEN THE TEMPORARY BRIDGE APPROACHES, AND THEN FINAL ROADWAY RECONSTRUCTION, SITE GRADING, AND CLEANUP TASKS.

PHASE 1
- ESTABLISH PERIMETER CONTROLS AND MARK PROJECT BOUNDARIES
- INSTALL SEDIMENT CONTROL MEASURES
- CLEARING
- INSTALL COFFERDAMS AND OTHER TEMPORARY STREAM DIVERSION STRUCTURE(S) AS NEEDED FOR CHANNEL AND STRUCTURE EXCAVATION WHICH CONFLICT WITH THE TEMPORARY BRIDGE AND APPROACHES
- CONSTRUCT TEMPORARY BRIDGE AND APPROACHES WHILE MAINTAINING TRAFFIC ON VT ROUTE 12 AND WATER FLOW THROUGH EXISTING CULVERT
- STABILIZE TEMPORARY DETOUR SIDE SLOPES
- SHIFT TRAFFIC ONTO TEMPORARY BRIDGE AND APPROACHES

PHASE 2
- INSTALL COFFERDAMS AND OTHER TEMPORARY STREAM DIVERSION STRUCTURES NEEDED FOR CHANNEL AND STRUCTURE EXCAVATION
- EXCAVATE FOR CHANNEL RELOCATION AND ABUTMENT AND WINGWALL CONSTRUCTION WHILE MAINTAINING WATER FLOW THROUGH EXISTING CULVERT OR DIVERSION STRUCTURES
- CONSTRUCT ABUTMENTS AND WINGWALLS
- REMOVE COFFERDAMS
- REMOVE EXISTING CORRUGATED GALVANIZED METAL PLATE PIPE
- BUILD FINAL CHANNEL RELOCATION EMBANKMENTS
- PLACE E-STONE AND STONE FILL
- REMOVE TEMPORARY STREAM DIVERSION STRUCTURES
- CONSTRUCT SUPERSTRUCTURE AND APPROACH SLABS

PHASE 3
- INSTALL OR ADJUST SEDIMENT CONTROL MEASURES
- CONSTRUCT ROADWAY EMBANKMENTS AND STABILIZE SIDE SLOPES
- PLACE ROADWAY SUBBASE
- INSTALL PERMANENT STABILIZATION MEASURES WHERE POSSIBLE
- PAVE ROADWAY BETWEEN THE TEMPORARY BRIDGE APPROACHES
- SWITCH TRAFFIC TO NEW ROADWAY AND BRIDGE

PHASE 4
- REMOVE TEMPORARY BRIDGE AND APPROACHES
- BUILD FINAL CHANNEL RELOCATION EMBANKMENTS WHILE MAINTAINING WATER FLOW THROUGH CENTER OF RELOCATED CHANNEL
- PLACE REMAINING E-STONE AND STONE FILL
- RE-ESTABLISH REMAINING PORTIONS OF THE ROADWAY EMBANKMENTS AND SHAPE FINAL SLOPES
- PAVE REMAINING ROADWAY
- INSTALL REMAINING PERMANENT STABILIZATION MEASURES

4. SITE DESCRIPTION

4.1 VEGETATED BUFFERS

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

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. SILT FENCE OR BARRIER FENCE WILL BE PLACED IN APPROPRIATE LOCATIONS AS SHOWN ON THE CONSTRUCTION SITE PLANS.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES (1) STREAM CROSSING, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THERE ARE NO WETLANDS OR WETLAND BUFFERS BEING IMPACTED WITHIN THE PROJECT LIMITS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE PROJECT AREA IS GENERALLY FOREST LAND.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF MOWED ROADSIDE GRASS, HERBACIOUS VEGETATION, SHRUBS, AND HARDWOODS. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:
TUNBRIDGE-LYMAN COMPLEX ROCKY, 8% TO 15% SLOPES, “K FACTOR” = 0.34
TUNBRIDGE-LYMAN COMPLEX ROCKY, 15% TO 25% SLOPES, “K FACTOR” = 0.33
ADAMS LOAMY SAND, 3% TO 8% SLOPES, “K FACTOR” = .17

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

4.7 OTHER SENSITIVE RESOURCES

THE PROJECT IS LOCATED WITHIN THE NORTHERN LONG-EARED BAT RANGE. POTENTIAL ROOSTING TREES IDENTIFIED ON THESE PLANS SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 656.11 TREE PROTECTION. THE CONTRACTOR SHALL REFERENCE NOTICE TO BIDDERS AND PERMIT RESTRICTIONS FOR TIME OF YEAR RESTRICTIONS ON TREE CLEARING.

THE PROJECT AREA IS IDENTIFIED AS A HIGHEST PRIORITY WILDLIFE CROSSING, HIGHEST PRIORITY SURFACE WATER AND RIPARIAN AREA.

A CHIMNEY AND CELLAR HOLE LOCATED OFF THE RIVER TRAIL OUTSIDE OF THE PROJECT LIMITS NEEDS TO REMAIN PROTECTED AS PART OF THIS PROJECT.

THE CC PUTNAM STATE FOREST, WHICH LIES ON THE NORTHEASTERN SIDE OF VT ROUTE 12 WAS IDENTIFIED AS A SECTION 4(F) RESOURCE.

THERE ARE NO OTHER RARE, THREATENED, OR ENDANGERED SPECIES, HISTORIC OR SECTION 4(F) RESOURCES IDENTIFIED WITHIN THE PROJECT VICINITY.

5. DRAINAGE

5.1 RECEIVING WATERS

UNNAMED BROOK IS THE ONLY WATER SOURCE ON THE PROJECT SITE. THE BROOK IS CLASSIFIED AS A PERENNIAL STEP-POOL SYSTEM WITH BOULDER, COBBLE AND GRAVEL SUBSTRATE. THE STREAM BANKS ARE VEGETATED UPSTREAM AND DOWNSTREAM OF BRIDGE NO. 90. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 1.2 MILES^2.

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF A BRIDGE PROJECT BEING LOCATED DIRECTLY OVER THE RECEIVING WATER, THERE ARE NO DISCRETE DISCHARGE POINTS. ALL WATER FROM THE PROJECT AREA DRAINS TOWARD THE BROOK AND ENTERS THE RECEIVING WATER IN MULTIPLE LOCATIONS IN THE AREAS DIRECTLY ADJACENT TO THE BRIDGE.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

THE PROJECT DOES HAVE CURBS ON THE BRIDGE AND IN FRONT OF THE BRIDGE APPROACH RAIL. STORMWATER WILL FLOW ALONG THE CURB FACE TO THE LOW END OF THE CURB ONTO STONE FILL. AREAS NOT CURBED, RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES BEFORE REACHING THE RECEIVING WATER.

THERE IS AN EXISTING CUVLERT ON THE SOUTH END OF THE PROJECT THAT CARRIES STORMWATER UNDER VT 12 AND OULETS ON STONE FILL UPLAND OF THE RECEVING WATERS.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION’S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

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

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.

6.3 STABILIZE DISTURBED AREAS

6.3.1 ACCESS POINTS/ENTRANCE/EXITS

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

STABILIZED CONSTRUCTION ENTRANCES ARE ANTICIPATED ON THIS PROJECT AND SHALL BE LOCATED AS SHOWN ON THIS EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

SURFACE ROUGHENING OF EXPOSED SLOPES, SEEDING OF TEMPORARY SLOPES AND STOCKPILES, AND STANDARD MULCHING PRACTICES DESCRIBED IN SPECIFICATION SECTION 653.07 SHALL BE UTILIZED TO TEMPORARILY STABILIZE DISTURBED AREAS.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.SEMPRINI
EPSC NARRATIVE I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER

6.3.3 PERMANENT STABILIZATION 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, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH.

E-STONE TYPE III AND STONE FILL TYPE III SHALL BE USED TO ARMOR THE STREAMBED AND CHANNEL AND WINGWALL SLOPES.

6.4 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 LOCATED WITHIN A VERTICAL SAG CURVE WITH THE SOUTH APPROACH DRAINING TOWARDS THE PROJECT AREA AND THE NORTH APPROACH DRAINING AWAY FROM THE PROJECT AREA. RUNOFF FROM THESE AREAS MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA. VT ROUTE 12 IS NORMAL CROWN TO SHEETFLOW RUNOFF OVERLAND ON THE EAST AND WEST SIDES OF VT ROUTE 12. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

SILT FENCE SHALL BE INSTALLED ALONG THE CONTOURS AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF RECEIVING WATERS.

6.6 SLOW DOWN CHANNELIZED RUNOFF

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

TEMPORARY STONE CHECK DAMS SHALL BE INSTALLED AS SHOWN ON THE PLANS.

7. CONSTRUCT PERMANENT CONTROLS

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

PERMANENT STORMWATER TREATMENT DEVICES ARE NOT ANTICIPATED TO BE NEEDED AS DESIGNED.

8. DEWATERING

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. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN THE COFFERDAM AND LIMITS OF UNCLASSIFIED EXCAVATION IS ANTICIPATED. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12" OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRADIENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1" THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT'S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC 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.

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

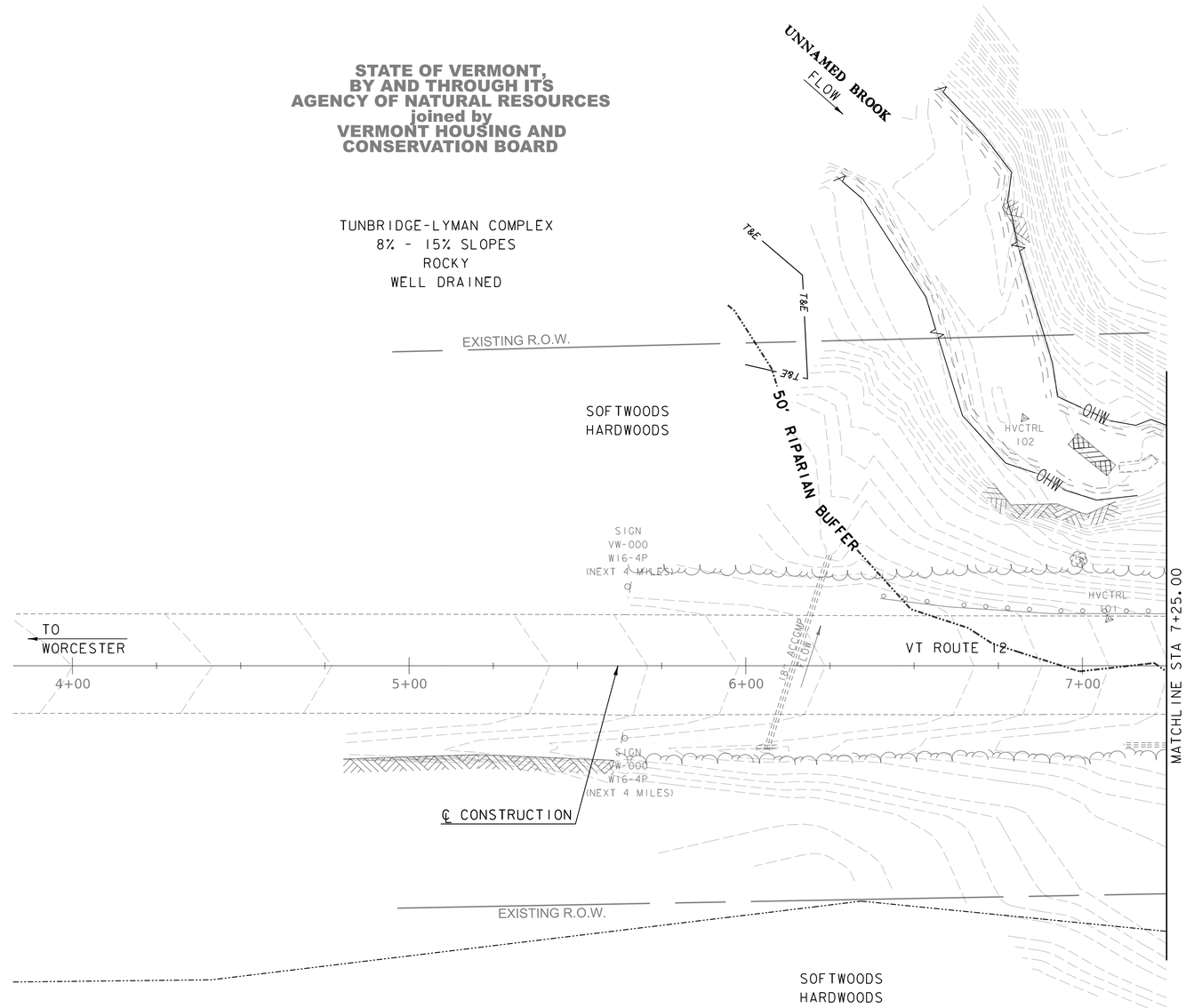
FILE NAME: zl8b003ero_nar.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.SEMPRINI	CHECKED BY: E.WEINGARTNER
EPSC NARRATIVE 2	SHEET 303 OF 370

VT STATE PLANE GRID

N

STATE OF VERMONT,
BY AND THROUGH ITS
AGENCY OF NATURAL RESOURCES
joined by
VERMONT HOUSING AND
CONSERVATION BOARD

TUNBRIDGE-LYMAN COMPLEX
8% - 15% SLOPES
ROCKY
WELL DRAINED



TUNBRIDGE-LYMAN COMPLEX
15% - 25% SLOPES
VERY ROCKY
WELL DRAINED

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC EXISTING SITE PLAN 1	SHEET 304 OF 370

VT STATE PLANE GRID

N

**STATE OF VERMONT,
BY AND THROUGH ITS
AGENCY OF NATURAL RESOURCES
joined by
VERMONT HOUSING AND
CONSERVATION BOARD**

SOFTWOODS
HARDWOODS

TUNBRIDGE-LYMAN COMPLEX
8% - 15% SLOPES
ROCKY
WELL DRAINED

50' RIPARIAN BUFFER

IRON PIPE
1.5" REBAR
UP 2"

T&E

EXISTING R.O.W.

℄ CONSTRUCTION

GRAVEL
DRIVE
18" CPEP
FLOW

SIGN
VD-701
(BRIDGE ℄
90
VT-12)

MATCHLINE STA 7+25.00

VT ROUTE 12

8+00 9+00 10+00 11+00 12+00

TO
MORRISTOWN

72" CMPP
FLOW

SOFTWOODS
HARDWOODS

SIGN
W8-701
(BRIDGE
HYDRL
VTRD2)

15" CMP
FLOW

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP .8"

50' RIPARIAN BUFFER

EXISTING R.O.W.

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP 0.4'

OHW

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP 6"

UNNAMED BROOK
FLOW

SOFTWOODS
HARDWOODS

EXISTING STONE FOUNDATION
AND CHIMNEY. CONTRACTOR
SHALL FOLLOW REQUIREMENTS
OF 900.645 SPECIAL
PROVISION (CONSTRUCTION
VIBRATION MONITORING)

50' RIPARIAN BUFFER

TUNBRIDGE-LYMAN COMPLEX
15% - 25% SLOPES
VERY ROCKY
WELL DRAINED

ADAMS LOAMY SAND
3% - 8% SLOPES
SOMEWHAT EXCESSIVELY DRAINED

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

HOYLE TANNER

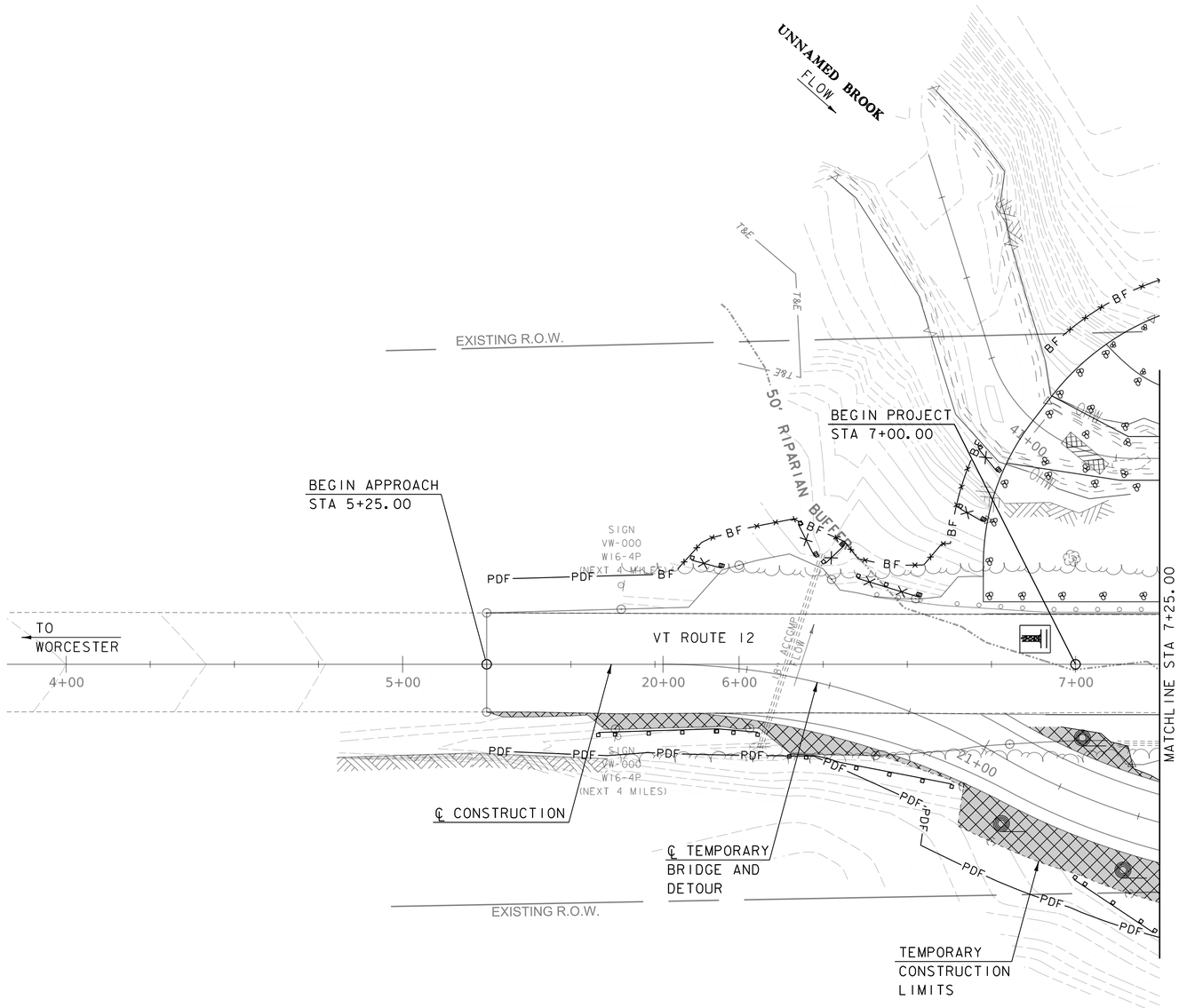
PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003bdr_erol.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC EXISTING SITE PLAN 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
SHEET 305 OF 370

VT STATE PLANE GRID

N



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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC CONSTRUCTION SITE PLAN 1	SHEET 306 OF 370

VT STATE PLANE GRID

N

50' RIPARIAN BUFFER

EXISTING R.O.W.

END BRIDGE
STA 8+56.19

END PROJECT
STA 10+00.00

℄ CONSTRUCTION

END APPROACH
STA 12+00.00

VT ROUTE 12

TO
MORRISTOWN

MATCHLINE STA 7+25.00

SIGN
VD-701
(BRIDGE)

SIGN
VT-12

15" CCMP
FLOW

IRON PIN
& REBAR
UP 2"

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP 0.4'

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP 6"

GRAVEL
DRIVE

18" CPEP
FLOW

BEGIN BRIDGE
STA 8+12.73

℄ TEMPORARY
BRIDGE AND
DETOUR

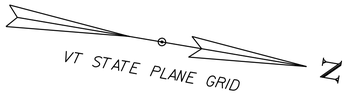
UNNAMED BROOK
FLOW

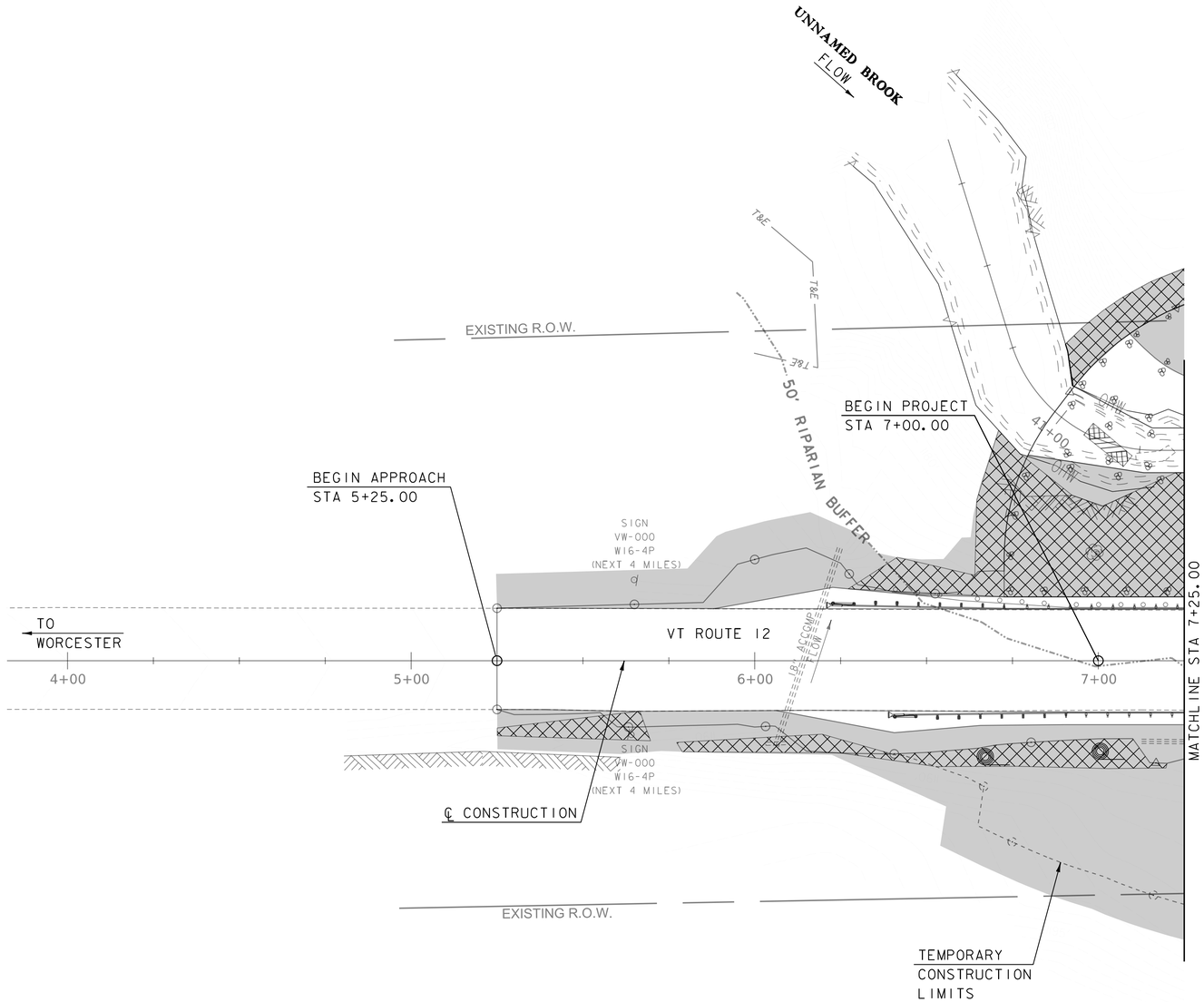
7+00 8+00 9+00 10+00 11+00 12+00
22+00 23+00 24+00 25+00
43+00 44+00 45+00

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)
FILE NAME: z18b003bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC CONSTRUCTION SITE PLAN 2	SHEET 307 OF 370





NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: z18b003bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC FINAL SITE PLAN 1	SHEET 308 OF 370

VT STATE PLANE GRID

N

50' RIPARIAN BUFFER

IRON PIPE
1.5" REBAR
UP 2"

T&E

EXISTING R.O.W.

END BRIDGE
STA 8+56.19

END PROJECT
STA 10+00.00

℄ CONSTRUCTION

END APPROACH
STA 12+00.00

GRAVEL
DRIVE

18" CPEP
FLOW

VT ROUTE 12

MATCHLINE STA 7+25.00

8+00

9+00

10+00

11+00

12+00

TO
MORRISTOWN

15" CCMP
FLOW

VT-12

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP 0.4'

BEGIN BRIDGE
STA 8+12.73

44+00

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP 6"

UNNAMED BROOK
FLOW

45+00

50' RIPARIAN BUFFER

4"X4" CONCRETE
BOUNDRY MARKER
VTHD, UP 0.4'

EXISTING R.O.W.

50' RIPARIAN BUFFER

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

HOYLE TANNER

NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: zl8b003bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: E.WEINGARTNER
EPSC CONSTRUCTION SITE PLAN 2	SHEET 309 OF 370

VAOT LOW GROW/FINE FESCUE MIX						
	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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						
	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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

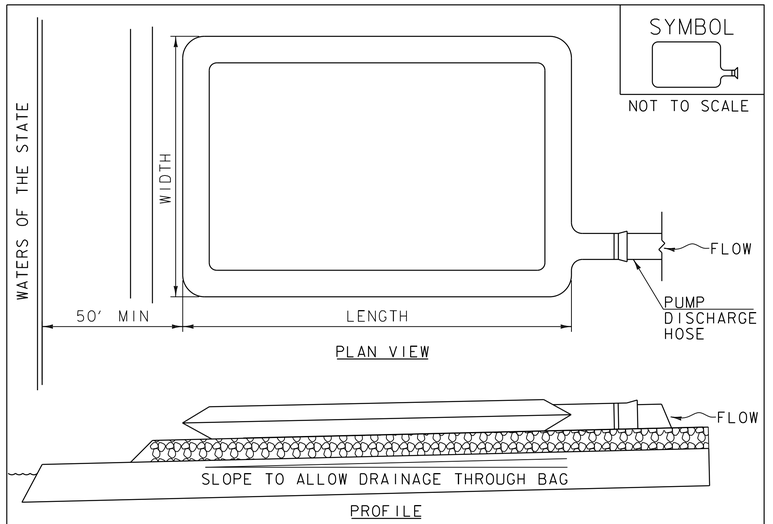
1. SEED MIX: THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER ON WHICH SEED MIX TO USE.
2. SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT 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. 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

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003ero_dtl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC DETAILS

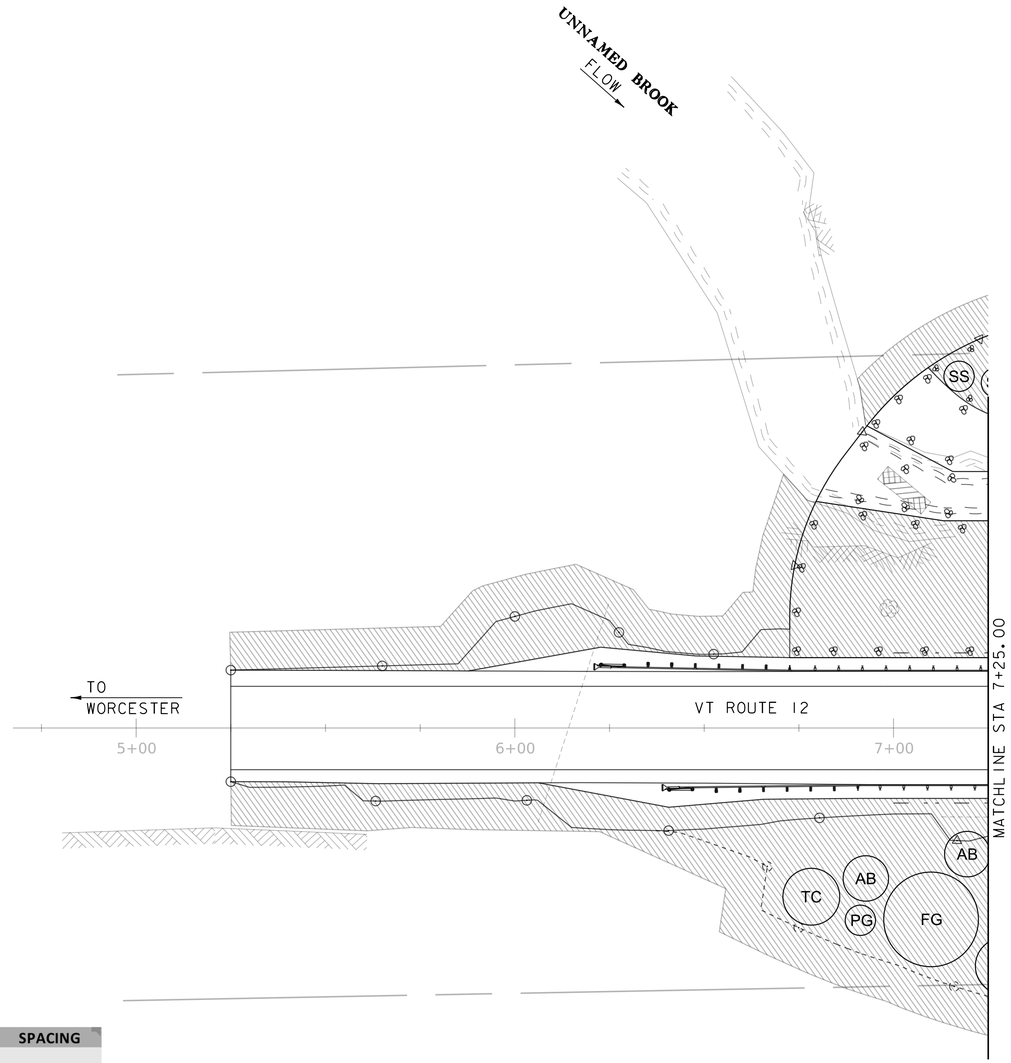
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: E.WEINGARTNER
SHEET 310 OF 370

VT STATE PLANE GRID

N

LEGEND

AOT RURAL AREA MIX



NOTES

1. SEEDED AREAS SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION SUBSECTION 651.07 PROTECTION. IF WETLANDS OR WETLAND BUFFERS ARE PRESENT, STRAW MULCH SHALL BE USE INSTEAD OF HAY MULCH.

2. IF AREAS WITHIN PDF OR BARRIER FENCE ARE NOT DISTURBED, THEY SHOULD REMAIN VEGETATED, AND ADDITIONAL REVEGETATION IS NOT REQUIRED.

3. PROVIDING SUFFICIENT MOISTURE IS CRITICAL DURING THE ENTIRE PLANT ESTABLISHMENT PERIOD. WATERING TO BE PAID FOR UNDER 656.65 LANDSCAPE WATERING.

4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 1 WEEK PRIOR TO PLANTING OPERATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER, VTRANS LANDSCAPE ARCHITECT, AND LANDSCAPE INSPECTOR WHO WILL CONFIRM PLANTING LOCATIONS BASED ON THE PREPARED SITE.

KEY	QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONT.	SPACING
TREES - EVERGREEN						
AB	5	*Abies balsamea*	Balsam Fir	3-4' height, natural	CONT.	12' O.C.
PG	7	*Picea glauca*	White spruce	3-4' height, natural	CONT.	8' O.C.
TC	5	*Tsuga canadensis*	Eastern Hemlock	3-4' height, natural	CONT.	15' O.C.
TREES - DECIDUOUS						
AR	3	*Acer rubrum*	Red Maple	5-6' height	CONT.	25' O.C.
AS	3	*Acer saccharum*	Sugar Maple	5-6' height	CONT.	25' O.C.
AL	5	*Alnus rugosa*	Speckled Alder	3-4' height, natural	CONT.	12' O.C.
FG	2	*Fagus grandifolia*	American Beech	5-6' height	CONT.	30' O.C.
SHRUBS - DECIDUOUS						
CA	8	*Cornus amomum*	Silky dogwood	1 GAL	CONT.	10' O.C.
CS	19	*Cornus sericea*	Red twig dogwood	1 GAL	CONT.	10' O.C.
SD	7	*Salix discolor*	Pussy willow	1 GAL	CONT.	10' O.C.
SS	7	*Salix sericea*	Silky willow	1 GAL	CONT.	10' O.C.
ST	7	*Spiraea tomentosa*	Steeplebush	1 GAL	CONT.	10' O.C.

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

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: STP CULV(64)

FILE NAME: z18b003bdr_lds.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.DONAHUE
LANDSCAPE PLAN 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: J.OLIN
SHEET 311 OF 370

VT STATE PLANE GRID

N

LEGEND

AOT RURAL AREA MIX

MATCHLINE STA 7+25.00

VT ROUTE 12

8+00 9+00 10+00 11+00 12+00 13+

TO MORRISTOWN

CZ

SS CS SD CA

AS TC PG FG AB AL ST AR

UNNAMED BROOK

FLOW

SCALE 1" = 20'-0"

20 0 20

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	STP CULV(64)

FILE NAME: z18b003bdr_lds.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.DONAHUE	CHECKED BY: J.OLIN
LANDSCAPE PLAN 2	SHEET 312 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 1	SHEET 313 OF 370

Replace this sheet

HOYLE TANNER

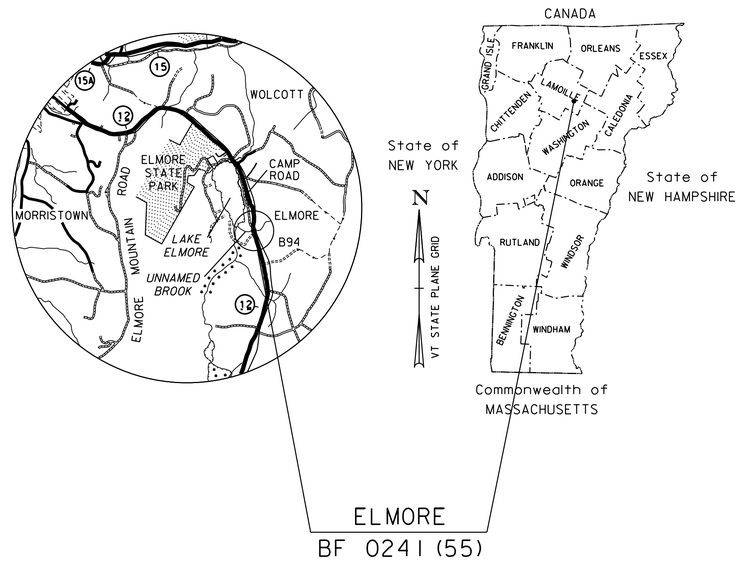
PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 2	SHEET 314 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. DETAIL SHEET	SHEET 315 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

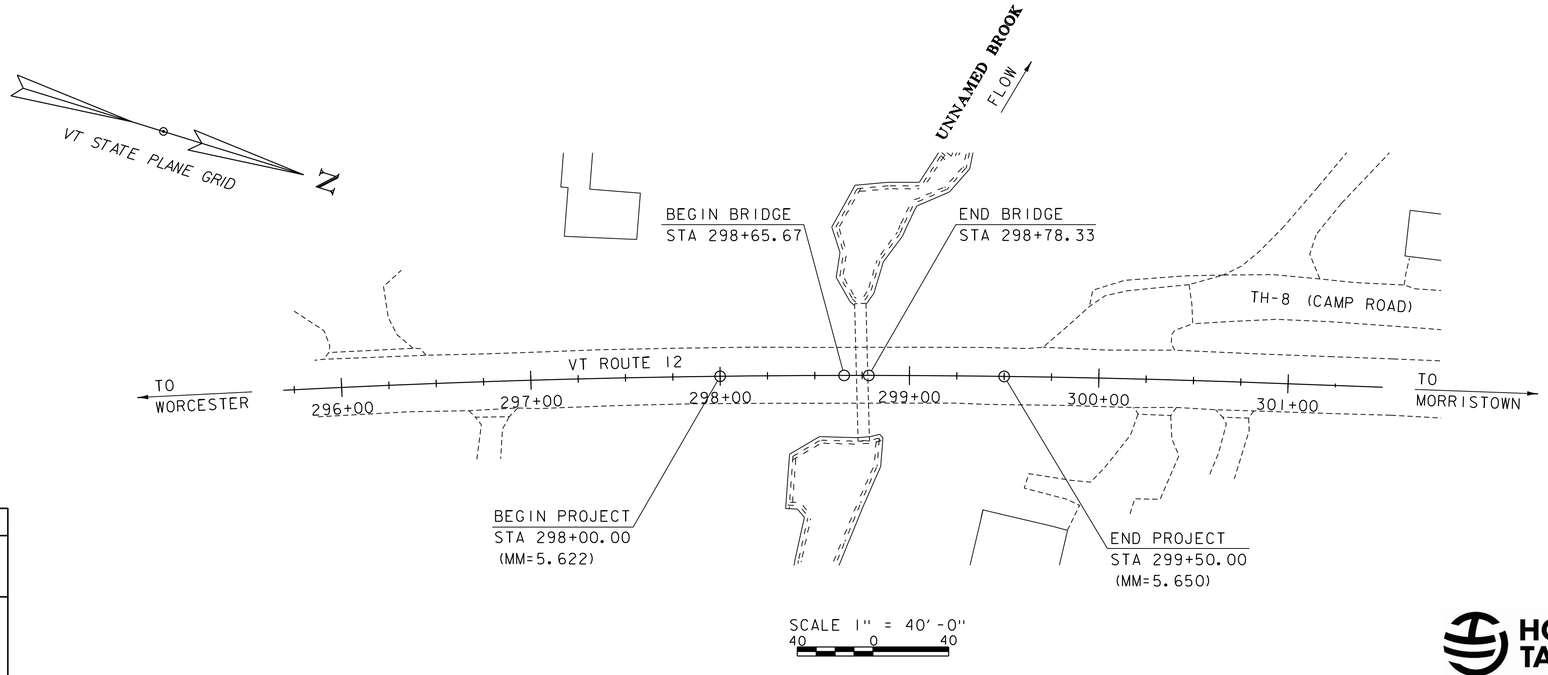
TOWN OF ELMORE
COUNTY OF LAMOILLE

ROUTE NO: VERMONT ROUTE 12 (MAJOR COLLECTOR) BRIDGE NO: 94

PROJECT LOCATION: VT ROUTE 12, BRIDGE 94, APPROXIMATELY 5.6 MILES SOUTH OF THE JUNCTION WITH VT ROUTE 15A, IN THE TOWN OF ELMORE

PROJECT DESCRIPTION: EXISTING CULVERT REPLACEMENT WITH A FOUR-SIDED PRECAST CONCRETE BOX CULVERT WITH ASSOCIATED ROADWAY IMPROVEMENTS

LENGTH OF BRIDGE:	12.67	FEET
LENGTH OF ROADWAY:	137.33	FEET
LENGTH OF PROJECT:	150.00	FEET



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 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 :	R. GILMAN AND H. MCGOWAN
SURVEYED DATE :	8/6/2019
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD83 (2011)

FINAL PLANS
25-MAY-2023

HOYLE TANNER

PROJECT MANAGER :	LAURA STONE
PROJECT NAME :	ELMORE
PROJECT NUMBER :	BF 0241(55)
SHEET	316 OF 370 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (CULVERT)

Version
LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

STANDARDS LIST

SEE SHEET 2 FOR LIST OF STANDARDS

DETAIL SHEETS

SEE SHEET 2 FOR DETAIL SHEETS

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 11/2/2022

DRAINAGE AREA : 0.9 sq. mi,
CHARACTER OF TERRAIN : Hilly
STREAM CHARACTERISTICS : Sinuous with wide floodplain
NATURE OF STREAMBED : Gravel & Cobble

PEAK FLOW DATA - ANNUAL EXCEEDANCE PROBABILITY (AEP)

43% =	48 cfs	2% =	150 cfs
10% =	90 cfs	1% =	180 cfs
4% =	120 cfs	0.2% =	270 cfs

DATE OF FLOOD OF RECORD Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ 2% AEP = 4.0 fps
ICE CONDITIONS : Moderate
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Unknown
IS ORDINARY RISE RAPID? Unknown
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE: N/A

WATERSHED STORAGE: 1.2%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Round ACCGMPP
YEAR BUILT: 1959
CLEAR SPAN(NORMAL TO STREAM): 6.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 6.0 ft.
WATERWAY OF FULL OPENING: 28.0 sq. ft.
DISPOSITION OF STRUCTURE: Replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See Borings

WATER SURFACE ELEVATIONS AT:

43% AEP =	1152.8 ft.	VELOCITY =	9.1 fps
10% AEP =	1153.9 ft.	"	10.8 fps
4% AEP =	1154.6 ft.	"	11.6 fps
2% AEP =	1155.2 ft.	"	12.3 fps
1% AEP =	1155.9 ft.	"	12.9 fps

LONG TERM STREAMBED CHANGES: Unknown

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

UPSTREAM STRUCTURE

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

DOWNSTRUCTURE STRUCTURE

TOWN: N/A — DISTANCE: N/A
HIGHWAY # : N/A — STRUCTURE #: N/A
CLEAR SPAN: N/A — CLEAR HEIGHT: N/A
YEAR BUILT: N/A — FULL WATERWAY: N/A
STRUCTURE TYPE: Lake Elmore

PROPOSED STRUCTURE

STRUCTURE TYPE: Concrete Box Culvert

CLEAR SPAN(NORMAL TO STREAM): 11.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 6.0 ft
WATERWAY OF FULL OPENING: 66.0 sq. ft.

WATER SURFACE ELEVATIONS AT:

43% AEP =	1151.7 ft.	VELOCITY=	6.9 fps
10% AEP =	1152.0 ft.	"	8.6 fps
4% AEP =	1152.4 ft.	"	9.7 fps
2% AEP =	1152.8 ft.	"	10.5 fps
1% AEP =	1153.2 ft.	"	11.3 fps

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @ 1% AEP: N/A

BRIDGE LOW CHORD ELEVATION:
FREEBOARD: @ 2% AEP = 3.5 ft.

SCOUR: N/A

REQUIRED CHANNEL PROTECTION: Stone Fill Type II & III*

PERMIT INFORMATION

AVERAGE DAILY FLOW:	-	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	-	-
ORDINARY HIGH WATER:	-	-

TEMPORARY BRIDGE MINIMUM HYDRAULIC REQUIREMENTS

STRUCTURE TYPE: Culvert (Round or Box) **
CLEAR SPAN (NORMAL TO STREAM): 6.0 ft.
VERTICAL CLEARANCE ABOVE STREAMBED: 6.0 ft.
WATERWAY AREA OF FULL OPENING: 28.27 sq. ft.

ADDITIONAL INFORMATION

*Use E-Stone Fill Type II for all upstream channel work and within proposed structure. Use E-Stone Fill Type III for all channel work downstream of proposed structure.
**Minimum temporary bottom beam/slab or crown elevation of 1152.7 ft. is required

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TWO WAY ALTERNATING TRAFFIC ON A TEMPORARY BRIDGE.
2. INSTALL AND MAINTAIN TRAFFIC SIGNALS.
3. SIDEWALKS ARE NOT NECESSARY
4. THE APPROACHES FOR THE TEMPORARY BRIDGE SHALL BE PAVED.

