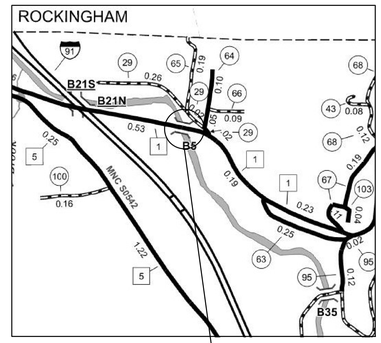
STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

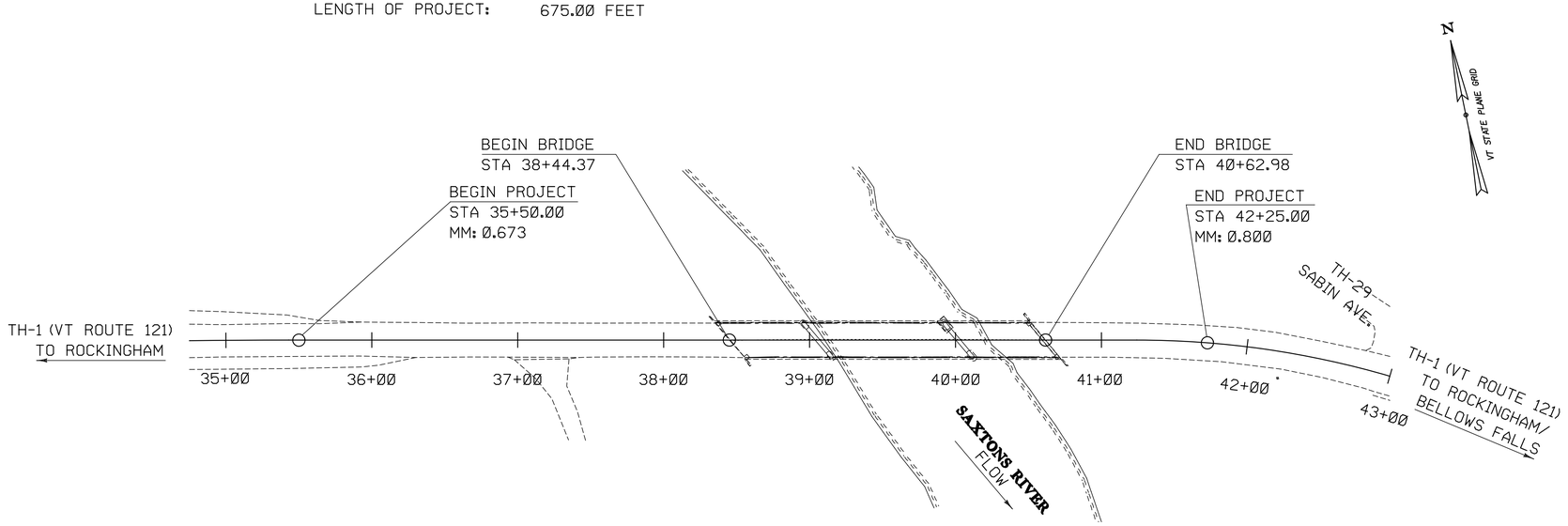
TOWN OF WESTMINSTER
COUNTY OF WINDHAM

ROUTE NO : FAS ROUTE Ø126, MAJOR COLLECTOR (TH-1 (VT ROUTE 121), SAXTONS RIVER RD.) BRIDGE NO: 5

PROJECT LOCATION: LOCATED IN THE TOWN OF WESTMINSTER ON FAS ROUTE Ø126, BRIDGE 5 OVER SAXTONS RIVER, APPROXIMATELY 1.5 MILES WEST OF THE JUNCTION WITH US ROUTE 5.

PROJECT DESCRIPTION: REHABILITATION OF THE EXISTING BRIDGE, ALONG WITH RELATED ROADWAY APPROACH WORK.

LENGTH OF STRUCTURE: 218.61 FEET
LENGTH OF ROADWAY: 456.39 FEET
LENGTH OF PROJECT: 675.ØØ FEET



SCALE 1" = 50'-Ø"
50 Ø 50

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
SURVEYED DATE :	Ø1/24/2017
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD 83(2011)

Hardesty & Hanover

HIGHWAY DIVISION, CHIEF ENGINEER	
APPROVED _____ DATE _____	
PROJECT MANAGER :	J.B.MCCARTHY
PROJECT NAME :	WESTMINSTER
PROJECT NUMBER :	BF Ø126(13)
SHEET 1 OF 51 SHEETS	

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version
LFD

INDEX OF SHEETS

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DETAIL SHEETS

SD-501.00	CONCRETE DETAILS AND NOTES	5/7/2010
SD-502.00	CONCRETE DETAILS AND NOTES	5/7/2010
SD-601.00	STRUCTURAL STEEL DETAILS AND NOTES	5/7/2010
SD-602.00	STRUCTURAL STEEL PLATE GIRDER DETAILS AND NOTES	5/7/2010

STANDARDS LIST

S-360A	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	04-07-2020
S-360B	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	04-07-2020
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	03-10-2017
B-5	SLOPE GRADING, EMBANKMENTS, MUCK	06-01-1994
C-10	CURBING	02-11-2008
D-1	PRECAST REINFORCED CONCRETE DROP INLET DETAILS	06-01-1994
D-16	DRAINAGE DETAILS INCLUDING DROP INLETS, IRON GRATE TYPE B&	06-01-1994
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDI/	03-10-2017

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2018	2700	360	51	6.6	210
2038	3000	410	51	10.1	350

20 year ESAL for flexible pavement from 2018 to 2038 : 836000

40 year ESAL for flexible pavement from 2018 to 2058 : 1976000

Design Speed: 30 mph

AS BUILT "REBAR" DETAIL

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

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 3/3/2021

DRAINAGE AREA : 76.4 square miles
CHARACTER OF TERRAIN : Hilly to mountainous, mostly forested with some open areas
STREAM CHARACTERISTICS : Sinuous with some floodplain access upstream & downstream
NATURE OF STREAMBED : Sand, gravel, cobbles and small boulders

PEAK FLOW DATA - ANNUAL EXCEEDANCE PROBABILITY (AEP)

43% =	2,700 cfs	2% =	7,500 cfs
10% =	4,800 cfs	1% =	8,800 cfs
4% =	6,200 cfs	0.2% =	12,400 cfs

DATE OF FLOOD OF RECORD: 8/28/2011*
ESTIMATED DISCHARGE: 21,600 cfs
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : @ 2% AEP = 10.2 fps
ICE CONDITIONS : Unknown
DEBRIS: Unknown
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: 2% HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Riveted two girder (3 span)
YEAR BUILT: 1940
CLEAR SPAN(NORMAL TO STREAM): 166 feet
VERTICAL CLEARANCE ABOVE STREAMBED: 20.7 feet
WATERWAY OF FULL OPENING: 3,632 square feet
DISPOSITION OF STRUCTURE: Bridge deck replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

43% AEP =	360.1 feet	VELOCITY =	5.6 fps
10% AEP =	361.9 feet	"	7.8 fps
4% AEP =	362.8 feet	"	9.1 fps
2% AEP =	363.6 feet	"	10.2 fps
1% AEP =	364.4 feet	"	11.1 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: Westminster DISTANCE: 1,600 feet
HIGHWAY # : I-91 NB & SB STRUCTURE #: 21N & 21S
CLEAR SPAN: Unknown CLEAR HEIGHT: Unknown
YEAR BUILT: 1963 FULL WATERWAY: Unknown
STRUCTURE TYPE: 7 Span rolled beam bridge

DOWNSTREAM STRUCTURE

TOWN: Westminster DISTANCE: 3,000 feet
HIGHWAY # : TH-25 STRUCTURE #: 35
CLEAR SPAN: Unknown CLEAR HEIGHT: Unknown
YEAR BUILT: 1975 (reconstructed 2011) FULL WATERWAY: Unknown
STRUCTURE TYPE: 2 Span rolled beam bridge

LFD LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	3AT	3S2	4AT	5AT	6AT	HS20
TONNAGE	20	30	36	34.5	38	66	36
INVENTORY	0.86	2.19	3.01	2.49	2.67	1.8	0.86
POSTING							
OPERATING	1.44	3.65	5.03	4.15	4.45	3.01	1.44
COMMENTS:							

PROPOSED STRUCTURE

STRUCTURE TYPE: Riveted two girder (3 span)

CLEAR SPAN(NORMAL TO STREAM): 166 feet
VERTICAL CLEARANCE ABOVE STREAMBED: 20.7 feet
WATERWAY OF FULL OPENING: 3,632 square feet

WATER SURFACE ELEVATIONS AT:

43% AEP =	360.1 feet	VELOCITY=	5.6 fps
10% AEP =	361.9 feet	"	7.8 fps
4% AEP =	362.8 feet	"	9.1 fps
2% AEP =	363.6 feet	"	10.2 fps
1% AEP =	364.4 feet	"	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: 372.0 feet
FREEBOARD: @ 2% AEP = 8.4 feet

SCOUR: Scour was not calculated for this deck replacement project
REQUIRED CHANNEL PROTECTION: Stone Fill, Type IV

PERMIT INFORMATION

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

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE:
CLEAR SPAN (NORMAL TO STREAM):
VERTICAL CLEARANCE ABOVE STREAMBED:
WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

*Tropical Storm Irene

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

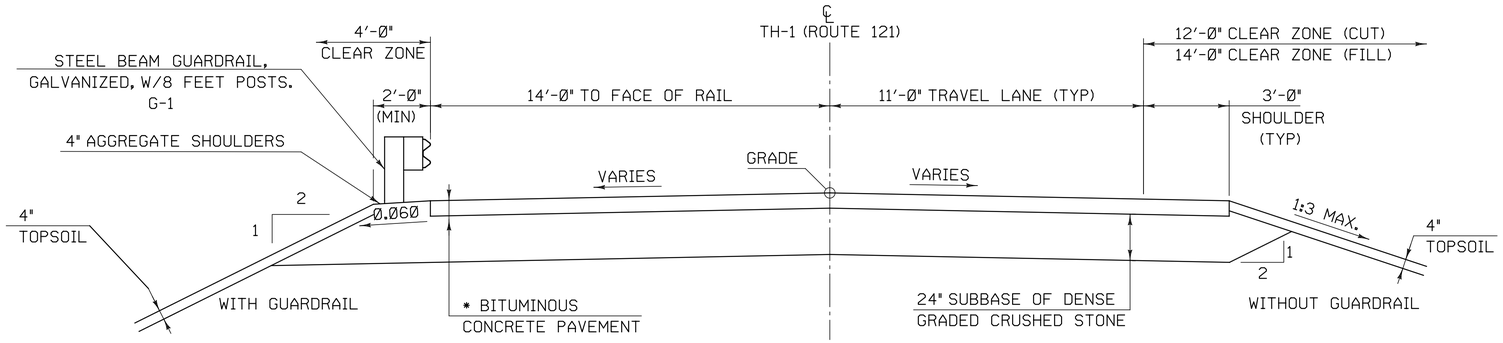
DESIGN VALUES

1.	DESIGN LIVE LOAD		HS20-44
2.	FUTURE PAVEMENT	d_P:	0.0 INCH
3.	DESIGN SPAN	L:	213.08 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:	4.0 KSI
10.	CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	3.5 KSI
11.	CONCRETE, CLASS C	f'_c:	3.0 KSI
12.	REINFORCING STEEL	f_y:	60 KSI
13.	STRUCTURAL STEEL AASHTO M329/ASTM A1055/ASTM A1094	f_y:	---
14.	NOMINAL BEARING RESISTANCE OF SOIL	q_n:	4.0 KSF
15.	SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
16.	NOMINAL BEARING RESISTANCE OF ROCK	q_n:	10.0 KSF
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.			---

PROJECT NAME: **WESTMINSTER**
PROJECT NUMBER: **BF 0126(13)**

FILE NAME: **12j668/s12j668forms.dgn**
PROJECT LEADER: **C. BAKER**
DESIGNED BY: **S. BROWN**
PRELIMINARY INFORMATION SHEET

PLOT DATE: 10/14/2021
DRAWN BY: **S. BROWN**
CHECKED BY: **C. SCHWARTZ**
SHEET 2 OF 51



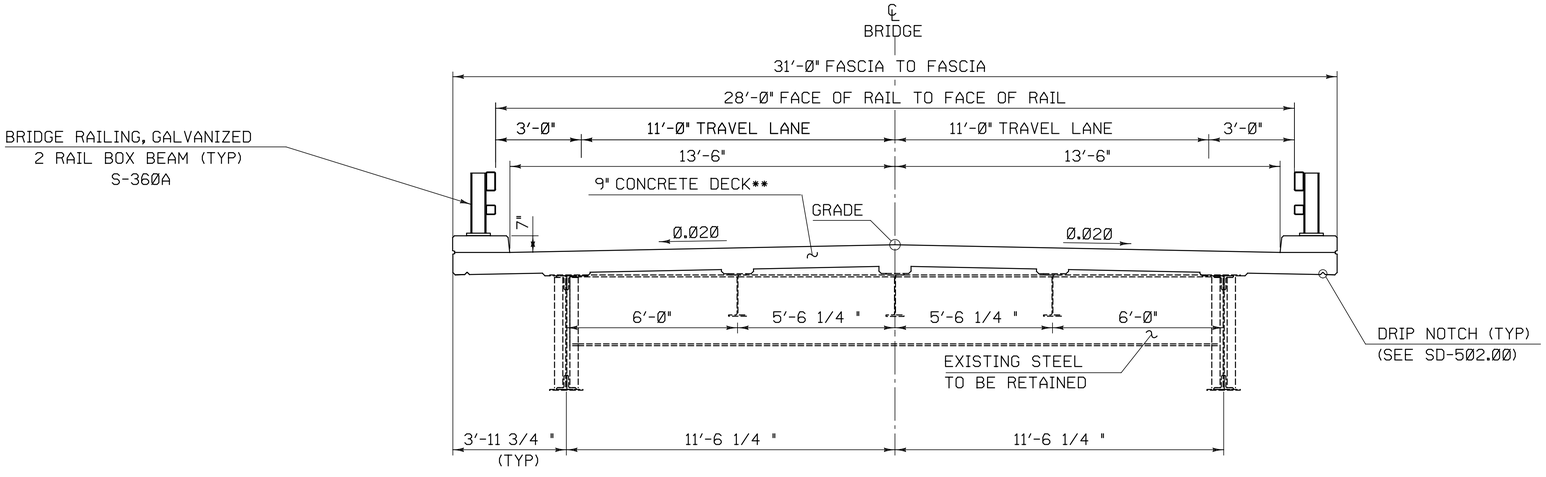
FAS Ø126 TYPICAL SECTION

SCALE 3/8" = 1'-Ø"
STA 35+5Ø - STA 38+44.37
STA 4Ø+62.98 - STA 42+25

* SUPERPAVE BITUMINOUS CONCRETE PAVEMENT
1 1/2" TYPE IVB OVER
1 1/2" TYPE IVB OVER
3 1/2" TYPE IIs

NOTE:
THE GYRATION SPECIFICATION FOR SUPERPAVE BITUMNIOUS CONCRETE SHALL BE 65.

** BARE DECK TO BE DIAMOND GROUND TO 8.5" THICKNESS IN ACCORDANCE WITH ITEM 9ØØ.67Ø, "SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)."



BRIDGE 5 TYPICAL SECTION

SCALE 3/8" = 1'-Ø"

MATERIAL TOLERANCES
(IF USED ON PROJECT)

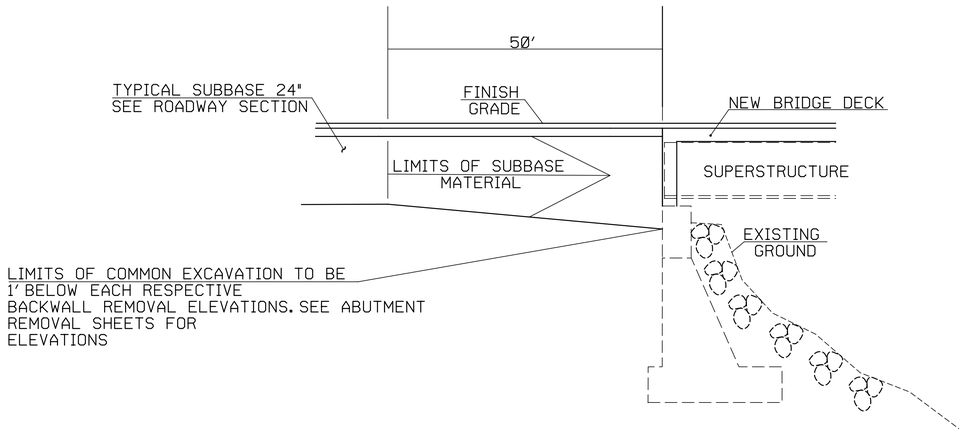
SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

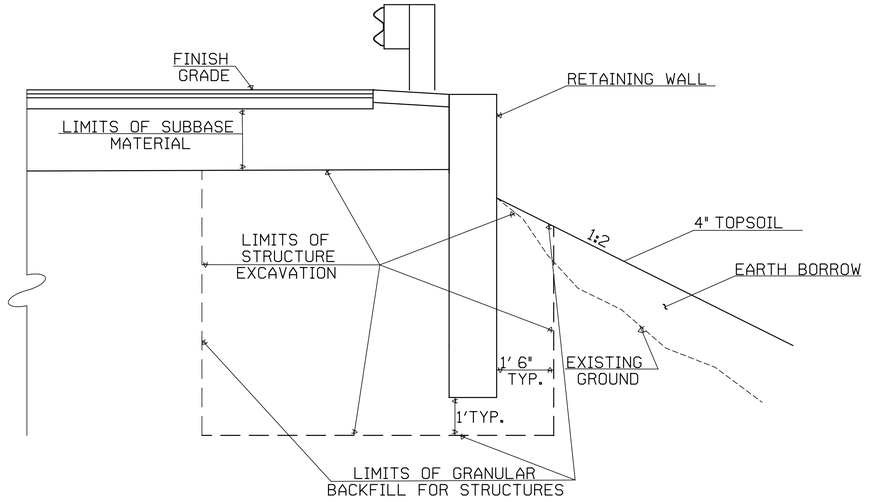
FILE NAME: z12j668typ.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
TYPICAL SECTIONS

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE



ABUTMENT EARTHWORK TYPICAL SECTION

(NOT TO SCALE)



RETAINING WALL TYPICAL SECTION

(NOT TO SCALE)

NOTES:
THE LIMITS OF EXCAVATION AND BACKFILL WILL BE
DETERMINED BY THE MANUFACTURER OF THE RETAINING WALL.

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
EARTHWORK TYPICAL SECTION

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 4 OF 51

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT AGENCY OF TRANSPORTATION, 2018 STANDARD SPECIFICATION FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 17TH EDITION UNLESS NOTED OTHERWISE.

2. THE DESIGN LIVE LOAD SHALL BE HS-20.

3. ANY REQUIRED SAW CUT OF THE EXISTING PAVEMENT WILL BE CONSIDERED INCIDENTAL TO COMMON EXCAVATION.

4. ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS.

5. FOLLOWING THE COMPLETION OF ALL OTHER CONSTRUCTION ACTIVITIES. ALL FABRIC DRAIN TROUGHS AND DOWNSPOUTS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE THOROUGHLY FLUSHED BY THE CONTRACTOR. COST FOR FLUSHING THE FABRIC DRAIN TROUGHS AND DOWNSPOUTS WILL BE INCIDENTAL TO ALL OTHER ITEMS IN THE CONTRACT.

6. DIMENSIONS SHOWN FOR EXISTING DETAILS ARE TAKEN FROM THE REFERENCE PLANS AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND DETAILS NECESSARY FOR THE COMPLETION OF ALL WORK BY FIELD MEASUREMENTS ON THE EXISTING STRUCTURE. FOR EMPHASIS, SOME PROPOSED DIMENSIONS ARE NOTED AS "VERIFY IN FIELD" OR "VIF". THIS IS DONE FOR EMPHASIS ONLY AND DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND DETAILS AS NOTED PREVIOUSLY. REFERENCE PLANS CIRCA 1940 ARE STATIONED OPPOSITE OF THESE PLANS. SUBSTRUCTURE ELEMENTS AND NUMBERING ARE IN REVERSE ORDER FROM THESE PLANS.

7. ITEM 529.20 PARTIAL REMOVAL OF STRUCTURE SHALL INCLUDE ALL REMOVAL AND DISASSEMBLY OF THE EXISTING STRUCTURES AS NECESSARY TO COMPLETE THE PROPOSED WORK, UNLESS NOTED OTHERWISE. THE FOLLOWING LIST IDENTIFIES THE MAJOR ITEMS OF WORK TO BE REMOVED UNDER ITEM 529.20:

   A. REMOVAL OF BRIDGE RAIL, BRIDGE PAVEMENT, CONCRETE DECK, AND EXPANSION JOINTS.
   B. REMOVAL OF BACKWALLS TO THE LIMITS SHOWN.

STRUCTURAL STEEL

1. EXISTING STRUCTURAL STEEL PAINT MAY CONTAIN LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. ANY REMOVED STRUCTURAL STEEL SHALL BECOME 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.

2. ALL WORK REQUIRED FOR SURFACE PREPARATION SHALL BE PAID AS ITEM 900.645, "SPECIAL PROVISION (REMOVAL, CONTAINMENT AND DISPOSAL OF LEAD PAINT) (TYPE II)." ALL REQUIRED SUBMITTALS SHALL BE APPROVED PRIOR TO THE BRIDGE CLOSURE PERIOD.

3. THE LOCATION OF SHEAR CONNECTORS SHALL BE MARKED OUT BEFORE SURFACE PREPARATION BEGINS. AN AREA 3" IN DIAMETER SHALL BE CLEANED FOR EACH CONNECTOR IN ACCORDANCE WITH ITEM 900.645 SPECIAL PROVISION "(REMOVAL, CONTAINMENT AND DISPOSAL LEAD PAINT, TYPE II)"

4. ALL FIELD CONNECTIONS SHALL BE MADE WITH $\frac{7}{8}$" DIAMETER HIGH-STRENGTH BOLTS IN $\frac{15}{16}$" DIAMETER HOLES, PER SECTION 506.19, UNLESS OTHERWISE SPECIFIED.

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

6. PRIOR TO REMOVING THE EXISTING CONCRETE DECK THE CONTRACTOR SHALL SUPPORT THE DECK GIRDERS AT TENTH POINTS ALONG EACH SPAN. THE DECK GIRDERS SHALL REMAIN SUPPORTED THROUGHOUT THE EXISTING DECK REMOVAL AND PLACEMENT OF THE PROPOSED CONCRETE DECK. THE SUPPORTS SHALL BE REMOVED AFTER THE CONCRETE DECK FORMS ARE REMOVED AND ALL WORK TO SUPPORT THE DECK GIRDERS SHALL BE INCIDENTAL TO ITEM 900.608, "SPECIAL PROVISION (PERFORMANCE-BASED CONCRETE, CLASS PCD)".

STRUCTURAL STEEL (CONTINUED)

7. AFTER THE EXISTING CONCRETE DECK HAS BEEN REMOVED AND STRUCTURAL STEEL REPAIRS HAVE BEEN COMPLETED, ELEVATIONS ALONG THE TOP OF THE GIRDERS SHALL BE TAKEN AS DIRECTED BY THE RESIDENT ENGINEER FOR USE IN DETERMINING FINISHED GRADES.

8 STRUCTURAL STEEL REPAIRS WILL BE PAID FOR UNDER ITEM 506.60 "STRUCTURAL STEEL", UNLESS NOTED OTHERWISE AND SHALL CONFORM TO AASHTO M270 GRADE 36.

9 RIVETS EXHIBITING GREATER THAN 50% LOSS OF THE HEAD DIAMETER WHICH ARE NOT PART OF A STEEL REPAIR SHALL BE REPLACED WITH $\frac{7}{8}$" H.S. BOLTS TO BE PAID UNDER ITEM 900.620, "SPECIAL PROVISION (RIVET REPLACEMENT)." THE ENGINEER SHALL DETERMINE ALL LOCATIONS OF RIVET REPLACEMENT.

REINFORCED CONCRETE

1. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" X 1".

2. CAST-IN-PLACE CONCRETE SHALL CONFORM TO THE SPECIAL PROVISION FOR ITEM 900.608, "SPECIAL PROVISION (PERFORMANCE-BASED CONCRETE, CLASS PCD)" AND ITEM 900.608, "SPECIAL PROVISION (PERFORMANCE-BASED CONCRETE, CLASS PCS)."

3. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED SURFACES OF THE CONCRETE DECK EXCEPT THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES AND TO THE EXPOSED FACE OF EXISTING ABUTMENTS. THIS WORK WILL BE PAID FOR UNDER ITEM 514.10. "WATER REPELLENT, SILANE".

4. THE DECK SHALL BE CAST TO AN INITIAL THICKNESS OF 9.0 INCHES. AFTER THE DECK HAS CURED AND THE BRIDGE RAIL IS INSTALLED THE ENTIRE BRIDGE DECK SURFACE SHALL BE DIAMOND GROUND A NOMINAL 0.5 INCH FOR A RESULTING DECK THICKNESS OF 8.5 INCHES. PAYMENT WILL BE MADE UNDER ITEM 900.670, "SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)."

5. ALL REINFORCEMENT STEEL USED IN THE ABUTMENTS SHALL BE LEVEL I, IN ACCORDANCE WITH SECTION 507 OF THE VTRANS STANDARD SPECIFICATIONS AND PAID FOR UNDER ITEM 507.11, "REINFORCING STEEL LEVEL I." ALL OTHER REINFORCING STEEL SHALL BE LEVEL II SHALL BE PAID FOR UNDER ITEM 507.12, "REINFORCING STEEL, LEVEL II."

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668notes.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: S. BROWN
PROJECT NOTES

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: K. SMITH

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES				TOTALS		DESCRIPTIONS			
1011 - ROADWAY	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
1500				1500		CY	UNCLASSIFIED EXCAVATION	203.17	
560				560		CY	EARTH BORROW	203.30	
360				360		SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.10	
775				775		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	
5				5		CY	AGGREGATE SURFACE COURSE	401.10	
50				50		TON	AGGREGATE SHOULDERS	402.12	
169				169		CWT	EMULSIFIED ASPHALT	404.65	
		1030		1030		LB	STRUCTURAL STEEL	506.60	
		725		725		LB	REINFORCING STEEL, LEVEL I	507.11	
		74900		74900		LB	REINFORCING STEEL, LEVEL II	507.12	
		23		23		LF	DRILLING AND GROUTING DOWELS	507.16	
		1		1		LS	SHEAR CONNECTORS	508.15	
		60		60		GAL	WATER REPELLENT, SILANE	514.10	
		41		41		LF	BRIDGE EXPANSION JOINT, VERMONT	516.11	
		435		435		LF	BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM	525.33	
		1		1		EACH	PARTIAL REMOVAL OF STRUCTURE	529.20	
		1		1		SY	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I	580.13	
11				11		LF	18" CPEP	601.0915	
1				1		EACH	PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON GRATE	604.18	
15				15		CY	STONE FILL, TYPE I	613.10	
30				30		CY	STONE FILL, TYPE IV	613.13	
215				215		LF	TREATED TIMBER CURB	616.35	
565				565		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED W/8 FEET POSTS	621.215	
4				4		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60	
4				4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM	621.72	
620				620		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80	
50				50		LF	TEMPORARY TRAFFIC BARRIER	621.90	
			1	1		LS	FIELD OFFICE, ENGINEERS	631.10	
			1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16	
			1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17	
			3000	3000		DL	FIELD OFFICE COMMUNICATIONS (N.A.B.I.)	631.26	
			1	1		LS	MOBILIZATION/DEMOBILIZATION	635.11	
1				1		LS	TRAFFIC CONTROL, ALL-INCLUSIVE	641.11	
1550				1550		LF	DURABLE 4 INCH WHITE LINE, EPOXY PAINT	646.403	
1550				1550		LF	DURABLE 4 INCH YELLOW LINE, EPOXY PAINT	646.413	
	13			13		LB	SEED	651.15	
	150			150		LB	FERTILIZER	651.18	
	1			1		TON	AGRICULTURAL LIMESTONE	651.20	
	150			150		CY	TOPSOIL	651.35	
	1			1		LS	EPSC PLAN	653.01	

DETAILED SUMMARY OF QUANTITIES		
QUANTITIES	UNIT	ITEMS

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668Quantity_Sheets.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: S. BROWN
QUANTITY SHEET 1

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: K. SMITH
SHEET 6 OF 51

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES				TOTALS		DESCRIPTIONS			
1011 - ROADWAY	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
	40			40		HR	MONITORING EPSC PLAN	653.02	
	1			1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	653.03	
	910			910		SY	ROLLED EROSION CONTROL PRODUCT, TYPE I	653.20	
	1400			1400		LF	SILT FENCE, TYPE I	653.475	
	1400			1400		LF	PROJECT DEMARCATION FENCE	653.55	
		210		210		CY	SPECIAL PROVISION (PERFORMANCE-BASED CONCRETE, CLASS PCD)	900.608	
		11		11		CY	SPECIAL PROVISION (PERFORMANCE-BASED CONCRETE, CLASS PCS)	900.608	
			96000	96000		DL	SPECIAL PROVISION (INCENTIVE/DISINCENTIVE)(N.A.B.I.)	900.615	
		8		8		EACH	SPECIAL PROVISION (BEARING LUBRICATION)	900.620	
		100		100		EACH	SPECIAL PROVISION (RIVET REPLACEMENT)	900.620	
		1		1		LS	SPECIAL PROVISION (REMOVAL, CONTAINMENT, AND DISPOSAL OF LEAD PAINT)(TYPE	900.645	
		1		1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY)(N.A.B.I.)	900.650	
		1		1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650	
		640		640		SF	SPECIAL PROVISION (CLEAN AND PAINT EXISTING SUPERSTRUCTURE)	900.670	
		130		130		SF	SPECIAL PROVISION (PRECAST CONCRETE RETAINING WALL)	900.670	
		5750		5750		SF	SPECIAL PROVISION (CONCRETE BRIDGE DECK SURFACE PREPARATION)	900.670	
		610		610		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668Quantity_Sheets.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: S. BROWN
QUANTITY SHEET 2

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: K. SMITH
SHEET 7 OF 51

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

- UTILITY (GENERIC-UNKNOWN)
- UT — TELEPHONE
- UE — ELECTRIC
- UTV — CABLE (TV)
- ELECTRIC+CABLE
- ELECTRIC+TELEPHONE
- CABLE+TELEPHONE
- ELECTRIC+CABLE+TELEPHONE
- G — GAS LINE
- W — WATER LINE
- S — SANITARY SEWER (SEPTIC)

ABOVE GROUND UTILITIES (AERIAL)

- UTILITY (GENERIC-UNKNOWN)
- T — TELEPHONE
- E — ELECTRIC
- CABLE (TV)
- ELECTRIC+CABLE
- ELECTRIC+TELEPHONE
- AER E&T — ELECTRIC+TELEPHONE
- CABLE+TELEPHONE
- 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 ℄L
- CULVERT PROPOSED
- STRUCTURE SUBSURFACE
- PDF — PDF — PROJECT DEMARCATION FENCE
- 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
- (H) 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

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668symlegend.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
CONVENTIONAL SYMBOLOGY LEGEND SHEET

PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS
SHEET 8 OF 51

NETWORK CONTROL

I91 EXIT 5 AZ MK
NORTH = 212899.5900
EAST = 1650764.2200
ELEV. = 434.080

GENERAL LOCATION, WESTMINSTER, VT.
THE MARK IS SET IN THE INTERSTATE 91 MEDIAN AT MILE MARKER 28.05; ABOUT 0.5 MILES SOUTH OF THE I-91 BRIDGES OVER WESTMINSTER STREET AT EXIT 5. IT IS SET 0.2 M BELOWGROUND SURFACE IN THE TOP OF A 0.8 M X 0.6 M ROCK OUTCROP. IT IS 3.5 M SOUTHEAST OF AND ABOUT 0.5 M LOWER THAN THE I-91 SOUTHBOUND SOUTHEAST EDGE OF PAVEMENT, 9.3 M NORTHWEST OF THE I-91 NORTHBOUND NORTHWEST EDGE OF PAVEMENT, AND 2.0 M NORTHWEST OF A FIBERGLASS WITNESS POST.

I91 EXIT 5
NORTH = 215738.0400
EAST = 1652161.3900
ELEV. = 422.870

GENERAL LOCATION, WESTMINSTER, VT.
LOCATED IN THE TRIANGLE FORMED BY THE I 91 SB LANE, THE I 91 SB OFF-RAMP, AND THE I-91 ACCESS ROAD TO US ROUTE 5 AT EXIT 5. IT IS 4.9 M NW OF AND ABOUT 0.8 M LOWER THAN THE NORTHWEST EDGE OF PAVEMENT OF THE SB LANE, 10.3 M SE OF THE SOUTHEAST EDGE OF PAVEMENT OF THE OFF-RAMP, 14.2 M WSW OF THE NORTHEAST END OF THE METAL GUARD RAIL POST, 23.5 M NNE OF MILE MARKER 28.65, 34.9 M ENE OF A WRONG WAY SIGN FOR THE OFF-RAMP, AND 4.5 M NW OF A FIBERGLASS WITNESS.

