# **SUDBURY BRUCE FREEMAN RAIL TRAIL** XXX-XXXX(XXX)X TITLE SHEET & INDEX

PROJECT FILE NO.

# MASSACHUSETTS DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION

PLAN AND PROFILE OF

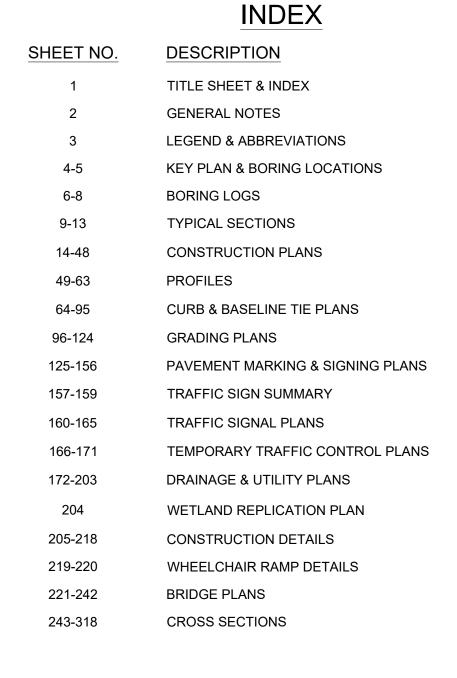
BRUCE FREEMAN RAIL TRAIL

IN THE TOWN OF

SUDBURY & CONCORD MIDDLESEX COUNTY

FEDERAL AID PROJECT NO. XXX-XXXX(XXX)X

# 75% SUBMITTAL



CONCORD PROJ. NO. 608164 E 684698.4172 E 684148.3645 (117) MAYNARD PANTRY BROOK DAVIS FIELD SPUR PATH BRIDGE NO. **SUDBURY BROAD ACRES** FARM PARKING LOT PARKINSON'S LOT SPUR PATH HOP BROOK BÉGINNING OF PRÓJEC PROJ. NO. 60816 BRIDGE NO. STA. 101+00.00 S-31-007 N 2957500.7922 E 677093.1169 WAYLAND

> 12000 SCALE: 1" = 3000'

LENGTH OF PHASE 2B IN SUDBURY = 23,449.63 FEET = 4.441 MILES LENGTH OF PHASE 2C IN CONCORD = 2,675.00 FEET = 0.507 MILES

THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES 2021 EDITION, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUA AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN

#### SHARED-USE PATH DESIGN DESIGNATION

#### BRUCE FREEMAN RAIL TRAIL

**DESIGN SPEED** 

FUNCTIONAL

CLASSIFICATION

OFF ROAD PEDESTRIAN/BICYCLE FACILITY

\* 18 MPH FOR GRADES LESS THAN 2%, 20 MPH FOR GRADES BETWEEN 2% & 4%

#### DESIGN DESIGNATION (HUDSON RD RTE 27)

30 MPH **DESIGN SPEED** ADT (2021) 20,404 vpd ADT (2041) 20,609 vpd T (PEAK HOUR) 2.6% T (AVERAGE DAY) 4.7%

FUNCTIONAL CLASSIFICATION URBAN PRINCIPAL ARTERIAL (EB/WB)

#### DESIGN DESIGNATION (NORTH RD)

**DESIGN SPEED** 12654 vpd ADT (2021) ADT (2041) 12780 vpd T (PEAK HOUR) 2.9% T (AVERAGE DAY) 3.2% URBAN MINOR ARTERIAL (EB/WB) FUNCTIONAL CLASSIFICATION

> 75% DESIGN SUBMISSION 5-12-2021 DESCRIPTION DATE

**TOWN OF SUDBURY DESIGN CONSULTANT:** FUSS&O'NEILL

BOSTON, MA 02110 800.286.2469 www.fando.com

TOWN OF CONCORD DESIGN CONSULTANT:



RECOMMENDED FOR APPROVAL

DATE CHIEF ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

**APPROVED:** 

**DIVISION ADMINISTRATOR** 

DATE

ABAN **ABANDON** ADJ **ADJUST APPROX APPROXIMATE** A.C. ASPHALT CONCRETE

ACCM PIPE ASPHALT COATED CORRUGATED METAL PIPE BIT. BITUMINOUS

BC **BOTTOM OF CURB** BD. BOUND **BASELINE BLDG** BUILDING **BENCHMARK** 

ВО BY OTHERS BOS **BOTTOM OF SLOPE** BR. BRIDGE

CC

**GRAV** 

CCM **CEMENT CONCRETE MASONRY** 

CEMENT CONCRETE

CEM CEMENT CI **CURB INLET** CLF CHAIN LINK FENCE CL CENTERLINE CO. COUNTY CONC CONCRETE

CONT CONTINUOUS / CONTINUED CONST CONSTRUCTION CR GR **CROWN GRADE** DIA DIAMETER DWY DRIVEWAY ELEV (or EL.) ELEVATION **EMB EMBANKMENT** 

EOP **EDGE OF PAVEMENT** EQ **EQUAL** EXIST (or EX) EXISTING EXC **EXCAVATION** 

FDN. **FOUNDATION** FDP FULL DEPTH PAVEMENT **FLDSTN FIELDSTONE** GAR **GARAGE** GD **GROUND** GRAN **GRANITE** 

**GRAVEL** 

GRD GUARD **HMA HOT MIX ASPHALT** HOR **HORIZONTAL** HWY **HIGHWAY** JUNCTION JCT

LOAM LOAM BORROW LSA LANDSCAPED AREA LEFT

MAHWL MEAN AVERAGE HIGH WATER LINE

MAX **MAXIMUM** MB MAILBOX

MHB MASSACHUSETTS HIGHWAY BOUND

MIN MINIMUM MOD MODIFIED

MSE MECHANICALLY STABILIZED EARTH **NERR** 

NEW ENGLAND RAILROAD NIC NOT IN CONTRACT NO. NUMBER NTS NOT TO SCALE O.C. ON CENTER O.D. OUTSIDE DIAMETER P.G.L. PROFILE GRADE LINE

**PREV** PREVIOUS/PREVIOUSLY PROJ PROJECT **PROP** PROPOSED

PSB PLANTABLE SOIL BORROW **PVMT PAVEMENT** R&D REMOVE AND DISCARD R&R REMOVE AND RESET

R&S REMOVE AND STACK RD ROAD **RDWY ROADWAY** REB **REBUILD** REM REMOVE

**REMOD** REMODEL RET RETAIN **RET WALL** RETAINING WALL **ROW** RIGHT OF WAY RR RAILROAD RIGHT

SB

SHLD SHOULDER SHLO/S.H.L.O. STATE HIGHWAY LAYOUT LINE

STONE BOUND

#### GENERAL ABBREVIATIONS (CONT)

**STREET** STA STATION STD STANDARD SW SIDEWALK **TEMP TEMPORARY** TC TOP OF CURB TOS TOP OF SLOPE **TRANS** TRANSITION TRM TURF REINFORCING MAT TYP **TYPICAL** VAR **VARIES VERT** VERTICAL **WCR** WHEEL CHAIR RAMP

**WORKING POINT** 

CROSS SECTION

### **UTILITY ABBREVIATIONS**

WP

X-SECT

**CATCH BASIN CBCI** CATCH BASIN WITH CURB INLET CIP CAST IRON PIPE CIT CHANGE IN TYPE **CMP** CORRUGATED METAL PIPE **CSP** CORRUGATED STEEL PIPE DI DROP INLET DIP **DUCTILE IRON PIPE FES** FLARED END SECTION F&C FRAME AND COVER F&G FRAME AND GRATE GG GAS GATE GI **GUTTER INLET** GIP GALVANIZED IRON PIPE **HDPE** HIGH DENSITY POLYETHYLENE PIPE **HDW** HEADWALL HYD **HYDRANT** INV INVERT LB LEACH BASIN LP LIGHT POLE MH MANHOLE MW MONITORING WELL **OVERHEAD WIRE** POLYVINYLCHLORIDE PIPE PVC **PWW** PAVED WATER WAY **RCP** REINFORCED CONCRETE PIPE SMH SEWER MANHOLE TSV&B TAPPING SLEEVE VALVE & BOX UP UTILITY POLE WG WATER GATE WIP WROUGHT IRON PIPE WM WATER METER/WATER MAIN

### **ALIGNMENT & GRADING ABBREVIATIONS**

CENTER OF CURVE HP **HIGH POINT** I.T. INTERSECTION OF TANGENT ΙP LOW POINT PC POINT OF CURVATURE **PCC** POINT OF COMPOUND CURVATURE Ы POINT OF INTERSECTION **PNT** POINT POC POINT ON CURVE POT POINT ON TANGENT **PRC** POINT OF REVERSE CURVATURE PT POINT OF TANGENCY **LPT** ANGLE POINT RADIUS OF CURVATURE TANGENT DISTANCE OF CURVE TAN TANGENT 25.45 SPOT ELEVATION

#### PROFILE ABBREVIATIONS

VERTICAL CURVE

ALGEBRAIC DIFFERENCE IN RATES OF GRADE HSD HORIZONTAL SIGHT DISTANCE RATE OF VERTICAL CURVATURE LENGTH OF CURVE PVC POINT OF VERTICAL CURVATURE **PVCC** POINT OF VERTICAL COMPOUND CURVATURE PVI POINT OF VERTICAL INTERSECTION **PVRC** POINT OF VERTICAL REVERSE CURVATURE POINT OF VERTICAL TANGENCY PVT SSD STOPPING SIGHT DISTANCE

#### TRAFFIC SIGNAL

VC

CAB. CCVE CLOSED CIRCUIT VIDEO EQUIPMENT DW STEADY DON'T WALK FDW FLASHING DON'T WALK FR FLASHING CIRCULAR RED  $\leftarrow$  FR-FLASHING RED LEFT ARROW - FR-FLASHING RED RIGHT ARROW FY FLASHING CIRCULAR YELLOW  $\leftarrow$  FY-FLASHING YELLOW LEFT ARROW -FY-FLASHING YELLOW RIGHT ARROW G STEADY CIRCULAR GREEN ⊢G-STEADY GREEN LEFT ARROW  $-G^{-1}$ STEADY GREEN RIGHT ARROW **GSL** STEADY GREEN SLASH LEFT ARROW **GSR** STEADY GREEN SLASH RIGHT ARROW STEADY GREEN VERTICAL ARROW OVERLAP PED PEDESTRIAN PTZ PAN, TILT, ZOOM STEADY CIRCULAR RED  $\leftarrow$ R $^-$ STEADY RED LEFT ARROW  $-\mathsf{R} o$ STEADY RED RIGHT ARROW TR SIG TRAFFIC SIGNAL TSC TRAFFIC SIGNAL CONDUIT STEADY WALK STEADY CIRCULAR YELLOW STEADY YELLOW LEFT ARROW STEADY YELLOW RIGHT ARROW

#### **SUDBURY BRUCE FREEMAN RAIL TRAIL**

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	2	318
	PROJECT FILE NO.	608164	,

**GENERAL NOTES** 

#### **GENERAL NOTES:**

- EXISTING CONDITIONS AND TOPOGRAPHICAL INFORMATION FROM AN ACTUAL FIELD SURVEY CONDUCTED BY VHB, INC. IN DECEMBER 2015 THROUGH APRIL 2016. SUPPLEMENTARY FIELD SURVEY WAS CONDUCTED BY GCG ASSOCIATES FROM NOVEMBER 2020 THROUGH DECEMBER 2020.
- 2. THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATION IS US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).
- 3. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND GRADES IN THE FIELD BEFORE COMMENCING WORK AND PROMPTLY NOTIFY THE ENGINEER OF ANY
- 4. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
- DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.
- THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH PROPOSED CONDUIT AND SIGNAL EQUIPMENT. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER.
- 7. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
- THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE AND SEWER STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK
- 9. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
- 10. EXISTING UTILITY POLES WILL BE RELOCATED BY OTHERS IF REQUIRED.
- 11. PRIOR TO ONSET OF TREE REMOVAL ACTIVITIES. THE CONTRACTOR, RESIDENT ENGINEER AND MASSDOT LANDSCAPE ARCHITECT AND TOWN REPRESENTATIVE SHALL WALK SITE TO IDENTIFY TREES TO BE REMOVED.
- 12. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.
- 13. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
- 14. JOINTS BETWEEN NEW ASPHALT CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.
- 15. AFTER MILLING OPERATIONS AND PRIOR TO PAVING THE SUPERPAVE INTERMEDIATE OR SURFACES COURSES THE ENGINEER SHALL EVALUATE THE MILLED SURFACE AND SHALL APPLY THE APPROPRIATE REPAIR METHOD IF REQUIRED.
- 16. EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- 17. IF SUITABLE, ALL EXISTING GRANITE CURB & EDGING SHALL BE RE-USED IN THE PROPOSED WORK, EXCEPT CURVED STONES OF A DIFFERENT RADIUS THAN PROPOSED CURB.
- 18. ALL PROPOSED HOT MIX ASPHALT CURB SHALL BE MASSDOT TYPE 3
- 19. ALL EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
- 20. ALL PROPOSED BOUNDS SHALL BE PLACED BY A LICENSED PROFESSIONAL SURVEYOR. THE CONTRACTOR SHALL EXERCISE DUE CARE WHEN WORKING AROUND ALL PROPERTY BOUNDS WHICH ARE TO REMAIN. SHOULD ANY DAMAGE TO A BOUND RESULT FROM THE ACTIONS OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE THE BOUND REPLACED AND/OR REALIGNED BY A LICENSED PROFESSIONAL SURVEYOR AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
- 21. DISPOSAL OF ALL SURPLUS MATERIAL SHALL BE AS APPROVED BY THE ENGINEER AND
- 22. LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE PLANS.

BR	SUDBURY UCE FREEMAN RA	AIL TR	AIL
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	XXX-XXXX(XXX)X	3	318

**LEGEND & ABBREVIATIONS** 

PROJECT FILE NO. 608164

#### GENERAL SYMBOLS

— — — — — — EASEMENT

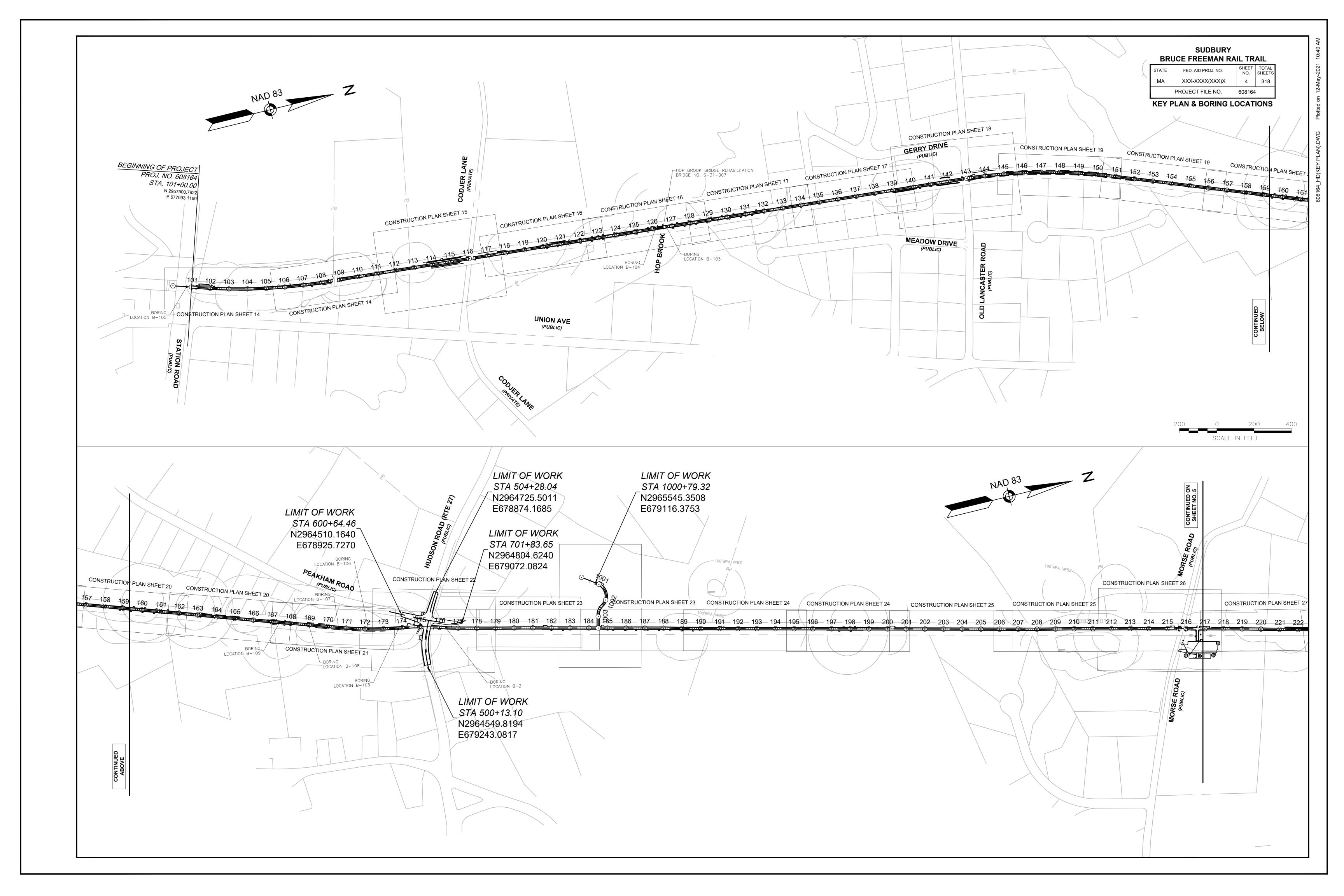
GENERAL S	SYMBOLS	
EXISTING	PROPOSED	DESCRIPTION
□ JB		JERSEY BARRIER
Ш ⊕ Д СВ	СВ	CATCH BASIN
		CATCH BASIN CURB INLET
⊗ FP ©I GP	♥ FP G GP	FLAG POLE GAS PUMP
□ MB	□ MB	MAIL BOX
		POST SQUARE
0	0	POST CIRCULAR
⊕ WELL	⊕ WELL	WELL
- EHH	□ EHH O	ELECTRIC HANDHOLE FENCE GATE POST
o GG	o GG	GAS GATE
⊕ BHL #	◆ BHL #	BORING HOLE
→ MW #  → TD "	→ MW # → TD #	MONITORING WELL
■ TP #	■ TP#	TEST PIT HYDRANT
*	*	LIGHT POLE
CO.BD.	11.	COUNTY BOUND
		GPS POINT
©	©	CABLE MANHOLE DRAINAGE MANHOLE
(E)	(D) (E)	ELECTRIC MANHOLE
G	<u>©</u>	GAS MANHOLE
M	M	MISC MANHOLE
<u>(S)</u>	<u>s</u>	SEWER MANHOLE
(T) (W)	① W	TELEPHONE MANHOLE WATER MANHOLE
■ MHB	■ MHB	MASSACHUSETTS HIGHWAY BOUND
□ MON		MONUMENT
□ SB		STONE BOUND TOWN OR CITY BOUND
■ TB		TRAVERSE OR TRIANGULATION STATION
-o TPL or GUY	→ TPL or GUY	TROLLEY POLE OR GUY POLE
o HTP		TRANSMISSION POLE
-b- UFB	- UFB	UTILITY POLE W/ FIREBOX
-∲- UPDL -&- ULT	→ UPDL → ULT	UTILITY POLE WITH DOUBLE LIGHT UTILITY POLE W / 1 LIGHT
-0- UP	- <b>→</b> UP	UTILITY POLE W/ 1 EIGHT
0		BUSH
•SIZE & TYPE		TREE
0		STUMP SWAMP / MARSH
• WG	• WG	WATER GATE
o PM	• PM	PARKING METER
		OVERHEAD CABLE/WIRE CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
<del></del>		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER) UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x		CHAIN LINK OR METAL FENCE
		WOOD FENCE EROSION CONTROL
		DRAINAGE SWALE
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER STATE HIGHWAY LAYOUT
		· TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

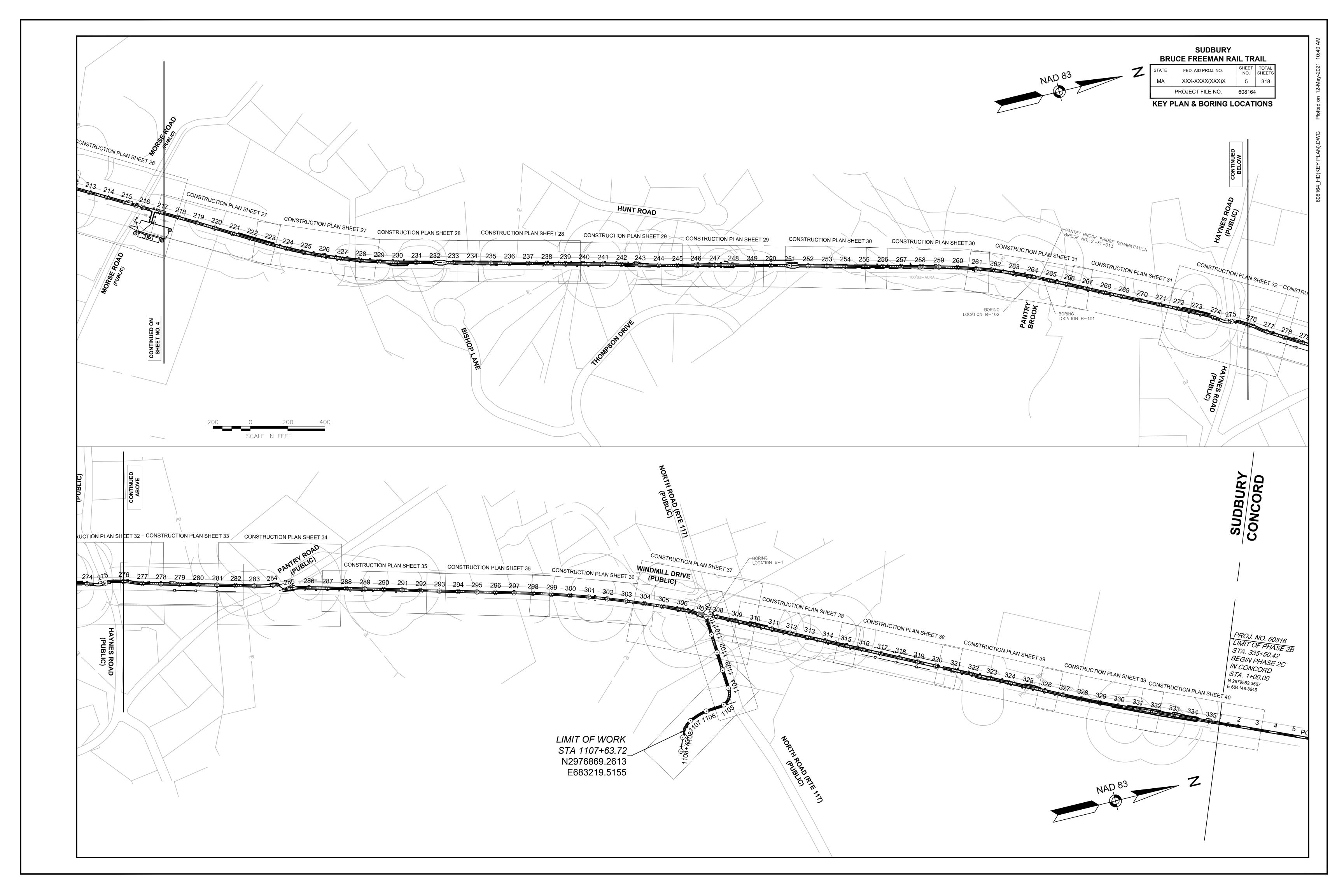
# TRAFFIC SYMBOLS

TRAFFIC STRIBULS						
EXISTING	PROPOSED	DESCRIPTION				
<b>Ø</b> 1	<b>Ø</b> 1	CONTROLLER PHASE ACTUATED				
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)				
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)				
72	*	VIDEO DETECTION CAMERA				
	<b>≻</b> ■	MICROWAVE DETECTOR				
$\oplus$	•	PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE				
*	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT				
<	-	VEHICULAR SIGNAL HEAD				
<<	<b>←</b>	VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED				
<		FLASHING BEACON				
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)				
⊠ RRSG	<b>⊠</b> RRSG	RAILROAD SIGNAL				
	•	SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)				
·	● 20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)				
		HIGH MAST POLE OR TOWER				
		SIGN AND POST				
00	00	SIGN AND POST (2 POSTS)				
	<b>★</b> <sup>20′</sup>	MAST ARM WITH LUMINAIRE				
	_	OPTICAL PRE-EMPTION DETECTOR				
	$\bowtie$	CONTROL CABINET, GROUND MOUNTED				
	$ \overset{\bullet}{\boxtimes} $	CONTROL CABINET, POLE MOUNTED				
		FLASHING BEACON CONTROL AND METER PEDESTAL				
	$\boxtimes$	LOAD CENTER ASSEMBLY				
		PULL BOX 12"x12" (OR AS NOTED)				
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)				
		= TRAFFIC SIGNAL CONDUIT				

## PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
	<b>⁴</b> 1	PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE
	cw	CROSSWALK
	SWL	SOLID WHITE LINE
	SYL	SOLID YELLOW LINE
	BWL	BROKEN WHITE LINE
	BYL	BROKEN YELLOW LINE
	<u>DWL</u>	DOTTED WHITE LINE
	<u>DYL</u>	DOTTED YELLOW LINE
	DWLEx	DOTTED WHITE LINE EXTENSION
	DYLEx	DOTTED YELLOW LINE EXTENSION
	DBWL	DOUBLE WHITE LINE
	DBYL	DOUBLE YELLOW LINE
	3' LDYL W/ 9' GAPS	LONG DASHED YELLOW LINE