DESIGN VALUES

1.	DESIGN LIVE LOAD		HL-93
2.	FUTURE PAVEMENT	d_P:	---
3.	CULVERT OPENING	W:	11.00 FT
4.	MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5.	PRESTRESSING STRAND	f_y:	---
6.	PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7.	PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8.	HIGH PERFORMANCE CONCRETE, CLASS PCD	f'_c:	4.0 KSI
9.	HIGH PERFORMANCE CONCRETE, CLASS PCS	f'_c:	3.5 KSI
10.	CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	---
11.	CONCRETE, CLASS C	f'_c:	---
12.	REINFORCING STEEL	f_y:	60 KSI
13.	STRUCTURAL STEEL AASHTO M270	f_y:	---
14.	NOMINAL BEARING RESISTANCE OF SOIL	q_n:	63.6 KSF
15.	SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
16.	NOMINAL BEARING RESISTANCE OF ROCK	q_n:	---
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_{3s}:	---
21.	MINIMUM GROUND SNOW LOAD	p_g:	---
22.	SEISMIC DATA PGA: ---	S_s:	---
		S_1:	---
23.			---
24.			---
25.			---
26.			---

BITUMINOUS CONCRETE PAVEMENT SUPERPAVE MIXTURE DESIGN CRITERIA	
DESIGN LANE / DESIGN LIFE ESAL	207,600
DESIGN NUMBER OF GYRATIONS	50
PERFORMANCE GRADE ASPHALT BINDER	SEE TABLE 406.03F

LRFR LOAD RATING FACTORS

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

CULVERT DESIGN CRITERIA

1. PROPOSED CULVERT IS A PRECAST CONCRETE STRUCTURE (11'-0" X 10'-0" X 57'-0" BOX).
2. CULVERT ENDS ARE NOT SKEWED.
3. CULVERT WILL BE SET AT A SLOPE OF 18.60 IN. ON 100 FT.
4. CULVERT WILL REQUIRE FISH PASSAGE ACCOMODATIONS
5. CULVERT CONSTRUCTION WILL REQUIRE A TEMPORARY PIPE

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2024	1700	260	60	4.7	90
2044	1800	270	60	7.2	140

20 year ESAL for flexible pavement from 2024 to 2044 : 346000
40 year ESAL for flexible pavement from 2024 to 2064 : 805000
Design Speed : 50 mph

AS BUILT "REBAR" DETAIL

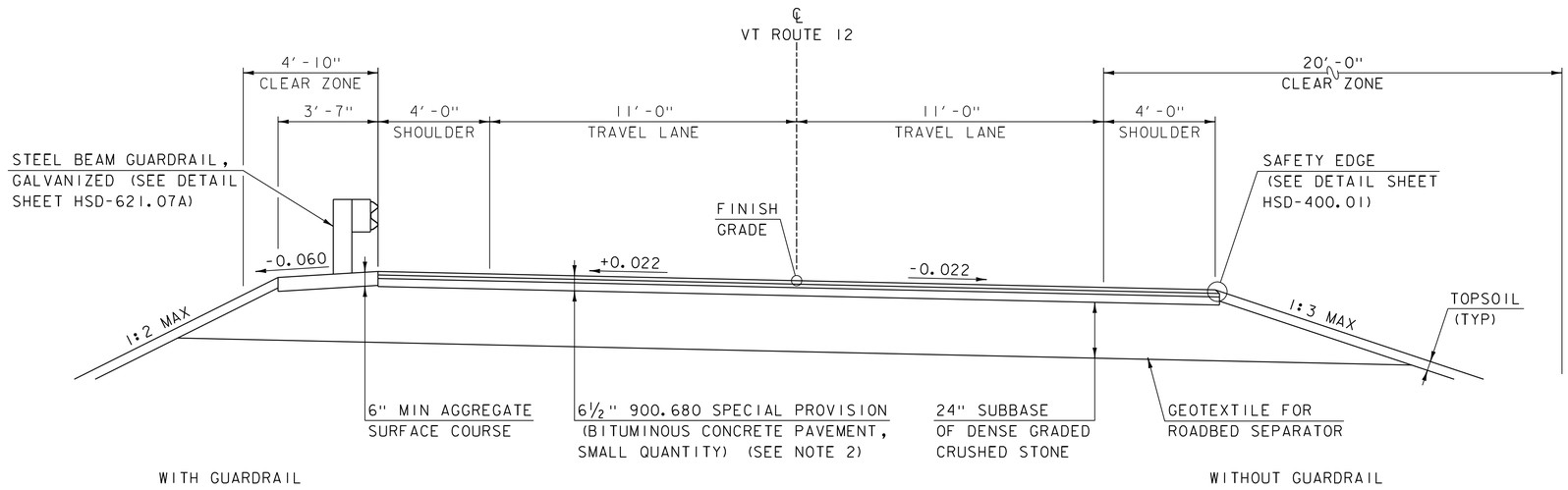
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

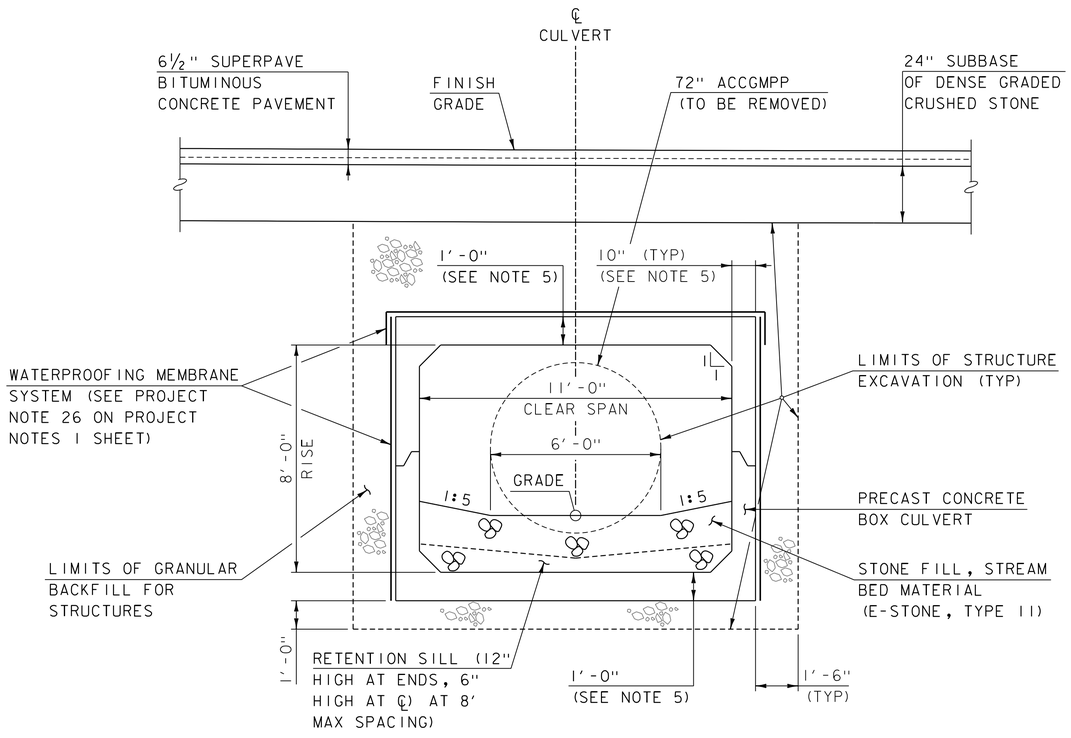
FILE NAME: z19b212pi.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
PRELIMINARY INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 317 OF 370



PROPOSED VT ROUTE 12 TYPICAL SECTION

SCALE: ⅜" = 1'-0"



CULVERT TYPICAL SECTION

SCALE: ⅜" = 1'-0"

MATERIAL TOLERANCES

(IF USED ON PROJECT)

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

NOTES

1. ROADWAY TYPICAL SECTION IS A GENERAL REPRESENTATION OF TYPICAL ROADWAY MATERIALS AND SLOPES. REFER TO THE LAYOUT SHEETS FOR LOCATION OF GUARDRAIL AND SLOPE TIE IN LOCATIONS.

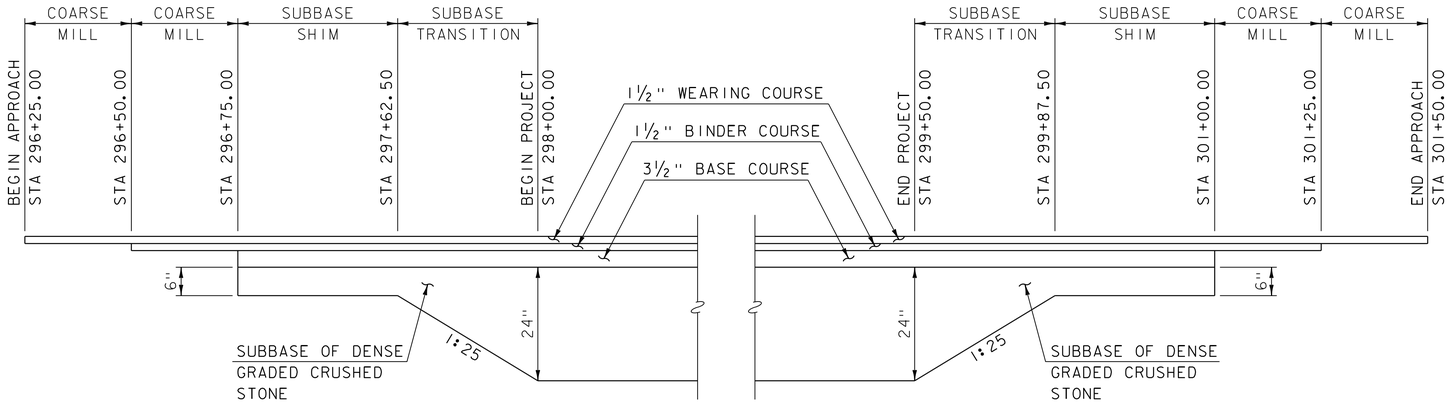
2. 6½" BITUMINOUS CONCRETE PAVEMENT SHALL CONSIST OF THE FOLLOWING:
   - 1½" TYPE IVS WEARING COURSE OVER
   - 1½" TYPE IVS BINDER COURSE
   - 3½" TYPE IIS BASE COURSE

3. PROPOSED VT ROUTE 12 ROADWAY MATERIALS AND DEPTHS SHALL BE USED FOR CONSTRUCTING PROPOSED BOAT LAUNCH DRIVE FROM STA 10+19.50 TO STA 10+75.15 AND CAMP ROAD TIE INS.

4. THE PRECAST CONCRETE BOX CULVERT WALLS AND SLABS, AND CAST-IN-PLACE WINGWALL THICKNESSES ARE ASSUMED. ACTUAL DIMENSIONS TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.

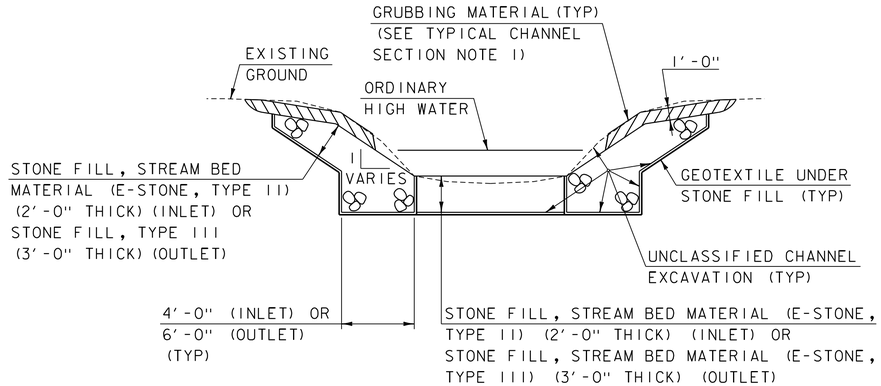
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 0241(55)
FILE NAME: z19b212typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
TYPICAL SECTIONS 1	SHEET 318 OF 370



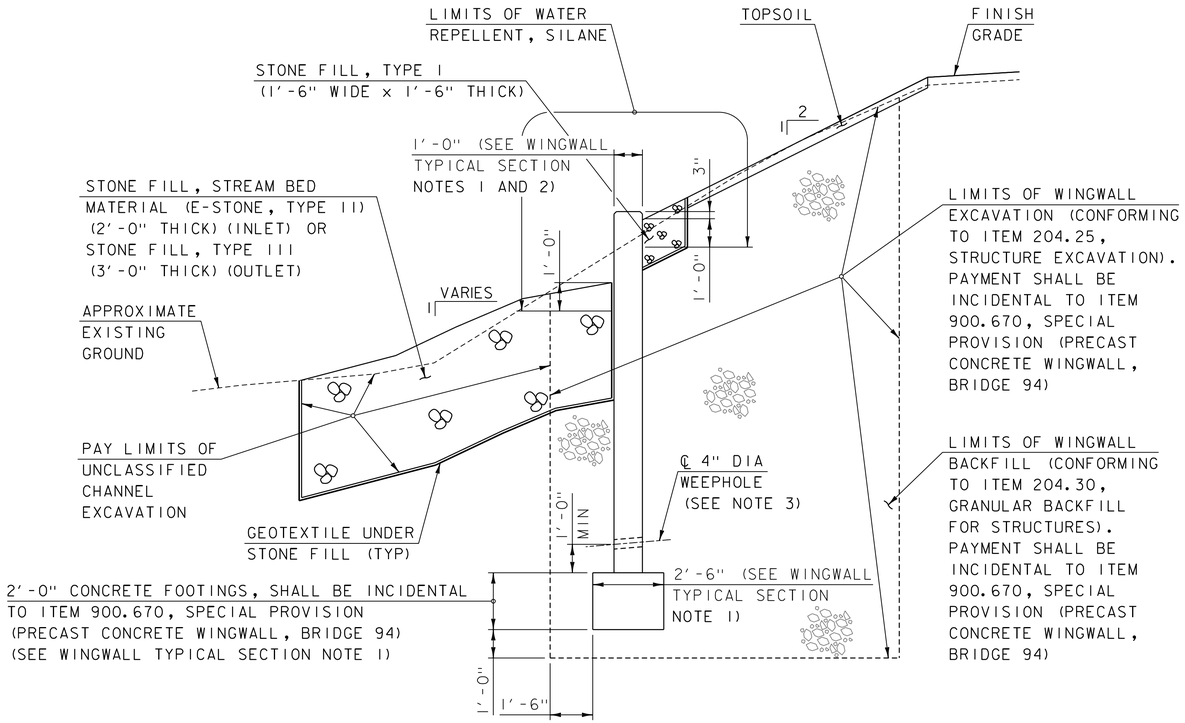
VT ROUTE 12 MATERIAL TRANSITION DETAIL

NOT TO SCALE



TYPICAL CHANNEL SECTION

(INLET SHOWN)
NOT TO SCALE



WINGWALL TYPICAL SECTION

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

TYPICAL CHANNEL SECTION NOTES

1. GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE BOX CULVERT.
2. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.

WINGWALL TYPICAL SECTION NOTES

1. ASSUMED DIMENSION. ACTUAL DIMENSION TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.
2. FABRICATOR SHALL HOLD THE BACK FACE OF THE WINGWALL AND ADJUST THE FRONT FACE FOR DIMENSIONS GREATER THAN 10".
3. MINIMUM OF TWO WEEPHOLES PER WINGWALL AT 10'-0" O.C. MAXIMUM.
4. MINIMIZE OR ELIMINATE WALL BATTER AS MUCH AS POSSIBLE.

HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: BF 0241(55)	
FILE NAME: z19b212typ.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
TYPICAL SECTIONS 2	SHEET 319 OF 370

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE VERMONT AGENCY OF TRANSPORTATION 2018 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, AND THEIR LATEST REVISIONS.

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

3. BOAT LAUNCH DRIVE AND CAMP ROAD INTERSECTION RELOCATION SHALL BE CONSTRUCTED PRIOR TO THE TEMPORARY TRAFFIC DETOUR.

4. BOAT LAUNCH ROAD AND CAMP ROAD ACCESS SHALL HAVE A MAXIMUM 5-DAY CLOSURE IN ORDER TO COMPLETE THIS WORK. THE ROAD CLOSURE SHALL BE RESTRICTED TO BETWEEN APRIL 1ST AND MAY 20TH TO AVOID PEAK BOATING SEASON.

EARTHWORK

5. THE REMOVAL OF THE EXISTING STRUCTURE WILL BE PAID UNDER ITEM 529.15 REMOVAL OF STRUCTURE. THIS WORK SHALL INCLUDE REMOVAL OF THE ENTIRE PIPE AND ANY PORTIONS OF THE EXISTING HEADWALLS THAT FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION.

6. THE USE OF EQUIPMENT AND METHOD OF BACKFILLING AROUND THE BURIED STRUCTURE SHALL BE IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATIONS, CARE SHALL BE TAKEN WHEN BACKFILLING AGAINST JOINT SEALING MATERIALS.

7. CONTACT THE RIVER MANAGEMENT ENGINEER, JARON BORG – (802) 371-8342 – A MINIMUM OF TWO WEEKS PRIOR TO CONSTRUCTION FOR APPROVAL OF STREAM BED MATERIAL AND FOR CONSULTATION REGARDING FINAL GRADING OF THE CHANNEL.

8. THE CONTRACTOR SHALL TAKE INTO ACCOUNT THAT VTRANS COMPLETED A CEMENT STABILIZED RECLAIM PROJECT IN 2010 WITHIN THE LIMITS OF THIS PROJECT. THIS MAY IMPACT THE ASSOCIATED EXCAVATION WORK.

TRAFFIC CONTROL

9. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE-SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING ALTERNATING ONE-WAY TRAFFIC, AND ROAD CLOSURE, RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE, AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. PAYMENT FOR ALL ACTIVITIES AND MATERIALS ASSOCIATED WITH THIS WORK WILL BE INCLUDED IN ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 94).

10. TWO-WAY TRAFFIC ON ROUTE 12 SHALL BE MAINTAINED DURING RELOCATION OF BOAT LAUNCH DRIVE AND CAMP ROAD INTERSECTION WORK WITH LANE SHIFTS AND PROTECTION AS REQUIRED. DAYTIME FLAGGING FOR ONE-WAY ALTERNATING TRAFFIC MAY BE ALLOWED FOR CERTAIN OPERATIONS, WITH TWO-WAY TRAFFIC BEING REINSTATED AT THE END OF EACH WORK DAY.

TEMPORARY BRIDGE AND APPROACH

11. THE ONE-WAY TEMPORARY BRIDGE AS SHOWN ON THE TRAFFIC CONTROL PLANS HAS BEEN LAID OUT BASED ON A 16' RAIL TO RAIL WIDTH FOR THE PURPOSES OF ESTABLISHING ALIGNMENT AND TEMPORARY IMPACTS. THE MINIMUM CLEAR WIDTH SHALL BE AS DEFINED BY SPECIFICATION SECTION 528.

12. THE TEMPORARY BRIDGE APPROACH HAS BEEN ESTABLISHED BASED ON 1:2 EMBANKMENT SLOPES AS SHOWN ON THE TRAFFIC CONTROL PLANS FOR THE PURPOSES OF ESTABLISHING TEMPORARY IMPACT LIMITS. SLOPES AND APPROACH RAILING ARE CONTRACTOR DETERMINED AND ARE NOT SHOWN ON TRAFFIC CONTROL PLANS PROVIDED HEREIN. CONTRACTOR SPECIFIED DETAIL SHALL BE INCLUDED ON THE WORKING DRAWINGS SUBMITTAL PER SPECIFICATION SECTION 528.

13. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORKING DRAWINGS AND TRAFFIC CONTROL DEVICES ON BRIDGE APPROACHES WITH THE SITE -SPECIFIC TRAFFIC CONTROL PLAN (REFERENCE NOTE 8 ABOVE).

14. WOODY VEGETATION (TREES, SHRUBS, ETC.) SHALL BE CUT AT OR ABOVE GROUND LEVEL AND NOT UPROOTED IN ORDER TO PREVENT DISRUPTION TO THE WETLAND SOIL STRUCTURE AND TO ALLOW STUMP SPROUTS TO REVEGETATE THE WORK AREA.

15. GEOTEXTILE FOR ROADBED SEPARATOR SHALL BE PLACED ON TOP OF EXISTING WETLAND GROUND, BELOW TEMPORARY ROADWAY FILL MATERIAL, TO PROVIDE EASIER CLEAN UP AND TO MINIMIZE IMPACTS TO THE WATER RESOURCE. EXTEND GEOTEXTILE OVER STRAW BALES TO CONTAIN TEMPORARY ROADWAY FILL.

16. MINIMIZE TEMPORARY IMPACTS TO WETLAND AREAS DURING INSTALLATION, USE, AND REMOVAL.

17. CONTRACTOR SHALL TAKE CARE TO REMOVE TEMPORARY ROADWAY FILL, STRAW BALES, AND GEOTEXTILE TO MINIMIZE LOSS OF MATERIAL ON NATIVE GRADE BELOW. ENGINEER MAY REQUIRE CONTRACTOR TO REMOVE MATERIAL BY HAND FROM WETLAND AREAS.
18. ALL WORK FOR ESTABLISHING THE TEMPORARY ROADWAY INCLUDING GEOTEXTILE FABRIC, ROADWAY FILL, AND STRAW BALES, SHALL BE CONSIDERED INCIDENTAL TO PAY ITEM 528.10 ONE-WAY TEMPORARY BRIDGE (BRIDGE 94).

TEMPORARY TRAFFIC SIGNAL

19. TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM AND IN COMPLIANCE WITH THE LATEST EDITION OF THE MUTCD.

20. SIGNAL FACES SHALL BE LED AND CONSIST OF 12 INCH LENSES (RED, YELLOW AND GREEN).

21. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY LIGHT THE STOP BAR AREAS. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

22. 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 UTILITY POLES, WIRES, ETC. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING SIGNAL PHASING AND TIMING. THE CONTRACTOR SHALL SUBMIT A PHASING DIAGRAM AND TIMING SCHEDULE TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL MAKE THE SIGNALS OPERATIONAL ONLY AFTER RECEIVING APPROVAL OF BOTH THE PHASING DIAGRAM AND TIMING SCHEDULE BY THE ENGINEER. DEVELOPMENT OF THE PHASING DIAGRAM AND TIMING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO THE ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM. ADDITIONAL ADJUSTMENTS TO SIGNAL TIMING OR PHASING REQUESTED BY THE ENGINEER SHALL BE COMPLETED WITHIN 48 HOURS OF REQUEST. PAYMENT FOR ADDITIONAL ADJUSTMENTS TO THE SIGNAL TIMING OR PHASING SCHEDULE WILL BE CONSIDERED INCIDENTAL TO ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM.

24. THE SUBMITTAL FOR ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM SHALL BE IN CONJUNCTION WITH THE SUBMITTAL FOR ITEM 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 94) AND SHALL INCLUDE AS A MINIMUM, THE SIGNAL LOCATION, TIMING AND PHASING PLAN, VEHICLE DETECTION SYSTEM AND EMERGENCY VEHICLE PREEMPTION SYSTEM.

CONCRETE/PRECAST CONCRETE

25. ALL CORNERS OF CONCRETE SHALL BE CHAMFERED 1" PER SD-501.00, UNLESS NOTED OTHERWISE.

26. WATER REPELLENT, SILANE, SHALL BE APPLIED TO ALL EXPOSED EXTERIOR SURFACES OF THE PRECAST STRUCTURE. SILANE WILL BE PAID UNDER ITEM 514.10 WATER REPELLENT, SILANE.

27. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING CONSISTENCY BETWEEN THE FABRICATOR'S SHOP DRAWINGS AND ENSURING THAT ALL PRECAST COMPONENTS FIT TOGETHER.

28. ALL LIFTING POINTS SHALL BE REMOVABLE OR COVERABLE TO THE MINIMUM CLEAR COVER FOR REINFORCING STEEL SPECIFIED IN THE PLANS. THE LIFTING POINTS SHALL BE DETAILED IN THE APPROPRIATE FABRICATION DRAWING. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE PRECAST ITEM.

29. ALL RECESSED LIFTING POINTS AND BLOCK OUTS SHALL BE FILLED WITH MORTAR, TYPE IV PER SUBSECTION 540.11 AND 707.03. PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE CORRESPONDING PRECAST ITEM.

30. THE BOX CULVERT HEADWALLS, CUTOFF WALLS AND RETENTION SILLS WILL BE CONSIDERED INCIDENTAL TO ITEM 540.10 PRECAST CONCRETE STRUCTURE (11' X 10' X 57' BOX CULVERT)

31. THE PRECAST CONCRETE BOX CULVERT SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS REFERENCED IN PROJECT NOTE 1. DESIGNS SHALL BE STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF VERMONT. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND CALCULATIONS TO THE ENGINEER IN ACCORDANCE WITH SECTION 105. USE THE FOLLOWING DESIGN CRITERIA:
    a. SOIL UNIT WEIGHT = 140 PCF
    b. DESIGN LIVE LOAD = HL-93
    c. NOMINAL BEARING RESISTANCE = 69.5 KSF
    d. BEARING RESISTANCE FACTOR = 0.45
    e. DESIGN FILL OVER BOX CULVERT = 7.0 FEET
    f. AT-REST EARTH PRESSURE (K_o) = 0.44
    g. REQUIRED DESIGN LIFE = 75 YEARS
    h. VEHICULAR SURCHARGE = PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

32. THE PRECAST BOX CULVERT DETAILS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND CONFIGURATION WILL BE DEPENDENT ON THE FABRICATOR. THE SPAN, RISE, AND LENGTH OF THE BOX CULVERT MAY BE NO LESS THAN SHOWN IN THE TYPICAL SECTIONS AND STRUCTURE DETAILS.

33. A TWO-FOOT-WIDE STRIP OF SHEET MEMBRANE WATERPROOFING MEETING THE REQUIREMENTS OF 540.10(c), SHALL BE PLACED AT EACH BOX CULVERT SECTION JOINT ALONG THE SIDES OF THE STRUCTURE. THE SHEET MEMBRANE MUST COVER ONE FOOT TO EACH SIDE OF THE JOINT ALONG THE FULL HEIGHT OF THE STRUCTURE. COVER THE ENTIRE TOP OF THE STRUCTURE WITH MEMBRANE WATERPROOFING. SHINGLE ANY JOINTS IN THE MEMBRANE WITH AN OVERLAP OF ONE FOOT. PAYMENT FOR THE MEMBRANE WILL BE INCLUDED IN THE UNIT BID PRICE FOR CONTRACT ITEM 540.10 PRECAST CONCRETE STRUCTURE (11'-0" X 10'-0" X 57' BOX CULVERT).

34. THE FABRICATOR SHALL SUPPLY THE STATE WITH THE LRFD LOAD RATING FACTORS FOR THE BOX CULVERT. COMPLETE AND SUBMIT THE LOAD RATING TABLE ON THE PRELIMINARY INFORMATION SHEET AND SUBMIT IT WITH THE BOX CULVERT DESIGN.

REINFORCING STEEL

35. ALL REINFORCING IN THE BOX CULVERT, HEADWALLS, CUTOFF WALLS. RETENTION SILLS AND WINGWALLS SHALL BE CORROSION PROTECTION LEVEL I, PER SECTION 507. PAYMENT WILL BE INCIDENTAL TO THE PRECAST ITEM.

36. REINFORCING STEEL CLEAR COVER REQUIREMENTS ARE STATED ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE NOTED IN THE PLANS:

INSIDE FACES OF BOX	1.5 INCHES
EXPOSED TO EARTH OR WEATHER	2.0 INCHES
TOP OF OUTSIDE FACES OF BOX	2.5 INCHES
DIRECT EXPOSURE TO DEICING SALTS (HEADWALL FASCIA, CURB, ETC.)	3.0 INCHES
CAST AGAINST EARTH	3.0 INCHES

37. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL, AVAILABLE ON THE AGENCY WEBSITE. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.

PRECAST CONCRETE WINGWALLS

38. THE PRECAST CONCRETE WINGWALLS SHALL BE DESIGNED BY THE FABRICATOR. ALL DESIGN WORK SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS REFERENCED IN PROJECT NOTE 1. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND CALCULATIONS TO THE ENGINEER IN ACCORDANCE WITH SECTION 105. USE THE FOLLOWING DESIGN CRITERIA:
    a. SOIL UNIT WEIGHT = 140 PCF
    b. DESIGN LIVE LOAD = HL-93
    c. NOMINAL BEARING RESISTANCE = 3.9 KSF
    d. BEARING RESISTANCE FACTOR = 0.45
    e. AT-REST EARTH PRESSURE (K_o) = 0.44
39. REQUIRED DESIGN LIFE = 75 YEARS

40. THE DESIGN OF THE WALLS MUST INCORPORATE PROVISIONS FOR ADJACENT OBSTRUCTIONS SUCH AS DRAINAGE FEATURES AND GUARDRAIL POSTS IF NECESSARY. DETAIL ANY CHANGES TO THE WALL SYSTEM IN THE FABRICATION DRAWINGS.

41. A BRIDGE PLAQUE FURNISHED BY THE AGENCY SHALL BE CAST INTO THE FACE OF THE BOX CULVERT ON THE WINGWALL #2 SIDE. SEE S-501 FOR FURTHER DETAILS.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212nts.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
PROJECT NOTES 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER

UTILITIES

1. THE CONTRACTOR IS ADVISED THAT THERE ARE HIGH-VOLTAGE UTILITY LINES IN THE VICINITY OF THE PROJECT.

MISCELLANEOUS

2. THE CONTRACTOR SHALL PROVIDE A SITE-SPECIFIC EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH SECTION 653 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. ESTIMATED QUANTITIES FOR EPSC WORK HAVE BEEN INCLUDED IN THE CONTRACT FOR BIDDING PURPOSES. IF THE CONTRACTOR'S EPSC PLAN REQUIRES ITEMS OF WORK THAT ARE NOT INCLUDED IN THE PLANS, THE EXTRA WORK WILL BE PAID FOR AS PART OF ITEM 653.03 MAINTENANCE OF EPSC PLAN (BRIDGE 94).

3. STONE FILL, STREAM BED MATERIAL SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION 613 AND 706. CONTRACTOR SHALL ENSURE E-STONE MATERIAL IS SUPPLEMENTED WITH MATERIAL EXCAVATED FROM THE CHANNEL AND/OR THE TAILINGS OF A TOPSOIL SCREENING OPERATION.

4. AN ELECTRIC CATTLE FENCE IS LOCATED ON THE DOWNSTREAM SIDE OF THE EXISTING CUVLERT. CONTRACTOR SHALL COORDINATE PROJECT START DATE WITH THE ENGINEER TO HAVE THE CATTLE FENCE RELOCATED (BY OWNER) OUTSIDE OF THE PROJECT LIMITS AND BARRIER FENCE.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212nts.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
PROJECT NOTES 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 321 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
1						1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (BRIDGE 94)	201.10	
1900						1900		CY	COMMON EXCAVATION	203.15	
			10			10		CY	SOLID ROCK EXCAVATION	203.16	
5						5		CY	CHANNEL EXCAVATION OF EARTH	203.25	
			180			180		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	
40						40		CY	EXCAVATION OF SURFACES AND PAVEMENTS	203.28	
240						240		CY	EARTH BORROW	203.30	
450						450		CY	TRENCH EXCAVATION OF EARTH	204.20	
1						1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	
			440			440		CY	STRUCTURE EXCAVATION	204.25	
			210			210		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	
350						350		SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.10	
1200						1200		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	
60						60		CY	AGGREGATE SURFACE COURSE	401.10	
20						20		CWT	EMULSIFIED ASPHALT	404.65	
45						45		SY	HAND-PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES	406.38	
1						1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	
			7			7		GAL	WATER REPELLENT, SILANE	514.10	
			1			1		LS	ONE-WAY TEMPORARY BRIDGE (900 SF - EST.)(BRIDGE 94)	528.10	
			1			1		EACH	REMOVAL OF STRUCTURE (6'-0" X 74'-0" ACCGMPP)	529.15	
			1			1		LS	PRECAST CONCRETE STRUCTURE (11' X 8' X 57' BOX CULVERT)	540.10	
160						160		LF	18" RCP CLASS III	601.0815	
70						70		LF	18" CPEP	601.0915	
70						70		LF	24" CPEP	601.0920	
2						2		EACH	18" RCPES CLASS III	601.6815	
4						4		EACH	18" CPEPES	601.7015	
2						2		EACH	24" CPEPES	601.7020	
2						2		EACH	PRECAST REINFORCED CONCRETE CATCH BASIN WITH CAST IRON GRATE	604.20	
10						10		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25	
			90			90		CY	STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE II)	613.06	
			90			90		CY	STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE III)	613.06	
5			10			15		CY	STONE FILL, TYPE I	613.10	
			60			60		CY	STONE FILL, TYPE III	613.12	
2						2		EACH	REMOVE AND RESET MAILBOX, SINGLE SUPPORT	617.10	
10						10		EACH	YIELDING MARKER POSTS	619.17	
488						488		LF	STEEL BEAM GUARDRAIL, GALVANIZED	621.20	
5						5		EACH	MANUFACTURED TERMINAL SECTION, TANGENT	621.51	
675						675		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80	
115						115		HR	UNIFORMED TRAFFIC OFFICERS	630.10	
720						720		HR	FLAGGERS	630.15	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORK SUMMARY
		FILL AVAILABLE
1900	CY	COMMON EXCAVATION (1900 x 1.0)
54	CY	UNCLASSIFIED CHANNEL EXCAVATION (180 x 0.3)
132	CY	STRUCTURE EXCAVATION (440 x 0.3)
0	CY	COFFERDAM EXCAVATION ((0+0) x 0.3)
4	CY	ROUNDING
2090	CY	TOTAL FILL AVAILABLE
		FILL REQUIRED
276	CY	FACTORED FILL REQUIRED (240 x 1.15)
4	CY	ROUNDING
280	CY	TOTAL FILL REQUIRED
		BORROW OR WASTE
1810	CY	WASTE
		BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY
358	TON	BASE COURSE, TYPE IIS
168	TON	INTERMEDIATE COURSE, TYPE IVS
182	TON	WEARING COURSE, TYPE IVS
708	TON	SUBTOTAL
22	TON	ROUNDING
730	TON	TOTAL

N.A.B.I. NOT A BID ITEM

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
QUANTITY SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 322 OF 370

HOYLE TANNER

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
				1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
								1		1		LS	FIELD OFFICE, ENGINEERS	631.10				
								1		1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
								1		1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
								1200		1200		DL	FIELD OFFICE COMMUNICATIONS (N.A.B.I.)	631.26				
					208					208		HR	EMPLOYEE TRAINEESHIP	634.10				
				1						1		LS	MOBILIZATION/DEMOBILIZATION (BRIDGE 94)	635.11				
				1						1		LS	TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 94)	641.11				
				1080						1080		LF	4 INCH WHITE LINE, WATERBORNE PAINT	646.201				
				760						760		LF	4 INCH YELLOW LINE, WATERBORNE PAINT	646.2111				
				30						30		LF	24 INCH STOP BAR, WATERBORNE PAINT	646.261				
				760						760		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.11				
							420			420		SY	GEOTEXTILE UNDER STONE FILL	649.31				
						65				65		LB	SEED	651.15				
						375				375		LB	FERTILIZER	651.18				
						2				2		TON	AGRICULTURAL LIMESTONE	651.20				
						420				420		CY	TOPSOIL	651.35				
						90				90		SY	GRUBBING MATERIAL (12 INCH)	651.40				
						1				1		LS	EPSC PLAN (BRIDGE 94)	653.01				
						170				170		HR	MONITORING EPSC PLAN	653.02				
						1				1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.) (BRIDGE 94)	653.03				
						2				2		TON	HAY MULCH	653.10				
						1800				1800		SY	ROLLED EROSION CONTROL PRODUCT, TYPE I	653.20				
						20				20		CY	CHECK DAM, TYPE I	653.25				
						35				35		CY	STABILIZED CONSTRUCTION ENTRANCE	653.35				
						1				1		EACH	INLET PROTECTION DEVICE, TYPE I	653.40				
						1				1		EACH	FILTER BAG	653.45				
						300				300		LF	SILT FENCE, TYPE I	653.475				
						270				270		LF	SILT FENCE, TYPE II	653.476				
						800				800		LF	BARRIER FENCE	653.50				
						250				250		LF	PROJECT DEMARCATION FENCE	653.55				
									4	4		EACH	DECIDUOUS TREES (ALNUS RUGOSA)(3 GALLON)(CONT.)	656.30				
									8	8		EACH	DECIDUOUS SHRUBS (SALIX DISCOLOR)(3 GALLON)(CONT.)	656.35				
									4	4		MGAL	LANDSCAPE WATERING	656.65				
									6	6		CY	LANDSCAPE BACKFILL, TRUCK MEASUREMENT	656.80				
									1	1		LS	TREE PROTECTION (BRIDGE 94)	656.85				
				13						13		SF	TRAFFIC SIGN, TYPE A	675.20				
				75						75		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341				
				7						7		EACH	REMOVING SIGNS	675.50				
				3						3		EACH	RESETTING SIGNS	675.60				
				5						5		EACH	DELINEATOR WITH STEEL POST	676.10				

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: ELMORE
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FILE NAME: z19b212qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
QUANTITY SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 323 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1031 - TRAINING	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING
5					
1					
3					
					6
					183
			1		
			970		
730					

TOTALS

GRAND TOTAL	FINAL
5	
1	
3	
6	
183	
1	
970	
730	

DESCRIPTIONS

UNIT	ITEMS	ITEM NUMBER	ROUND
EACH	REMOVAL OF EXISTING DELINEATOR AND POST	676.12	
EACH	TEMPORARY TRAFFIC SIGNAL SYSTEM	678.40	
EACH	SPECIAL PROVISION (DRIVEWAY ASSISTANCE DEVICE)	900.620	
LB	SPECIAL PROVISION (WET AREA SEED MIX)	900.635	
LF	SPECIAL PROVISION (LIVE FASCINE)	900.640	
LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)(BRIDGE 94)	900.645	
SF	SPECIAL PROVISION (PRECAST CONCRETE WINGWALL)(BRIDGE 94)	900.670	
TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS

N.A.B.I. NOT A BID ITEM

HOYLE TANNER

PROJECT NAME: ELMORE
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FILE NAME: z19b212qty.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
QUANTITY SHEET 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 324 OF 370

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

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

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

POINT	CODE	DESCRIPTION
	BF	BARRIER FENCE
	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
	PDF	PROJECT DEMARCATION FENCE
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	R.T.& I.	RIGHT, TITLE, AND INTEREST
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
◎	IPNF	IRON PIN FOUND
●	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 VALVE
	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 RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE
CB	CHORD BEARING

UTILITY SYMBOLOGY

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+TELEPHONE
- 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+TELEPHONE
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

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

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

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

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

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

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

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

ARCHEOLOGICAL & HISTORIC

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

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

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

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212leg.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
CONVENTIONAL SYMBOLOGY LEGEND

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 325 OF 370

PRIMARY CONTROL

HVCTRL #1
14 HBC
NORTH = 734294.6740
EAST = 1636901.5150
ELEV. = 1271.3550

GENERAL LOCATION, ELMORE, VT.

TO REACH FROM THE INTERSECTION OF VT ROUTE 15C AND VT ROUTE 12 IN MORRISVILLE, GO SOUTH ALONG VT ROUTE 12 FOR 4.2 MI (6.8 KM) TO THE INTERSECTION OF BEACH ROAD RIGHT AT THE NORTH END OF LAKE ELMORE. CONTINUE SOUTH ALONG VT ROUTE 12 FOR 2.0 MI (3.2 KM) TO THE SITE OF THE MARK ON THE RIGHT ON THE EAST EDGE OF A LARGE FIELD.

THE MARK IS SET IN THE SOUTH END OF A MASSIVE ROCK OUTCROP PROJECTING 2.0 M (6.6 FT) ABOVE GROUND SURFACE ON THE WEST SIDE. IT IS 17.4 M (57.1 FT) WEST OF AND ABOUT 0.5 M (1.6 FT) LOWER THAN THE CENTERLINE OF VT ROUTE 12, 6.9 M (22.6 FT) NORTH-NORTHWEST OF POLE NO 61/211, 3.2 M (10.5 FT) NORTHEAST OF A GUY ANCHOR AND 72.8 M (238.8 FT) SOUTH-SOUTHWEST OF POLE NO 60.

HVCTRL #5
ELMORE
NORTH = 736670.8550
EAST = 1636389.7590
ELEV. = 1234.1770

GENERAL LOCATION, ELMORE, VT.

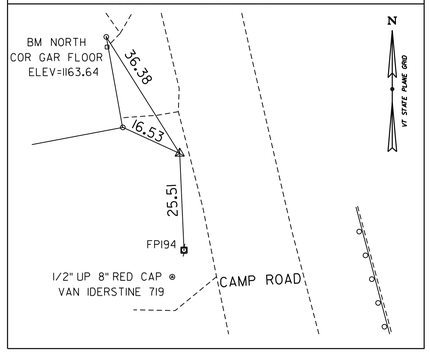
TO REACH FROM THE INTERSECTION OF VT ROUTE 15C AND VT ROUTE 12 IN MORRISVILLE, GO SOUTH ALONG VT ROUTE 12 FOR 5.5 MI (8.8 KM) TO THE INTERSECTION OF CAMP STREET RIGHT. CONTINUE STRAIGHT AHEAD AND GO SOUTH ALONG VT ROUTE 12 FOR 0.3 MI (0.5 KM) TO THE SITE OF THE MARK ON THE LEFT.

THE MARK IS SET IN THE TOP OF THE NORTHEAST CORNER OF A DROP INLET WITH VANE GRATE, JUST WEST OF THE LAKE ELMORE CEMETERY. IT IS 7.7 M (25.3 FT) EAST OF AND 0.1 M (0.3 FT) LOWER THAN THE CENTERLINE OF VT ROUTE 12, 4.8 M (15.7 FT) WEST OF A CHAIN-LINK FENCE, 36.2 M (118.8 FT) NORTH-NORTHEAST OF AND ACROSS THE ROAD FROM POLE NO 50/201, 39.9 M (130.9 FT) SOUTHEAST OF AND ACROSS THE ROAD FROM POLE NO 49/3/200, 7.0 M (23.0 FT) NORTH OF THE MOST NORTHERLY (OF TWO) GATED GRAVEL CEMETERY ENTRANCE DRIVES AND 7.0 M (23.0 FT) NORTHWEST OF ITS NORTH GATEPOST.