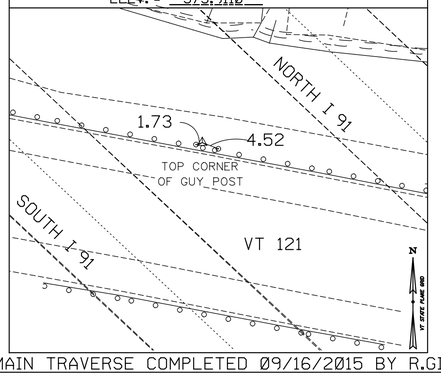
HVCTRL #3
SAXTON
NORTH =227024.3500
EAST = 1649716.4800
ELEV. = 371.7600

GENERAL LOCATION WESTMINSTER, VT.
TO REACH FROM THE I-91 NORTHBOUND BRIDGE OVER VT ROUTE 121 GO SOUTHEAST ALONG VT ROUTE 121 FOR 0.15 MI TO THE SITE OF THE MARK ON THE LEFT.
THE MARK IS SET 12 CM BELOW GROUND SURFACE IN THE TOP OF A FENO-STYLE MONUMENT. IT IS 7.3 M (24.0 FT) NORTHEAST OF AND 0.1 M (0.3 FT) LOWER THAN THE CENTER LINE OF VT ROUTE 121, 20.4 M (66.9 FT) EAST OF POLE NO 9 AND 0.1 M 0.3 FT) SOUTHWEST OF A FIBERGLASS WITNESS POST.

LOCAL CONTROL

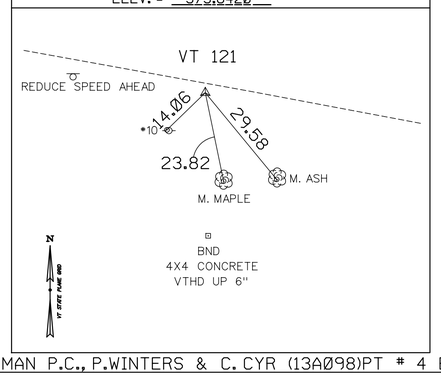
HVCTRL #51

NORTH = 227161.3015
EAST = 1648982.1907
ELEV. = 375.9110



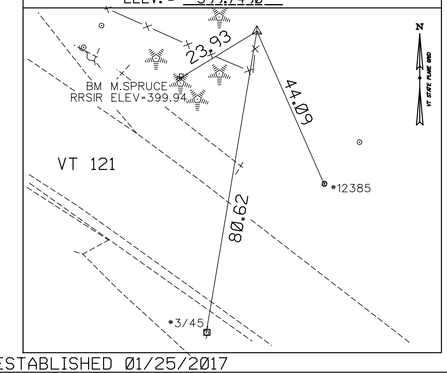
HVCTRL #52

NORTH = 227028.4495
EAST = 1649437.0057
ELEV. = 375.6420



HVCTRL #4

NORTH = 226784.5312
EAST = 1650729.2630
ELEV. = 399.7490



HVCTRL

NORTH =
EAST =
ELEV. =

HVCTRL

NORTH =
EAST =
ELEV. =

*MAIN TRAVERSE COMPLETED 09/16/2015 BY R.GILMAN P.C., P.WINTERS & C. CYR (13A098) PT # 4 ESTABLISHED 01/25/2017

LOCAL CONTROL

HVCTRL

NORTH =
EAST =
ELEV. =

HVCTRL

NORTH =
EAST =
ELEV. =

HVCTRL

NORTH =
EAST =
ELEV. =

HVCTRL

NORTH =
EAST =
ELEV. =

HVCTRL

NORTH =
EAST =
ELEV. =

DATUM
VERTICAL NAVD88
HORIZONTAL NAD83(2011)
ADJUSTMENT NONE

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: Z12J668
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
SURVEY TIE SHEET

PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS
SHEET 9 OF 51

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 35+69.4 - STA 38+00.0 LT
STA 37+40.7 - STA 38+00.0 RT

HD STEEL BEAM GUARDRAIL, GALVANIZED (W/8' POST)
STA 35+66.7 - STA 38+00.0 LT
STA 37+44.0 - STA 38+00.0 RT

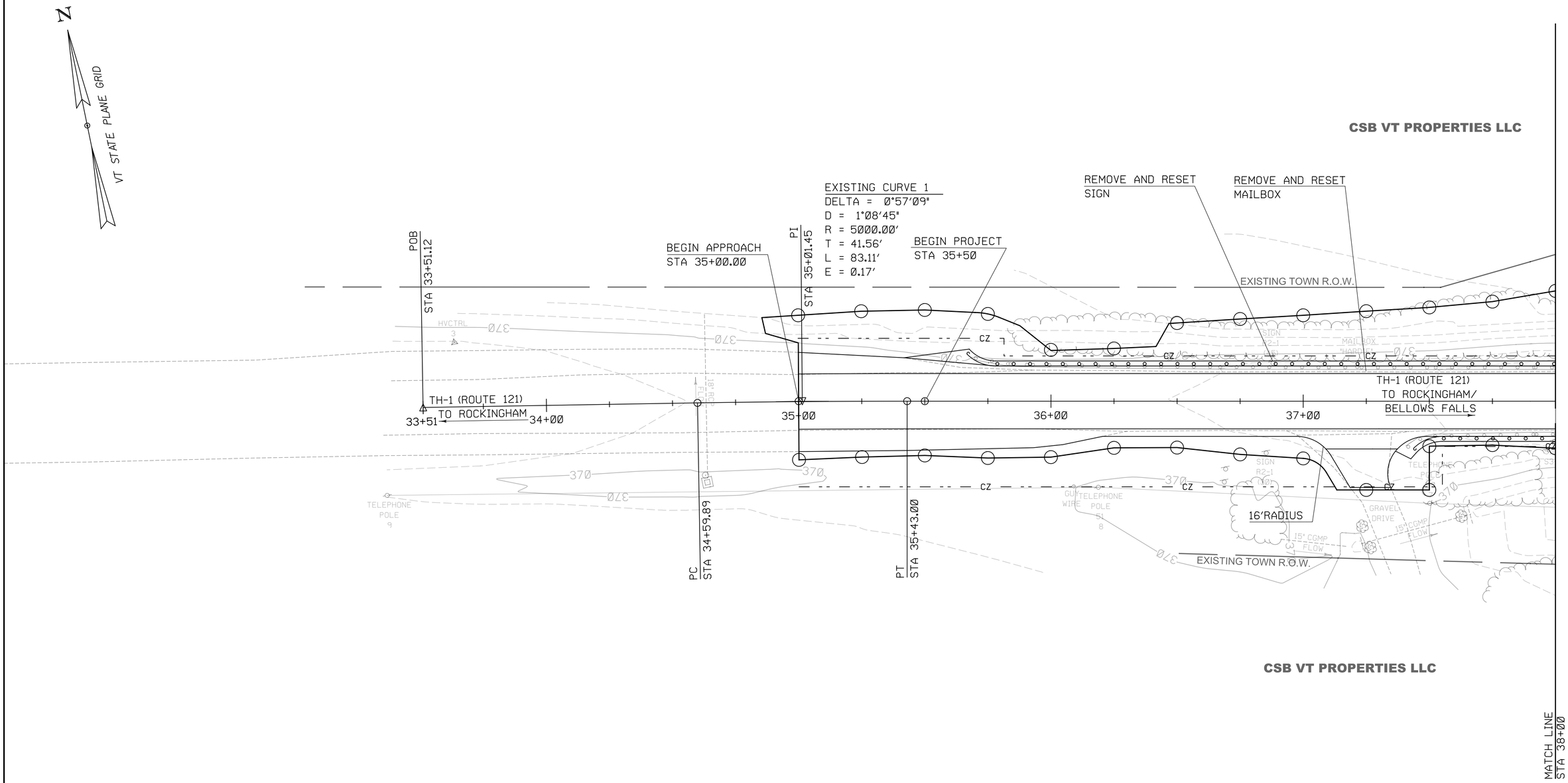
ANCHOR FOR STEEL BEAM RAIL
STA 35+65.1 LT
STA 37+38.9 RT

PAVED APRON
STA 37+26.00 RT

COARSE MILLING, BITUMNIOUS CONCRETE PAVMENT
STA 35+00 - STA 38+00

DURABLE 4 INCH WHITE LINE
STA 35+00 - STA 38+00

DURABLE 4 INCH YELLOW LINE
STA 35+00 - STA 38+00



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

Hardesty & Hanover

PROJECT NAME: WESTMINSTER	
PROJECT NUMBER: BF 0126(13)	
FILE NAME: z12j668border.dgn	PLOT DATE: 10/14/2021
PROJECT LEADER: C. BAKER	DRAWN BY: T. MARQUETTE
DESIGNED BY: K. HO	CHECKED BY: C. JENNE
LAYOUT SHEET 1	SHEET 10 OF 51

REMOVAL AND DISPOSAL OF GUARDRAIL
STA 38+00.0 - STA 38+35.0 LT
STA 38+00.0 - STA 38+55.0 RT
STA 40+51.8 - STA 40+94.9 LT
STA 40+71.9 - STA 42+68.2 RT

DURABLE 4 INCH WHITE LINE
STA 38+00 - STA 42+75

DURABLE 4 INCH YELLOW LINE
STA 38+00 - STA 42+75

HD STEEL BEAM GUARDRAIL, GALVANIZED (W/8' POST)
STA 38+00.0 - STA 38+03.3 LT
STA 38+00.0 - STA 38+27.3 RT
STA 40+80.1 - STA 41+26.6 LT
STA 41+04.1 - STA 42+98.9 RT

TREATED TIMBER CURB
STA 40+71.86 - STA 42+86.47 RT

ANCHOR FOR STEEL BEAM RAIL
STA 41+26.2 LT
STA 42+98.5 RT

GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM
STA 38+03.3 - STA 38+32.4 LT
STA 38+27.3 - STA 38+56.4 RT
STA 40+51.0 - STA 40+80.1 LT
STA 40+75.0 - STA 41+04.1 RT

BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM
STA 38+32.4 - STA 40+51.0 LT
STA 38+56.4 - STA 40+75.0 RT

COARSE MILLING, BITUMNIOUS CONCRETE PAVMENT
STA 41+00 - STA 42+75

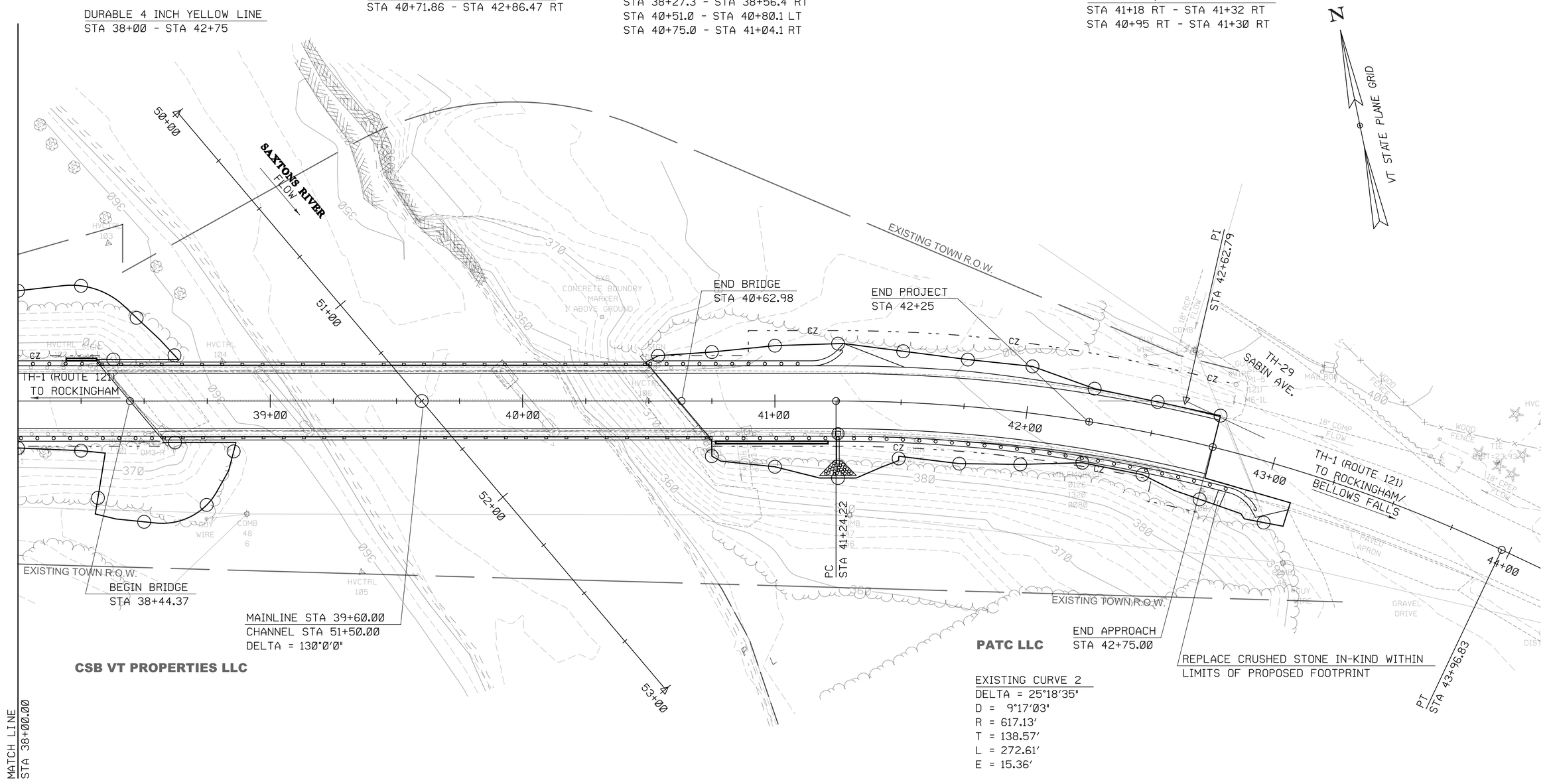
PRECAST REINFORCED CONCRETE DROP INLET WITH CAST IRON GRATE
STA 41+25 RT

18" CPEP
STA 41+25 RT

STONE FILL, TYPE I
STA 41+18 RT - STA 41+32 RT
STA 40+95 RT - STA 41+30 RT

SPECIAL PROVISION - PRECAST CONCRETE RETAINING WALL
STA 38+19 - STA 38+31 LT
STA 40+76 - STA 41+21 RT

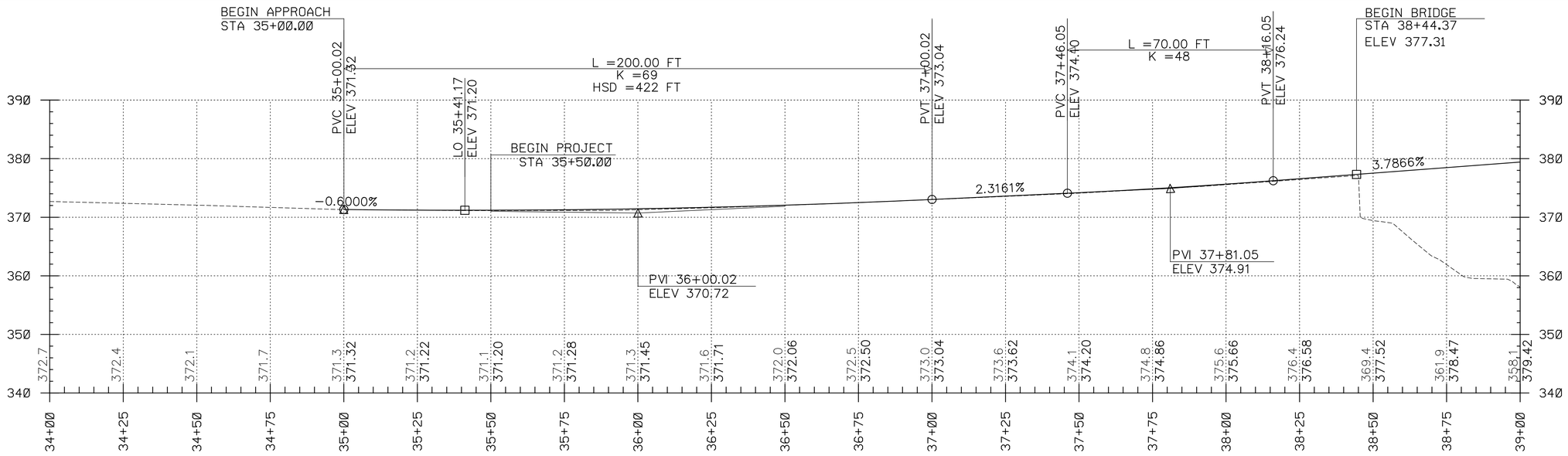
STONE FILL, TYPE IV
STA 50+90 RT, STA 52+25 LT



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

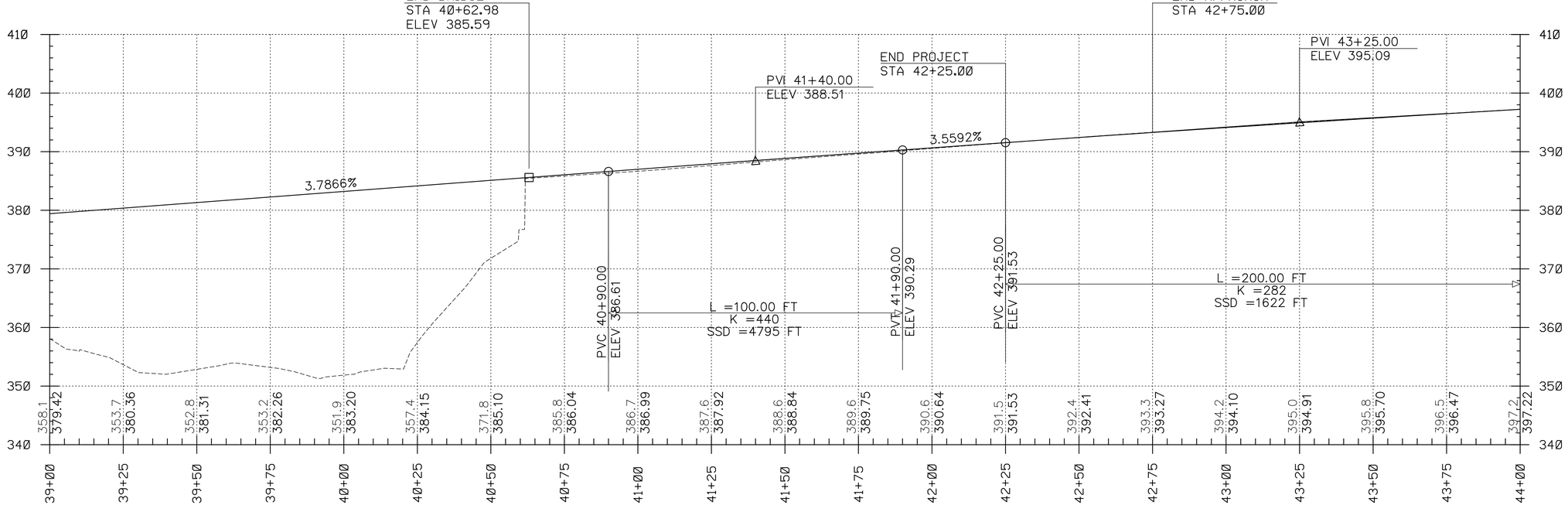
PROJECT NAME: WESTMINSTER	
PROJECT NUMBER: BF 0126(13)	
FILE NAME: z12j668border.dgn	PLOT DATE: 10/14/2021
PROJECT LEADER: C. BAKER	DRAWN BY: T. MARQUETTE
DESIGNED BY: K. HO	CHECKED BY: C. JENNE
LAYOUT SHEET 2	SHEET 11 OF 51

Hardesty & Hanover



FAS 0126 (VT ROUTE 121) PROFILE PART 1

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



FAS 0126 (VT ROUTE 121) PROFILE PART 2

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

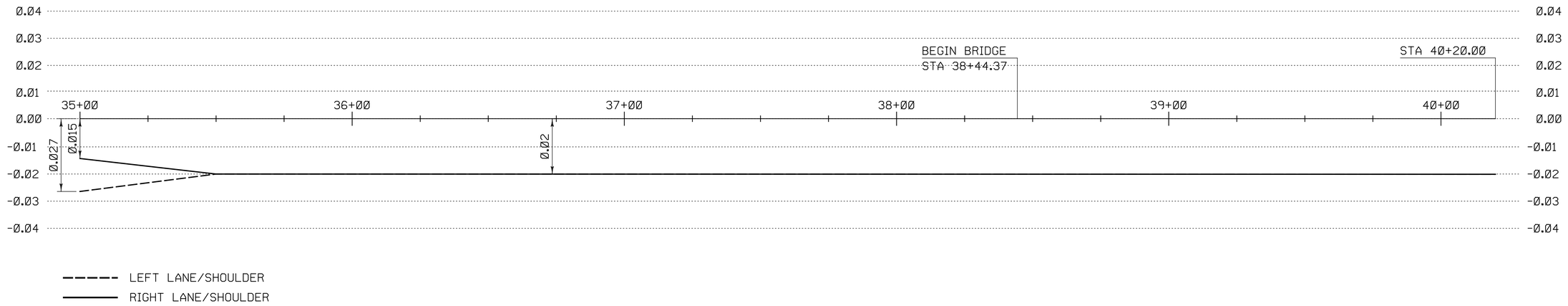
NOTE:
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG L^C
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG L^C

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

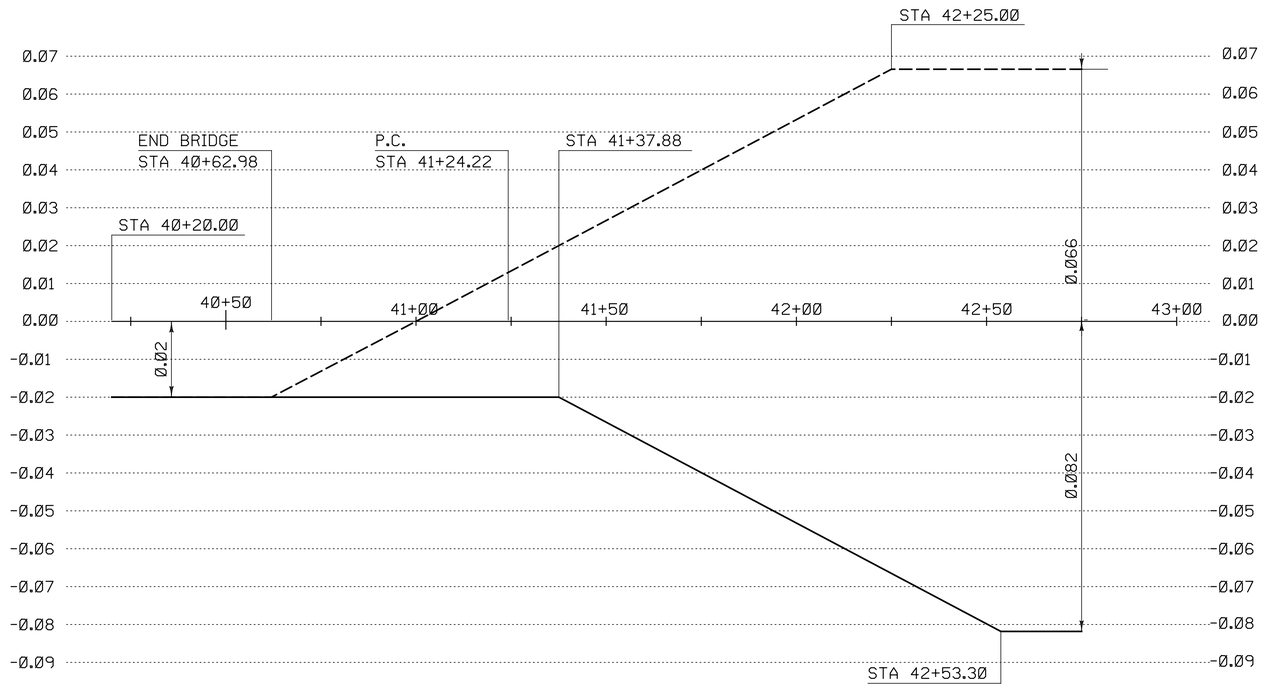
FILE NAME: z12j668profile.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
PROFILE

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 12 OF 51



BANKING DIAGRAM

HORIZONTAL SCALE: 1" = 20'-0"
NO VERTICAL SCALE



BANKING DIAGRAM

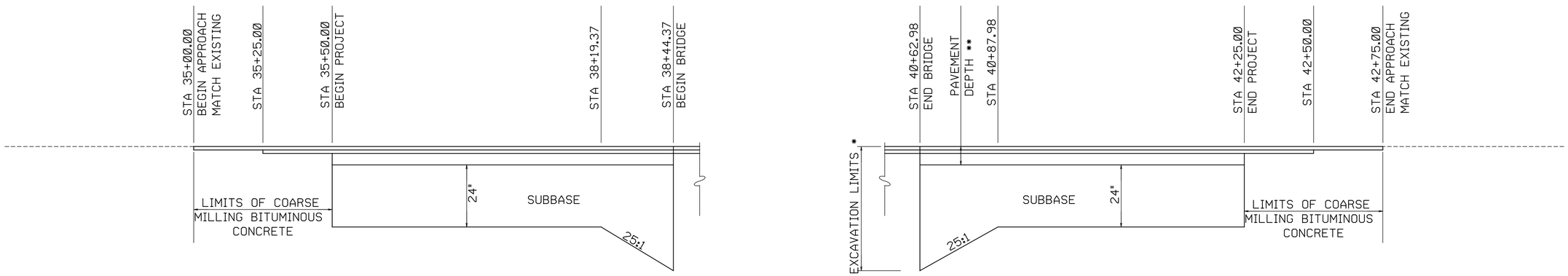
HORIZONTAL SCALE: 1" = 20'-0"
NO VERTICAL SCALE

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668banking diagram.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
BANKING DIAGRAM

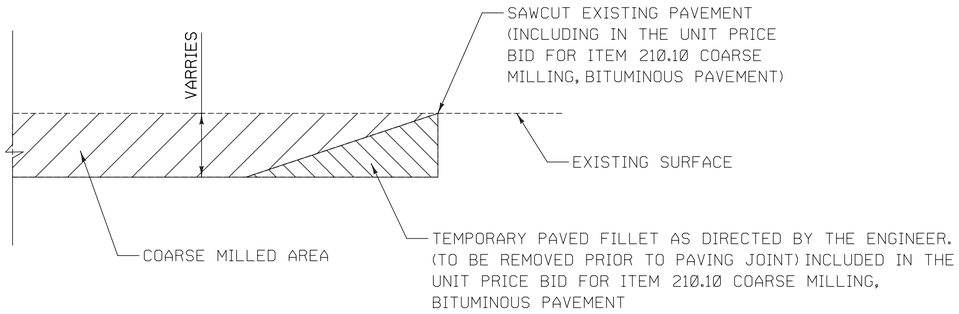
PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 13 OF 51



VT ROUTE 121 MATERIAL TRANSITION DIAGRAM

(NOT TO SCALE)

* SEE ABUTMENT EARTHWORK TYPICAL SECTION, FOR MORE INFORMATION
** SEE ROADWAY TYPICAL SECTIONS FOR PAVEMENT DESIGN



DETAIL AT VERTICAL COARSE MILLING JOINTS

NOTE: THIS DETAIL SHALL BE USED AT THE LOCATIONS SHOWN ABOVE
AS DIRECTED BY THE ENGINEER.

Hardesty & Hanover

PROJECT NAME: WESTMINSTER	
PROJECT NUMBER: BF 0126(13)	
FILE NAME: z12j668xs.dgn	PLOT DATE: 10/14/2021
PROJECT LEADER: C. BAKER	DRAWN BY: T. MARQUETTE
DESIGNED BY: K. HO	CHECKED BY: C. JENNE
MATERIAL TRANSITION DIAGRAM	SHEET 14 OF 51

SOIL CLASSIFICATION

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

ROCK QUALITY DESIGNATION

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

SHEAR STRENGTH

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

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

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

COMMONLY USED SYMBOLS

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

COLOR

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

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.

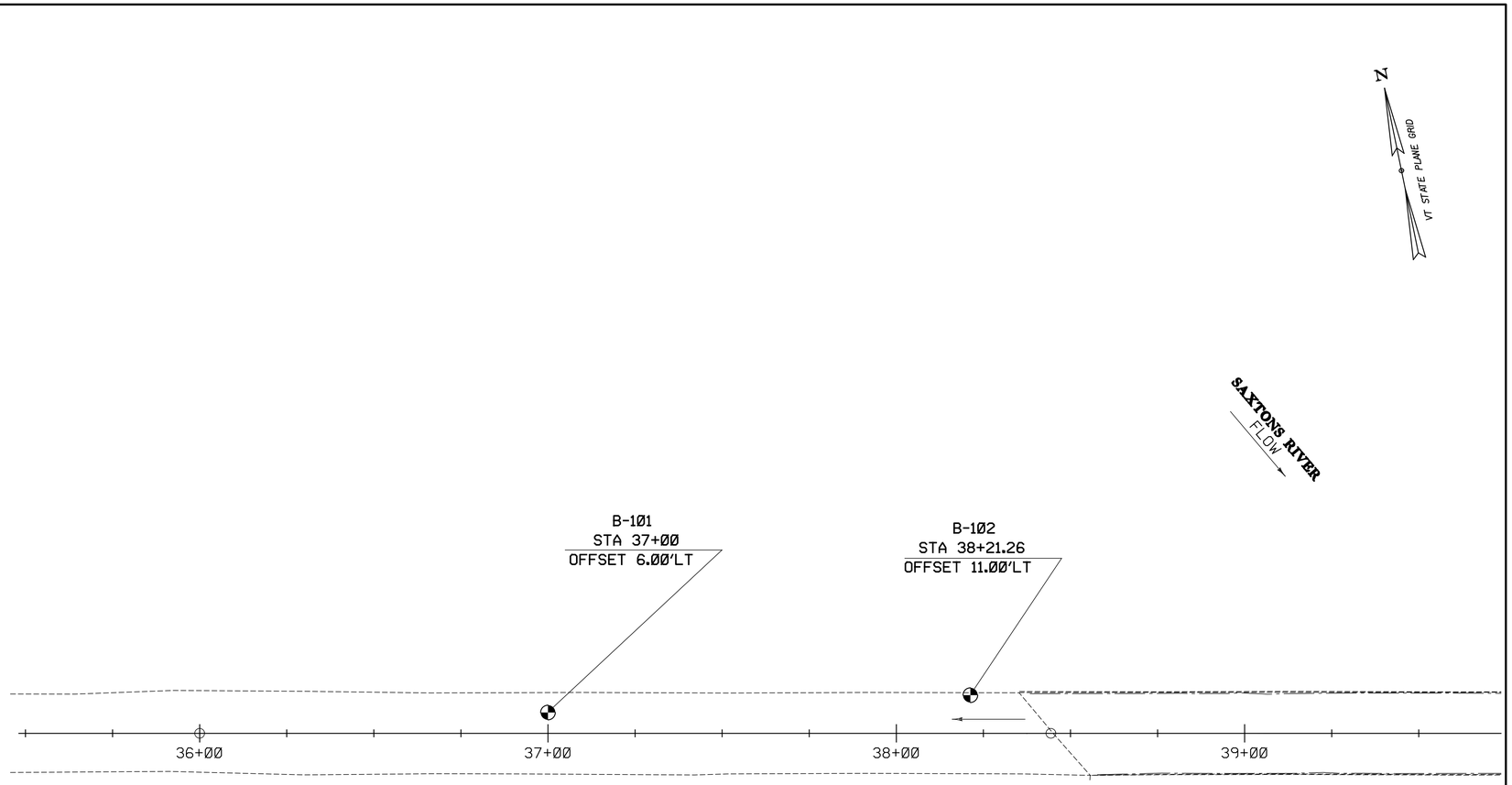
MUCK - Soft organic soil (containing > 10% organic material.

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.



20 0 20

SCALE: 1" = 20'-0"

GENERAL NOTES

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

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

BORING CHART

HOLE NO.	NORTHING	EASTING
B-101	226939.87	1650042.65
B-102	226920.46	1650162.45

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668Bor1.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
BORING LAYOUT SHEET 1

PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS
SHEET 15 OF 51

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)	
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<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
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%Rec.	Percent Recovery
RQD	Rock Quality Designation
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>	Greater Than
R	Refusal (N > 100)
VTSPG	NAD83 - See Note 7

COLOR			
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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		

DEFINITIONS (AASHTO)

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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. 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.

2. 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.

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5. 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.

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

BORING CHART

HOLE NO.	NORTHING	EASTING
B-103	226845.40	1650419.44
B-104	226837.46	1650480.83

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668Bor2.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
BORING LAYOUT SHEET 2

PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS
SHEET 16 OF 51

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

BORING LOG

Westminster
BF 0126(13)
VT 121 BR 5

Boring No.: B-101
Page No.: 1 of 1
Pin No.: 12j668
Checked By: J. Baron

Boring Crew: P. Schofield (NEBC), A. Fournier (GZA)
Date Started: 3/29/21 Date Finished: 3/29/21
VTSPG NAD83: N 226939.50 ft E 1650047.10 ft
Station: 37+04 Offset: 6' LT
Ground Elevation: 373.0 ft

	Casing	Sampler
Type:		SS
I.D.:		2 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:		Auto/AWJ
Rig: Mobile Drill B-48 Truck	CE = 1.3	

Groundwater Observations

Date	Depth (ft)	Notes
03/29/21		Not Encountered

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Approximately 6 inches of pavement, 0.0 ft – 0.5 ft, ASPHALT					
		Visual Description, (Modified Burmister), S-1 (0.5-2.5'): Dense, brown, GRAVEL, some medium Sand, little Silt (A-1-a). Moist, Rec. = 1.0 ft, SAND and GRAVEL	19-20-21-30 (41)				
		Classification:, (Modified Burmister), S-2 (2.5-4.5'): Very dense, brown, GRAVEL, some medium Sand, trace Silt (A-1-a). Moist, Rec. = 0.83 ft, SAND and GRAVEL	15-30-48-47 (78)	1.6	72.0	22.2	5.8
5		Visual Description, (Modified Burmister), S-3 (4.5-6.5'): Medium dense, brown, fine to coarse SAND, some Gravel, trace Silt (A-1-a). Moist, Rec. = 0.83 ft, SAND and GRAVEL	17-11-11-13 (22)				
		Hole stopped @ 6.5 ft					
10							
15							
20							
25							
30							

Remarks:
1. The tip of the split spoon for sample S-3 contained fine to medium SAND, trace Silt.
2. Boring terminated at approximately 6.5 feet below ground surface (bgs). Boring backfilled with drill cuttings and capped with approximately 4 inches of cold patch apshalt.
3. Visual descriptions are based on the Modified Burmister classification system.