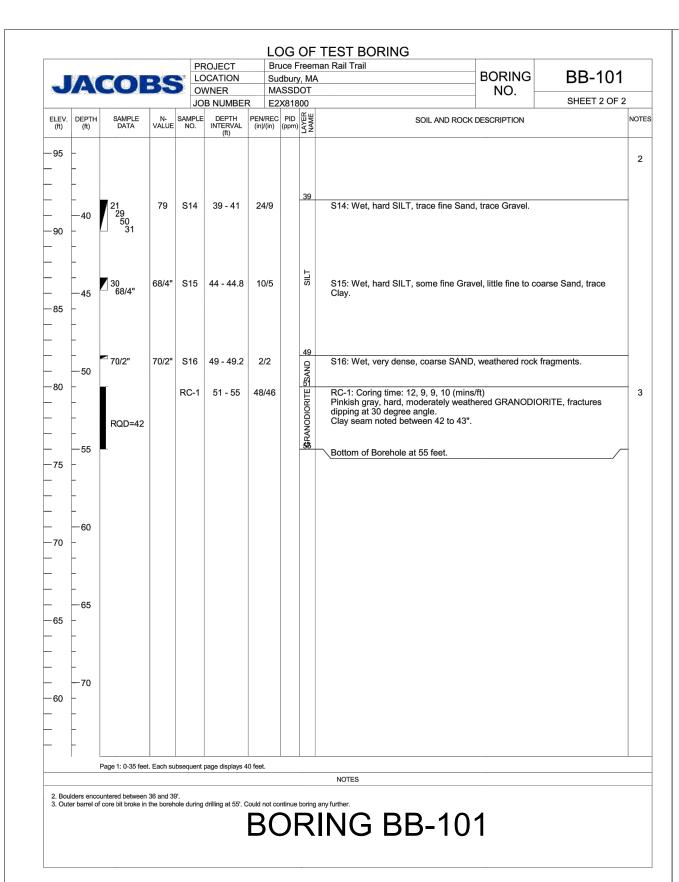
**BORING LOGS** 

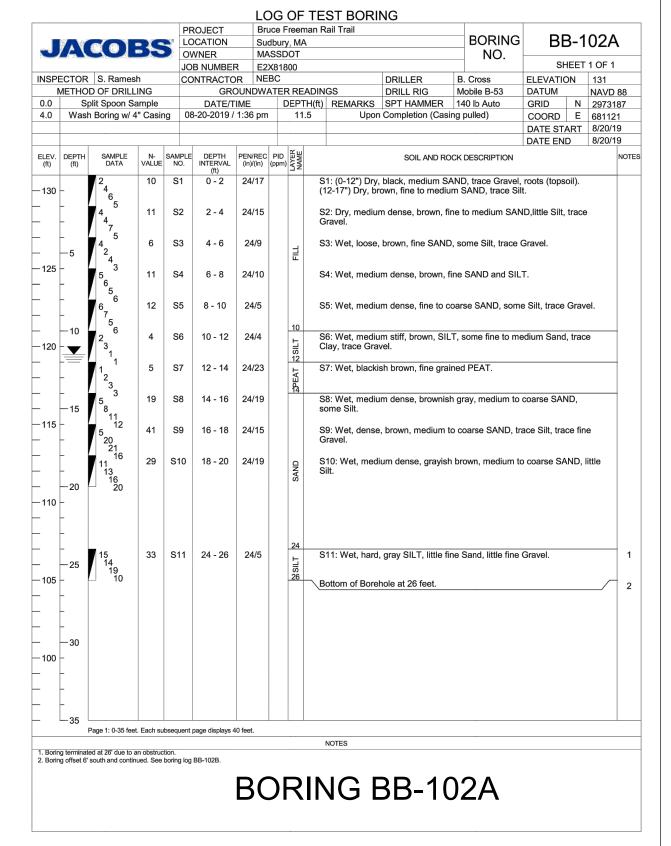
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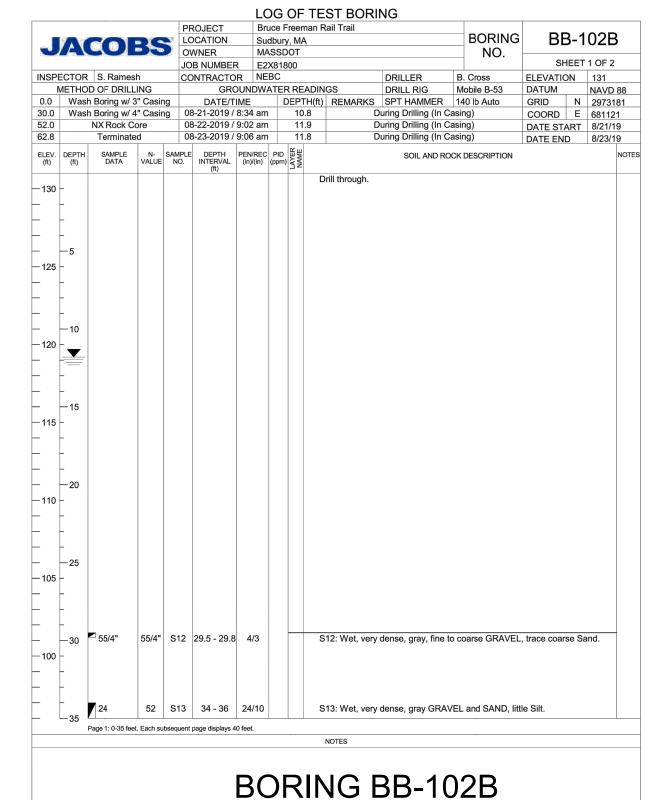
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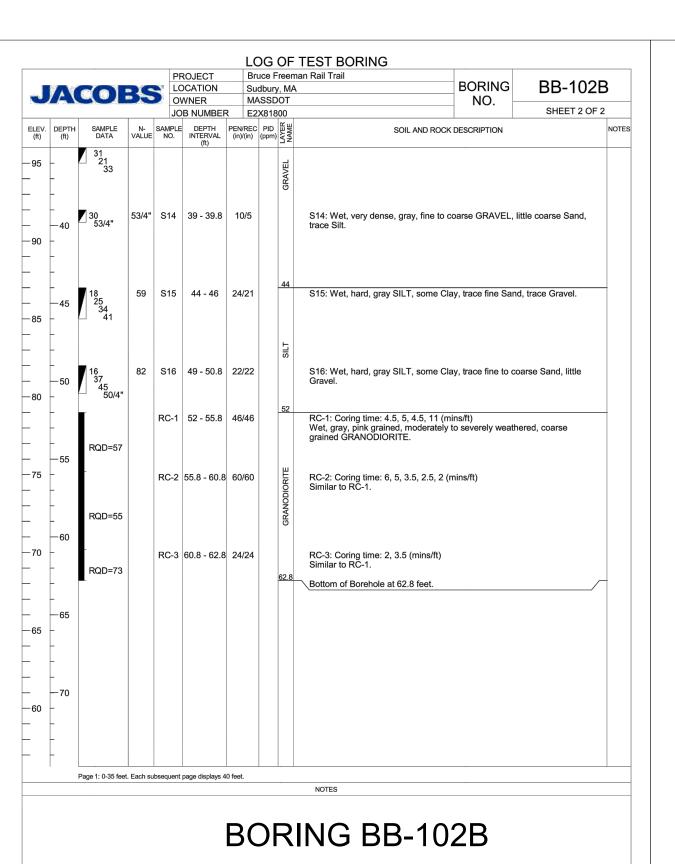
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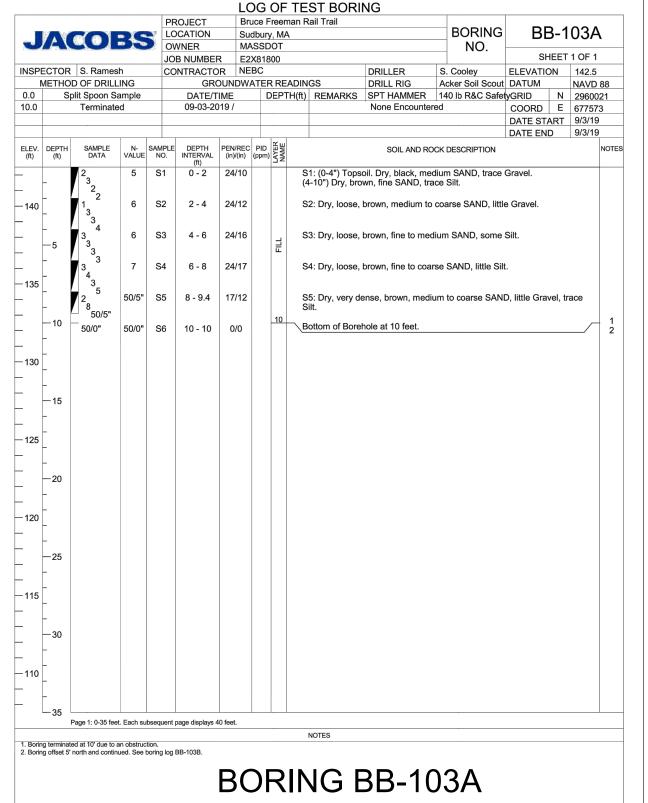
LOG OF TEST BORING PROJECT Bruce Freeman Rail Trail BORING LOCATION OWNER NO. JOB NUMBER E2X81800 CONTRACTOR NEBC GROUNDWATER READINGS DRILL RIG Mobile B-53 DATUM NAVD 88 DATE/TIME DEPTH(ft) REMARKS SPT HAMMER 140 lb Auto GRID N 2973226 4.0 Wash Boring w/ 4" Casing 08-19-2019 / 8:18 am 9.3 COORD E 681132 NX Rock Core DATE START 8/16/19 Terminated DATE END 8/19/19 SAMPLE N- VALUE NO. INTERVAL (in)/(in) (ppm) SOIL AND ROCK DESCRIPTION <del>- 130 -</del> Dry, medium dense, brown, medium to coarse SAND, trace Gravel. 10 S3 4 - 6 24/4 **-- 125** --13 S4 6-8 24/12 S5: Wet, medium dense, brown, medium to coarse SAND, some Silt, 15 S5 8 - 10 24/20 S6: Wet, medium stiff, brown SILT, some fine to medium Sand. <del>- 120 -</del>  $\overline{\overline{o}}$  S7: Wet, medium stiff, brown SILT and fine SAND. S8: Wet, blackish brown, fine grained PEAT, trace Gravel. 115 S9. Wet, medium dense, blackish brown SAND and Organic Silt, trace 21 | S10 | 18 - 20 | 24/24 | S10: Wet, medium dense, medium SAND, little Silt, trace Gravel. S11: Wet, dense, fine GRAVEL and coarse Sand, little Silt. -25 22S12: Wet, very dense, fine to coarse GRAVEL, trace Silt, trace coarse **⊢ ⊢** 30 100 50/5" | 50/5" | S13 | 34 - 34.3 | 5/4 S13: Wet, very dense, coarse GRAVEL, trace Silt. Page 1: 0-35 feet. Each subsequent page displays 40 feet. **BORING BB-101** 

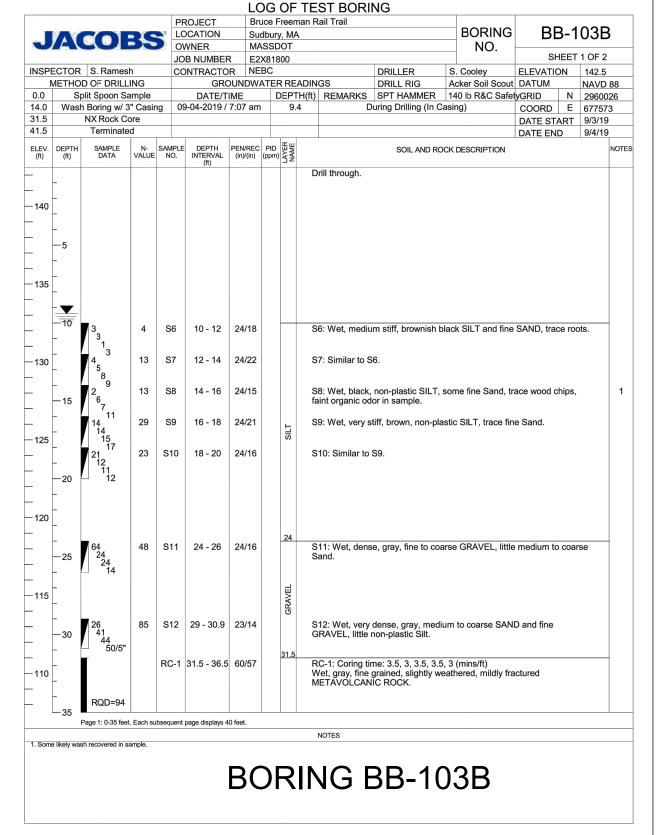


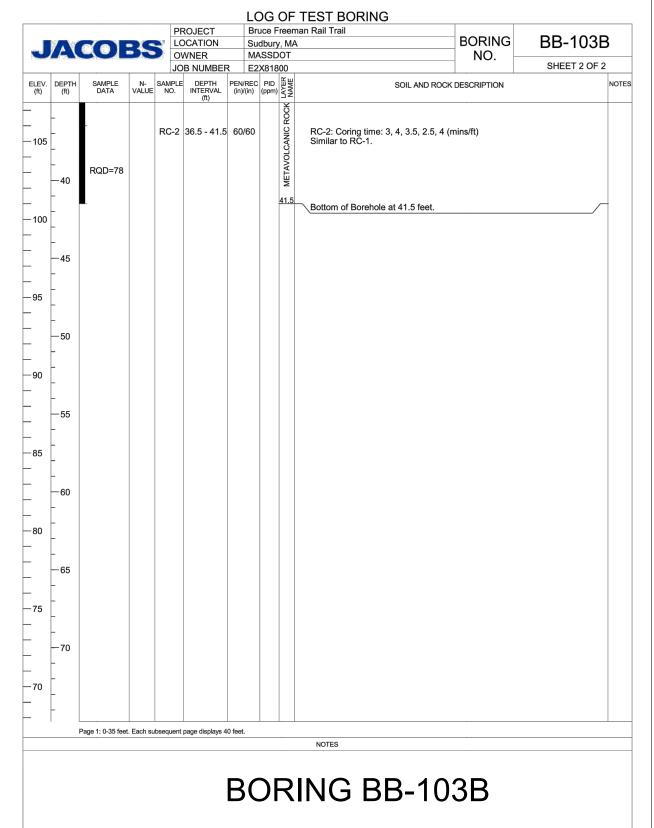












FED. AID PROJ. NO.

SHEET TOTAL SHEETS

XXX-XXXX(XXX)X

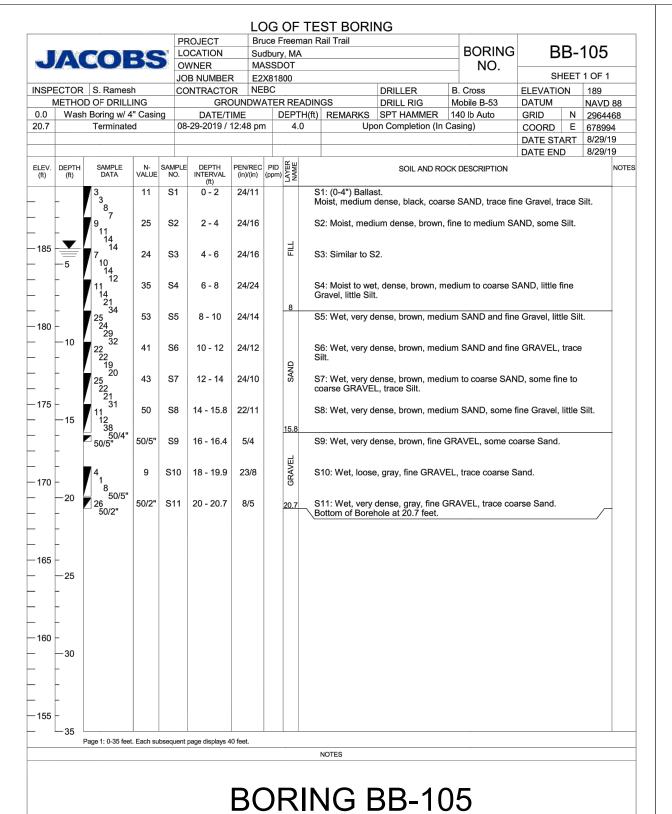
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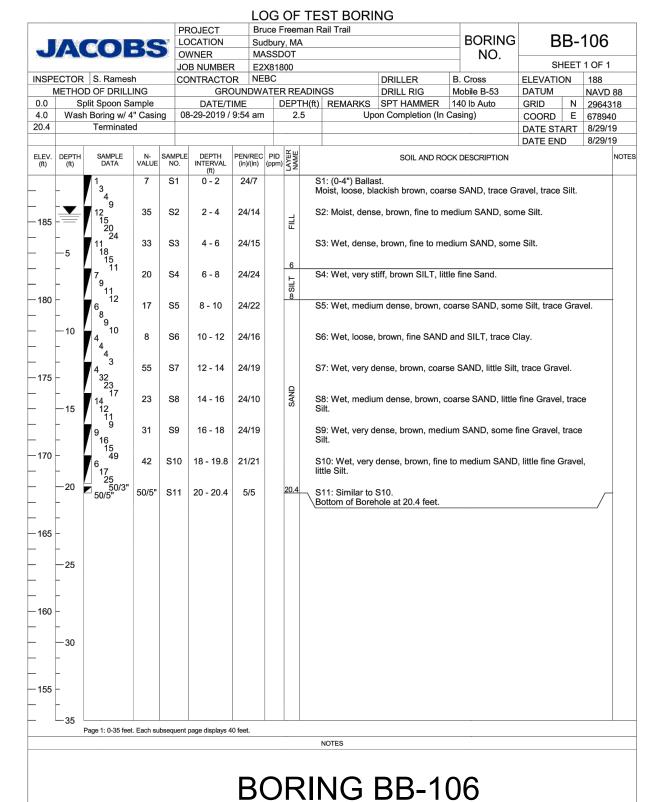
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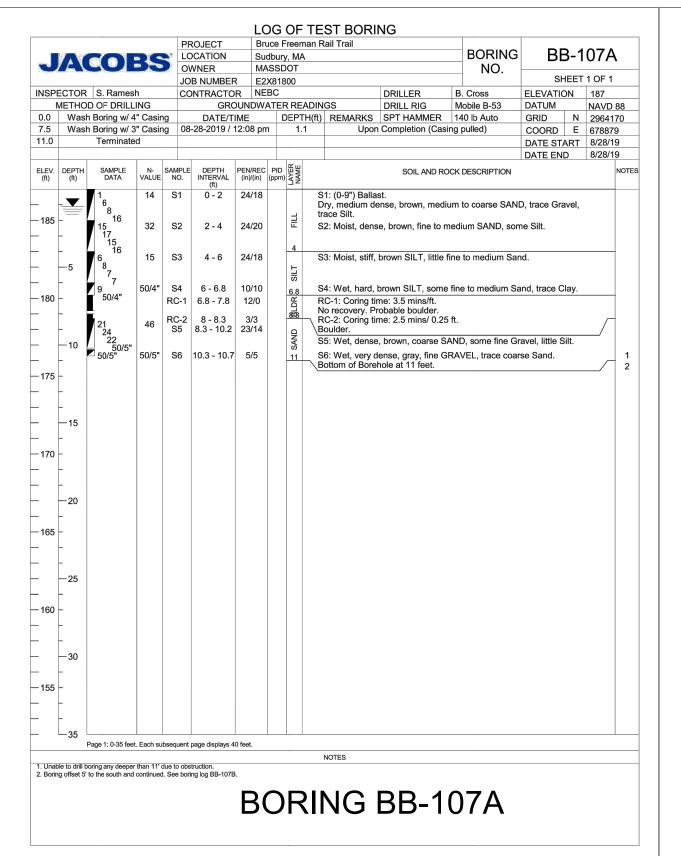
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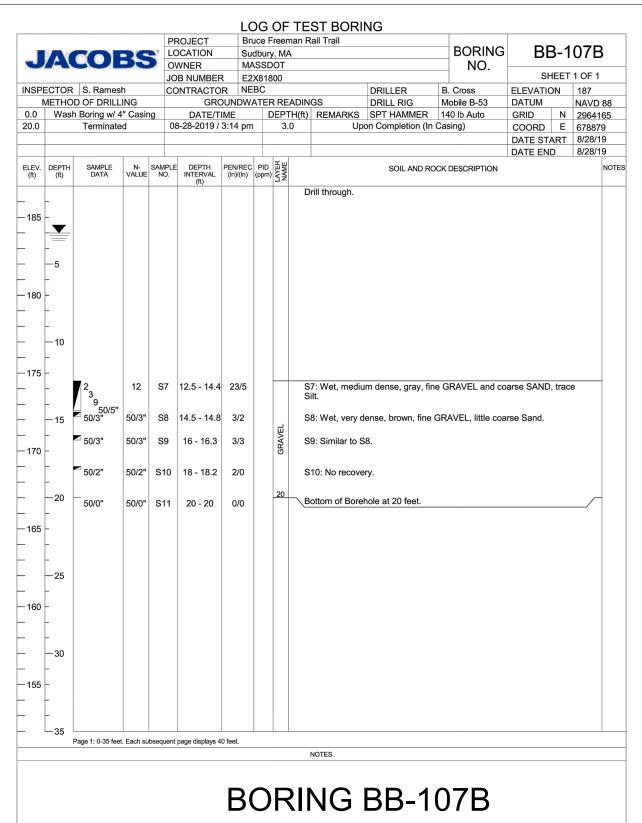
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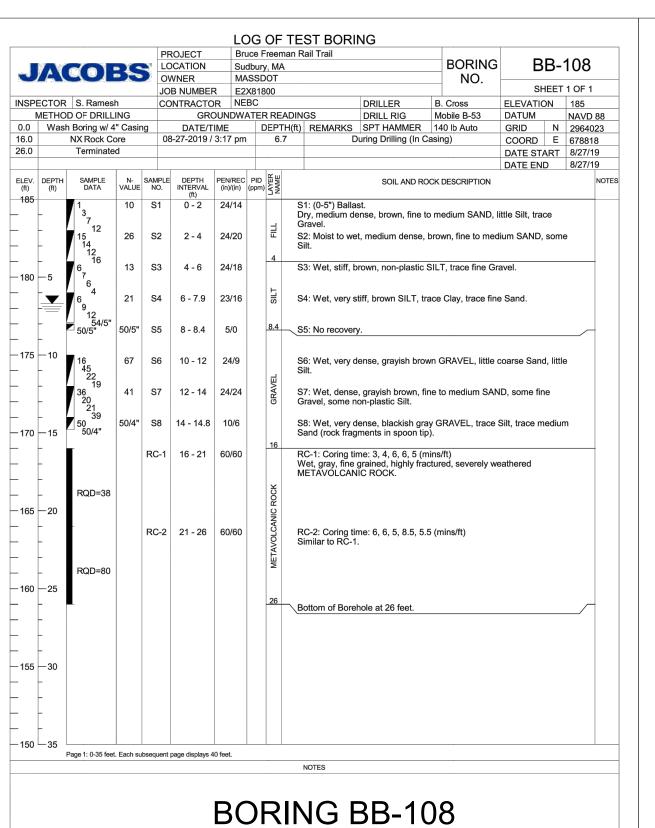
**BORING LOGS** 

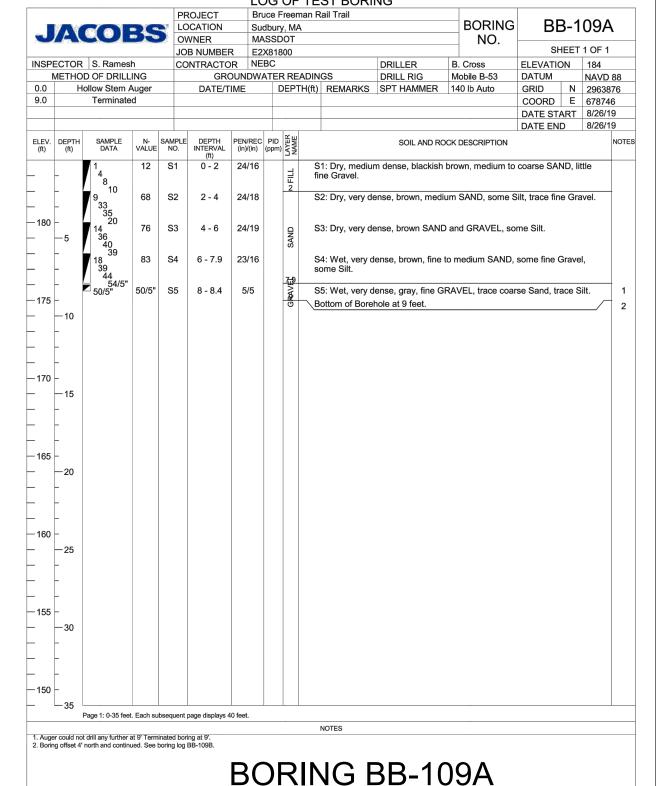




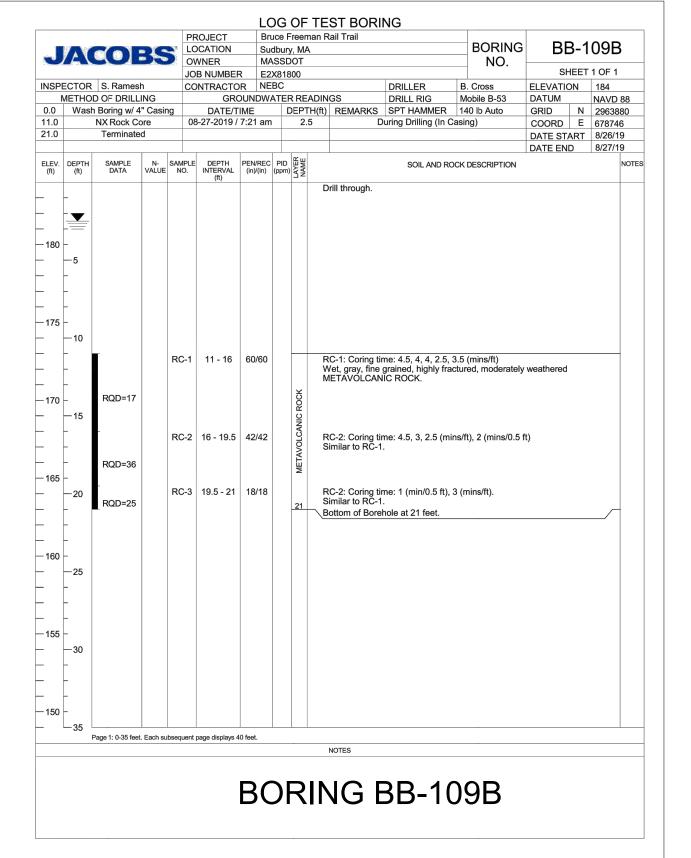








LOG OF TEST BORING



**BORING LOGS** 

PROJECT FILE NO. 608164

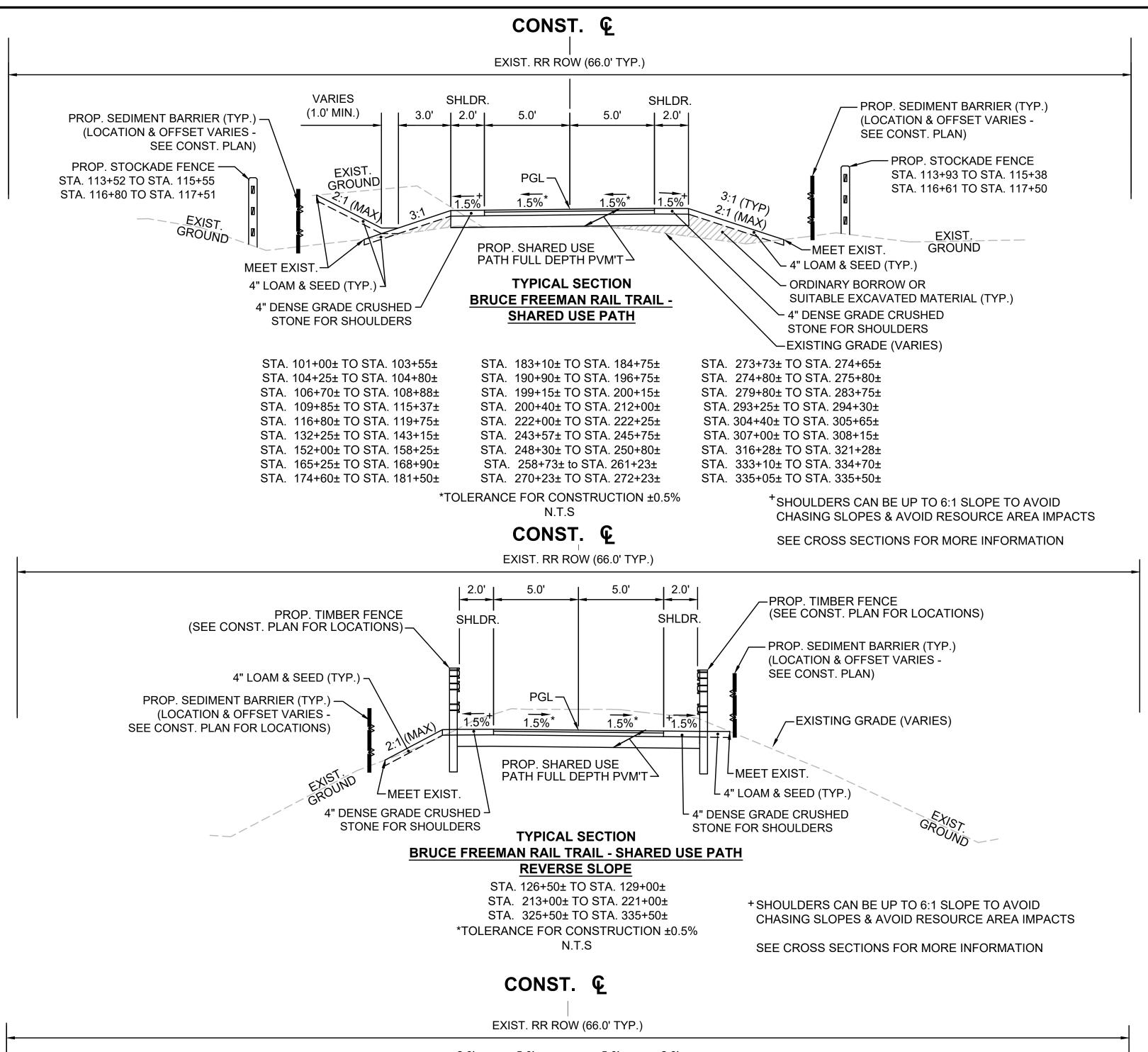
Client:	Fuss & O'Neil				ABOARI		Test Bor	•	B-1
	North Road S		.,	DRILLING, INC. 649 Meadow St., Chicopee, MA 01013			Monitor	well ID:	
Project:	Bruce Freema				_				4 .
Contracto	r: Seaboa	ard Dril		· · · · · · · · · · · · · · · · · · ·	NG/SOIL		Sheet No		1 of
	Casing		Core Barrel	Hammer (We	_	I-30")	Start:	3/26/2021	
Туре	HSA	SS	N/A	<del>                                     </del>	300/24		Finish:	3/26/2021	
O.D. Inch	8-1/2"			Rig Type: I	Mobile B	-53	Driller:	Dale Griffin	
I.D. Inch	4-1/4"								
Depth (ft.)	Blows	Sample	Recovery	F	IELD CL	<b>ASSIFICAT</b>	<b>TONS AN</b>	D REMARKS	
Range		No.							
0-2'	2-3-4-3	S-1	9"	fine to coarse	SAND				
5-7'	2-5-2-13	S-2	14"	fine to coarse	SAND to fir	ne Sand, trace	Silt (wet)		
10-12'	13-13-9-12	S-3	12"	Similar to S-2	above				
15-17'	woh-3-4	S-4	24"	fine SAND & S	Silt				
20-22'	18-25-35-50/3	S-5	18"	weathered roc	k				
25-27	50/3"	S-6	0	Auger refusal ( End of Boring					
	SAMPLE P	ENETRAT	I TION RESIST.	 ANCE - 140 lb.	Wt. Falling	30" on 2" O.E	). sampler		
Densi	ty (# Hammer			sive Consistenc				PROPORTION	S
0-4	•		0-2	Very Soft	3-4	Soft	Trace	0 to 10%	
5-9	•	<del></del>	5-8	Medium-Stiff		Stiff	Little	10 to 20%	
10-29		n-Dense	16-30	Very Stiff	31+	Hard	Some	20 to 35%	
		ם פוו פת	10-30	very our	011	riaiu			
30-4							and	30 to 50%	