SECONDARY CONTROL

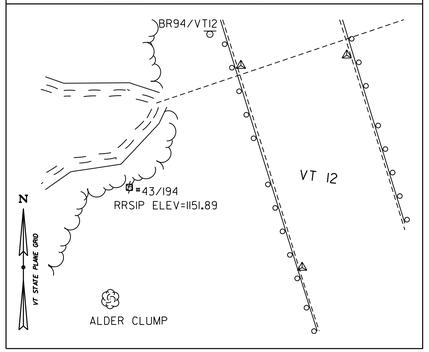
HVCTRL 60

NORTH = 738460.5341
EAST = 1635579.0714
ELEV. = 1162.4140



BM 1555

NORTH = 738177.2732
EAST = 1635665.6700
ELEV. = 1151.8865



NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
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NORTH =
EAST =
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NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

TRAVERSE COMPLETED BY R. GILMAN AND H. MCGOWAN ON 8/6/2019

DATUM

VERTICAL NAVD88
HORIZONTAL NAD83(2011)
ADJUSTMENT COMPASS

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

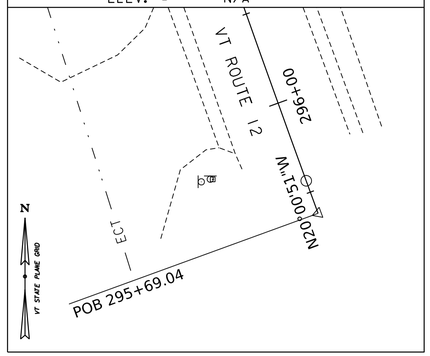
FILE NAME: z19b212ti.dgn
PROJECT LEADER: L.STONE
DESIGNED BY: VTRANS
TIE SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: H.MCGOWAN
CHECKED BY: G.HITCHCOCK
SHEET 326 OF 370

ALIGNMENT TIES
VT ROUTE 12

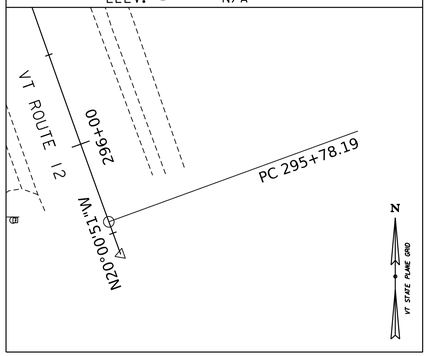
POB 295+69.04

NORTH =	737922.0178
EAST =	1635806.2107
ELEV. =	N/A



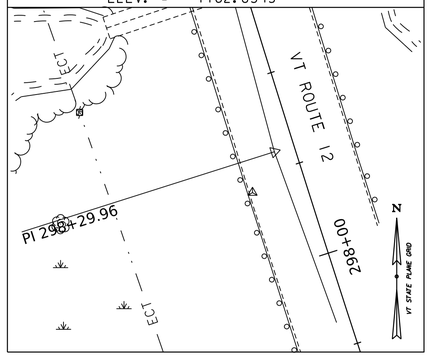
PC 295+78.19

NORTH =	737930.6151
EAST =	1635803.0792
ELEV. =	N/A



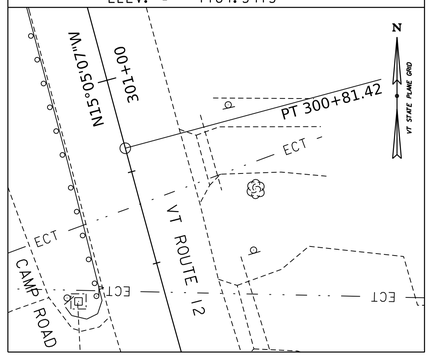
PI 298+29.96

NORTH =	738167.1782
EAST =	1635716.9115
ELEV. =	1162.8345



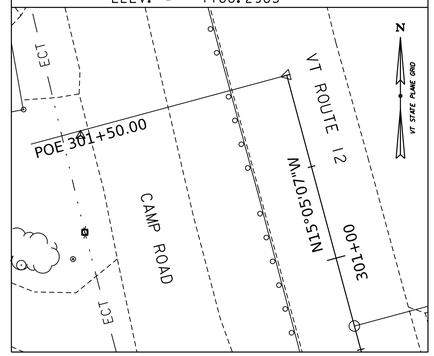
PT 300+81.42

NORTH =	738410.2697
EAST =	1635651.3869
ELEV. =	1164.5473



POE 301+50.00

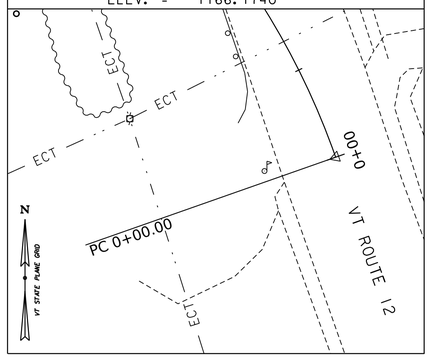
NORTH =	738476.4874
EAST =	1635633.5381
ELEV. =	1166.2983



ALIGNMENT TIES
DETOUR

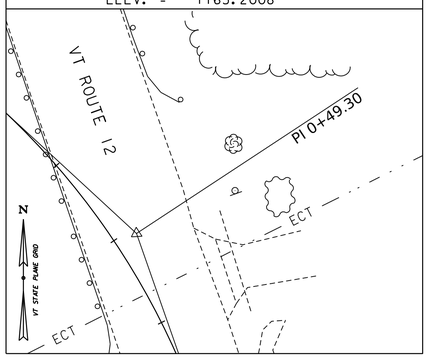
POB 0+00.00

NORTH =	737995.3377
EAST =	1635779.9339
ELEV. =	1166.1740



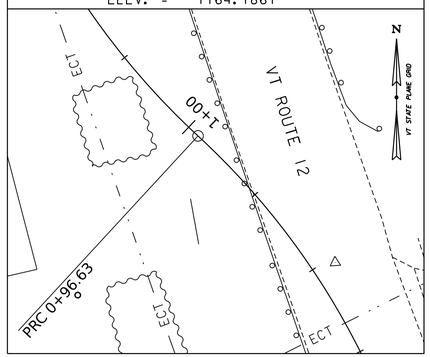
PI 0+49.30

NORTH =	738041.8534
EAST =	1635763.6071
ELEV. =	1165.2008



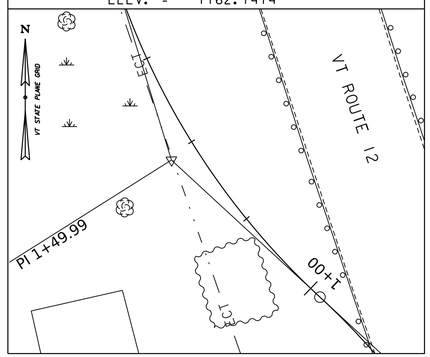
PRC 0+96.63

NORTH =	738075.2832
EAST =	1635727.3756
ELEV. =	1164.1861



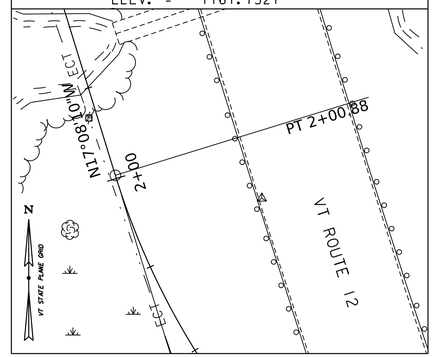
PI 1+49.99

NORTH =	738111.4697
EAST =	1635688.1562
ELEV. =	1162.7474



PT 2+00.88

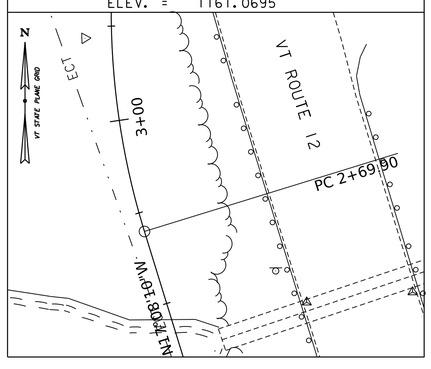
NORTH =	738162.4640
EAST =	1635672.4330
ELEV. =	1161.7527



ALIGNMENT TIES
DETOUR

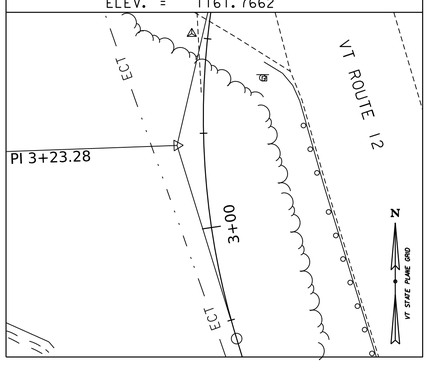
PC 2+69.90

NORTH =	738228.4188
EAST =	1635652.0970
ELEV. =	1161.0695



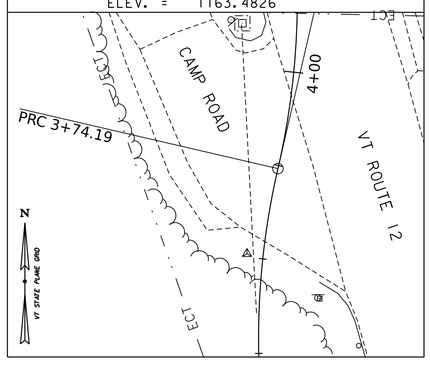
PI 3+23.28

NORTH =	738279.4344
EAST =	1635636.3672
ELEV. =	1161.7662



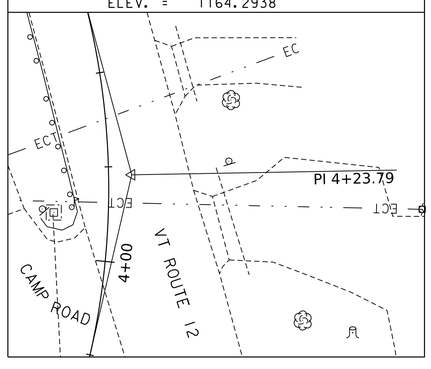
PRC 3+74.19

NORTH =	738331.4427
EAST =	1635648.4151
ELEV. =	1163.4826



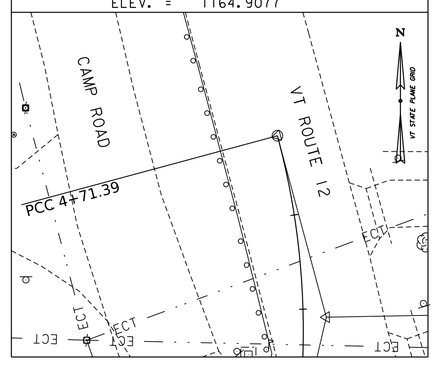
PI 4+23.79

NORTH =	738379.7653
EAST =	1635659.6092
ELEV. =	1164.2938



PCC 4+71.39

NORTH =	738427.6581
EAST =	1635646.6999
ELEV. =	1164.9077



DATUM

VERTICAL NAVD88

HORIZONTAL NAD83(2011)

ADJUSTMENT COMPASS

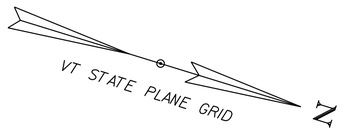
HOYLE TANNER

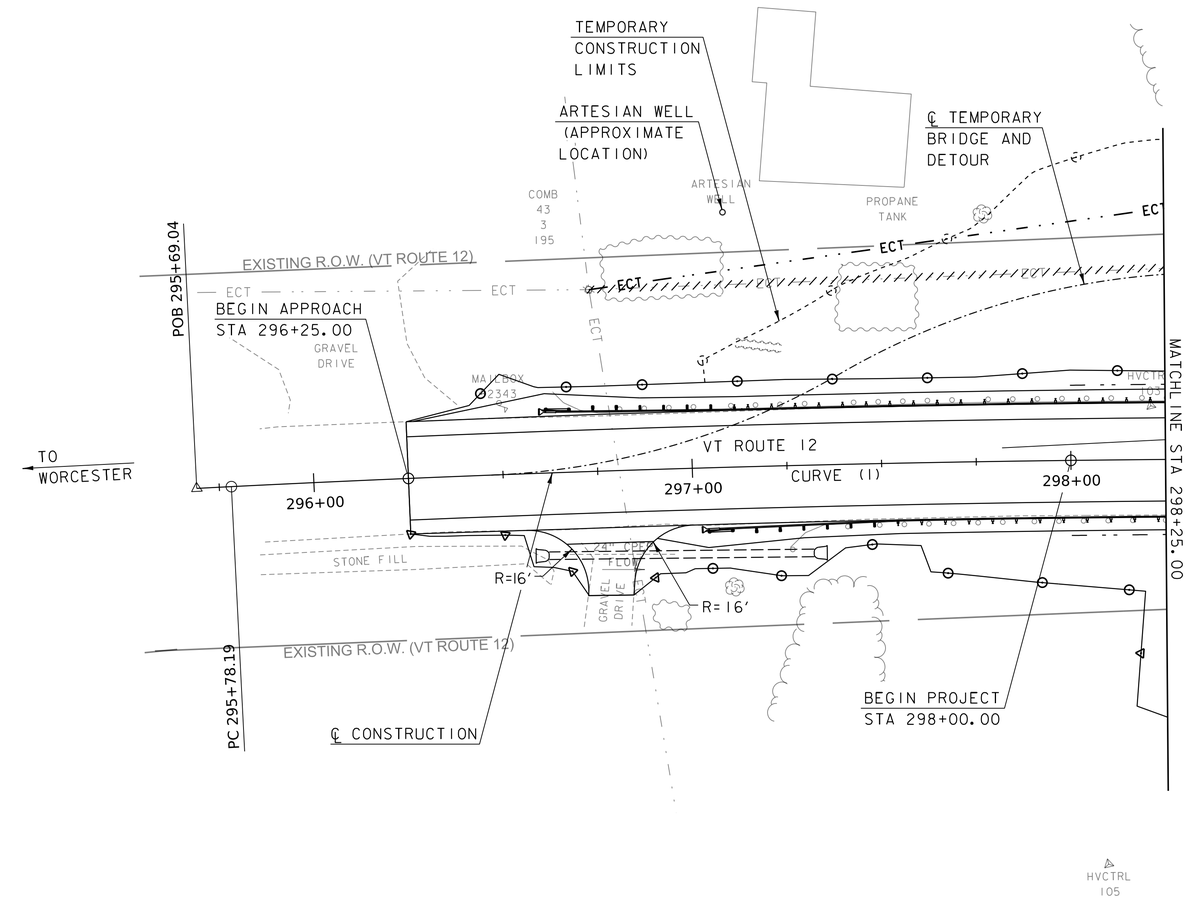
PROJECT NAME: ELMORE

PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212ti.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TIE SHEET 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS





VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 4°55'43"
D = 0°58'46"
R = 5850.00'
T = 251.77'
L = 503.22'
E = 5.42'

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 296+64, LT - STA 299+75, LT
STA 297+26, RT - STA 299+38, RT

STEEL BEAM GUARDRAIL, GALVANIZED (MGS)
STA 297+54.04, RT - STA 299+24.29, RT
(OMIT POST AS REQUIRED FOR D3)
STA 297+11.54, LT - STA 299+99.22, LT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 297+04.04, RT - STA 297+54.04, RT
STA 296+61.82, LT - STA 297+11.54, LT

CONSTRUCT 4' PAVED DRIVE APRON
STA 296+67 - STA 296+92, RT

REMOVE AND RESET MAILBOX, SINGLE SUPPORT
STA 296+50, LT (RELOCATE TO STA 296+42, LT)

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

HOYLE TANNER

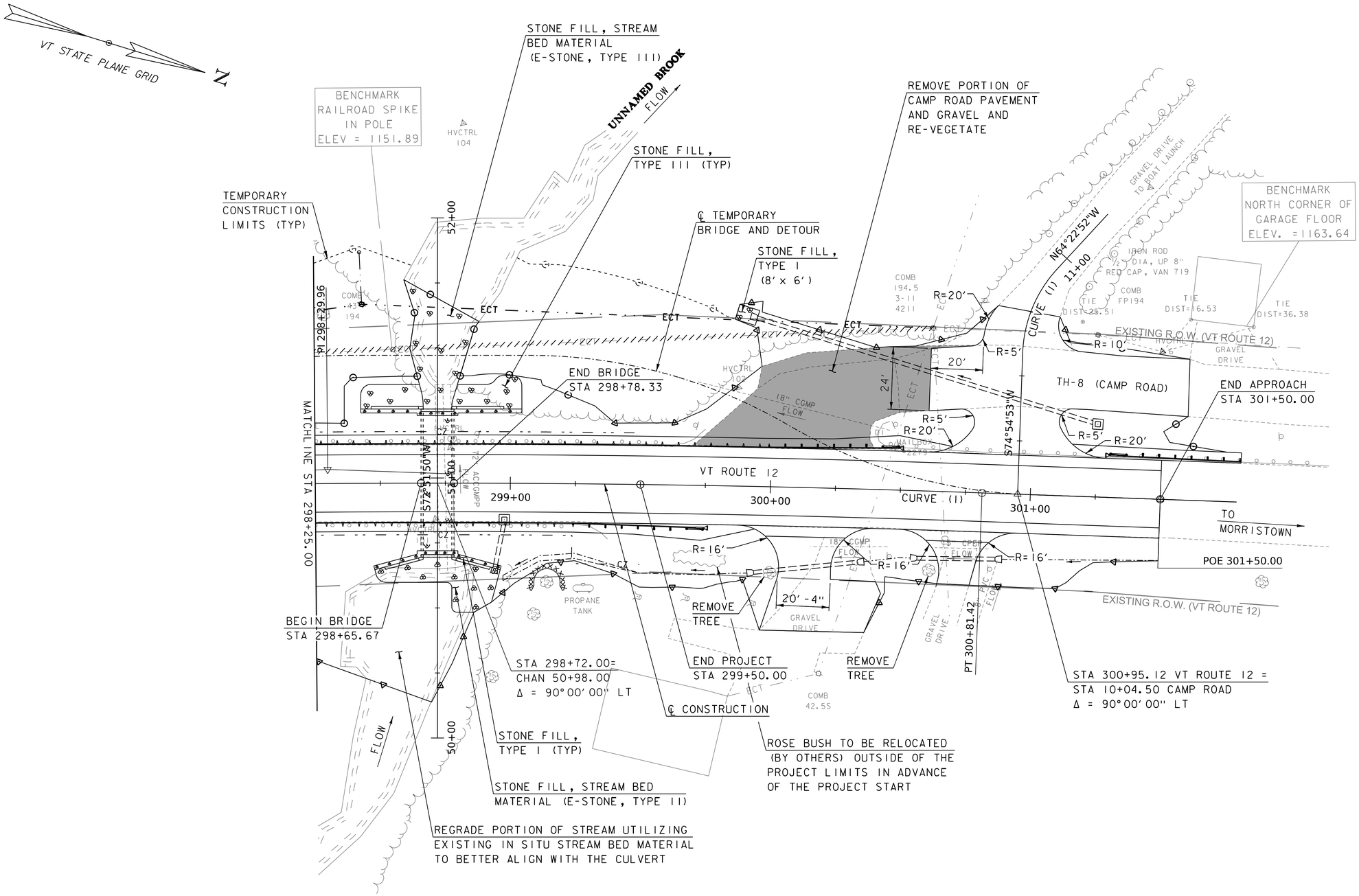
TRAFFIC CONTROL NOTES

1. SEE PROJECT NOTES FOR ADDITIONAL INFORMATION REGARDING BOAT LAUNCH DRIVE AND CAMP ROAD INTERSECTION RELOCATION.

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bdr_lay.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
LAYOUT SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 328 OF 370



EXISTING CULVERT INFORMATION
BUILT 1959
74' LONG ACCGMPP, 72" DIA
28 SQ FT WATERWAY AREA
7' AVERAGE COVER

VT ROUTE 12 CURVE DATA

CURVE (1)
DELTA = 4°55'43"
D = 0°58'46"
R = 5850.00'
T = 251.77'
L = 503.22'
E = 5.42'

BOAT LAUNCH CURVE DATA

CURVE (1)
DELTA = 40°42'15"
D = 114°35'30"
R = 50.00'
T = 18.55'
L = 35.52'
e = 3.33

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 300+41, LT - STA 301+75, LT

MANUFACTURED TERMINAL SECTION, TANGENT
STA 299+24.29, RT - STA 299+74.28, RT
STA 299+99.22, LT - STA 300+48.94, LT
STA 301+30.25, LT - STA 301+80.12, LT

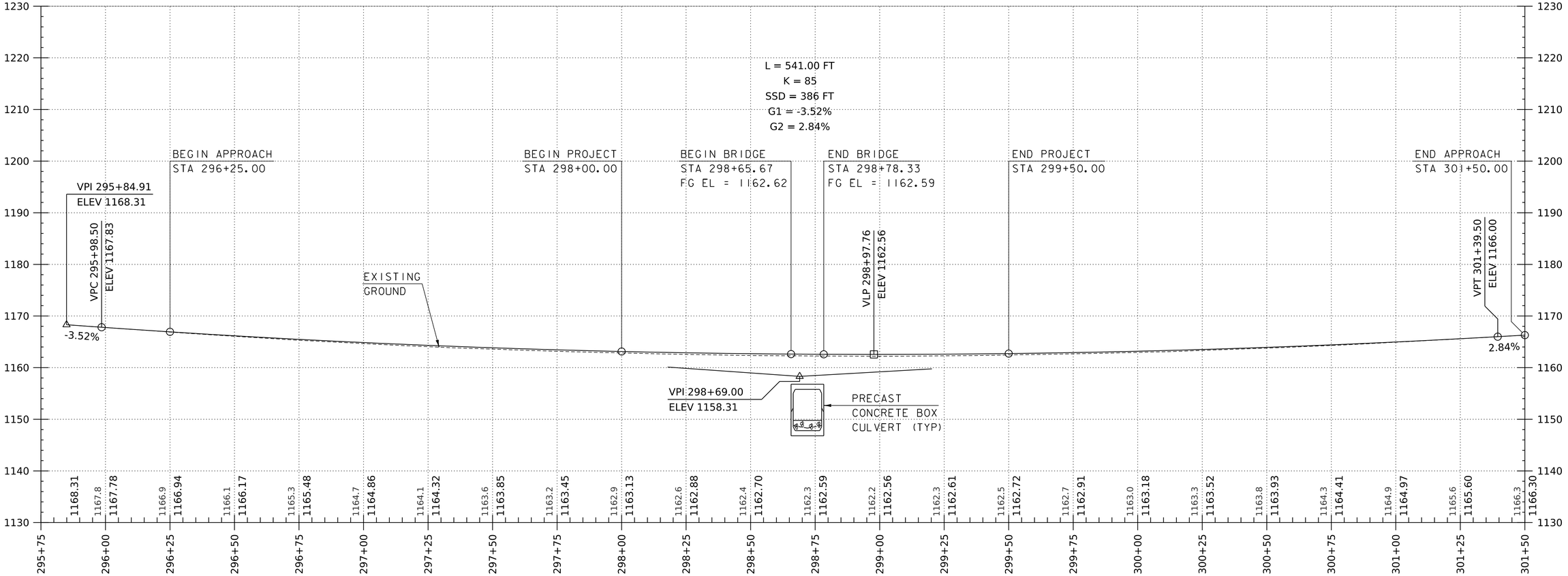
CONSTRUCT 4' PAVED DRIVE APRON
STA 299+87 - STA 300+40, RT
STA 300+50 - STA 300+95, RT

REMOVE AND RESET MAILBOX,
SINGLE SUPPORT
STA 300+46, LT (RELOCATE
TO STA 300+61, LT)
(SEE TRAFFIC CONTROL SHEET 1
FOR TEMPORARY RELOCATION)

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

HOYLE TANNER

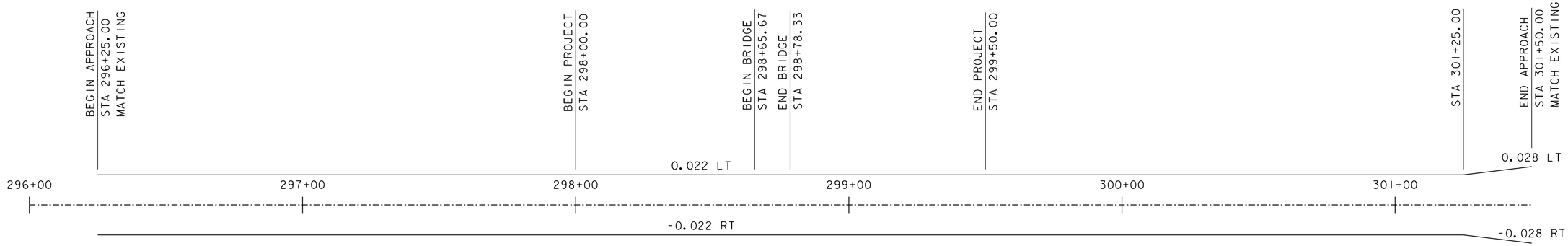
PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 0241(55)
FILE NAME:	z19b212bdr_lay.dgn
PROJECT LEADER:	J.OLIN
DESIGNED BY:	N.CENTERBAR
LAYOUT SHEET	2
PLOT DATE:	25-MAY-2023
DRAWN BY:	P.DUSTIN
CHECKED BY:	S.HAAS
SHEET	329 OF 370



VT ROUTE 12 PROFILE

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

NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄



VT ROUTE 12 BANKING DIAGRAM

SCALE: HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 0.04'/'

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 0241(55)
FILE NAME: z19b212pro.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
PROFILE SHEET	SHEET 330 OF 370

VT STATE PLANE GRID

N

W20-1a
ROAD WORK AHEAD
STA 266+51, LT & RT

G20-2
END ROAD WORK
STA 271+51, LT

W3-5
SPEED LIMIT 40
STA 271+51, RT

G20-5aP
R2-1
WORK ZONE
SPEED LIMIT 40
FINES DOUBLE
R2-6aP
STA 276+51, RT

R2-1
SPEED LIMIT 50
STA 276+51, LT

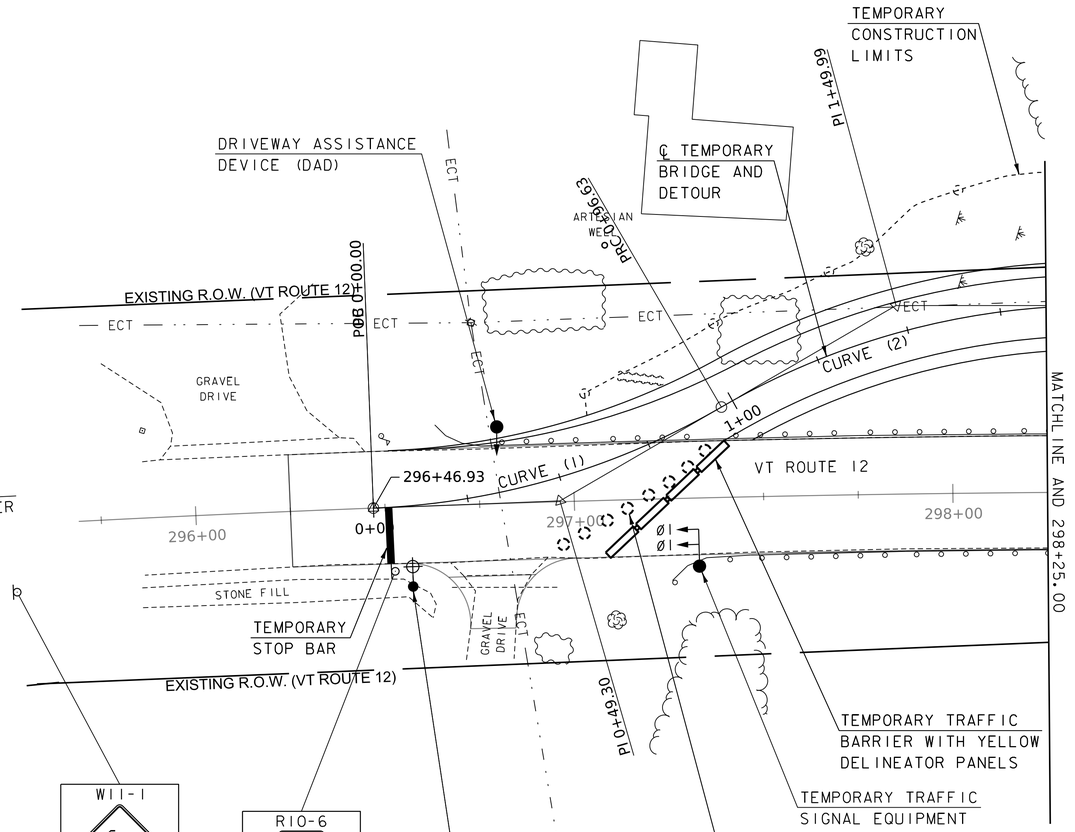
W20-4
ONE LANE ROAD AHEAD
STA 281+51, RT

W24-1L

W3-3
1000 FT
W16-2aP
STA 286+51, RT

25 MPH
W13-1P
STA 291+51, RT

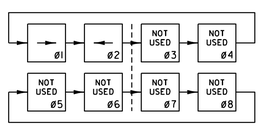
TO WORCESTER



W11-1
IN LANE
STA 294+01, RT

R10-6
STOP HERE ON RED
STA 296+51, RT

NEMA STD 8Ø CONTROLLER



SIGNAL PHASING	Ø1	Ø2
TIMING IN SECONDS	→	←
INITIAL INTERVAL	10	10
VEHICLE EXTENSION	3	3
MAX 1	13.5	13.5
YELLOW	4.5	4.5
ALL RED	17	17
RECALL	MIN	MIN
DETECTOR MEMORY	L	L
FLASH	RED	RED

MAX 1: ALL TIME PERIODS

NOTES

1. TEMPORARY SIGNAL SHALL PROVIDE MINIMUM RECALL FOR Ø1 AND Ø2 AS THE DAD DO NOT PROVIDE DETECTION.
2. TEMPORARY SIGNAL SHALL PROVIDE BICYCLE DETECTION FOR Ø1 AND Ø2.
3. TEMPORARY SIGNAL SHALL BE CAPABLE OF DETECTING SLOW MOVING VEHICLES AND BICYCLES WITHIN THE WORK ZONE TO EXTEND THE ALL RED TIME TO PROVIDE SAFE PASSAGE.

DETOUR ROAD CURVE DATA

CURVE (1)	CURVE (2)
DELTA = 27°57'44"	DELTA = 30°10'01"
D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'
T = 49.30'	T = 53.36'
L = 96.63'	L = 104.25'
E = 6.04'	E = 7.06'

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

HOYLE TANNER

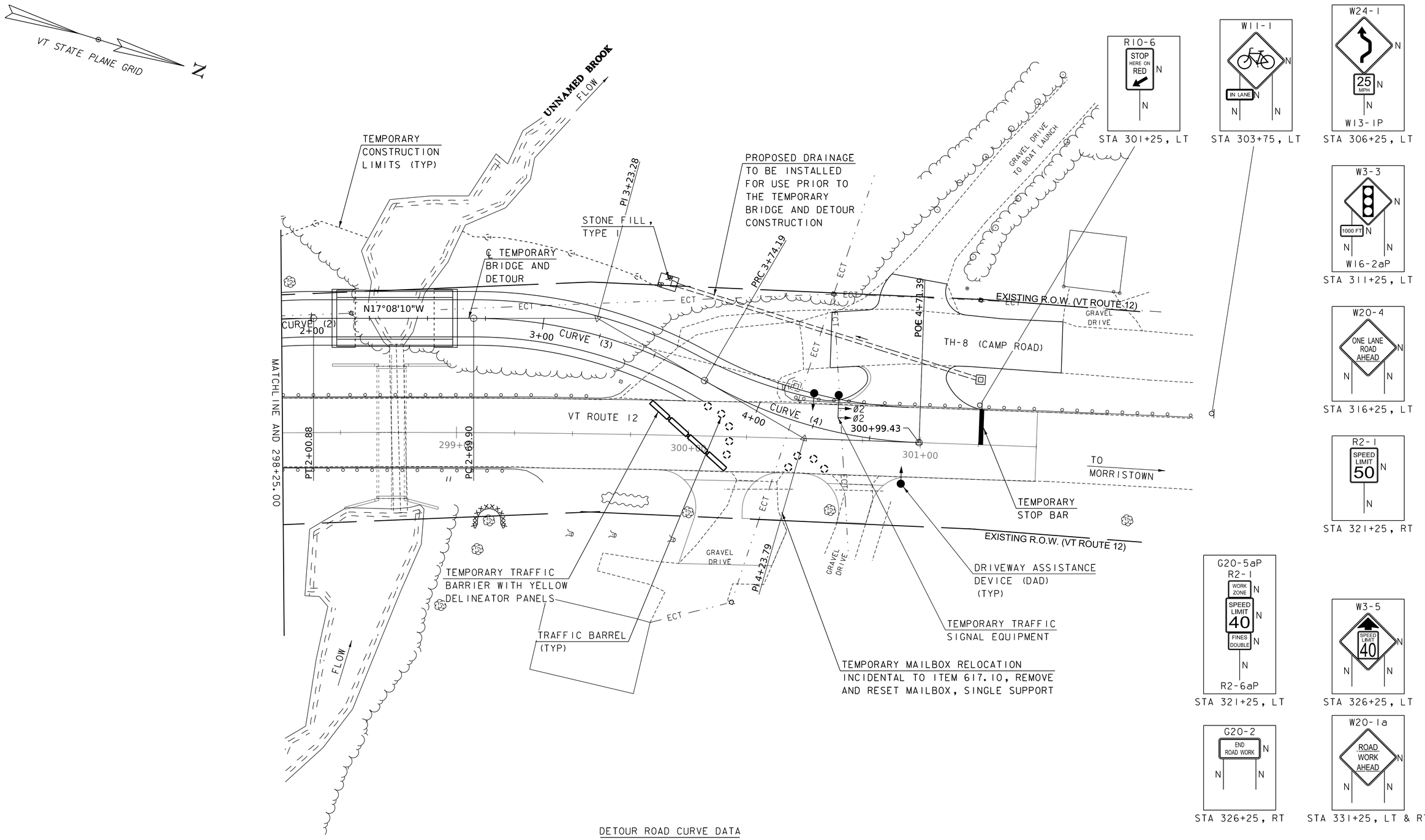
TRAFFIC CONTROL NOTES

1. TRAFFIC CONTROL SHEETS 1 AND 2 ARE CONCEPTUAL. CONTRACTOR IS RESPONSIBLE FOR TEMPORARY TRAFFIC CONTROL PLANS PER 641.11 TRAFFIC CONTROL, ALL-INCLUSIVE.
2. CONTRACTOR SHALL UTILIZE YELLOW TEMPORARY TYPE C TAPE TO CHANGE PASSING ZONE PAVEMENT MARKINGS WITHIN 600 FEET OF THE WORK ZONE TO A DOUBLE YELLOW CENTERLINE. CONTRACTOR SHALL ALSO COVER EXISTING SIGNAGE PERTAINING TO THESE PASSING ZONES WITHIN 600 FEET OF THE WORK ZONE.
3. SEE PROJECT NOTES SHEET FOR ADDITIONAL INFORMATION REGARDING TEMPORARY BRIDGE AND APPROACH WITHIN A WETLAND.

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bdr_tcp.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
TRAFFIC CONTROL SHEET 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS



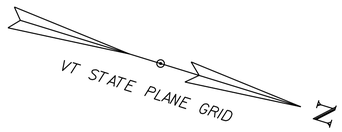
DETOUR ROAD CURVE DATA

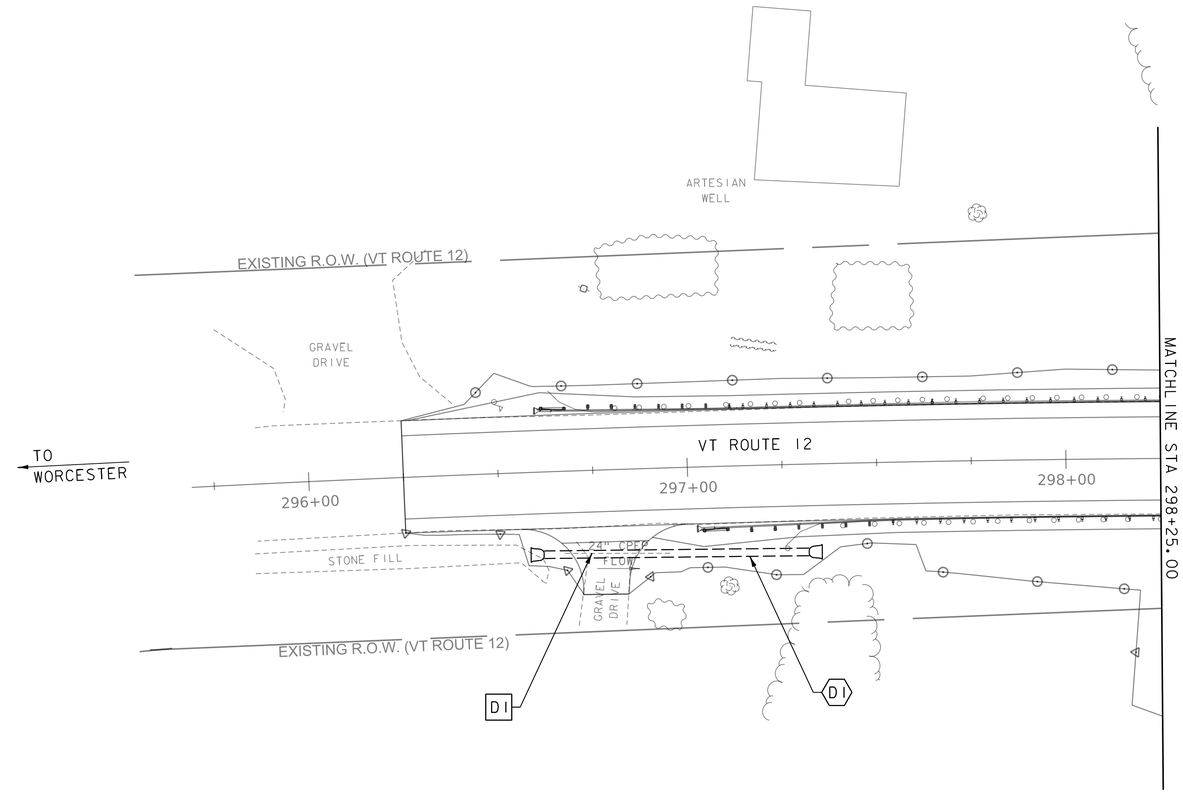
CURVE (2)	CURVE (3)	CURVE (4)
DELTA = 30°10'01"	DELTA = 30°10'44"	DELTA = 28°07'41"
D = 28°56'14"	D = 28°56'14"	D = 28°56'14"
R = 198.00'	R = 198.00'	R = 198.00'
T = 53.36'	T = 53.39'	T = 49.60'
L = 104.25'	L = 104.29'	L = 97.20'
E = 7.06'	E = 7.07'	E = 6.12'

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)
FILE NAME:	z19b212bdr_tcp.dgn
PROJECT LEADER:	J.OLIN
DESIGNED BY:	N.CENTERBAR
TRAFFIC CONTROL SHEET 2	
PLOT DATE:	25-MAY-2023
DRAWN BY:	P.DUSTIN
CHECKED BY:	S.HAAS
SHEET	332 OF 370





D1 STA 296+95.26, RT 22.57′ TO
STA 296+66.93, RT 21.68′
REMOVE 28 LF x 24" CPEP

D1 STA 297+32.00, RT. 23.00′ TO
STA 296+62.00, RT. 22.00′
CONSTRUCT 70 LF x 24" CPEP
CONSTRUCT 24" CPEPES AT INLET
CONSTRUCT 24" CPEPES AT OUTLET
INLET EL = 1161.50
OUTLET EL = 1158.97

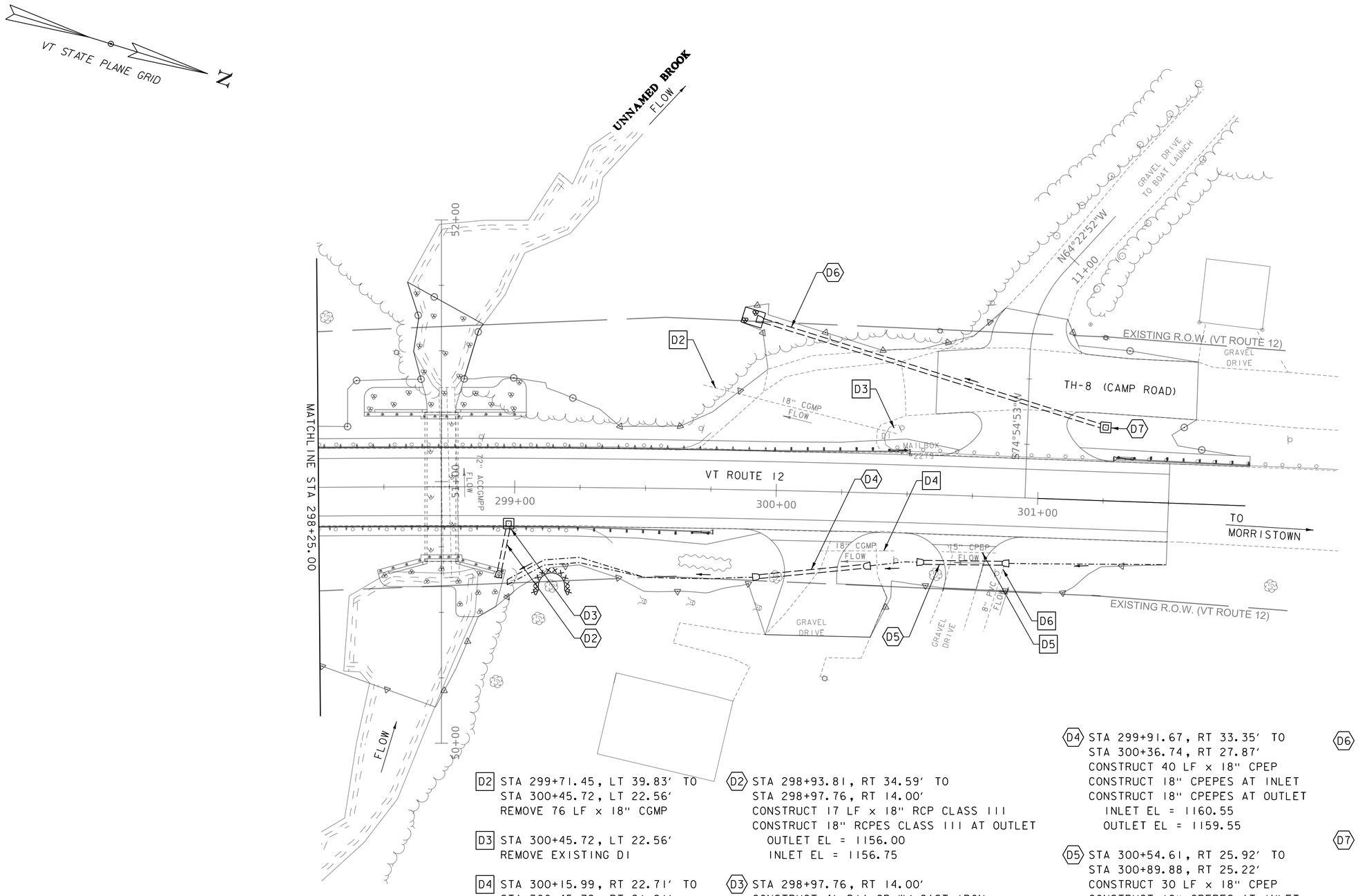
SCALE 1" = 20′-0"
20 0 20

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bdr_drn.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
DRAINAGE LAYOUT 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 333 OF 370



D2 STA 299+71.45, LT 39.83′ TO
STA 300+45.72, LT 22.56′
REMOVE 76 LF x 18" CGMP

D3 STA 300+45.72, LT 22.56′
REMOVE EXISTING DI

D4 STA 300+15.99, RT 22.71′ TO
STA 300+45.72, RT 21.91′
REMOVE 30 LF x 18" CGMP

D5 STA 300+64.00, RT 21.66′ TO
STA 300+84.78, RT 21.43′
REMOVE 21 LF x 15" CPEP

D6 STA 300+88.19, RT 25.82′ TO
STA 300+81.09, RT 51.54′
REMOVE 5 LF x 8" PVC FROM
OUTLET

D2 STA 298+93.81, RT 34.59′ TO
STA 298+97.76, RT 14.00′
CONSTRUCT 17 LF x 18" RCP CLASS III
CONSTRUCT 18" RCPES CLASS III AT OUTLET
OUTLET EL = 1156.00
INLET EL = 1156.75

D3 STA 298+97.76, RT 14.00′
CONSTRUCT 4′ DIA CB W/ CAST IRON
GRATE TYPE D, +97.76, RT 14.00′
INV OUT = 1156.75
RIM EL = 1162.25

D4 STA 299+91.67, RT 33.35′ TO
STA 300+36.74, RT 27.87′
CONSTRUCT 40 LF x 18" CPEP
CONSTRUCT 18" CPEPES AT INLET
CONSTRUCT 18" CPEPES AT OUTLET
INLET EL = 1160.55
OUTLET EL = 1159.55

D5 STA 300+54.61, RT 25.92′ TO
STA 300+89.88, RT 25.22′
CONSTRUCT 30 LF x 18" CPEP
CONSTRUCT 18" CPEPES AT INLET
CONSTRUCT 18" CPEPES AT OUTLET
INLET EL = 1161.22
OUTLET EL = 1160.89

D6 STA 299+93.69, LT 64.79′ TO
STA 301+25.00, LT 28.00′
CONSTRUCT 136 LF x 18" RCP CLASS III
INSTALL 18" RCPES CLASS III AT OUTLET
OUTLET EL = 1155.00
INLET EL = 1157.50

D7 STA 301+25.00, LT 28.00′
CONSTRUCT 4′ DIA CB W/ CAST IRON
GRATE TYPE D, +25.00, LT 28.00′
INV OUT = 1157.50
RIM EL = 1162.00

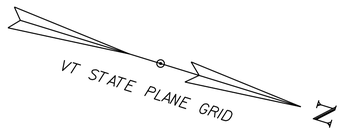
SCALE 1" = 20′-0"
20 0 20

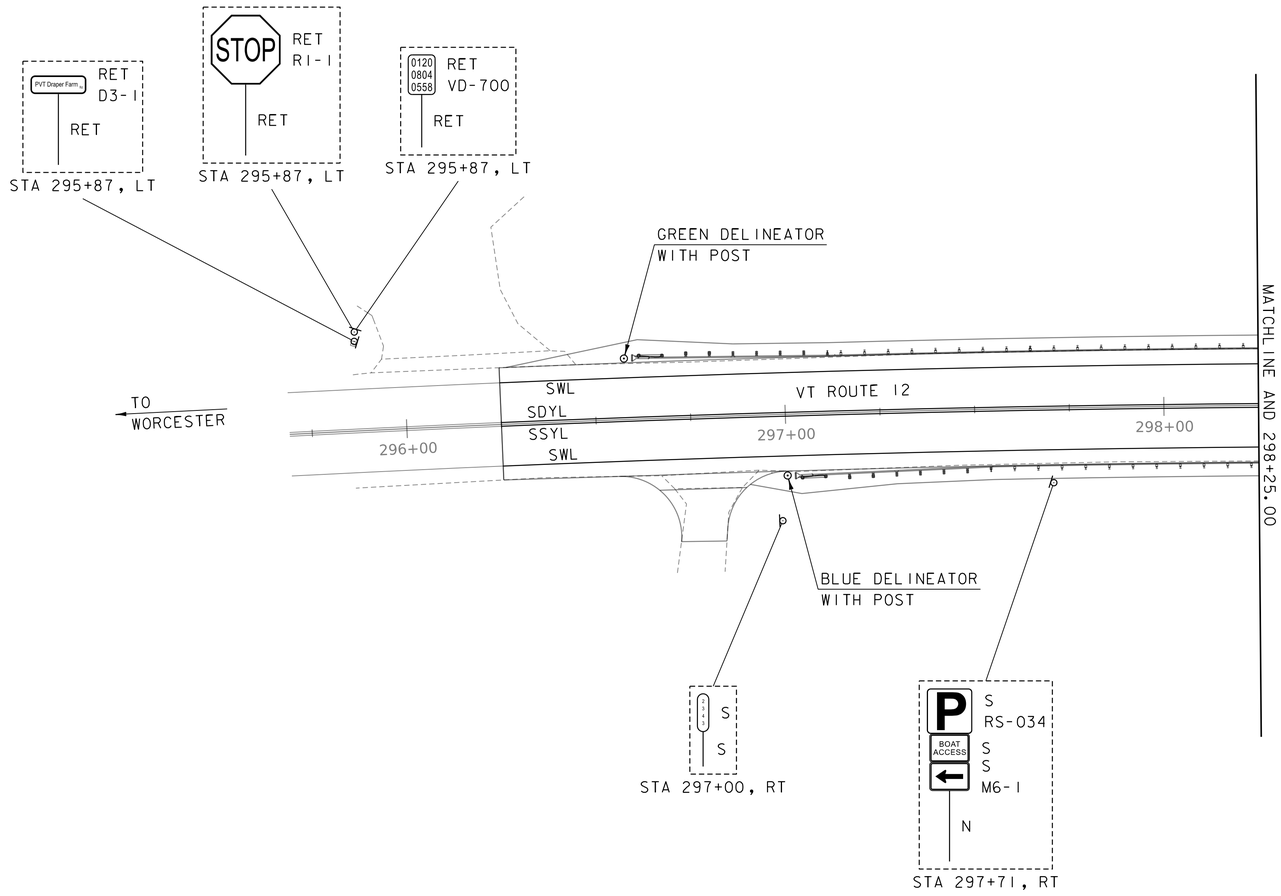
HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bdr_drn.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
DRAINAGE LAYOUT 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 334 OF 370