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

BORING LOG 04.0191154.11 VTRANS WESTMINSTER BF 0126(13).GPJ VERMONT AOT.GDT 7/1/21

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

BORING LOG

Westminster
BF 0126(13)
VT 121 BR 5

Boring No.: B-102
Page No.: 1 of 2
Pin No.: 12j668
Checked By: J. Baron

Boring Crew: P. Schofield (NEBC), A. Fournier (GZA)
Date Started: 3/29/21 Date Finished: 3/29/21
VTSPG NAD83: N 226914.80 ft E 1650165.30 ft
Station: 38+25 Offset: 6' LT
Ground Elevation: 376.0 ft

	Casing	Sampler
Type:	WASH BORE	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:		Auto/AWJ
Rig: Mobile Drill B-48 Truck	CE = 1.3	

Groundwater Observations

Date	Depth (ft)	Notes
03/29/21	14.5	Stab. time = 10 min

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Approximately 6 inches of pavement, 0.0 ft – 0.5 ft, ASPHALT					
		Visual Description, SAND and GRAVEL					
		Visual Description, (Modified Burmister), S-1 (1-3'): Dense, brown, fine to coarse SAND, some Gravel, little Silt (A-1-a). Moist, Rec. = 0.67 ft, SAND and GRAVEL	15-15-15-14 (30)				
		Visual Description, SAND and GRAVEL					
5		Visual Description, (Modified Burmister), S-2 (4-6'): Dense, brown, fine to coarse SAND, some Silt (A-2-4). Moist, Rec. = 0.4 ft, SILTY SAND	50-20-10-10 (30)				
		Visual Description, SILTY SAND					
10		Visual Description, (Modified Burmister), S-3 (9-11'): Medium dense, brown, fine SAND, some Silt (A-2-4). Moist, Rec. = 0.5 ft, SILTY SAND	9-7-6-5 (13)				
		Visual Description, SILTY SAND					
15		Classification:, (Modified Burmister), S-4 (14-16'): Loose, brown, fine SAND, some Silt (A-2-4). Moist, Rec. = 0.67 ft, SILTY SAND	7-5-4-4 (9)	18.2	1.8	70.3	27.9
		Visual Description, SILTY SAND					
20		Visual Description, (Modified Burmister), S-5 (19-21'): Loose, brown, fine SAND, some Silt, trace Gravel (A-2-4). Moist, Rec. = 0.83 ft, SILTY SAND	2-3-6-5 (9)				
		Visual Description, SILTY SAND					
25		Visual Description, (Modified Burmister), S-6 (24-26'): NO RECOVERY, Rec. = 0.0 ft, SILTY SAND	6-9-6-14 (15)				
		Visual Description, GLACIAL TILL					
30		Classification:, (Modified Burmister), S-7 (29-31'): Dense, light brown, fine to coarse SAND, some Silt, little Gravel (A-1-b). Wet, Rec. = 0.83 ft, GLACIAL TILL	14-19-24-26 (43)	11.7	26.5	51.5	22.0
		Hole stopped @ 31.0 ft					

Remarks:
1. Cobbles encountered during drilling from approximately 23 to 24 feet bgs.

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

BORING LOG 04.0191154.11 VTRANS WESTMINSTER BF 0126(13).GPJ VERMONT AOT.GDT 7/1/21

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668Bor1.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
BORING LOG SHEET 1

PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS
SHEET 17 OF 51

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

BORING LOG

Westminster
BF 0126(13)
VT 121 BR 5

Boring No.: B-102
Page No.: 2 of 2
Pin No.: 12J668
Checked By: J. Baron

Boring Crew: P. Schofield (NEBC), A. Fournier (GZA)
Date Started: 3/29/21 Date Finished: 3/29/21
VTSPG NAD83: N 226914.80 ft E 1650165.30 ft
Station: 38+25 Offset: 6' LT
Ground Elevation: 376.0 ft

	Casing	Sampler
Type:	WASH BORE	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto/AWJ	
Rig: Mobile Drill B-48 Truck	CE = 1.3	

Groundwater Observations		
Date	Depth (ft)	Notes
03/29/21	14.5	Stab. time = 10 min

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
40		2. Boring terminated at approximately 31 feet bgs. Boring backfilled with drill cuttings, sand, and capped with 4 inches of cold patch apshalt.					
		3. Visual descriptions are based on the Modified Burmister classification system.					
45							
50							
55							
60							
65							

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

BORING LOG 04.01911541.11 VTRANS WESTMINSTER BF 0126(13).GPJ VERMONT AOT.GDT 7/1/21

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

BORING LOG

Westminster
BF 0126(13)
VT 121 BR 5

Boring No.: B-103
Page No.: 1 of 2
Pin No.: 12J668
Checked By: J. Baron

Boring Crew: P. Schofield (NEBC), A. Fournier (GZA)
Date Started: 3/30/21 Date Finished: 3/30/21
VTSPG NAD83: N 226848.80 ft E 1650425.10 ft
Station: 40+93 Offset: 6' RT
Ground Elevation: 386.0 ft

	Casing	Sampler
Type:	WASH BORE	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:	Auto/AWJ	
Rig: Mobile Drill B-48 Truck	CE = 1.3	

Groundwater Observations		
Date	Depth (ft)	Notes
03/30/21	17.0	Stab. time = 10 min

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Approximately 6 inches of pavement, 0.0 ft – 0.5 ft, ASPHALT					
		Visual Description, SAND and GRAVEL					
		Visual Description, (Modified Burmister), S-1 (1-3'): Medium dense, dark brown, fine to medium SAND, some Gravel, trace Silt (A-2-4). Moist, Rec. = 0.75 ft, SAND and GRAVEL	8-8-8-8 (16)				
		Visual Description, SAND and GRAVEL					
5		Classification:, (Modified Burmister), S-2 (4-6'): Medium dense, brown, fine to medium SAND, some Gravel, little Silt (A-2-4). Moist, Rec. = 0.5 ft, SAND and GRAVEL	11-7-8-10 (15)	11.7	29.9	53.4	16.7
		Visual Description, SAND and GRAVEL					
10		Visual Description, (Modified Burmister), S-3 (9-11'): Medium dense, brown, fine to medium SAND, little Silt, trace Gravel (A-1-a). Moist, Rec. = 0.58 ft, SAND	11-12-9-8 (21)				
		Visual Description, SAND					
15		Visual Description, (Modified Burmister), S-4 (14-16'): Very dense, brown, GRAVEL, some fine to medium Sand, trace Silt (A-1-a). Moist, Rec. = 0.5 ft, SAND and GRAVEL	38-34-33-24 (77)				
		Visual Description, SAND and GRAVEL					
20		Classification:, (Modified Burmister), S-5 (19-21'): Loose, olive brown, fine to medium SAND, some Silt, little Gravel (A-2-4). Wet, Rec. = 0.5 ft, SAND	6-4-4-4 (8)	13.1	22.4	44.4	33.2
		Visual Description, SAND					
		Visual Description, WEATHERED ROCK					
25		Visual Description, (Modified Burmister), S-6 (24-25.1'): Very dense, olive brown, WEATHERED ROCK, little Silt, trace Gravel, trace Sand (Weathered Rock). Wet, Rec. = 0.67 ft, WEATHERED VROCK	66-68-100/1" (R)				
		Visual Description, WEATHERED ROCK					
30		Visual Description, (Modified Burmister), S-7 (29-29.1'): Very dense, olive brown, WEATHERED ROCK (Weathered Rock). Wet, Rec. = 0.1 ft, WEATHERED ROCK	100/1" (R)				
		Visual Description, WEATHERED ROCK					
		Visual Description, (Modified Burmister), S-8 (34-34.2'): Very dense, olive brown,	100/2" (R)				

Notes:
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BORING LOG 04.01911541.11 VTRANS WESTMINSTER BF 0126(13).GPJ VERMONT AOT.GDT 7/1/21

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668Bor1.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
BORING LOG SHEET 2

PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS

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

BORING LOG

Westminster
BF 0126(13)
VT 121 BR 5

Boring No.: B-103
Page No.: 2 of 2
Pin No.: 12j668
Checked By: J. Baron

Boring Crew: P. Schofield (NEBC), A. Fournier (GZA)
Date Started: 3/30/21 Date Finished: 3/30/21
VTSPG NAD83: N 226848.80 ft E 1650425.10 ft
Station: 40+93 Offset: 6' RT
Ground Elevation: 386.0 ft

	Casing	Sampler
Type:	WASH BORE	SS
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	24 in.	30 in.
Hammer/Rod Type:		Auto/AWJ
Rig: Mobile Drill B-48 Truck	CE = 1.3	

Groundwater Observations

Date	Depth (ft)	Notes
03/30/21	17.0	Stab. time = 10 min

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
40		WEATHERED ROCK (Weathered Rock). Wet, Rec. = 0.1 ft, WEATHERED ROCK					
		Hole stopped @ 34.2 ft					
45		Remarks: 1. Driller notes a possible increase in gravel and soil density at approximately 12 feet bgs based on a change in the drilling difficulty. 2. Advancing casing became very difficult at approximately 23.5 feet bgs. 3. Boring terminated at approximately 34.2 feet bgs. Boring backfilled with drill cuttings, sand, and capped with 4 inches of cold patch apshalt. 4. Visual descriptions are based on the Modified Burmister classification system.					
50							
55							
60							
65							

Notes:
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BORING LOG 04.0191154.11 VTRANS WESTMINSTER BF 0126(13).GPJ VERMONT AOT.GDT 7/1/21

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

BORING LOG

Westminster
BF 0126(13)
VT 121 BR 5

Boring No.: B-104
Page No.: 1 of 1
Pin No.: 12j668
Checked By: J. Baron

Boring Crew: P. Schofield (NEBC), A. Fournier (GZA)
Date Started: 3/30/21 Date Finished: 3/30/21
VTSPG NAD83: N 226833.30 ft E 1650490.70 ft
Station: 41+60 Offset: 7' RT
Ground Elevation: 388.0 ft

	Casing	Sampler
Type:		SS
I.D.:		2 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:		Auto/AWJ
Rig: Mobile Drill B-48 Truck	CE = 1.3	

Groundwater Observations

Date	Depth (ft)	Notes
03/30/21		Not Encountered

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Approximately 6 inches of pavement, 0.0 ft – 0.5 ft, ASPHALT					
		Classification:, (Modified Burmister), S-1 (0.5-2.5'): Dense, brown, GRAVEL, and fine to medium Sand, trace Silt (A-1-a). Moist, Rec. = 0.83 ft, SAND and GRAVEL	12-16-21-15 (37)	3.2	61.0	30.3	8.7
		Classification:, (Modified Burmister), S-2 (2.5-4.5'): Medium dense, brown, fine to medium SAND, some Silt, little Gravel (A-2-4). Moist, Rec. = 1.67 ft, SAND and GRAVEL	10-8-10-9 (18)	9.4	24.4	49.0	26.6
5		Visual Description, (Modified Burmister), S-3 (4.5-6.5'): Medium dense, brown, fine to medium SAND, some Gravel, some Silt (A-2-4). Moist, Rec. = 0.83 ft, SAND and GRAVEL	6-6-6-6 (12)				
		Hole stopped @ 6.5 ft					
10		Remarks: 1. Boring terminated at approximately 6.5 feet bgs. Boring backfilled with drill cuttings and capped with approximately 4 inches of cold patch apshalt. 2. Visual descriptions are based on the Modified Burmister classification system.					
15							
20							
25							
30							

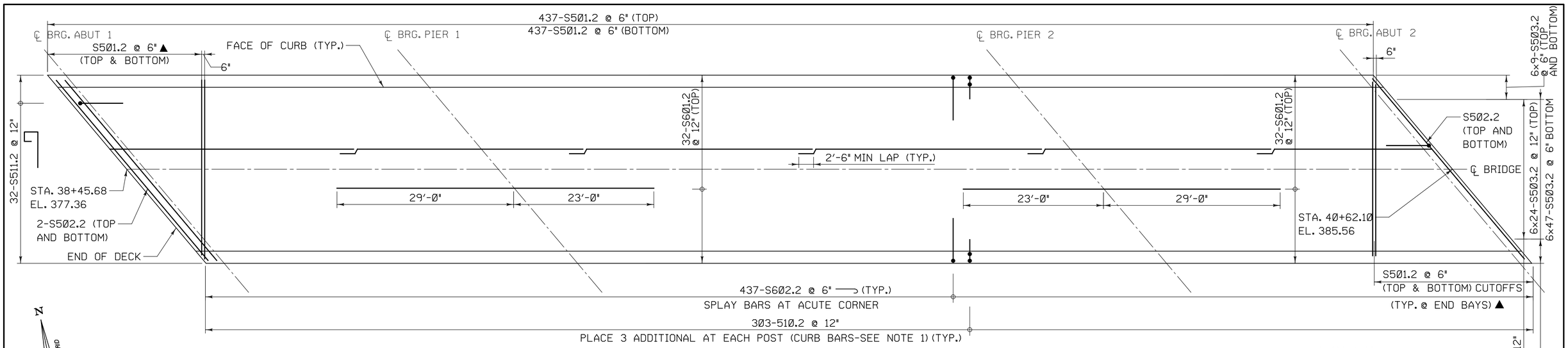
Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. CE is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations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

BORING LOG 04.0191154.11 VTRANS WESTMINSTER BF 0126(13).GPJ VERMONT AOT.GDT 7/1/21

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668Bor1.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
BORING LOG SHEET 3

PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS
SHEET 19 OF 51

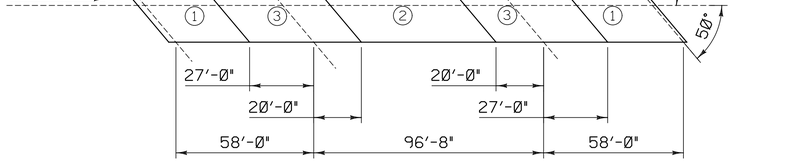


DECK REINFORCING PLAN

SCALE: ⅛" = 1'-0"

LEGEND

▲ DENOTES CUT IN FIELD (USE CUTOFFS ON OPPOSITE ACUTE CORNER OF DECK WHERE APPLICABLE)

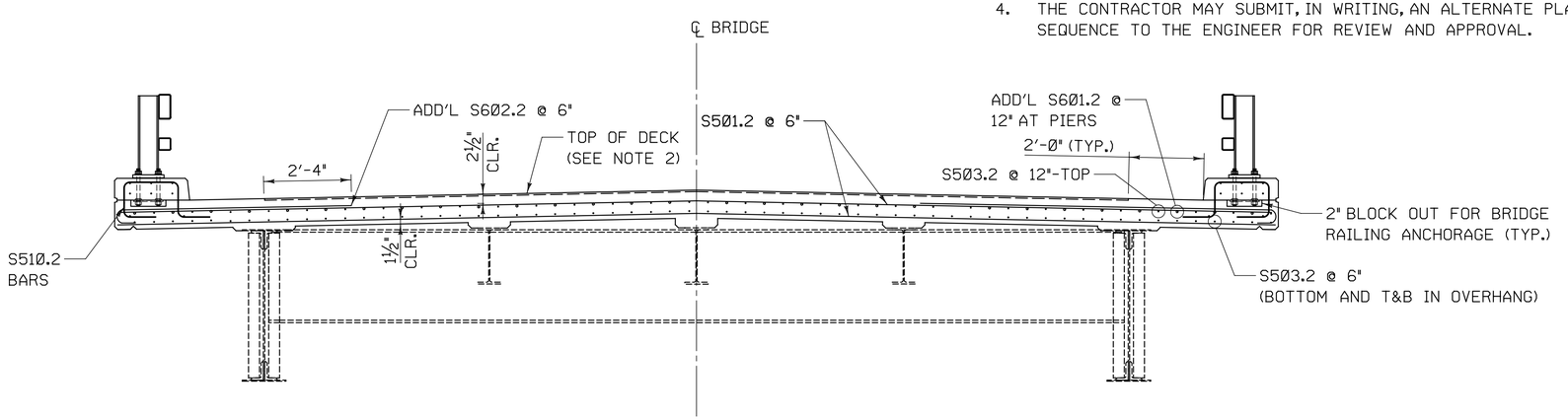


DECK POUR SEQUENCE

NOT TO SCALE

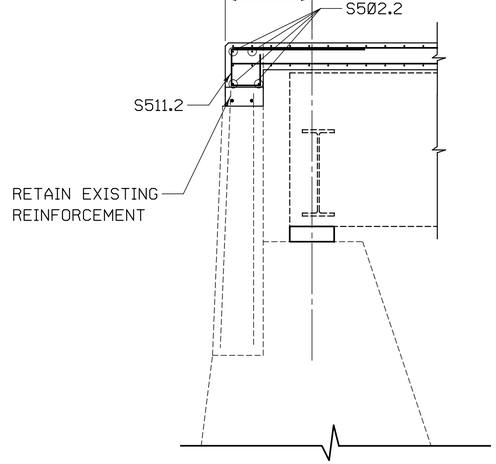
DECK POUR NOTES:

1. THE BRIDGE DECK SLAB CONCRETE SHALL BE PLACED IN ACCORDANCE WITH THE DECK POUR SEQUENCE. CONCRETE SHALL BE PLACED CONTINUOUSLY WITH THE CONCRETE REMAINING PLASTIC THROUGHOUT THE PLACEMENT WITH A MAXIMUM DURATION OF EIGHT HOURS PER PLACEMENT. IF CIRCUMSTANCES BEYOND THE CONTRACTOR'S CONTROL PREVENT THIS FROM BEING ACCOMPLISHED, A CONSTRUCTION JOINT SHALL BE USED.
2. FOLLOWING THE COMPLETION OF DECK PLACEMENT 2 A MINIMUM 96 HOURS OF ACCEPTABLE CURING SHALL BE OBSERVED PRIOR TO PLACEMENT OF CONCRETE IN DECK AREA 3.
3. THE CONCRETE SHALL BE DEPOSITED PARALLEL TO THE CENTERLINE OF BEARING SO AS TO LOAD THE GIRDERS EQUALLY.
4. THE CONTRACTOR MAY SUBMIT, IN WRITING, AN ALTERNATE PLACEMENT SEQUENCE TO THE ENGINEER FOR REVIEW AND APPROVAL.



TYPICAL DECK REINFORCING CROSS SECTION

SCALE: ½" = 1'



DECK OVER BACKWALL DETAIL

SCALE: ½" = 1'

NOTES:

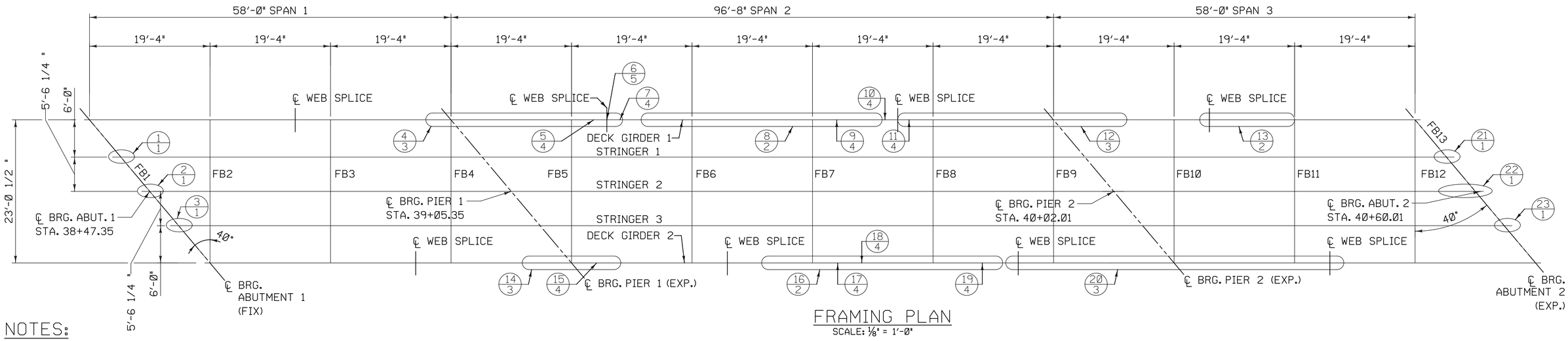
1. SEE STANDARD DRAWING S-360A FOR CURB REINFORCING DETAILS
2. DECK TO BE POURED TO 9" MIN THICKNESS AND DIAMOND GROUND TO 8.5" IN ACCORDANCE WITH THE SPECIAL PROVISIONS

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668sup.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. SMITH
DECK REINFORCEMENT SHEET

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: S. BROWN
SHEET 20 OF 51



FRAMING PLAN
SCALE: ⅛" = 1'-Ø"

NOTES:

1. SEE SUPERSTRUCTURE REPAIR DETAIL SHEET 1 FOR DESCRIPTIONS OF IDENTIFIED STEEL REPAIRS.

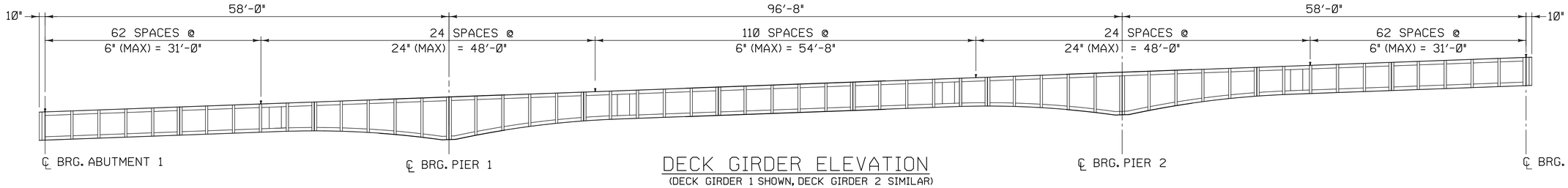
2. THE 3" HORIZONTAL SECTION MAY BE ELIMINATED FOR FORMING SYSTEMS DESIGNED FOR THE CONSTRUCTION OF VERTICAL HAUNCHES. ANY VOIDS RESULTING FROM FORMING SYSTEM ELEMENTS SHALL BE FILLED WITH JOINT SEALER, POLYURETHANE MEETING THE REQUIREMENTS OF SECTION 524. THE COST OF THE JOINT SEALER, POLYURETHANE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

STEEL REPAIR LEGEND

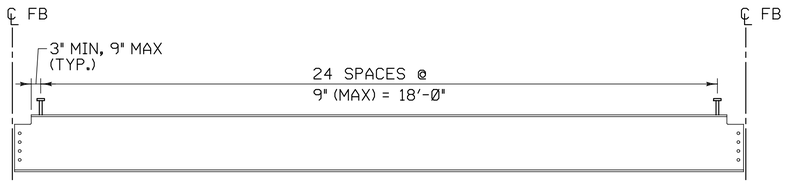
XX — REPAIR NUMBER
X — REPAIR TYPE

REPAIR TYPE:

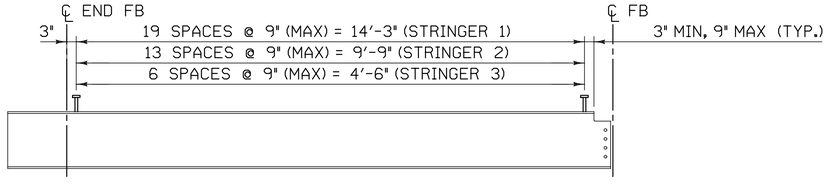
1 - CLEAN AND PAINT STRINGER ENDS
2 - BOTTOM FLANGE PACK RUST REPAIR
3 - TOP AND BOTTOM FLANGE PACK RUST REPAIR
4 - INTERMEDIATE STIFFENER REPAIR
5 - BOTTOM FLANGE SPLICE PLATE REPLACEMENT



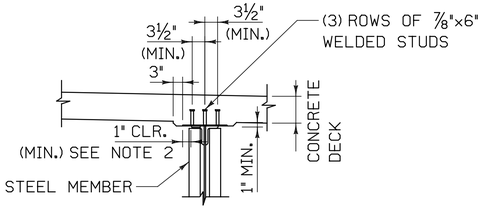
DECK GIRDER ELEVATION
(DECK GIRDER 1 SHOWN, DECK GIRDER 2 SIMILAR)
SCALE: ⅛" = 1'-Ø"



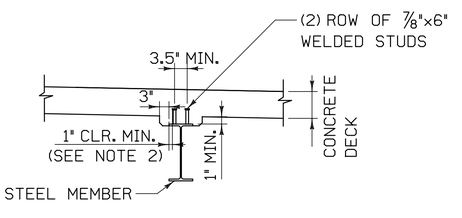
INTERIOR STRINGER ELEVATION
(STRINGER 1 SHOWN, STRINGER 2 & 3 SIMILAR)
SCALE: ½" = 1'-Ø"



END STRINGER ELEVATION
(STRINGERS AT FB1 SHOWN, STRINGERS AT FB13 MIRRORED)
SCALE: ½" = 1'-Ø"



HAUNCH AND SHEAR CONNECTOR DETAIL AT DECK GIRDER
SCALE: ½" = 1'-Ø"

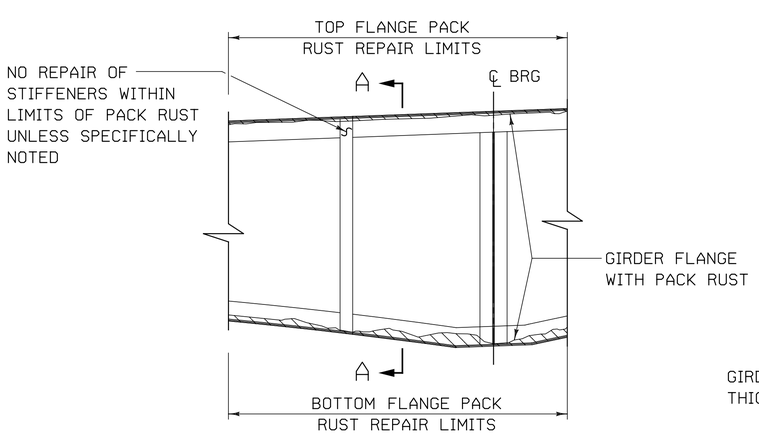


HAUNCH AND SHEAR CONNECTOR DETAIL AT STRINGER
SCALE: ½" = 1'-Ø"

PROJECT NAME: WESTMINSTER	
PROJECT NUMBER: BF 0126(13)	
FILE NAME: z12j668sup.dgn	PLOT DATE: 10/14/2021
PROJECT LEADER: C. BAKER	DRAWN BY: S. BROWN
DESIGNED BY: S. BROWN	CHECKED BY: K. SMITH
FRAMING PLAN	SHEET 21 OF 51

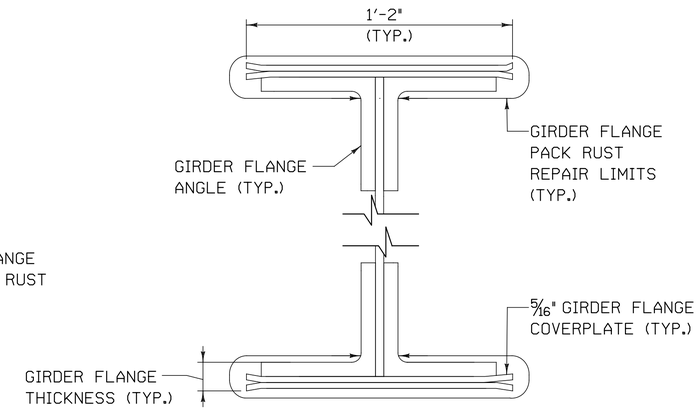
STEEL REPAIR SUMMARY TABLE

REPAIR NO.	REPAIR TYPE	SPAN	MEMBER TYPE	REPAIR LENGTH	NOTES	REPAIR NO.	REPAIR TYPE	SPAN	MEMBER TYPE	REPAIR LENGTH	NOTES
1	CLEAN AND PAINT STRINGER END	1	STRINGER 1	2′-6"		13	BOTTOM FLANGE PACK RUST REPAIR	3	NORTH GIRDER	15′-6"	
2	CLEAN AND PAINT STRINGER END	1	STRINGER 2	2′-6"		14	TOP AND BOTTOM FLANGE PACK RUST REPAIR	1-2	SOUTH GIRDER	16′-Ø"	
3	CLEAN AND PAINT STRINGER END	1	STRINGER 3	2′-6"		15	INTERMEDIATE STIFFENER REPAIR	2	SOUTH GIRDER	----	TOP FLANGE IS TENSION FLANGE
4	TOP AND BOTTOM FLANGE PACK RUST REPAIR	1-2	NORTH GIRDER	32′-Ø"		16	BOTTOM FLANGE PACK RUST REPAIR	2	SOUTH GIRDER	39′-Ø"	
5	INTERMEDIATE STIFFENER REPAIR	2	NORTH GIRDER	----	TOP FLANGE IS TENSION FLANGE	17	INTERMEDIATE STIFFENER REPAIR	2	SOUTH GIRDER	----	BOTTOM FLANGE IS TENSION FLANGE
6	BOTTOM FLANGE SPLICE PLATE REPAIR	2	NORTH GIRDER	----		18	INTERMEDIATE STIFFENER REPAIR	2	SOUTH GIRDER	----	BOTTOM FLANGE IS TENSION FLANGE
7	INTERMEDIATE STIFFENER REPAIR	2	NORTH GIRDER	----	BOTTOM FLANGE IS TENSION FLANGE	19	INTERMEDIATE STIFFENER REPAIR	2	SOUTH GIRDER	----	BOTTOM FLANGE IS TENSION FLANGE
8	BOTTOM FLANGE PACK RUST REPAIR	2	NORTH GIRDER	39′-Ø"		2Ø	TOP AND BOTTOM FLANGE PACK RUST REPAIR	2-3	SOUTH GIRDER	54′-6"	
9	INTERMEDIATE STIFFENER REPAIR	2	NORTH GIRDER	----	BOTTOM FLANGE IS TENSION FLANGE	21	CLEAN AND PAINT STRINGER END	3	STRINGER 3	2′-6"	
1Ø	INTERMEDIATE STIFFENER REPAIR	2	NORTH GIRDER	----	BOTTOM FLANGE IS TENSION FLANGE	22	CLEAN AND PAINT STRINGER END	3	STRINGER 2	7′-Ø"	
11	INTERMEDIATE STIFFENER REPAIR	2	NORTH GIRDER	----	BOTTOM FLANGE IS TENSION FLANGE	23	CLEAN AND PAINT STRINGER END	3	STRINGER 1	2′-6"	
12	TOP AND BOTTOM FLANGE PACK RUST REPAIR	2-3	NORTH GIRDER	37′-Ø"							



GIRDER FLANGE PACK RUST REPAIR DETAIL

SCALE: ½" = 1′

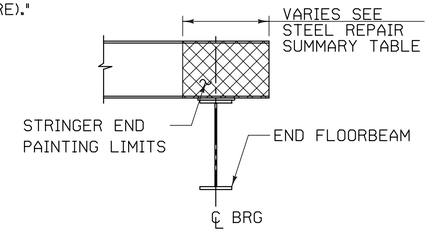


SECTION A-A

SCALE: 3" = 1′

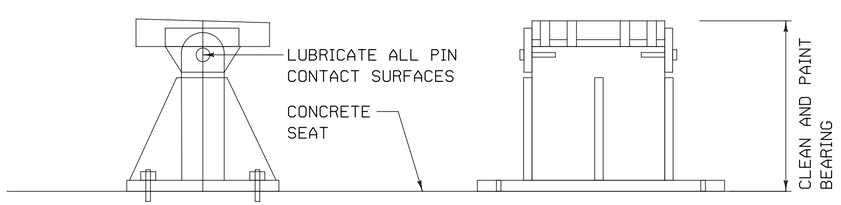
NOTES:

1. EXISTING BEARING LUBRICATION SHALL BE PAID UNDER ITEM 9ØØ.62Ø, "SPECIAL PROVISION (BEARING LUBRICATION)".
2. ALL STEEL REPAIR AREAS DETAILED ON THE FRAMING PLAN SHEET WERE IDENTIFIED DURING A 2Ø21 SITE VISIT. THE CONTRACTOR SHALL VERIFY THE STEEL REPAIR AREAS INCLUDING THE LIMITS OF EACH REPAIR PRIOR TO BEGINNING ANY STEEL REPAIR WORK. ANY MODIFICATIONS TO IDENTIFIED STEEL REPAIR AREAS OR ADDITIONAL STEEL REPAIR AREAS SHALL BE APPROVED BY THE ENGINEER.
3. THE CONTRACTOR SHALL PROVIDE ACCESS TO THE SUPERSTRUCTURE FOR THE ENGINEER TO INSPECT EACH IDENTIFIED REPAIR LOCATION AND ANY ADDITIONAL REPAIR AREAS PRIOR TO BEGINNING THE REPAIR AND AFTER THE REPAIR HAS BEEN COMPLETED. ACCESS TO THE SUPERSTRUCTURE SHALL BE PAID UNDER ITEM 529.2Ø, "PARTIAL REMOVAL OF STRUCTURE"
4. STRINGER END PAINTING AND GIRDER FLANGE PACK RUST REPAIR SHALL INCLUDE ABRASIVE BLASTING THE AREAS OF THE STEEL SUPERSTRUCTURE TO BASE METAL AND REMOVING ALL DEBRIS AND ACTIVE CORROSION. SAND BLASTING AND ASSOCIATED WORK SHALL BE PAID UNDER ITEM 9ØØ.64Ø, "SPECIAL PROVISION (CLEAN AND PAINT EXISTING SUPERSTRUCTURE)."