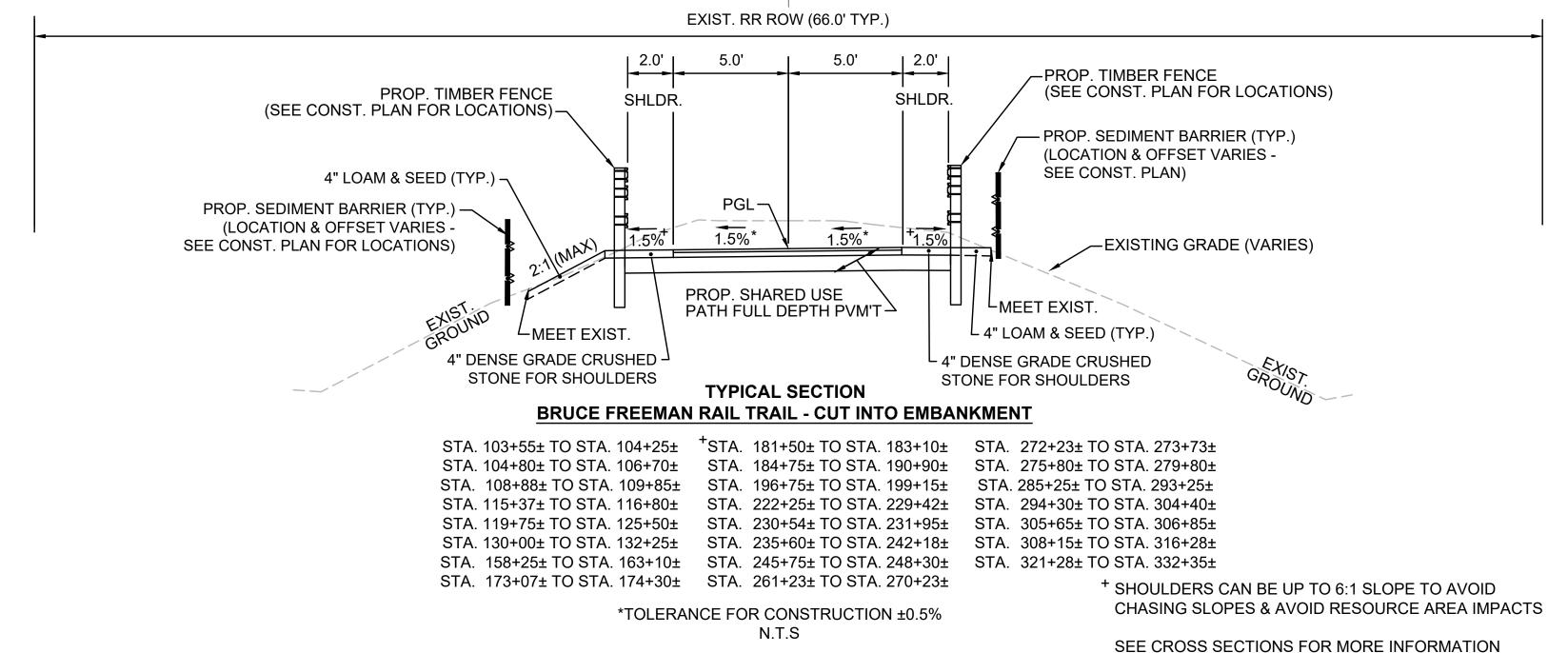
Client: Location: Project:	ocation: Peakham/Hudson Sudbury Ma		Peakham/Hudson Sudbury Ma DRILLING, INC.			, INC.	Test Bori Monitor \	B-2	
-	or: Seaboard Drilling, Inc.								1 of 1
			Core Barrel	Hammer (Weight-Ib./fall-30")		<b>Start</b> : 3/26/2021			
Туре	HSA	SS	N/A	1	300/24	•	Finish:	3/26/2021	
O.D. Inch	8-1/2"			Rig Type: I		B-53	Driller:	Dale Griffin	
I.D. Inch	4-1/4"			ing Typo		2 00	<b>D</b> 1111011.	Daio Giiiiii	
Depth (ft.)	Blows	Sample	Recovery		IEI D C	LASSIFICAT	IONS AND	DEMVBKS	
Range	DIOWS	No.	Recovery	'	ILLD C	LAGGII ICAT	IONO ANI	J INLIVIAINING	
0-2'	3-2-10-11	S-1	18"	6	CAND III	Ha Caracal I was a d			
0-2	3-2-10-11	3-1	10	line to coarse	SAND, III	tlr Gravel, wood			
5-7'	38-43-50-50/4	S-2	20"	fine to coarse	SAND and	d Gravel			
10-12'	15-20-50/4"	S-3	8"	Similar to S-2	ahove (w	et)			
				Similar to 3-2	above (w	61)			
15-17'	50/2"	S-4	0	Auger refusal	@ 15.5' v	ery dense from 1	2-15.5'		
				End of Boring	@ 15.5'				
						.,			
				,		ng 30" on 2" O.D	). sampler	DDODODTION	
	ty (# Hammer E			sive Consistenc		-		PROPORTIONS	<u> </u>
0-4	,	oose	0-2	Very Soft	3-4	Soft	Trace	0 to 10%	
5-9	Loose		5-8	Medium-Stiff	9-15	Stiff	Little	10 to 20%	
10-29	9 Mediun	n-Dense	16-30	Very Stiff	31+	Hard	Some	20 to 35%	
30-4	9 Dense						and	30 to 50%	
50-	+ Very D	0000	[				1		

MAST ARM & STRAIN POLE LOCATION KEY							
NO.	STATION/ OFFSET	INTERSECTION	MAST ARM SIZE	SOIL BORING NO.	SOIL TYPE	FOUNDATION DEPTH	
1	502+56/ 32.9 RT	HUDSON/ PEAKHAM	45'-0"	B-2	LOOSE TO DENSE DRY SAND	12'-0"	
2	307+80 / 9.8 LT	BFRT/ NORTH ROAD	25'-0"	B-1	LOOSE DRY SAND	7'-6"	

\*FOR BIDDING PURPOSES ONLY.
ACTUAL FOUNDATION DEPTH TO
BE DETERMINED BY THE
CONTRACTORS STRUCTURAL
ENGINEER/SUPPLIER AND
APPROVED THROUGH STAMPED
SHOP DRAWINGS.

50+ Very Dense





# SUDBURY PRINCE EREEMAN RAIL TRAIL

DRUCE FREEIVIAN KAIL TRAIL								
STA.TE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS					
MA	XXX-XXXX(XXX)X	9	318					
	PROJECT FILE NO.	608164						

TYPICAL SECTIONS

## **PAVEMENT NOTES:**

PROPOSED SHARED-USE PATH

SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)

INTERMEDIATE: 2-1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0)

SUBBASE: 4" to 8" GRAVEL BORROW, TYPE b (FOR LEVELING)

OVER RESHAPED EXISTING RAILROAD BALLAST

PROPOSED PARKING LOT FULL DEPTH PAVEMENT

SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE 9.5 OVER

BASE: 2-1/2" SUPERPAVE INTERMEDIATE COURSE 19.0 - OVER

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED FULL DEPTH CONSTRUCTION (LESS THAN 4.00' WIDE) - PEAKHAM ROAD

& HUDSON ROAD

SURFACE: 1-3/4" SUPERPAVE SURFACE COURSE - 12.5 POLYMER INTERMEDIATE: 2-1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 OVER

BASE: 6" CEMENT CONCRETE BASE COURSE -

4000psi, 610, 3/4" OVER

SUBBASE: 8" GRAVEL BORROW, TYPE b.

PROPOSED PAVEMENT MILLING & OVERLAY - PEAKHAM ROAD & HUDSON ROAD

1-3/4" PAVEMENT MILLING

1-3/4" SUPERPAVE SURFACE COURSE - 12.5 POLYMER

PROPOSED HOT MIX ASPHALT SIDEWALK & DRIVEWAY

SURFACE: 1-1/2" SUPERPAVE SURFACE COURSE 9.5 OVER

2-1/2" SUPERPAVE INTERMEDIATE COURSE 19.0

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE REST AREA, CONCRETE WALK & WHEELCHAIR RAMP

SURFACE: 6" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI, 3/4", 610

SUBBASE: 8" GRAVEL BORROW, TYPE b

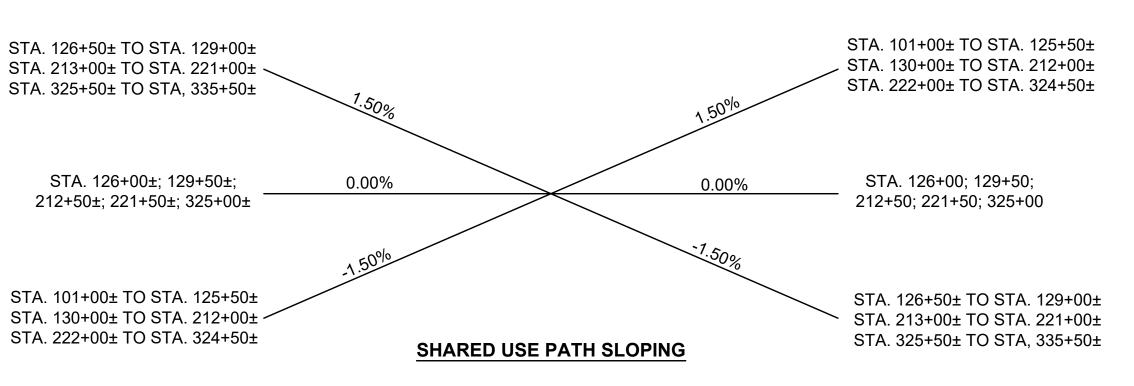
NOTES: EXIST. GRAVEL/BALLAST SUBGROUND MATERIAL DETERMINED BY THE ENGINEER TO BE SUITABLE SHALL REMAIN. THE DEPTH OF THE GRAVEL BORROW WILL BE AS REQUIRED BASED ON THE PROPOSED SUB-BASE ELEVATIONS.

AFTER REMOVAL OF STEEL RAILS AND WOOD TIMBER, ROUGH GRADE AND COMPACT SUBGROUND AREA. THEN PLACE AND COMPACT GRAVEL BORROW SUB-BASE MATERIAL IN MULTIPLE LIFTS.

ASPHALT EMULSION FOR TACK COAT AND HMA JOINT SEALANT SHALL BE APPLIED PER SECTION 450 QA OF THE SPECIAL PROVISIONS.

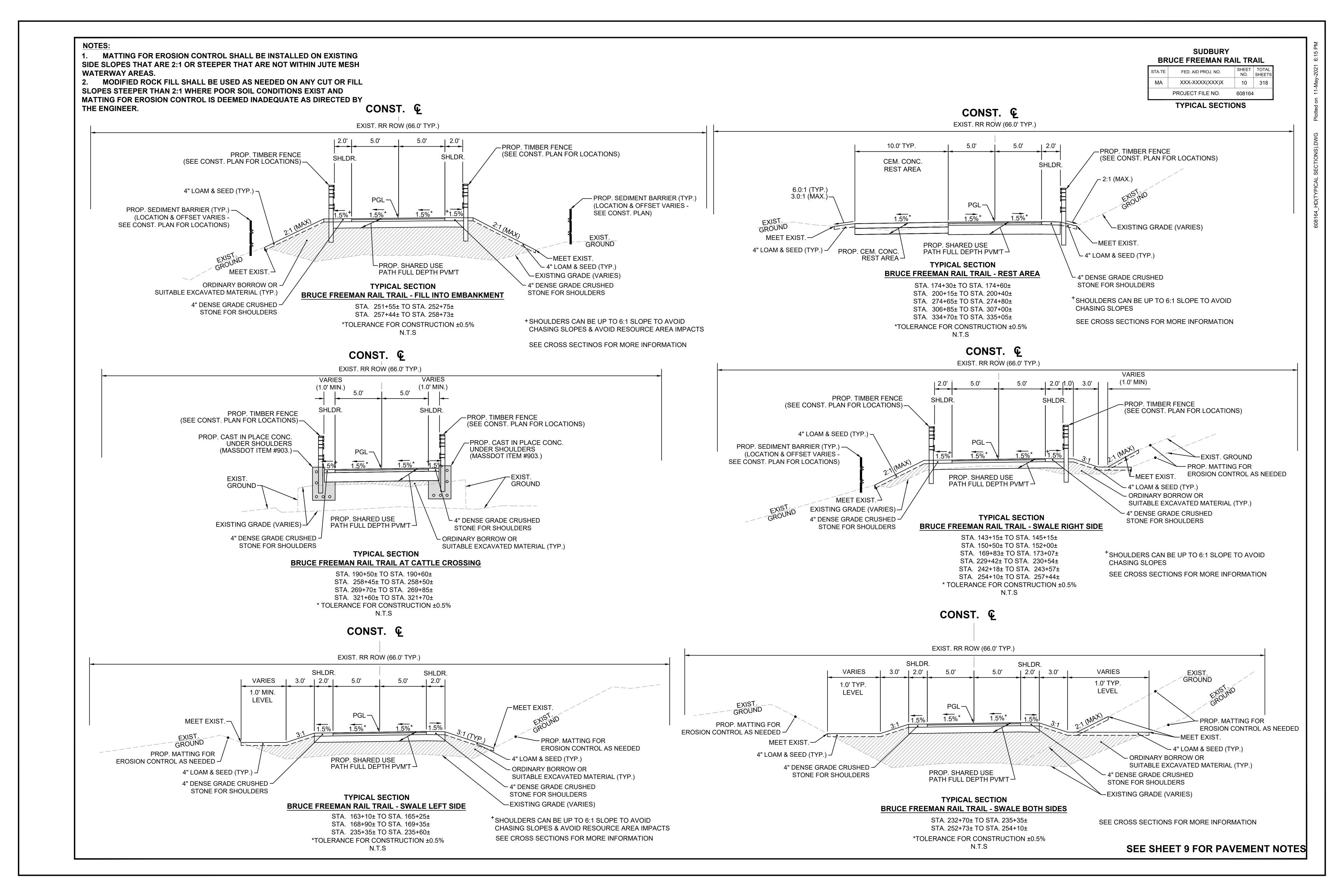
HMA FOR PATCHING SHALL BE USED FOR ALL PERMANENT, PARTIAL, AND FULL DEPTH PAVEMENT REPAIRS OF UNSOUND PAVEMENT PER SECTION 450 IN AREAS OUTSIDE OF PROP.OSED FULL DEPTH RECLAMATION OR RECONSTRUCTION ROADWAY AREAS.

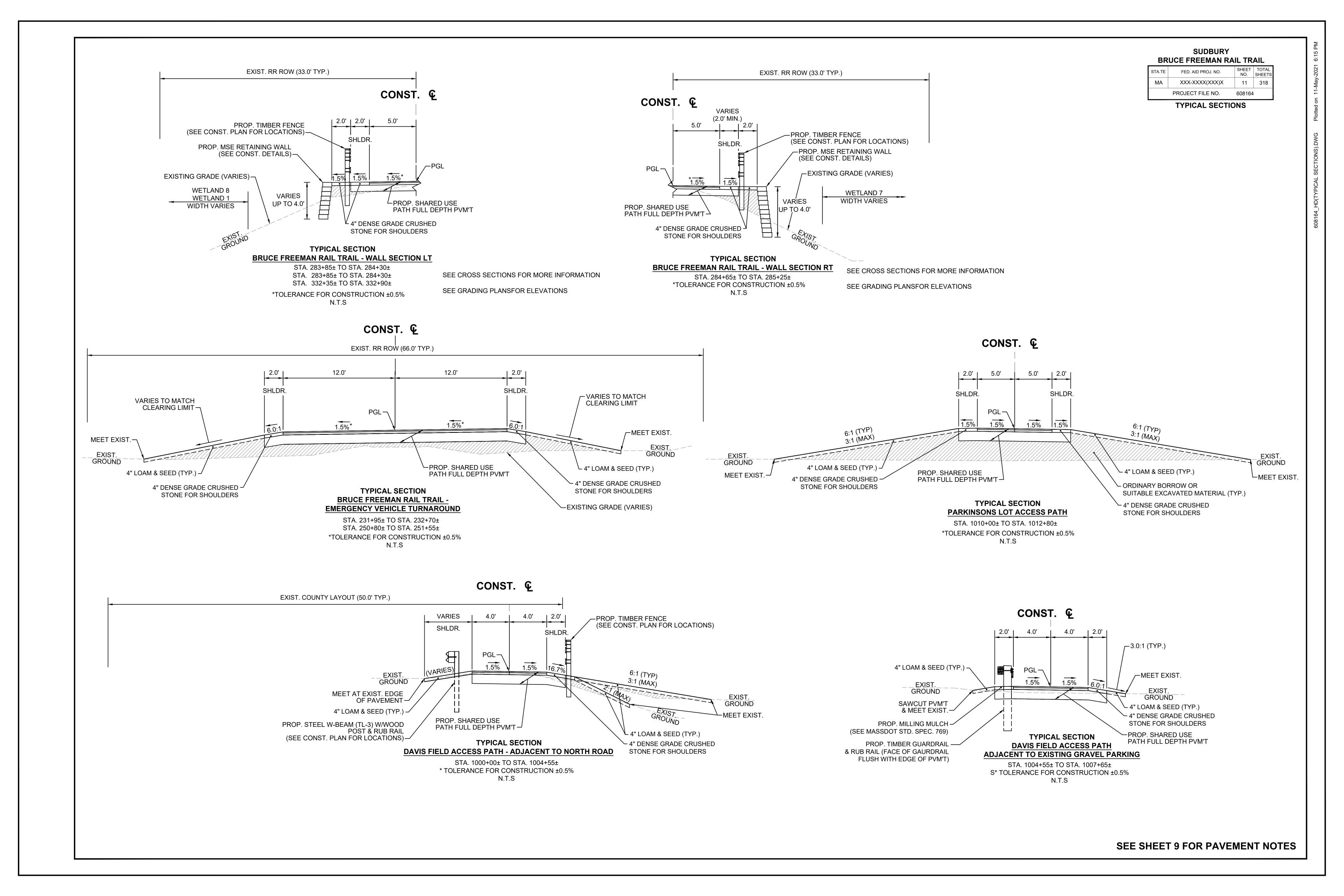
HMA FOR MISCELLANEOUS WORK SHALL BE USED FOR ALL TEMPORARY CONSTRUCTION, TAPER RAMPS, CURB CUT RAMPS, TEMPORARY TRENCH REPAIR, ETC.

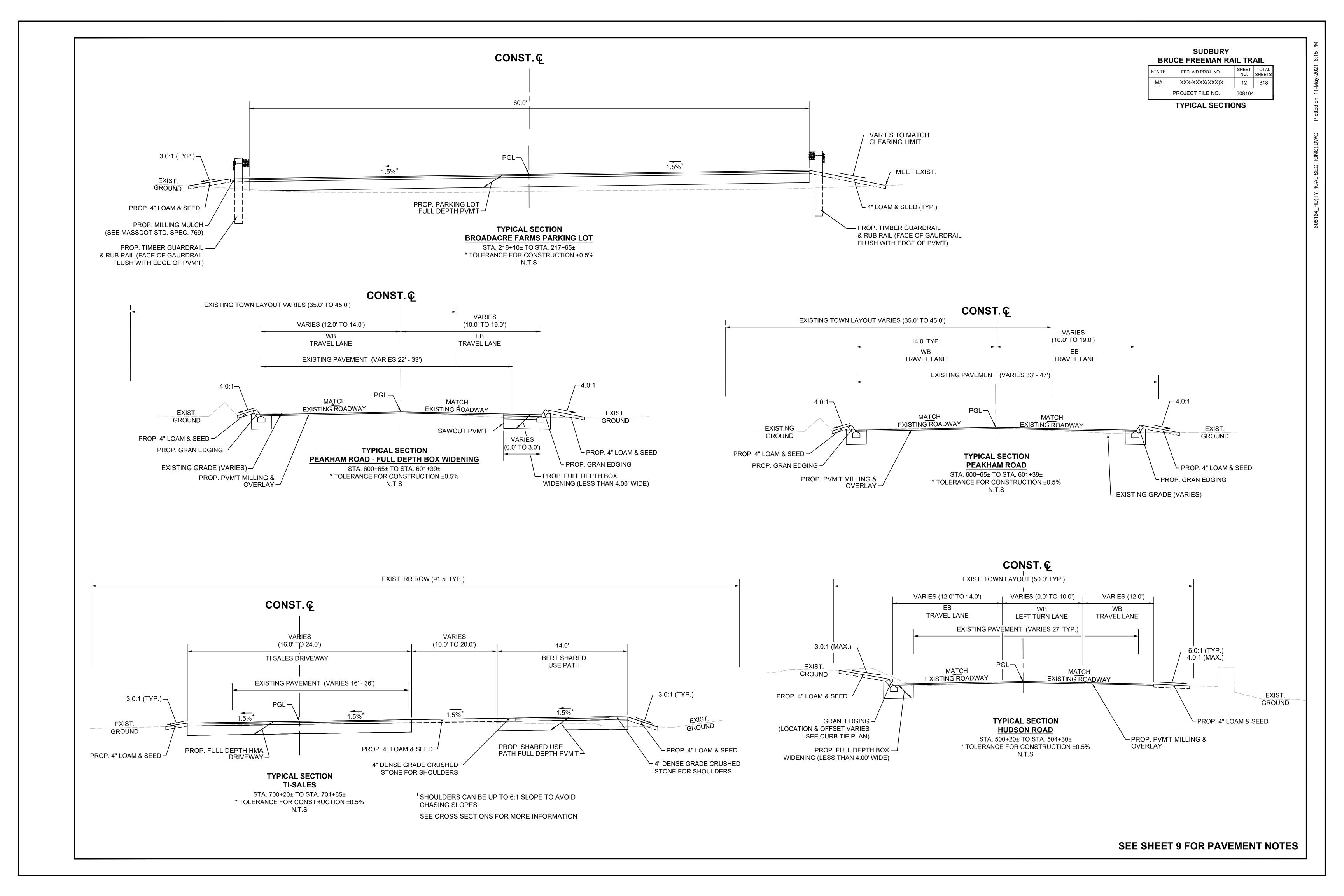


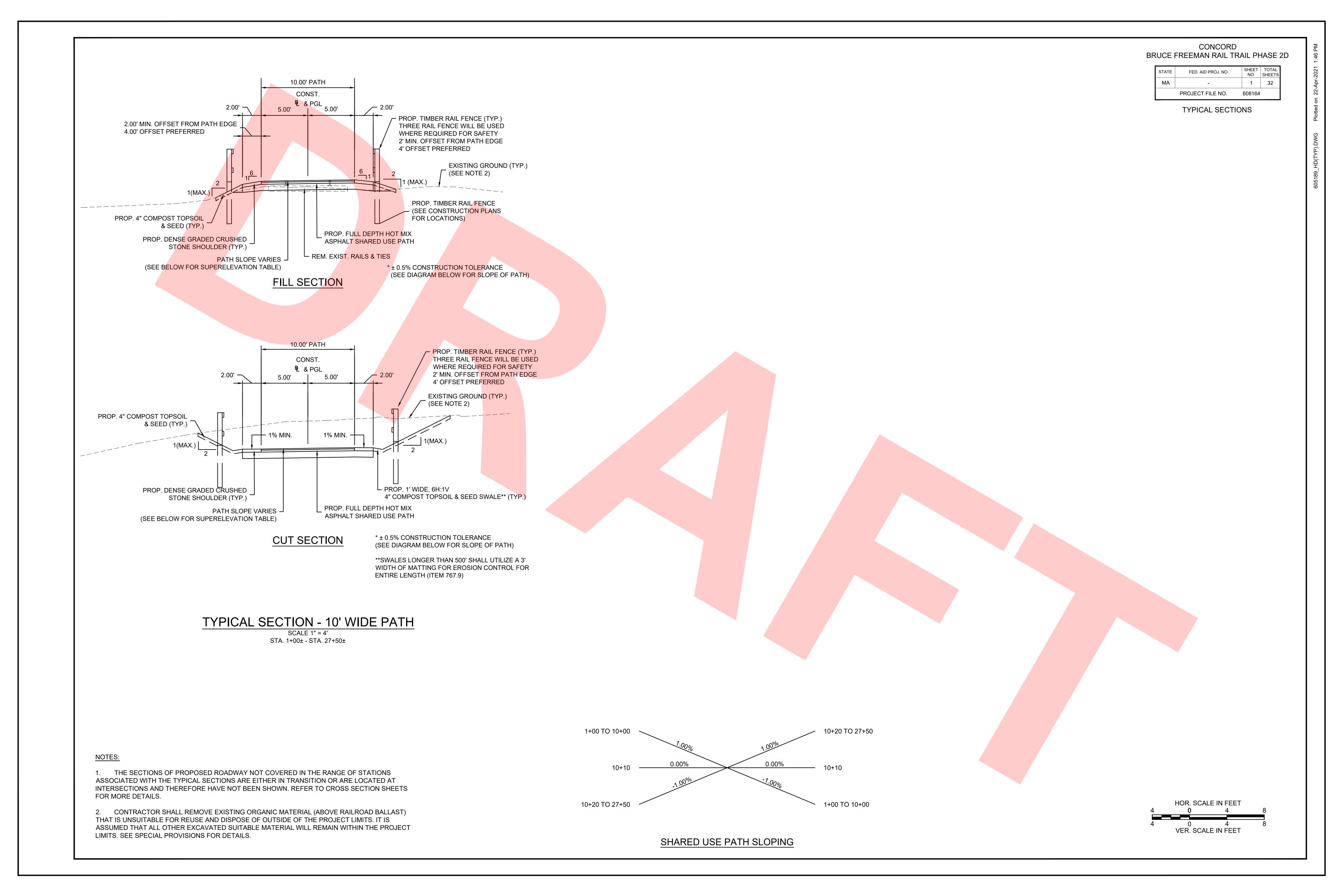
### NOTE:

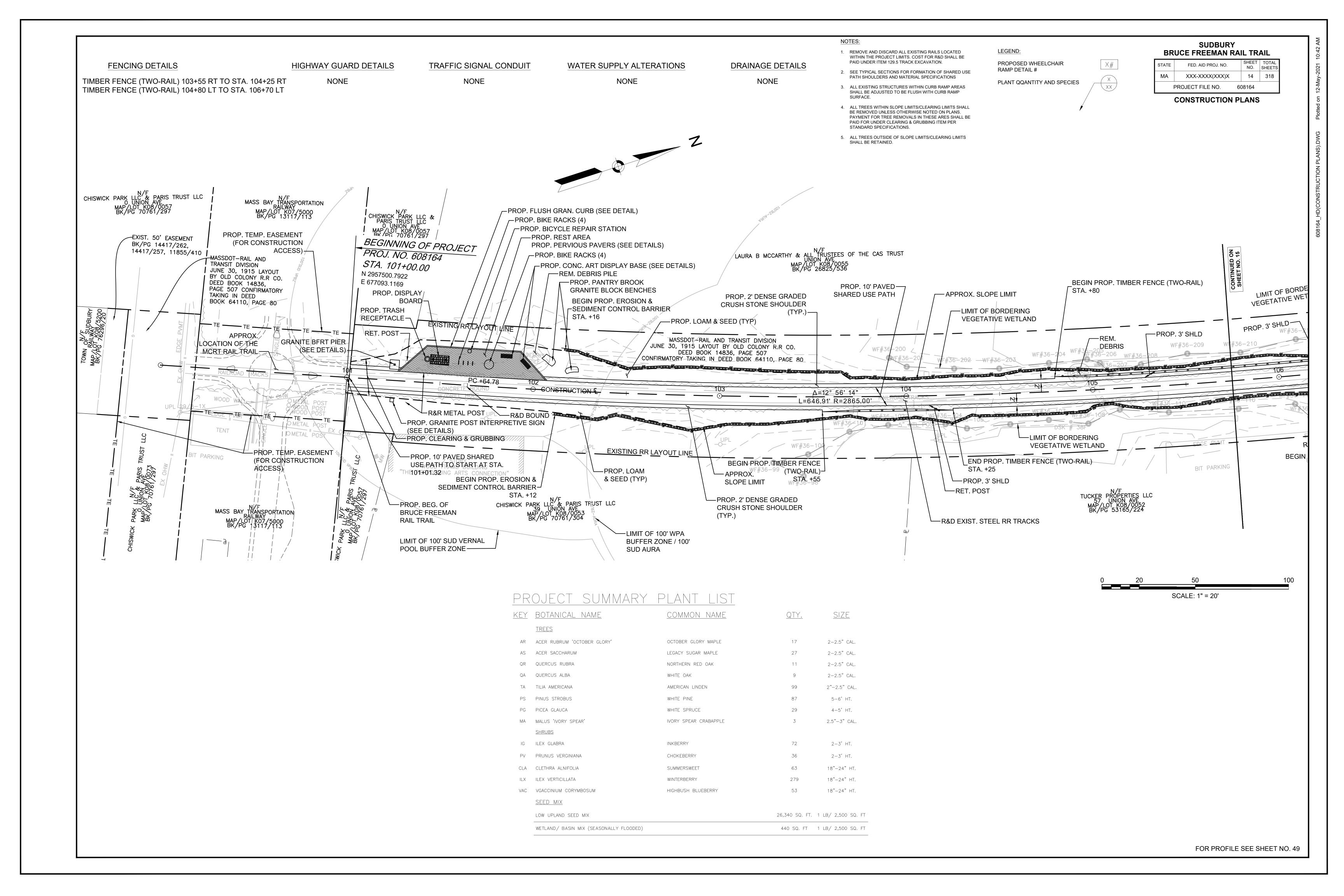
1. THE SECTIONS OF PROPOSED ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER IN TRANSITION OR ARE LOCATED AT INTERSECTIONS AND THEREFOR HAVE NOT BEEN SHOWN. REFER TO CROSS SECTION SHEETS FOR MORE DETAILS.