LEGEND

R	REMOVE
R&S	REMOVE & SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

4" WHITE LINE
STA 296+25 - STA 300+53, LT
STA 296+25 - STA 301+50, RT

4" YELLOW LINE
STA 296+25 - STA 299+25, ℄ (DASHED)
STA 296+25 - STA 299+25, ℄

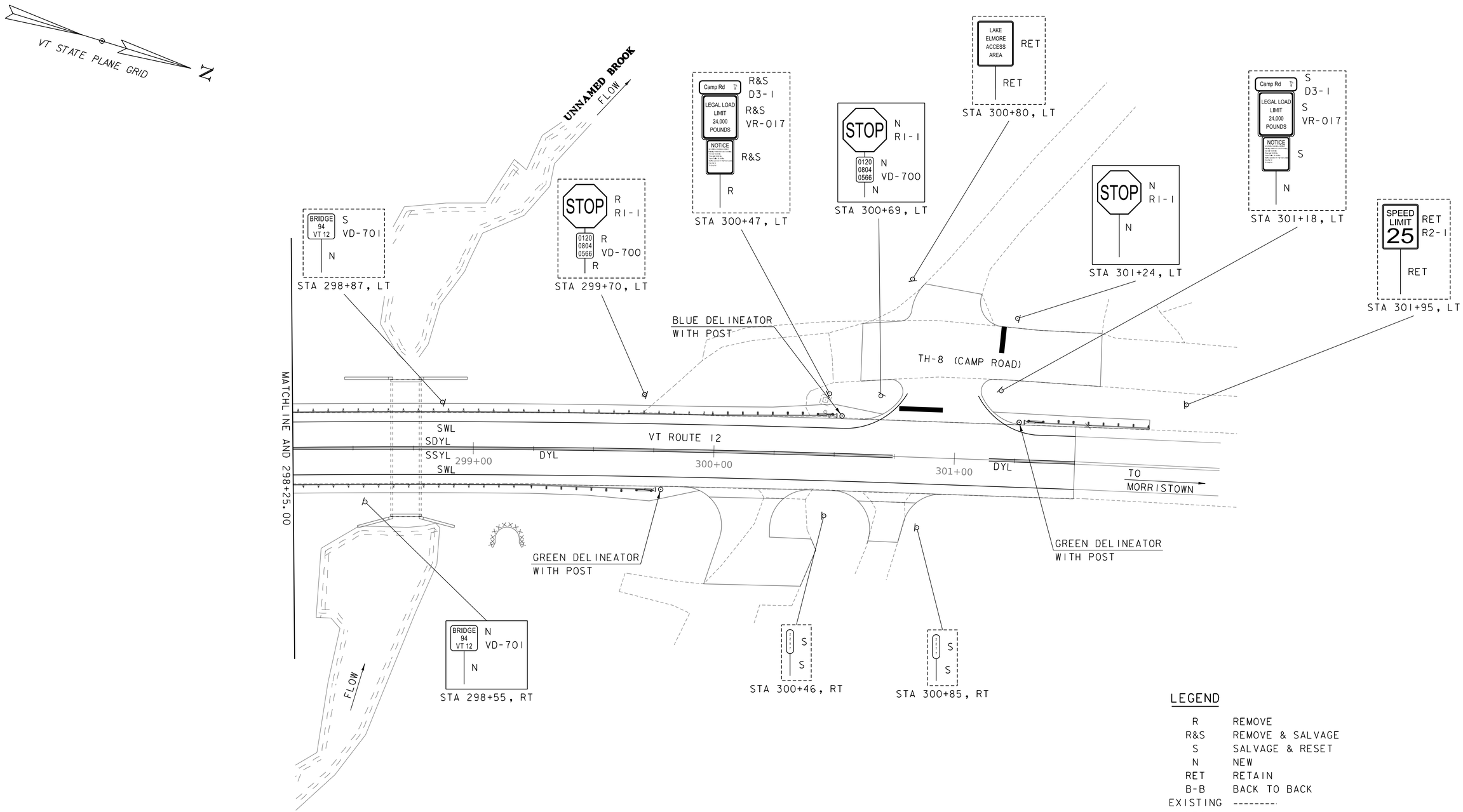
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 335 OF 370



4" WHITE LINE
STA 300+53 - STA 300+82, LT
STA 301+06 - STA 301+33, LT
STA 301+33 - STA 301+50, LT

4" YELLOW LINE
STA 299+25 - STA 300+74, ℄ (DOUBLE)
STA 301+14 - STA 301+50, ℄ (DOUBLE)

24" STOP BAR
STA 300+72 - STA 300+94, LT
STA 301+17 - STA 301+20, LT

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

HOYLE TANNER

LEGEND

R	REMOVE
R&S	REMOVE & SALVAGE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	--------
NEW	———
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bdr_tsl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: Z.ROUSSEL
TRAFFIC SIGN AND LINE LAYOUT 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 336 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

MILE MARKER, STATION OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																							REMARKS	SIGN DETAIL	
											NO. OF	FLANGED CHANNEL			SQUARE STEEL (in)					TUBULAR ALUMINUM Ø (IN)			TUBULAR STEEL Ø (IN)					W-SHAPE STEEL									DETAIL ON SHEET NUMBER	STANDARD SHEET NUMBER
		EACH	WIDTH (in)	HEIGHT (in)	"A"	"B"	SALV SIGN	SALV TIS	RETAIN	SALVAGE	POST	(LB / FT)			1.75 (LB / FT)	2.00 (LB / FT)	2.50 (LB / FT)	ANCHOR	SLEEVE	3.00 (LB / FT)	4.00 (LB / FT)	4.0 MOD (LB / FT)	FOUNDATION	3.00 (LB / FT)	3.50 (LB / FT)	4.00 (LB / FT)	5.00 (LB / FT)	FTG. SIZE 24"	FTG. SIZE 30"	WEIGHT	POST SIZE	SIGN FRAME REQUIRED			
												1.12	2.00	3.00	1.88	2.42	3.35			1.30	1.70	1.70		7.60	9.00	10.80	14.60								
OPTION ITEMS																																			
297+00, RT	2343	1					X			X	0.0																					USE SALVAGED SIGN AND POST		
297+71, RT	←	1	12.0	24.0			X				0.0																					M6-1 ,USE SALVAGED SIGN, MOUNT WITH RS-034		
297+71, RT	P	1	24.0	24.0			X				1.0					15.0		X	X													RS-034 use salvaged sign, new post		
297+71, RT	BOAT ACCESS	1	24.0	24.0			X				0.0																					USE SALVAGED SIGN, MOUNT WITH RS-034		
298+55, RT	BRIDGE 94 VT 12	1	6.0	10.0	0.4						1.0				8.0			X	X													VD-701		T-42
298+87, LT	BRIDGE 94 VT 12	1	6.0	10.0			X				1.0				8.0			X	X													VD-701, USE SALVAGED SIGN		
300+46, RT	227	1					X				0.0																					USE SALVAGED SIGN AND POST		
300+69, LT	STOP	1	30.0	30.0	6.3						1.0					14.0		X	X													R1-1, USE SALVAGED SIGN FROM Sta. 299+71, LT		
300+69, LT	0120 0804 0566	1	6.0	10.0			X				0.0																					VD-700, MOUNT WITH R1-1		T-44
300+85, RT	277	1					X				0.0																					USE SALVAGED SIGN AND POST		
301+18, LT	Camp Rd Th 8	1	48.0	12.0			X				1.0						15.0	X	X													D3-1, USE SALVAGED SIGN AND NEW POST		
301+18, LT	LEGAL LOAD LIMIT 24,000 POUNDS	1	30.0	24.0			X				0.0																					VR-017, USE SALVAGED SIGN, MOUNT WITH D3-1		T-70
301+18, LT	NOTICE	1	12.0	18.0			X				0.0																					USE SALVAGED SIGN, MOUNT WITH D3-1		
301+24, LT	STOP	1	30.0	30.0	6.3						1.0					14.0		X	X													R1-1		
FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE VTRANS "SIGN POST DESIGN GUIDELINE."												FT .	FT .	FT .	FT 16.	FT 43.	FT 15.	XXXXX XXXXX XXXXX XXXXX	EA .	LB .	LB .	LB .		LB .	LB .	LB .	LB .								
	TOTALS				SF 12.9	SF .	EA. .	SF .	XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX			FT .			FT 74.					LB .			EA.	LB .				EA. .	EA. .	LB .							

HOYLE TANNER

PROJECT NAME:	WORCESTER
PROJECT NUMBER:	BF 0241(57)
FILE NAME:	z19b212tss.dgn
PROJECT LEADER:	J.OLIN
DESIGNED BY:	Z.ROUSSEL
TRAFFIC SIGN SUMMARY SHEET	
PLOT DATE:	25-MAY-2023
DRAWN BY:	P.DUSTIN
CHECKED BY:	S.HAAS
SHEET	337 OF 370

SOIL CLASSIFICATION

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

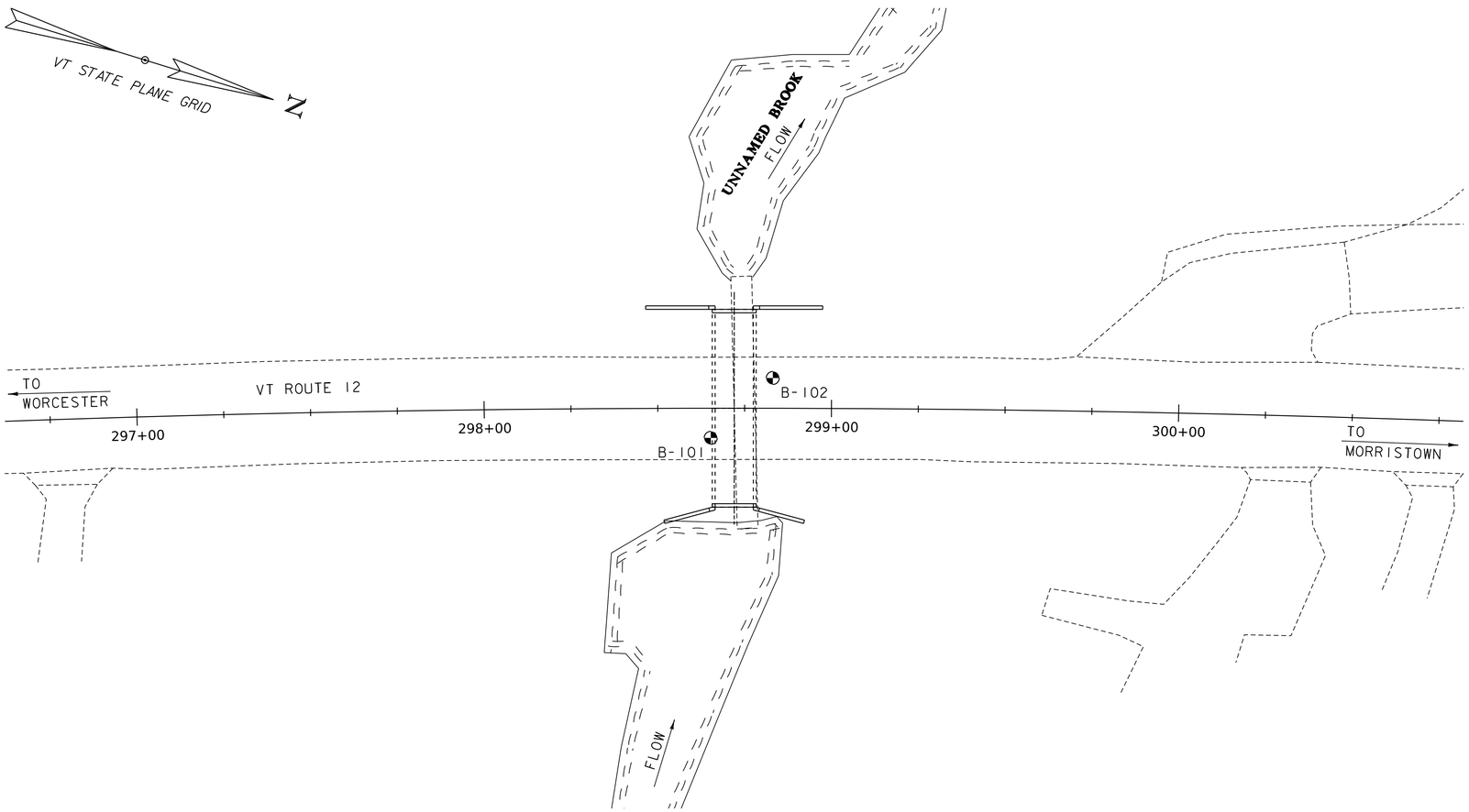
CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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

COMMONLY USED SYMBOLS

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

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



BORING LAYOUT

BORING CHART

HOLE NO.	SURV. STATION	OFFSET	NORTHING	EASTING	GROUND ELEV.	ELEV. TLOB
B-101	298+65	9 RT	738205.15	1635719.64	1162.1	1115.6
B-102	298+84	9 LT	738217.15	1635697.89	1162.5	1121.0

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.

1. The subsurface explorations shown herein were made August 2021 and overseen by Haley & Aldrich, Inc.

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

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

GENERAL NOTES

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

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

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

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

HOYLE TANNER

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

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bor.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING INFORMATION SHEET

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 338 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241055-100 BR 94
Elmore, Vermont

Boring No.: **B-101**
Page No.: 1 of 3
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/03/21 Date Finished: 8/03/21
VTSPG NAD83: N 738205.15 ft E 1635719.64 ft
Station: 298+65 Offset: 9R
Ground Elevation: 1162.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/03/21	12.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		BITUMINOUS CONCRETE, 0.0 ft - 0.4 ft								
		(Fill - Roadway Subgrade) Poorly-graded SAND wilt Silt and Gravel (SP-SM), dense, gray-brown, dry, no structure, no odor, mps 0.75 in., 0.4 ft - 2.8 ft Rec. = 1.8 ft				22-21-14-17 (35)		48.6	39.8	11.6
2.5		Rec. = 1.0 ft				8-7-8-10 (15)				
		A-2-4, Silty SAND (SM), medium dense, brown, moist, no structure, no odor, mps 0.4 mm (Glaciofluvial Deposits), 2.8 ft - 9.0 ft								
5.0		A-2-4, Silty SAND (SM), medium dense, brown, moist, bonded, no odor, mps 0.4 mm (Glaciofluvial Deposits), Rec. = 1.2 ft, 5.0 ft				8-8-8-8 (16)		7.2	71.6	21.2
7.5		No Recovery, Rec. = 0.0 ft, 7.0 ft				6-5-6-9 (11)				
10.0		A-4, Silty SAND (SM), dense, olive-brown, moist, bonded, no odor, mps 0.5 in. (Glacial Till Deposits), 9.0 ft - 20.0 ft Rec. = 1.1 ft				3-26-5-4 (31)				
12.5		A-4, Silty SAND (SM), loose, olive-brown, wet, bonded, no odor, mps 0.5 in. (Glacial Till Deposits), Rec. = 1.3 ft, 12.0 ft				3-3-4-4 (7)				
15.0		A-4, Silty SAND (SM), loose, gray, wet, bonded, no odor, mps 0.42 mm (Glacial Till Deposits), Rec. = 1.8 ft, 15.0 ft				2-3-5-6 (8)		15.1	48.9	36.0
17.5										
20.0		A-4, Sandy SILT (ML), stiff, gray, wet, bonded, no odor, mps 0.42 mm (Glacial Till Deposits), Rec. = 1.3 ft, 20.0 ft - 30.0 ft				5-5-8-12 (13)		7.0	37.1	55.9
22.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200707_VTTRANS_PH 2 BR 94.GPJ VERMONT AOT.GDT 1/10/21

BOTTOM OF
BOX CULVERT
EL 1144.93
(SEE NOTE 1)

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241055-100 BR 94
Elmore, Vermont

Boring No.: **B-101**
Page No.: 2 of 3
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/03/21 Date Finished: 8/03/21
VTSPG NAD83: N 738205.15 ft E 1635719.64 ft
Station: 298+65 Offset: 9R
Ground Elevation: 1162.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/03/21	12.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-4, SILT with Gravel (ML), hard, gray, wet, bonded, no odor, mps 0.5 in. (Glacial Till Deposits), Rec. = 2.0 ft, 25.0 ft				10-16-20-30 (36)				
27.5										
30.0		A-4, SILT with Sand (ML), hard, gray, wet, bonded, no odor, mps 0.5 in. (Glacial Till Deposits), Rec. = 0.75 ft, 30.0 ft - 35.0 ft				10-25-27-35 (52)				
32.5										
35.0		A-4, Sandy SILT (ML), hard, gray, wet, bonded, no odor, mps 0.5 in. (Glacial Till Deposits), Rec. = 1.8 ft, 35.0 ft - 46.5 ft				35-50-52-50/0.25' (102)				
37.5										
40.0		A-4, Sandy SILT (ML), hard, gray, wet, bonded, no odor, mps 0.5 in. (Glacial Till Deposits), Rec. = 0.6 ft, 40.0 ft				80-50/0.1'				
42.5										
45.0		A-4, Sandy SILT (ML), very dense, gray-brown, wet, bonded, no odor, mps 0.75 in. (Glacial Till Deposits), Rec. = 1.4 ft, 45.0 ft				60-75-100/0.4' (175+)		6.1	30.4	63.5
		Top of Bedrock @ 46.5 ft								
47.5										

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200707_VTTRANS_PH 2 BR 94.GPJ VERMONT AOT.GDT 1/10/21

NOTES

1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-0" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING LOGS 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 339 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241055-100 BR 94
Elmore, Vermont

Boring No.: **B-101**
Page No.: 3 of 3
Pin No.:
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/03/21 Date Finished: 8/03/21
VTSPG NAD83: N 738205.15 ft E 1635719.64 ft
Station: 298+65 Offset: 9R
Ground Elevation: 1162.1 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/03/21	12.0	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
52.5		50.0 ft - 55.0 ft, Green and white, SCHIST, aphanitic to fine grained, soft to medium hard, slightly to moderately weathered. Primary joint set dipping at high angle, very close, rough, discolored, tight to open. No discernible secondary joint set. Fair Rock, NQ, RMR=42 (MORETOWN FORMATION)	C1	100 (58)	2.5 2.5 2 2 2.5					
55.0		55.0 ft - 60.0 ft, Green and white, SCHIST, aphanitic to fine grained, soft to medium hard, slightly weathered. Primary joint set dipping at high angle, very close, rough, discolored, tight to open. No discernible secondary joint set. Fair Rock, NQ, RMR=42 (MORETOWN FORMATION)	C2	92 (66)	1.5 2.5 2.5 2.5 2					
60.0		Hole stopped @ 60.0 ft								
62.5										
65.0										
67.5										
70.0										
72.5										

Remarks:
AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 94.GPJ VERMONT AOT.GDT 1/1/021

BOTTOM OF
BOX CULVERT
EL 1144.66
(SEE NOTE 1)

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241055-100 BR 94
Elmore, Vermont

Boring No.: **B-102**
Page No.: 1 of 3
Pin No.: 19B212
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/02/21 Date Finished: 8/02/21
VTSPG NAD83: N 738217.15 ft E 1635697.89 ft
Station: 298+84 Offset: 9L
Ground Elevation: 1162.5 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/02/21	11.2	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
		ASPHALT ROADWAY, 0.0 ft - 0.5 ft										
		A-1-a, Silty SAND with gravel (SM), dense, gray-brown, dry, no structure, no odor, mps 0.75 in. (Roadway Subgrade), Rec. = 0.5 ft, 0.5 ft - 2.5 ft				24-27-20-29 (47)		50.4	37.0	12.6		
2.5		(Fill) Sandy SILT (SM), dense, gray-brown, no structure, no odor, mps 0.75 in., Rec. = 1.2 ft, 2.5 ft - 4.0 ft				28-20-21-28 (41)		8.3	39.6	52.1		
5.0		A-2-4, Silty SAND (SM), dense, brown and gray, dry, stratified, no odor, mps 0.25 in., stratification with alternating silt and sand lenses (Glaciofluvial Deposits), 4.0 ft - 5.5 ft Rec. = 1.2 ft				3-8-17-20 (25)		20.3	57.9	21.8		
7.5		A-4, Sandy SILT (ML), medium dense, olive-brown, moist, moderately well bonded, no odor, mps 0.5 in. (Glacial Till Deposits), 5.5 ft - 25.0 ft										
10.0		A-4, Sandy SILT (ML), loose, olive-gray, wet at 11.2 ft, loosely bonded, no odor, mps 0.75 in., trace organic pocket at 11.8 ft (localized) (Glacial Till Deposits), Rec. = 1.0 ft, 10.0 ft				3-3-4-5 (7)		12.4	32.6	55.0		
12.5												
15.0		A-4, Sandy SILT (ML), loose, olive-gray, wet, loosely bonded, no odor, mps 0.5 in. (Glacial Till Deposits), Rec. = 1.2 ft, 15.0 ft				4-2-3-3 (5)		6.3	24.4	69.3		
17.5												

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 94.GPJ VERMONT AOT.GDT 30/3/22

NOTES

1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-0" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING LOGS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 340 OF 370

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241055-100 BR 94
Elmore, Vermont

Boring No.: **B-102**
Page No.: 2 of 3
Pin No.: 19B212
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/02/21 Date Finished: 8/02/21
VTSPG NAD83: N 738217.15 ft E 1635697.89 ft
Station: 298+84 Offset: 9L
Ground Elevation: 1162.5 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/02/21	11.2	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
22.5		A-4, Sandy SILT (ML), medium dense, gray, wet, well bonded, no odor, mps 0.75 in. (Glacial Till Deposits), Rec. = 1.5 ft, 20.0 ft				6-7-12-12 (19)						
25.0		A-4, SILT with Sand (ML), dense, gray, wet, very well bonded, no odor, mps 0.75 in. (Glacial Till Deposits), Rec. = 1.8 ft, 25.0 ft - 35.0 ft				22-19-30-47 (49)		2.1	27.1	70.8		
27.5												
30.0		A-4, SILT with Sand (ML), very dense, gray, wet, very well bonded, no odor, mps 0.75 in. (Glacial Till Deposits), Rec. = 1.7 ft, 30.0 ft				14-25-27-42 (52)					9	4
32.5		Note: Drill action indicates a cobbly layer at 33.5 ft., 32.0 ft										
35.0		A-1-b, Silty SAND with Gravel (SM), very dense, gray, wet, very well bonded, no odor, mps 0.75 in. (Glacial Till Deposits), Rec. = 1.7 ft, 35.0 ft - 40.1 ft				15-21-35-57 (56)		41.0	37.6	21.4		
37.5												

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 94.GPJ VERMONT AOT.GDT 3/03/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Vermont Route 12 Bridges
0241055-100 BR 94
Elmore, Vermont

Boring No.: **B-102**
Page No.: 3 of 3
Pin No.: 19B212
Checked By: TJE

Boring Crew: P. Michaud (Terracon), J. Fletcher
Date Started: 8/02/21 Date Finished: 8/02/21
VTSPG NAD83: N 738217.15 ft E 1635697.89 ft
Station: 298+84 Offset: 9L
Ground Elevation: 1162.5 ft

	Casing	Sampler
Type:	HW	SS
I.D.:	4 in	1.38 in
Hammer Wt:	140 lbs	140 lbs
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto	
Rig:	CME 45 Truck	C_E = 1.51

Groundwater Observations

Date	Depth (ft)	Notes
08/02/21	11.2	

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Run (Dip deg.)	Core Rec. % (RQD %)	Drill Rate minutes/ft	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %	LL %	PI %
42.5		A-1-b, Silty SAND with Gravel (SM), very dense, gray, wet, no structure, no odor, mps 0.75 in., possible weathered rock in tip (Glacial Till Deposits), Rec. = 0.1 ft, 40.0 ft				50/0.1"						
		Note: Drill action indicates weathered rock from 40.1 to 41.5 ft. (Weathered Bedrock), 40.1 ft - 41.5 ft										
		Note: Drill action indicates competent rock from 41.5 to 43.0 ft., 41.5 ft - 43.0 ft										
		Top of Bedrock @ 41.5 ft										
45.0		43.0 ft - 46.4 ft, Green with white, SCHIST, aphanitic to medium grained, hard, fresh to very slightly weathered. Primary joint set dipping horizontal, only present at 46.1 ft, rough, fresh to discolored, open, no infilling. No discernible secondary joint set. Quartz stringers throughout. Fair Rock, NQ, RMR=57 (MORETOWN FORMATION)	C1	100 (90)	4 3.5 3 2.5							
47.5		46.4 ft - 51.6 ft, Green with white, SCHIST, aphanitic to fine grained, hard, fresh. Primary joint set dipping moderately, moderate spacing, smooth to rough, fresh, tight to open, no infilling. No discernible secondary joint set, possible vertical set. Quartz stringers throughout. Fair Rock, NQ, RMR=50 (MORETOWN FORMATION)	C2	100 (69)	2.5 3.5 3 3.5							
50.0												
52.5		51.6 ft - 53.0 ft, Green with white, SCHIST, aphanitic to fine grained, hard, fresh. No joints present. Wide (up to 0.75 in.) quartz veins. Fair Rock, NQ, RMR=50 (MORETOWN FORMATION)	C3	71 (71)	3 3							
		Hole stopped @ 53.0 ft										
55.0		Remarks: AASHTO classifications are based on visual description of sample recovery at depths where lab testing is not performed.										
57.5												

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_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 200767_VTTRANS_PH 2 BR 94.GPJ VERMONT AOT.GDT 3/03/22

NOTES

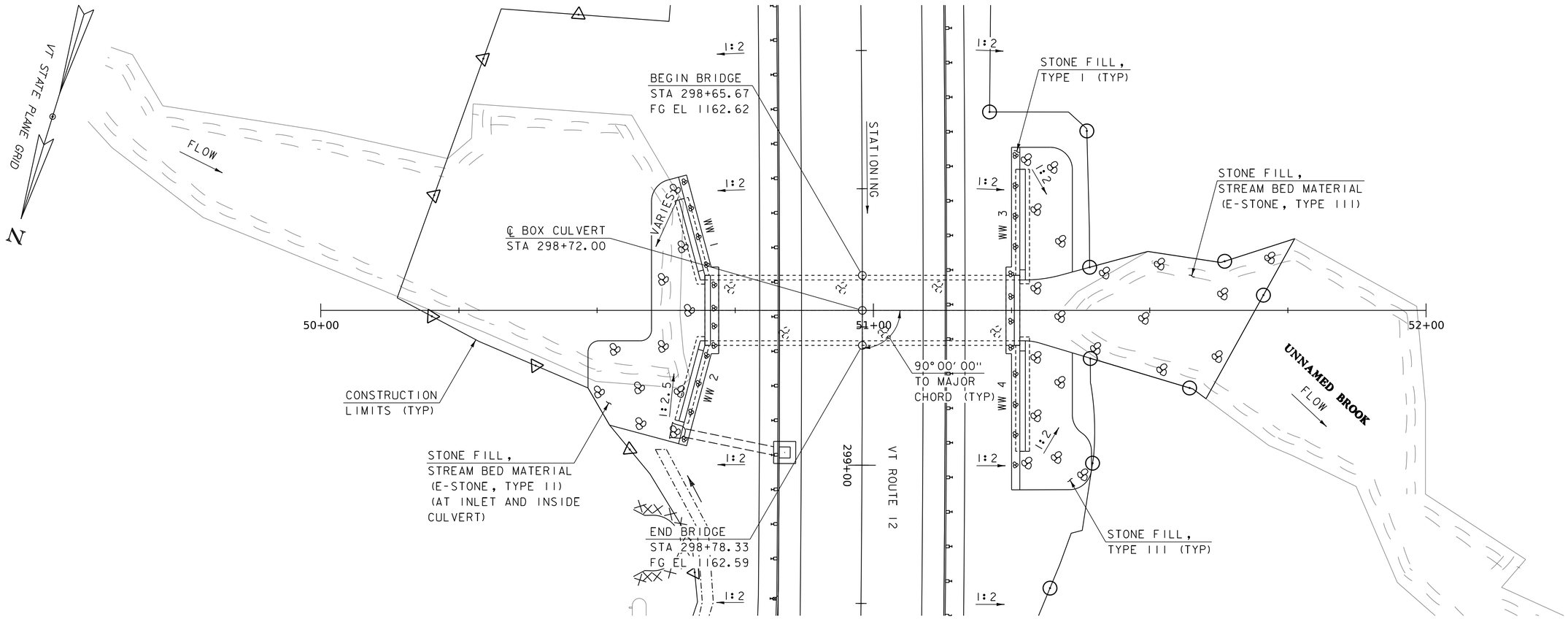
1. BOTTOM OF BOX CULVERT IS BASED ON A BOTTOM SLAB THICKNESS OF 1'-0" AND MAY VARY BASED ON FABRICATOR'S DESIGN.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

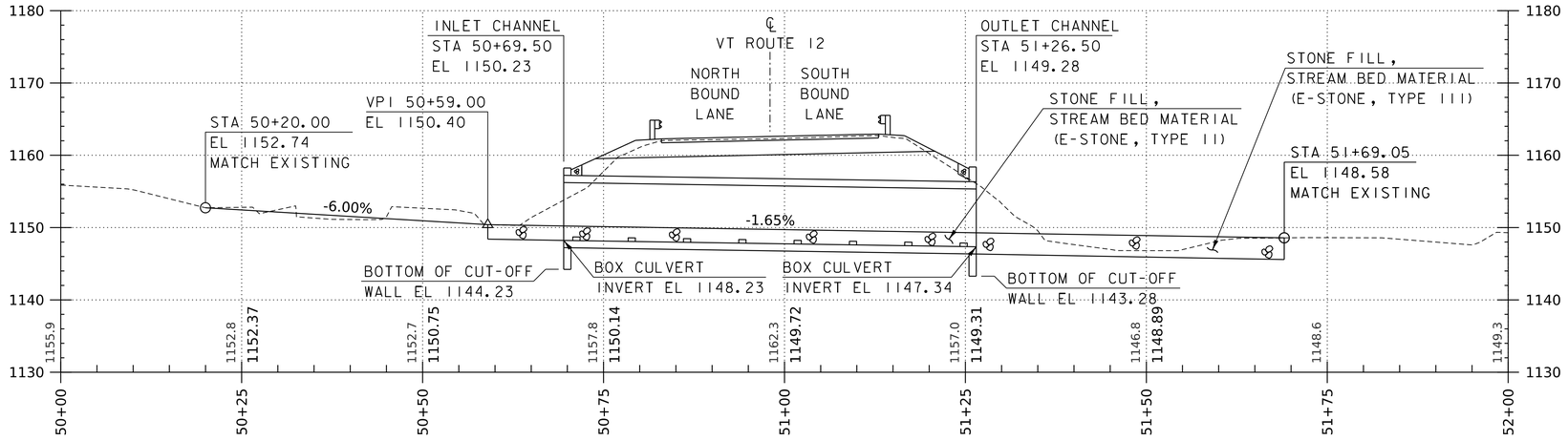
FILE NAME: z19b212log.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
BORING LOGS 3

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 341 OF 370



CULVERT PLAN

SCALE: 1" = 10'



CULVERT PROFILE

SCALE: 1" = 10'

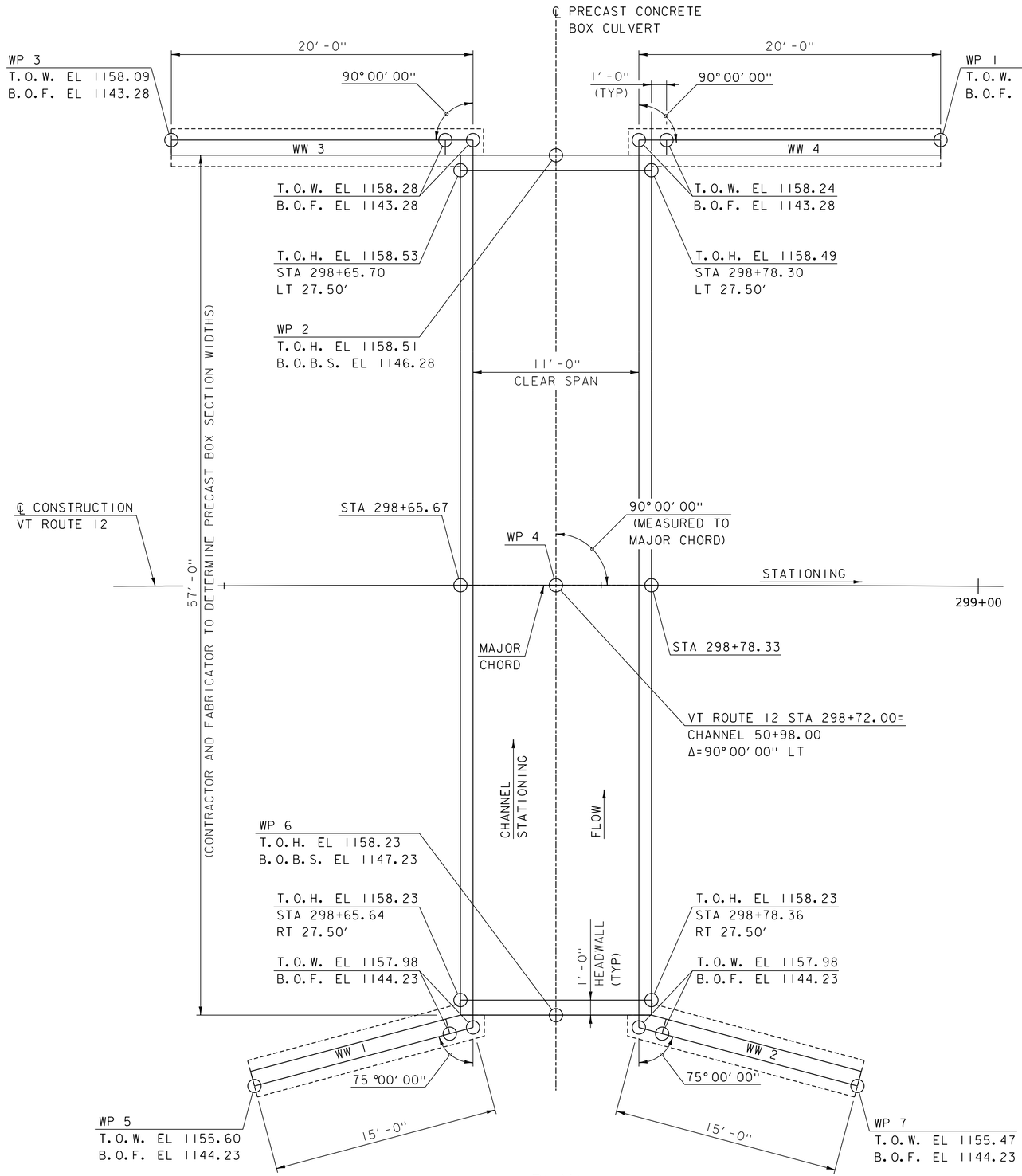
NOTE
GRADES SHOWN TO THE NEAREST
TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST
HUNDREDTH ARE FINISH GRADE ALONG ℄

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

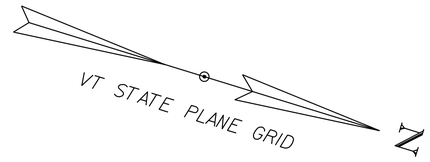
FILE NAME: z19b212pln.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
CULVERT PLAN AND PROFILE

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 342 OF 370



PLAN

SCALE: 1/4″ = 1′-0″



WORKING POINT COORDINATES		
WP	NORTHING	EASTING
1	738224.7619	1635673.7929
2	738200.6886	1635682.2620
3	738176.0259	1635688.8198
4	738209.0871	1635709.5006
5	738199.7649	1635747.1070
6	738217.4833	1635736.7315
7	738237.9680	1635735.3278

LEGEND

T.O.H. TOP OF HEADWALL
T.O.W. TOP OF WINGWALL
B.O.F. BOTTOM OF FOOTING
B.O.B.S. BOTTOM OF BOTTOM SLAB

NOTES

1. THE PRECAST CONCRETE BOX CULVERT WALLS AND SLABS, AND PRECAST WINGWALL THICKNESSES ARE ASSUMED. ACTUAL DIMENSIONS TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.

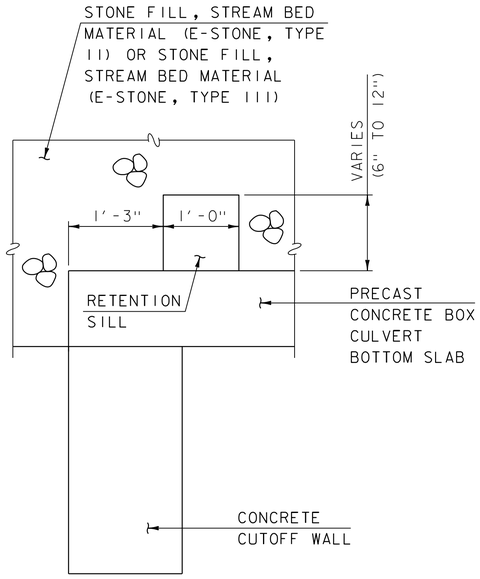
2. THE FABRICATOR TO HOLD THE FRONT FACE OF THE BOX CULVERT AND WINGWALLS AND ADJUST THE BACK FACE IF THE DESIGN DIFFERS FROM WHAT IS SHOWN HERE.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212subl.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
CULVERT LAYOUT PLAN

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 343 OF 370



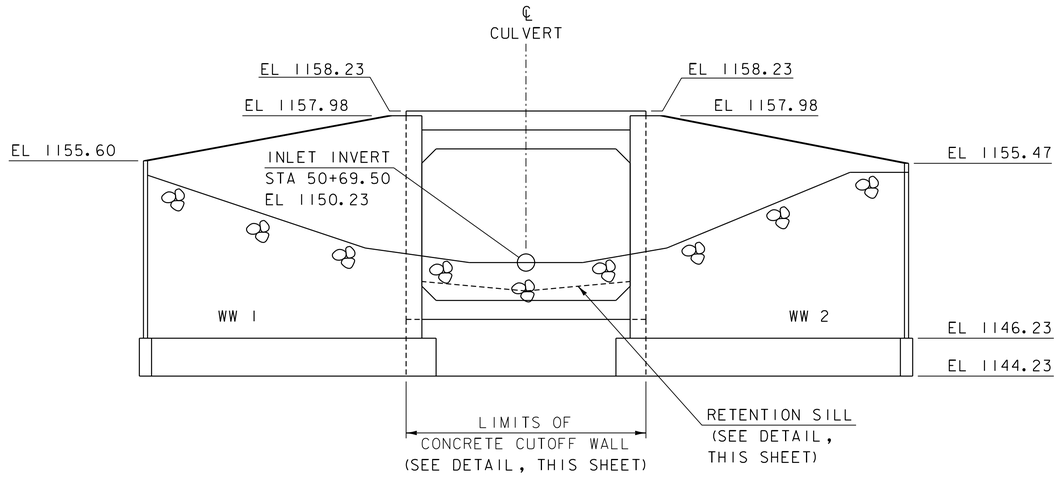
CULVERT RETENTION SILL DETAIL

SCALE: 1" = 1'-0"

RETENTION SILL REQUIREMENTS	
	DIMENSION
HEIGHT AT ENDS	12"
HEIGHT AT CENTER	6"
SPACING (O.C.)	8'-0"

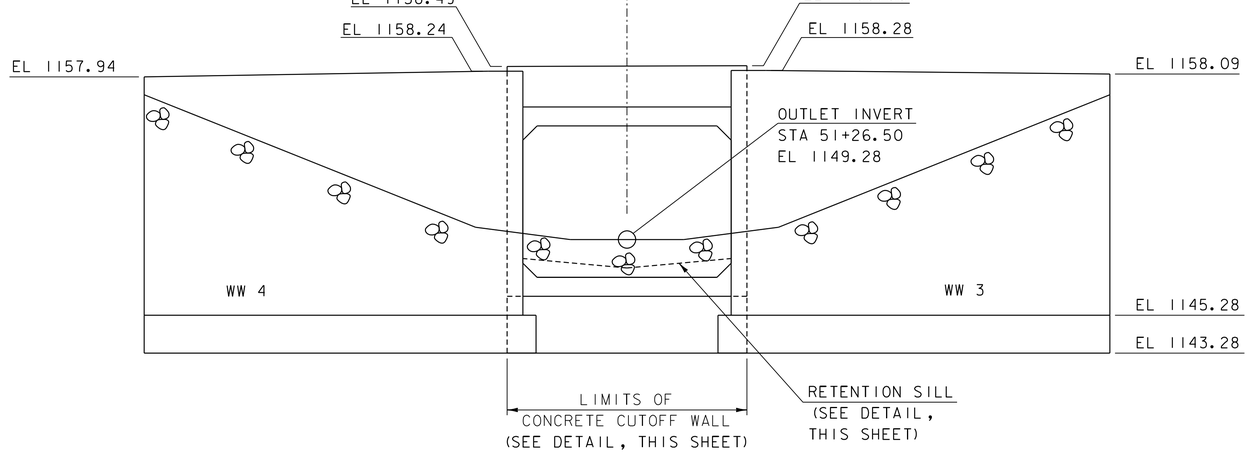
NOTES

1. PLACE A RETENTION SILL AT THE INLET AND OUTLET OF THE STRUCTURE, AS SHOWN, AS WELL AS CONTINUOUSLY THROUGHOUT THE STRUCTURE AT THE MAX SPACING SPECIFIED.
2. BOX CULVERT FABRICATOR SHALL DESIGN AND DETAIL THE PRECAST RETENTION SILL TO BE CAST INTEGRAL WITH THE BOX CULVERT.



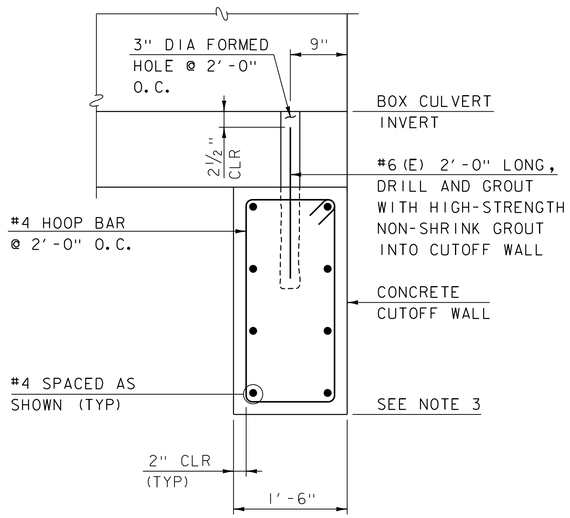
INLET ELEVATION

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



OUTLET ELEVATION

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



NOTES

1. LENGTH OF CUTOFF WALL TO MATCH TOTAL WIDTH OF CULVERT.
2. ALL WORK INCIDENTAL TO BOX CULVERT.
3. REFERENCE ELEVATION VIEWS FOR BOTTOM OF CUTOFF WALL ELEVATIONS, THIS SHEET.

CONCRETE CUTOFF WALL DETAIL

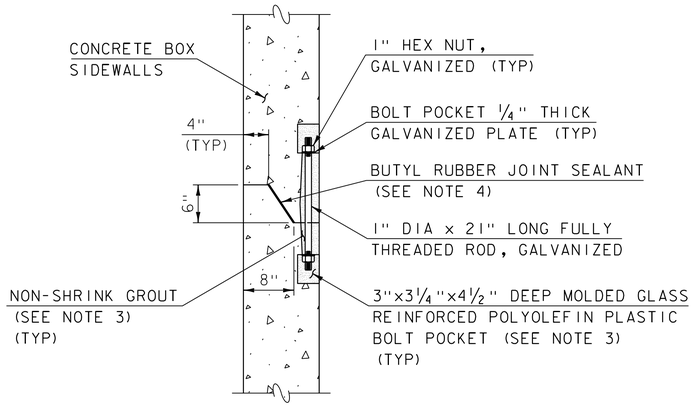
SCALE: 1" = 1'-0"

NOTES

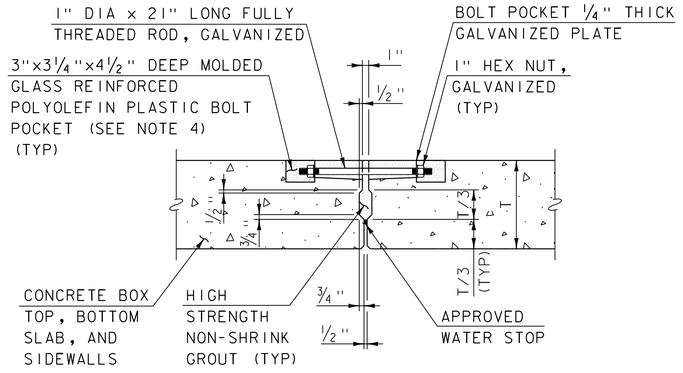
1. THE PRECAST BOX SECTIONS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND SHAPE WILL BE DEPENDENT ON THE FABRICATOR.
2. FOR BOX PROFILE SEE CULVERT PLAN AND PROFILE SHEET.

HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: BF 024I(55)	
FILE NAME: z19b212sub2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: J.RIPLEY	CHECKED BY: T.SUMNER
SUBSTRUCTURE DETAILS I	SHEET 344 OF 370



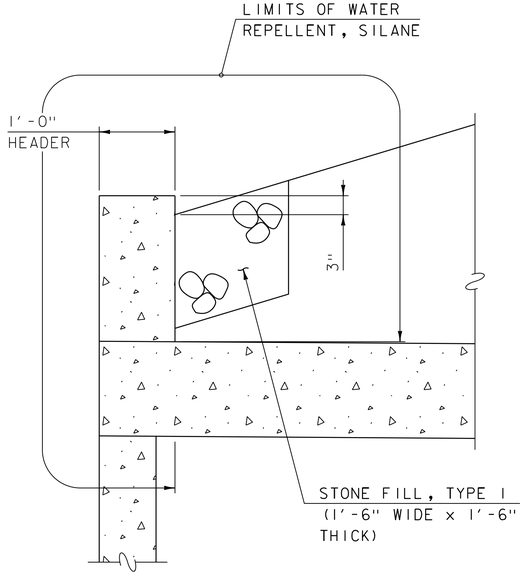
SIDEWALL HORIZONTAL JOINTS



TOP, BOTTOM SLAB JOINTS AND SIDEWALL VERTICAL JOINTS

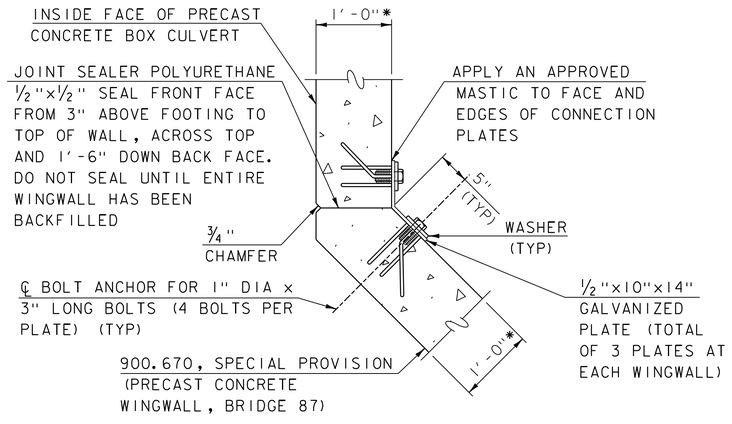
BOX CULVERT MECHANICAL CONNECTION DETAIL

NOT TO SCALE



HEADER WATER REPELLENT DETAIL

NOT TO SCALE



* ASSUMED DIMENSION, ACTUAL DIMENSION TO BE DETERMINED BY FABRICATOR

WINGWALL TO PRECAST CONCRETE STRUCTURE CONNECTION DETAIL

NOT TO SCALE

BOX CULVERT MECHANICAL CONNECTION NOTES

1. ALTERNATIVE MECHANICAL PRECAST BOX CONNECTION MAY BE SUBMITTED FOR VTRANS REVIEW AND APPROVAL.

2. ALL WORK INCIDENTAL TO BOX CULVERT.

3. 3"x3 1/4"x4 1/2" DEEP MOLDED GLASS REINFORCED POLYOLEFIN PLASTIC BOLT POCKETS CAST IN TOP FACE OF TOP SLAB AND TOP FACE OF BOTTOM SLAB AND EXTERIOR SIDEWALLS TO ACCEPT 1" DIA GALVANIZED THREADED ROD, NUTS AND WASHERS FOR PERMANENT ASSEMBLY IN FIELD. UPON SUCCESSFUL INSTALLATION, ALL POCKETS SHALL BE THOROUGHLY FILLED IN WITH AN VTRANS APPROVED, NON-SHRINK GROUT AND STRUCK LEVEL.

SIDEWALL HORIZONTAL JOINTS

4. BUTYL RUBBER JOINT SEALANT PER ASTM C-990 AND AASHTO M-198 SHALL BE PROVIDED.

5. A MINIMUM OF 2 MECHANICAL CONNECTORS ARE REQUIRED FOR EACH PRECAST BOX CULVERT UNIT (1 CROSSING EACH HORIZONTAL LEG CONSTRUCTION JOINT).

BOX TOP, BOTTOM SLAB JOINTS AND SIDEWALL VERTICAL JOINTS

6. A MINIMUM OF 8 MECHANICAL CONNECTORS ARE REQUIRED FOR EACH BOX UNIT (2 TOP, 2 BOTTOM AND 2 EACH EXTERIOR SIDEWALL) (1 ABOVE AND 1 BELOW THE HORIZONTAL JOINT).

WINGWALL TO STRUCTURE CONNECTION NOTES

1. ALL HARDWARE TO BE HOT-DIPPED GALVANIZED.

2. FABRICATOR TO DESIGN ALL CONNECTION PLATES, BOLTS AND BOLT ANCHORS, BUT SHALL NOT BE SIZED SMALLER THAN AS DETAILED.

3. ALL CONNECTION MATERIALS AND WORK SHALL BE INCIDENTAL TO ITEM 900.670, SPECAIL PROVISION (PRECAST CONCRETE WINGWALL, BRIDGE 87).

4. CONTRACTOR IS RESPONSIBLE FOR PROPER FIT UP OF CULVERT AND WINGWALL CONNECTION.

5. BOLTS, BOLT ANCHORS AND CONNECTION PLATES SHALL BE SUPPLIED BY THE PRECAST WINGWALL FABRICATOR TO THE PRECAST BOX FABRICATOR (IF DIFFERENT) FOR INCLUSION IN BOX FABRICATION.

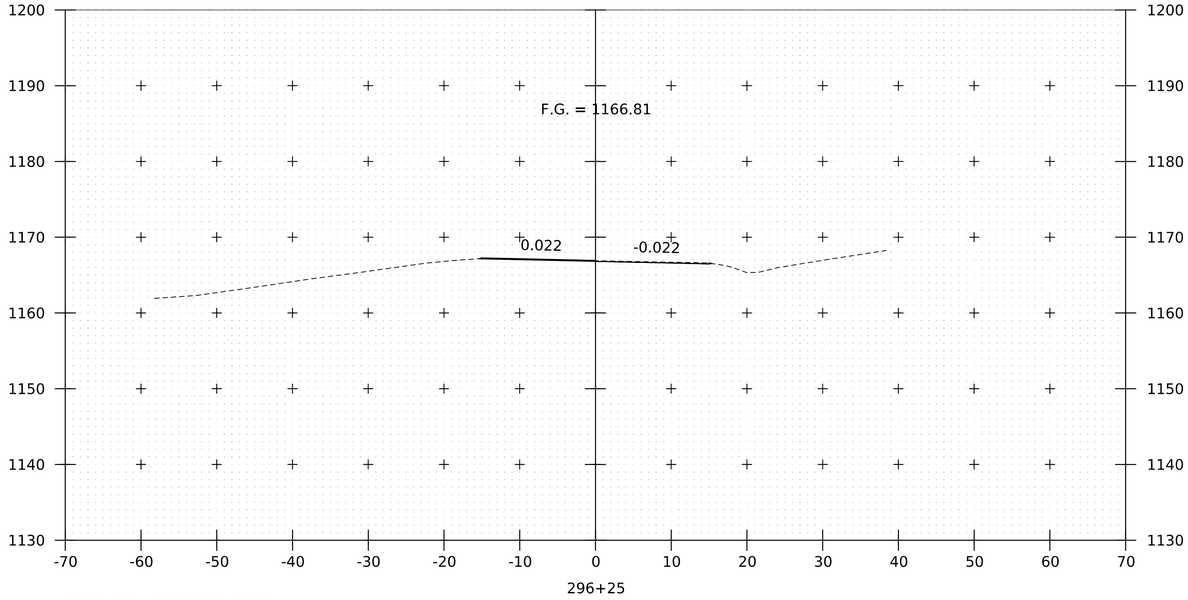
6. ALTERNATIVE MECHANICAL CONNECTION MAY BE SUBMITTED FOR VTRANS REVIEW AND APPROVAL.

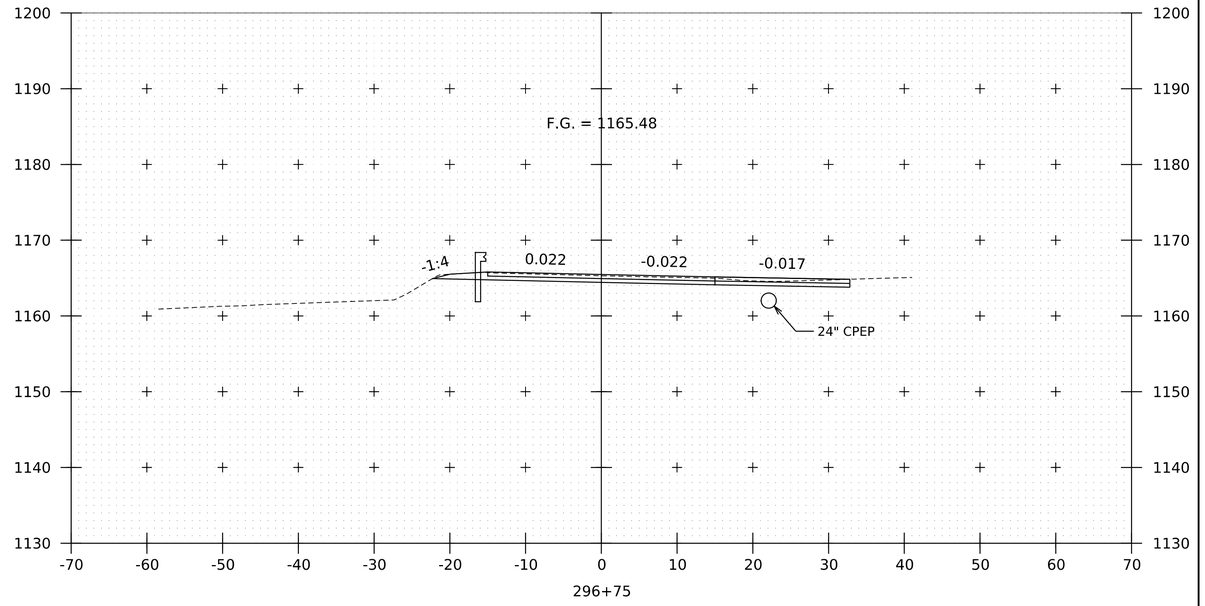
HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

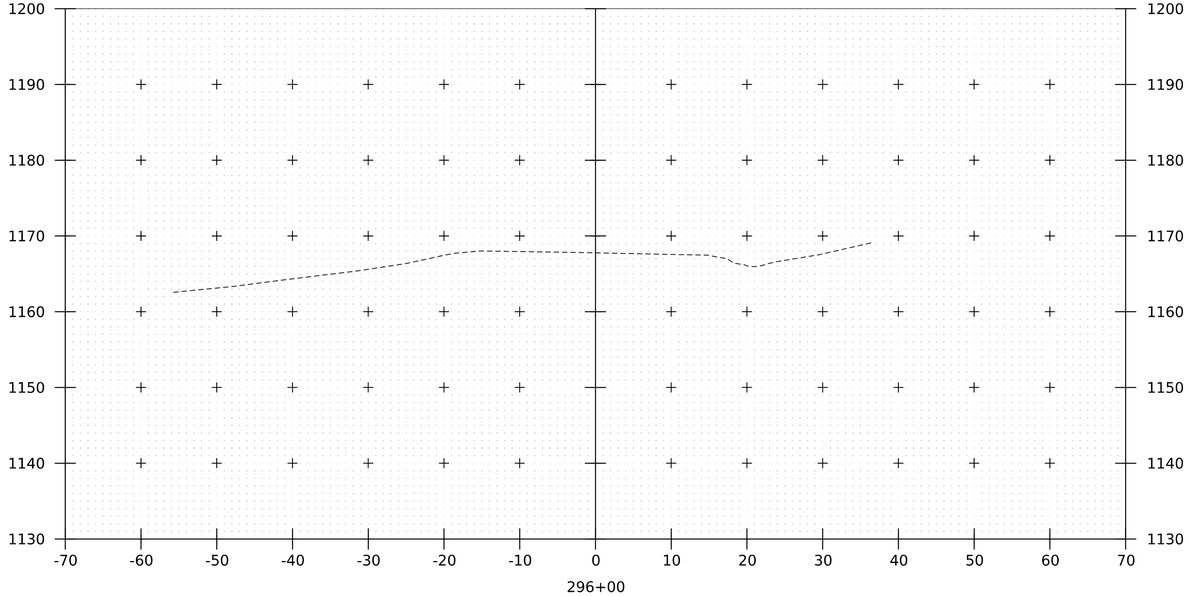
FILE NAME: z19b212sub2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
SUBSTRUCTURE DETAILS 2

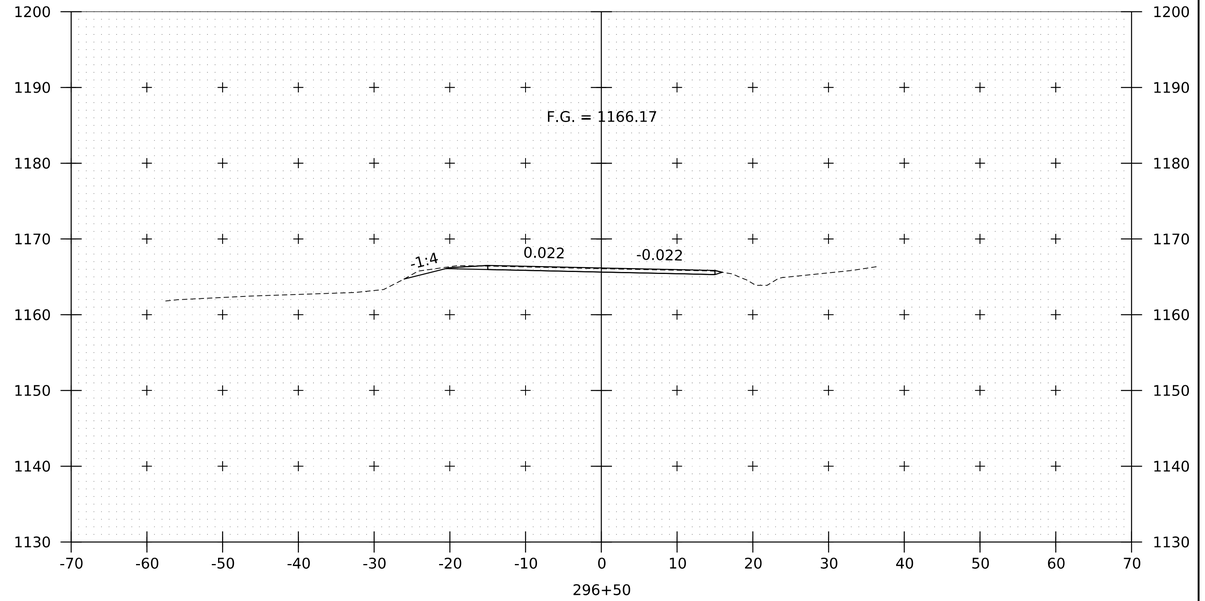
PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 345 OF 370





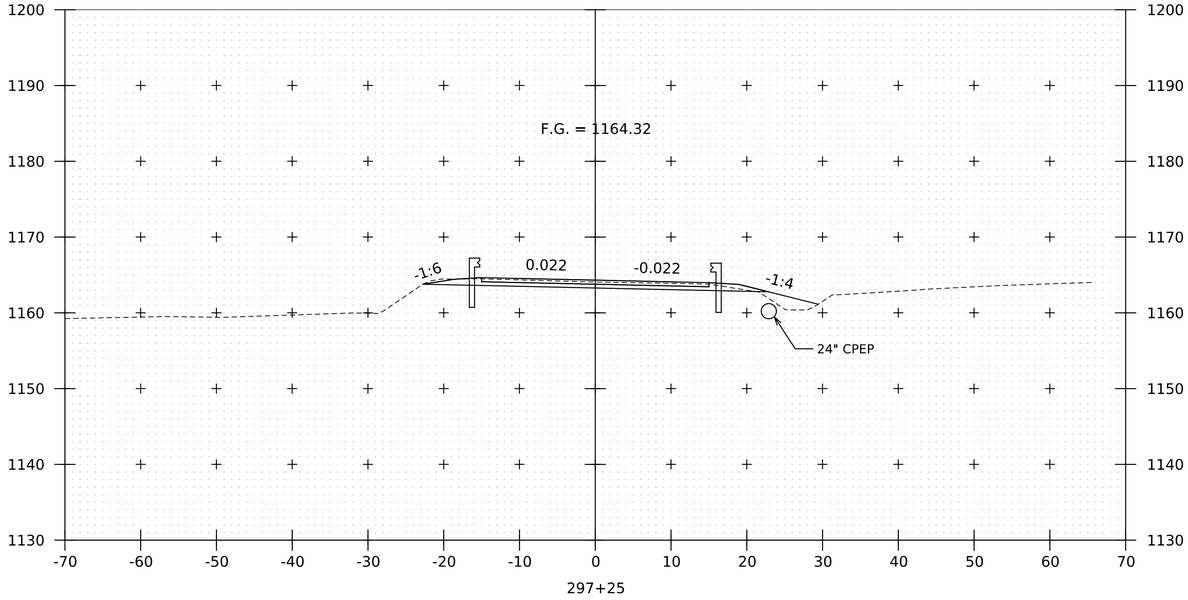
BEGIN APPROACH
STA 296+25.00
MATCH EXISTING

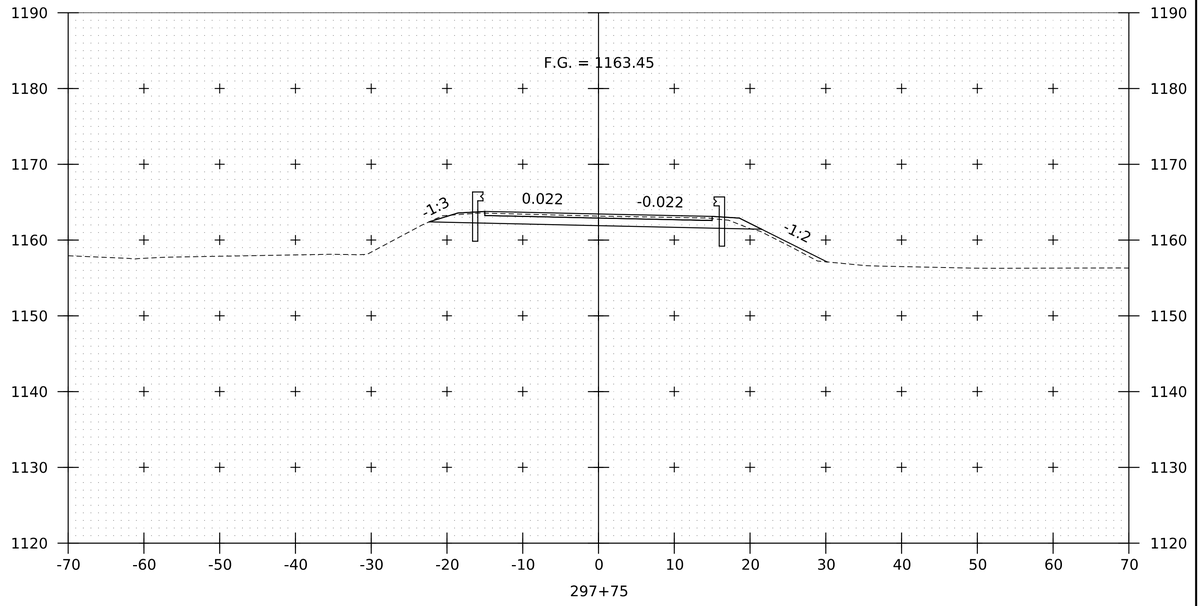


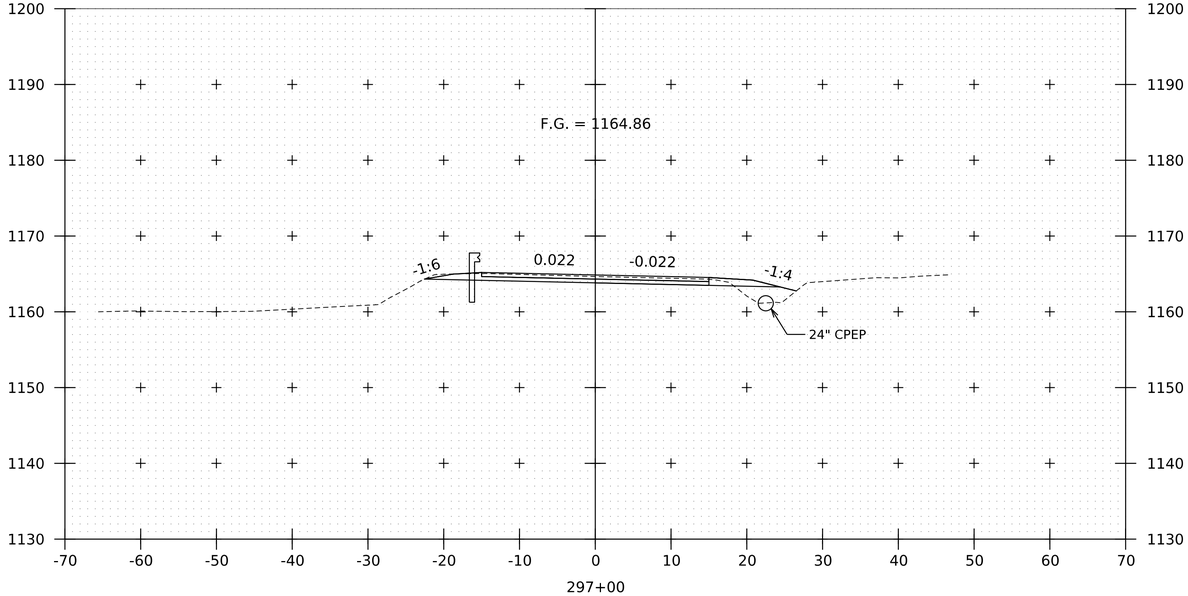


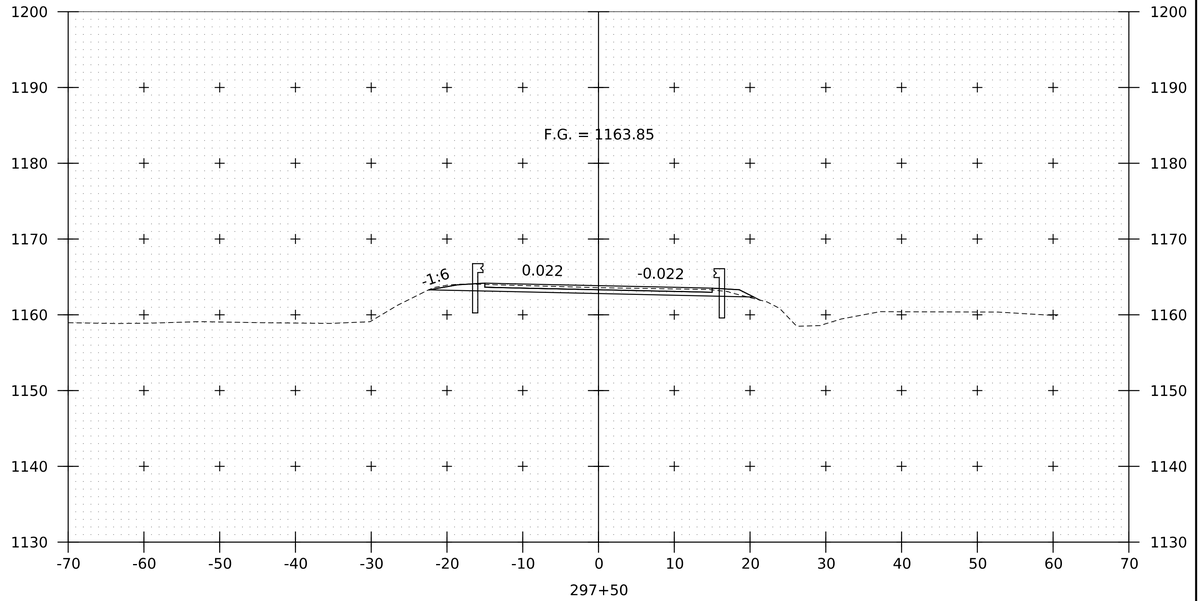
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)
FILE NAME: z19b212xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 1	SHEET 346 OF 370



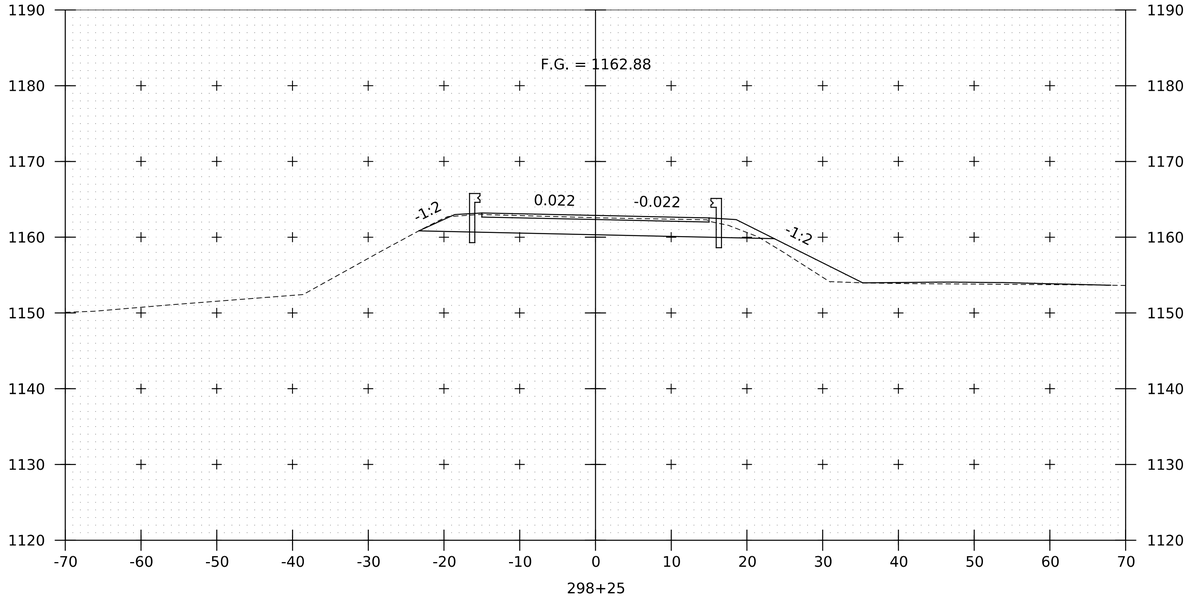


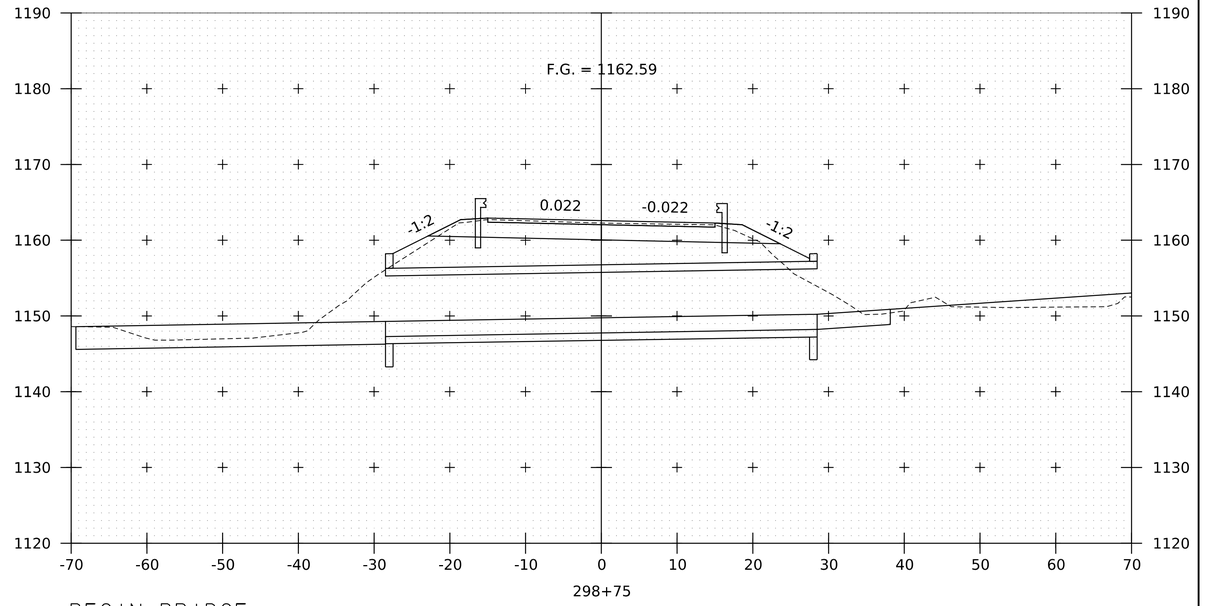




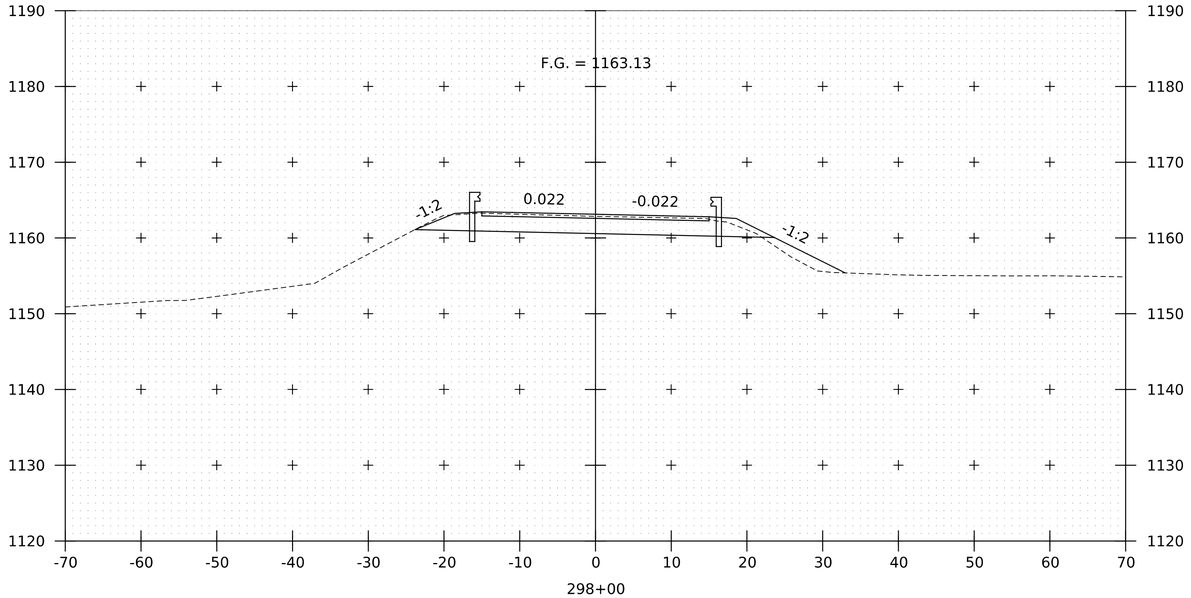
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)
FILE NAME: z19b212xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 2	SHEET 347 OF 370

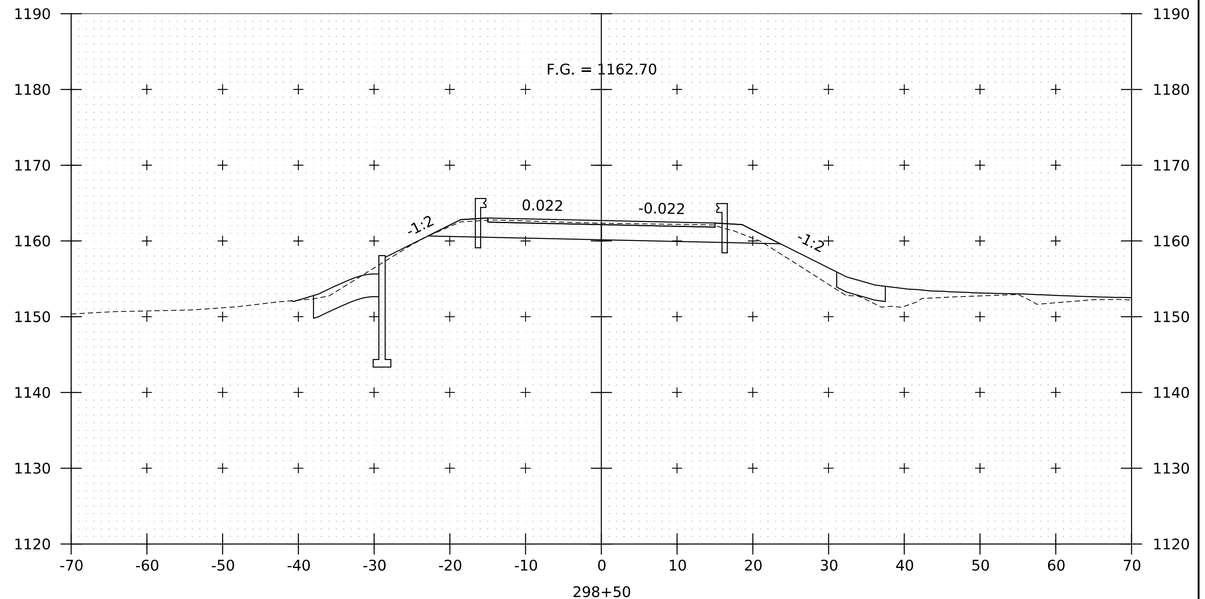




BEGIN BRIDGE
STA 298+65.67



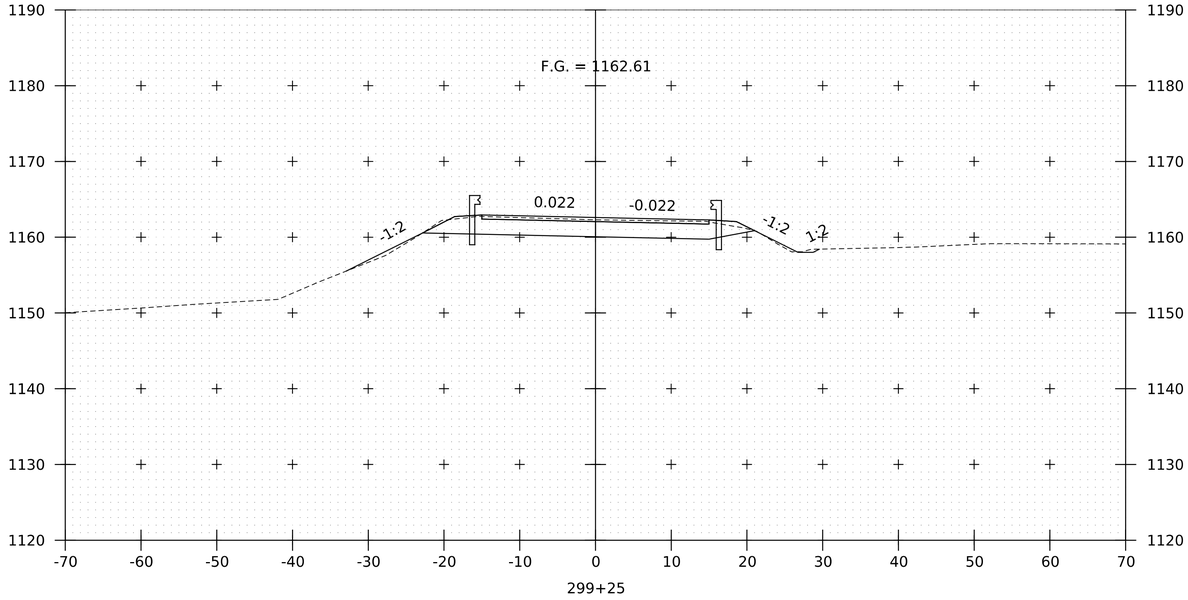
BEGIN PROJECT
STA 298+00.00

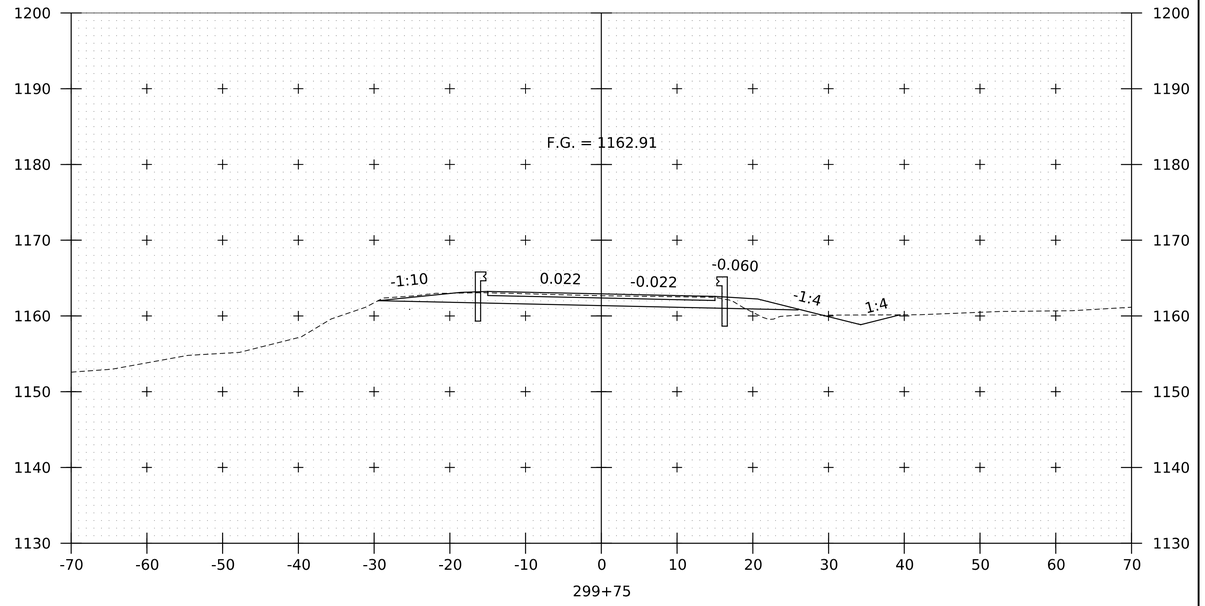


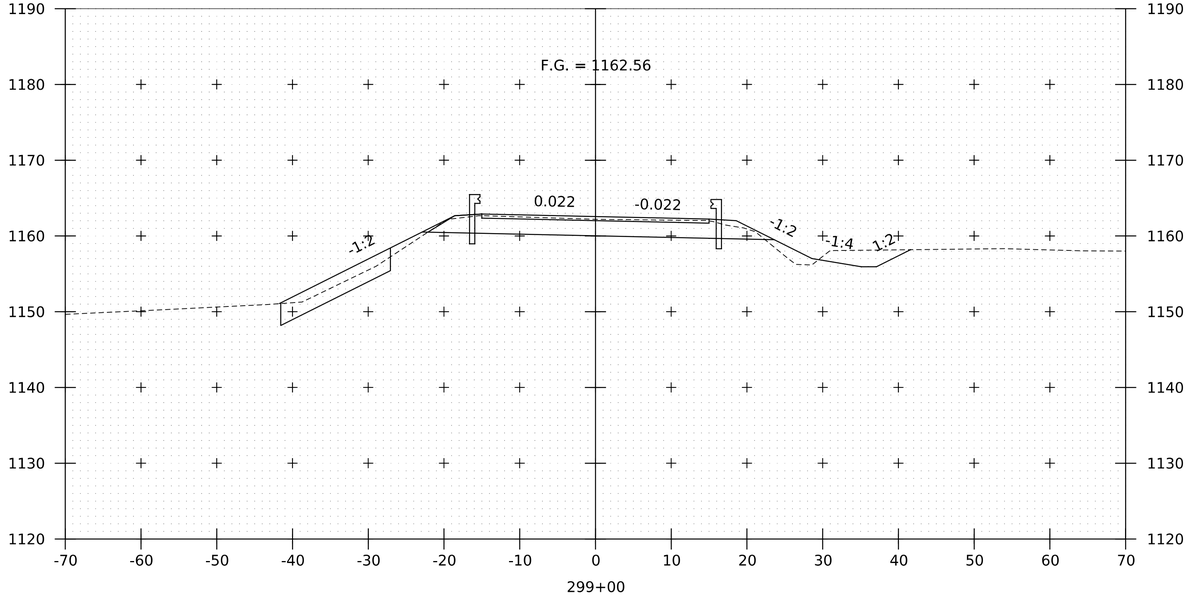
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)

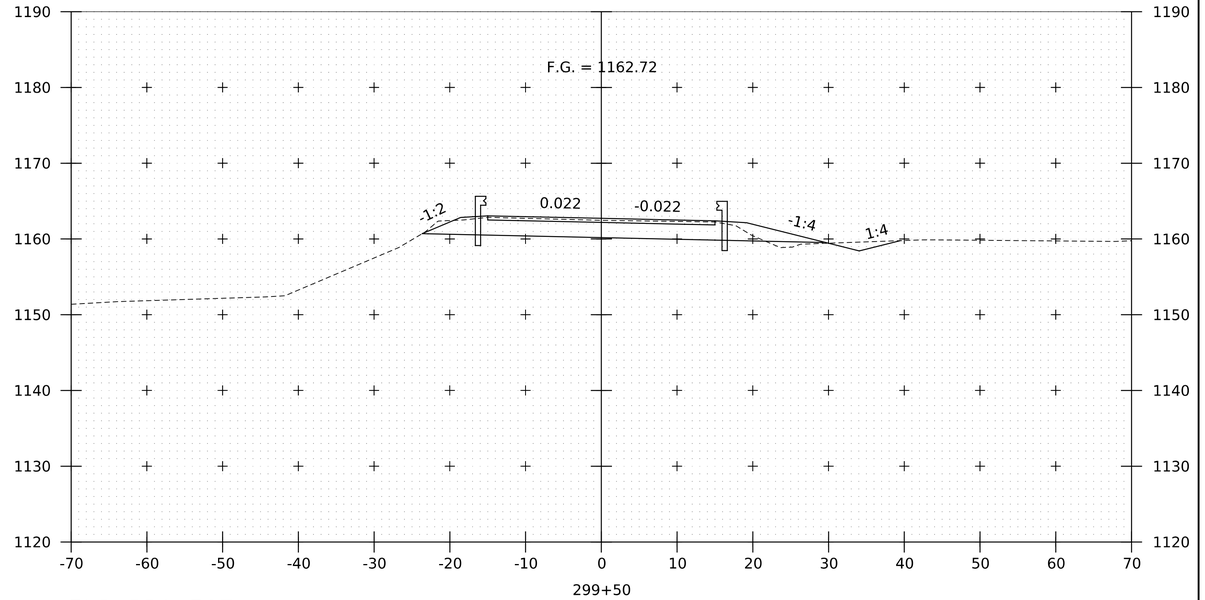
FILE NAME: z19b212xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 3	SHEET 348 OF 370