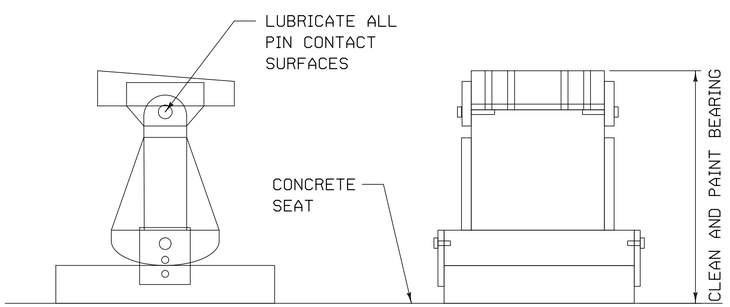
STRINGER END PAINTING DETAIL

SCALE: ½" = 1′



FIXED BEARING DETAILS

SCALE: 1½" = 1′



EXPANSION BEARING DETAILS

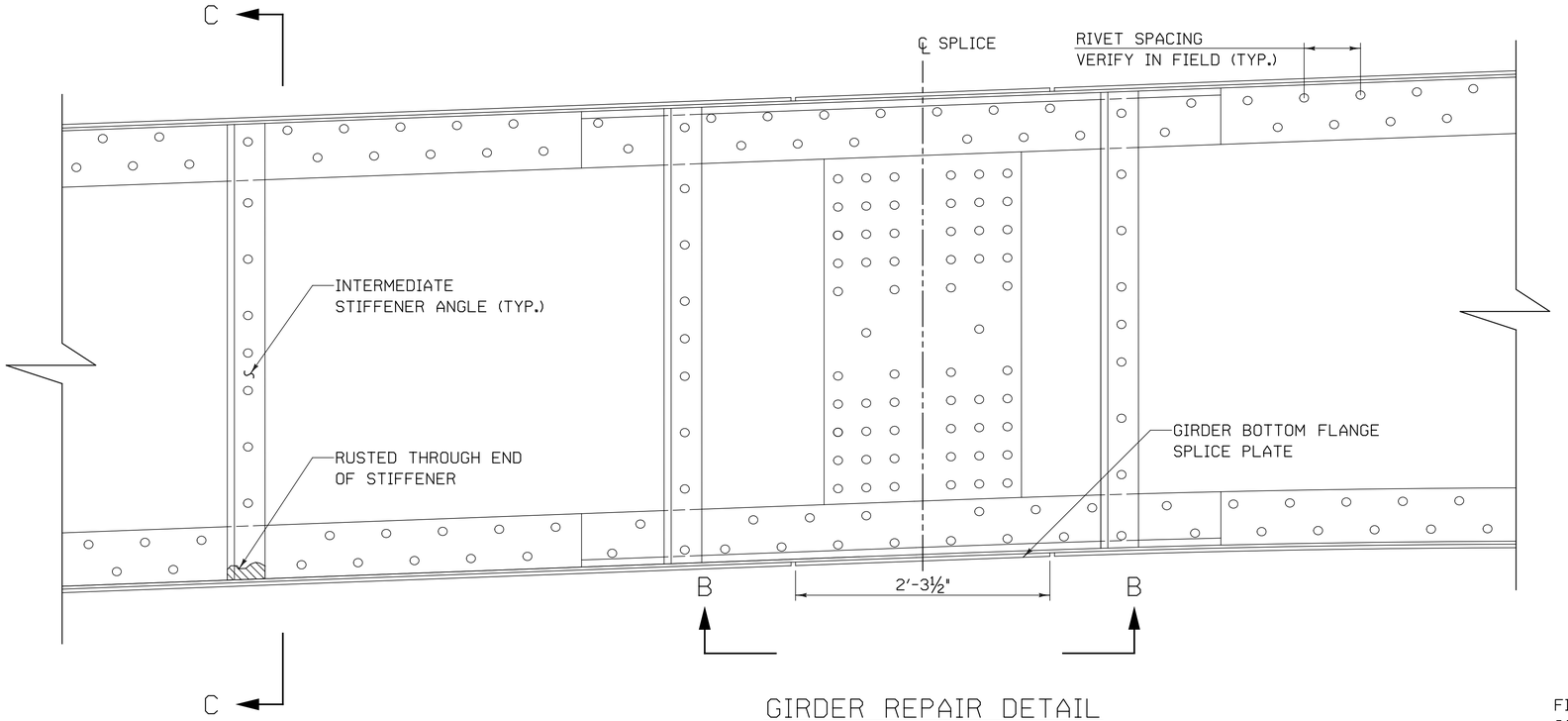
SCALE: 1½" = 1′

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

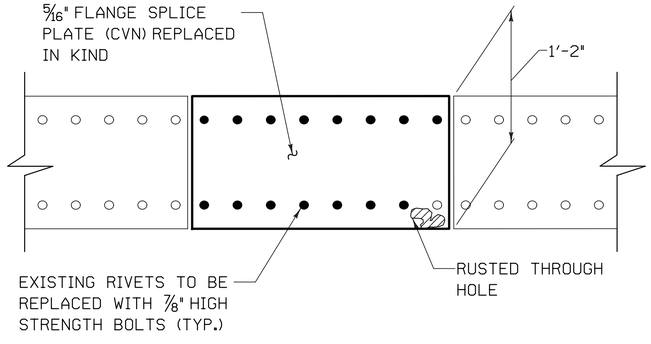
FILE NAME: z12j668sup.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: S. BROWN
SUPERSTRUCTURE REPAIR DETAIL SHEET 1

PLOT DATE: 10/14/2021
DRAWN BY: S. BROWN
CHECKED BY: K. SMITH
SHEET 22 OF 51



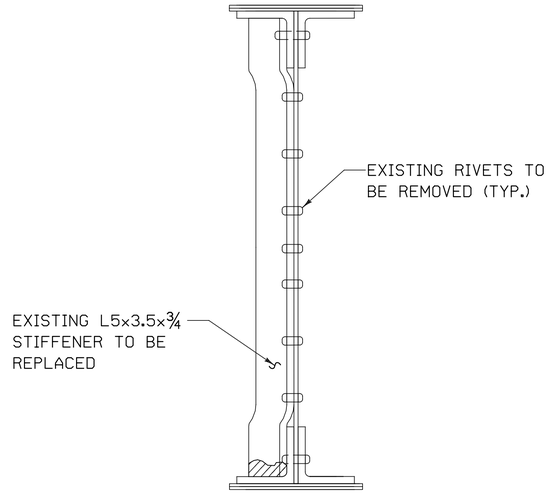
GIRDER REPAIR DETAIL
PARTIAL ELEVATION

SCALE: 1-½" = 1′

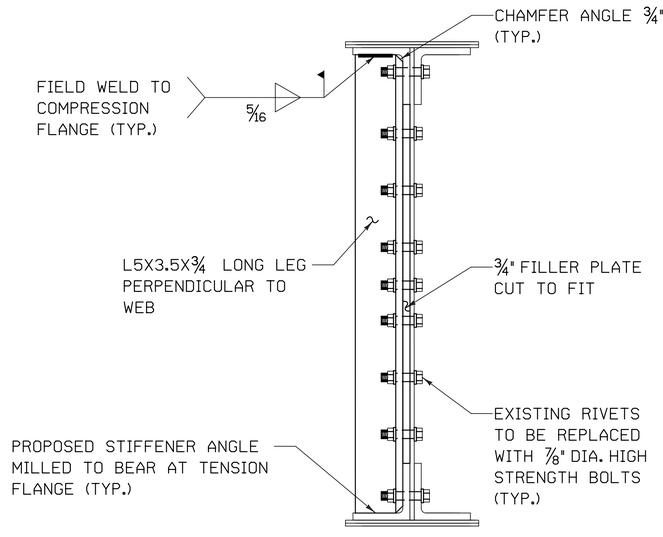


VIEW B-B

SCALE: 1-½" = 1′



EXISTING STIFFENER



STIFFENER REPAIR

SECTION C-C

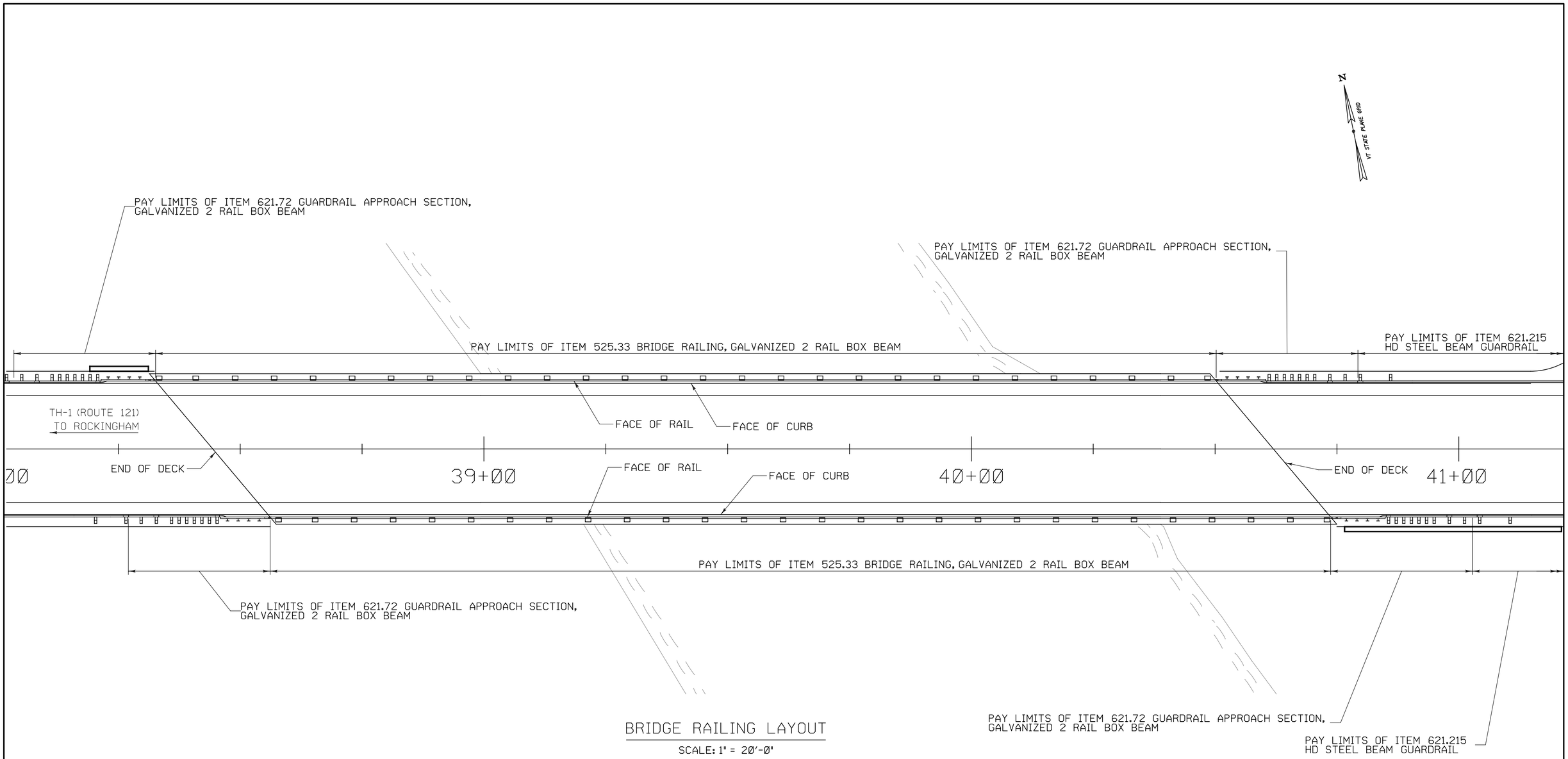
SCALE: 1-½" = 1′

Hardesty &Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668sup.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: S. BROWN
PLOT DATE: 10/14/2021
DRAWN BY: S. BROWN
CHECKED BY: K. SMITH

SUPERSTRUCTURE REPAIR DETAIL SHEET 2



BRIDGE RAILING LAYOUT

SCALE: 1" = 20'-0"

NOTES:

REFER TO THE FOLLOWING STANDARDS FOR MATERIALS AND INSTALLATION DETAILS:

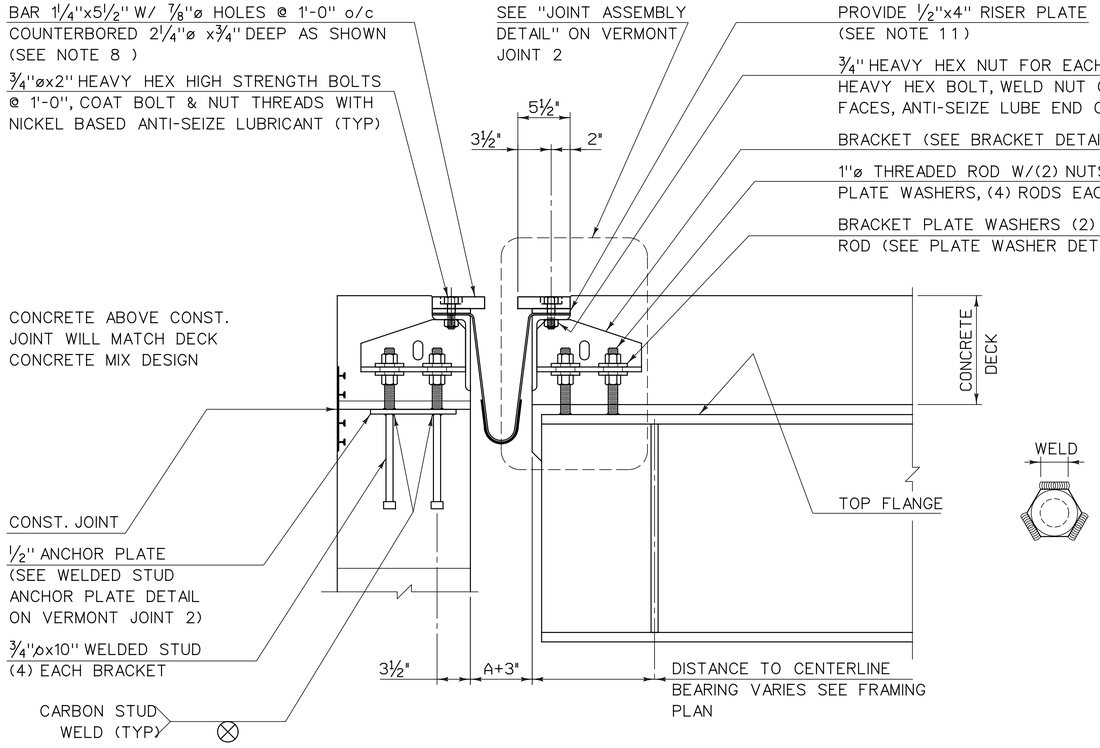
S-360A BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM
S-360B GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM

Hardesty & Hanover

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

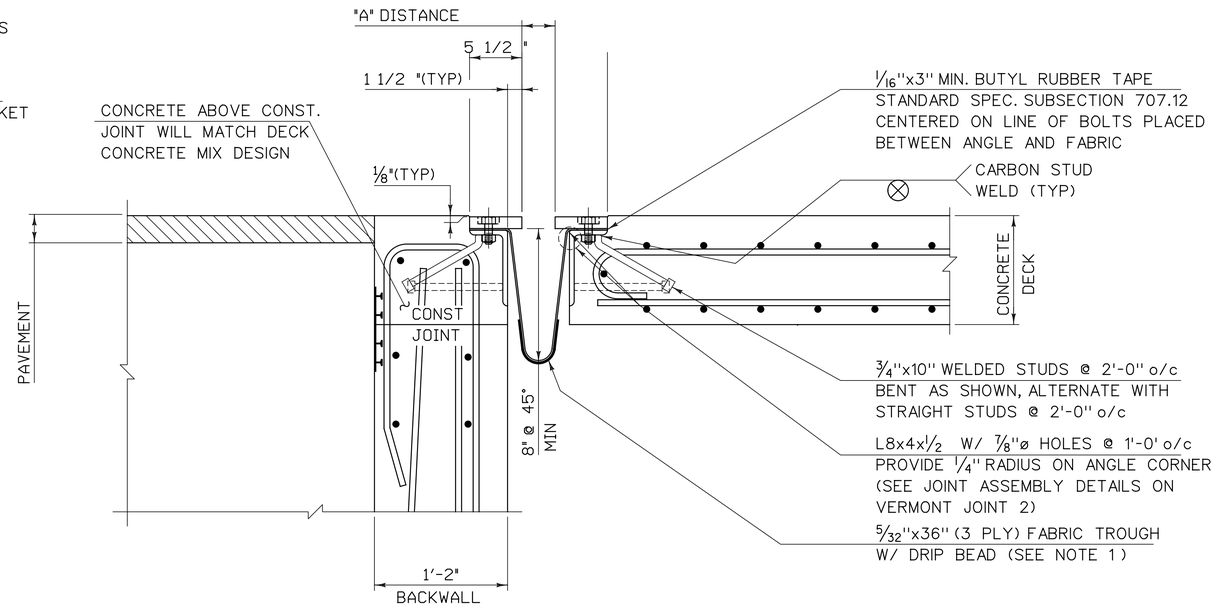
FILE NAME: z12j668border.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: A. CHRISTIE
BRIDGE RAILING LAYOUT SHEET

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: K. SMITH
SHEET 24 OF 51



TYPICAL SECTION AT GIRDERS

SCALE 1½" = 1'-Ø"

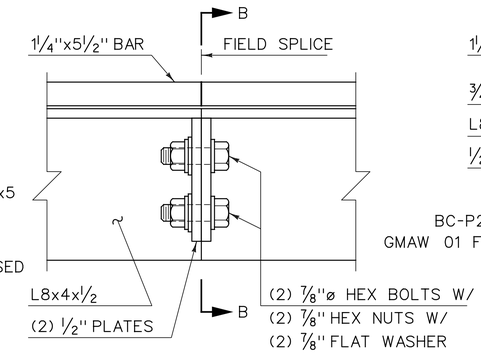


TYPICAL SECTION BETWEEN GIRDERS

SCALE 1½" = 1'-Ø"

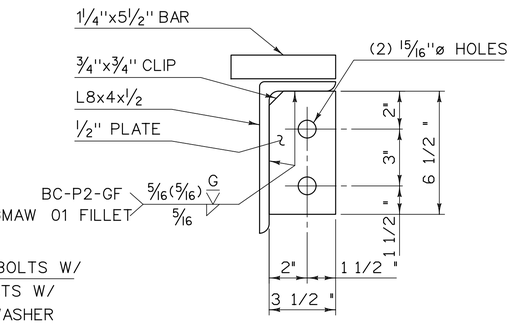
NOTES FOR ITEM 516.11 "BRIDGE EXPANSION JOINT, VERMONT"

1. FABRIC TROUGH SHALL BE THOROUGHLY CLEANED AND FLUSHED AFTER PAVING OPERATION. A DRIP BEAD OF 1/4"x7" STRIP OF PREFORMED FABRIC MATERIAL SHALL BE CEMENTED TO THE BOTTOM OF THE FABRIC TROUGH USING AN ADHESIVE APPROVED BY THE MANUFACTURER. THE DRIP BEAD SHALL BE APPLIED 1" FROM THE DOWNSPOUT END OF THE TROUGH. PREFORMED FABRIC MATERIAL SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE JOINT.
2. THE EXPANSION DEVICE SHALL BE COVERED TO PROTECT THE FINISH DURING PLACING OF BRIDGE DECK CONCRETE.
3. SEE "JOINT GAP DIMENSION TABLE" FOR DISTANCE "A" VALUES IN TEMPERATURE RANGE PROVIDED.
4. JOINT BRACKET LENGTH "X" VARIES DEPENDENT ON THE BRIDGE SKEW ANGLE. THE BRACKET MUST BE LOCATED SUCH THAT THE THREADED RODS ARE NOT LESS THAN 1½" FROM GIRDERS END OR FLANGE SIDES.
5. ALL STEEL COMPONENTS SHALL BE GALVANIZED OR METALIZED AND MEET THE REQUIREMENTS OF SUBSECTION 516.02. PRIOR TO GALVANIZING OR METALIZING, ALL CORNERS AND EDGES OF STEEL PLATES, SHAPES, ETC., SHALL BE GROUND TO A 1/16" INCH RADIUS. THREADED RODS SHALL CONFORM TO THE REQUIREMENTS OF 714.04. THE "WELDED STUD ANCHOR PLATE" AND WELDED STUDS MAY BE SUPPLIED WITHOUT GALVANIZING OR METALIZING.
6. THE 4"x8"x1/2" ANGLES MAY BE FURNISHED AS ONE CONTINUOUS PIECE OR SPLICED AS SHOWN IN THE FIELD SPLICE DETAIL WHEN SPECIFIED. THE 1¼"x5½" BARS EACH SIDE OF THE JOINT SHALL BE PROVIDED IN TWO EQUAL LENGTHS.
7. PROJECTING THREADS OF THE 3/4" ø BOLTS IN THE JOINT SHALL BE GREASED BY THE CONTRACTOR PRIOR TO PLACING ADJACENT CONCRETE. THIS WILL FACILITATE BOLT REMOVAL IF REQUIRED IN THE FUTURE.
8. FILL COUNTERBORED HOLES WITH HOT POURED JOINT SEALER (STD. SPEC. 707.04) AFTER BOLT INSTALLATION. PAYMENT FOR THE WORK SHALL BE INCIDENTAL TO ITEM 516.11 "BRIDGE EXPANSION JOINT, VERMONT".
9. THE EXPANSION JOINT, INCLUDING THE FABRIC TROUGH, SHALL BE SHOP ASSEMBLED AND SHIPPED AS ONE UNIT. IF THE EXPANSION JOINT HAS A FIELD SPLICE SPECIFIED, THE FABRIC TROUGH SHALL BE SHIPPED WITH ONE UNIT AND ASSEMBLED WITH THE SECOND UNIT PRIOR TO CONCRETE PLACEMENT.
10. TEMPORARY SHIPPING ATTACHMENTS SHALL BE ATTACHED BY BOLTING; WELDING WILL NOT BE PERMITTED.
11. BARE DECK "RISER PLATE" AS SHOWN IN "TYPICAL SECTION AT GIRDERS" DRAWING SHALL BE INCLUDED ON BRIDGES WITH BARE CONCRETE DECK SPECIFIED. RISER PLATES SHALL BE INCLUDED FOR BOTH SIDES AND MATCH THE LENGTHS OF THE 1¼"x5½" BARS. THE RISER PLATE CAN BE REMOVED IF THE DECK IS MILLED IN THE FUTURE.



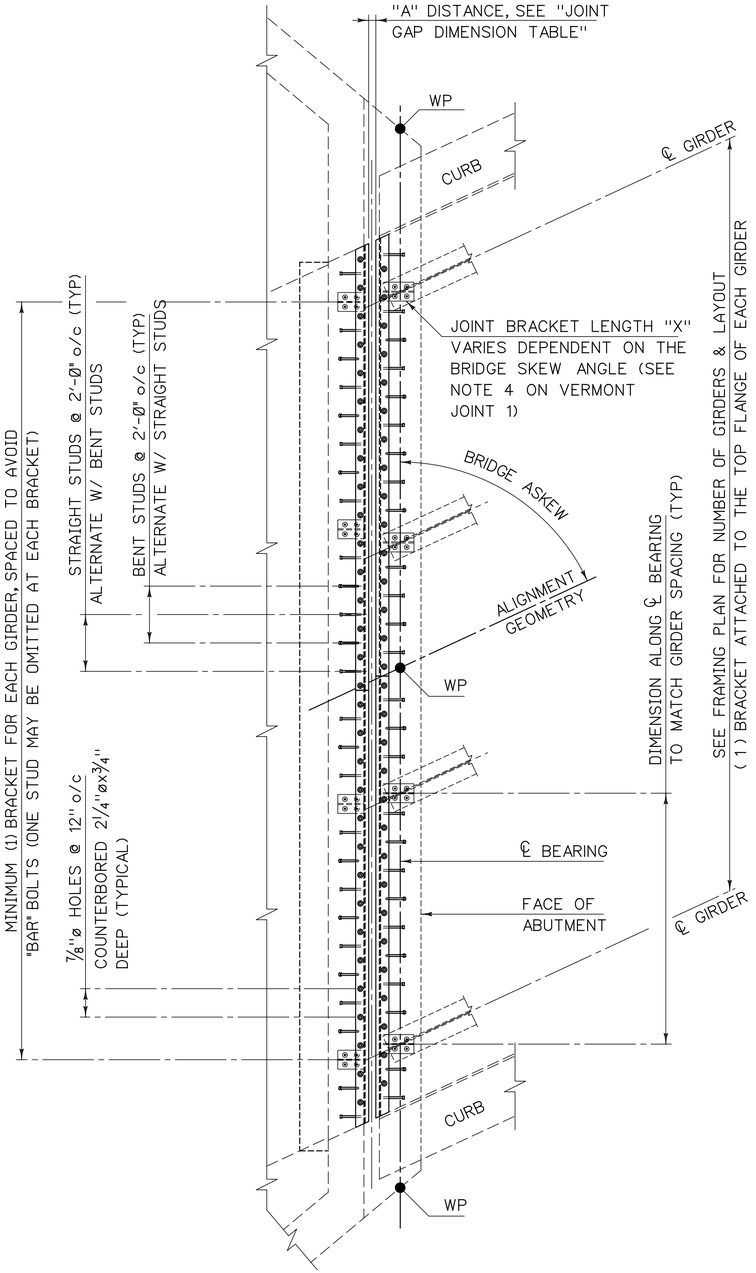
FIELD SPLICE DETAIL

SPLICE ONLY WHEN SPECIFIED ON PLANS.

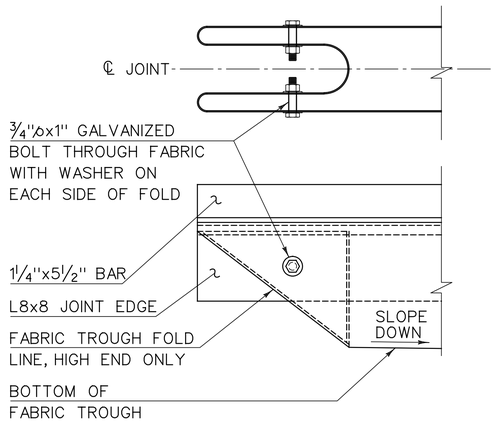


SECTION "B-B"

PROJECT NAME: WESTMINSTER	
PROJECT NUMBER: BF 0126(13)	
FILE NAME: z12j668VermontJoint.dgn	PLOT DATE: 10/14/2021
PROJECT LEADER: C. BAKER	DRAWN BY: VTRANS
DESIGNED BY: VTRANS	CHECKED BY: VTRANS
VERMONT JOINT 1	SHEET 25 OF 51



EXPANSION JOINT PLAN



FOLDED TROUGH END DETAIL

SCALE 1 ½" = 1'-Ø"

1. TROUGH SHALL BE FOLDED AT HIGH ENDS. TROUGH SHALL SLOPE AT MIN 2% DOWN TOWARD THE NEAREST DRAINAGE SPOUT HOPPER LOCATION.

2. BOLTS, NUTS AND WASHERS FOR FOLD SHALL MEET REQUIREMENTS OF SUBSECTION 714.Ø4 AND SHALL BE GALVANIZED.

JOINT GAP DIMENSION TABLE

Temp (°F)	"A" Distance (in) Expansion Length (ft)				
	100 - 120	>120 - 140	>140 - 160	>160 - 180	>180 - 200
0	1 5/8	1 13/16	1 7/8	1 15/16	2 1/8
15	1 1/2	1 5/8	1 11/16	1 3/4	1 7/8
30	1 5/16	1 1/2	1 1/2	1 1/2	1 5/8
45	1 3/16	1 5/16	1 5/16	1 5/16	1 7/16
60	1 1/16	1 1/8	1 1/8	1 1/16	1 3/16
75	15/16	1	15/16	7/8	15/16
90	3/4	13/16	3/4	11/16	11/16
105	5/8	11/16	9/16	7/16	1/2

1) Expansion Length: Length of span, from Expansion Joint to nearest Fixed Bearing.
2) "A" Distance: measured distance during joint placement.
3) Temp: Approximate temperature of steel during joint placement.

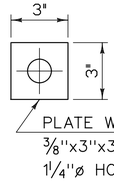
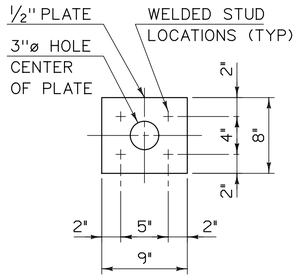


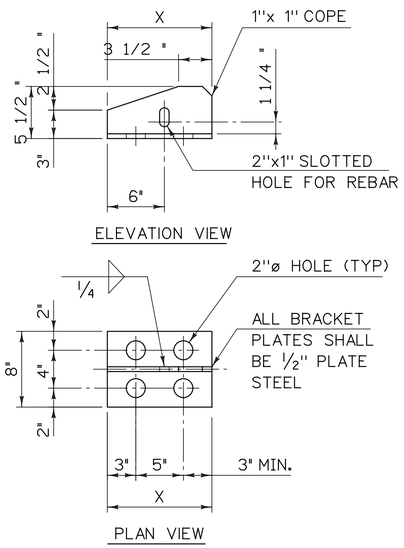
PLATE WASHER DETAIL

SCALE 3" = 1'-Ø"



WELDED STUD ANCHOR PLATE DETAIL

SCALE 1½" = 1'-Ø"



BRACKET DETAILS

SCALE 1½" = 1'-Ø"

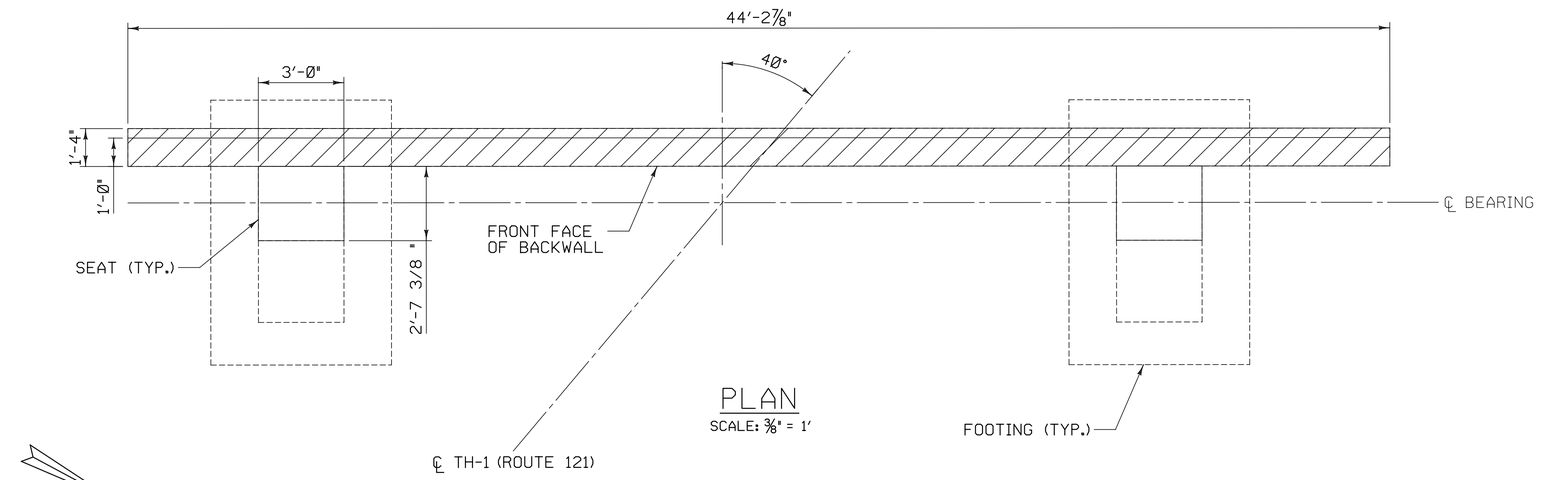
JOINT ASSEMBLY DETAIL

SCALE 3" = 1'-Ø"

PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

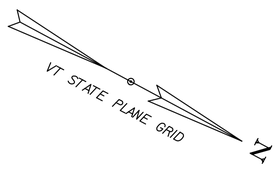
FILE NAME: z12j668VermontJoint.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: VTRANS
VERMONT JOINT 2

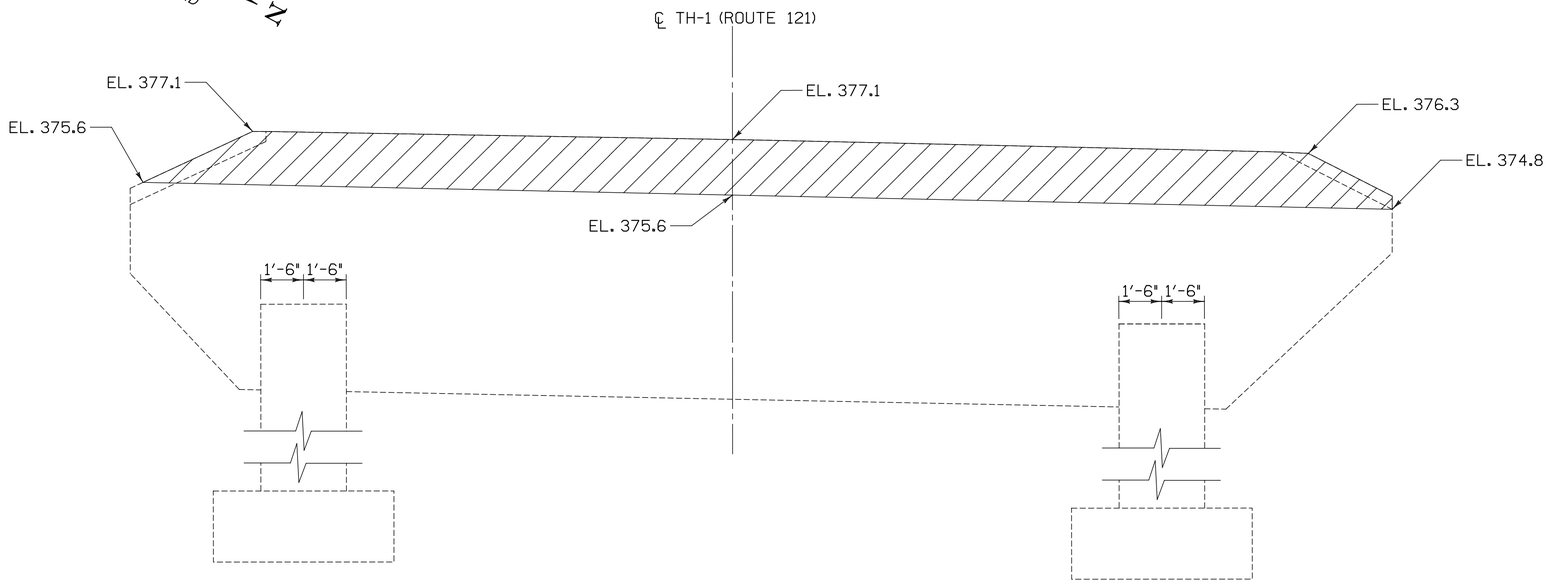
PLOT DATE: 10/14/2021
DRAWN BY: VTRANS
CHECKED BY: VTRANS
SHEET 26 OF 51