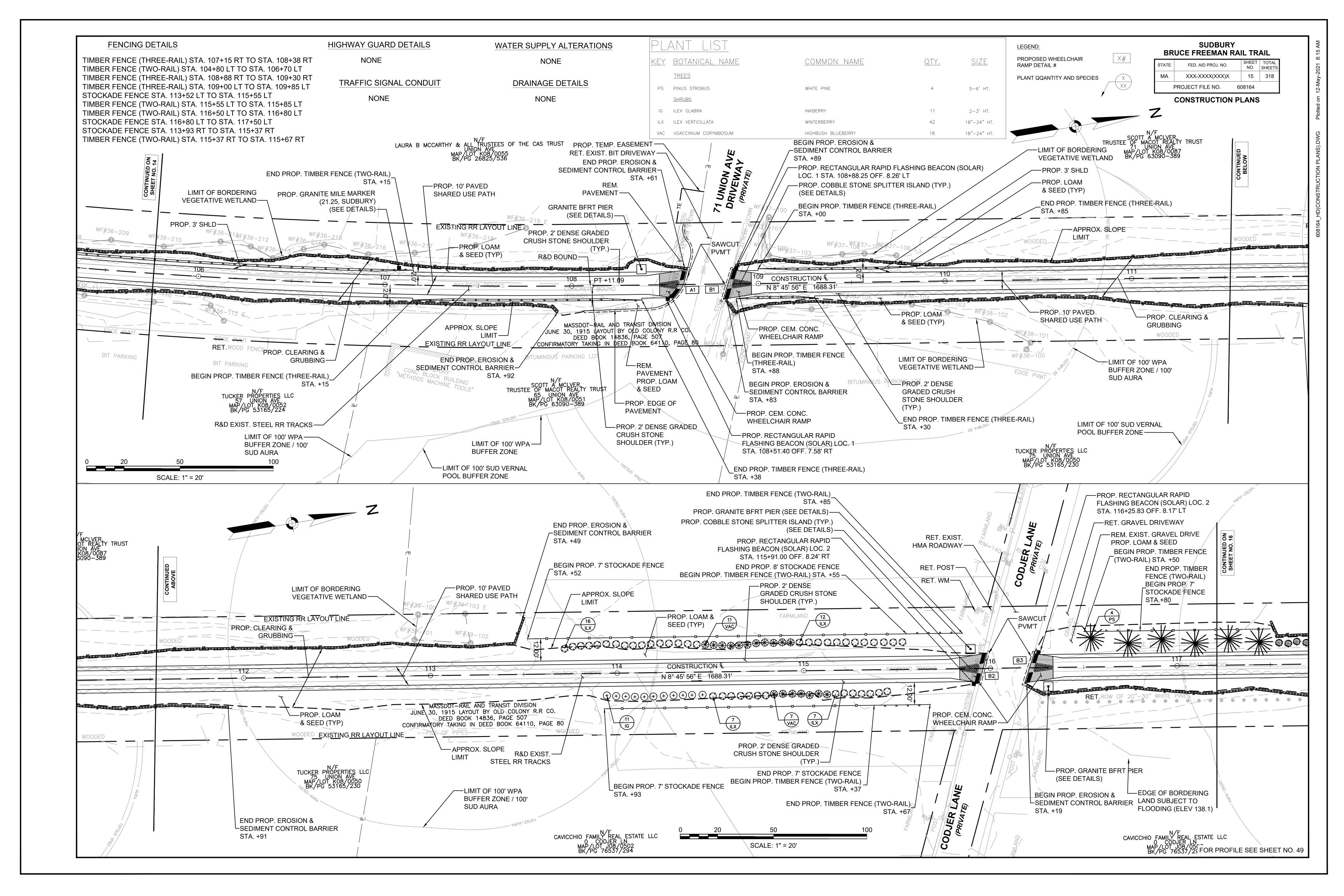


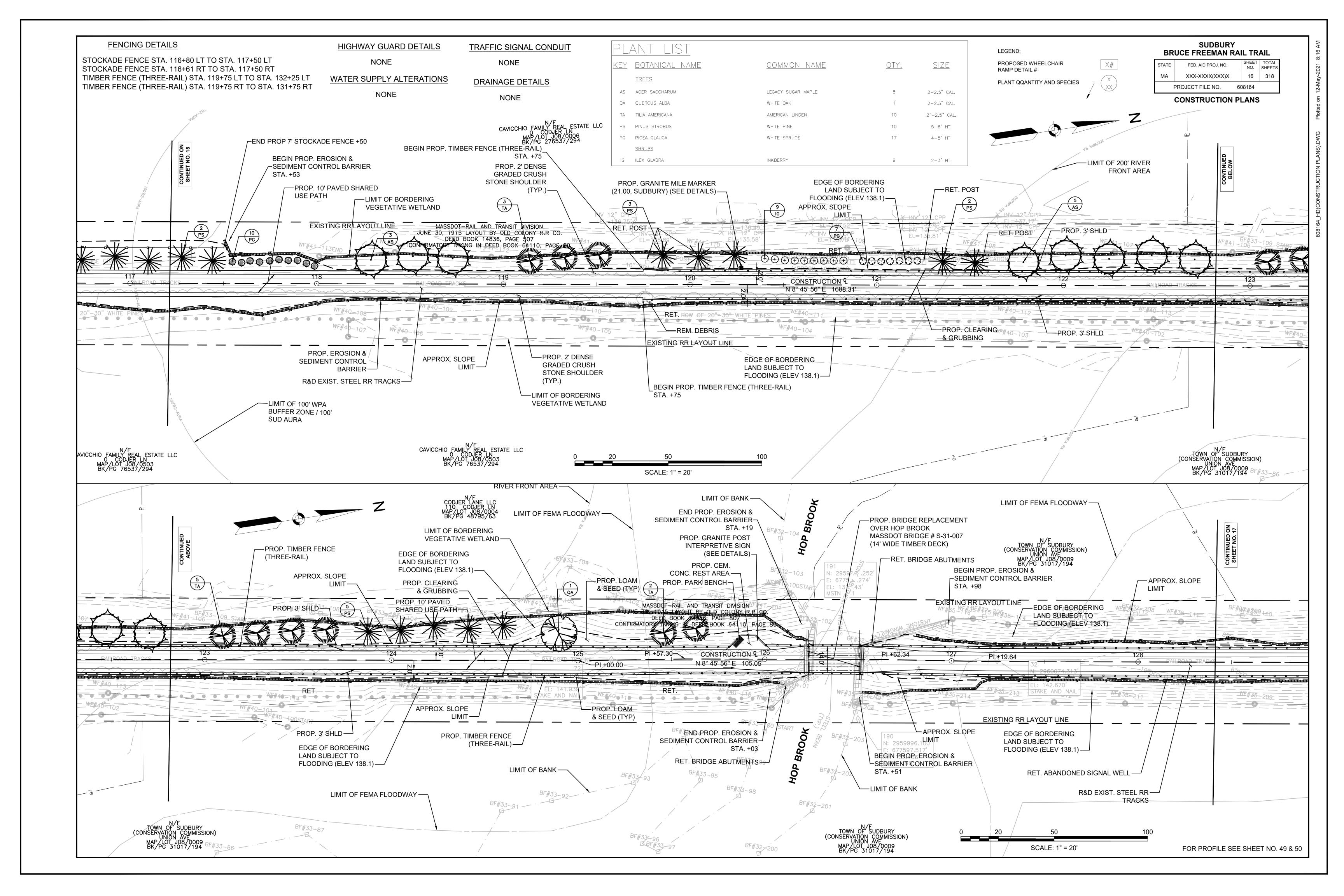


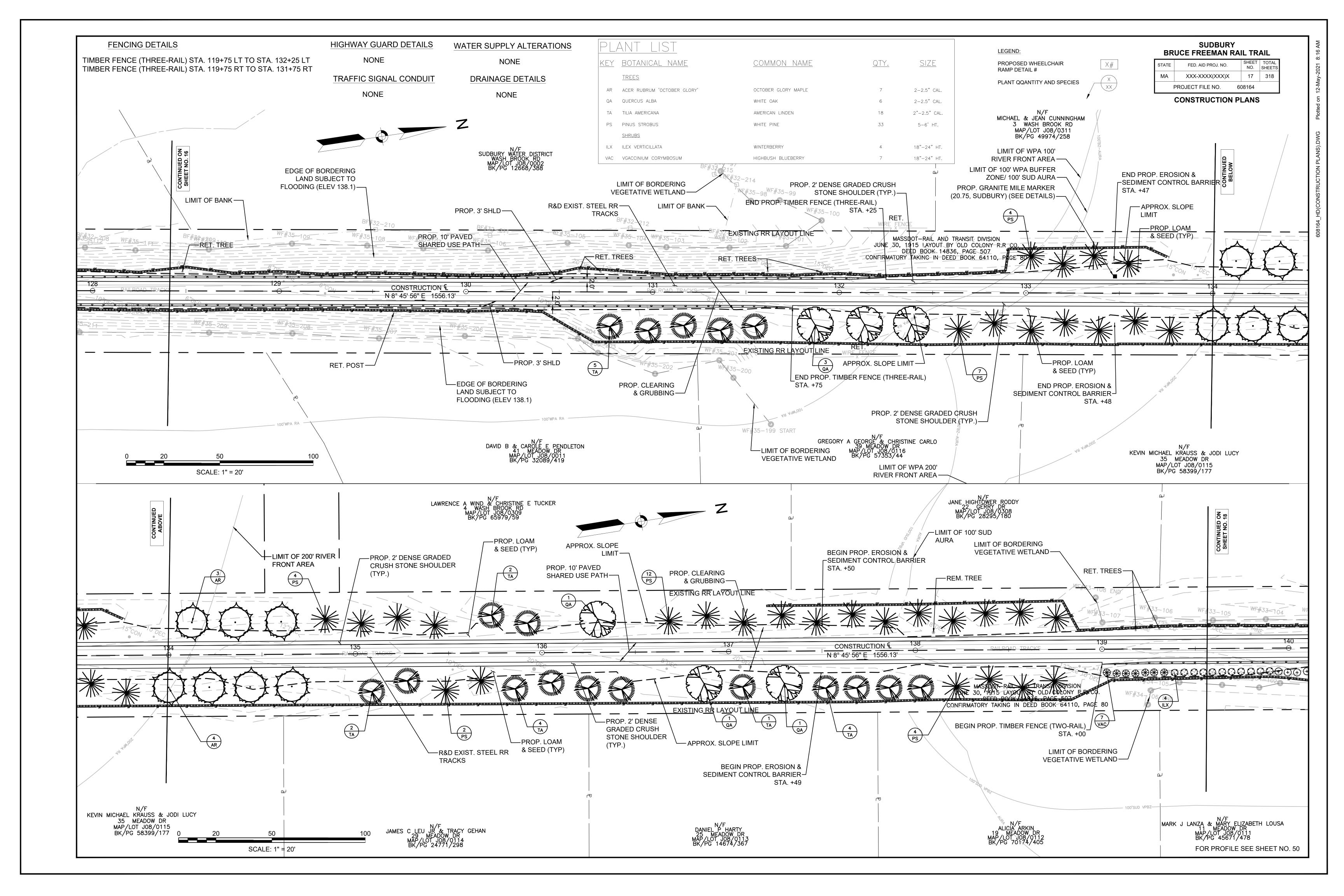


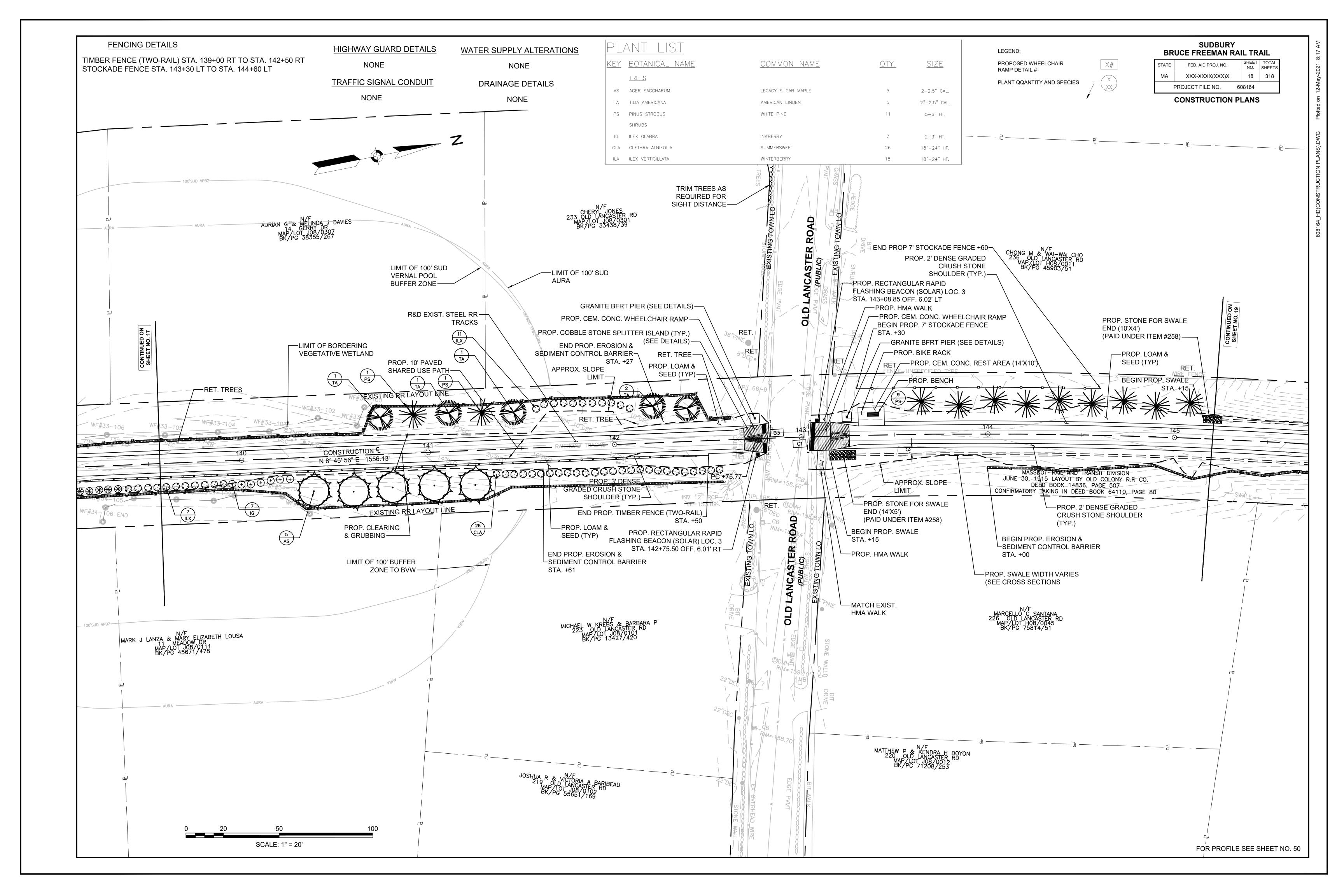


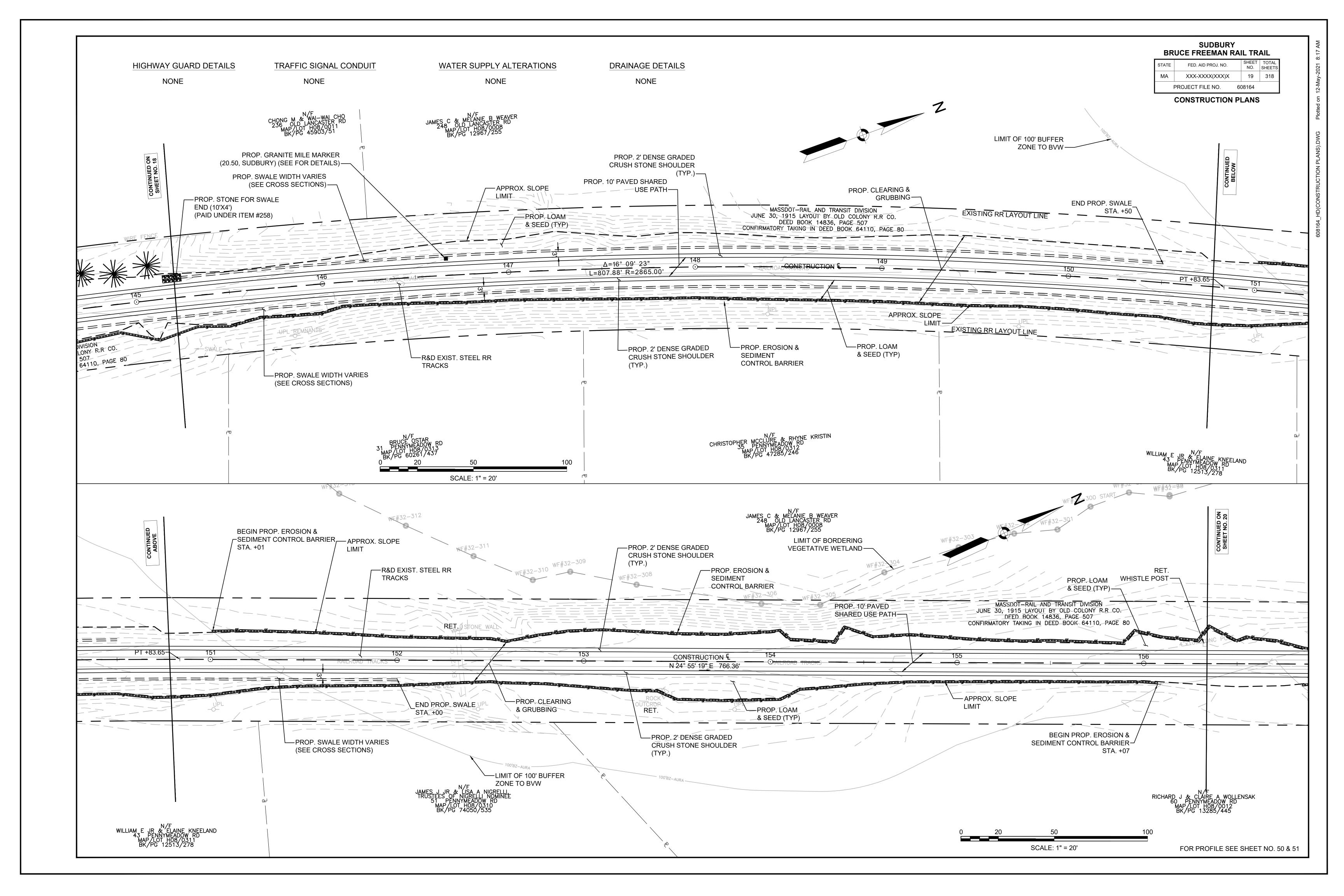


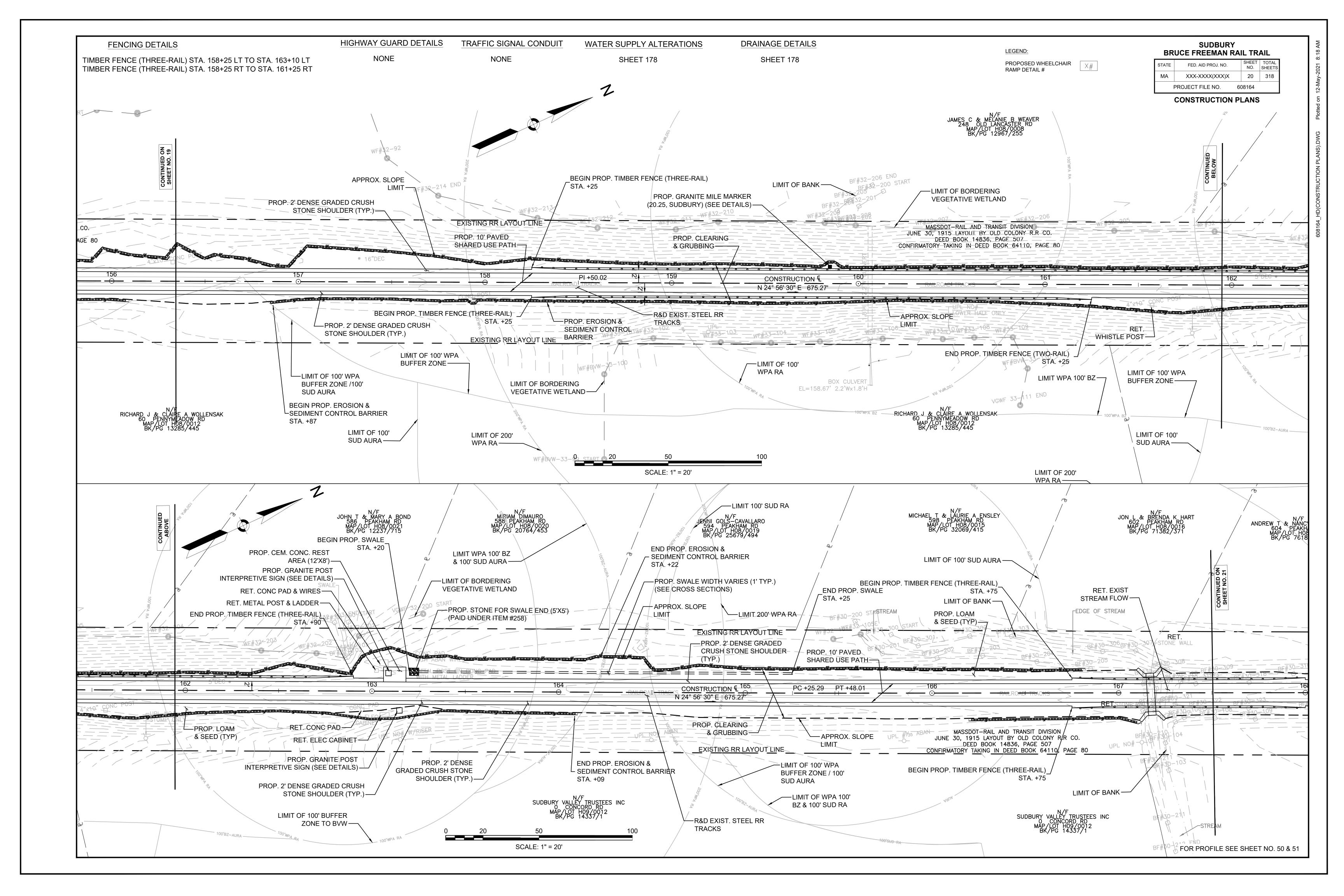


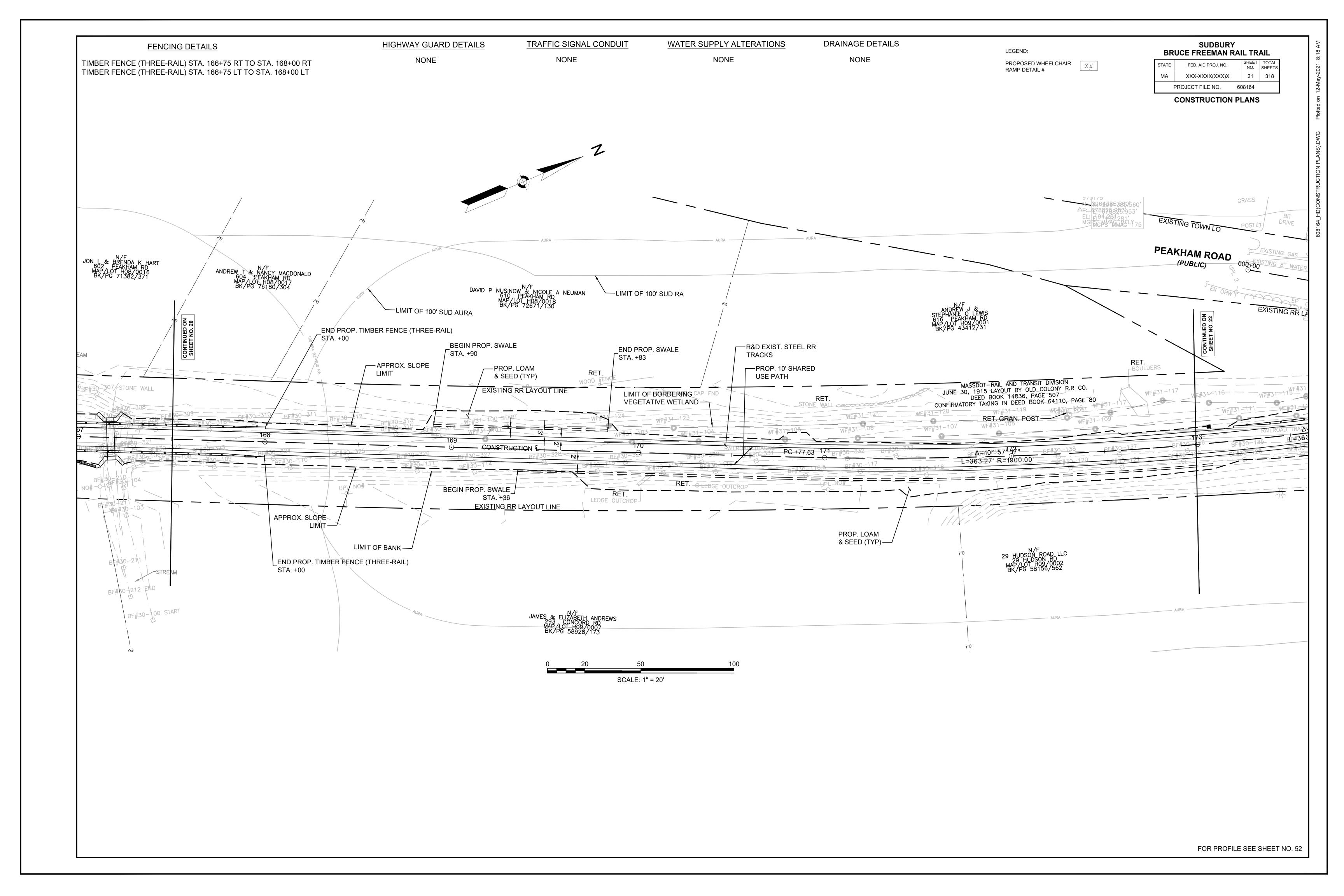


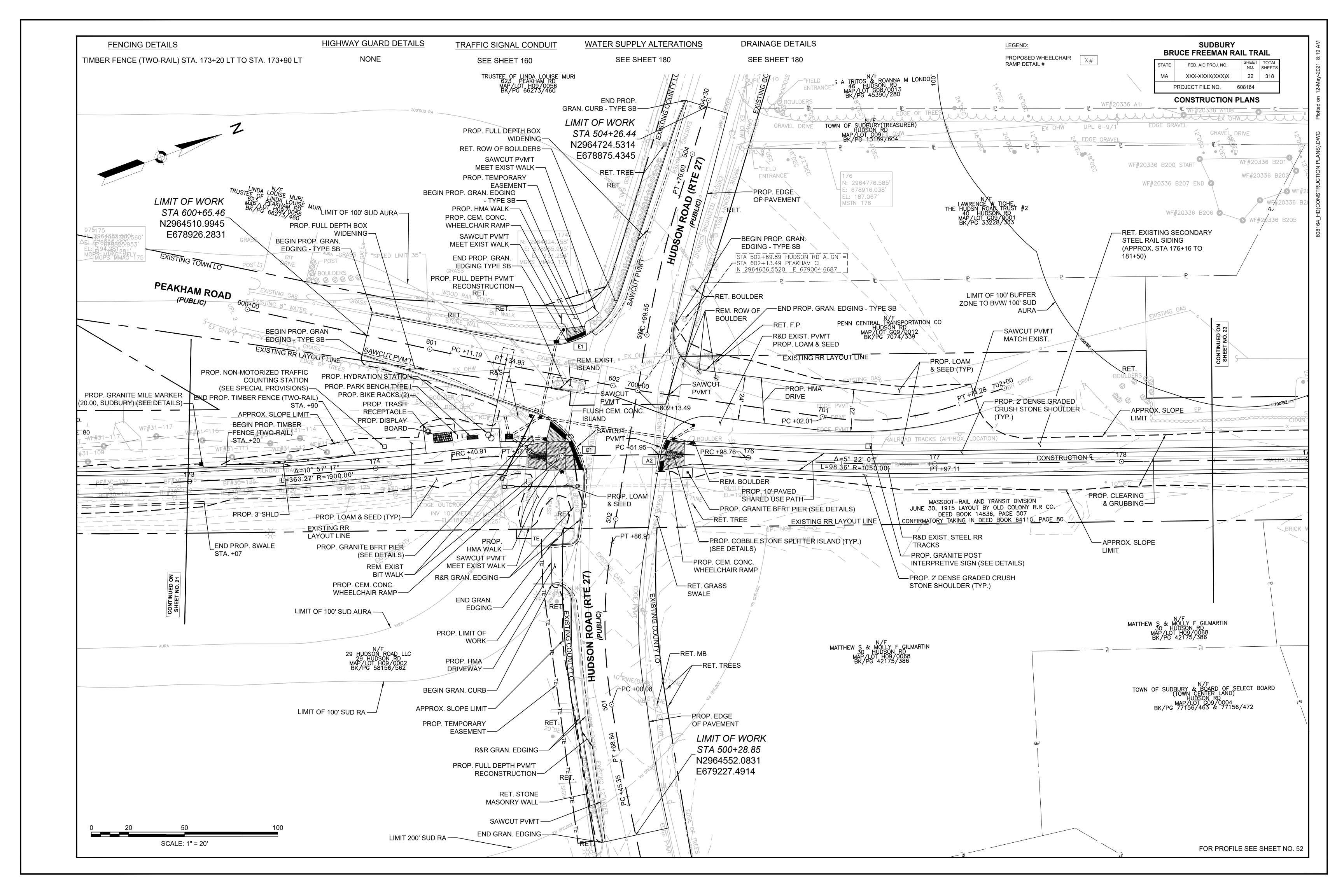


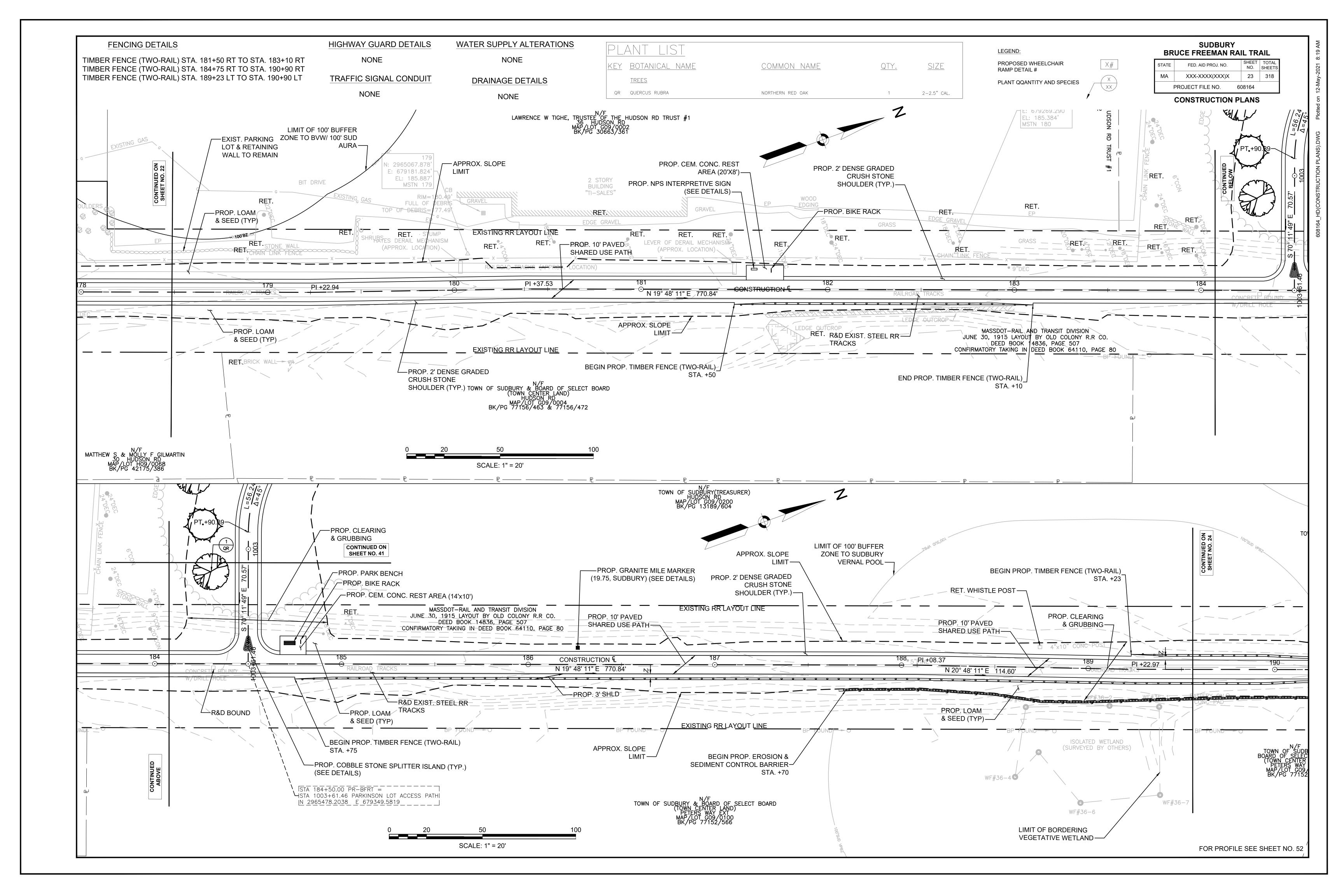


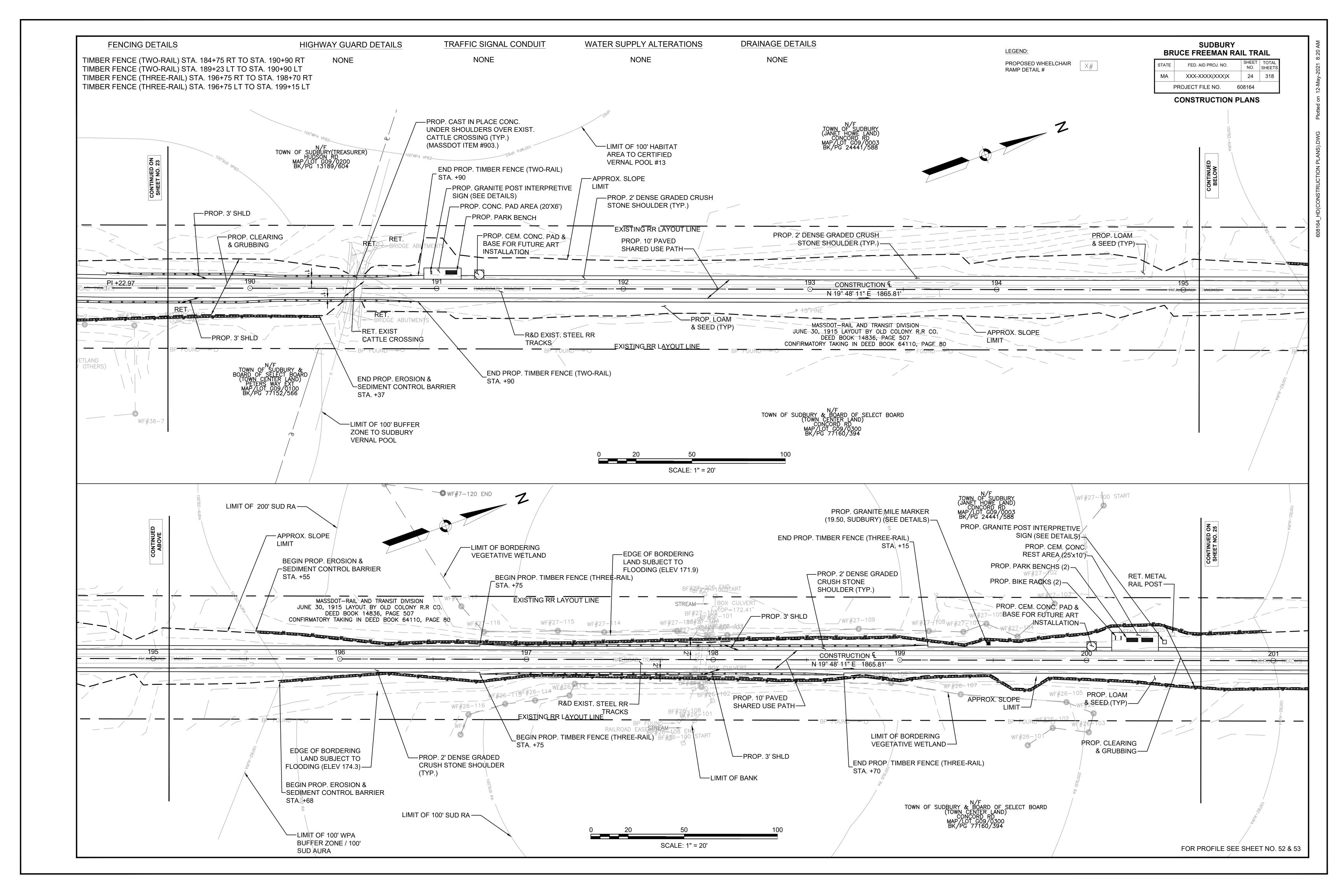