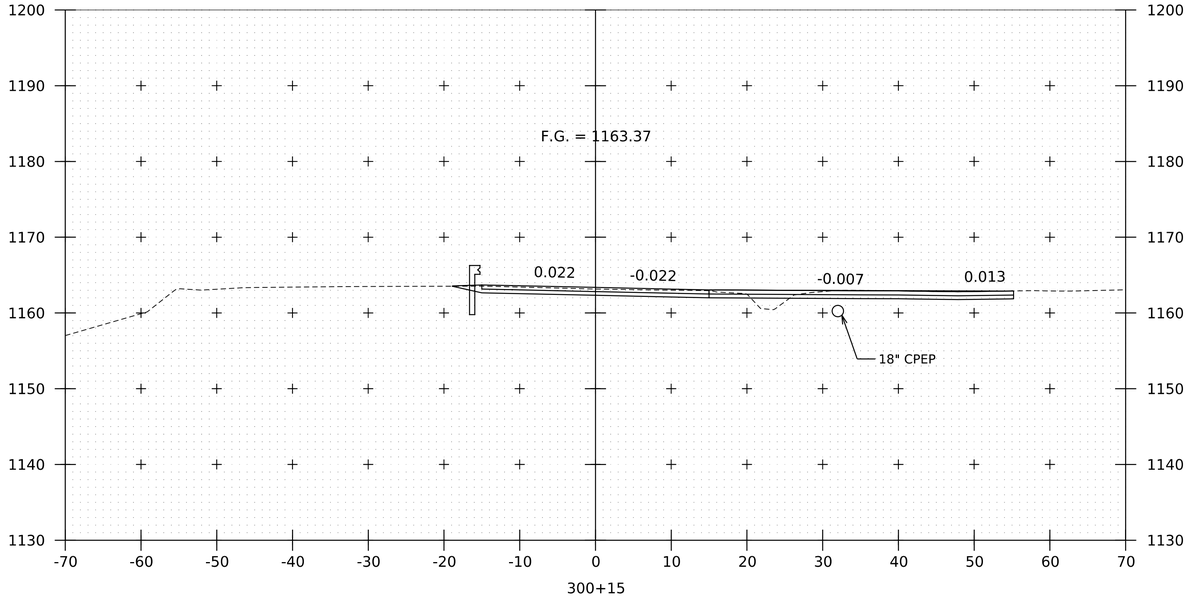
END BRIDGE
STA 298+78.33

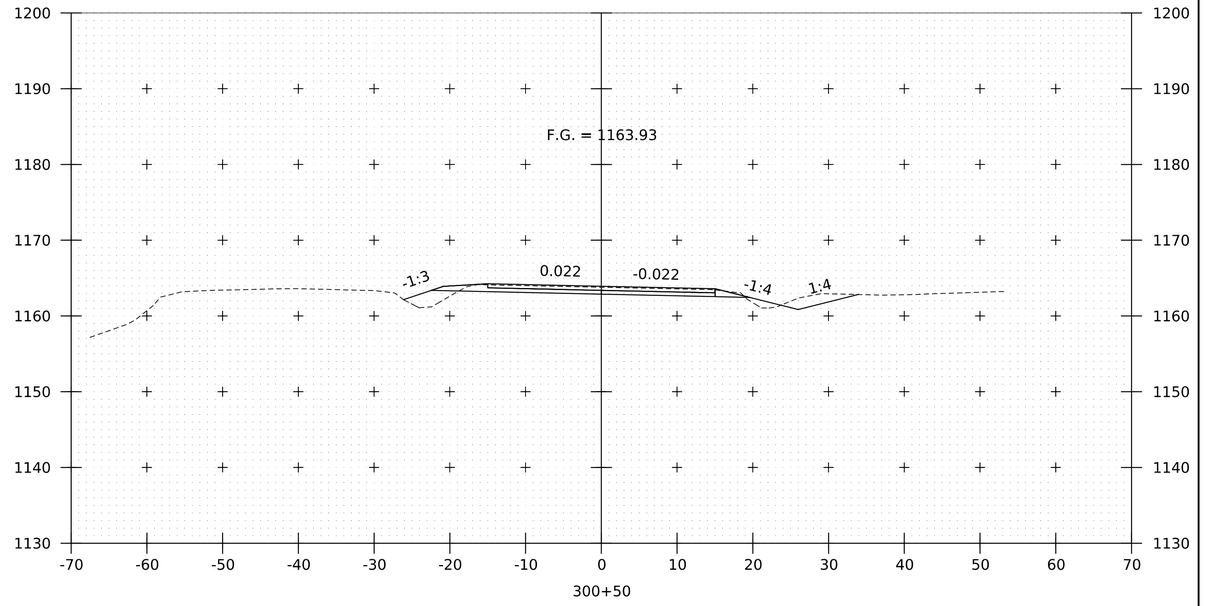


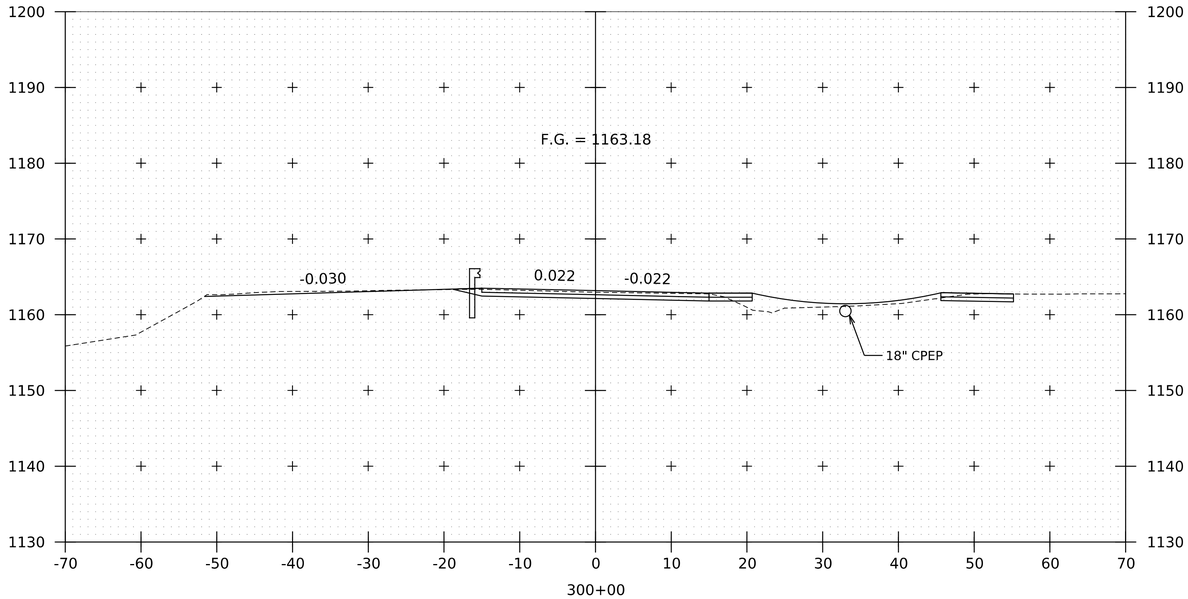
END PROJECT
STA 299+50.00

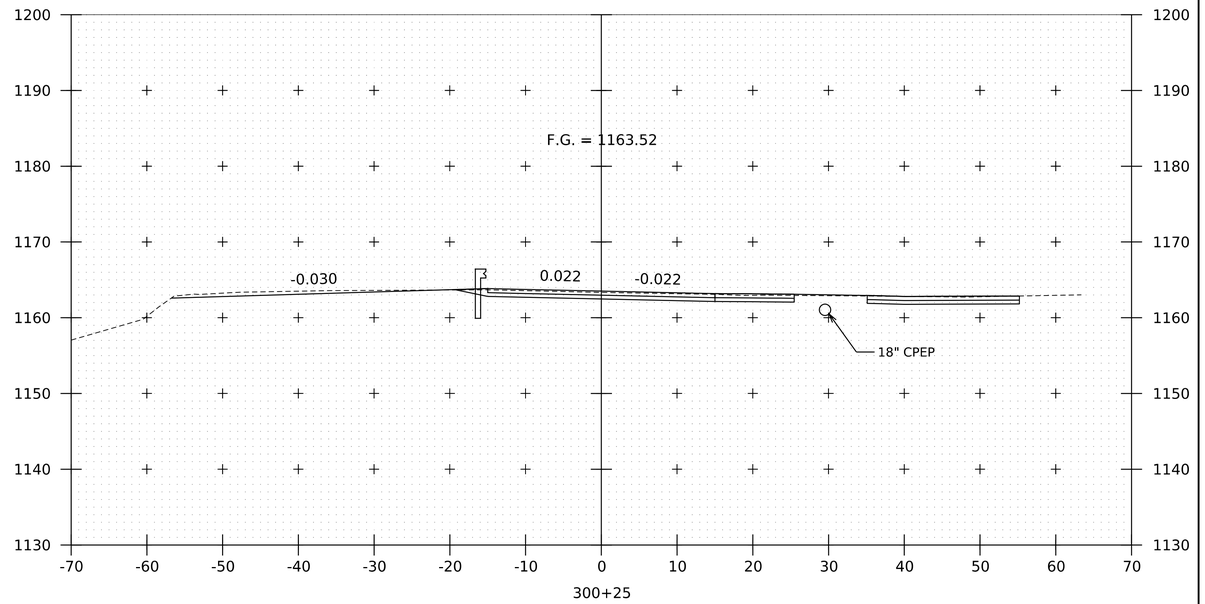
HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)
FILE NAME: z19b212xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 4	SHEET 349 OF 370



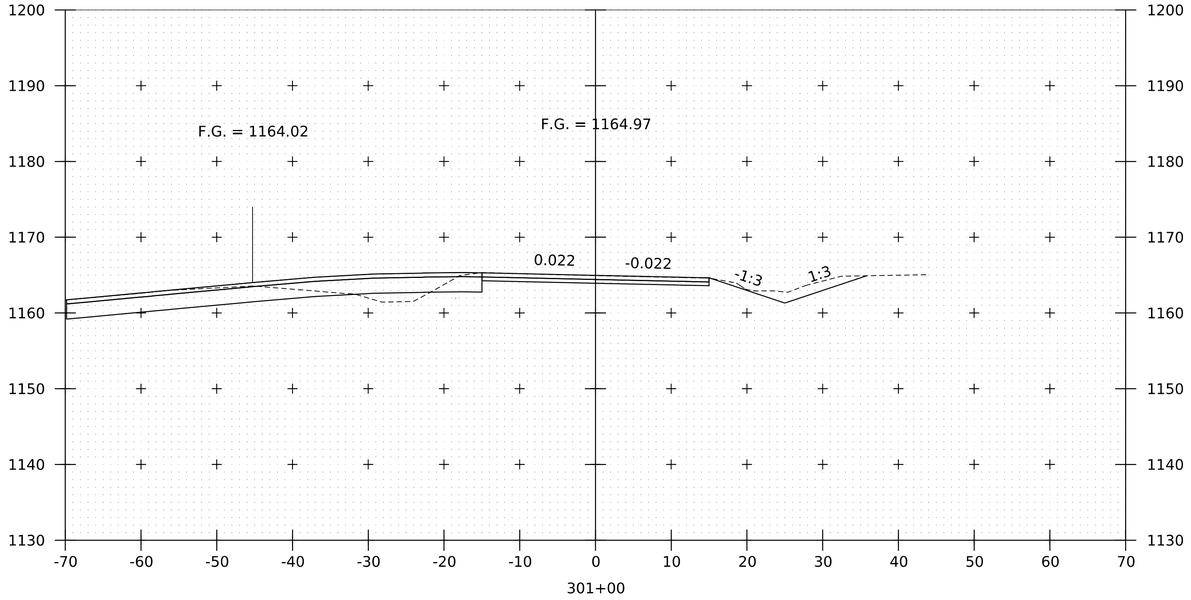


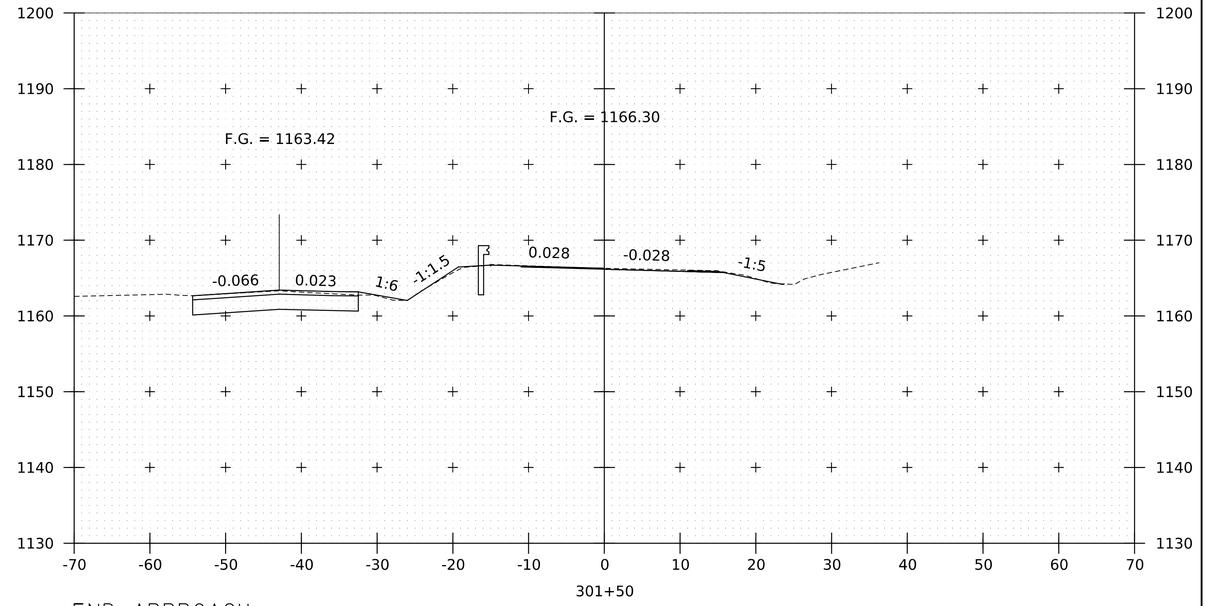




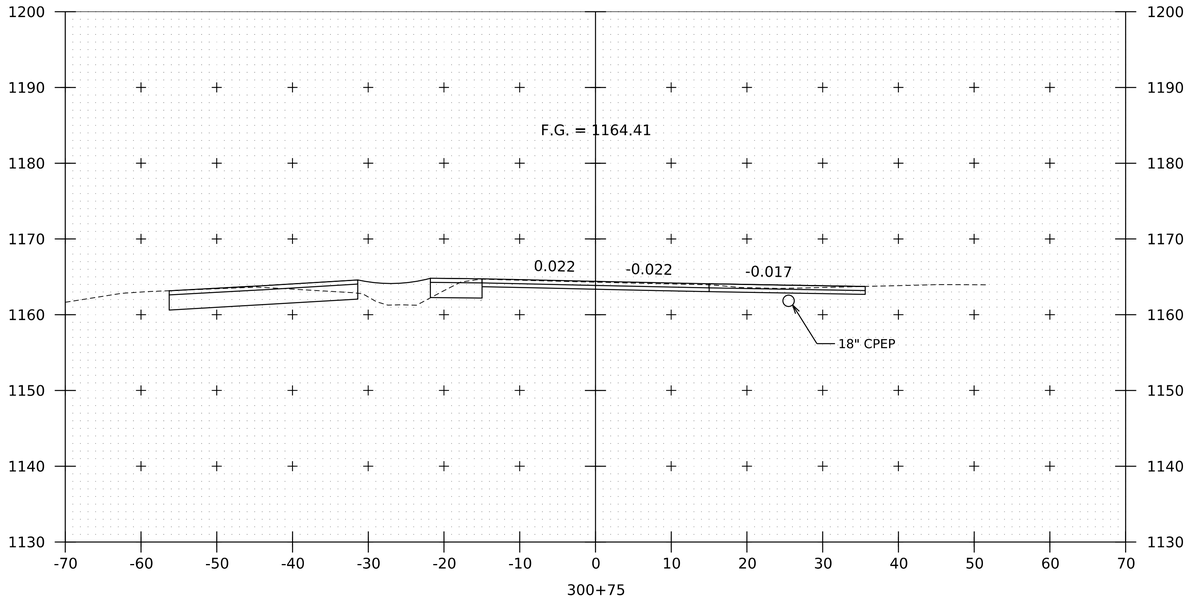
HOYLE TANNER

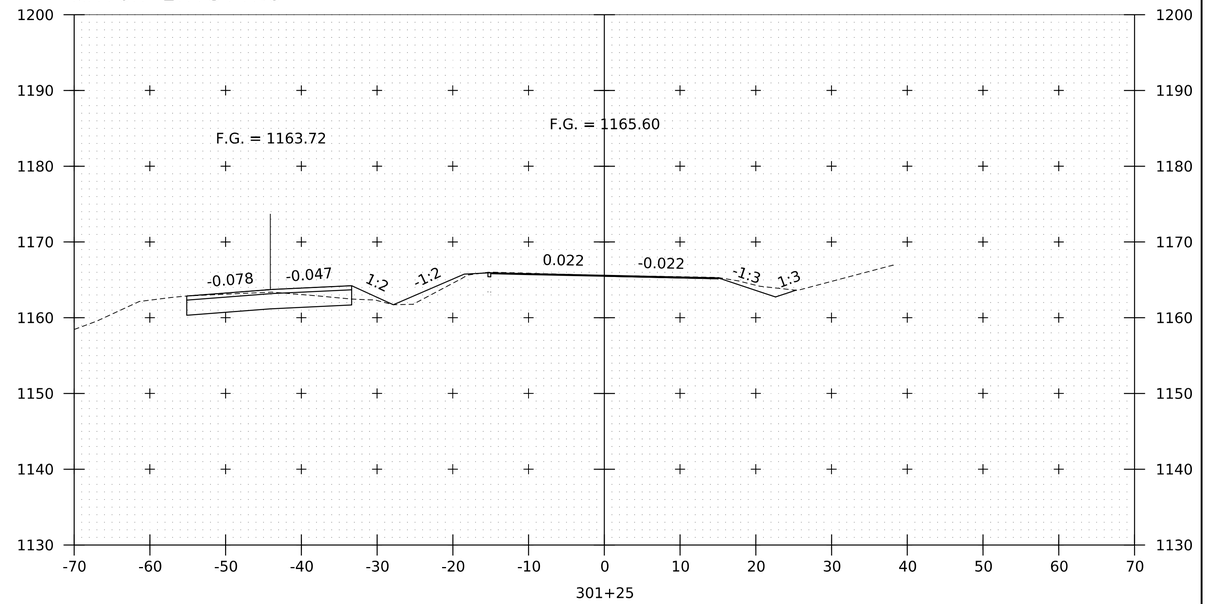
PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)
FILE NAME: z19b212xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 5	SHEET 350 OF 370





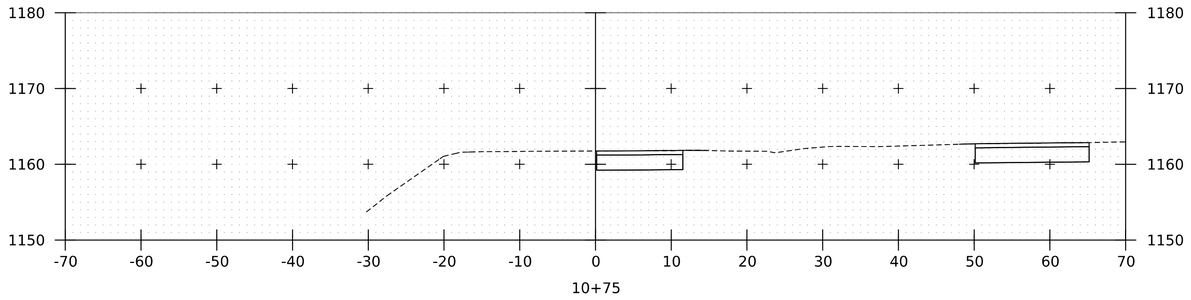
END APPROACH
STA 301+50.00
MATCH EXISTING

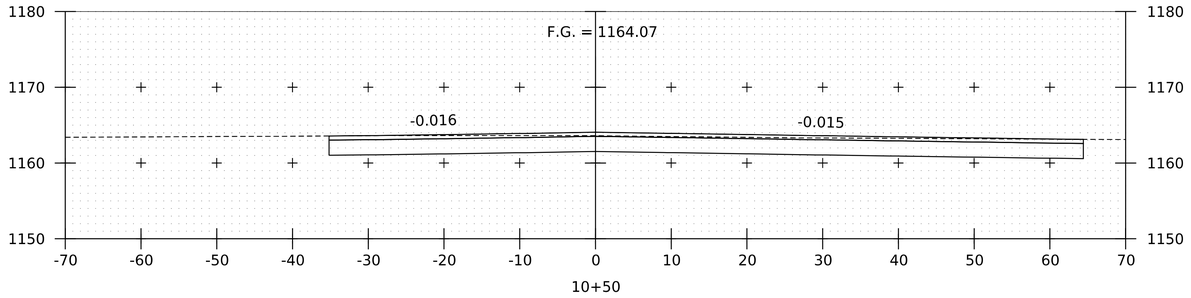


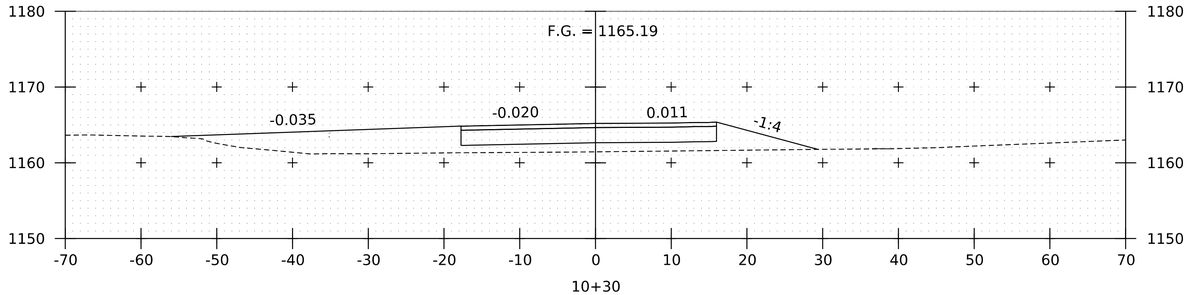


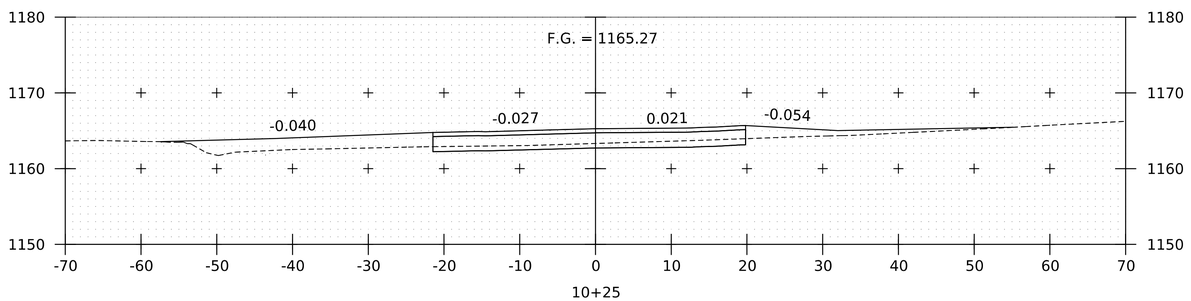
HOYLE TANNER

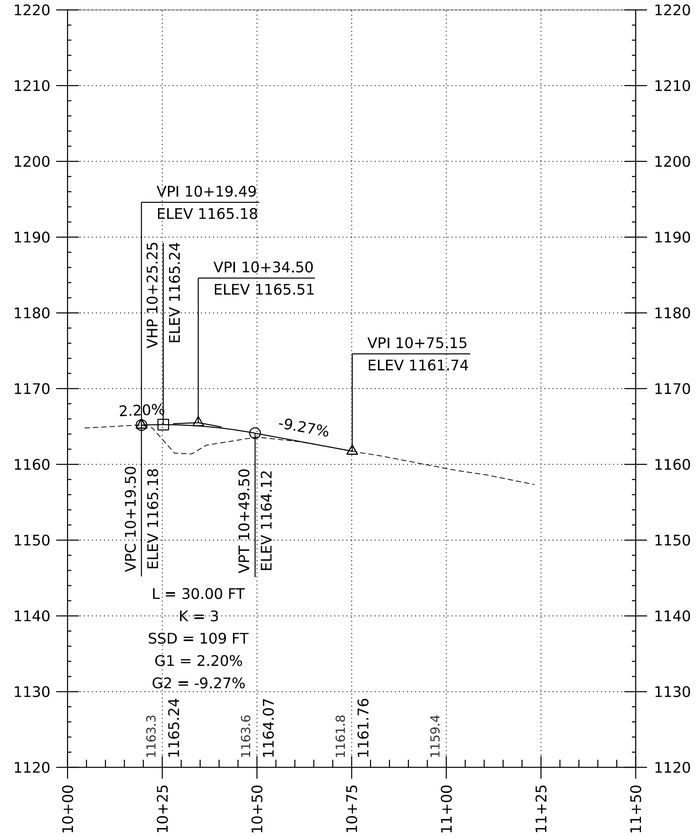
PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)
FILE NAME: z19b212xsl.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: K.PRESTON
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
VT ROUTE 12 CROSS SECTIONS 6	SHEET 351 OF 370











BOAT LAUNCH PROFILE

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

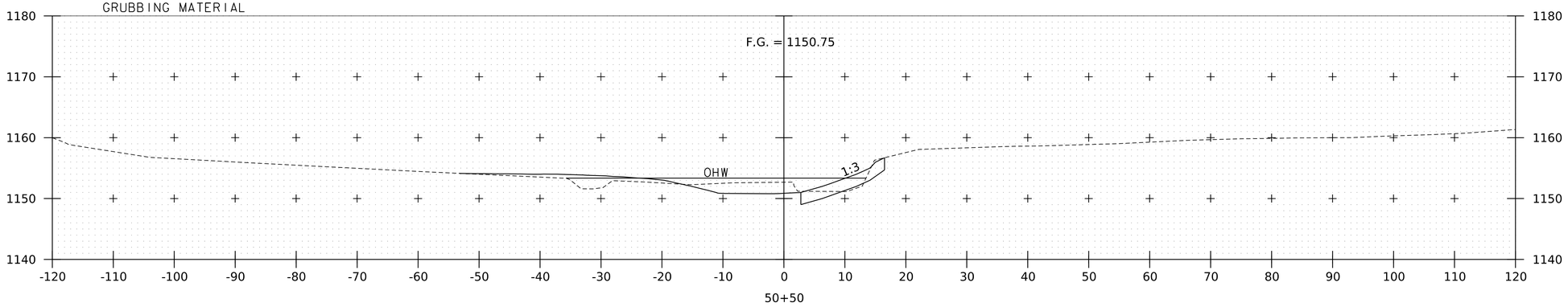
NOTE
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

HOYLE TANNER

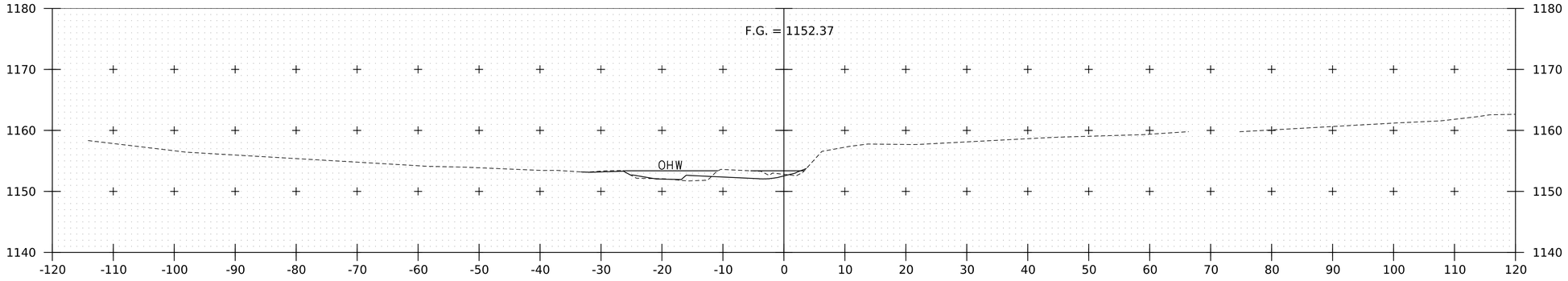
PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212xs4.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
PLOT DATE: 25-MAY-2023
DRAWN BY: K.PRESTON
CHECKED BY: S.HAAS

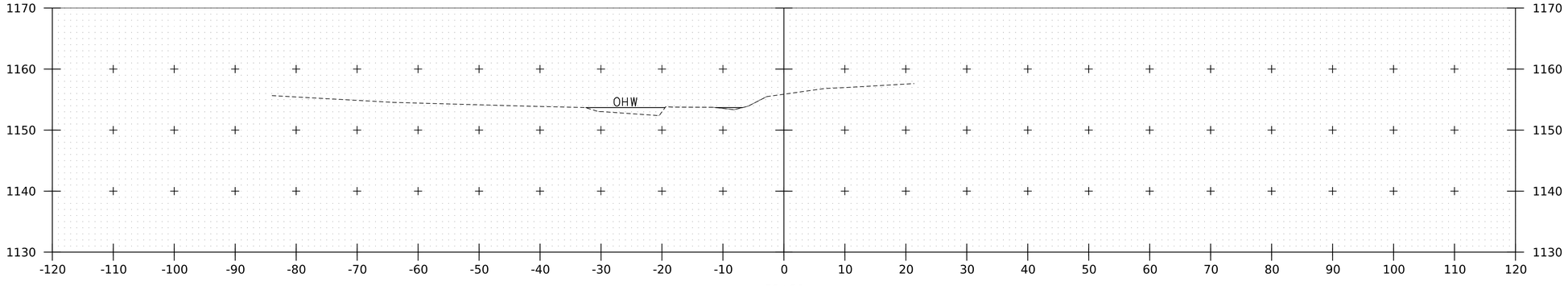
STA 50+59.0, LT & RT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE II)
GRUBBING MATERIAL



50+50



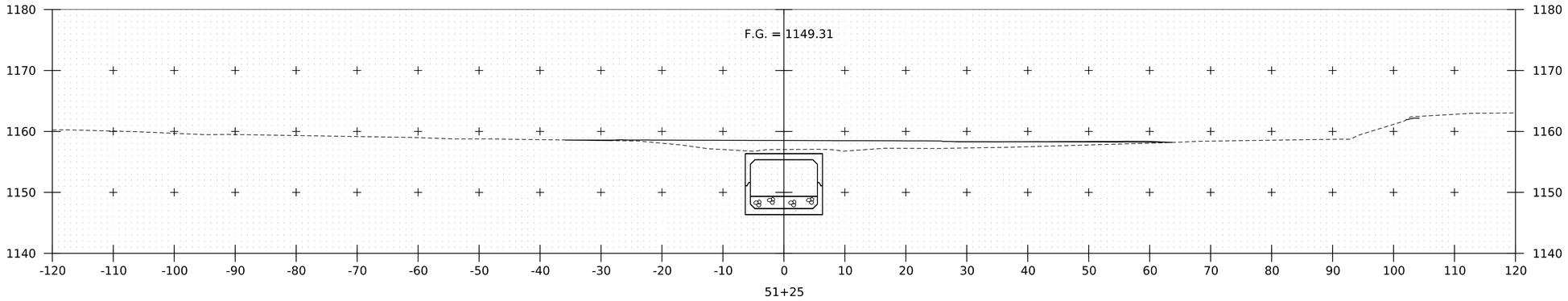
50+25



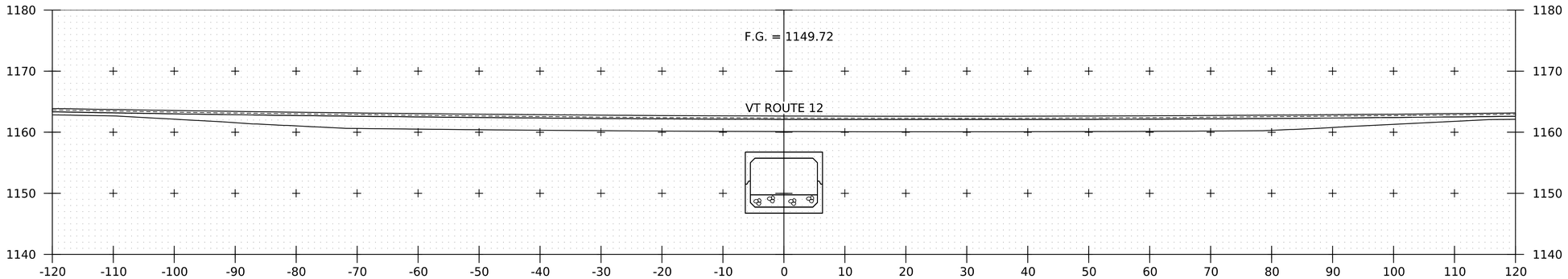
50+00

HOYLE TANNER

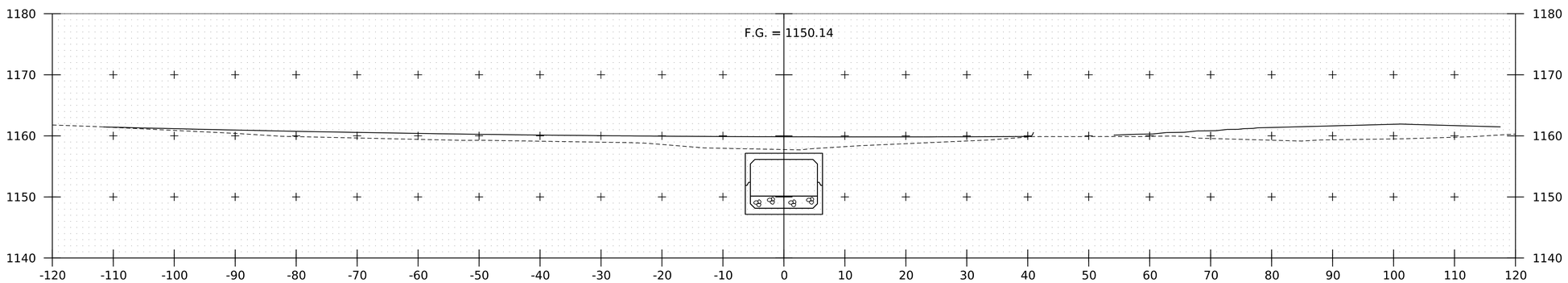
PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)
FILE NAME: z19b212xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
CHANNEL CROSS SECTIONS I	SHEET 353 OF 370



51+25



51+00



50+75

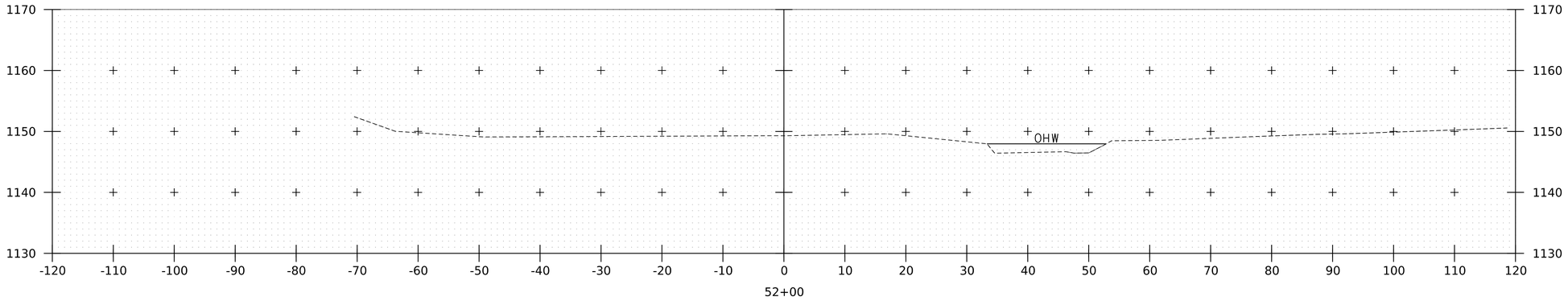
STA 50+69.5, LT & RT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
GRUBBING MATERIAL

HOYLE TANNER

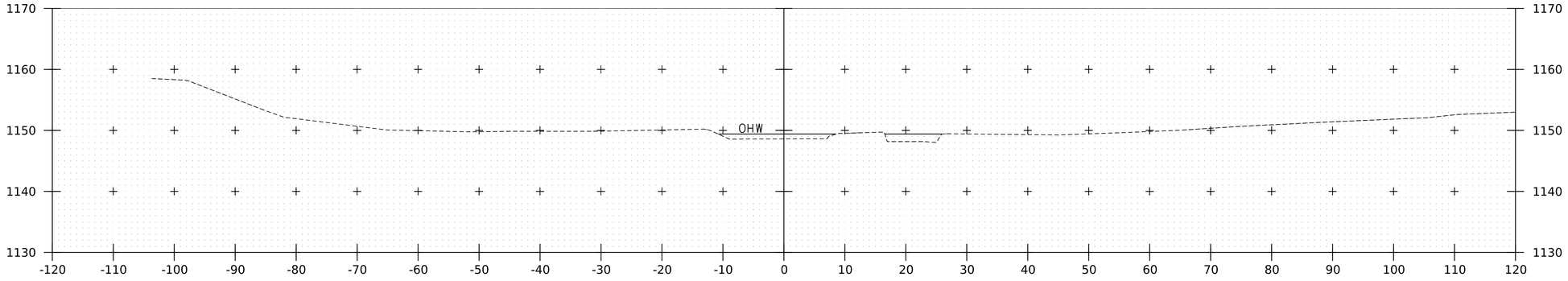
PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212xs3.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: N.CENTERBAR
CHANNEL CROSS SECTIONS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: S.HAAS
SHEET 354 OF 370

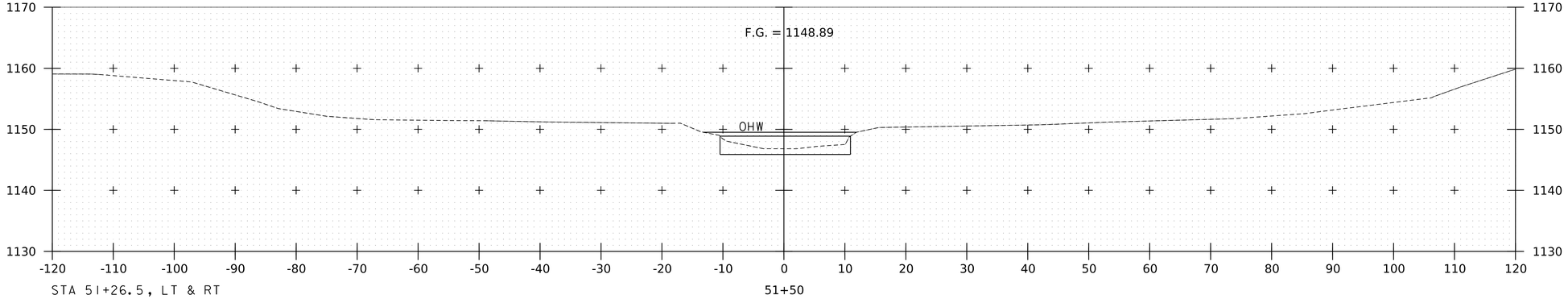


52+00



51+75

STA 51+69.0, LT & RT
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE III)
GRUBBING MATERIAL



51+50

STA 51+26.5, LT & RT
END STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE II)
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, STREAM BED MATERIAL (E-STONE, TYPE III)
GRUBBING MATERIAL

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 024I(55)

FILE NAME: z19b212xs3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: N.CENTERBAR	CHECKED BY: S.HAAS
CHANNEL CROSS SECTIONS 3	SHEET 355 OF 370

EPSC PLAN NARRATIVE

1. PROJECT DESCRIPTION

THIS PROJECT INVOLVES REMOVAL AND REPLACEMENT OF BRIDGE NO. 94 WITH A NEW PRECAST CONCRETE BOX CULVERT CONVEYING UNNAMED BROOK IN ELMORE, VT. BRIDGE NO. 94 IS LOCATED ON VT ROUTE 12 AT MILE MARKER 5.6, APPROXIMATELY 5.6 MILES SOUTH OF THE JUNCTION WITH VT ROUTE 15A. THE EXISTING STRUCTURE IS A 6 FOOT DIAMETER ALUMINUM COATED CORRUGATED GALVANIZED METAL PLATE PIPE WHICH WILL BE ENTIRELY REPLACED IN THE SAME LOCATION.

CONSTRUCTION WILL ALSO INCLUDE 0.024 MILES OF ROADWAY RECONSTRUCTION AND IMPROVEMENTS TO THE INTERSECTION OF VT ROUTE 12 AND CAMP ROAD NORTH OF BRIDGE NO. 94. TRAFFIC CONTROL DURING CONSTRUCTION WILL CONSIST OF A TEMPORARY BRIDGE INCLUDING TEMPORARY PAVED ROADWAY APPROACHES WITH EMBANKMENTS AND SIDESLOPES DOWNSTREAM OF BRIDGE NO. 94.

IT IS ANTICIPATED THAT CONSTRUCTION WILL LAST ONE CONSTRUCTION SEASON.

2. AMOUNT OF DISTURBANCE & RISK EVALUATION

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 1.34 ACRES.

THE MAXIMUM CONCURRENT EARTH DISTURBANCE USED TO SCORE THIS PROJECT IN APPENDIX A RISK ASSESSMENT IS 1.34 ACRES.

THIS PROJECT REQUIRES COVERAGE UNDER GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES FOR LOW RISK.

ANY MODIFICATIONS TO THE PROJECT THAT INCREASE THE RISK TO ENVIRONMENTAL RESOURCES SHALL BE EVALUATED IN ACCORDANCE WITH THE PERMIT REQUIREMENTS. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

3. MAJOR COMPONENTS & SEQUENCING

THE CONTRACTOR SHALL SEQUENCE CONSTRUCTION ACTIVITIES TO MINIMIZE THE EXTENT OF DISTURBED SOILS LEFT OPEN TO EROSION AT ANY GIVEN TIME.

THE MAJOR COMPONENTS OF THE PROJECT AND A PROPOSED GENERAL SEQUENCE IS AS FOLLOWS:

CONSTRUCTION OF THE PROJECT WILL BE BROKEN INTO FOUR MAIN PHASES THAT CONSIST OF INSTALLING THE TEMPORARY BRIDGE AND APPROACHES, REMOVING AND REPLACING BR. 94, RECONSTRUCTING THE NEW ROADWAY APPROACHES BETWEEN THE TEMPORARY BRIDGE APPROACHES, AND THEN FINAL ROADWAY RECONSTRUCTION, SITE GRADING, AND CLEANUP TASKS.

PHASE 1
- ESTABLISH PERIMETER CONTROLS AND MARK PROJECT BOUNDARIES
- INSTALL SEDIMENT CONTROL MEASURES
- CLEARING
- INSTALL PORTION OF TEMPORARY RELOCATION OF STREAM STRUCTURE THAT IS TO BE BELOW THE TEMPORARY DETOUR
- CONSTRUCT TEMPORARY BRIDGE AND APPROACHES WHILE MAINTAINING TRAFFIC ON VT ROUTE 12
- RELOCATE CAMP ROAD AND VT 12 INTERSECTION
- SHIFT TRAFFIC ONTO TEMPORARY BRIDGE AND APPROACHES

PHASE 2
- COMPLETE INSTALLATION OF TEMPORARY RELOCATION OF STREAM STRUCTURE AND DIVERT UNNAMED BROOK AROUND BR. 94.
- EXCAVATE AND REMOVE THE EXISTING METAL CULVERT (BRIDGE NO. 94)
- INSTALL THE LOWER HALF OF THE NEW BOX CULVERT
- INSTALL E-STONE WITHIN THE BOX CULVERT
- INSTALL TOP HALF OF NEW BOX CULVERT AND WINGWALLS
- DIVERT UNNAMED BROOK FLOW BACK THROUGH BR. 94
- REMOVE TEMPORARY STREAM DIVERSION

PHASE 3
- RECONSTRUCT ROADWAY EMBANKMENTS AND STABILIZE SIDE SLOPES BETWEEN THE TEMPORARY BRIDGE APPROACHES
- PLACE ROADWAY SUBBASE AND PAVE ROADWAY BETWEEN THE TEMPORARY BRIDGE APPROACHES
- SWITCH TRAFFIC TO NEW ROADWAY AND BRIDGE
- INSTALL PERMANENT EROSION MEASURES WHERE POSSIBLE

PHASE 4
- REMOVE TEMPORARY BRIDGE AND APPROACHES
- RE-ESTABLISH REMAINING PORTIONS OF THE ROADWAY EMBANKMENTS AND STABILIZE SIDE SLOPES
- PAVE REMAINING ROADWAY
- INSTALL REMAINING PERMANENT STABILIZATION MEASURES

4. SITE DESCRIPTION
4.1 VEGETATED BUFFERS

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

THIS PROJECT DOES NOT RELY ON VEGETATED BUFFERS AS A MITIGATING RISK FACTOR. SILT FENCE OR BARRIER FENCE WILL BE PLACED IN APPROPRIATE LOCATIONS AS SHOWN ON THE CONSTRUCTION SITE PLANS.

4.2 STREAM CROSSINGS

THIS PROJECT INCLUDES (1) STREAM CROSSING, AS DESCRIBED IN SECTION 5.1 BELOW. WORK WITHIN THE WATER IS BEING AUTHORIZED THROUGH THE VANR DEC RIVER MANAGEMENT PROGRAM AND THE US ARMY CORPS OF ENGINEERS.

4.3 WETLANDS

THE PROJECT INVOLVES 10,853 SF OF WETLAND AND 8,570 SF OF WETLAND BUFFER. THIS WORK WITHIN THESE AREAS IS BEING AUTHORIZED THROUGH THE VANR WETLANDS OFFICE AND THE US ARMY CORPS OF ENGINEERS.

4.4 TOPOGRAPHY

THE TOPOGRAPHY OF THE PROJECT AREA IS GENERALLY RURAL WITH RESIDENCES ADJACENT TO THE EXISTING BRIDGE IN THE NORTHEAST, SOUTHEAST, AND SOUTHWEST QUADRANTS. THE INTERSECTION OF VT ROUTE 12 AND CAMP ROAD IS IN THE NORTHWEST QUADRANT.

4.5 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF SHRUBS WITHIN THE WETLANDS AND GRASSLAND ADJACENT TO THE WETLANDS. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE PROJECT. UPON COMPLETION, THE DISTURBED VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES AS DESCRIBED IN THE TURF ESTABLISHMENT DETAIL, UNLESS NOTED OTHERWISE.

4.6 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE. SOILS ON THE PROJECT SITE INCLUDE:
BERKSHIRE FINE SANDY LOAM, 3% TO 8% SLOPES, “K FACTOR” = 0.32
BERKSHIRE FINE SANDY LOAM ,8% TO 15% SLOPES, “K FACTOR” = 0.32
POTSDAM SILT LOAM, 3% TO 8% SLOPES, “K FACTOR” = 0.37

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

4.7 OTHER SENSITIVE RESOURCES

THE ARCHEOLOGICALLY SENSITIVE AREA LOCATED IN THE SOUTHWEST QUADRANT OF THE PROJECT AND SHOWN ON THESE PLANS IS BEYOND THE LIMITS OF DISTURBANCE FOR THIS PROJECT. THE ARCHAEOLOGICALLY SENSITIVE AREA LOCATED IN THE SOUTHEAST QUADRANT OF THE PROJECT AND SHOWN ON THESE PLANS SHALL BE PROTECTED WITH ORANGE BARRIER FENCE. THERE ARE NO RARE, THREATENED, OR ENDANGERED SPECIES OR HISTORIC OR SECTION 4(F) RESOURCES IDENTIFIED WITHIN THE PROJECT VICINITY.

5. DRAINAGE
5.1 RECEIVING WATERS

UNNAMED BROOK AND ADJACENT CLASS II WETLANDS ARE THE ONLY WATER SOURCES ON THE PROJECT SITE. RESIDENCE WATER SUPPLIES ARE FROM DRILLED WELLS. THE BROOK IS CLASSIFIED AS GRADUAL, SINUOUS, NARROW, WITH A CONFINED AND ARMORED CHANNEL AT THE SITE. THE STREAM BED CONSISTS OF GRAVEL, COBBLES AND BOULDERS. THE TRIBUTARY AREA AT THE BRIDGE CROSSING IS 0.91 MILES^2.

5.2 DISCHARGE POINTS

DUE TO THE NATURE OF A BRIDGE PROJECT BEING LOCATED DIRECTLY OVER THE RECEIVING WATER, ALL WATER FROM THE PROJECT AREA DRAINS TOWARD THE BROOK AND ENTERS THE RECEIVING WATER IN MULTIPLE LOCATIONS IN THE AREAS DIRECTLY ADJACENT TO THE BRIDGE.