PLAN

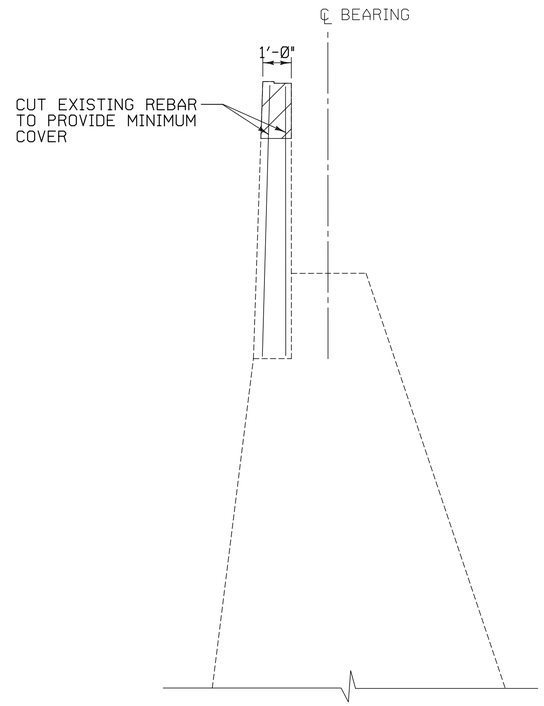
SCALE: ⅜" = 1'





ELEVATION

SCALE: ⅜" = 1'



TYPICAL SECTION

SCALE: ⅜" = 1'

LEGEND/KEY:

CONCRETE REMOVAL

NOTES:

1. CONCRETE REMOVAL PAID UNDER ITEM 529.20
2. ALL REINFORCING STEEL TO BE CUT TO PROVIDE MINIMUM COVER

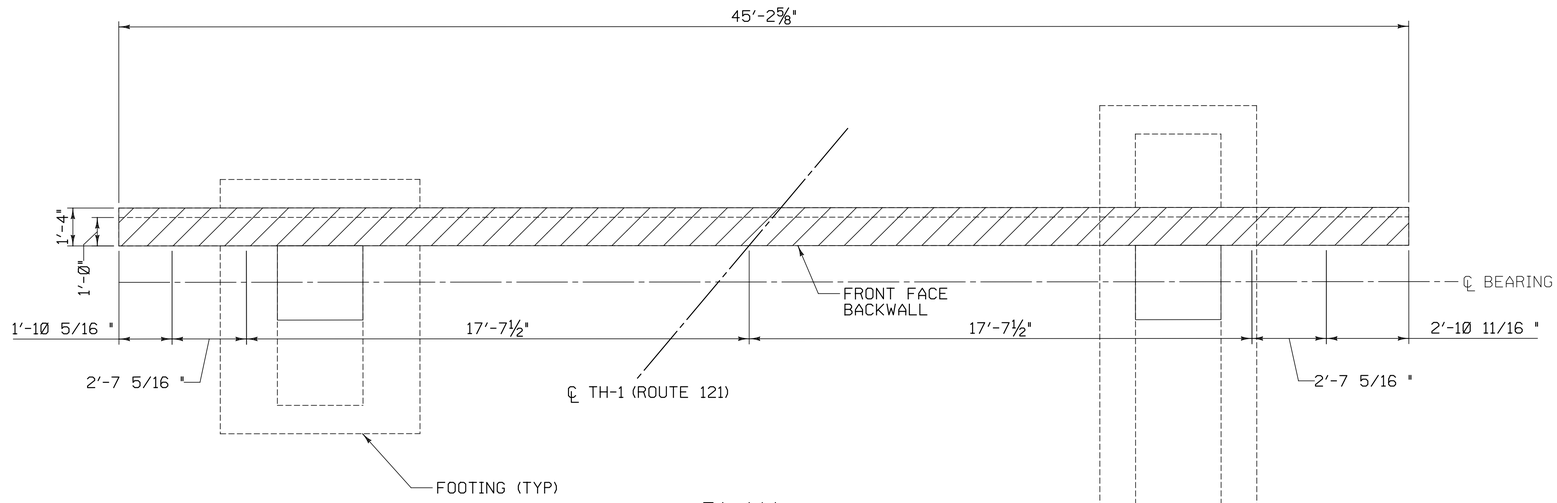
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

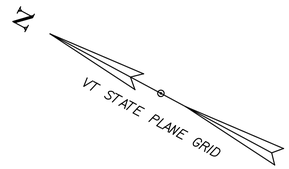
FILE NAME: z12j668sub.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. SMITH
ABUTMENT 1 REMOVAL

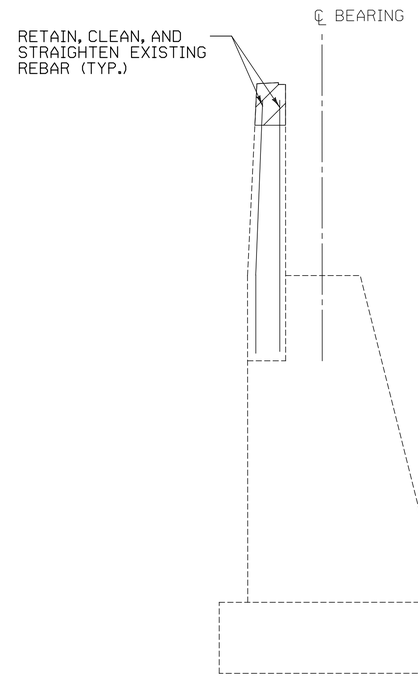
PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: S. BROWN
SHEET 27 OF 51



PLAN

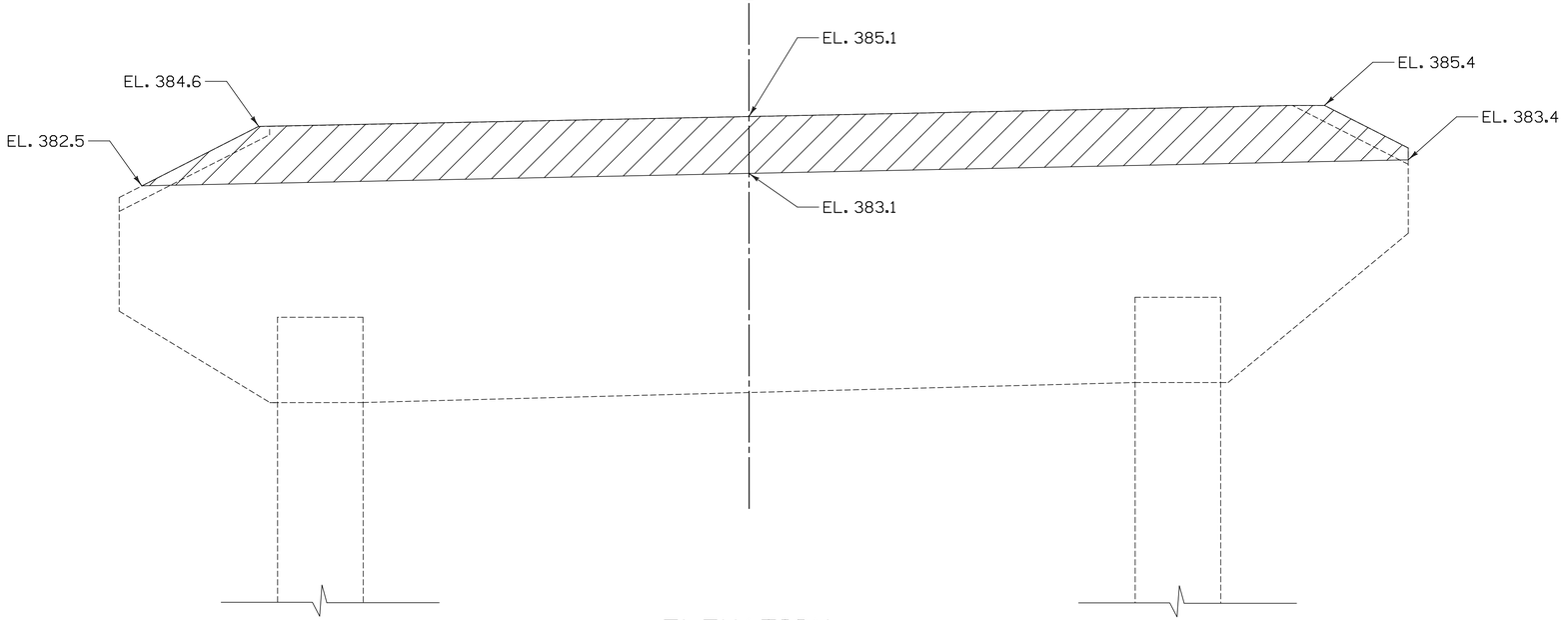
SCALE: ⅜" = 1'





TYPICAL SECTION

SCALE: ⅜" = 1'



ELEVATION

SCALE: ⅜" = 1'

LEGEND/KEY:

CONCRETE REMOVAL

NOTES:

1. CONCRETE REMOVAL PAID UNDER ITEM 529.20
2. ALL REINFORCING STEEL RETAINED, CLEANED, AND STRAIGHTENED UNLESS APPROVED BY ENGINEER.

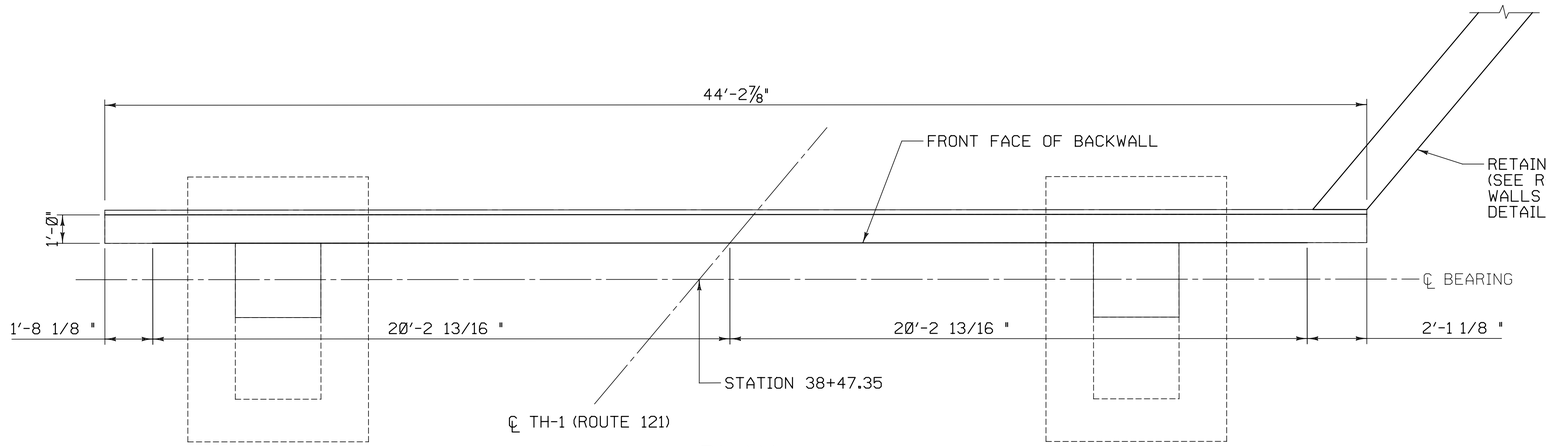
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

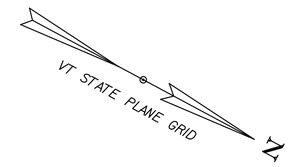
FILE NAME: z12j668sub.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. SMITH
ABUTMENT 2 REMOVAL

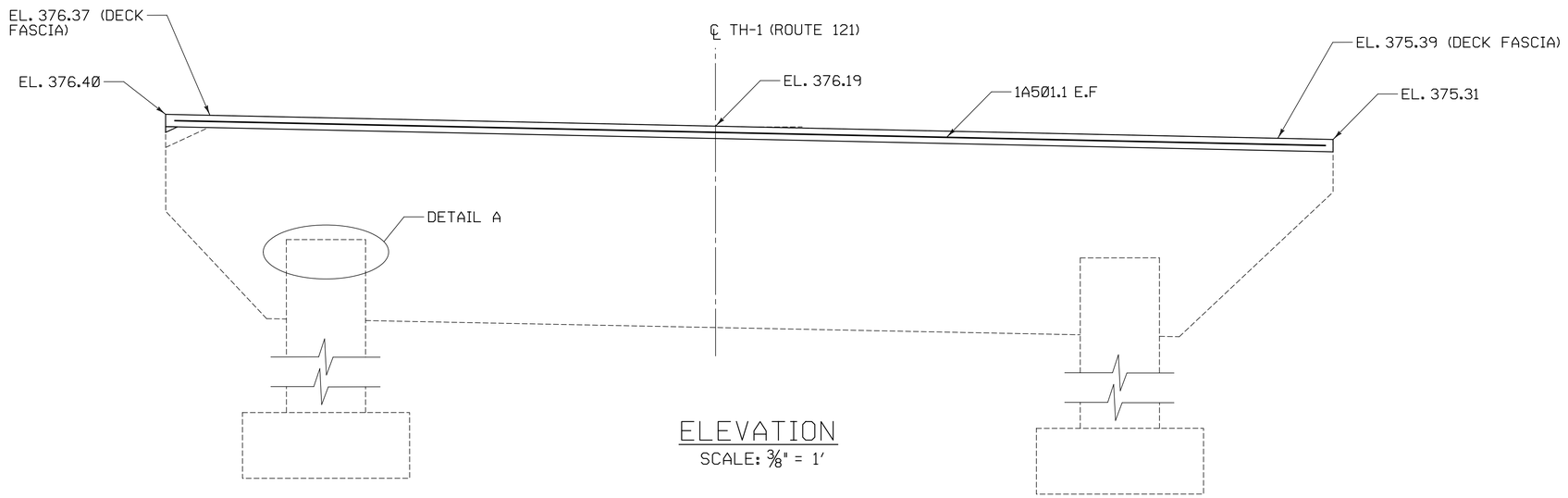
PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: S. BROWN
SHEET 28 OF 51



PLAN

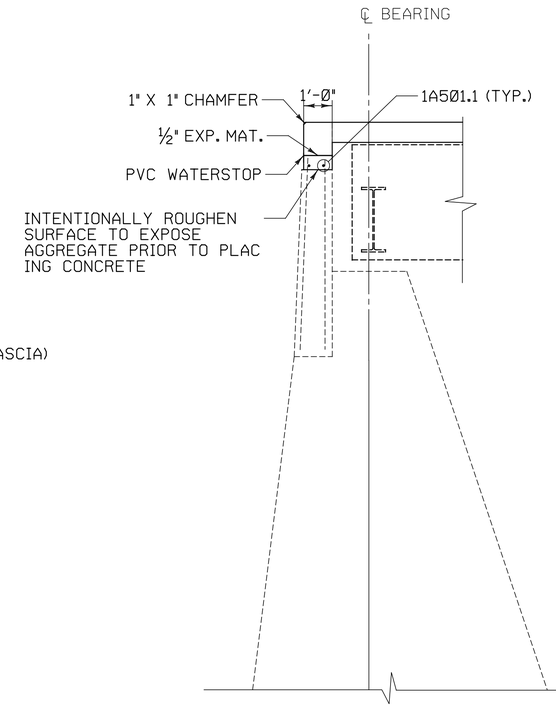
SCALE: 3/8" = 1'





ELEVATION

SCALE: 3/8" = 1'

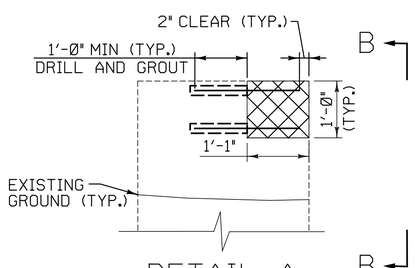


TYPICAL SECTION

SCALE: 3/8" = 1'

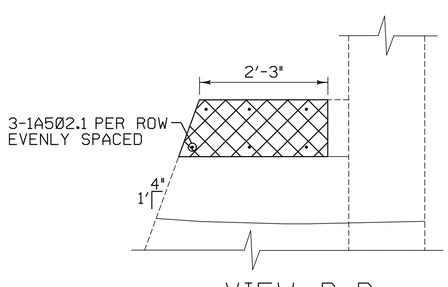
LEGEND

⊠ GIRDER BEARING SEAT SPALL AREA



DETAIL A

SCALE: 1/2 " = 1'



VIEW B-B

SCALE: 1/2 " = 1'

NOTE:

1. ALL ELEVATIONS ARE THE FRONT FACE OF BACKWALL.
2. GIRDER BEARING AND SWEDGE BOLTS NOT SHOWN FOR CLARITY.
3. CONCRETE USED TO REPAIR THE GIRDER BEARING SEAT SHALL BE PAID FOR UNDER ITEM 580.13, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS 1".

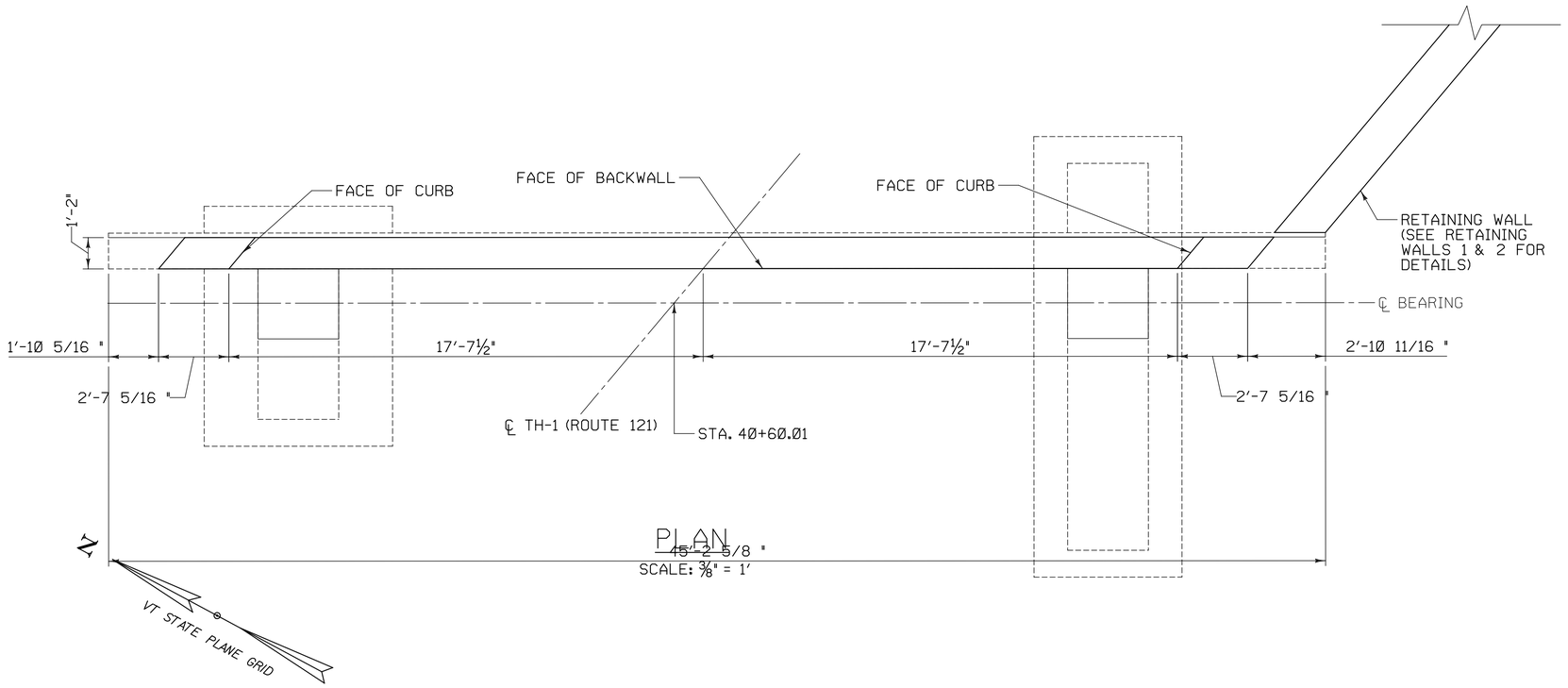
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

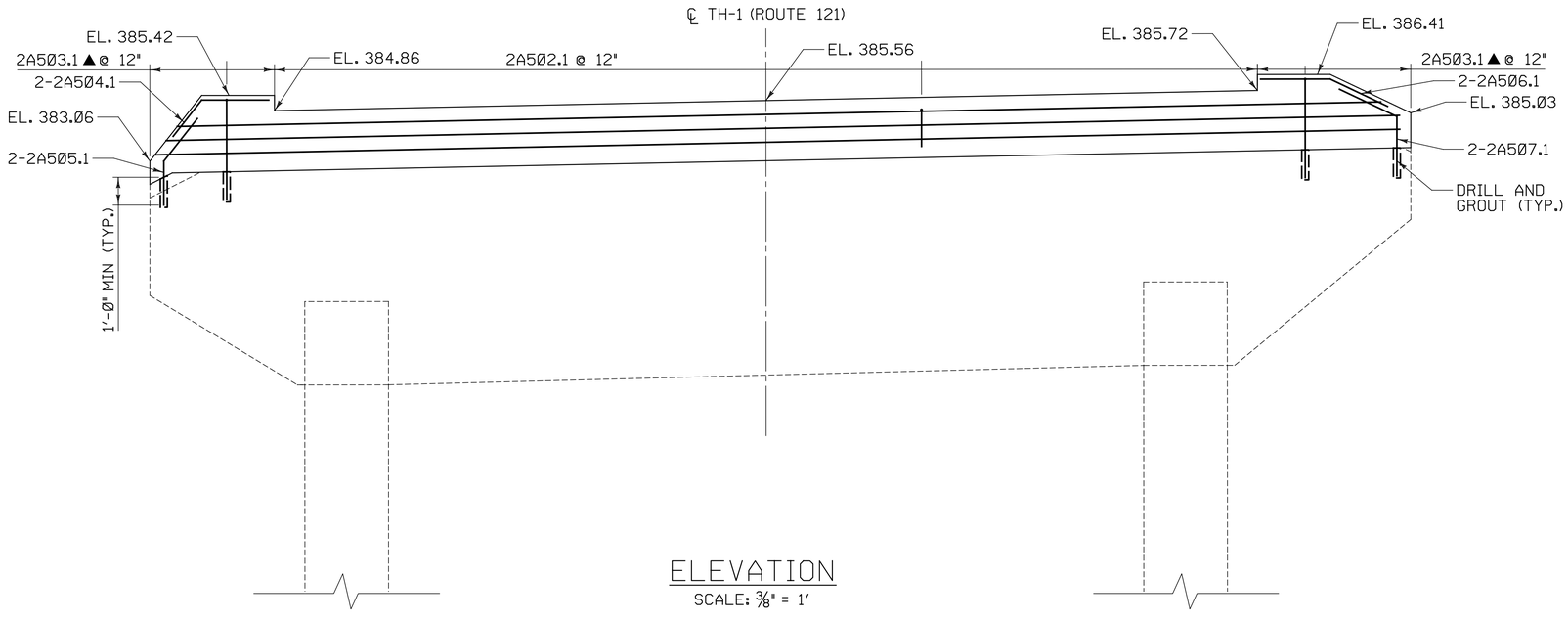
FILE NAME: z12j668sub.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. SMITH
ABUTMENT 1 MODIFICATIONS

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: S. BROWN
SHEET 29 OF 51



PLAN

SCALE: ⅜" = 1'

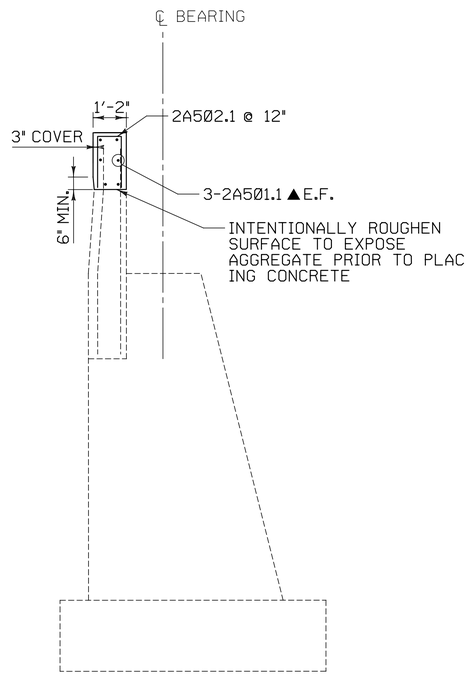


ELEVATION

SCALE: ⅜" = 1'

LEGEND

▲ DENOTES CUT IN FIELD



TYPICAL SECTION

SCALE: ⅜" = 1'

NOTES:

1. ALL ELEVATIONS ARE AT THE FRONT FACE OF BACKWALL.

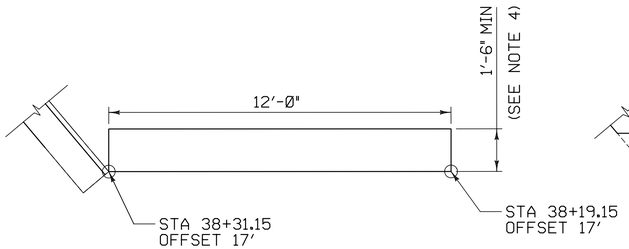
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

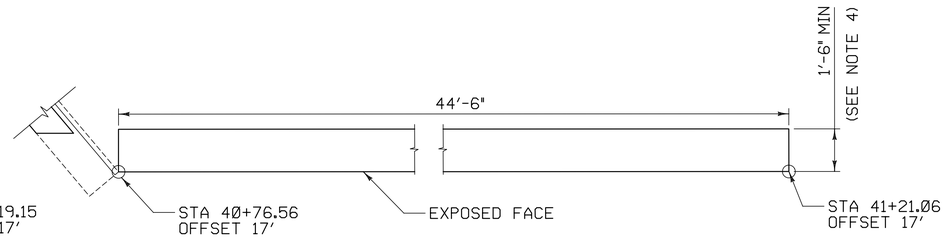
FILE NAME: z12j668sub.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. SMITH
ABUTMENT 2 MODIFICATIONS

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: S. BROWN
SHEET 30 OF 51



ABUTMENT 1 RETAINING WALL PLAN

SCALE: 3/8" = 1'



ABUTMENT 2 RETAINING WALL PLAN

SCALE: 3/8" = 1'

NOTES:

1. FOUNDATION DESIGN VALUES GIVEN IN THESE NOTES ARE PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 9TH EDITION.

2. THE FOLLOWING SOIL PROPERTIES SHALL BE USED IN THE DESIGN OF THE RETAINING WALLS:

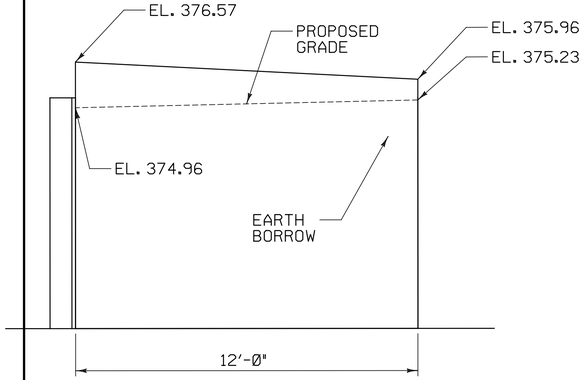
   A. FOUNDATION BEARING DESIGN VALUES:
   FACTORED BEARING RESISTANCE (Phi=0.45)= 6KSF

   B. FOUNDATION SOIL PARAMETERS
   UNIT WEIGHT: 120 PCF
   FRICTION ANGLE: 32 DEG

   C. BACKFILL SOIL PARAMETERS
   UNIT WEIGHT: 120 PCF
   FRICTION ANGLE: 34 DEG

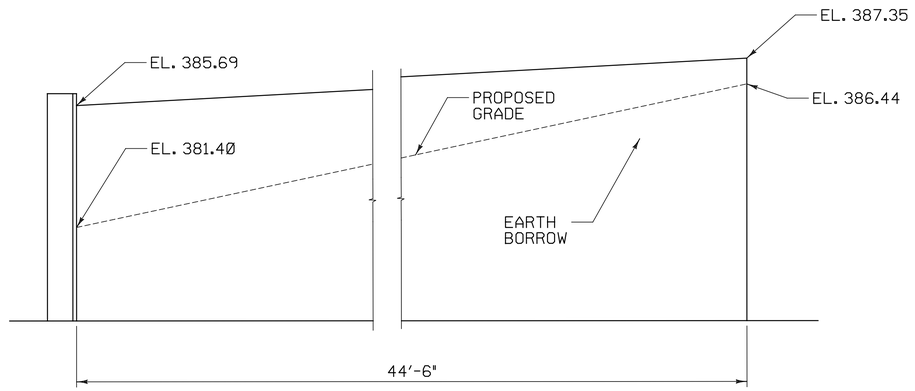
3. THE INTERFACE BETWEEN THE RETAINING WALL AND THE ABUTMENT CAP SHALL BE DESIGNED TO ALLOW 0.5 INCHES OF MOVEMENT. A JOINT DETAIL SHALL BE SUBMITTED FOR REVIEW AND APPROVAL. JOINT SHALL PROVIDE A FLEXIBLE WATER TIGHT SEAL IN ORDER TO PREVENT MIGRATION OF BACKFILL MATERIAL THROUGH THE JOINT. ALL COMPONENTS WILL BE INCLUDED IN THE UNIT PRICE FOR ITEM 900.670. "SPECIAL PROVISION (CONCRETE RETAINING WALL)." DIMENSIONS AND STATIONS SHOWN INCLUDE AN ASSUMED JOINT THICKNESS OF 3/4". IF A DIFFERENT THICKNESS IS USED THE GEOMETRY WILL NEED TO BE MODIFIED BY THE CONTRACTOR.

4. DIMENSION ARE BASED ON A RETAINING WALL THICKNESS OF 1'-6" (MIN). IF A DIFFERENT THICKNESS IS USED, GEOMETRY WILL NEED TO BE MODIFIED BY THE CONTRACTOR.