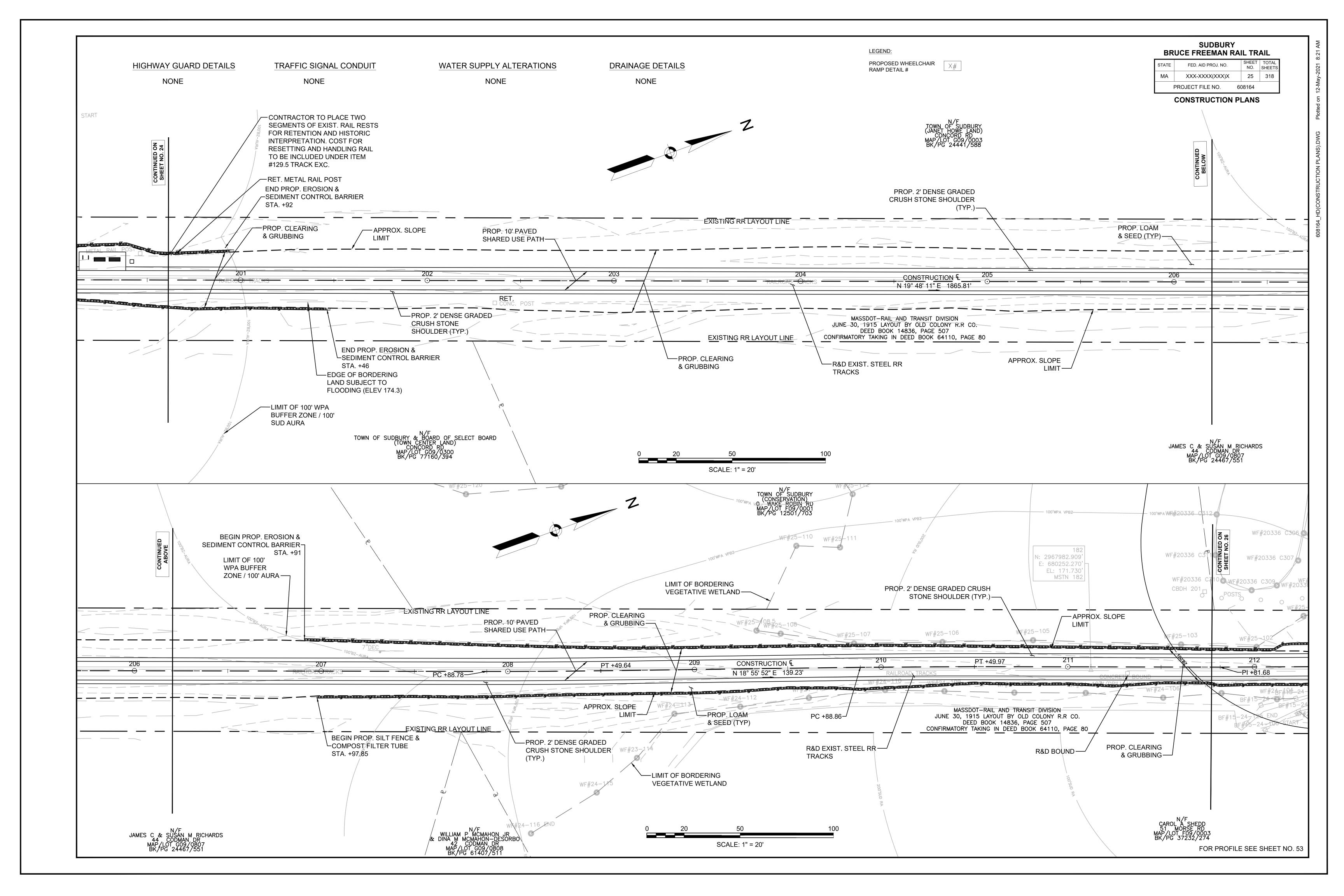


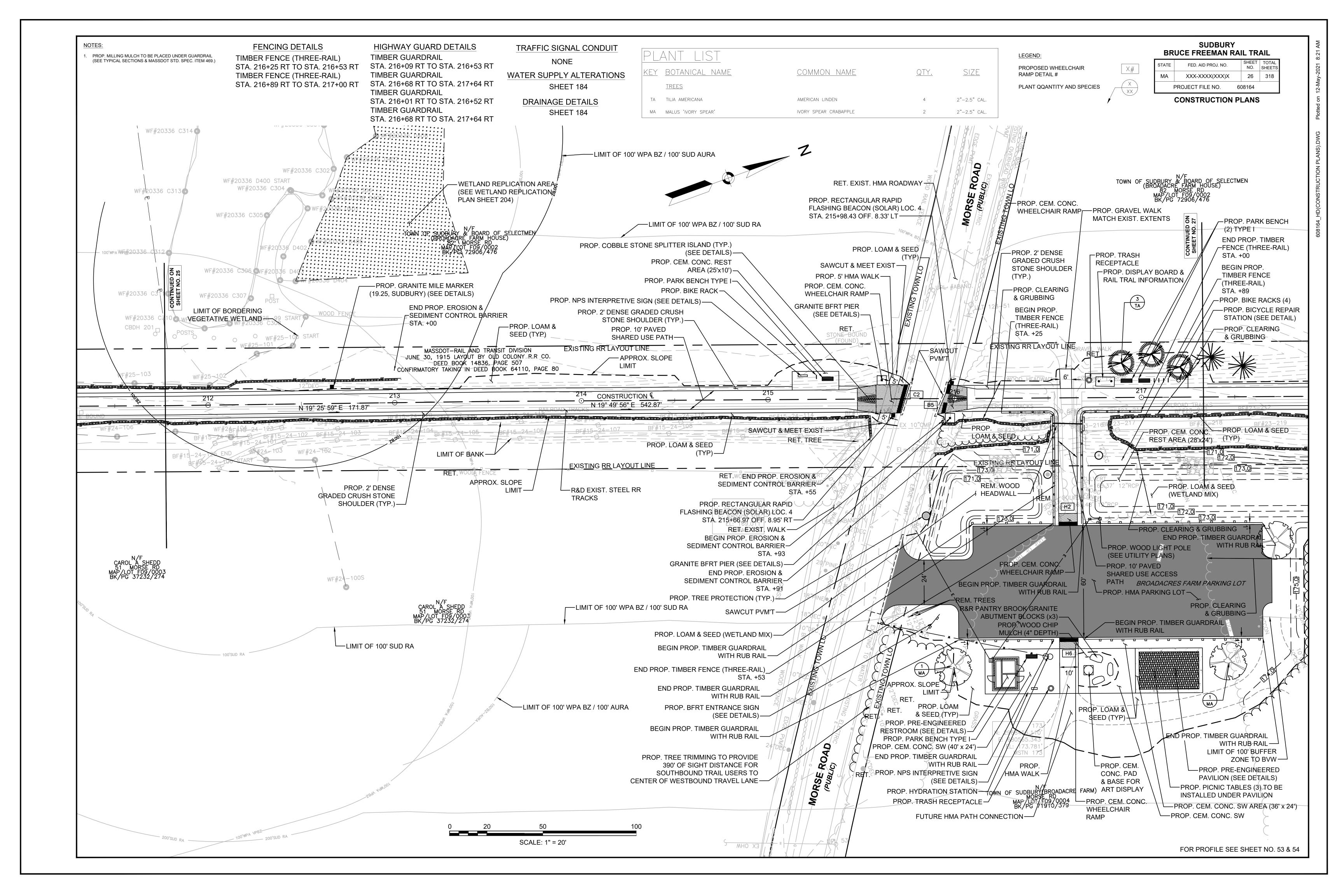


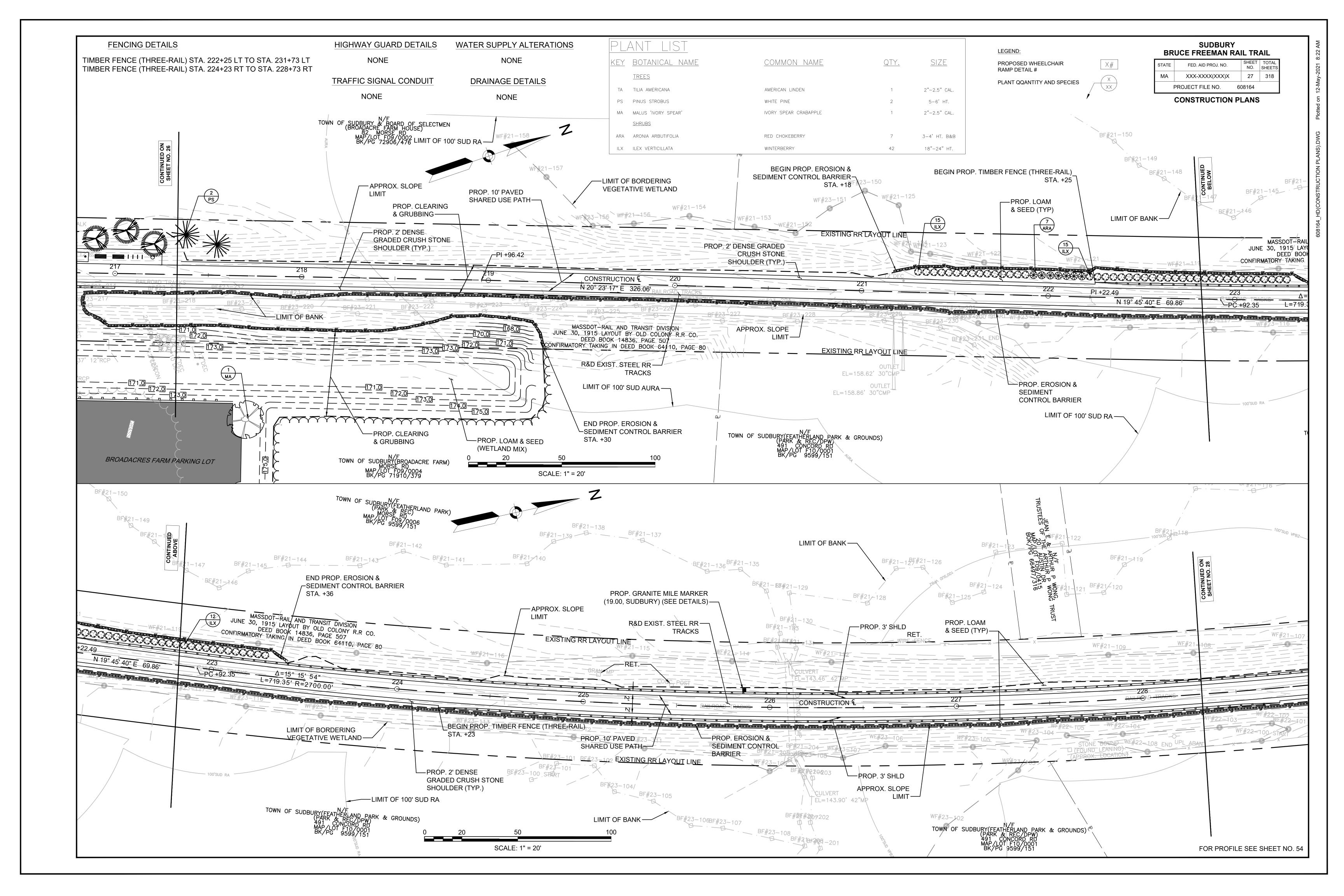


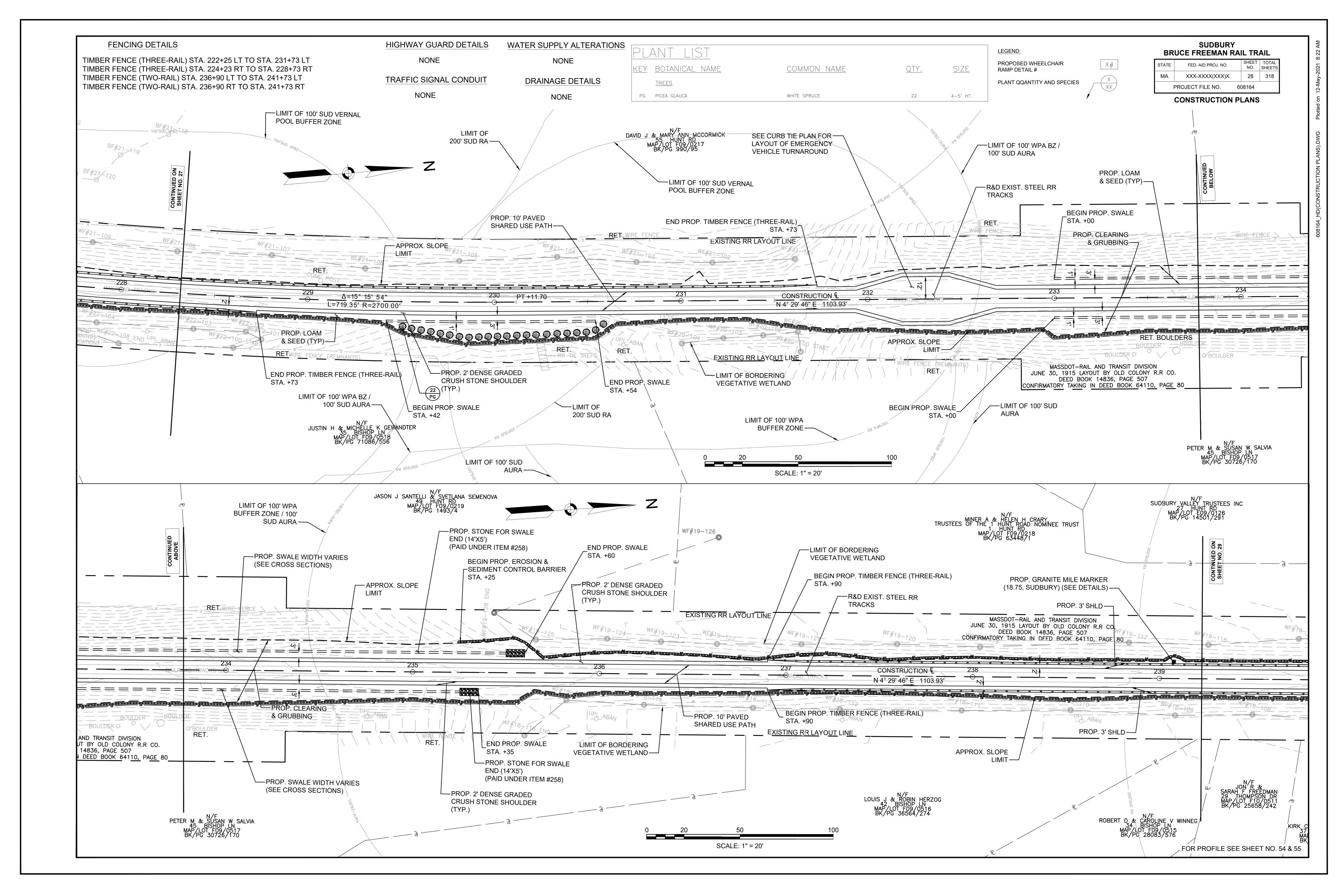


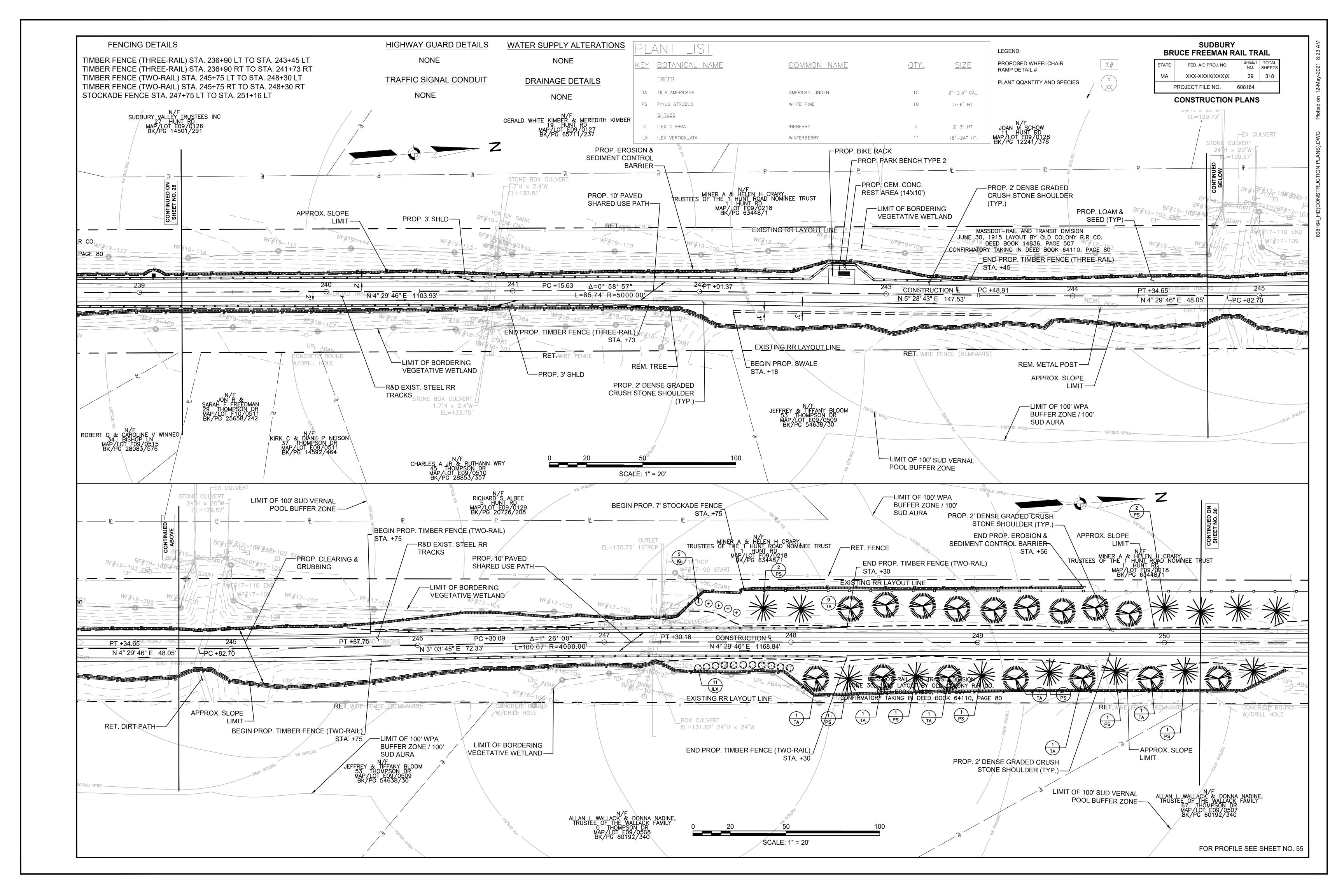


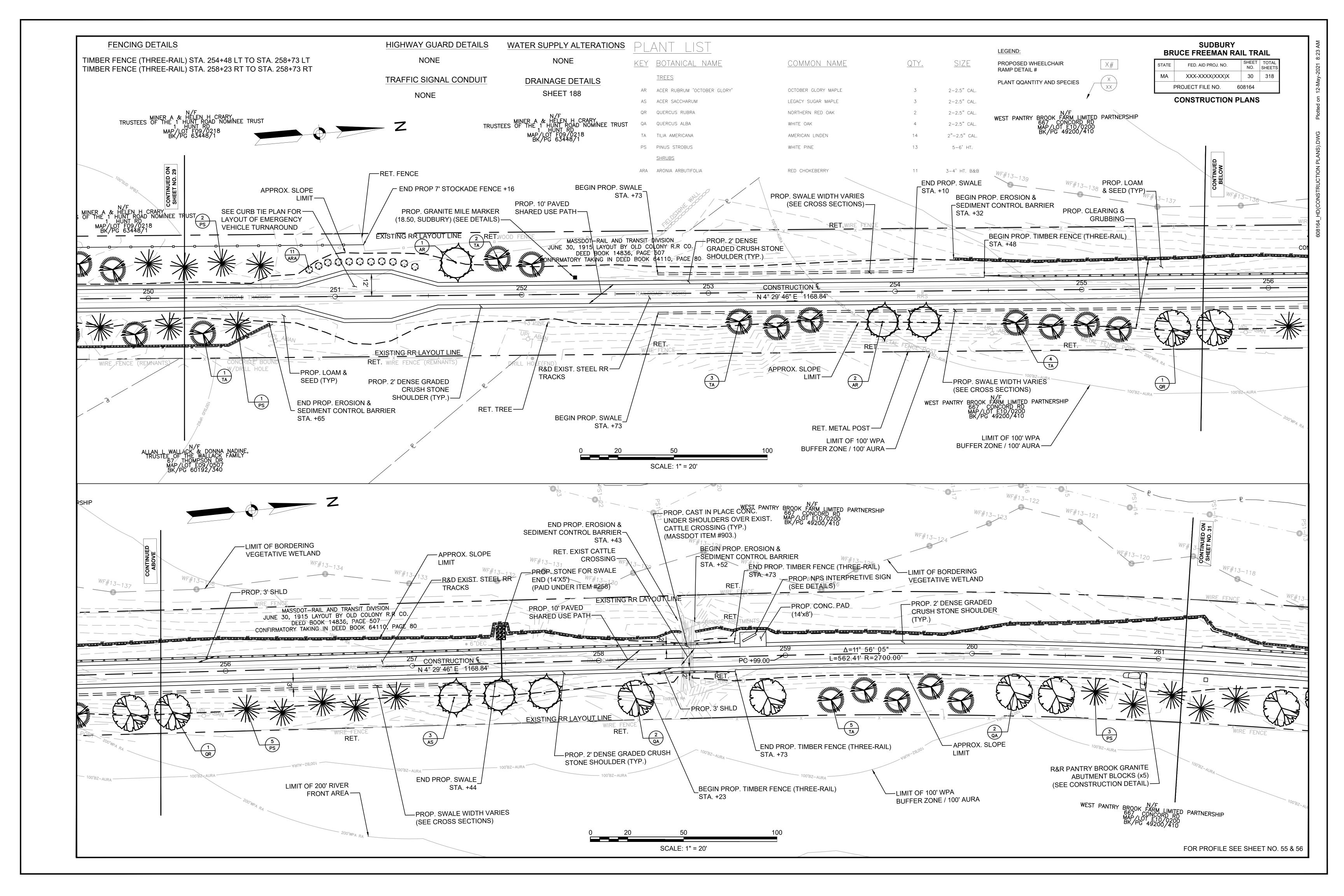


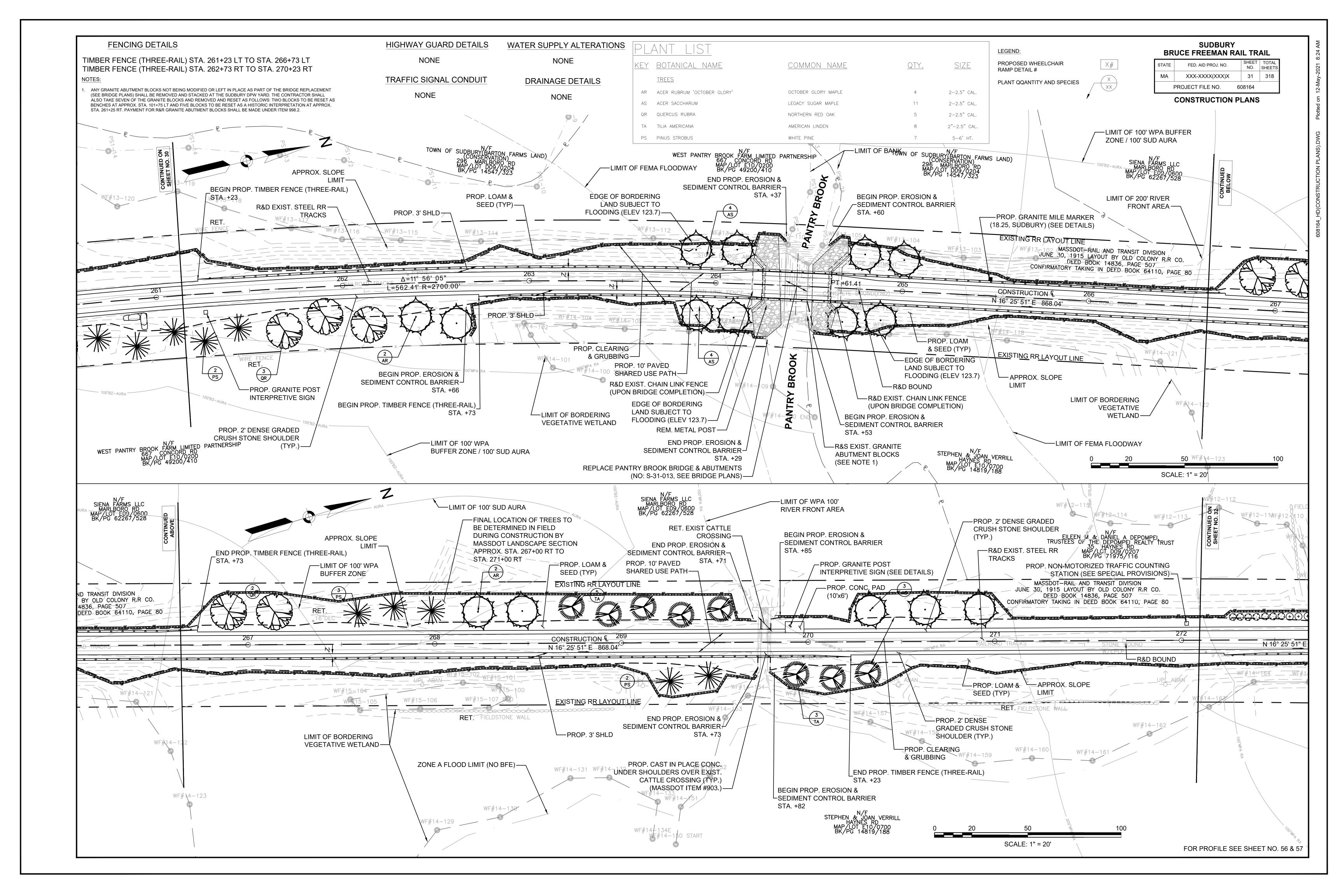


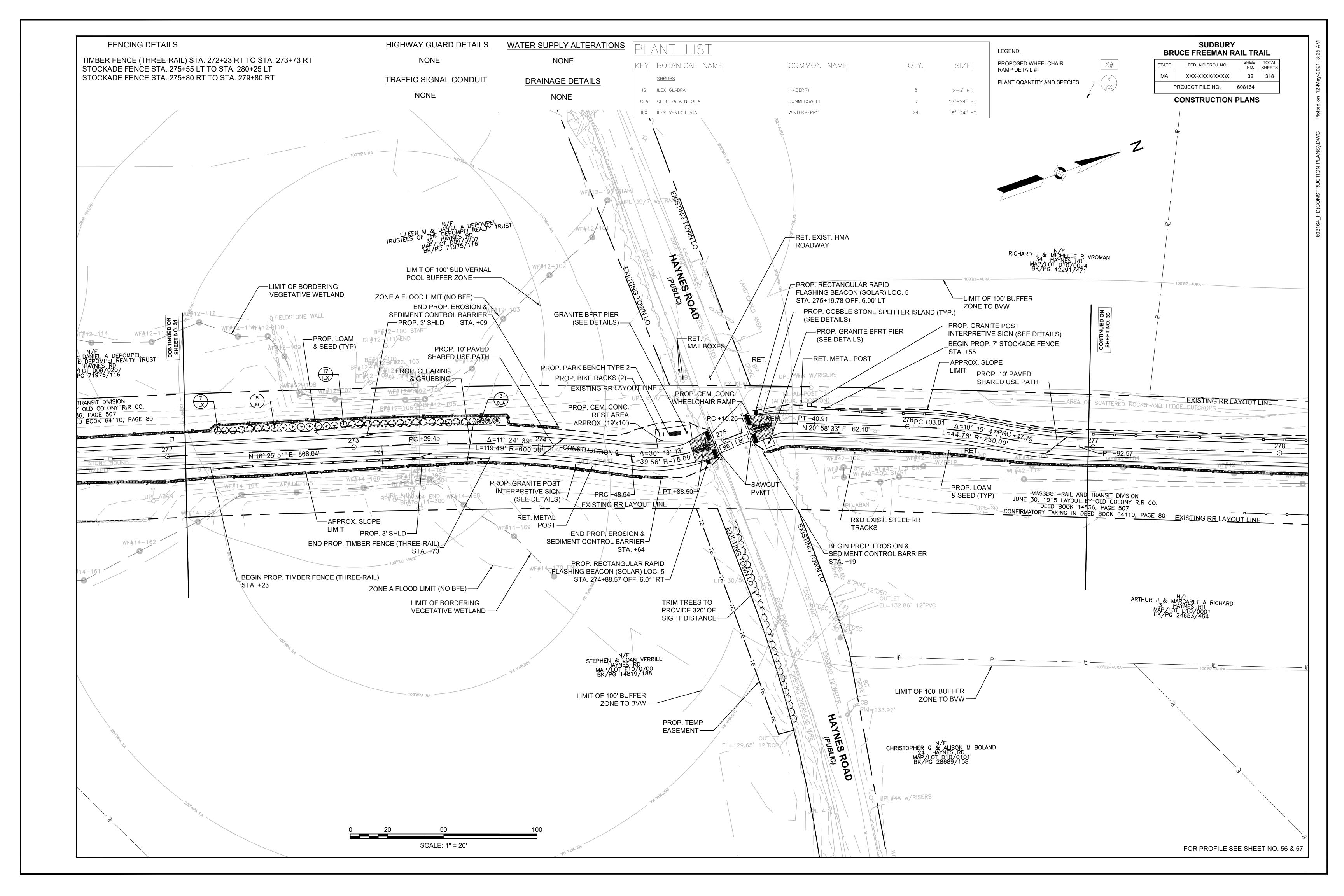


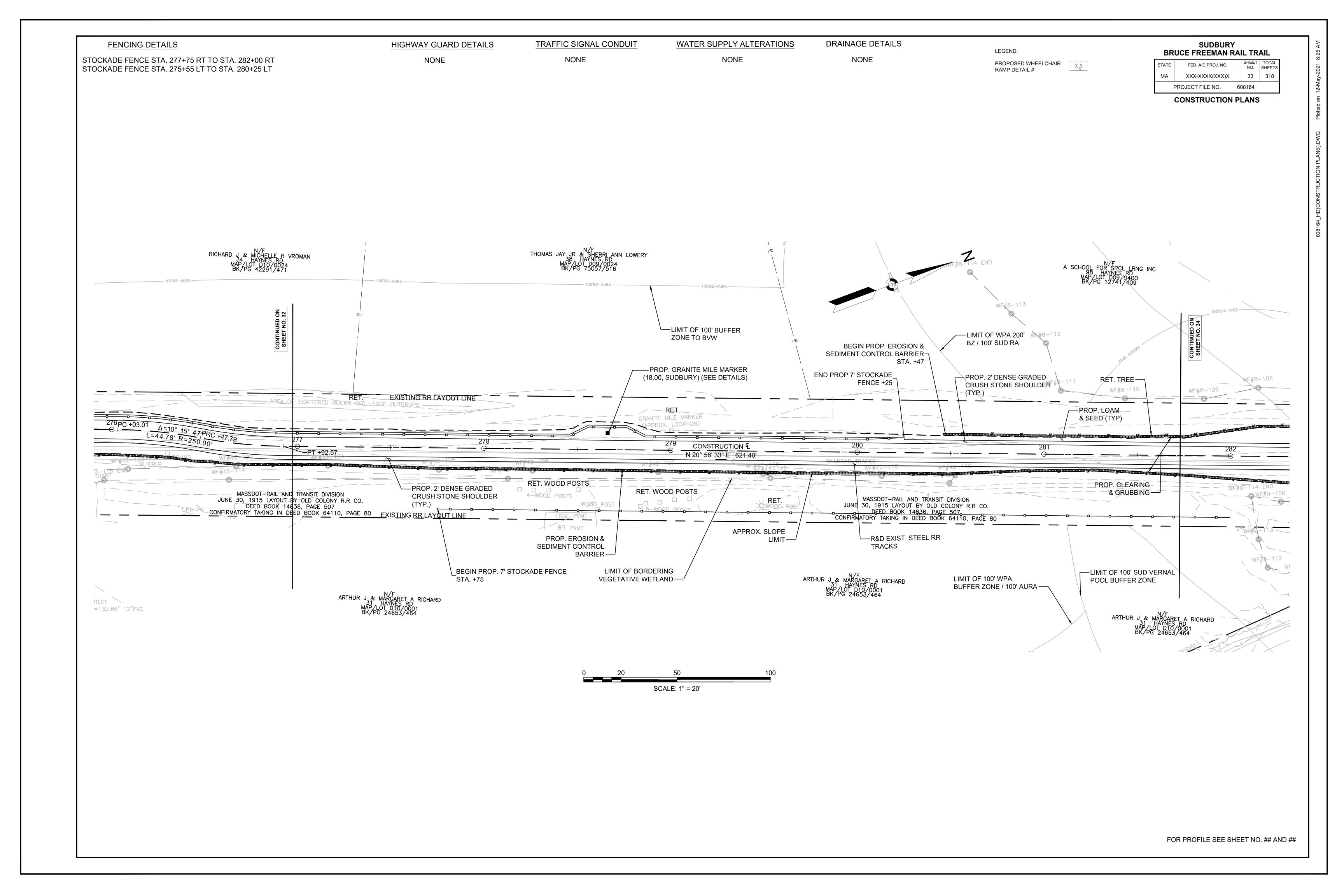


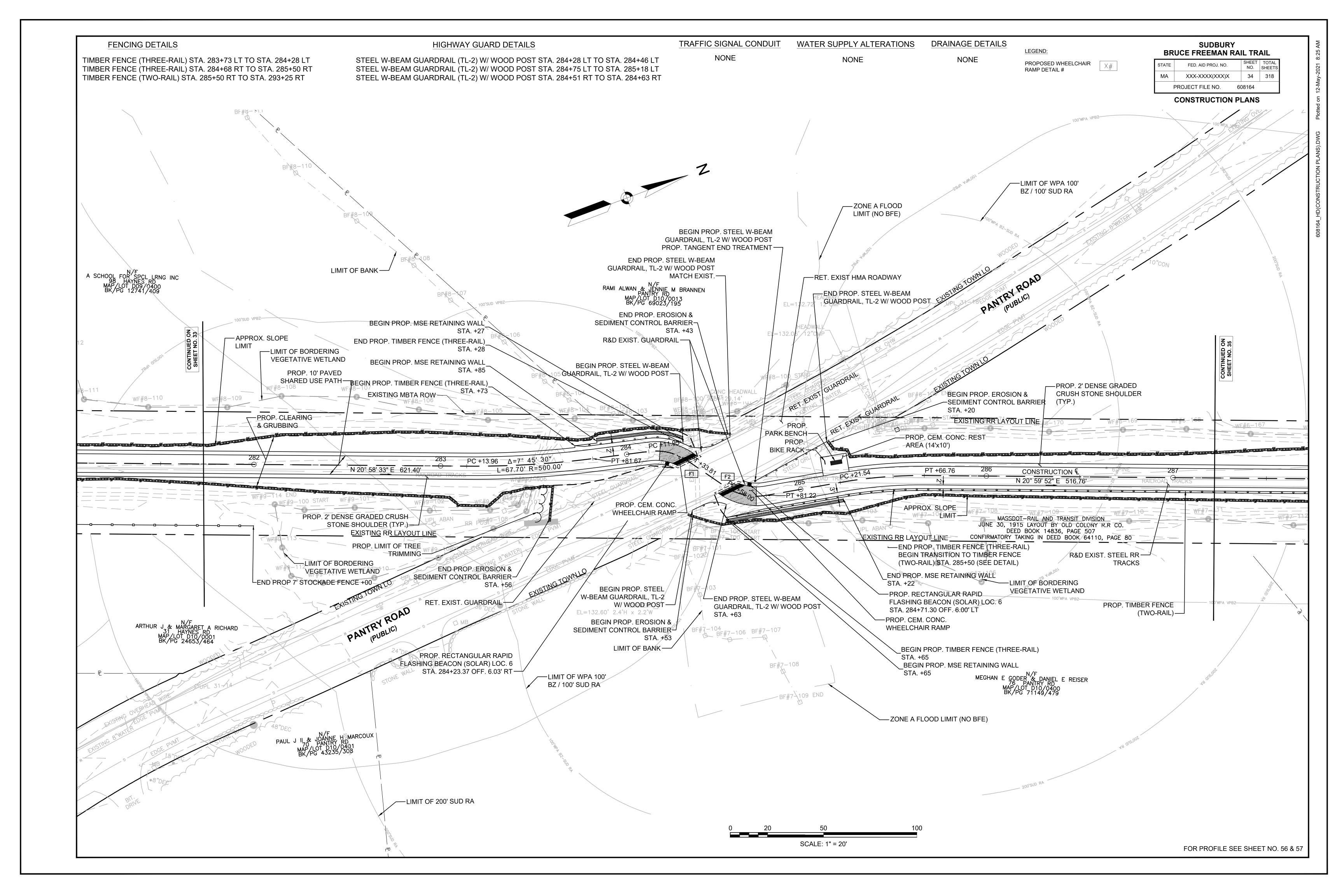