5.3 CONVEYANCE/FLOW PATH FROM PROJECT TO WATERS

THE PROJECT IS NOT CURBED AND RUNOFF DRAINS OVERLAND ACROSS ADJACENT VEGETATED SIDE SLOPES AND A DITCH LINE TO THE EAST OF VT ROUTE 12 BEFORE REACHING THE RECEIVING WATER. A CLOSED DRAINAGE STRUCTURE AT THE INTERSECTION OF CAMP ROAD AND VT ROUTE 12 IS PROVIDED TO COLLECT AND CONVEY STORMWATER TO THE RECEIVING WATER. THERE IS AN ADDITIONAL CLOSED DRAINAGE STRUCTURE AT THE LOWPOINT OF THE SAG IN THE ROADWAY TO CAPTURE SNOW MELT DURING THE WINTER. OTHERWISE, SHEET FLOW OFF THE ROADWAY SURFACE IS EXPECTED.

6. EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

THE MEASURES INCLUDED IN THIS PLAN ARE PROVIDED AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. IT IS EXPECTED THAT THE CONTRACTOR MAY USE THIS PLAN, WITH ADJUSTMENTS AS NECESSARY, BASED ON THEIR SPECIFIC MEANS AND METHODS OF CONSTRUCTION.

APPLYING THESE MEASURES THROUGHOUT CONSTRUCTION IS CRITICAL TO THEIR SUCCESS IN MINIMIZING SEDIMENT TRANSPORT TO THE RECEIVING WATERS. REFER TO THE DETAILS INCLUDED IN THESE PLANS AND THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION’S VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR SPECIFIC GUIDANCE.

6.1 IDENTIFY LIMITS OF DISTURBANCE

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

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC).

6.2 LIMIT CONCURRENT DISTURBANCE

LIMITING THE AMOUNT OF SOIL EXPOSED AT ONE TIME REDUCES THE POTENTIAL EROSION ON SITE. CONCURRENT EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY AND EMPLOYING STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE.

6.3 STABILIZE DISTURBED AREAS
6.3.1 ACCESS POINTS/ENTRANCE/EXITS

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

STABILIZED CONSTRUCTION ENTRANCES ARE ANTICIPATED ON THIS PROJECT AND SHALL BE LOCATED AS SHOWN ON THIS EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

6.3.2 TEMPORARY MEASURES FOR EXPOSED AREAS DURING CONSTRUCTION

ALL AREAS OF EARTH DISTURBANCE MUST HAVE STABILIZATION IN PLACE WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THIS TIME, DISTURBED AREAS MUST BE STABILIZED IN ADVANCE OF ANY RUNOFF PRODUCING EVENT.

SURFACE ROUGHENING OF EXPOSED SLOPES, SEEDING OF TEMPORARY SLOPES AND STOCKPILES, AND STANDARD MULCHING PRACTICES DESCRIBED IN SPECIFICATION SECTION 653.07 SHALL BE UTILIZED TO TEMPORARILY STABILIZE DISTURBED AREAS.

6.3.3 PERMANENT STABILIZATION 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, ROLLED EROSION CONTROL PRODUCT, TYPE I SHALL BE USED INSTEAD OF MULCH.

E-STONE TYPE IV WILL BE USED TO ARMOR THE CHANNEL AND WINGWALLS AT THE INLET AND OUTLET OF THE BOX CULVERT.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
EPSC NARRATIVE I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER

6.4 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 LOCATED WITHIN A VERTICAL SAG CURVE WITH THE NORTH AND SOUTH APPROACHES DRAINING TOWARD THE PROJECT AREA. RUNOFF FROM THESE AREAS MAY NEED TO BE DIVERTED AWAY FROM THE PROJECT AREA, HOWEVER, VT ROUTE 12 IS SUPERELEVATED TO DRAIN ALL RUNOFF INTO THE DITCH LINE ON THE EAST SIDE OF VT ROUTE 12. THE CONTRACTOR SHALL REFER TO THE LOW RISK HANDBOOK FOR GUIDANCE.

6.5 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED ON THE DOWNHILL SIDE OF CONSTRUCTION ACTIVITIES, PRIOR TO ANY UP-SLOPE WORK.

SILT FENCE WILL BE INSTALLED ALONG THE CONTOURS AND AS PROPOSED ON THE EPSC PLAN. WOVEN WIRE REINFORCED SILT FENCE SHALL BE USED INSTEAD OF SILT FENCE WITHIN 100 FEET UPSLOPE OF RECEIVING WATERS.

6.6 SLOW DOWN CHANNELIZED RUNOFF

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

TEMPORARY STONE CHECK DAMS WILL BE INSTALLED WITHIN THE EXISTING DITCH LINES TO THE EAST SIDE OF VT ROUTE 12 AS SHOWN ON THE PLANS.

7. CONSTRUCT PERMANENT CONTROLS

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

A STONE LINED DITCH IN GENERALLY THE SAME LOCATION AS THE EXISTING DITCH TO THE EAST SIDE OF VT ROUTE 12 IS PROPOSED.

8. DEWATERING

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. DEWATERED STORMWATER OR GROUNDWATER MUST BE FILTERED AND ROUTED IN A MANNER THAT DOES NOT RESULT IN VISIBLY TURBID DISCHARGES TO WATERS.

DEWATERING OF SURFACE WATER WITHIN THE LIMITS OF STRUCTURE EXCAVATION IS ANTICIPATED. THE FILTER BAG DETAIL AND PAY ITEM HAVE BEEN INCLUDED AS A POTENTIAL TREATMENT MEASURE FOR THIS PURPOSE, HOWEVER THE SPECIFIC MEANS FOR TREATMENT OF DISCHARGE SHALL BE PROVIDED BY THE CONTRACTOR. ALL COSTS FOR TREATMENT OF DISCHARGE SHALL BE PAID FOR UNDER CONTRACT ITEM 653.45.

9. OFF-SITE AREAS

OFF-SITE WASTE AND BORROW AREAS HAVE NOT BEEN IDENTIFIED FOR THIS PROJECT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PERMIT, AS NECESSARY, ANY OFF-SITE AREAS THAT ARE NEEDED IN ACCORDANCE WITH STANDARD SPECIFICATIONS 105.25 - 105.28. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES NECESSARY FOR WASTE, BORROW, AND STAGING AREAS OUTSIDE THE PROJECT LIMITS SHALL BE PAID FOR PER 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

VEHICLE AND EQUIPMENT STORAGE AREAS OR AREAS ADJACENT TO CONSTRUCTION TRAILERS OR OTHER HIGH TRAFFIC AREAS SHALL BE COVERED WITH GEOTEXTILE FABRIC AND 12" OF GRAVEL. FOLLOWING COMPLETION OF CONSTRUCTION, ALL NON-NATIVE MATERIALS SHALL BE REMOVED FROM THE STAGING AREA. COMPACTED, RUTTED, OR OTHERWISE DISTURBED SOILS SHALL BE TILLED, RAKED, SEEDED AND MULCHED.

ERODIBLE MATERIALS STOCKPILED WITHIN THE MATERIAL STORAGE AREAS SHALL BE ISOLATED WITH SILT FENCE OR OTHER ACCEPTABLE SEDIMENT BARRIER. SOIL STOCKPILED ON THE SITE SHALL BE SEEDED AND MULCHED.

CONTRACTOR SHALL NOT USE ANY PORTION OF ANR PARCEL FOR WASTE, BORROW, OR STAGING PURPOSES.

10. WINTER CONSTRUCTION

CONSTRUCTION ACTIVITIES MAY CONTINUE INTO THE WINTER CONSTRUCTION SEASON, DEPENDING ON ACTUAL FIELD AND WEATHER CONDITIONS. IF ACTIVITIES ARE ON-GOING BETWEEN OCTOBER 15 AND APRIL 15, THE CONTRACTOR SHALL FOLLOW REQUIREMENTS FOR WINTER CONSTRUCTION, AS DEFINED IN SPECIFIC PERMIT CONDITIONS AND AS FOLLOWS:

- ENLARGED ACCESS POINTS, STABILIZED TO PROVIDE FOR SNOW STOCKPILING.
- LIMITS OF DISTURBANCE MOVED OR REPLACED TO REFLECT BOUNDARY OF WINTER WORK.
- DEVELOPMENT OF A SNOW MANAGEMENT PLAN THAT INCLUDES:
  - ADEQUATE STORAGE AND CONTROL OF MELT-WATER
  - STORAGE OF CLEARED SNOW TO BE PLACED DOWN SLOPE OF DISTURBED AREAS AND OUT OF STORMWATER TREATMENT STRUCTURES
- AREAS OF DISTURBANCE WITHIN 100 FT OF A WATERBODY MUST HAVE REINFORCED (WOVEN WIRE) SILT FENCE INSTALLED ACROSS THE SLOPE, DOWNGRADIENT OF THE EARTH DISTURBANCE. ALTERNATIVELY, REGULAR, NON-WOVEN WIRE SILT FENCE MAY BE USED IF COMBINED WITH EROSION CONTROL BERM, EROSION LOG, OR STRAW WATTLE.
- DRAINAGE STRUCTURES MUST BE KEPT OPEN AND FREE OF SNOW AND ICE DAMS.
- SILT FENCE AND OTHER PRACTICES REQUIRING EARTH DISTURBANCE MUST BE INSTALLED AHEAD OF FROZEN GROUND.
- MULCH TO BE APPLIED AT A MINIMUM OF 2 INCHES DEPTH WITH 80-90% COVERAGE.
- AREAS OF DISTURBED SOILS MUST BE STABILIZED PRIOR TO ANY RUNOFF-PRODUCING EVENT, WITH THE FOLLOWING EXCEPTION:
  - STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH NO OUTLET AND A DEPTH OF 2 FT OR GREATER (OPEN UTILITY TRENCHES), PROVIDED THAT ANY DEWATERING, IF NECESSARY, IS CONDUCTED AS REQUIRED.
- PRIOR TO STABILIZATION, SNOW OR ICE MUST BE REMOVED TO LESS THAN 1" THICKNESS.
- USE STONE TO STABILIZE AREAS WHERE CONSTRUCTION VEHICLE TRAFFIC IS ANTICIPATED.

11. INSPECTION & MAINTENANCE

INSPECTION AND MONITORING OF THE PROJECT'S EPSC MEASURES SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD SPECIFICATION 653.04 MONITORING EROSION PREVENTION AND SEDIMENT CONTROL PLAN, ALONG WITH PERMIT SPECIFIC INSPECTION REQUIREMENTS.

THE CONTRACTOR SHALL PROVIDE A COPY OF THEIR INSPECTION FORM AS PART OF THEIR EPSC PLAN.

ALL EPSC 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.

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212ero_nar.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: J.RIPLEY
EPSC NARRATIVE 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER

VT STATE PLANE GRID

N

CABOT SILT LOAM
0% - 8% SLOPES
VERY STONY
POORLY DRAINED

ROBERT & LAUREL BURBANK

JOHNATHAN & AMY DRAPER

BERKSHIRE FINE SANDY LOAM
3% - 8% SLOPES
WELL DRAINED
K = 0.32

POTSDAM SILT LOAM
3% - 8% SLOPES
WELL DRAINED
K = 0.37

WETLAND
CLASS II

ARTESIAN WELL

PROPANE TANK

EXISTING R.O.W. (VT ROUTE 12)

ECT

ARCH

GRAVEL DRIVE

MATCHLINE STA 298+25.00

TO WORCESTER

N20°00'51"W

VT ROUTE 12

296+00

297+00

298+00

24" CPEP FLOW

STONE FILL

℄ CONSTRUCTION

SHRUBS
SOFTWOODS

50' RIPARIAN BUFFER

OHW

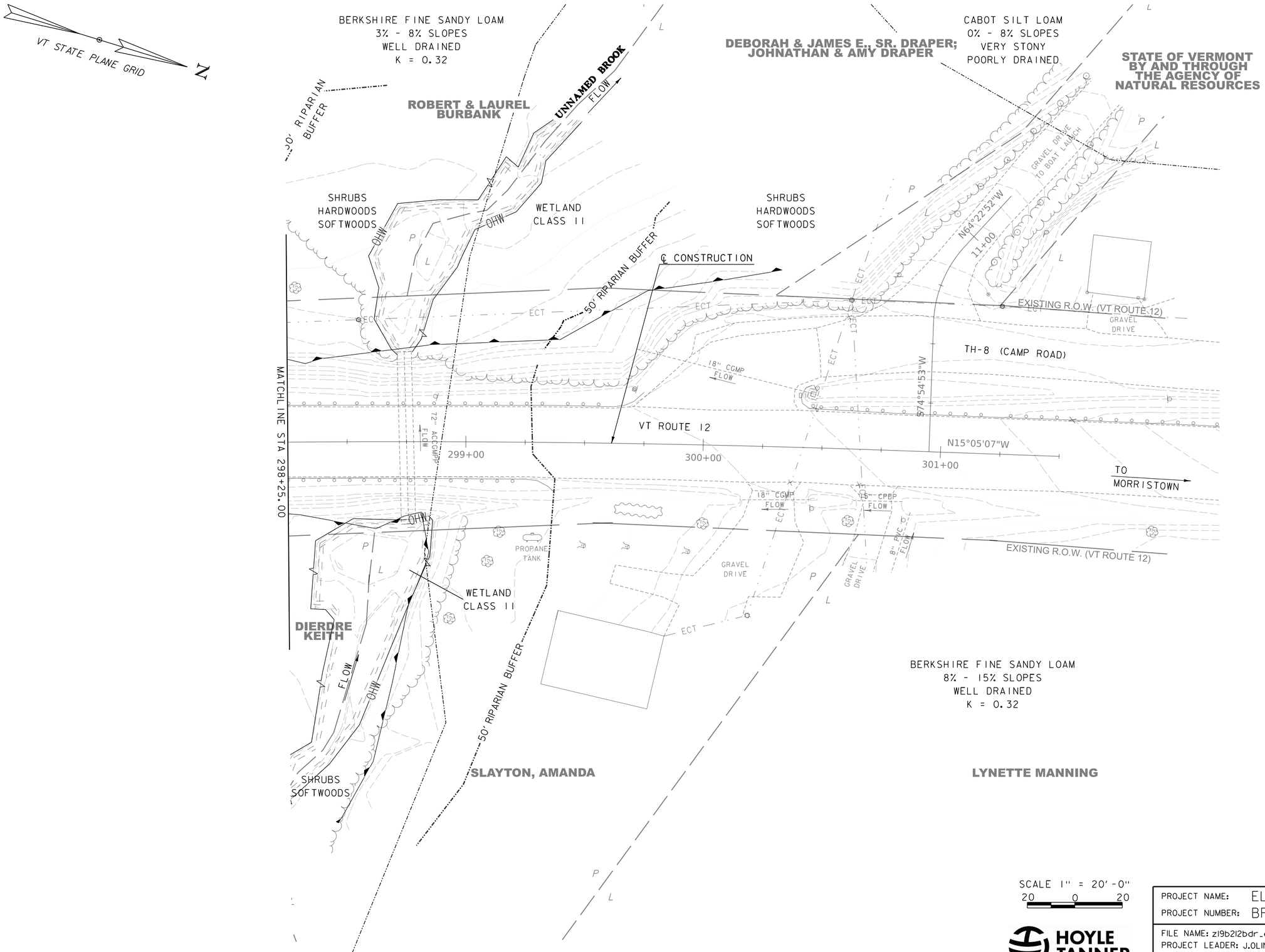
DIERDRE KEITH

PERU FINE SANDY LOAM
0% - 8% SLOPES
MODERATELY WELL DRAINED

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 0241(55)
FILE NAME: z19b212bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC EXISTING SITE PLAN 1	SHEET 358 OF 370



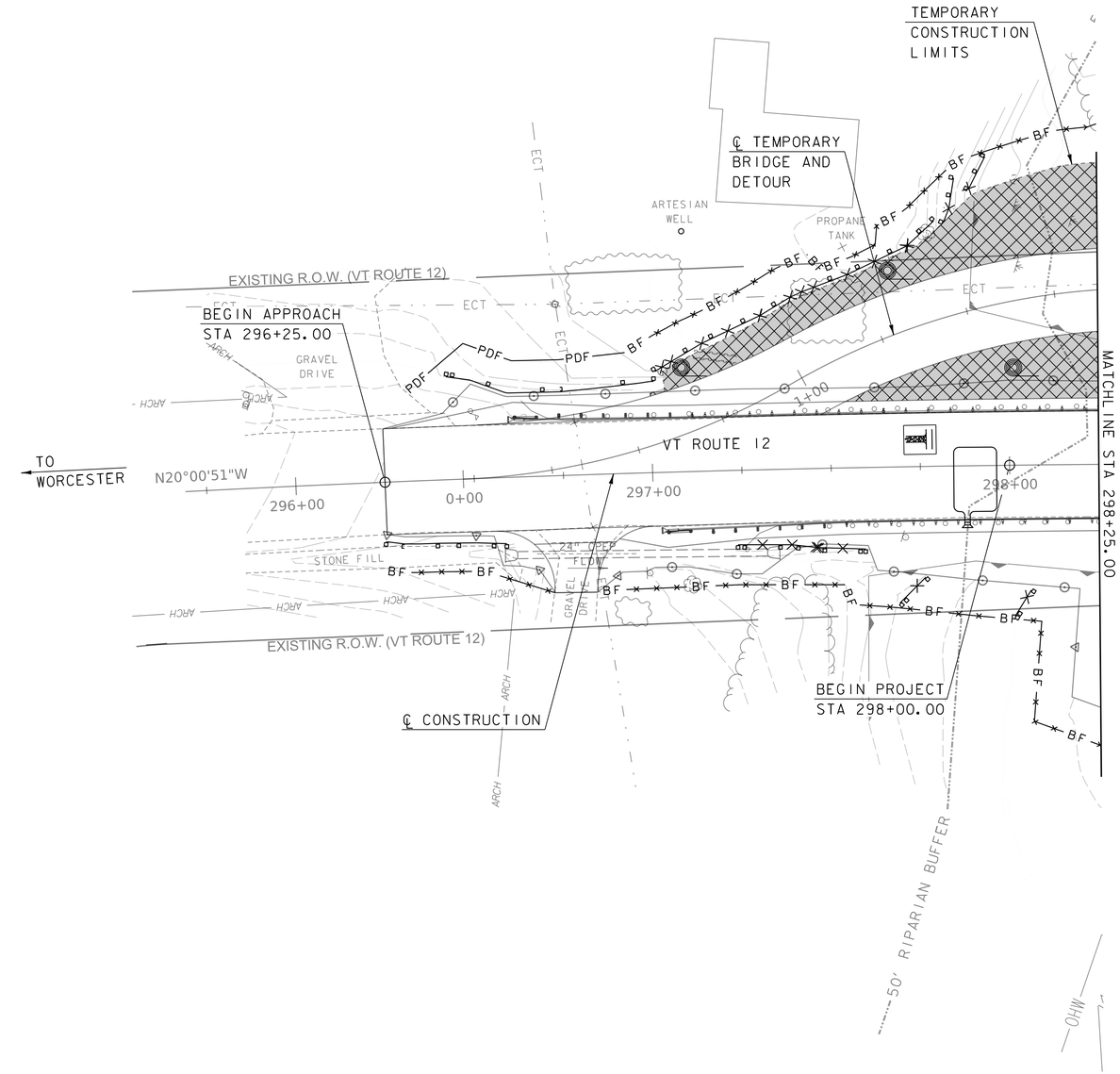
SCALE 1" = 20'-0"
20 0 20

HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: BF 0241(55)	
FILE NAME: z19b212bdr_erol.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC EXISTING SITE PLAN 2	SHEET 359 OF 370

VT STATE PLANE GRID

N



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

HOYLE TANNER

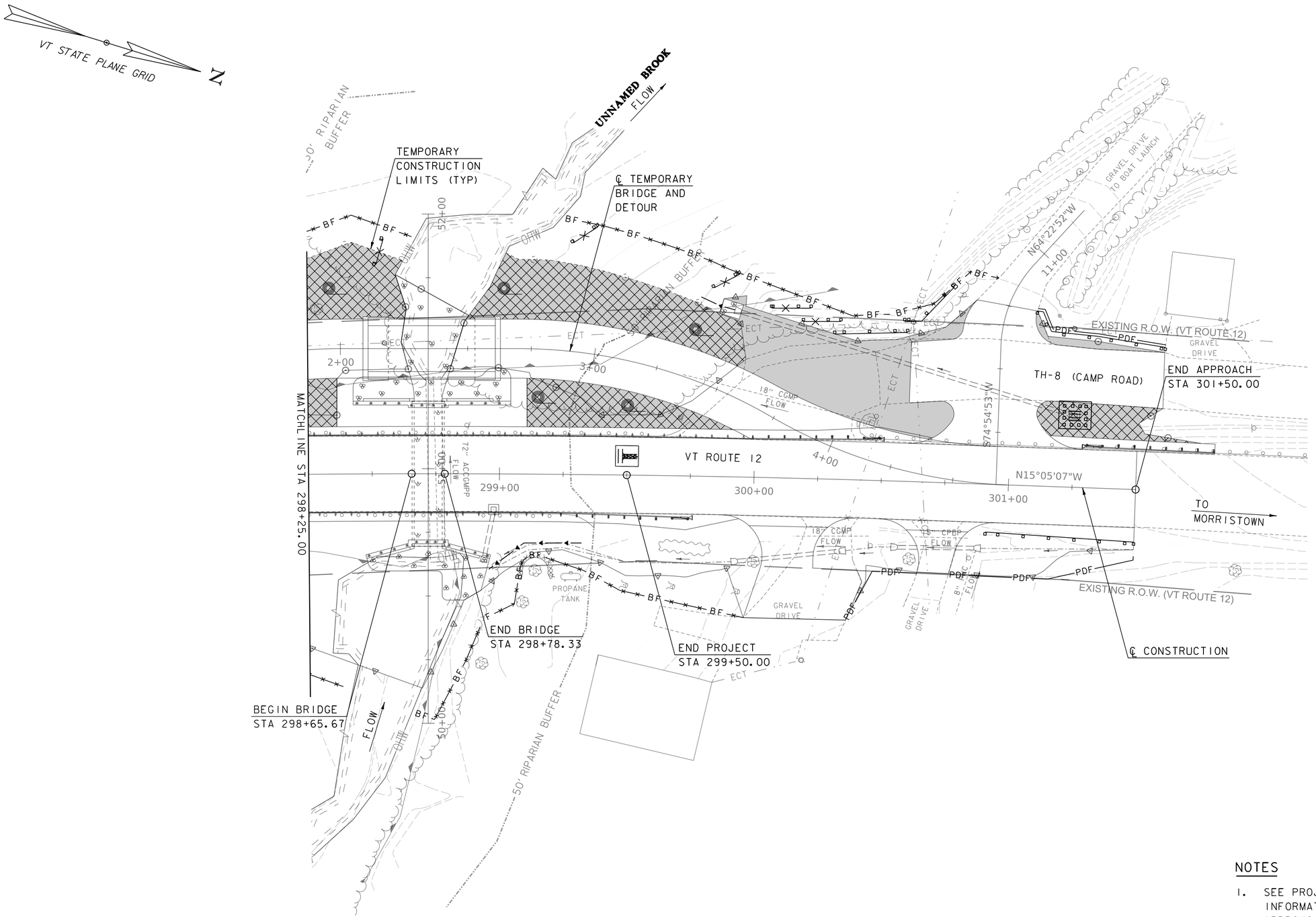
NOTES

1. SEE PROJECT NOTES SHEET FOR ADDITIONAL INFORMATION REGARDING TEMPORARY BRIDGE AND APPROACH WITHIN A WETLAND.

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212bdr_ero2.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: P.DUSTIN
EPSC CONSTRUCTION SITE PLAN 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 360 OF 370



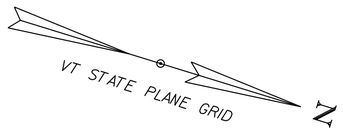
NOTES

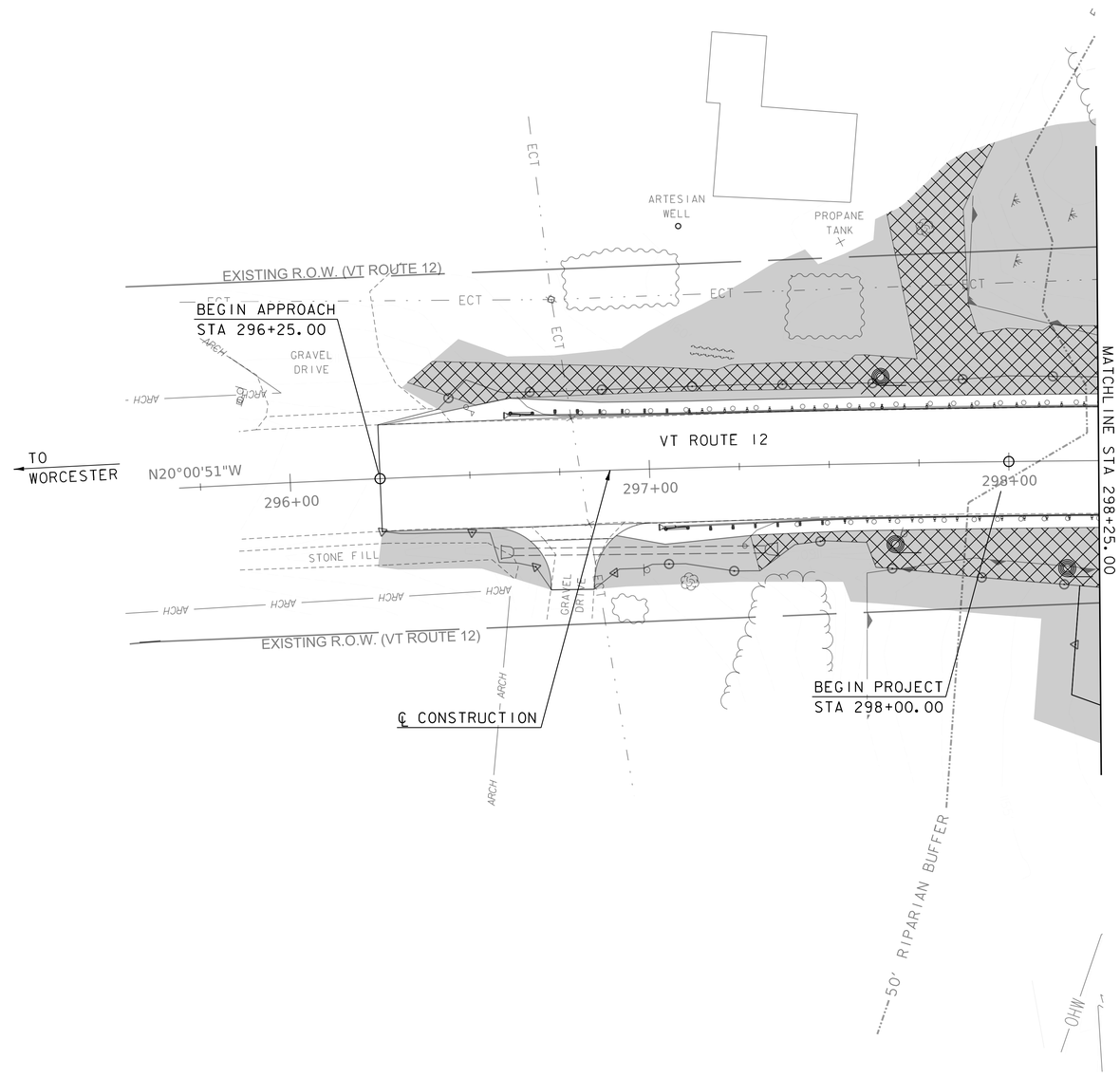
1. SEE PROJECT NOTES SHEET FOR ADDITIONAL INFORMATION REGARDING TEMPORARY BRIDGE AND APPROACH WITHIN A WETLAND.

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

HOYLE TANNER

PROJECT NAME: ELMORE	
PROJECT NUMBER: BF 0241(55)	
FILE NAME: z19b212bdr_ero2.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC CONSTRUCTION SITE PLAN 2	SHEET 361 OF 370





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

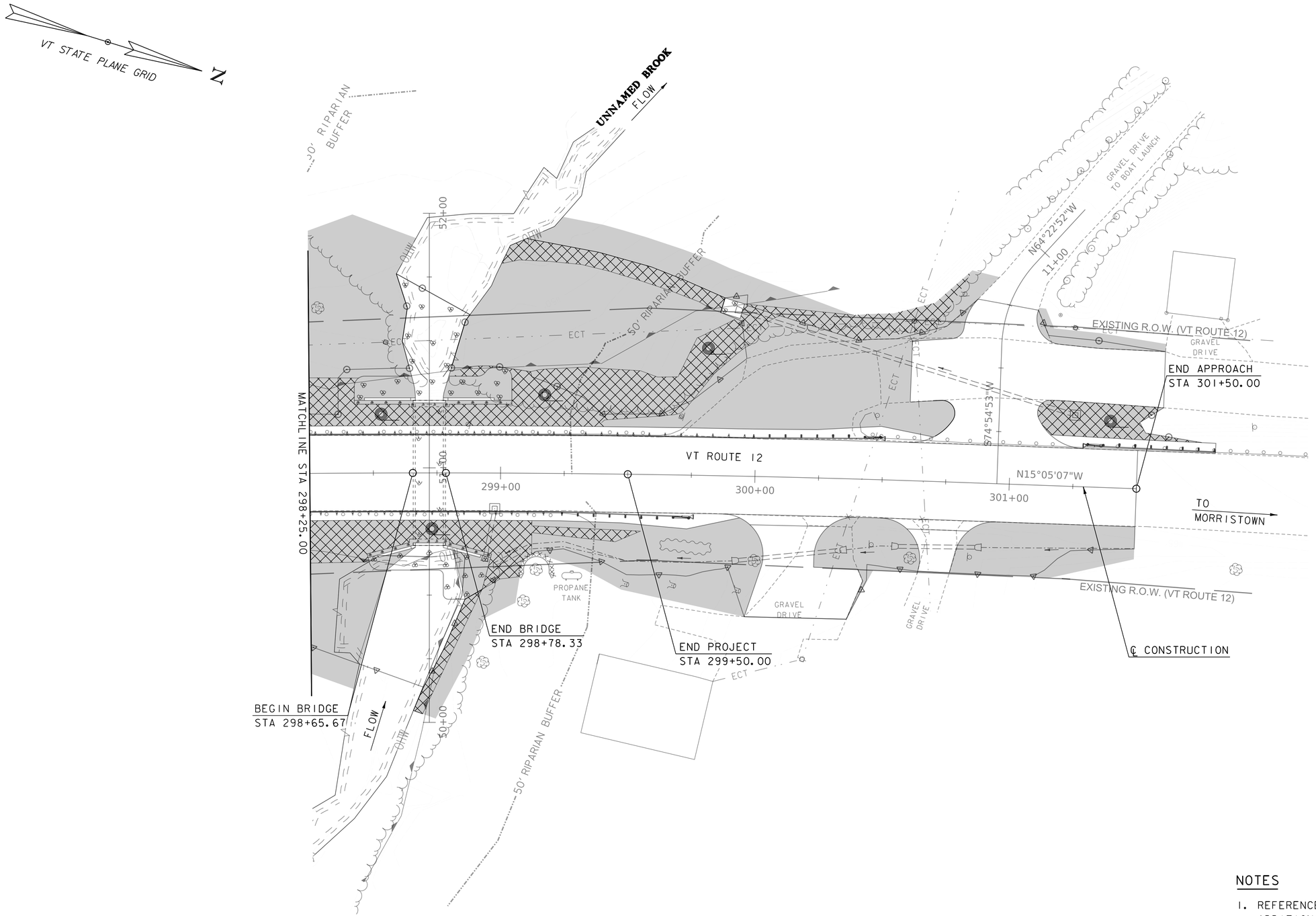
HOYLE TANNER

NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 0241(55)

FILE NAME: z19b212bdr_ero3.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: P.DUSTIN	CHECKED BY: T.SUMNER
EPSC FINAL SITE PLAN 1	SHEET 362 OF 370



NOTES

1. REFERENCE LANDSCAPE PLANS FOR PLANTINGS AND ADDITIONAL SEEDING INFORMATION.

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 0241(55)
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EPSC FINAL SITE PLAN 2	SHEET 363 OF 370

VAOT LOW GROW/FINE FESCUE MIX

	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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

	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
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

VAOT URBAN LAWN MIX

	LBS/AC					
WEIGHT	BROADCAST	HYDROSEED	NAME	LATIN NAME	GERM	PURITY
42.5%	34	68	CREEPING RED FESCUE	FESTUCA RUBRA X RUBRA	85%	98%
20.0%	16	32	PERENNIAL RYE GRASS	LOLIUM PERENNE	90%	95%
32.5%	26	52	KENTUCKY BLUE GRASS	POA PRATENSIS	85%	85%
5.0%	4	8	ANNUAL RYE GRASS	LOLIUM MULTIFLORUM	85%	95%
100%	80	160				

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 URBAN AREA MIX SHALL NOT BE USED IN WETLANDS OR ANY WATERS OF THE STATE OF VERMONT.
2. SEED MIX: USE ONLY AS INDICATED IN THE PLANS.
3. SEED MIX: 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 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)

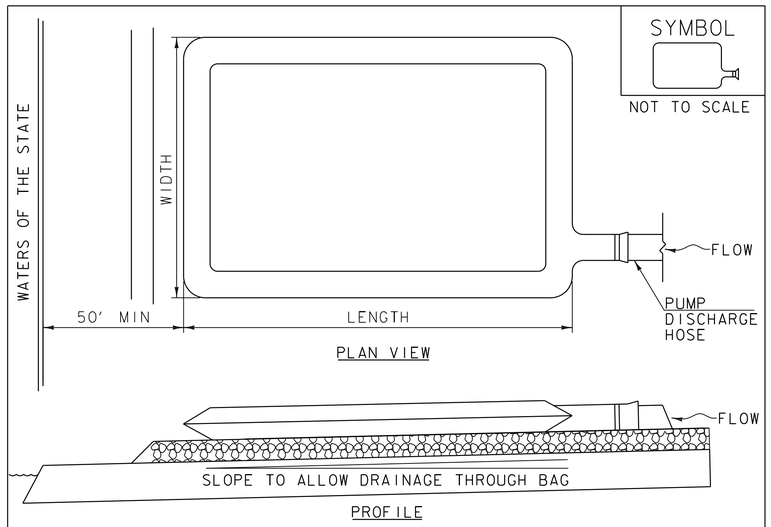
REVISIONS	
JANUARY 22, 2015	WHF

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212ero_dtl.dgn
PROJECT LEADER: L.STONE
DESIGNED BY: P.DUSTIN
EPSC DETAILS I

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 364 OF 370



CONSTRUCTION SPECIFICATIONS

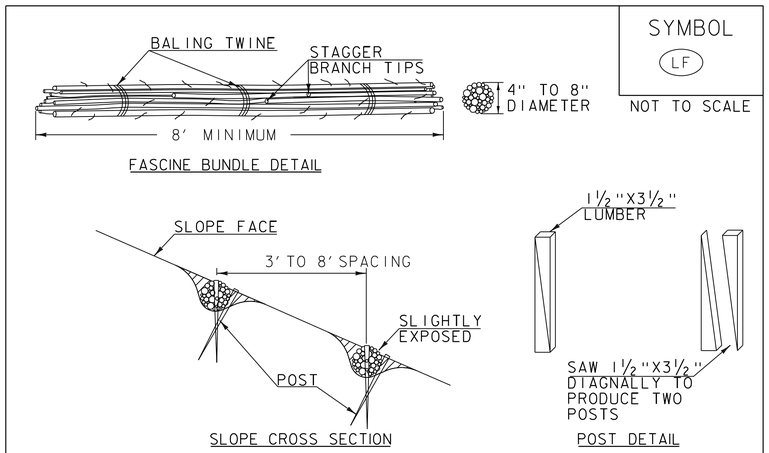
1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION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

FILTER BAG

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

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

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



CONSTRUCTION SPECIFICATIONS

1. LIVE FASCINES SHALL BE OBTAINED FROM SOURCES APPROVED BY THE ENGINEER. THEY SHALL BE PREPARED FROM FRESHLY CUT DORMANT PLANTS AND INSALLED WITHIN 8 HOURS OF THE TIME THE MATERIAL IS HARVESTED, UNLESS PROPERLY STORED.
2. LIVE FASCINES SHALL BE PLACED AS INDICATED IN THE CONTRACT DOCUMENTS.
3. BEGINNING AT THE BASE OF THE SLOPE, A TRENCH SHALL BE DUG LARGE ENOUGH TO CONTAIN THE LIVE FASCINES. THE LIVE FASCINES SHAL BE PLACED IN THE TRENCH. WHERE ENDS MEET IN THE TRENCH, THE FASCINES SHALL OVERLAP 18".
4. WOOD POSTS SHALL BE INSTALLED FLUSH TO THE TOP OF THE FASCINE EVERY 18" ALONG THE LENGTH OF THE BUNDLES AS SHOWN ON THE CROSS SECTIONS. WHERE SPECIFIED LIVE STAKES MAY BE USED IN PLACE OF POSTS.
5. THE TRENCH SHALL BE BACKFILLED WITH MOIST SOIL AND HAND TAMPED. THE TOP OF THE FASCINE SHALL BE SLIGHTLY EXPOSED WHEN THE INSTALLATION IS COMPLETE AS SHOWN ON THE CROSS SECTION.
6. SEED OR OTHER EROSION CONTROL MATERIAL SHALL BE USED BETWEEN THE FASCINE ROWS, AS SPECIFIED IN THE COCNTRACT DOCUMENTS.

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

LIVE FASCINE

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 LIVE FASCINE (PAY ITEM 653.65).

REVISIONS	
MARCH 7, 2008	WHF
DECEMBER 9, 2008	WHF
JANUARY 13, 2009	WHF

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 024I(55)

FILE NAME: z19b212ero_dtl.dgn
PROJECT LEADER: L.STONE
DESIGNED BY: P.DUSTIN
EPSC DETAILS 2

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: T.SUMNER
SHEET 365 OF 370

VT STATE PLANE GRID

N

LEGEND

- AOT RURAL AREA MIX
- WET AREA SEED MIX
- LIVE FASCINE
- APPROXIMATE AREA WITH EXISTING INVASIVE JAPANESE KNOTWEED

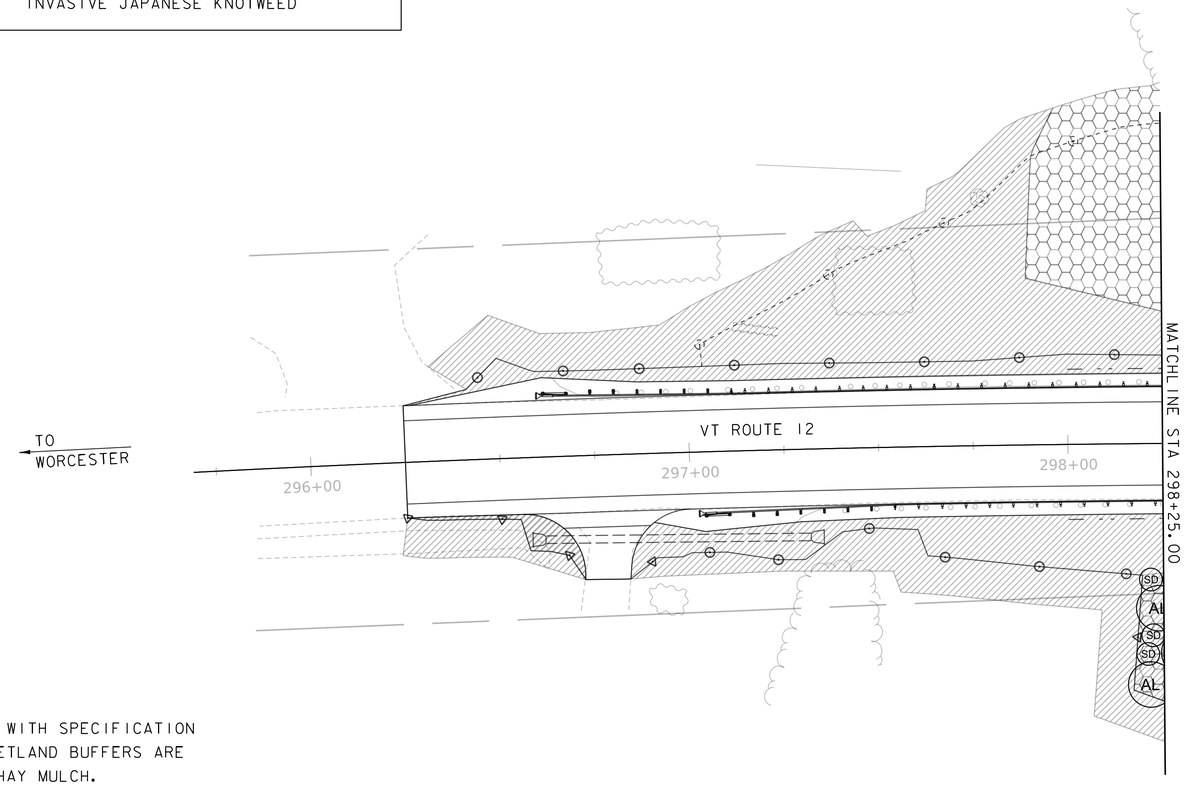
WET AREA SEED MIX

WET AREA SEED MIX TO BE PAID FOR UNDER 900.635 SPECIAL PROVISION (WET AREA SEED MIX). APPLICATION RATES VARY BY SEED MIX. WET AREA SEED MIX TO BE ONE OF THE FOLLOWING, OR APPROVED EQUAL:

- VERMONT WET MEADOW & DETENTION BASIN MIX
SUPPLIER: VERMONT WETLAND PLANT SUPPLY.
APPLICATION RATE: 35 LBS/ACRE.

- NEW ENGLAND WET MIX (WETLAND SEED MIX)
SUPPLIER: NEW ENGLAND WETLAND PLANTS, INC.
APPLICATION RATE: 18 LBS/ACRE.

- PA NEW ENGLAND PROVINCE FACW MIX.
SUPPLIER: ERNST CONSERVATION SEEDS, INC.
APPLICATION RATE: 20 LBS/ACRE WITH A COVER CROP (GRAIN RYE (1 SEP TO 30 APR; 30 LBS/ACRE). JAPANESE MILLET OR BARNYARD GRASS (1 MAY TO 31 AUG; 10 LBS/ACRE)).



CONTAINING EXISTING INVASIVE JAPANESE KNOTWEED. SEE NOTES.

NOTES

1. SEEDED AREAS SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION SUBSECTION 651.07 PROTECTION. IF WETLANDS OR WETLAND BUFFERS ARE PRESENT, STRAW MULCH SHALL BE USE INSTEAD OF HAY MULCH.

2. IF AREAS WITHIN PDF OR BARRIER FENCE ARE NOT DISTURBED, THEY SHOULD REMAIN VEGETATED, AND ADDITIONAL REVEGETATION IS NOT REQUIRED.

3. PROVIDING SUFFICIENT MOISTURE IS CRITICAL DURING THE ENTIRE PLANT ESTABLISHMENT PERIOD. WATERING TO BE PAID FOR UNDER 656.65 LANDSCAPE WATERING.

4. FOR WETLAND AREAS RECEIVING WET AREA SEED, NO TOPSOIL OR GRUBBINGS SHALL BE ADDED. SCARIFY SOIL SURFACE TO LOOSEN SOIL FOR BETTER SEED-SOIL CONTACT. FOR TREES AND SHRUBS, LANDSCAPE BACKFILL SHALL BE USED PER VTRANS STANDARD E-1 TREE PLANTING AND E-2 SHRUB PLANTING.

5. SEE WETLAND PERMIT FOR LANDSCAPE-RELATED PROJECT COMMITMENTS.

6. AT THE WETLAND AREA ON THE WEST SIDE OF THE ROAD, CONTRACTOR SHALL LEAVE EXISTING STUMPS IN PLACE. SEE PROJECT NOTES SHEET FOR GUIDANCE ON SEPARATING TEMPORARY FILL FROM EXISTING GRADE. AFTER TEMPORARY FILL IS REMOVED, WOODY STUMPS SHALL BE LEFT IN PLACE EXPOSED TO AID IN REGENERATION.

7. INVASIVE JAPANESE KNOTWEED HAS BEEN IDENTIFIED ON THIS PROJECT SITE. SEE APPROXIMATE DELINEATION IN PLAN. SOIL CONTAMINATED WITH JAPANESE KNOTWEED SHALL NOT BE SPREAD TO AREAS WITHOUT EVIDENCE OF EXISTING JAPANESE KNOTWEED. CONTAMINATED FILL SHALL BE PUT BACK IN PLACE, OR MANAGED PER VTRANS ROADSIDE TERRESTRIAN INVASIVE PLANTS BMPS. THE APPROACH TO MANAGING CONTAMINATED FILL SHALL BE APPROVED BY THE RESIDENT ENGINEER. MANAGEMENT OF FILL CONTAMINATED WITH JAPANESE KNOTWEED SHALL BE INCIDENTAL TO THE PROJECT.

8. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 1 WEEK PRIOR TO PLANTING OPERATIONS. THE ENGINEER WILL NOTIFY THE PROJECT MANAGER, VTRANS LANDSCAPE ARCHITECT, AND LANDSCAPE INSPECTOR WHO WILL CONFIRM PLANTING LOCATIONS BASED ON THE PREPARED SITE.