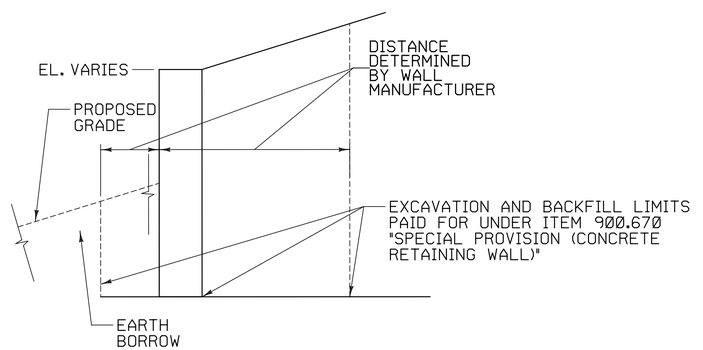
ABUTMENT 1 RETAINING WALL ELEVATION

SCALE: 3/8" = 1'



ABUTMENT 2 RETAINING WALL ELEVATION

SCALE: 3/8" = 1'



TYPICAL SECTION

SCALE: 3/8" = 1'

Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668sub.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K.SMITH
RETAINING WALLS 1 & 2

PLOT DATE: 10/14/2021
DRAWN BY: C. SCHWARTZ
CHECKED BY: S. BROWN
SHEET 31 OF 51

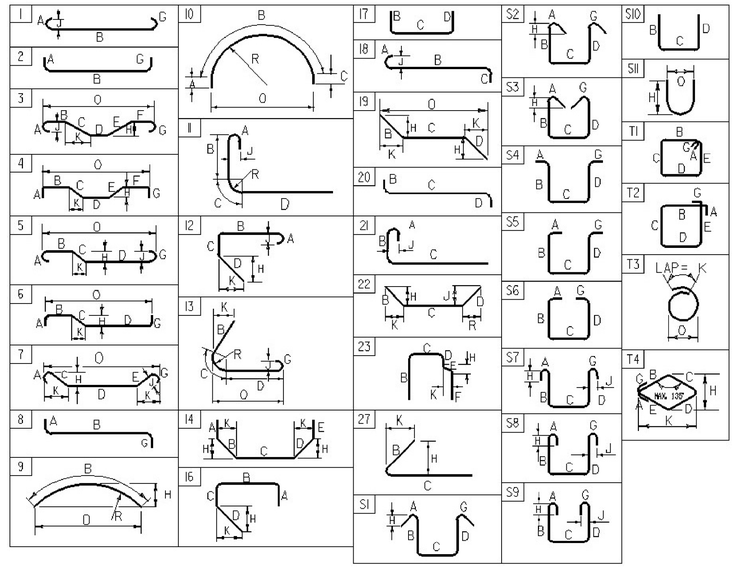
STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	DECK																
▲	874	5	30'- 6"	S501.2	STR												
	6	5	40'- 9"	S502.2	STR												
	738	5	38'- 4"	S503.2	STR												
	64	6	52'- 0"	S601.2	STR												
	606	5	4'- 10"	S510.2	S5	0'- 10"	0'- 10"	1'- 6"	0'- 10"			0'- 10"					
	32	5	5'- 8"	S511.2	S5	3'- 6"	0'- 10"	0'- 8"	0'- 8"			---					
△	26	5	3'- 7"	S512.2	1	0'- 7"	3'- 0"					---		0'- 5"			
△	876	6	6'- 10"	S602.2	1	0'- 8"	6'- 2"					---		0'- 6"			
	ABUTMENT 1																
▲	2	5	43'- 9"	1A501.1	STR												
	6	5	1'- 11"	1A502.1	STR												
	ABUTMENT 2																
	6	5	44'- 9"	2A501.1	STR												
			0'- 0"														
	37	5	5'- 0"	2A502.1	S10		2'- 2"	0'- 8"	2'- 2"								
△ ▲	15	5	7'- 10"	2A503.1	S10		3'- 7"	0'- 8"	3'- 7"								
	2	5	3'- 7"	2A504.1	19	---	1'- 6"	2'- 1"	---				1'- 2"		0'- 11"		
	2	5	3'- 6"	2A505.1	19	---	2'- 0"	1'- 6"	---				1'- 3"		1'- 7"		
	2	5	3'- 7"	2A506.1	19	---	1'- 6"	2'- 1"	---				0'- 8"		1'- 4"		
	2	5	3'- 6"	2A507.1	19	---	2'- 0"	1'- 6"	---				1'- 10"		0'- 10"		

~ 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

#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

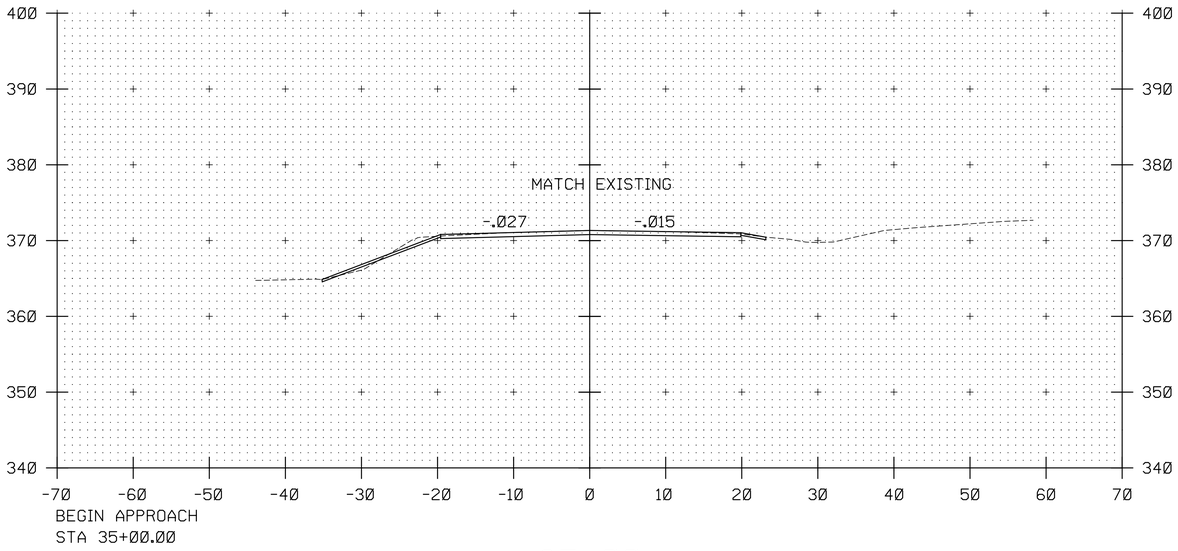
~ REINFORCING STEEL CORROSION RESISTANCE LEVEL ~

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.

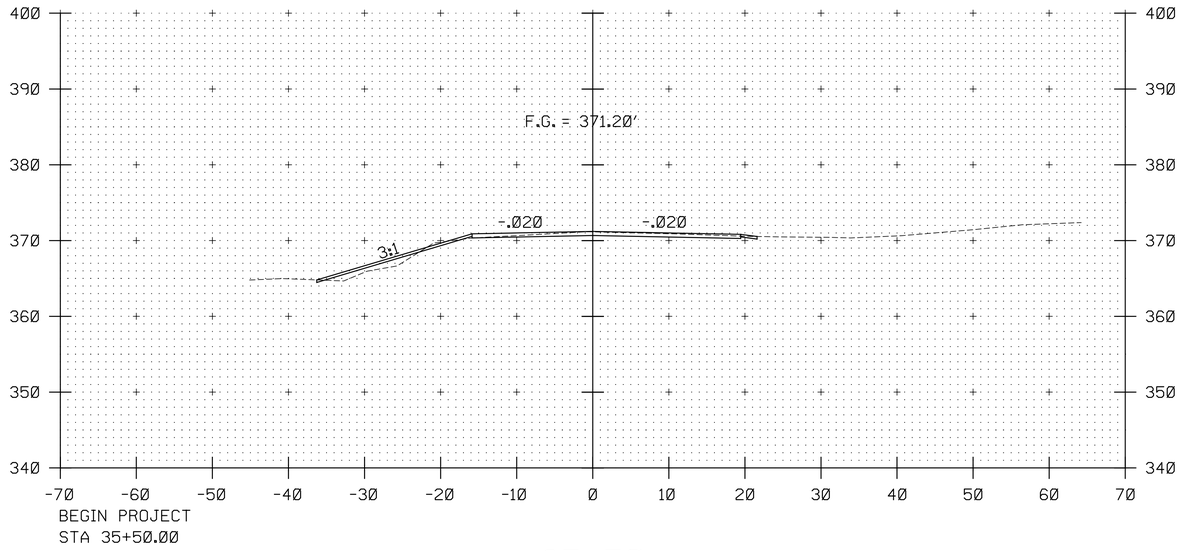
PROJECT NAME: **WESTMINSTER**
PROJECT NUMBER: **BF 0126(13)**

FILE NAME: **z12j668BarSchedule.dgn**
PROJECT MANAGER: **C. BAKER**
DESIGNED BY: **K. SMITH**
REINFORCING STEEL SCHEDULE SHEET

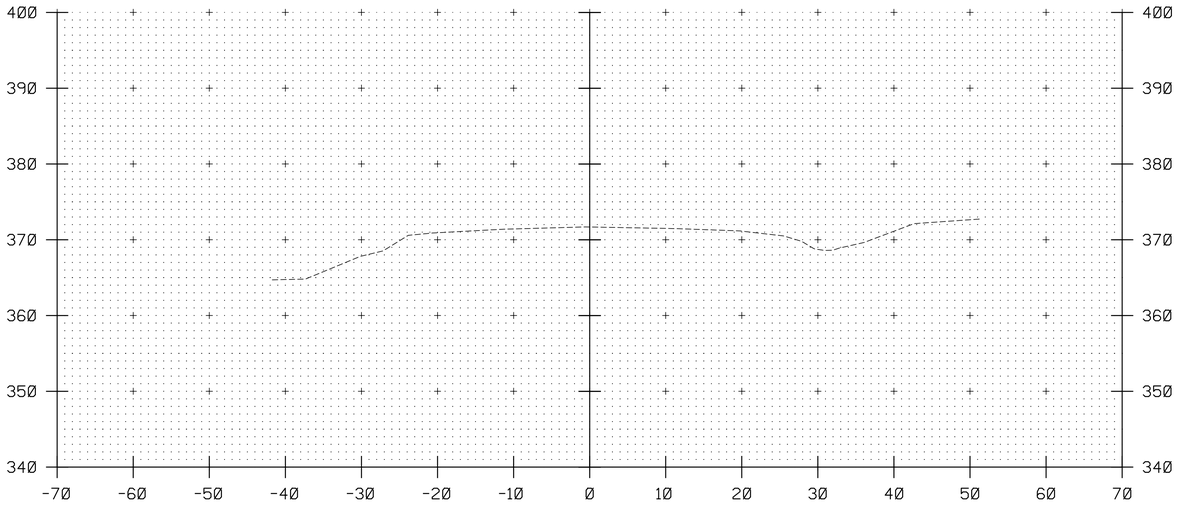
PLOT DATE: **10/15/2021**
DRAWN BY: **C. SCHWARTZ**
CHECKED BY: **S. BROWN**
SHEET 32 OF 51



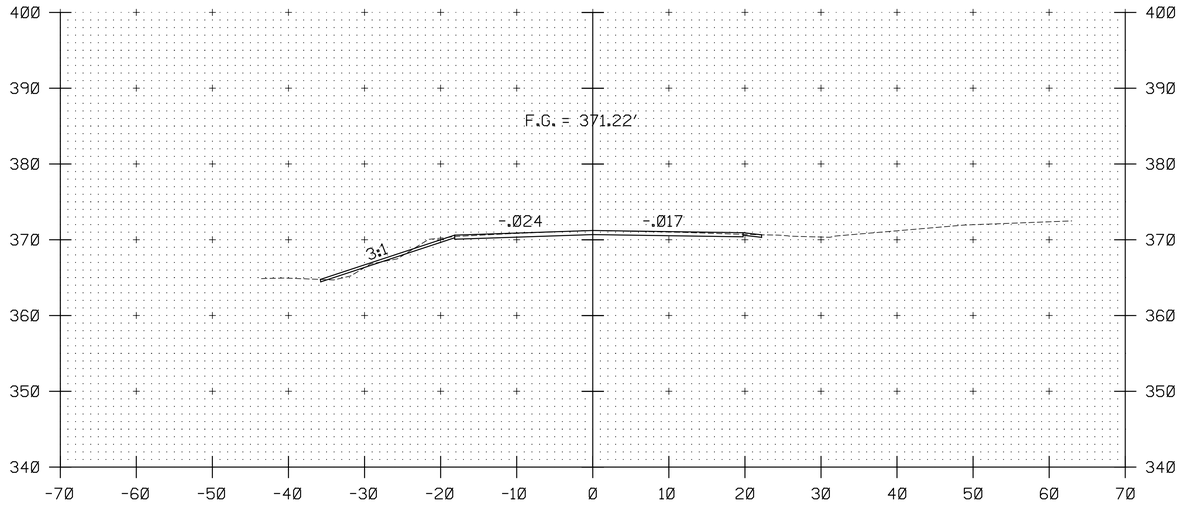
35+00



35+50



34+75



35+25

STA.34+75 TO STA.35+50

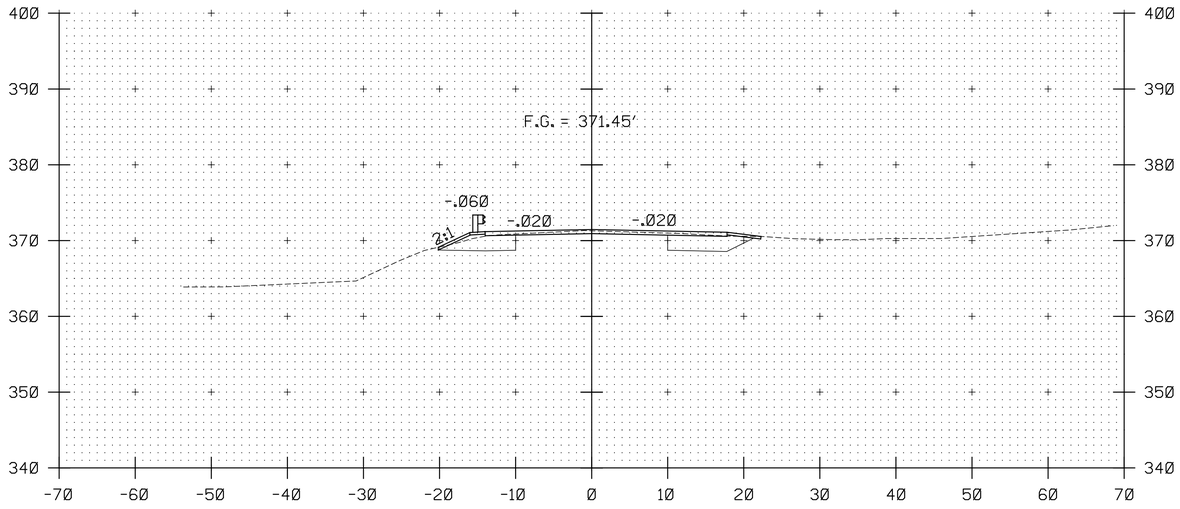
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

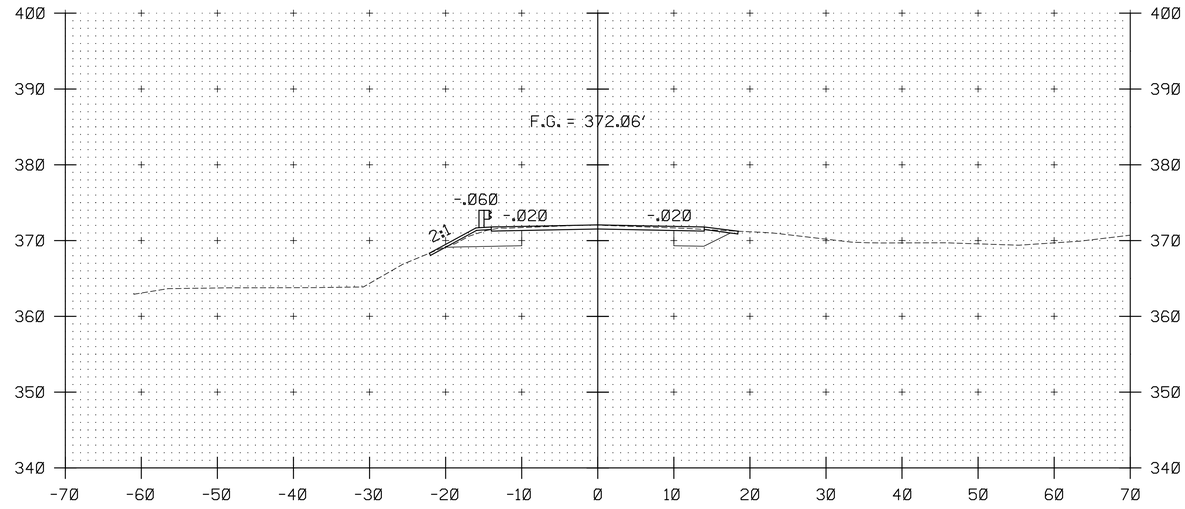
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 1

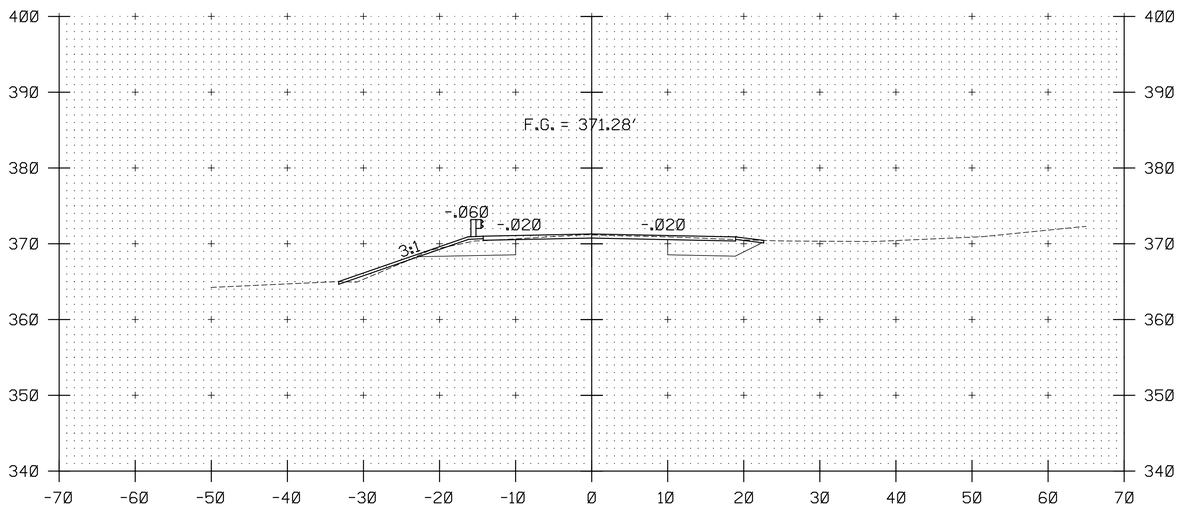
PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 33 OF 51



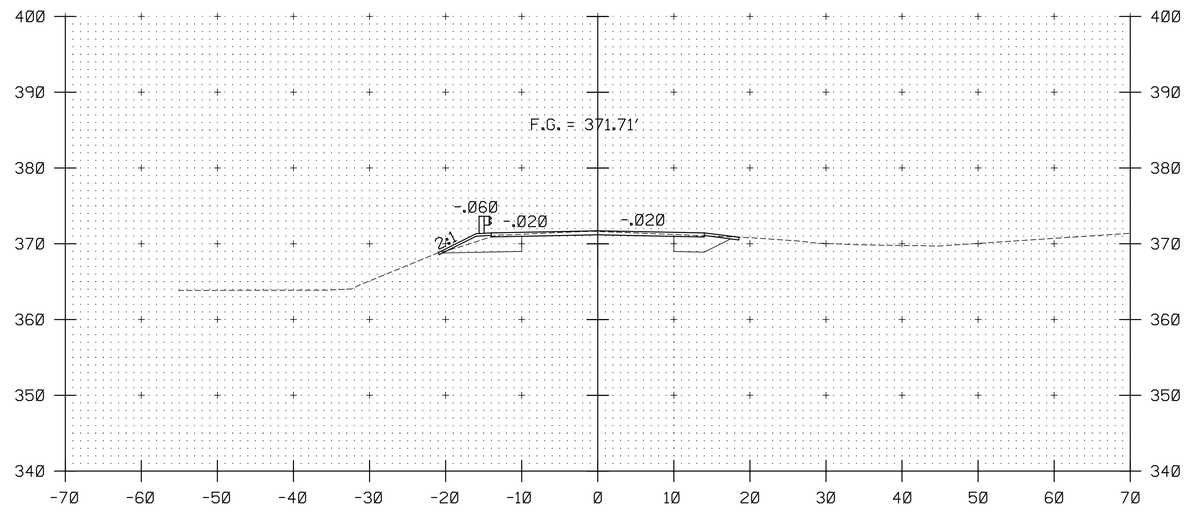
36+00



36+50



35+75



36+25

STA.35+75 TO STA.36+50

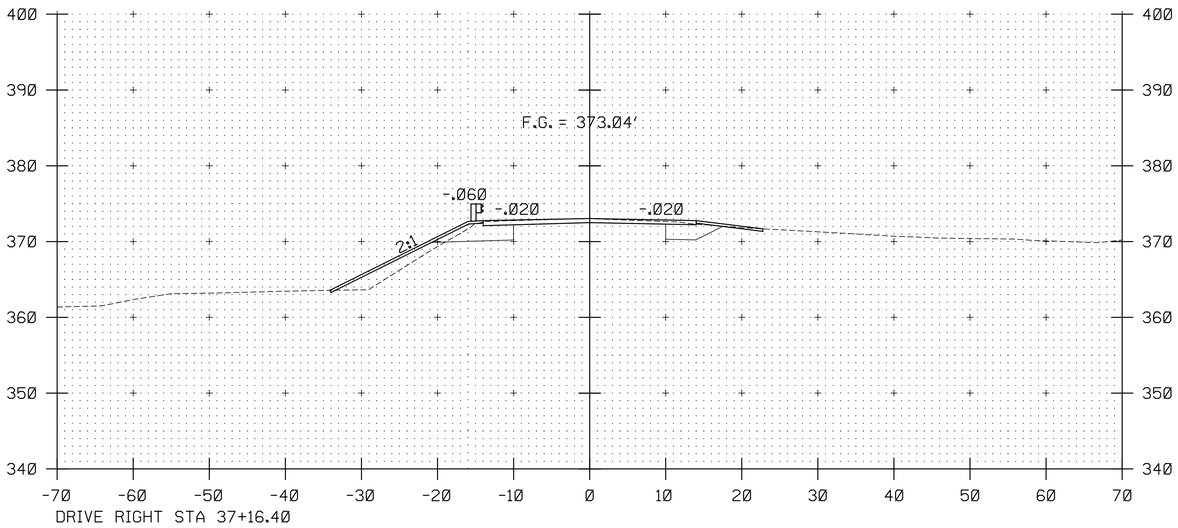
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

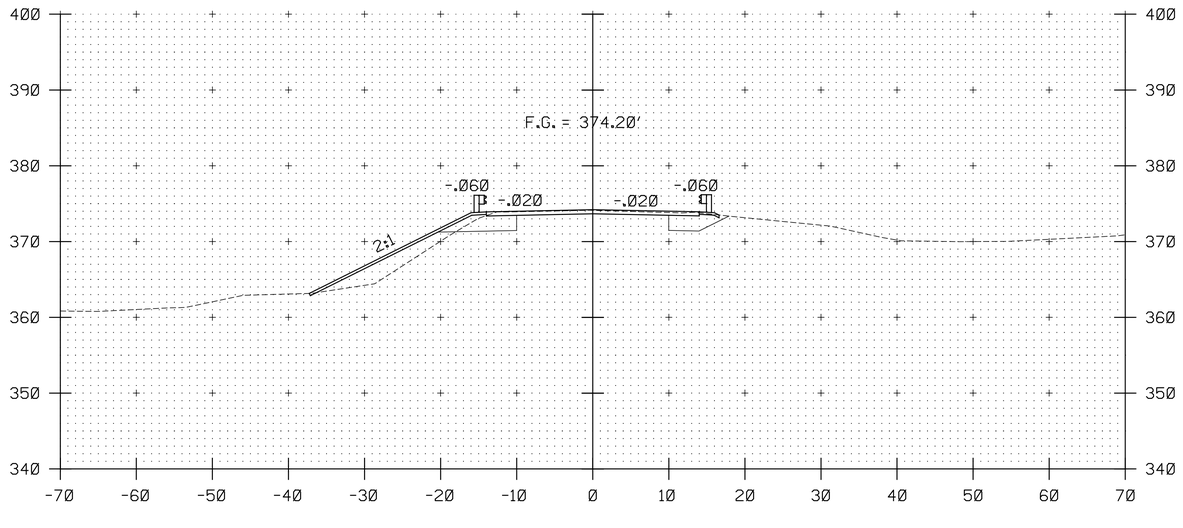
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 2

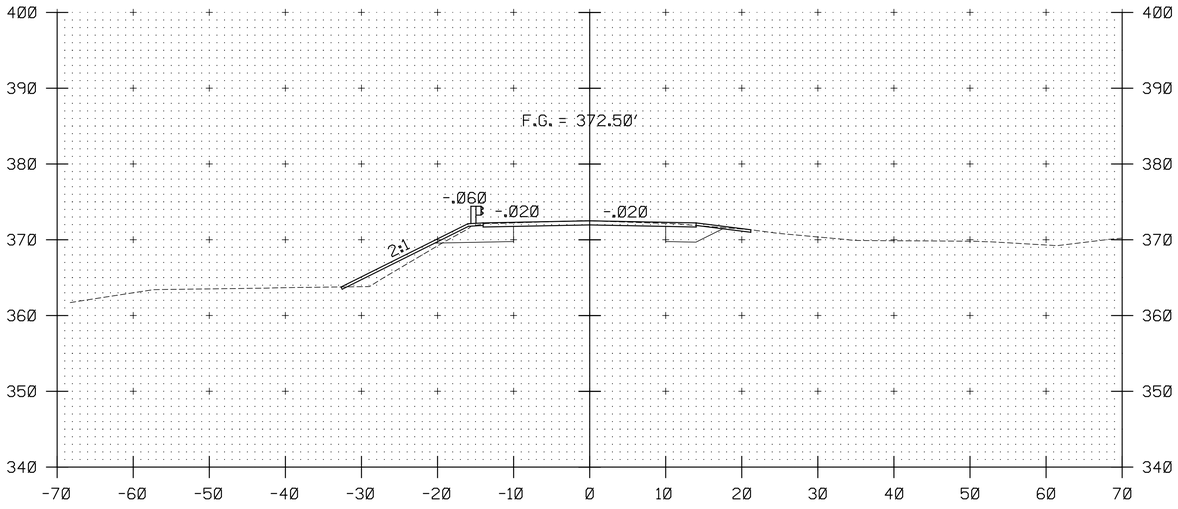
PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 34 OF 51



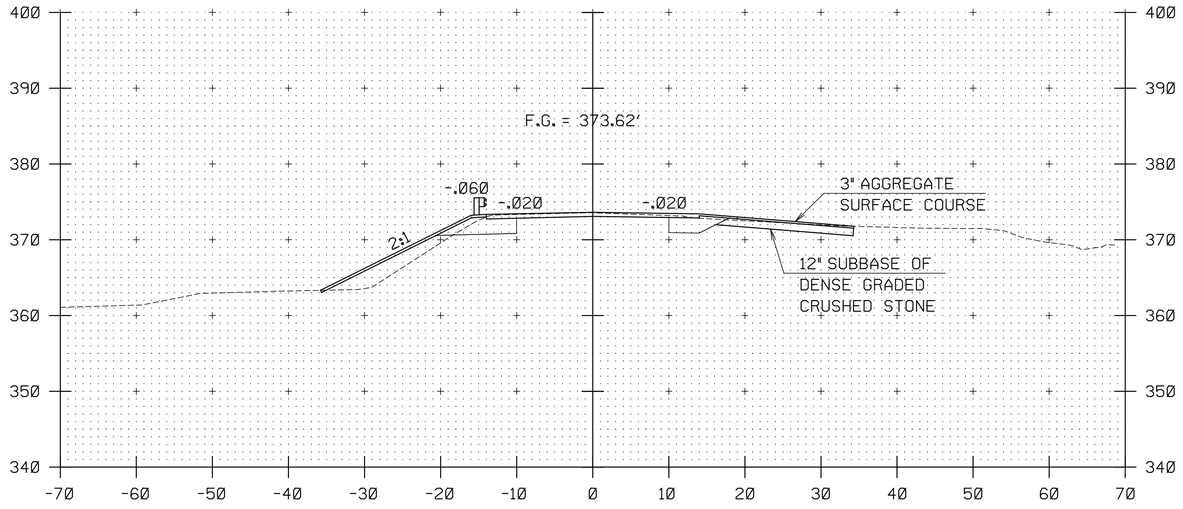
37+00



37+50



36+75



37+25

STA.36+75 TO STA.37+50

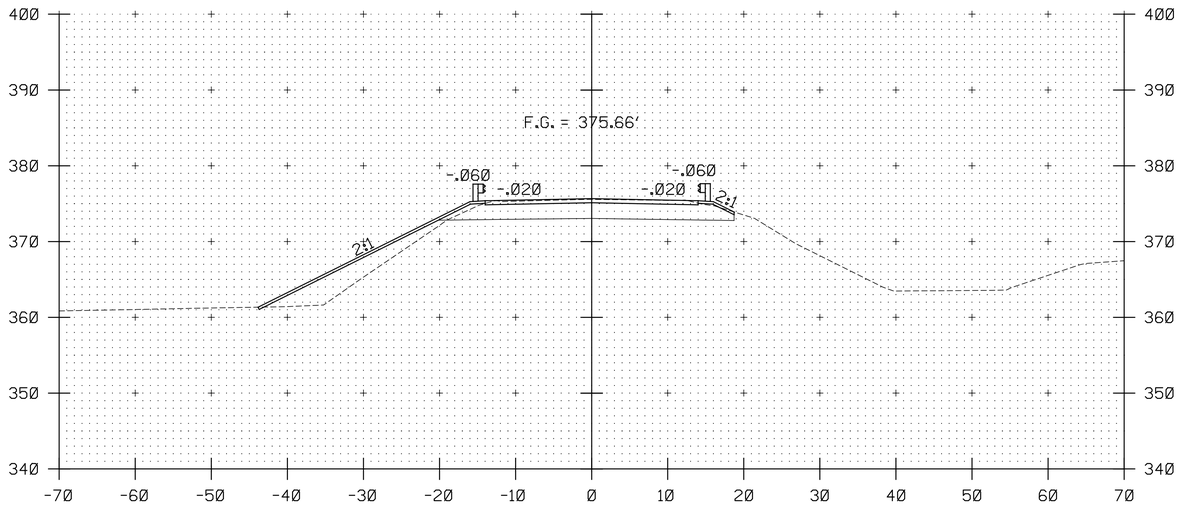
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

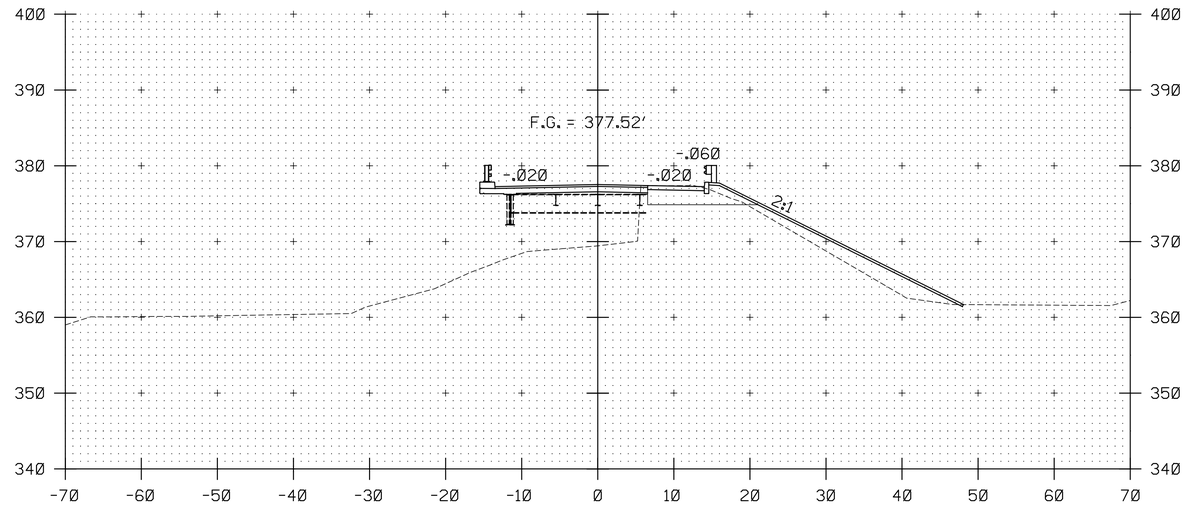
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 3

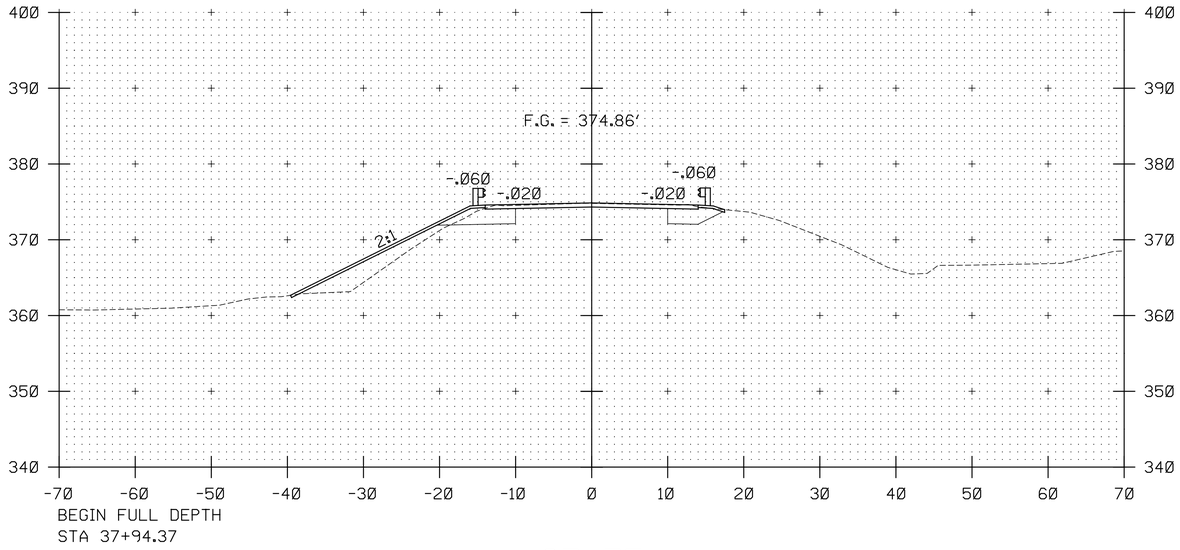
PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 35 OF 51



38+00



38+50



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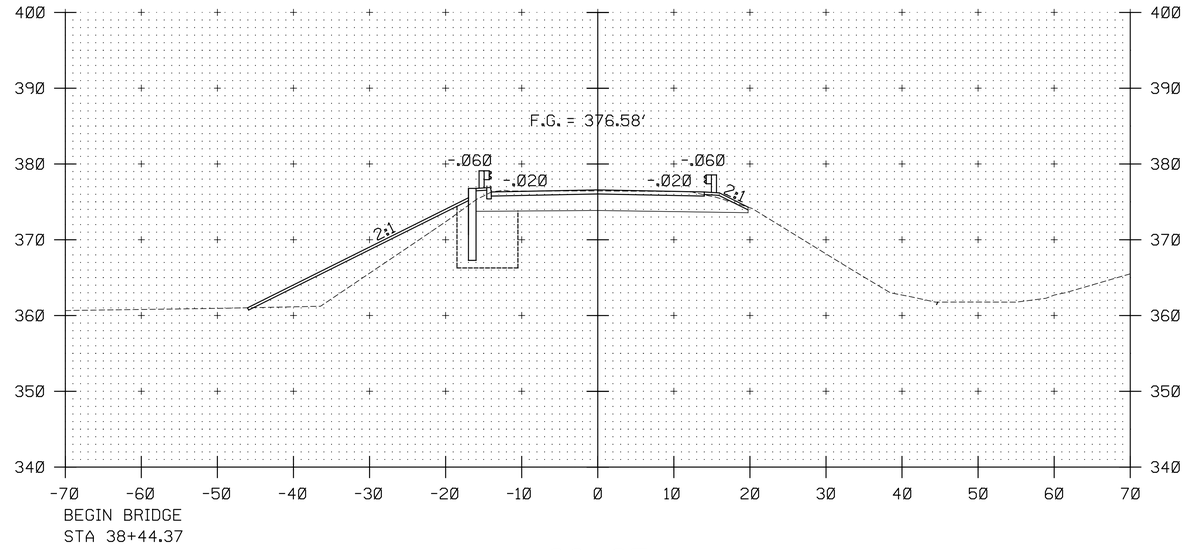