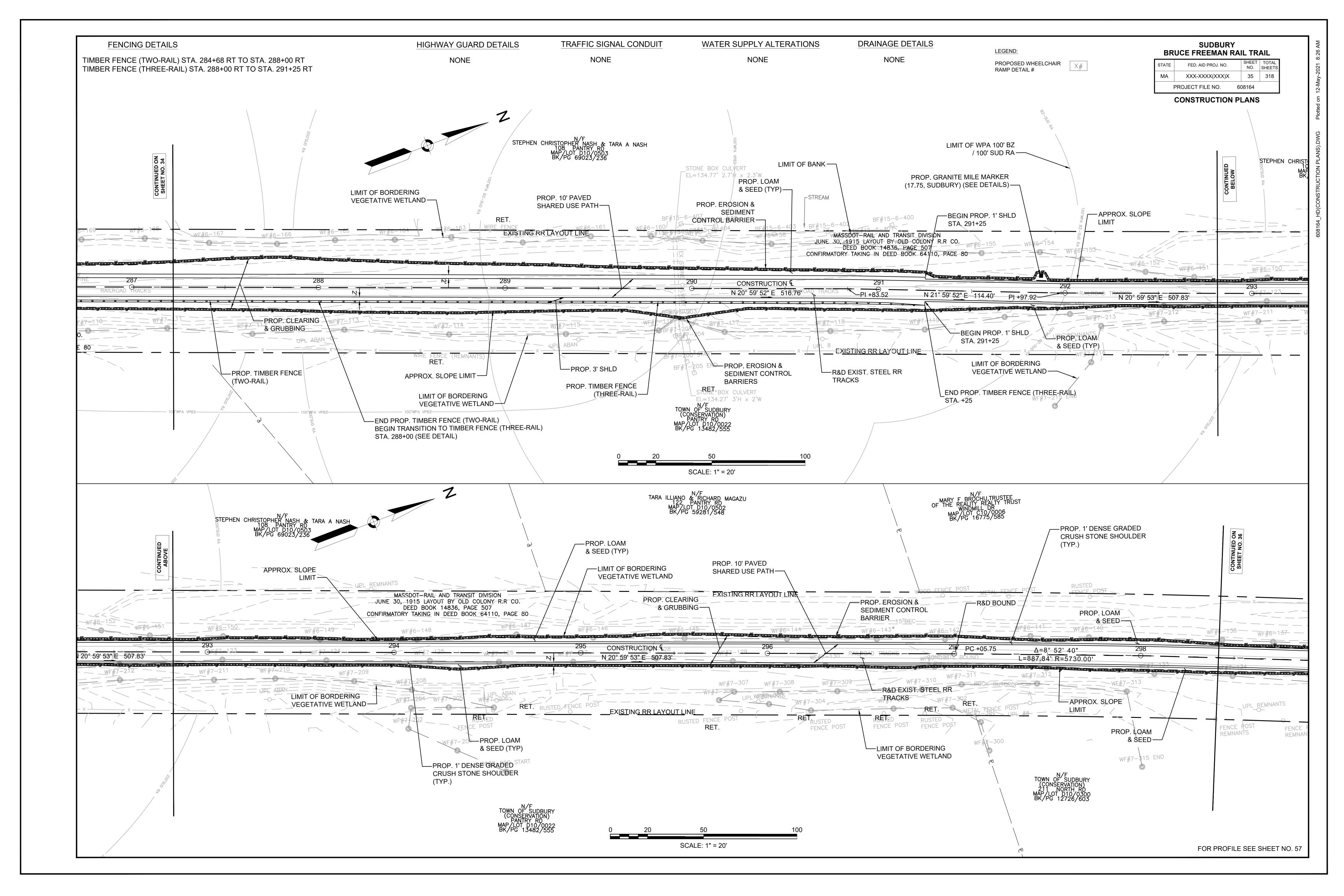


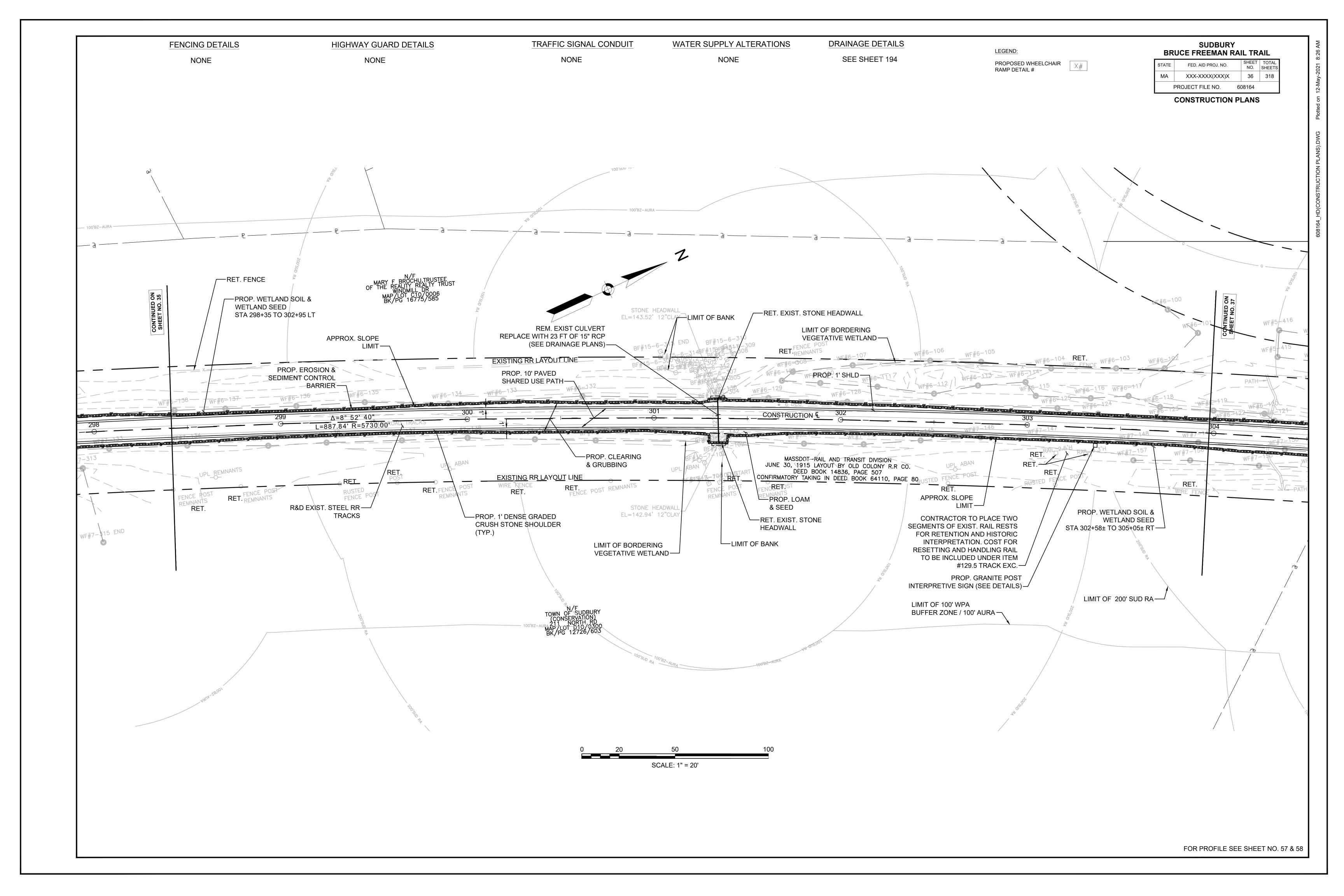


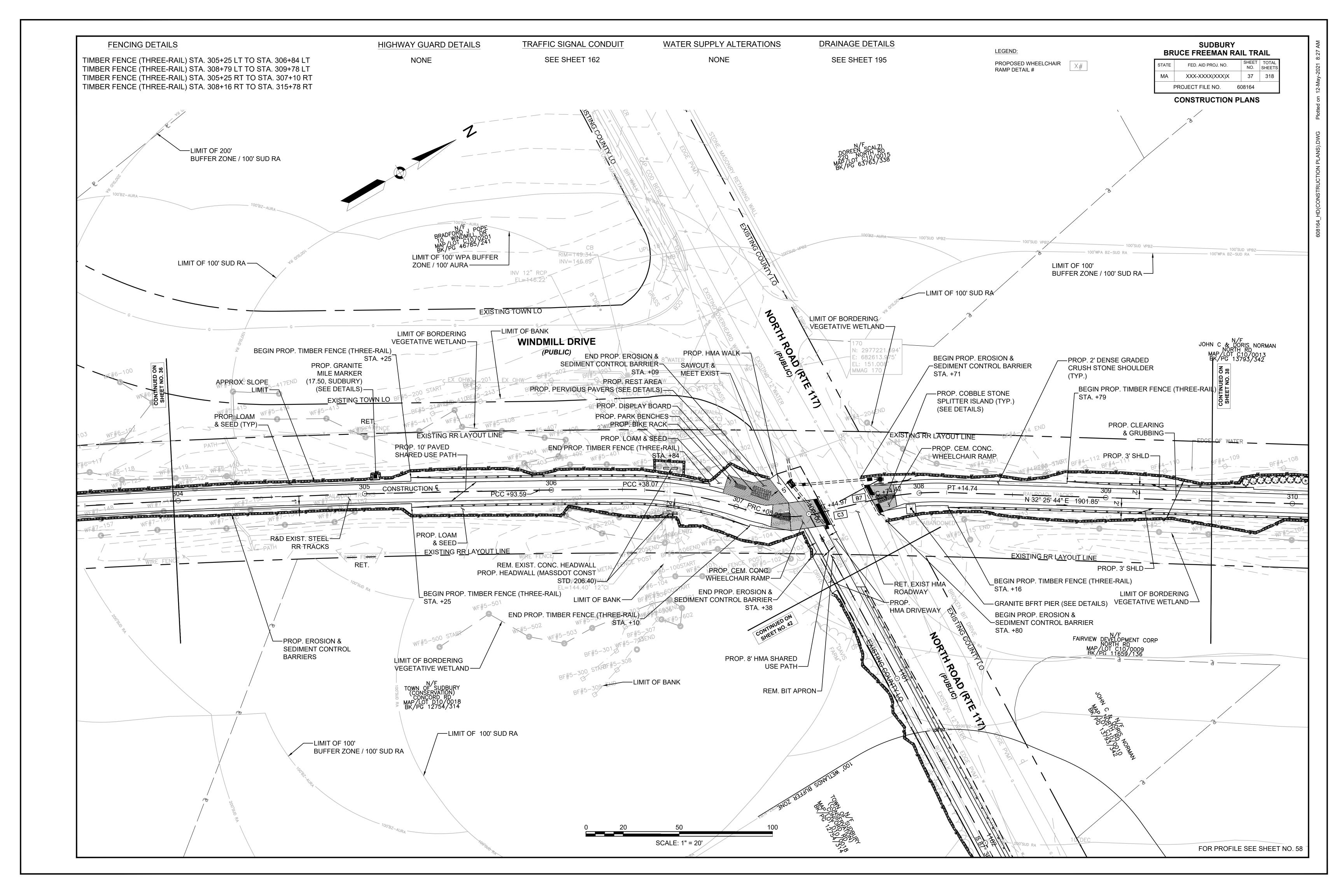


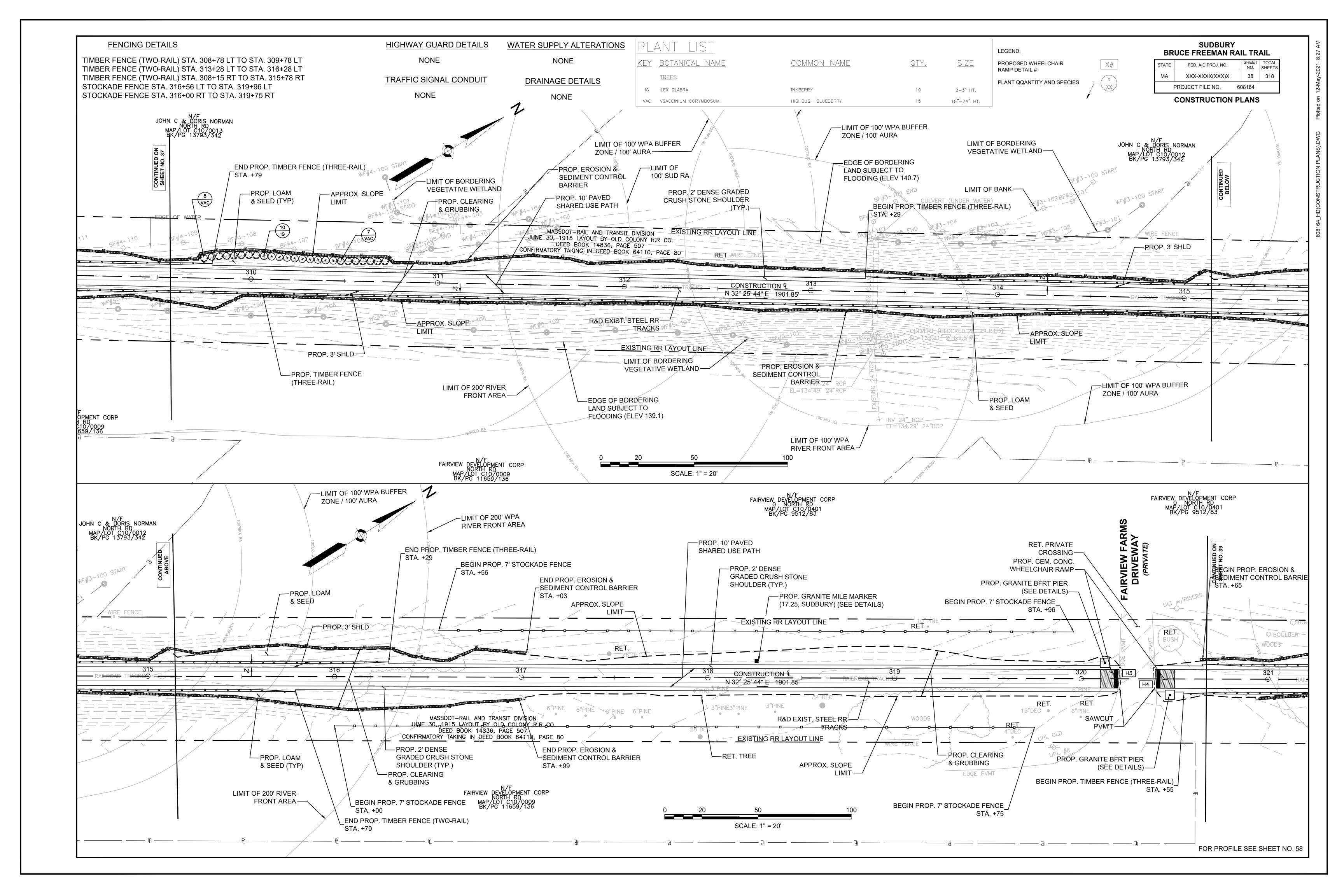


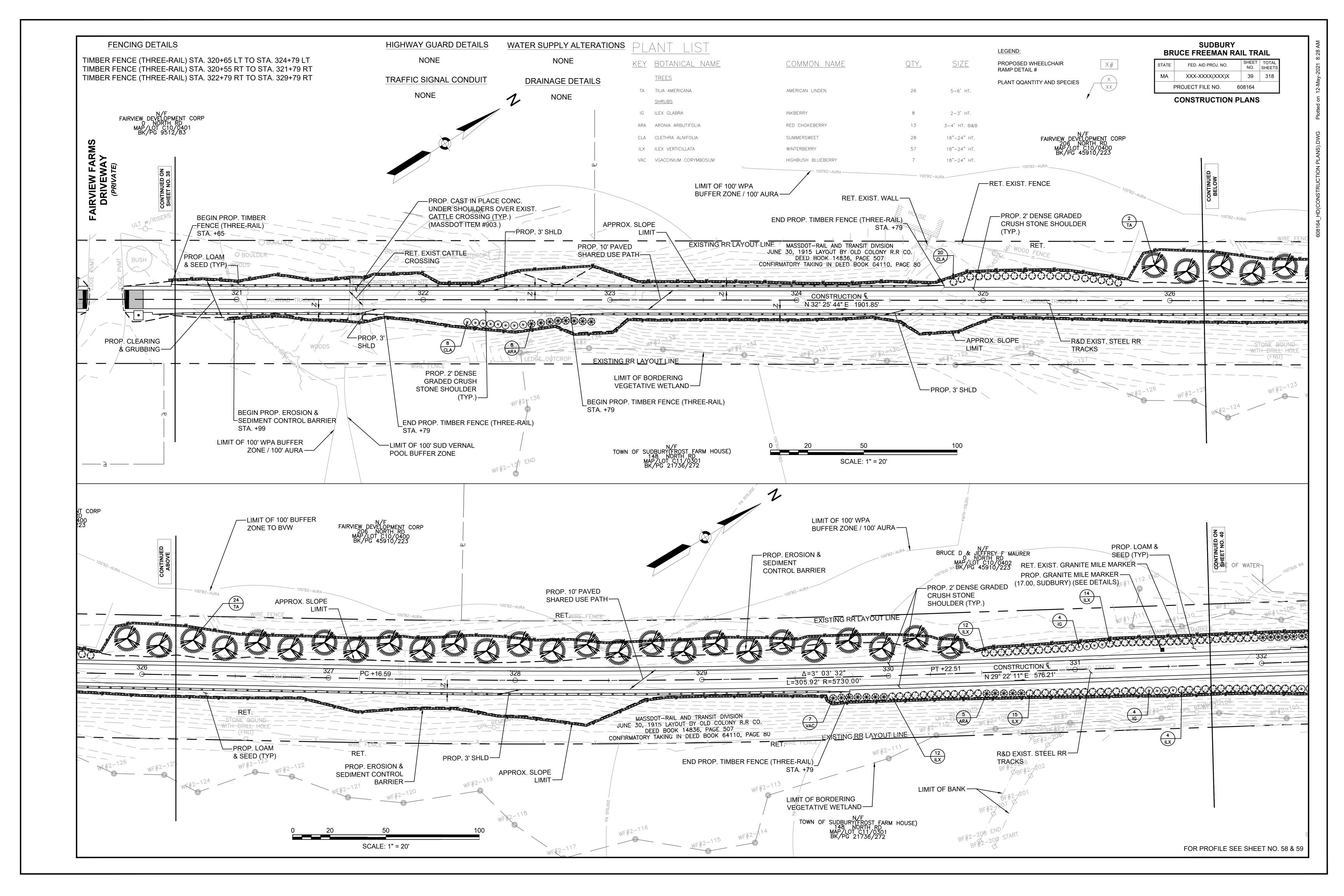


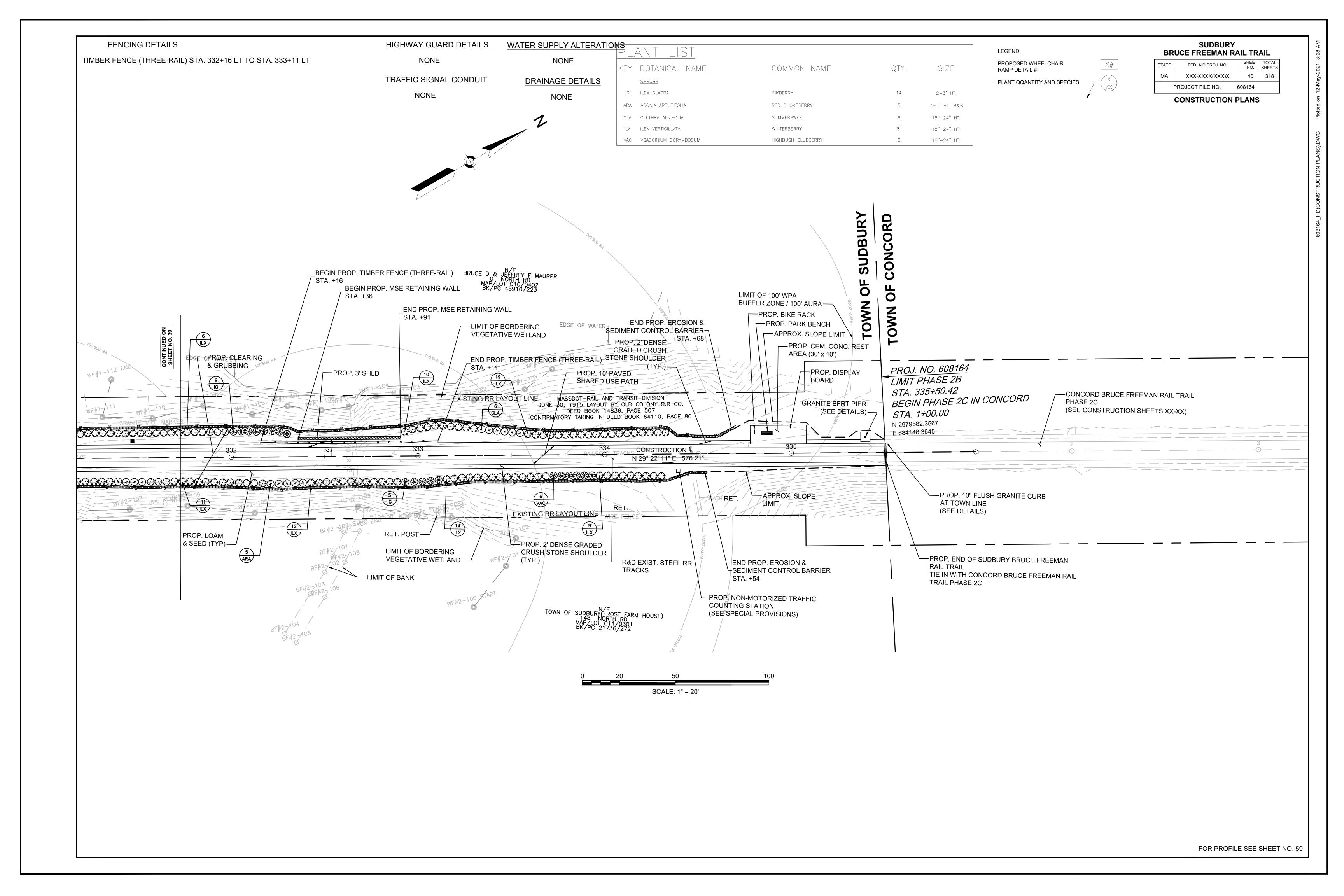


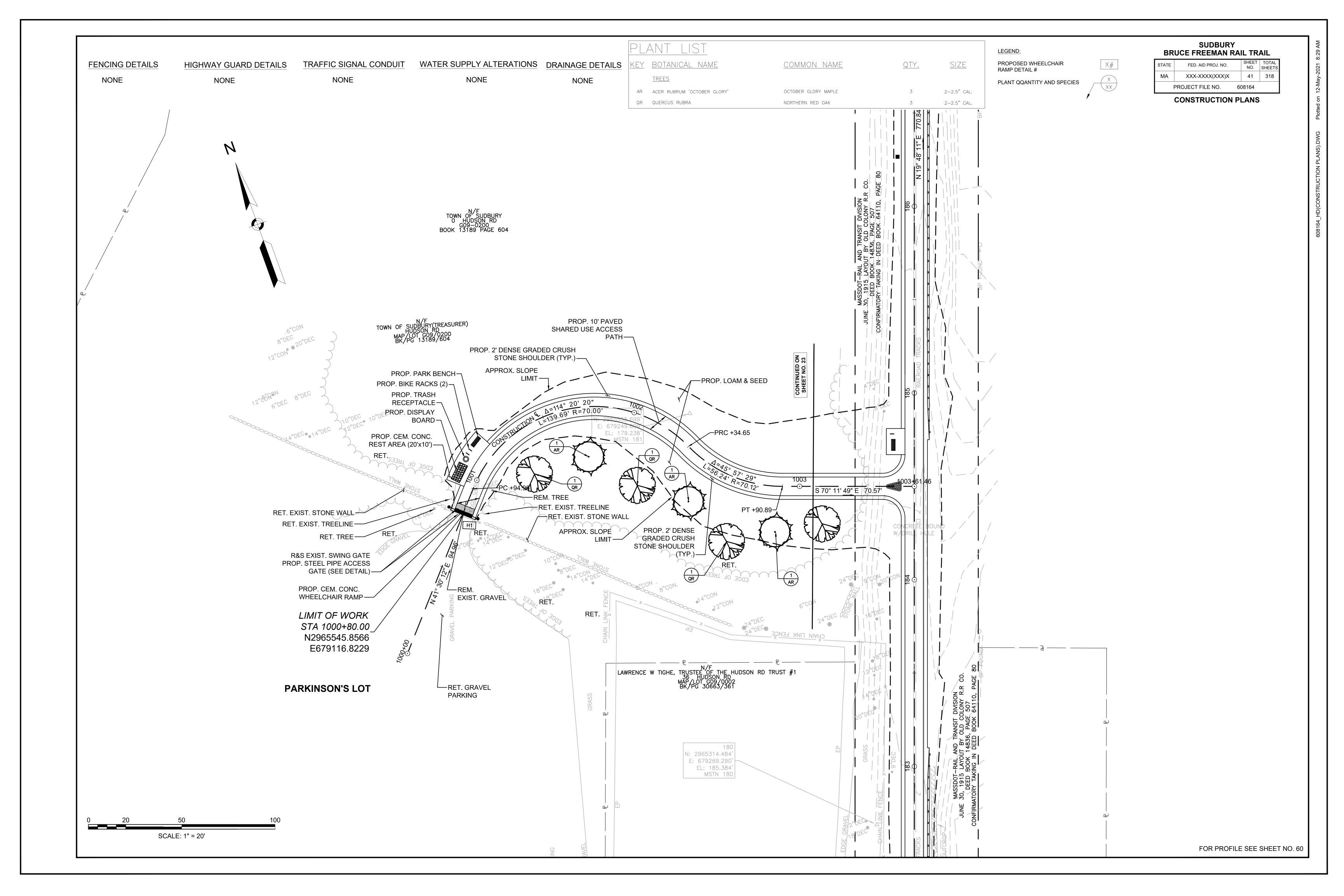


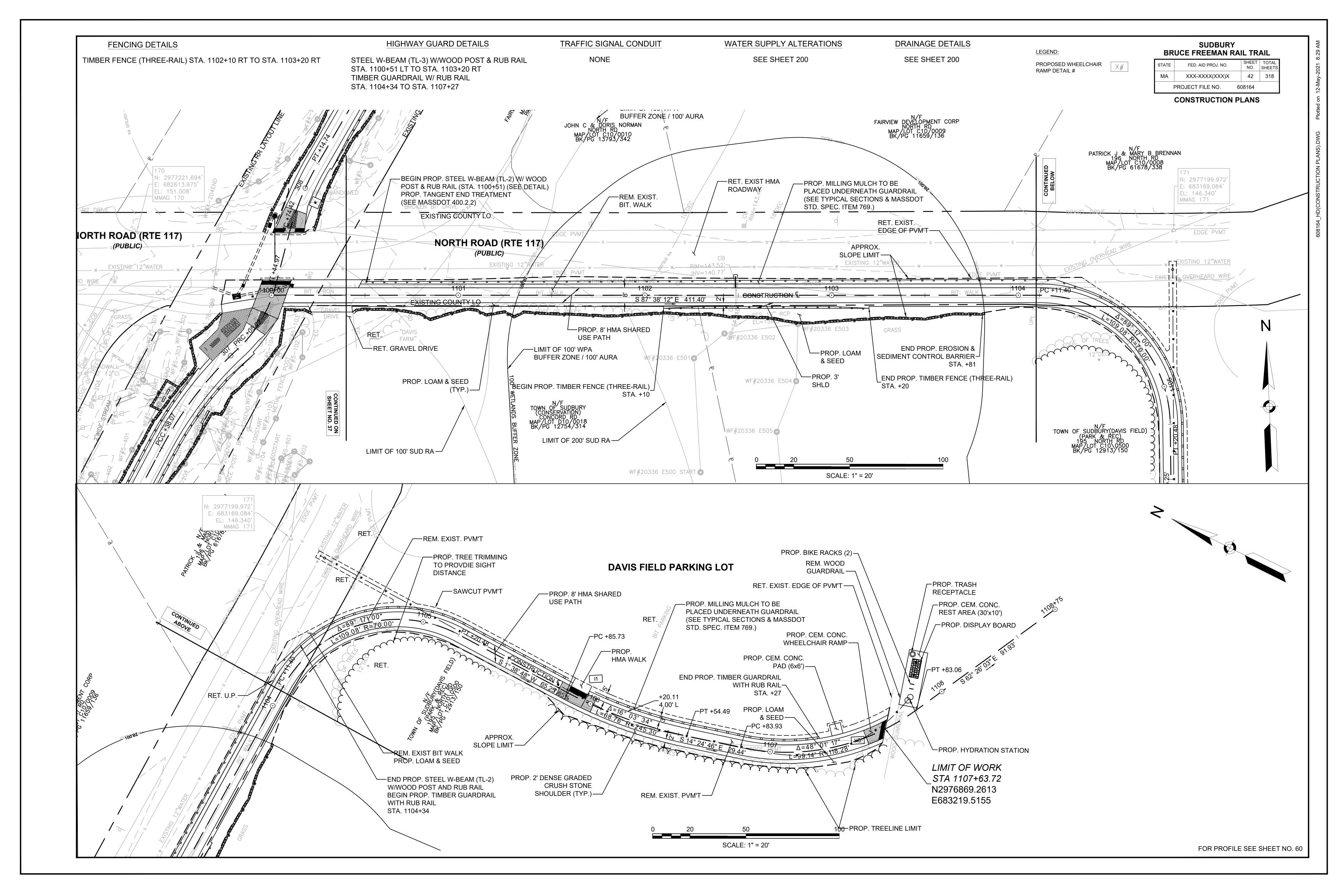


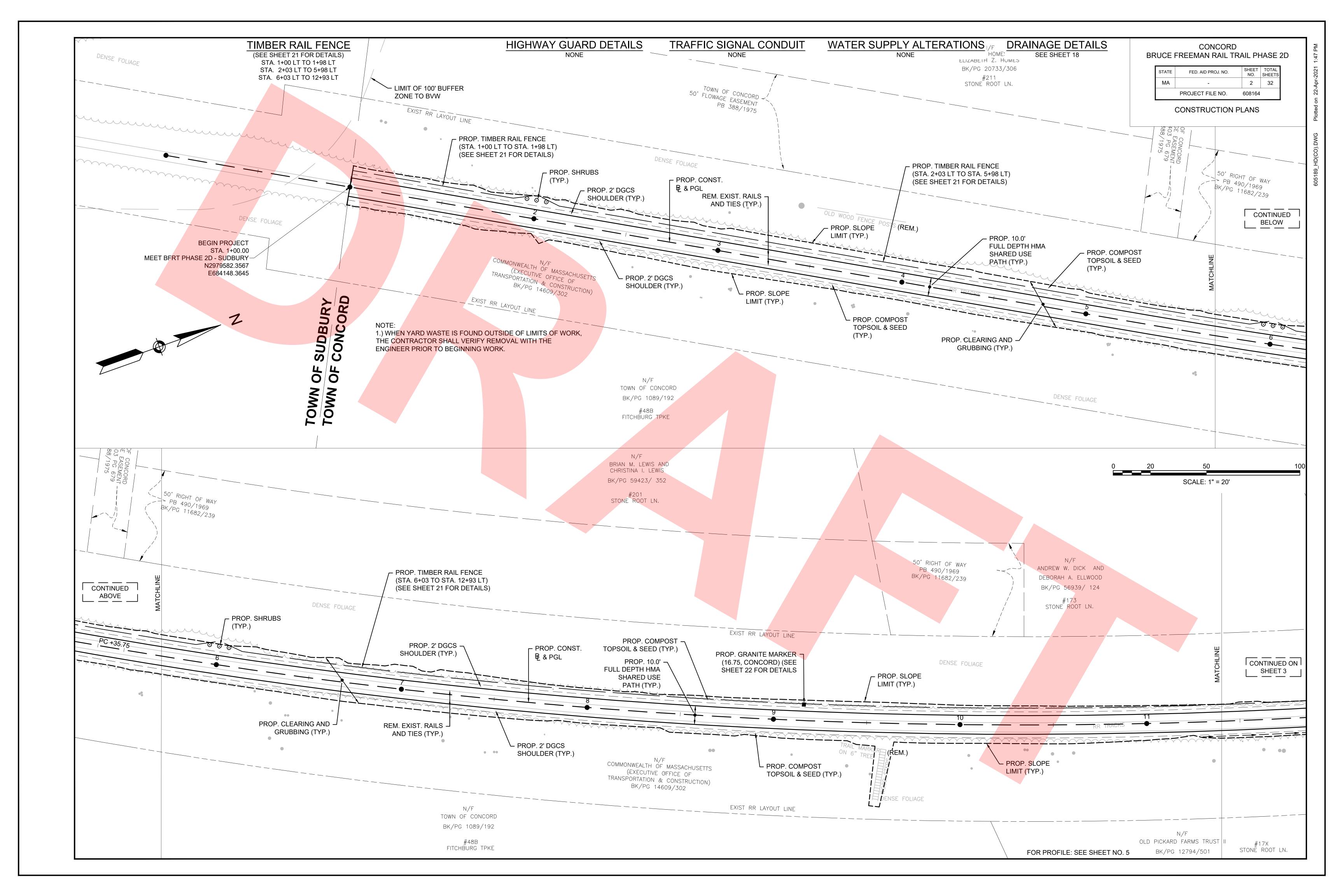


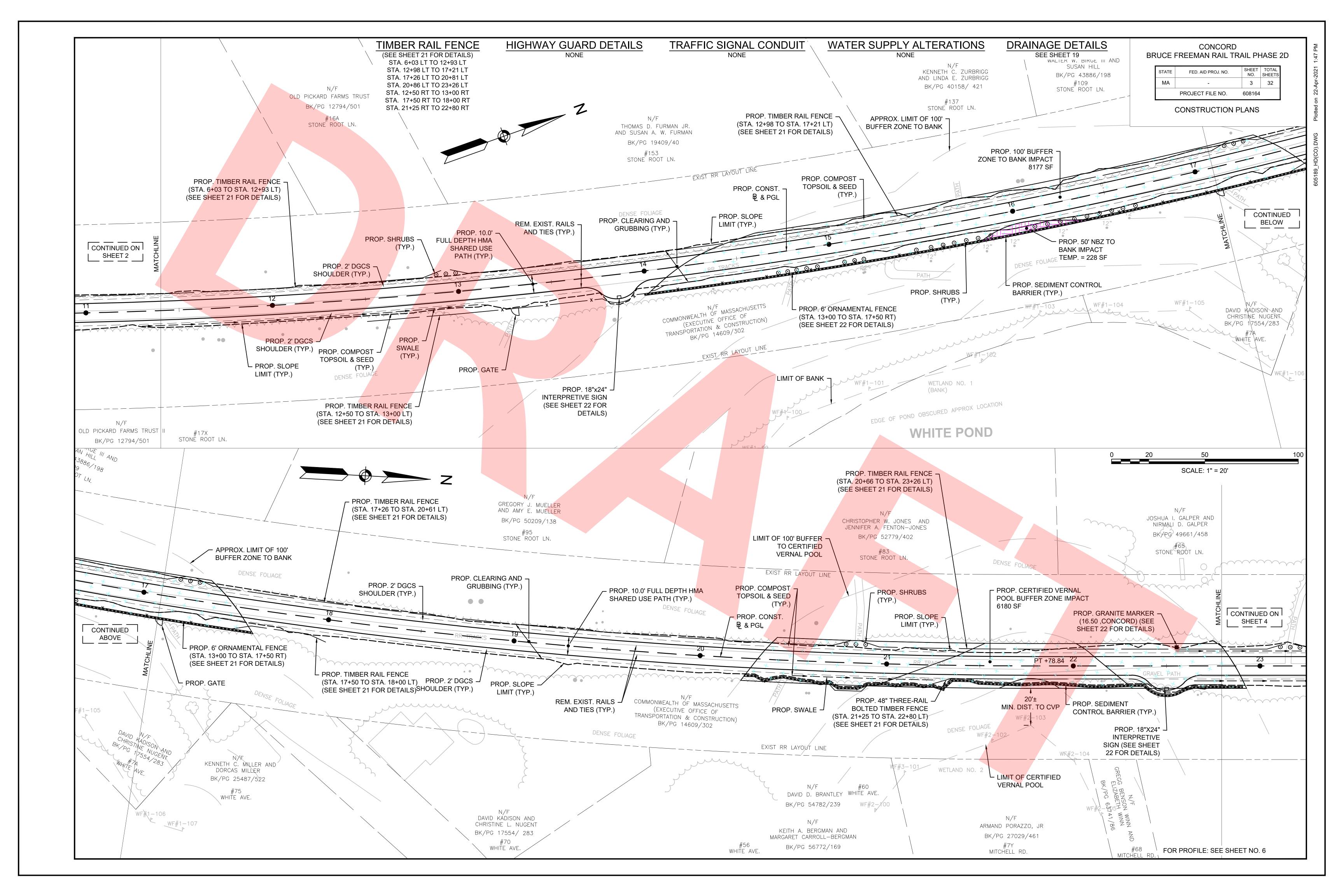