KEY	QUANTITY	SCIENTIFIC	COMMON NAME	SIZE	CONT.	SPACING
TREES - DECIDUOUS						
AL	4	*Alnus rugosa*	Speckled Alder	3 GAL.	CONT.	12' O.C.
SHRUBS - DECIDUOUS						
SD	8	*Salix discolor*	Common pussy willow	3 GAL	CONT.	6' O.C.

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

HOYLE TANNER

PROJECT NAME: ELMORE
PROJECT NUMBER: BF 0241(55)

FILE NAME: z19b212bdr_lds.dgn
PROJECT LEADER: J.OLIN
DESIGNED BY: B.DONAHUE
LANDSCAPE PLAN 1

PLOT DATE: 25-MAY-2023
DRAWN BY: P.DUSTIN
CHECKED BY: J.OLIN
SHEET 366 OF 370

VT STATE PLANE GRID

N

UNNAMED BROOK
FLOW

LEGEND

- AOT RURAL AREA MIX
- WET AREA SEED
- LIVE FASCINE
- APPROXIMATE AREA WITH EXISTING INVASIVE JAPANESE KNOTWEED

TH-8 (CAMP ROAD)

VT ROUTE 12

MATCHLINE STA 298+25.00

299+00

300+00

301+00

TO
MORRISTOWN

CZ

SD

AL

PROTECT
TREE

APPROXIMATE AREA
CONTAINING EXISTING
INVASIVE JAPANESE

FLOW

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

HOYLE TANNER

PROJECT NAME:	ELMORE
PROJECT NUMBER:	BF 0241(55)
FILE NAME: z19b212bdr_lds.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER: J.OLIN	DRAWN BY: P.DUSTIN
DESIGNED BY: B.DONAHUE	CHECKED BY: J.OLIN
LANDSCAPE PLAN 2	SHEET 367 OF 370

Replace this sheet

HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 1	SHEET 368 OF 370

Replace this sheet

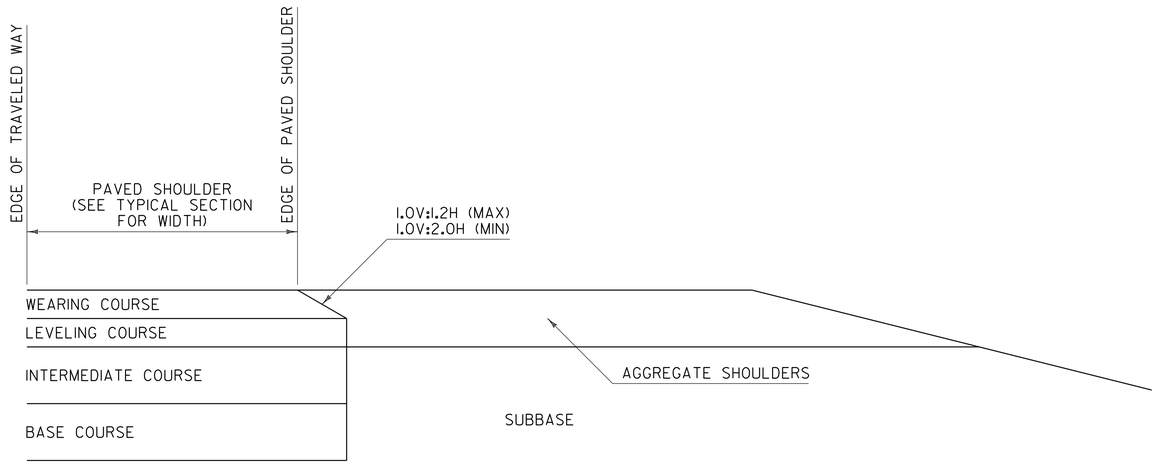
HOYLE TANNER

PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. LAYOUT SHEET 2	SHEET 369 OF 370

Replace this sheet

HOYLE TANNER

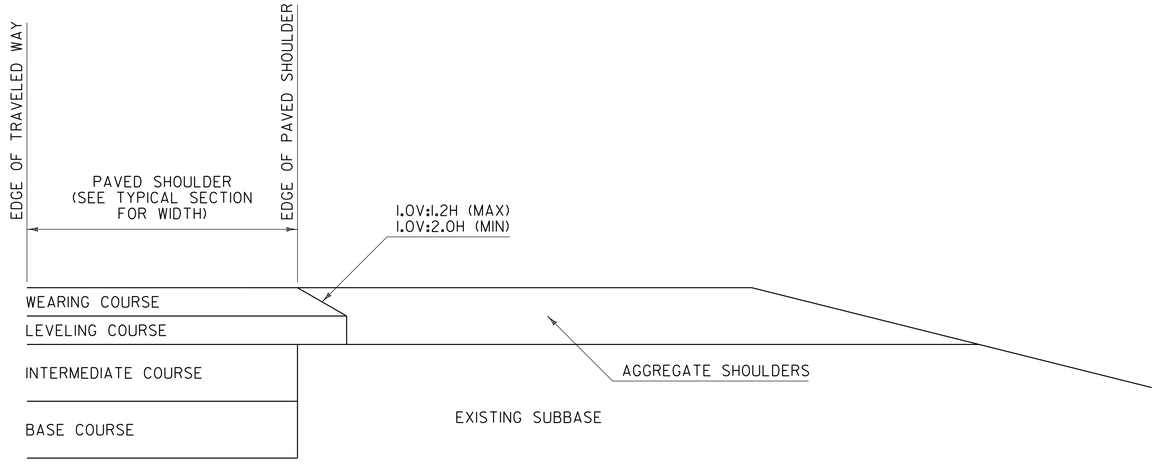
PROJECT NAME:	
PROJECT NUMBER:	
FILE NAME: z86e053row_c.dgn	PLOT DATE: 25-MAY-2023
PROJECT LEADER:	DRAWN BY:
DESIGNED BY:	CHECKED BY:
R.O.W. DETAIL SHEET	SHEET 370 OF 370



SAFETY EDGE DETAIL
FOR PAVING BELOW WEARING COURSE

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 SHOULDERS 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 WEARING COURSE ONLY

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 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

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
1	JAN. 5, 2018	ANNOTATION CORRECTIONS

OTHER DETAILS REQUIRED: NONE

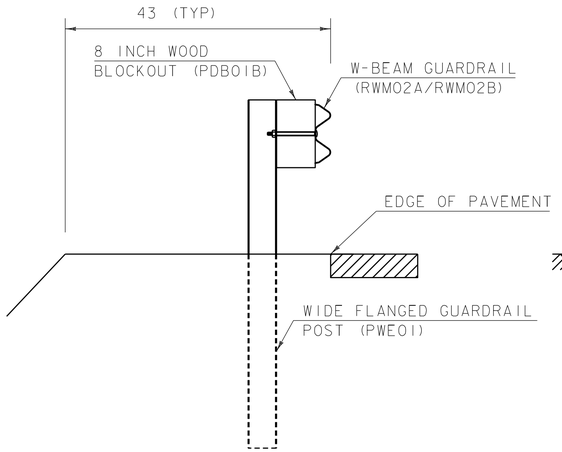
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

SAFETY EDGE DETAILS

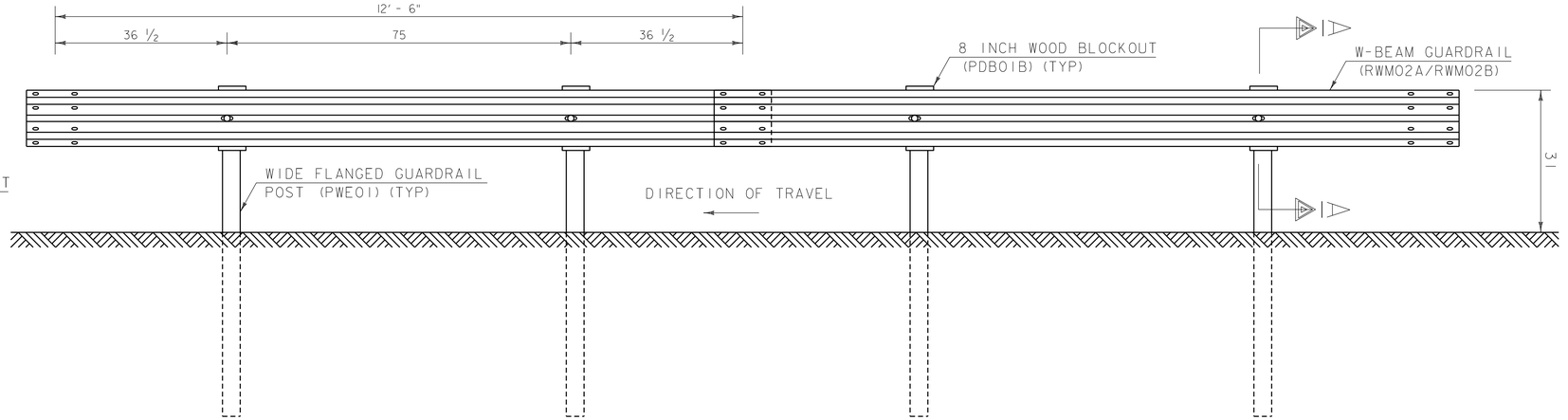
VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

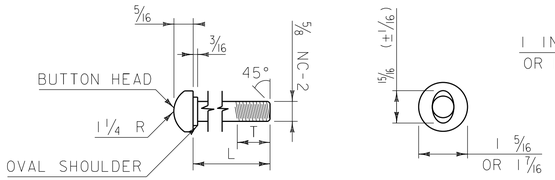
HSD-400.01



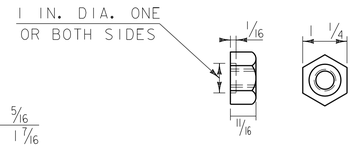
TYPICAL GUARDRAIL DETAIL
SECTION A-A



GUARDRAIL ELEVATION

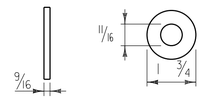


GUARDRAIL BOLT



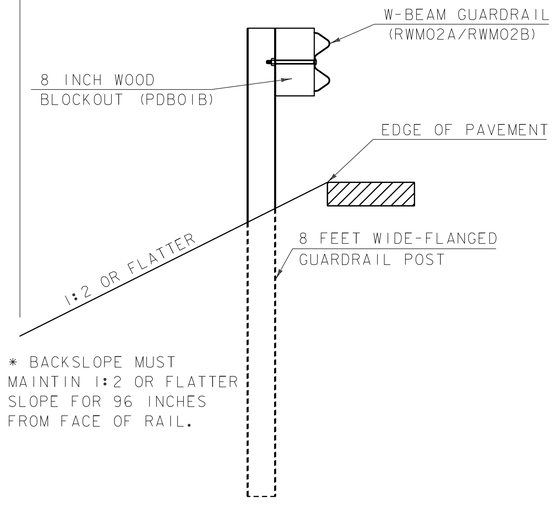
RECESSED NUT FOR GUARDRAIL BOLT

NOTE: WASHER IS USED UNDER RECESSED NUT WHERE GUARDRAIL BOLT IS USED WITH WOOD POSTS.

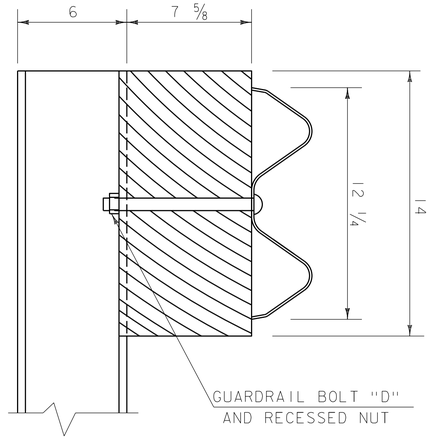


WASHER FOR 5/8" BOLTS
ARTBA F-13-73

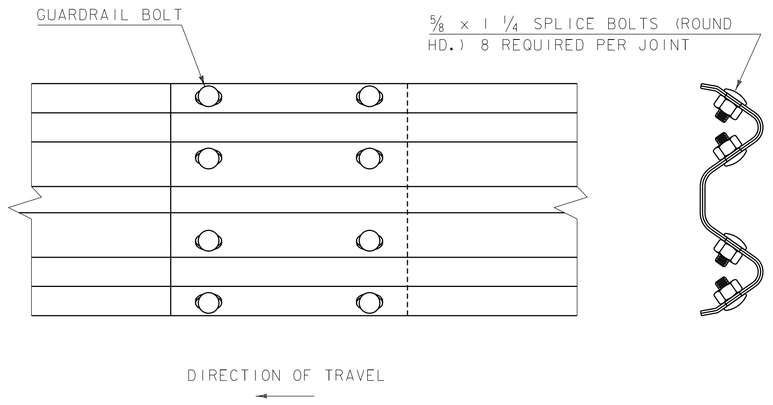
GUARDRAIL BOLTS				FASTENER USED IN	
BOLT DES.	ARTBA REF. NO.	L	T (MIN.)	STEEL POSTS	WOOD POSTS
"A"	F-3[1¼]-76	1¼"	1"	X	X
"C"	F-3[9½]-76	9½"	1¾"	X	
"D"	F-3[18]-76	18"	2½"		X
"F"	F-3[25]-76	25"	2"		X



8 FEET POSTS GUARDRAIL DETAIL
SECTION A-A



POST ATTATCHMENT DETAIL



SPLICE DETAIL

GENERAL NOTES

1. DESIGNATIONS ARE AS IDENTIFIED IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" AS PUBLISHED BY THE "AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS" (AASHTO), "ASSOCIATED GENERAL CONTRACTORS OF AMERICA" (AGC) AND THE "AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION" (ARTBA).
2. MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 728 OF THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AS APPLICABLE.
3. WHEN W-BEAM GUARDRAIL, 8 FEET POSTS IS SPECIFIED ON THE PLANS, WIDE FLANGED GUARDRAIL POST (PWE01) SHALL BE INCREASED FROM 72 INCHES TO 96 INCHES, SEE DETAIL HSD-621.07B.
4. THE DYNAMIC DEFLECTION DISTANCE OF 57 INCHES FOR W BEAM GUARDRAIL SHALL BE MAINTAINED CLEAR OF OBSTACLES, TO BE MEASURED FROM THE BACK OF POST.
5. FOR TEST LEVEL 3 APPLICATIONS, AS APPROVED IN THE FEDERAL HIGHWAY ADMINISTRATION'S ELIGIBILITY LETTER, HSST/B-240, DATED NOVEMBER 8, 2012.
6. ALL DIMENSION IN INCHES, UNLESS OTHERWISE NOTED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL
1	JAN. 4, 2021	CORRECTED REFERENCE IN NOTE 3

OTHER DETAILS REQUIRED: 621.07B

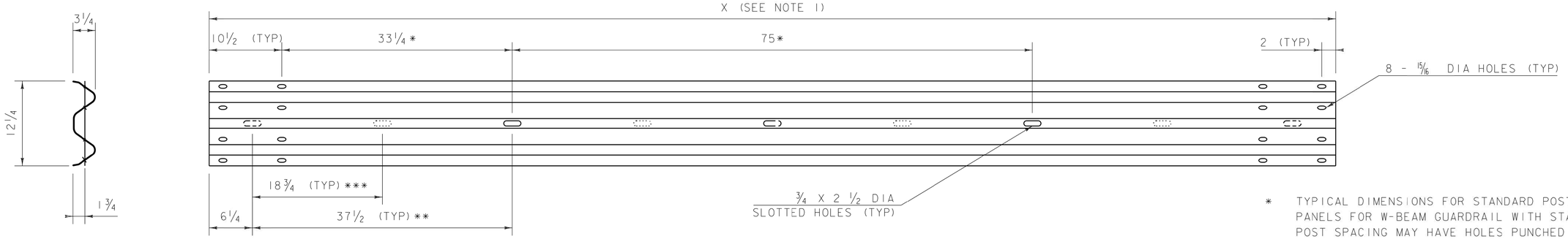
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM (MGS)

VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

HSD-621.07A



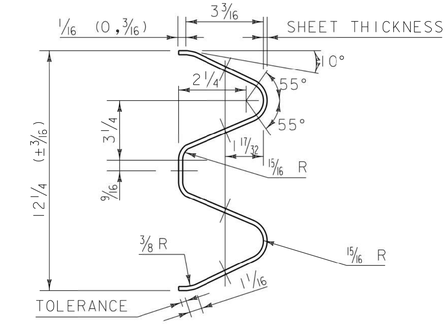
1. TANGENT W-BEAM RAIL LENGTHS SHALL BE 13'-6 1/2" OR 26'-1/2", UNLESS OTHERWISE SPECIFIED.
2. W-BEAM THICKNESS SHALL BE 1/8" FOR STANDARD W-BEAM GUARDRAIL (RWM02A) AND 9/64 " FOR HEAVY DUTY GUARDRAIL (RWM02B).

* TYPICAL DIMENSIONS FOR STANDARD POST SPACING. PANELS FOR W-BEAM GUARDRAIL WITH STANDARD POST SPACING MAY HAVE HOLES PUNCHED AT ONE-HALF POST SPACING FOR INVENTORY PURPOSES.
** TYPICAL DIMENSION FOR ONE-HALF POST SPACING.
*** TYPICAL DIMENSION FOR ONE-QUARTER POST SPACING.

W-BEAM GUARDRAIL (RWM02A/ RWM02B)

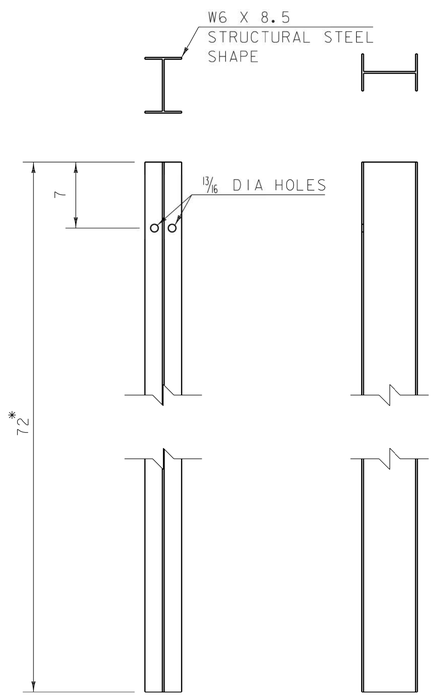
NOTES:

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



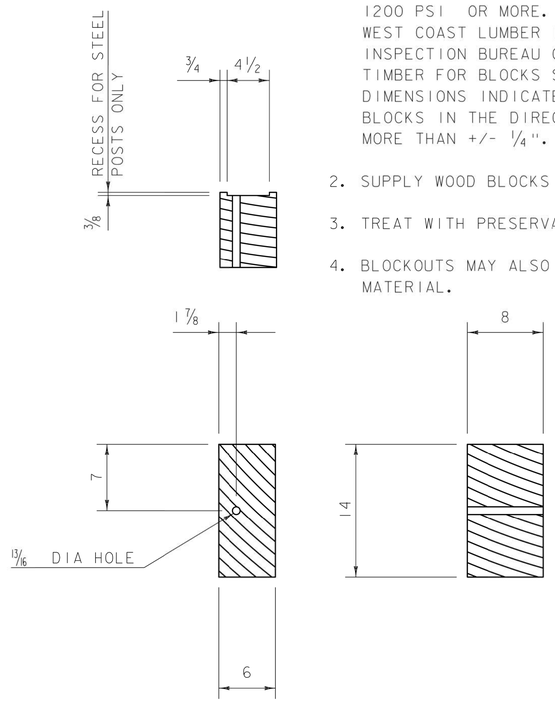
ARTBA RE-3(2@6'-3"=12'-6" CLASS A, TYPE 1)-73

TYPICAL GUARDRAIL SECTION



WIDE FLANGED GUARDRAIL POST (PWE01)

* POST LENGTH SHALL BE INCREASED TO 96 INCHES WHEN W BEAM GUARDRAIL, 8 FEET POSTS IS SPECIFIED.



8 INCH WOOD BLOCKOUT (PDB01B)

GENERAL NOTES

1. DESIGNATIONS ARE AS IDENTIFIED IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" AS PUBLISHED BY THE "AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS" (AASHTO), "ASSOCIATED GENERAL CONTRACTORS OF AMERICA" (AGC) AND THE "AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION" (ARTBA).
2. MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 728 OF THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AS APPLICABLE.
3. ALL DIMENSION IN INCHES, UNLESS OTHERWISE NOTED.

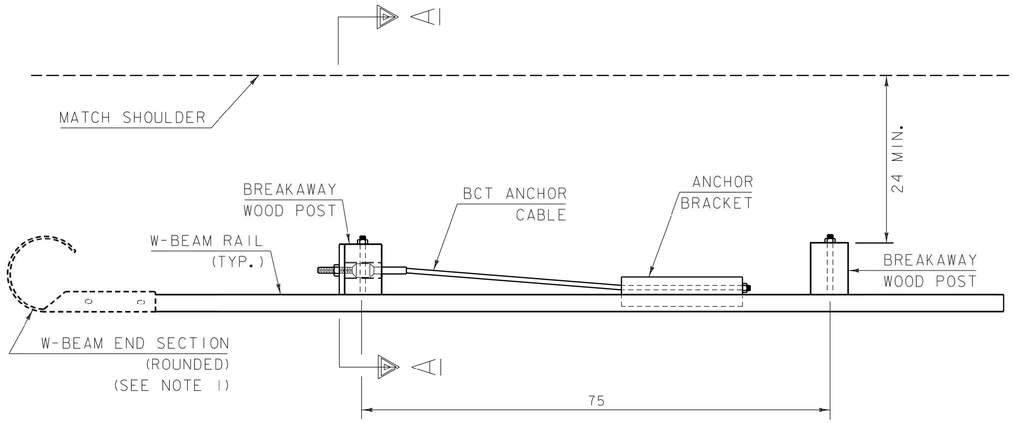
REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL
OTHER DETAILS REQUIRED: NONE		
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN		

W-BEAM GUARDRAIL COMPONENTS

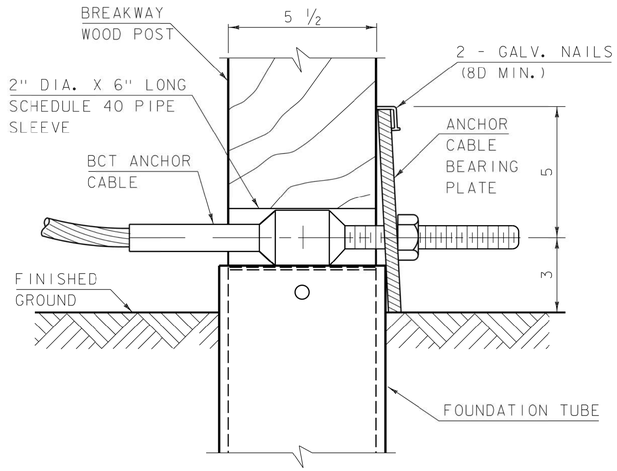
VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

HSD-621.07B

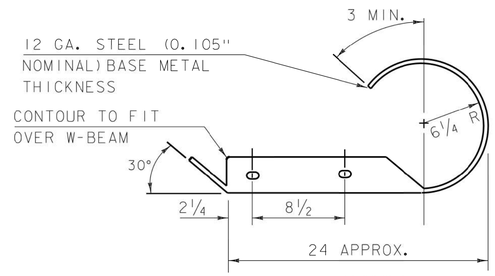


PLAN VIEW

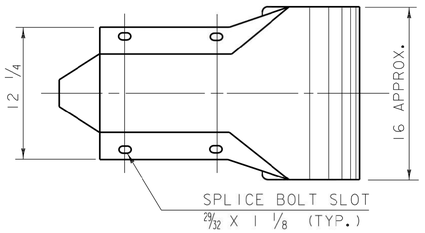


DETAIL A

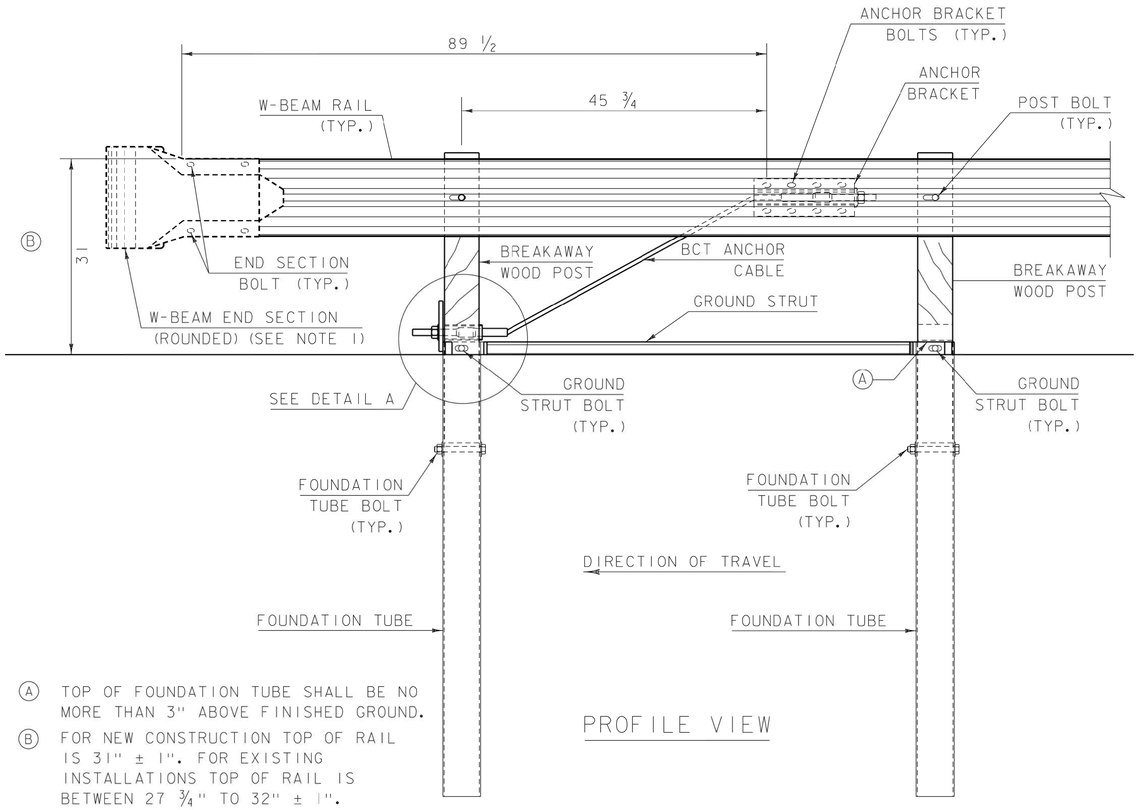
POST NO. 1
GROUND STRUT NOT SHOWN FOR CLARITY.



PLAN VIEW



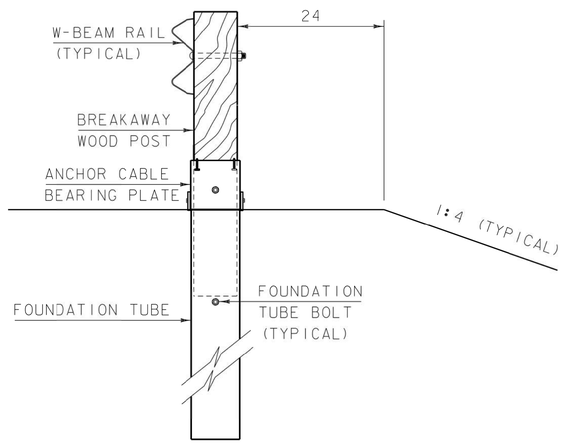
PROFILE VIEW
W-BEAM END SECTION (ROUNDED)



Ⓐ TOP OF FOUNDATION TUBE SHALL BE NO MORE THAN 3" ABOVE FINISHED GROUND.

Ⓑ FOR NEW CONSTRUCTION TOP OF RAIL IS 31" ± 1". FOR EXISTING INSTALLATIONS TOP OF RAIL IS BETWEEN 27 ¾" TO 32" ± 1".

PROFILE VIEW



SECTION A-A

GENERAL NOTES

1. WHEN AN ANCHOR IS USED IN THE MIDDLE OF A GUARDRAIL RUN A STANDARD W-BEAM MID-SPLICE CONNECTION SHALL BE UTILIZED.
2. END SECTION SHALL ONLY BE INSTALLED AS TRAILING END ON ONE-WAY TRAFFIC ROADS.
3. W-BEAM END SECTION ROUNDED HAS THE SAME MATERIAL PROPERTIES AS STANDARD STEEL RAIL.
4. END SECTION BOLTS AND NUTS HAVE THE SAME MATERIAL REQUIREMENTS AS SPLICE BOLTS.
5. FOUNDATION TUBE BOLTS ARE ⅞" DIAMETER ASTM A307 HEX HEAD BOLT. FOUNDATION TUBE BOLTS REQUIRE ASTM A563 A NUT AND TWO ASTM F844 ⅞" DIAMETER FLAT WASHERS. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.
6. ANCHOR BRACKET AND GROUND STRUT BOLTS ARE A ⅝" DIAMETER ASTM A307 HEX HEAD BOLT. ANCHOR BRACKET BOLTS REQUIRE ASTM A563 A NUT AND TWO ASTM F844 ⅝" DIAMETER FLAT WASHERS. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.
7. W-BEAM END SECTION (ROUNDED) AND W-BEAM RAIL SHALL BE PAID FOR UNDER ITEM 621.20 STEEL BEAM GUARDRAIL GALVANIZED. ALL OTHER COMPONENTS SHALL BE PAID FOR UNDER ITEM 621.60 ANCHOR FOR STEEL BEAM RAIL.
8. ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

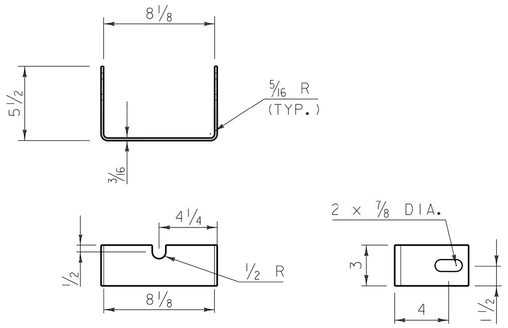
REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL
OTHER DETAILS REQUIRED: HSD-621.07D, HSD-621.07E		
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN		

MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR

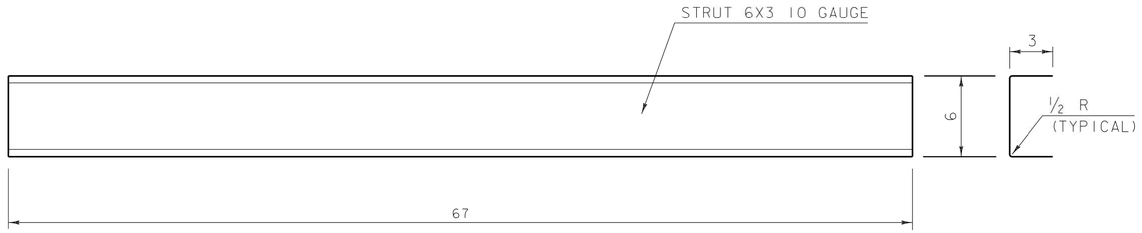
VTrans Working To Get You There — VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

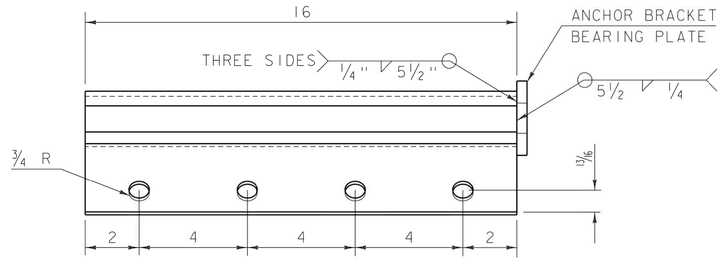
HSD-621.07C

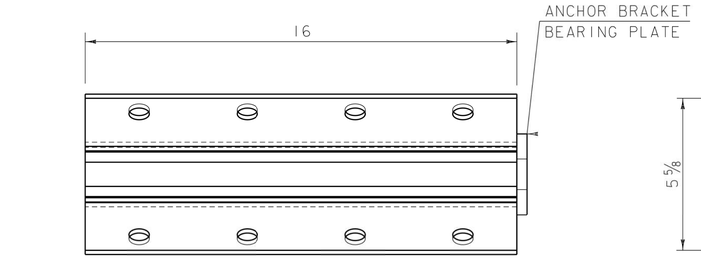


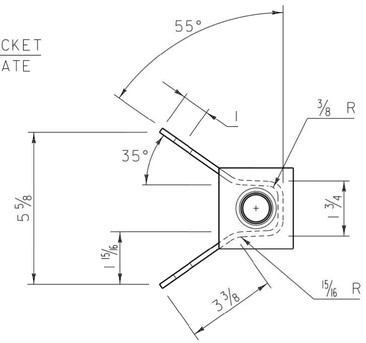
YOKE DETAIL



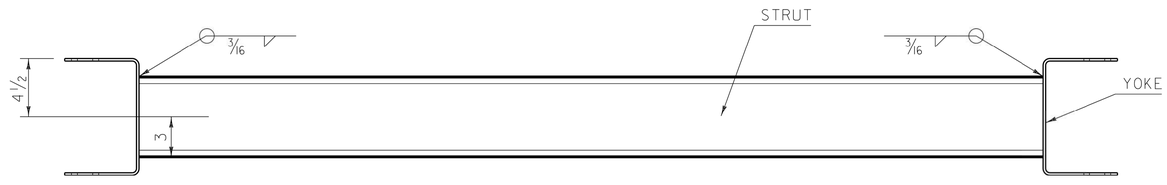
STRUT DETAIL



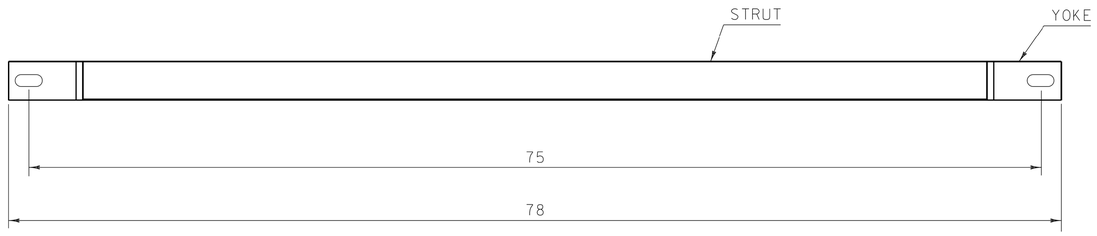




ANCHOR BRACKET

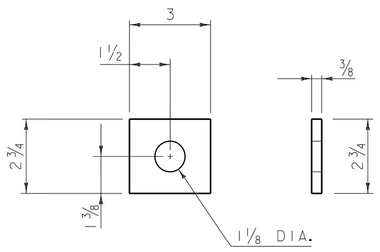


PLAN VIEW



PROFILE VIEW

GROUND STRUT DETAIL



ANCHOR BRACKET
BEARING PLATE

GENERAL NOTES

1. ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL

OTHER DETAILS REQUIRED: HSD-621.07C, HSD-621.07E

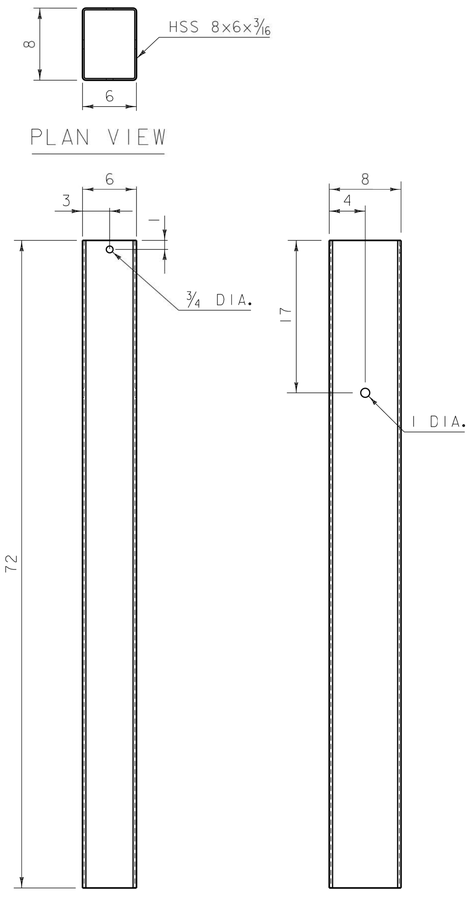
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR COMPONENTS

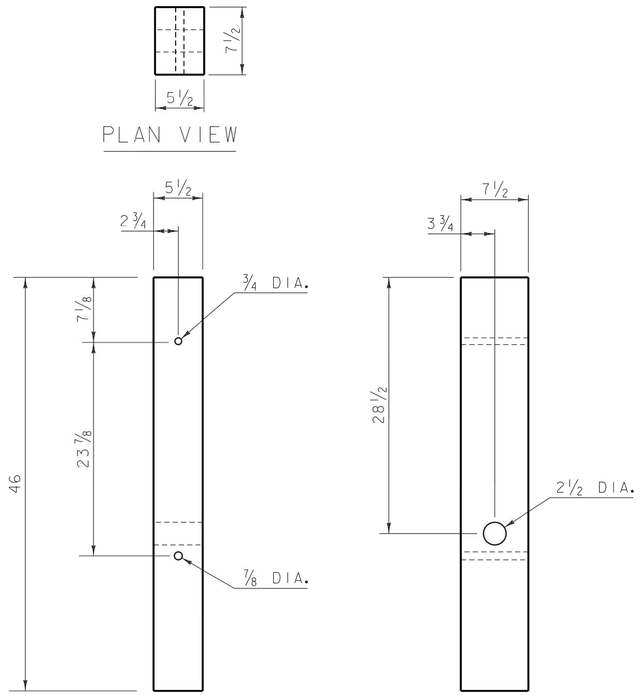
VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

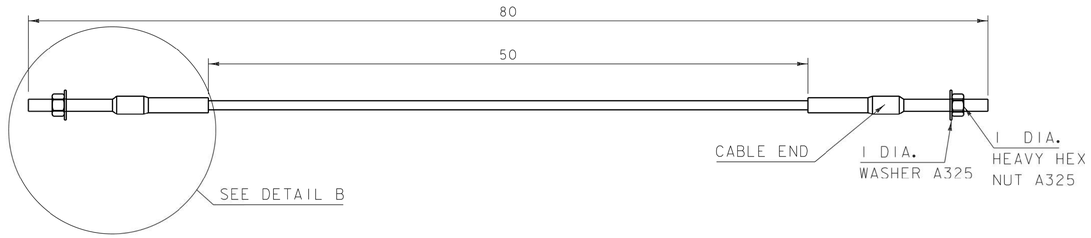
HSD-621.07D



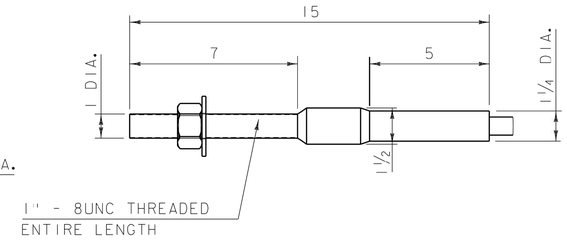
FOUNDATION TUBE



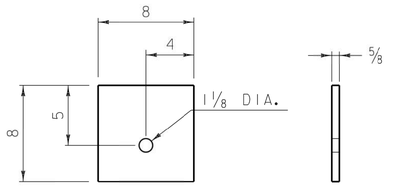
BREAKAWAY WOOD POST



BCT ANCHOR CABLE



DETAIL B



ANCHOR CABLE
BEARING PLATE

GENERAL NOTES

1. BCT ANCHOR CABLE IS A 3/4" DIAMETER 6X19 IWRC IPS GALVANIZED WIRE ROPE. THE SWAGED FITTINGS AND STUD ARE REQUIRED.
2. END FITTING SHALL BE MACHINED FROM HOT-ROLLED CARBON STEEL CONFORMING TO ASTM A576 GRADE 1035 AND GALVANIZED ACCORDING TO ASTM A123.
3. TREADED STUD SHALL CONFORM TO ASTM A325 OR SAE GRADE 5.
4. MINIMUM BREAKING STRENGTH OF WIRE ROPE IS 43,000 LB.
5. WIRE ROPE IS TO BE TAUT.
6. ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL

OTHER DETAILS REQUIRED: HSD-621.07C, HSD-621.07D

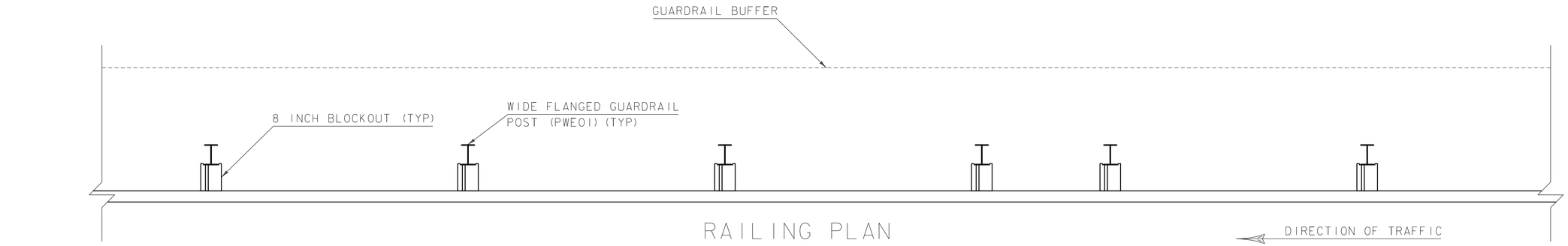
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR COMPONENTS

VTrans Working to Get You There — VERMONT AGENCY OF TRANSPORTATION

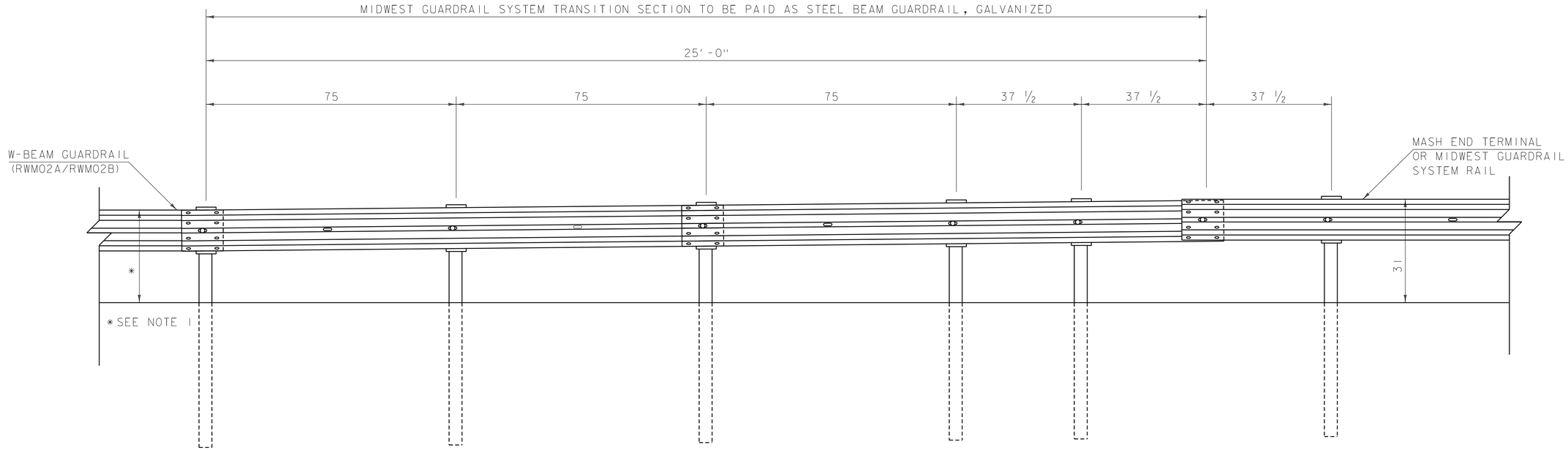
HIGHWAY SAFETY & DESIGN DETAIL

HSD-621.07E



RAILING PLAN

DIRECTION OF TRAFFIC



RAILING ELEVATION

GENERAL NOTES

1. THE HEIGHT OF RAIL AT THE END OF THIS TRANSITION SHALL MATCH THE DESIGN FOR THE APPLICABLE GUARDRAIL SYSTEM.
2. TRANSITIONS FROM 31 INCH HIGH MIDWEST GUARDRAIL SYSTEM TO OTHER RAIL SYSTEMS SHALL BE ACCOMPLISHED WITH 2 STANDARD 12½ FOOT SECTIONS OF W-BEAM RAIL.
3. POSTS, BLOCKOUTS AND SPLICES SHALL BE IN ACCORDANCE WITH DETAILS HSD-621.07A AND HSD-621.07B AND LOCATED AS SHOWN IN THE DETAILS ABOVE.
4. STANDARD 6 FOOT POSTS SHALL BE USED UNLESS OTHERWISE NOTED ON PLANS.
5. END TERMINAL SHALL BE A VTRANS APPROVED PRODUCT MEETING MASH TESTING CRITERIA. ANY TERMINAL USED SHALL BE FROM THE VTRANS APPROVED PRODUCTS LIST.
6. ALL MEASURMENTS ARE IN INCHES UNLESS OTHERWISE NOTED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL
1	JAN. 4, 2021	CORRECTED NOTE 3 REFERENCES

OTHER DETAILS REQUIRED: HSD-621.07A, HSD-621.07B

DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM TRANSITION SECTION

VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

HSD-621.07F