38+25

STA.37+75 TO STA.38+50

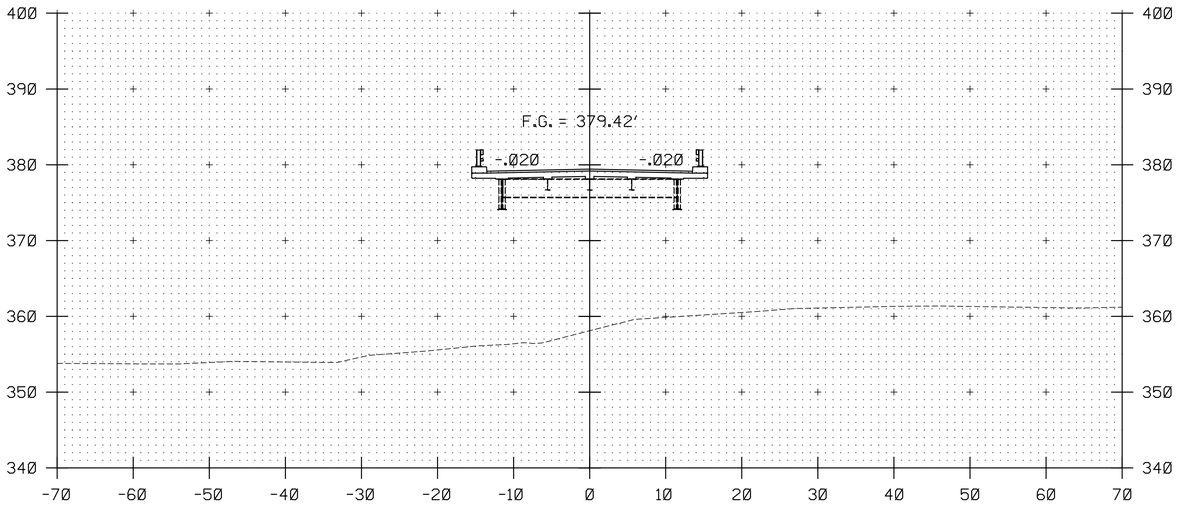
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

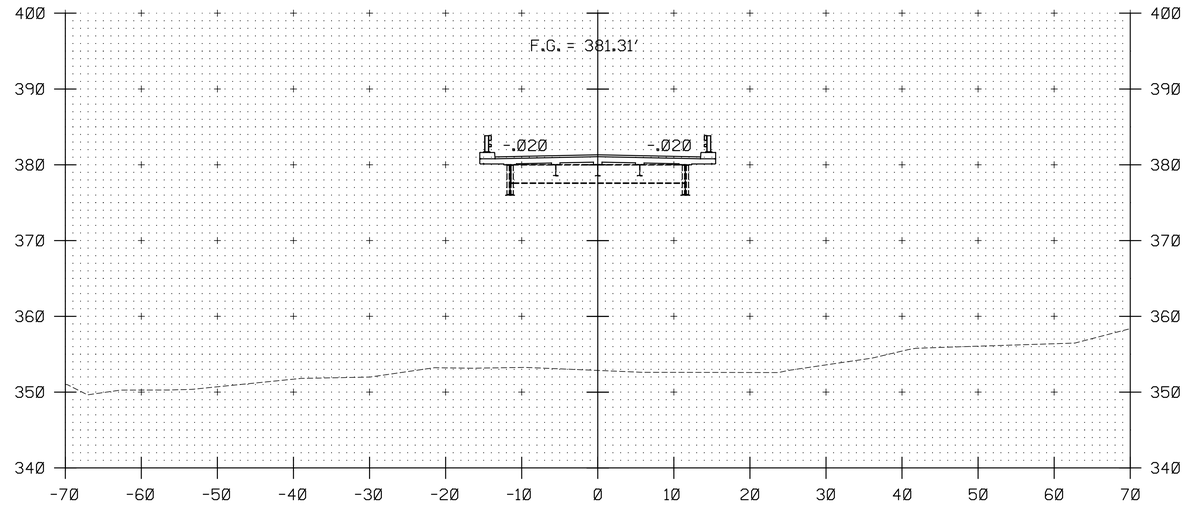
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 4

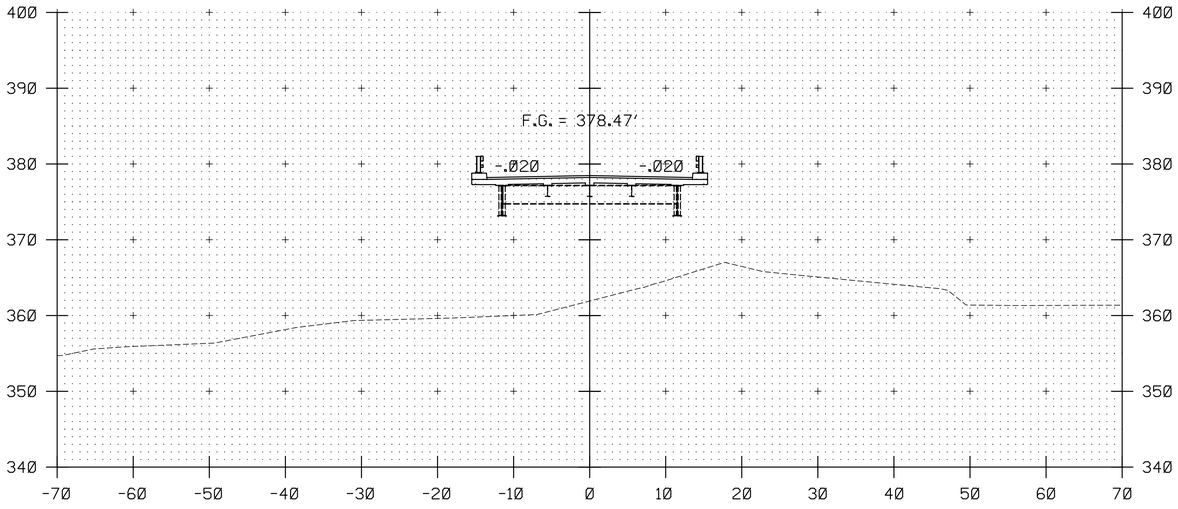
PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 36 OF 51



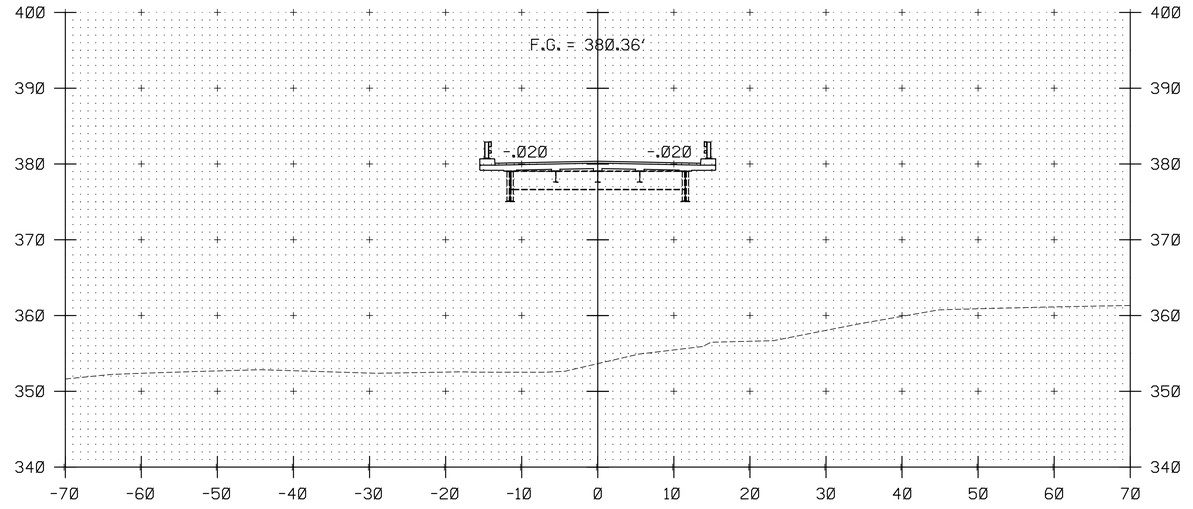
39+00



39+50



38+75



39+25

STA.38+75 TO STA.39+50

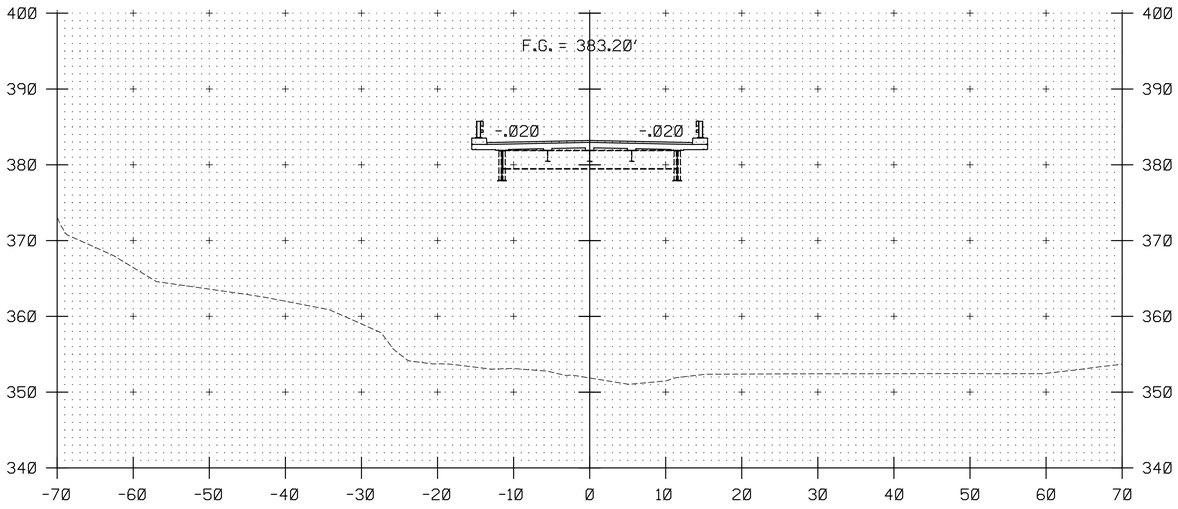
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

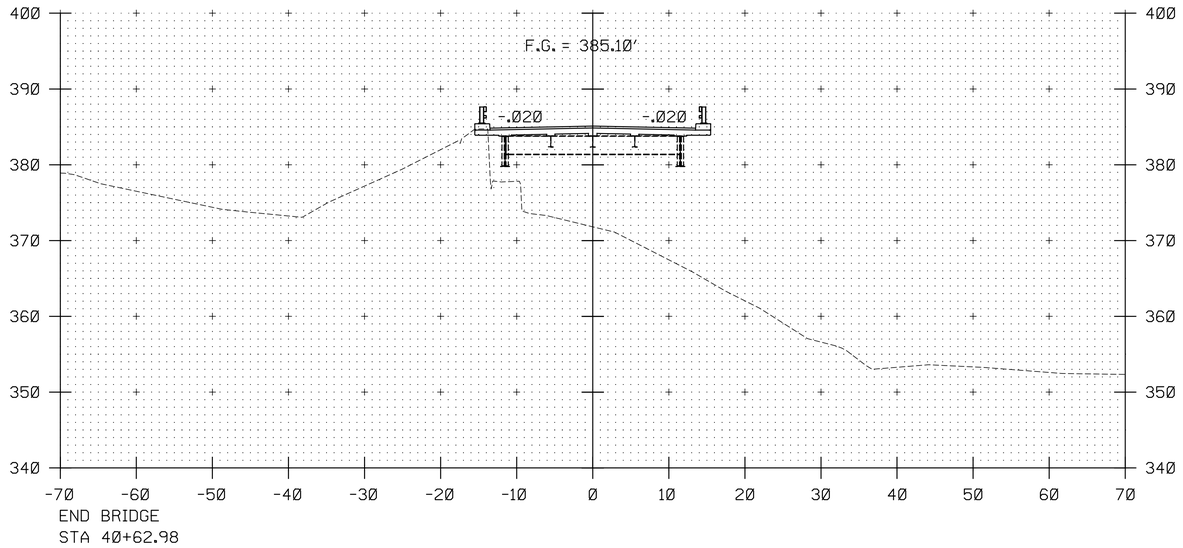
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 5

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 37 OF 51



40+00



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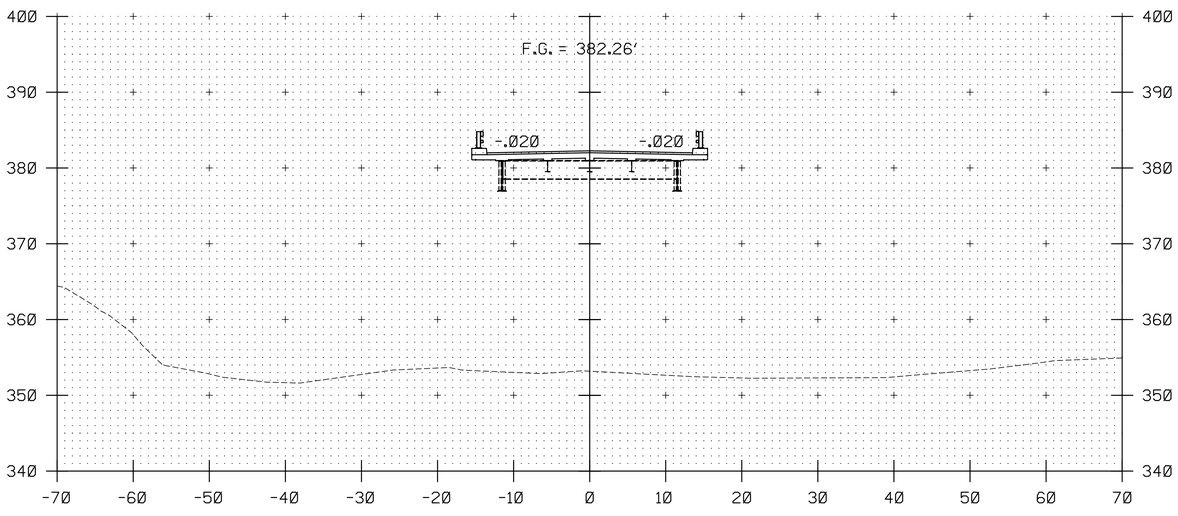
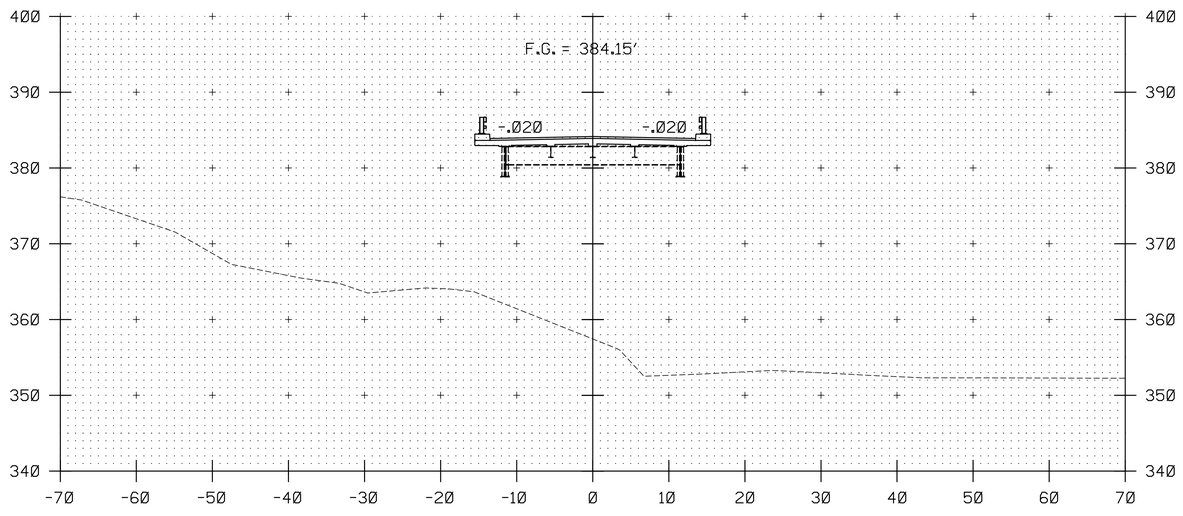


39+75



40+25

STA.39+75 TO STA.40+50

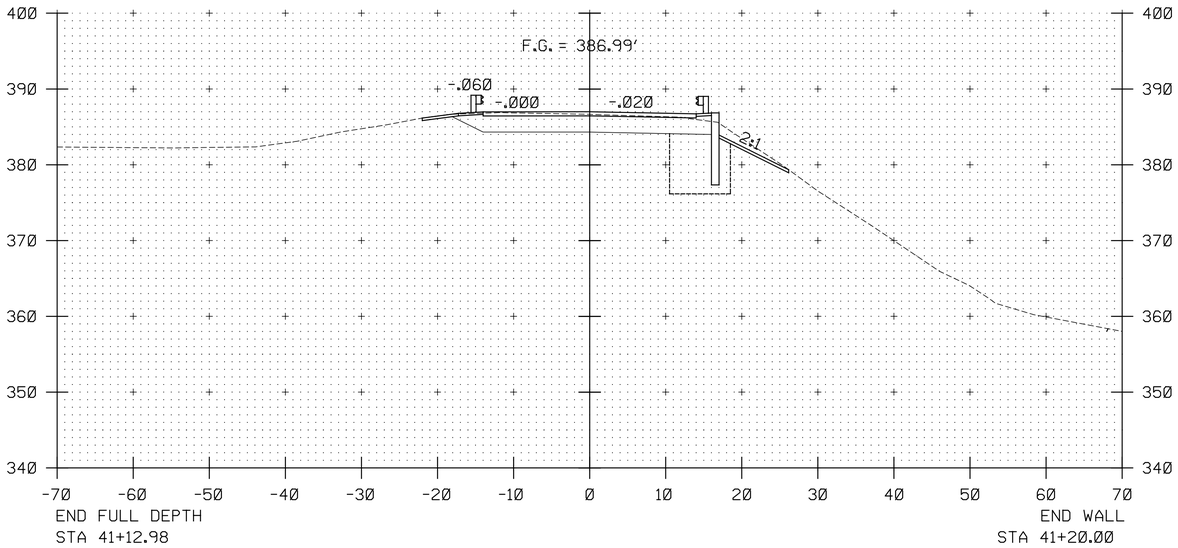
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

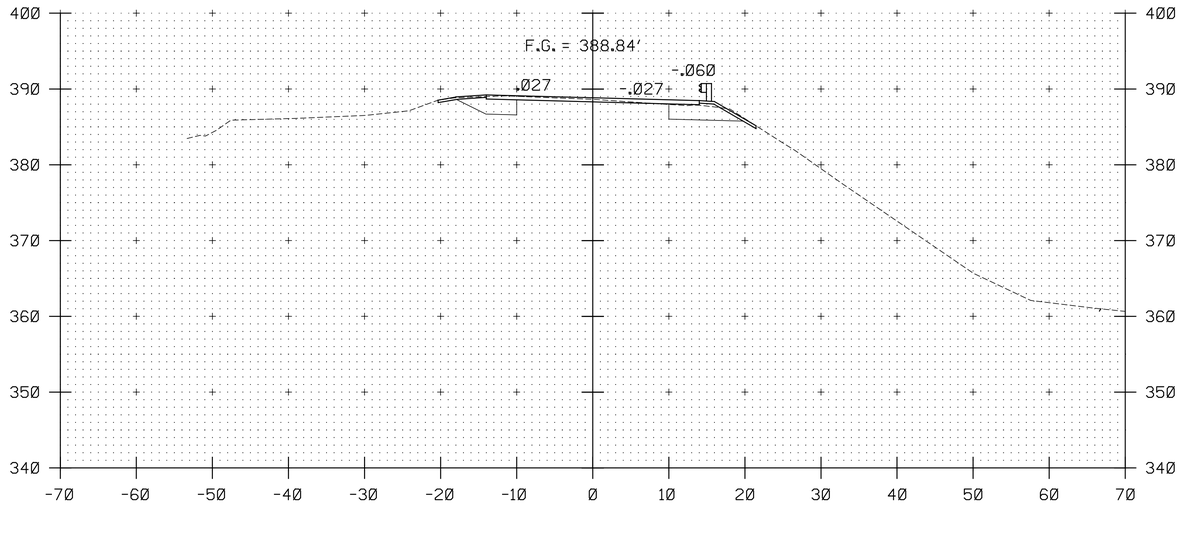
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 6

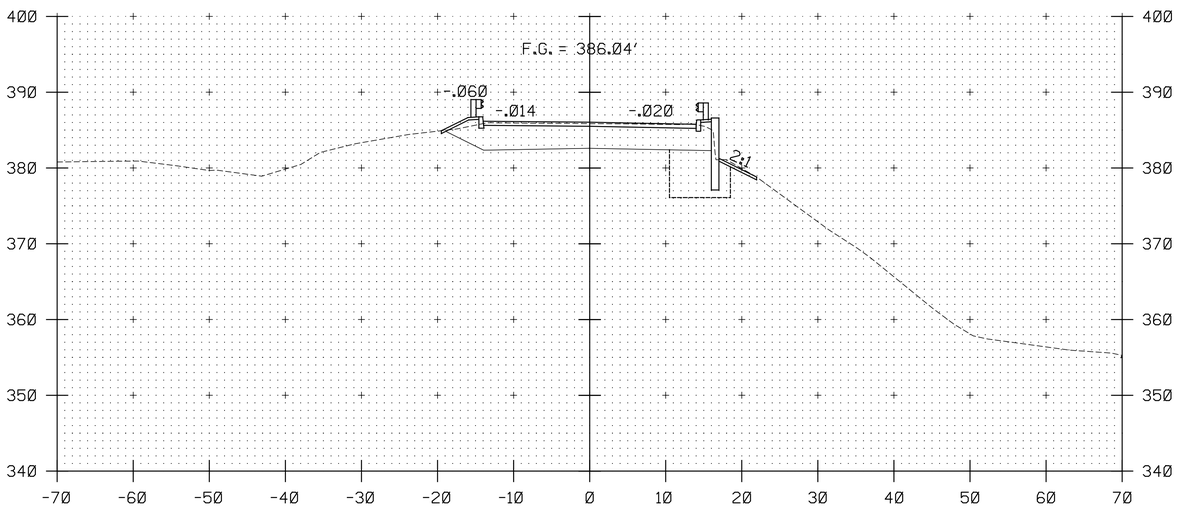
PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 38 OF 51



41+00



41+50



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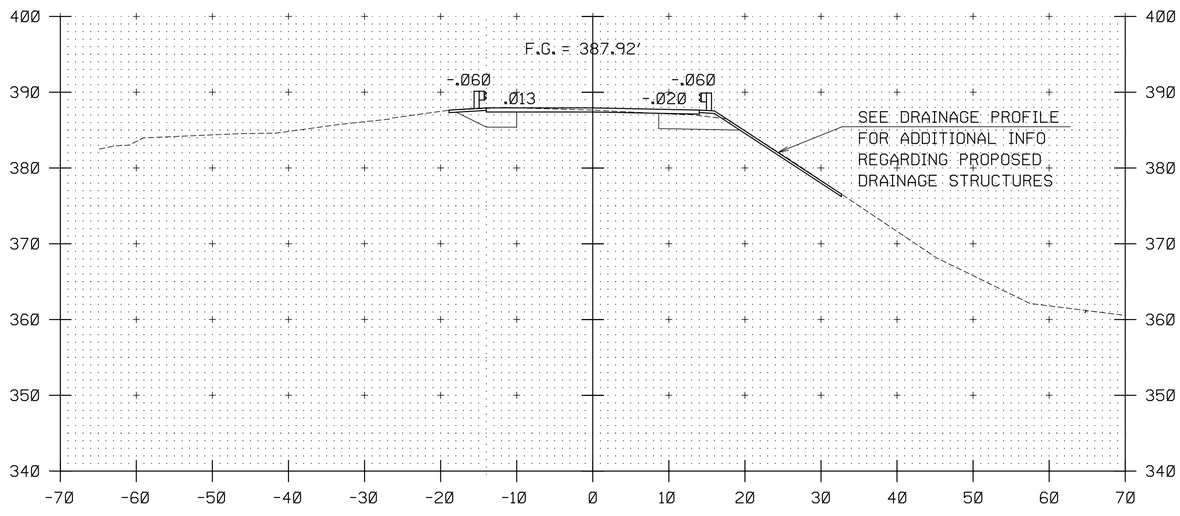


41+25

STA.40+75 TO STA.41+50

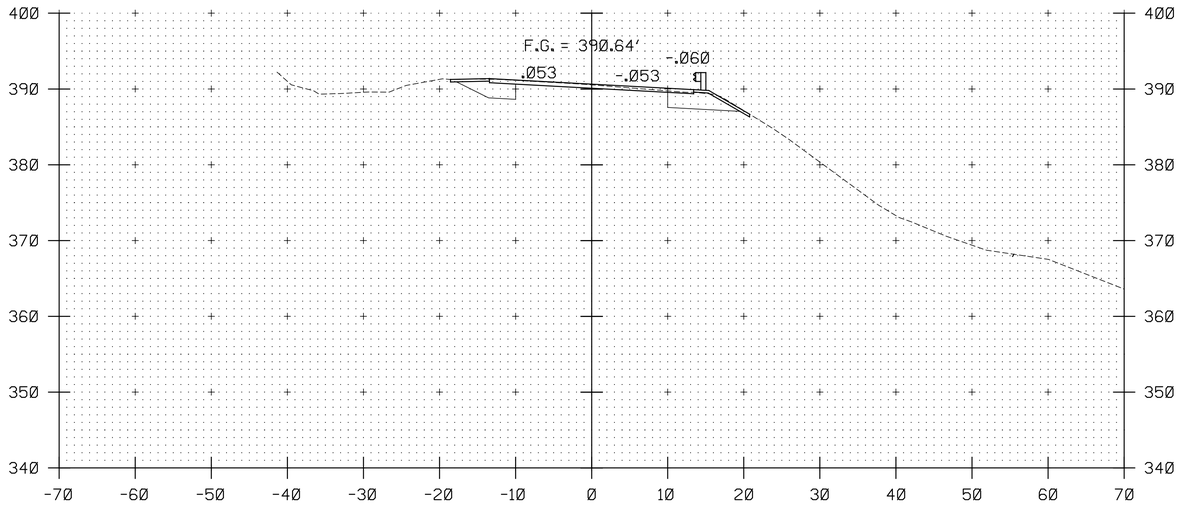
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

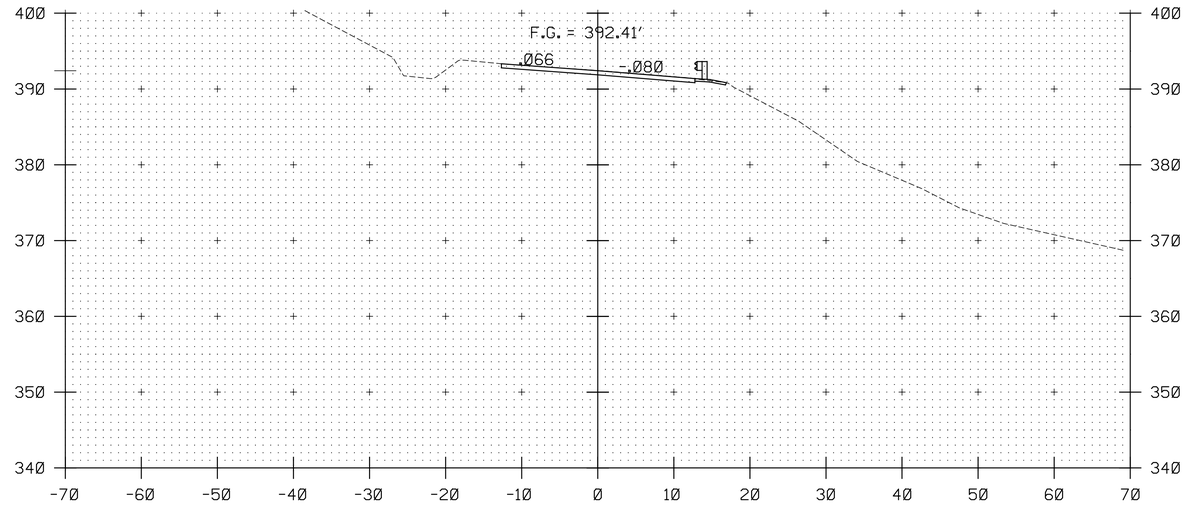
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 7

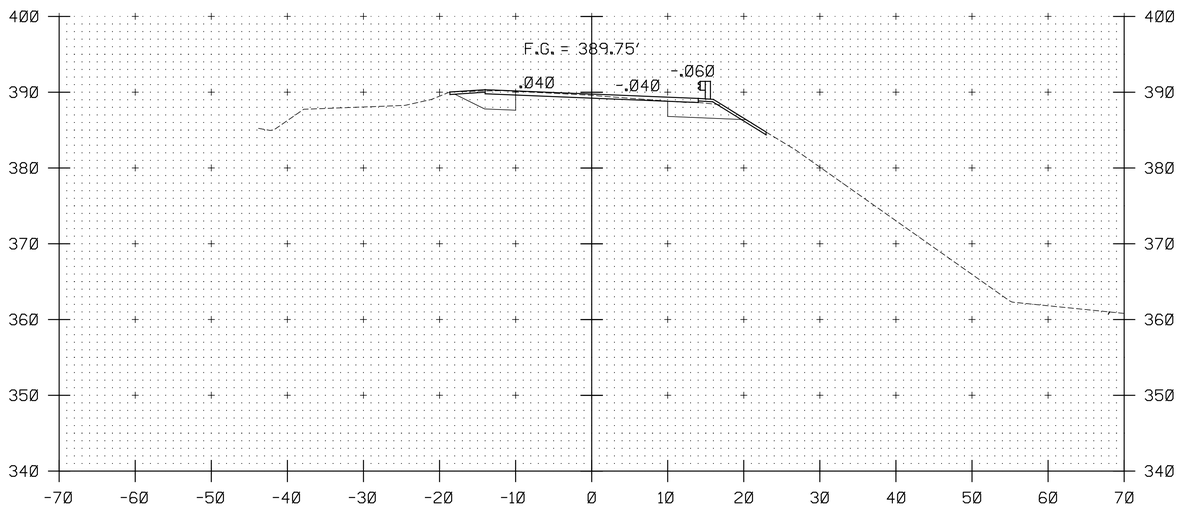
PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 39 OF 51



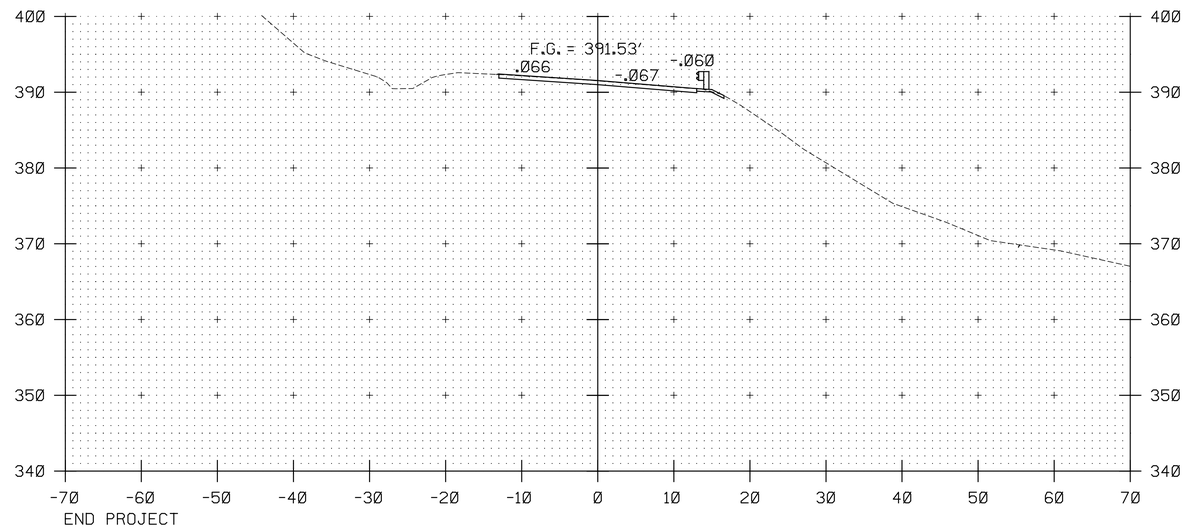
42+00



42+50



41+75



42+25

STA.41+75 TO STA.42+50

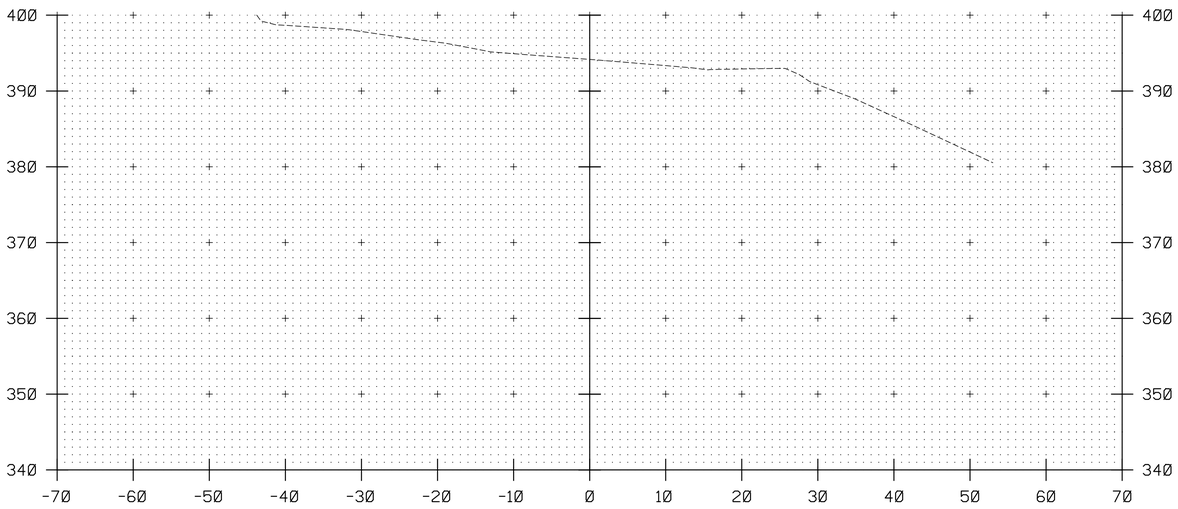
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

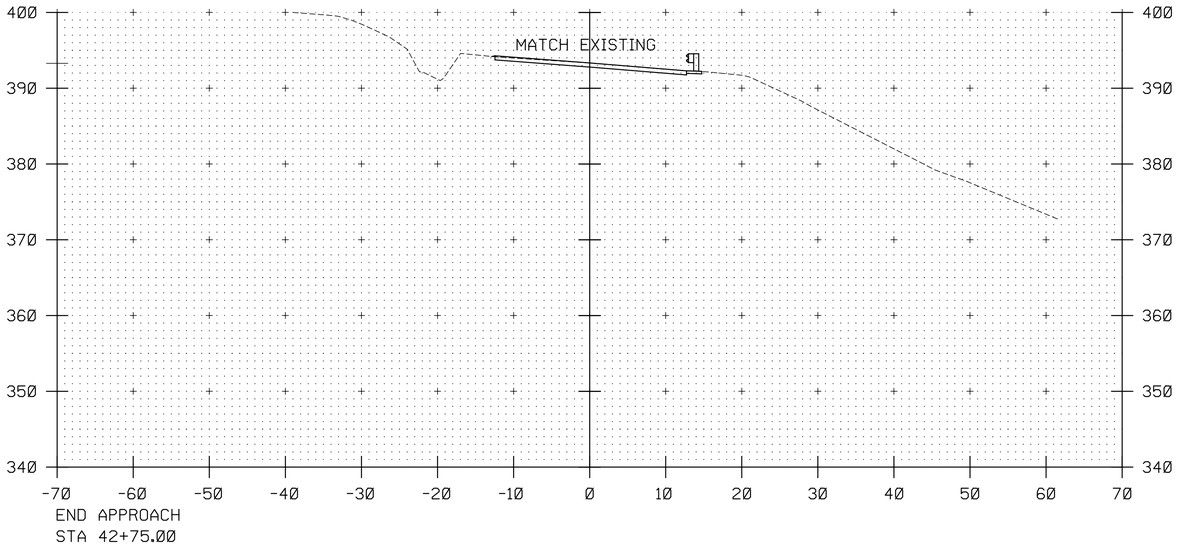
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 8

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 40 OF 51



43+00



42+75

STA.42+75 TO STA.43+00

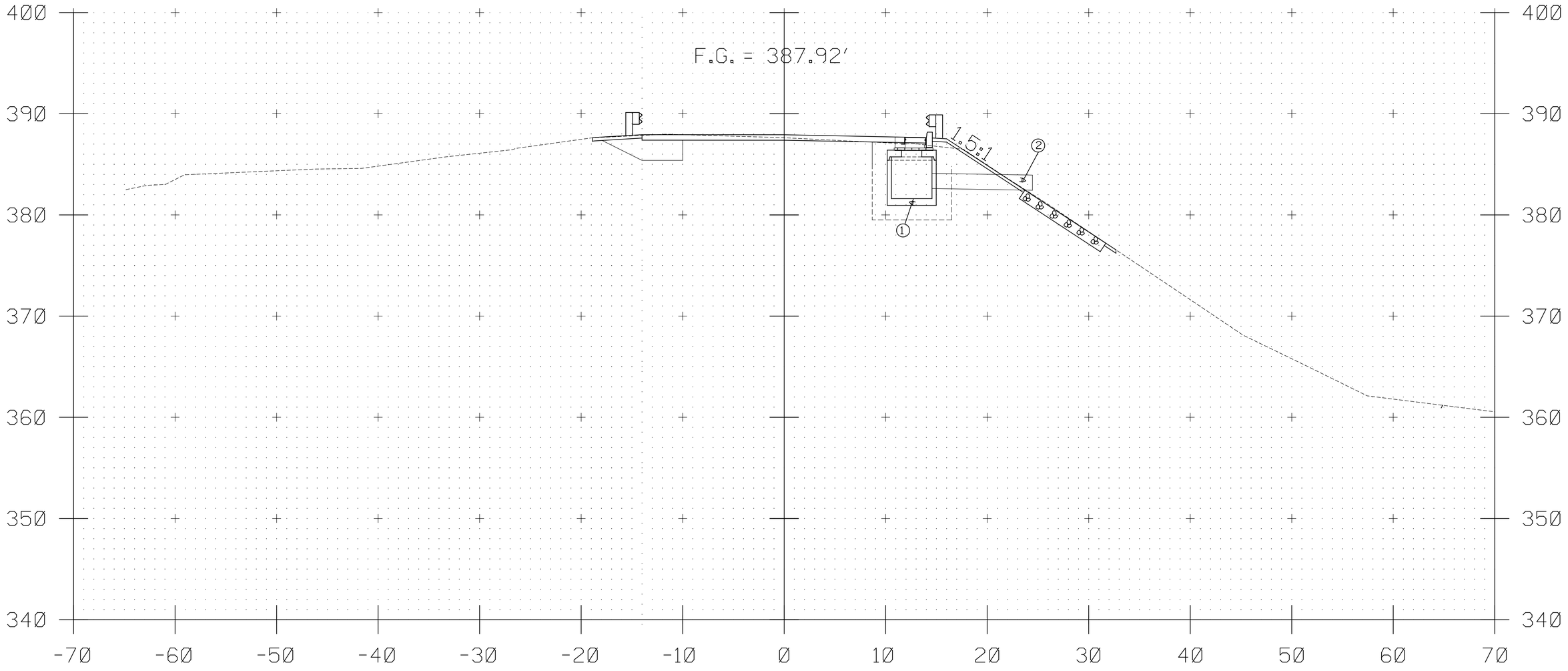
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
MAINLINE CROSS SECTIONS 9

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 41 OF 51



① STA 41+25.00, 13.00' RT
PRECAST REINFORCED DROP INLET
WITH CAST IRON GRATE, TYPE D
RIM EL. 387.70
SUMP EL. 381.20

② STA 41+25.00, 14.00' RT
NEW 18" X 12' CPEP (SL)
INLET EL. 382.20
OUTLET EL. 382.03

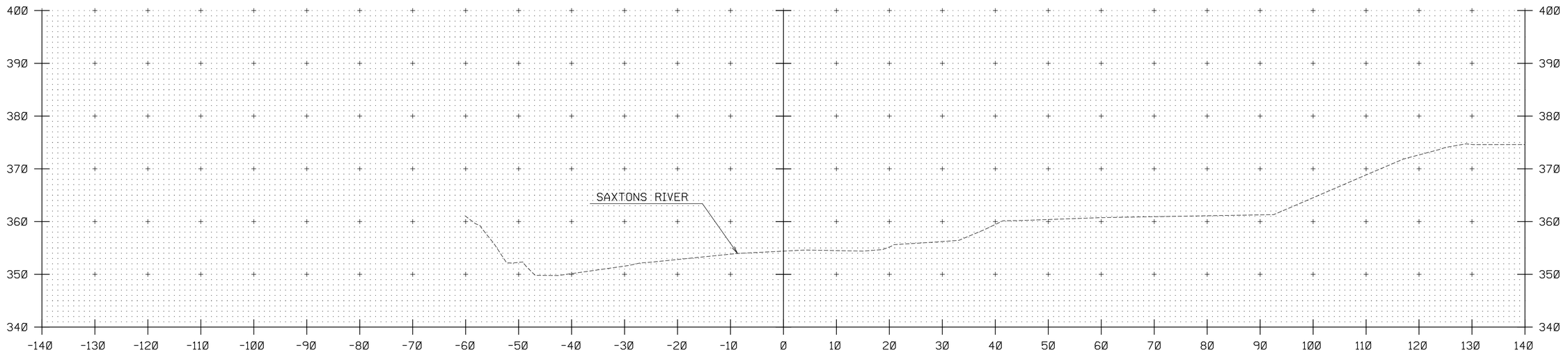
DRAINAGE PROFILE
STA @ 41+25.00 RT

Hardesty & Hanover

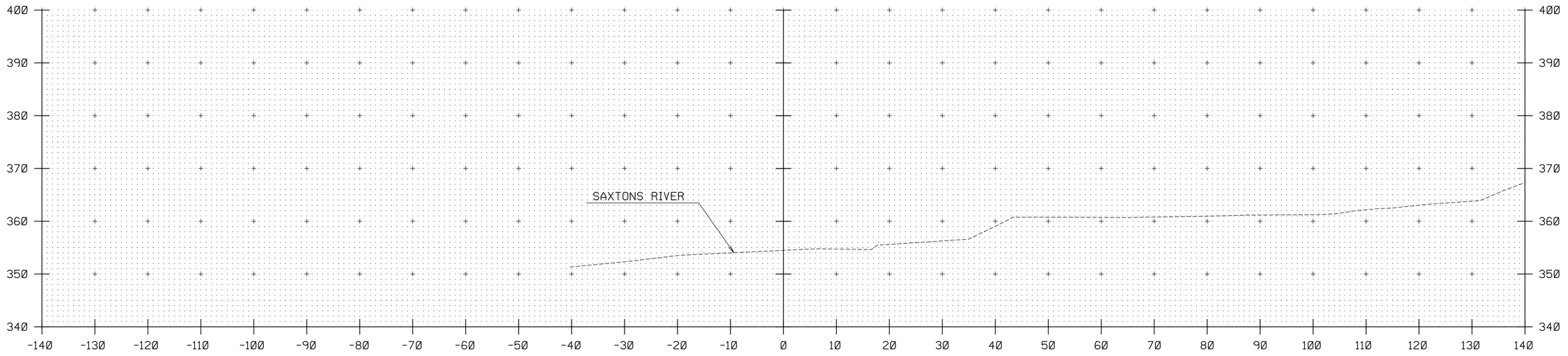
PROJECT NAME: WESTMINSTER
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
DRAINAGE PROFILE

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 42 OF 51



50+25



50+00

STA.50+00 TO STA.50+25

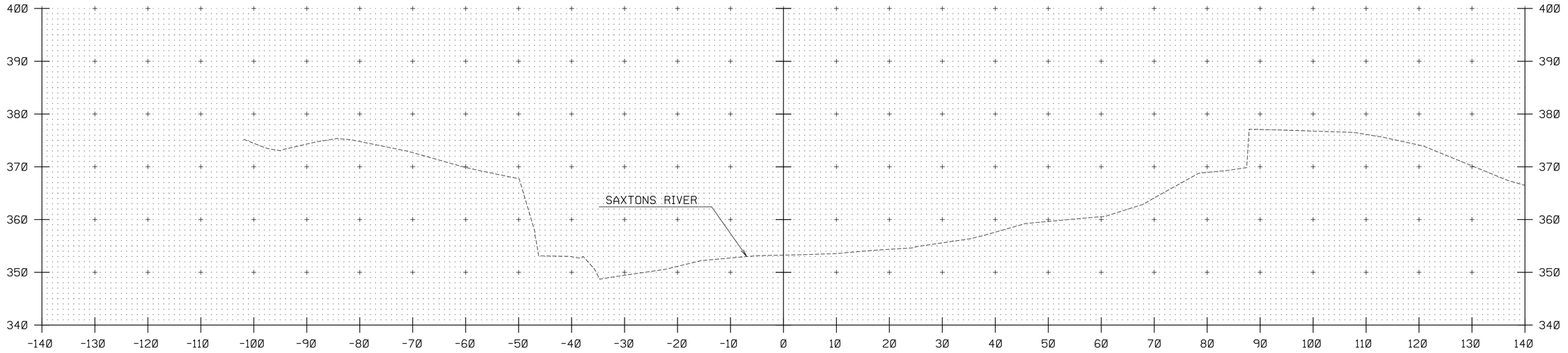
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

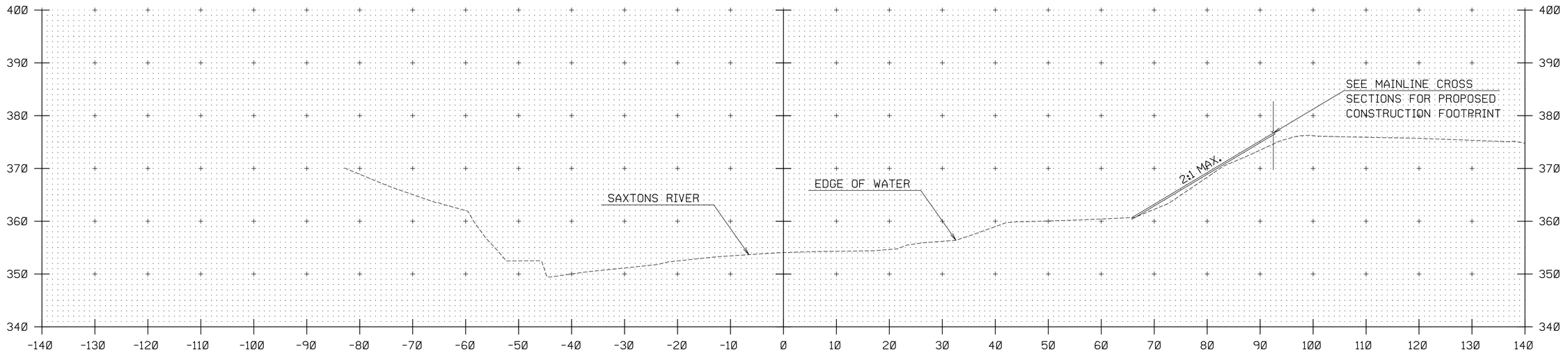
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
CHANNEL CROSS SECTIONS 1

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 43 OF 51



50+75



50+50

STA.50+50 TO STA.50+75

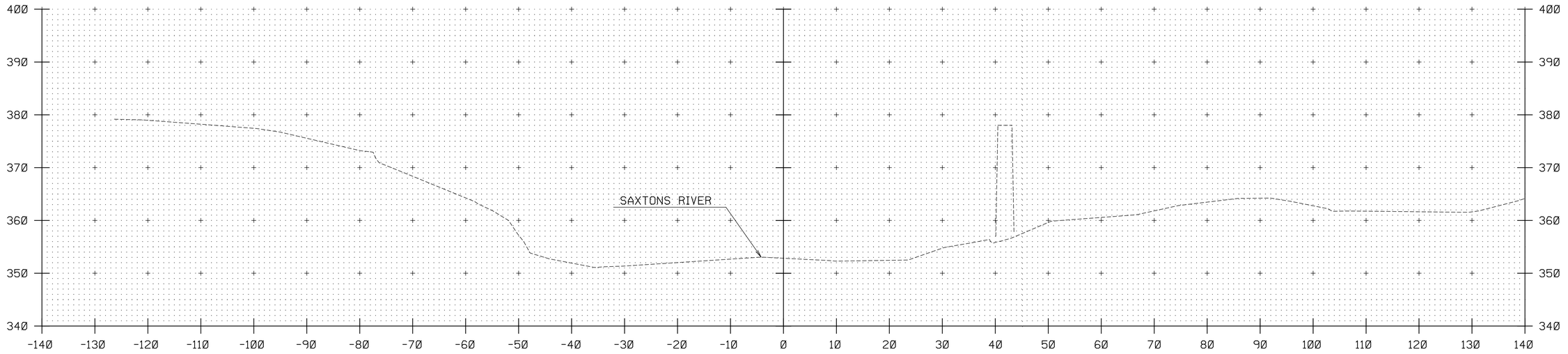
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

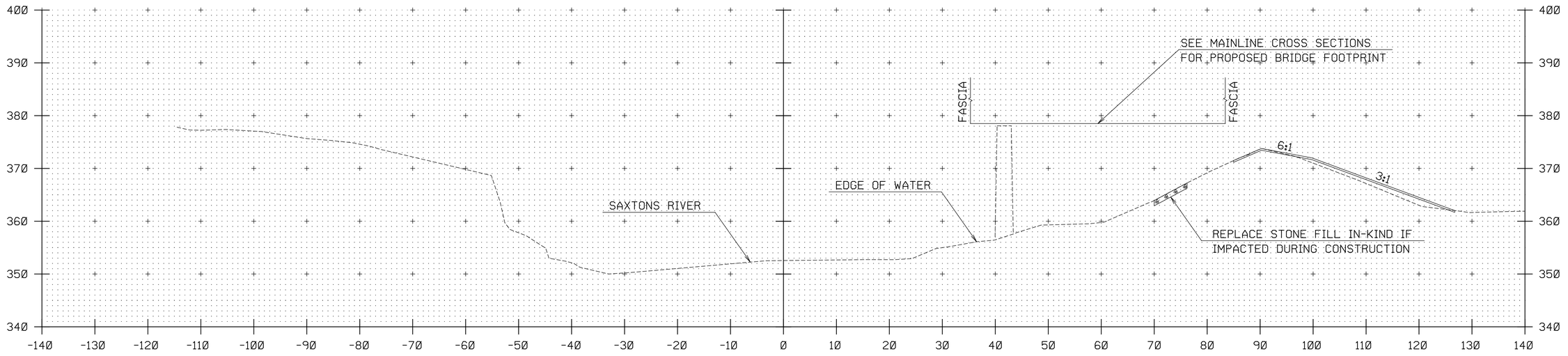
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
CHANNEL CROSS SECTIONS 2

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 44 OF 51



51+25



51+00

STA.51+00 TO STA.51+25

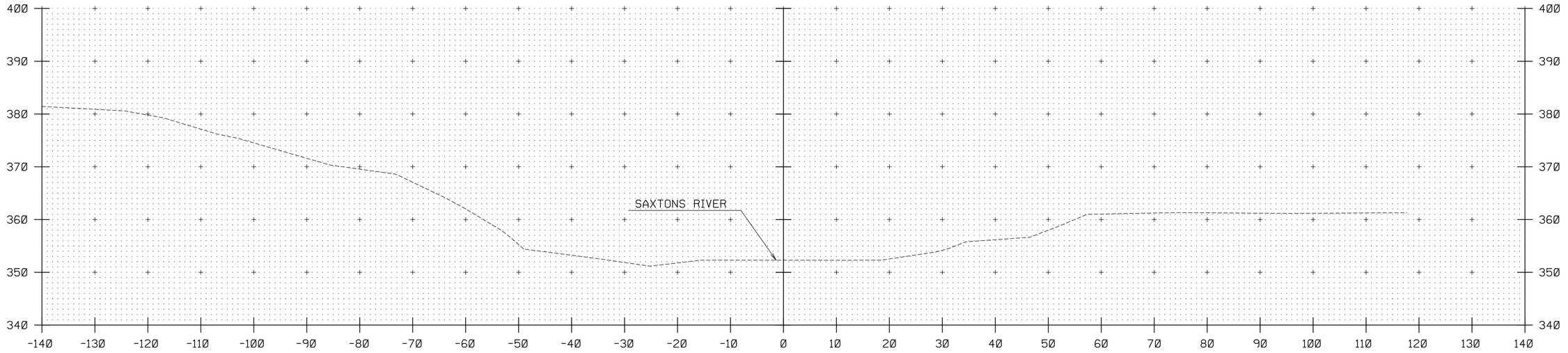
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

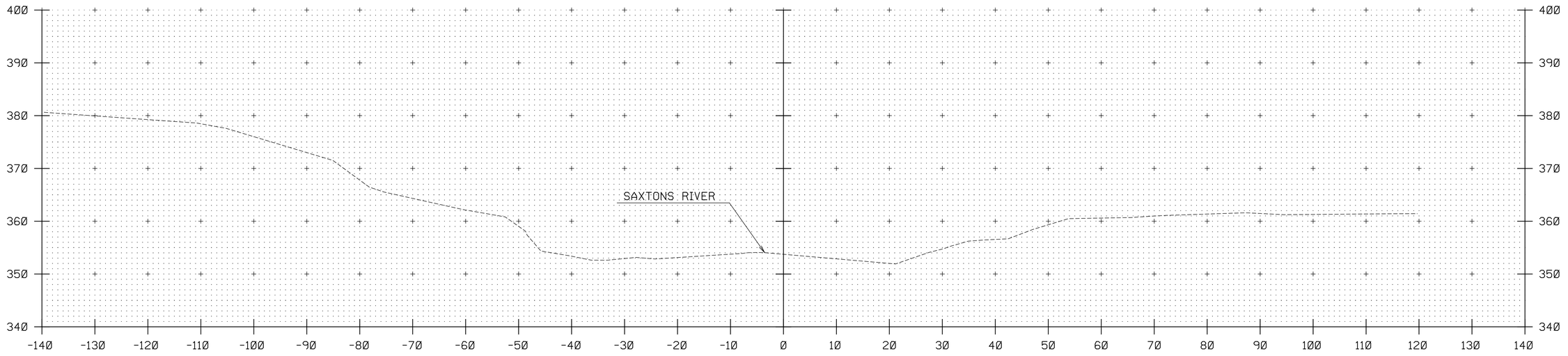
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
CHANNEL CROSS SECTIONS 3

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 45 OF 51



51+75



51+50

STA.51+50 TO STA.51+75

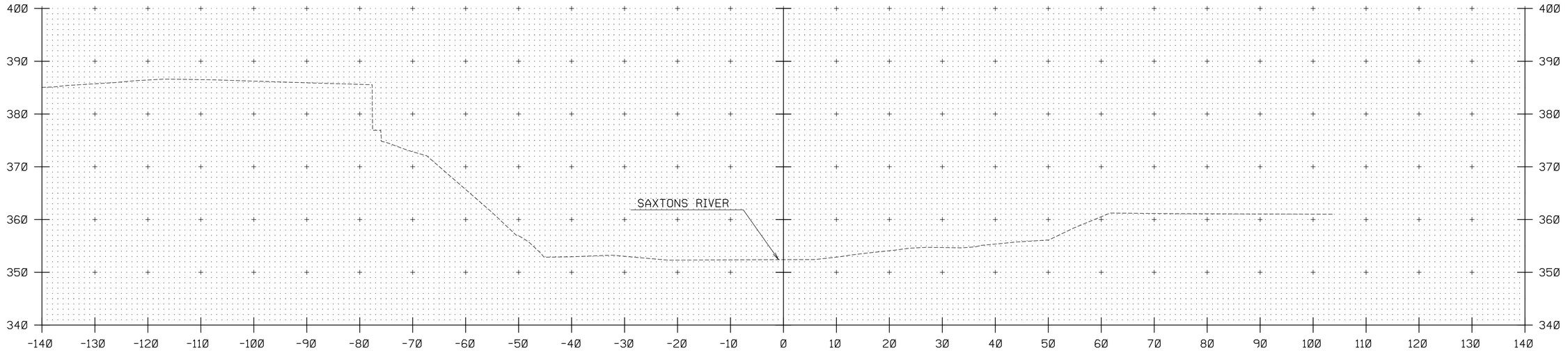
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

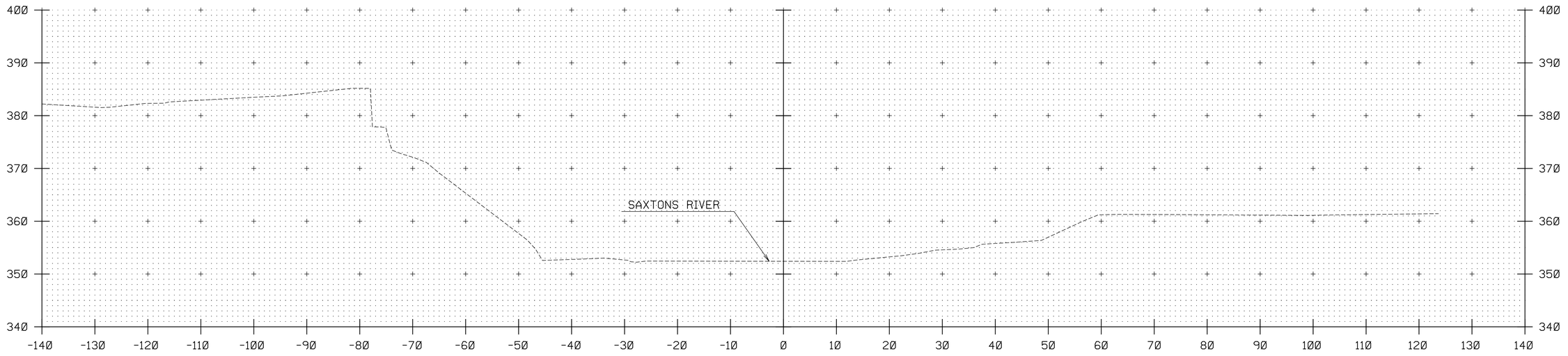
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
CHANNEL CROSS SECTIONS 4

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 46 OF 51



52+25



52+00

STA.52+00 TO STA.52+25

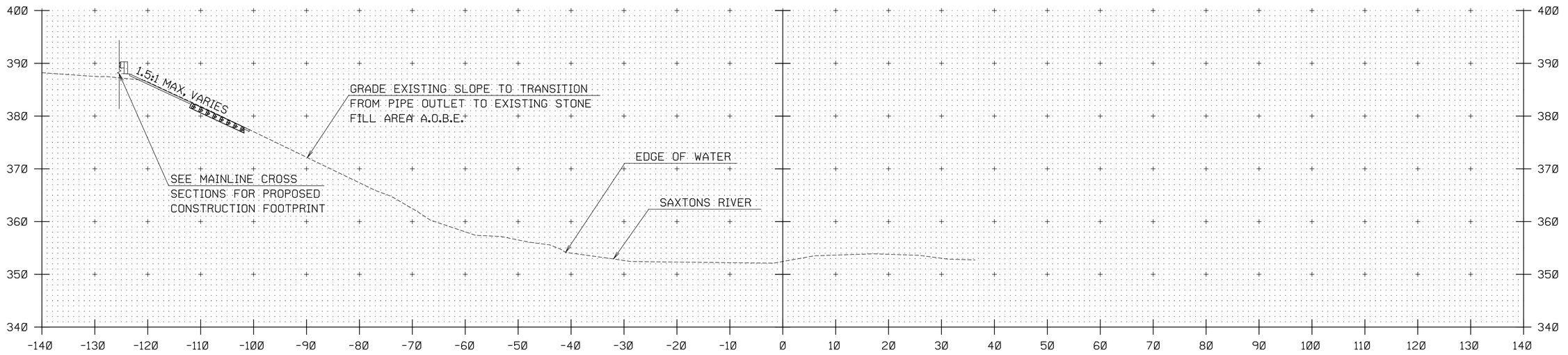
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

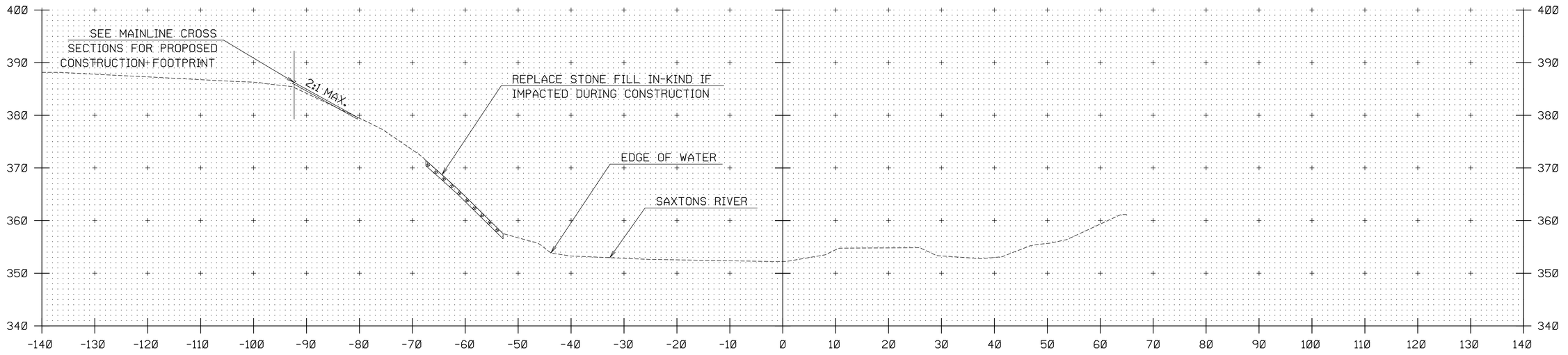
PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
CHANNEL CROSS SECTIONS 5

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 47 OF 51



52+75



52+50

STA.52+50 TO STA.52+75

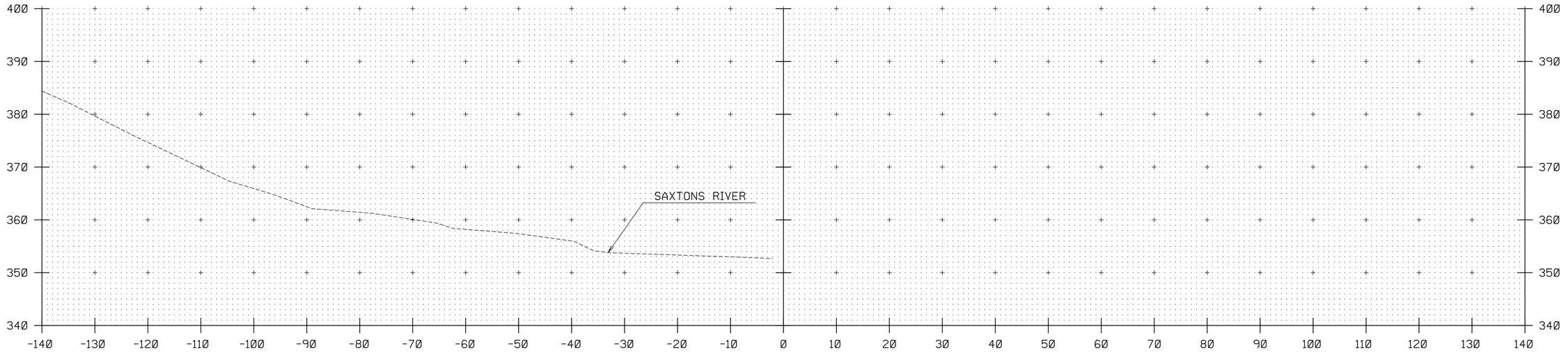
Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
CHANNEL CROSS SECTIONS 6

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 48 OF 51



53+00

STA.53+00 TO STA.53+00

Hardesty & Hanover

PROJECT NAME: WESTMINSTER

PROJECT NUMBER: BF 0126(13)

FILE NAME: z12j668xs.dgn
PROJECT LEADER: C. BAKER
DESIGNED BY: K. HO
CHANNEL CROSS SECTIONS 7

PLOT DATE: 10/14/2021
DRAWN BY: T. MARQUETTE
CHECKED BY: C. JENNE
SHEET 49 OF 51

N

VT STATE PLANE GRID

CSB VT PROPERTIES LLC

EXISTING CURVE 1
DELTA = 0°57′09"
D = 1°08′45"
R = 5000.00′
T = 41.56′
L = 83.11′
E = 0.17′

POB STA 33+51.12

PI STA 35+01.45

PC STA 34+59.89

PT STA 35+43.00

EXISTING TOWN R.O.W.

TH-1 (ROUTE 121) TO ROCKINGHAM

TH-1 (ROUTE 121) TO ROCKINGHAM/ BELLOWS FALLS

33+51 34+00 35+00 36+00 37+00

HVCTRL 3

18" RCP

CB

CZ

370

SIGN R2-1

MAILBOX

TELEPHONE POLE 9

GUY WIRE

TELEPHONE POLE 51 8

GRAVEL DRIVE

15" CGMP FLOW

MATCH LINE STA 38+00

CSB VT PROPERTIES LLC

EXISTING CONDITIONS

SCALE 1" = 20′-0"
20 0 20

Hardesty & Hanover

PROJECT NAME: WESTMINSTER	
PROJECT NUMBER: BF 0126(13)	
FILE NAME: z12j668border.dgn	PLOT DATE: 10/14/2021
PROJECT LEADER: C. BAKER	DRAWN BY: C. SCHWARTZ
DESIGNED BY: K. SMITH	CHECKED BY: S. BROWN
EXISTING CONDITIONS SHEET 1	SHEET 50 OF 51

N

VT STATE PLANE GRID

SAXTONS RIVER
FLOW

50+00

51+00

52+00

53+00

39+00

40+00

41+00

42+00

43+00

44+00

TH-1 (ROUTE 121)
TO ROCKINGHAM

TH-1 (ROUTE 121)
TO ROCKINGHAM/
BELLOWS FALLS

TH-29
SABIN AVE.

EXISTING TOWN R.O.W.

EXISTING TOWN R.O.W.

EXISTING TOWN R.O.W.

PI
STA 42+62.79

PC
STA 41+24.22

PT
STA 43+96.83

6X6
CONCRETE BOUNDRY
MARKER
X ABOVE GROUND

SIGN

HVCTRL
103

HVCTRL
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HVCTRL
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CSB VT PROPERTIES LLC

PATC LLC

EXISTING CURVE 2
DELTA = 25°18'35"
D = 9°17'03"
R = 617.13'
T = 138.57'
L = 272.61'
E = 15.36'

MATCH LINE
STA 38+00.00

EXISTING CONDITIONS

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

Hardesty & Hanover

PROJECT NAME: WESTMINSTER	
PROJECT NUMBER: BF 0126(13)	
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PROJECT LEADER: C. BAKER	DRAWN BY: C. SCHWARTZ
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EXISTING CONDITIONS SHEET 2	SHEET 51 OF 51