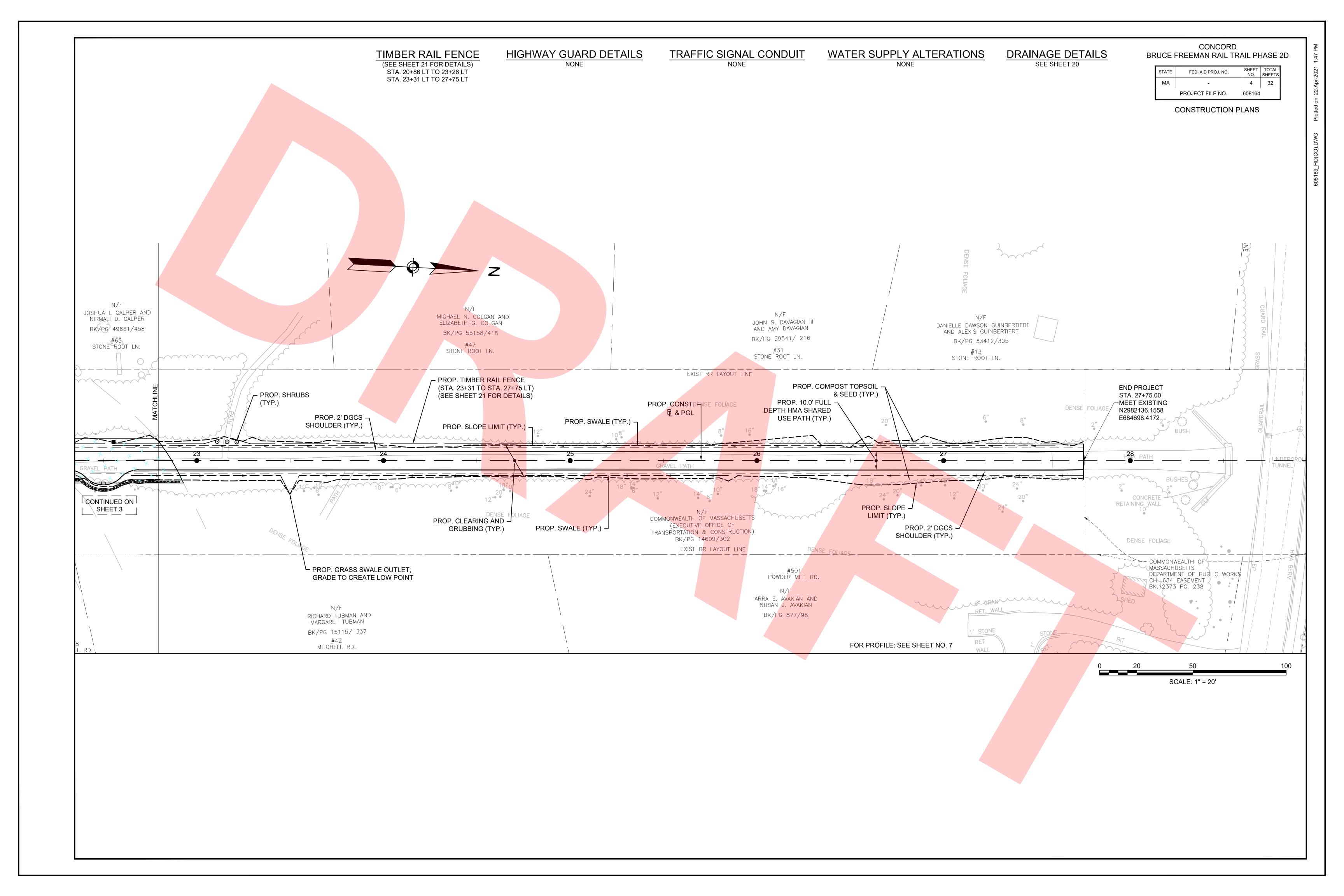








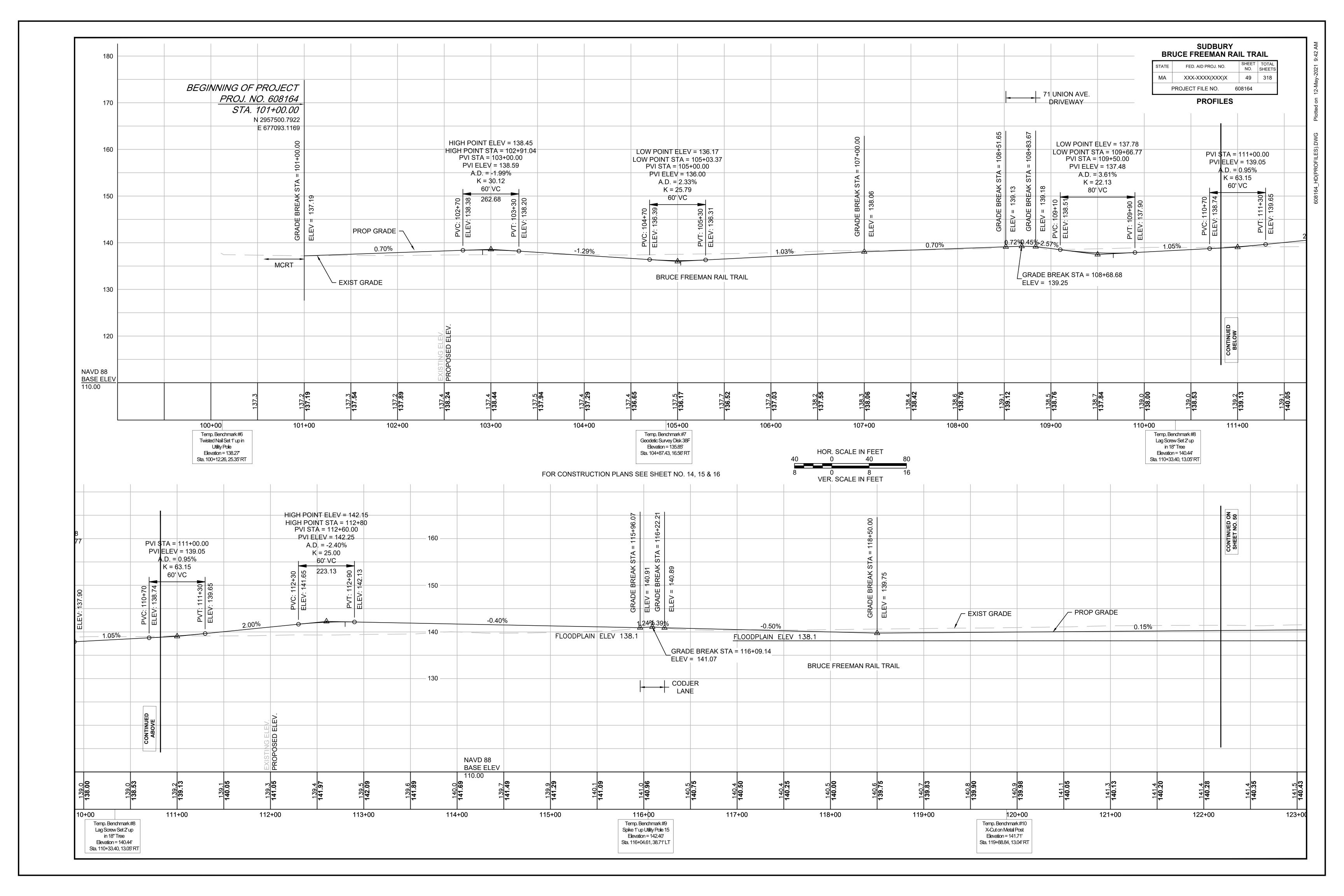


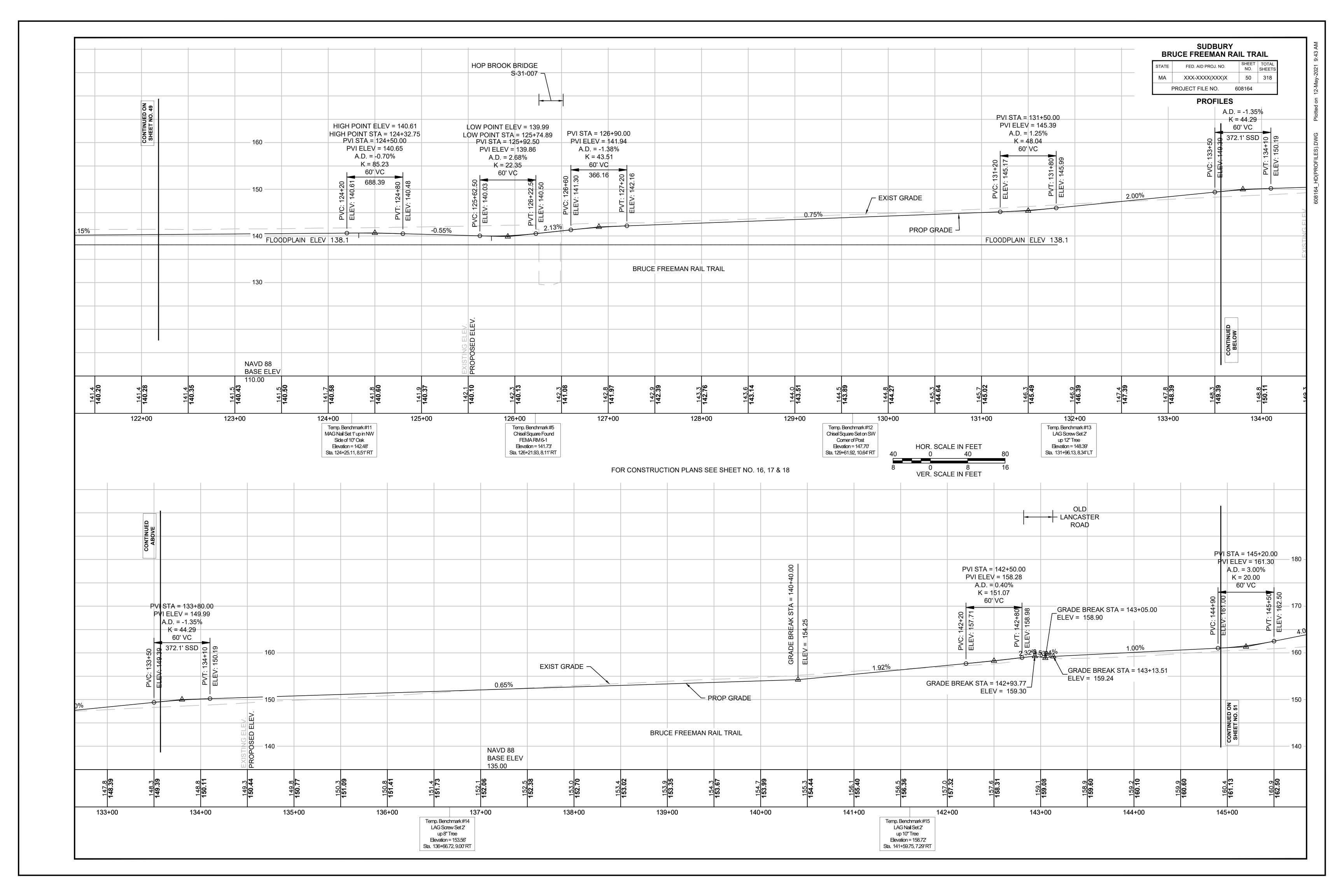


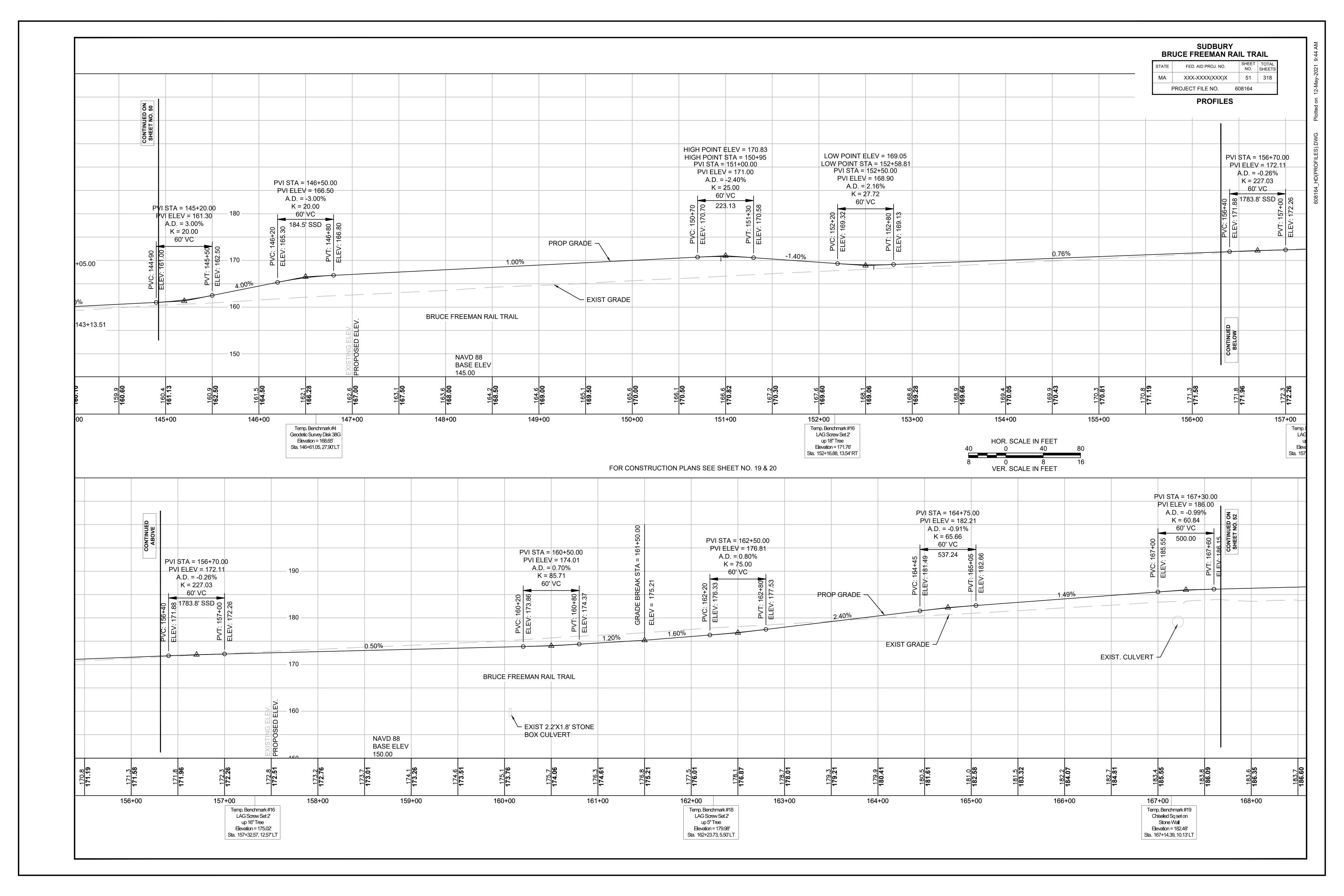
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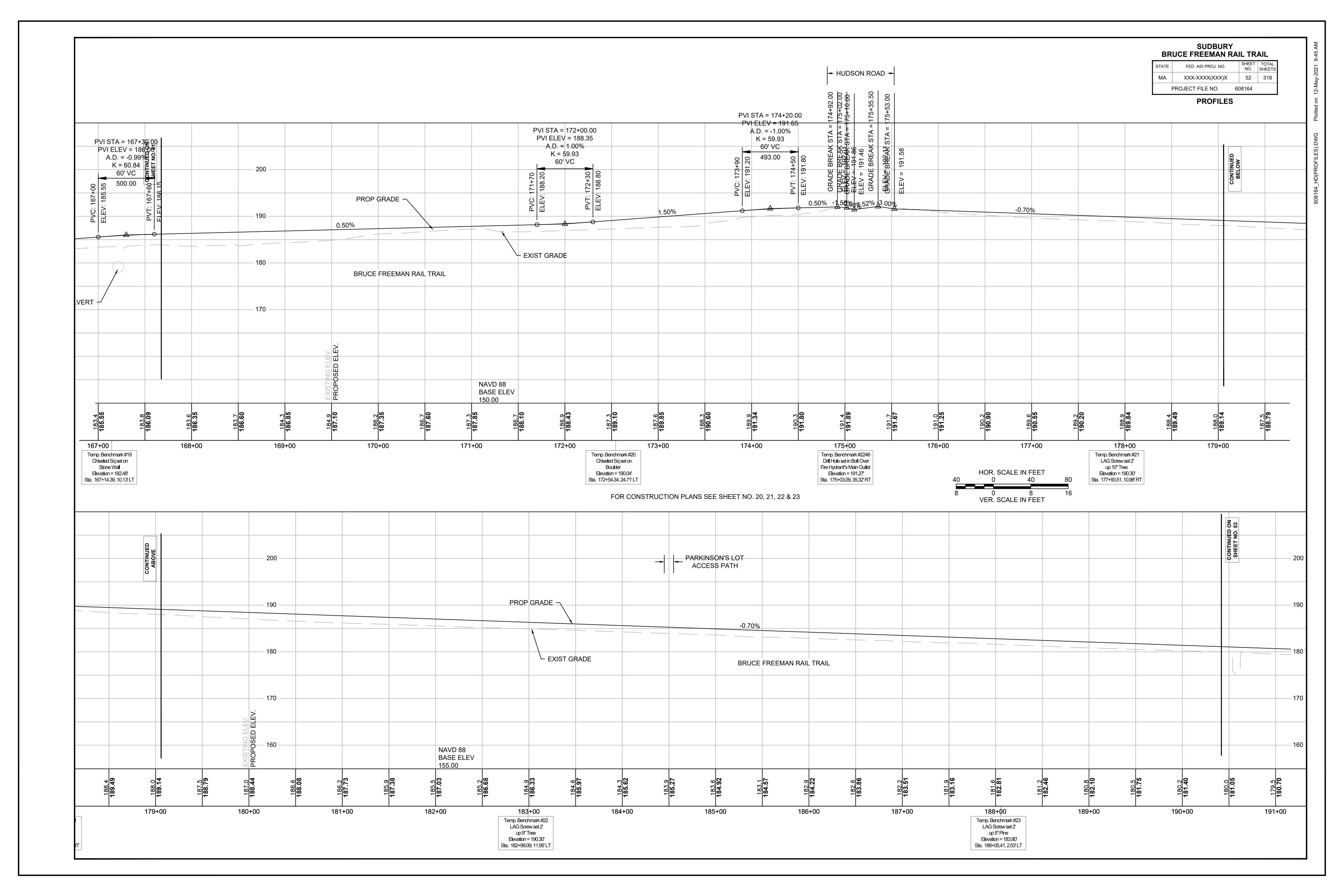
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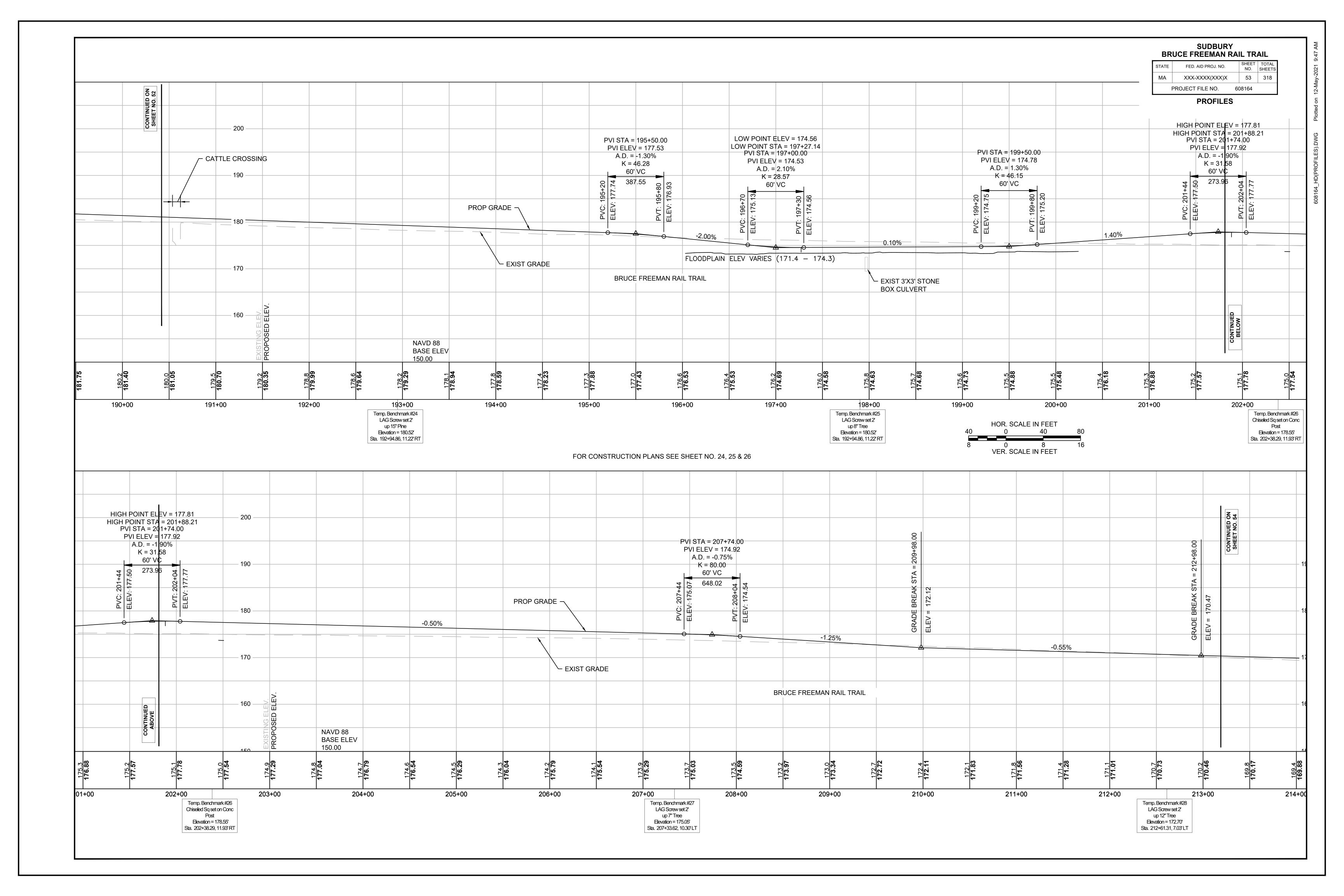
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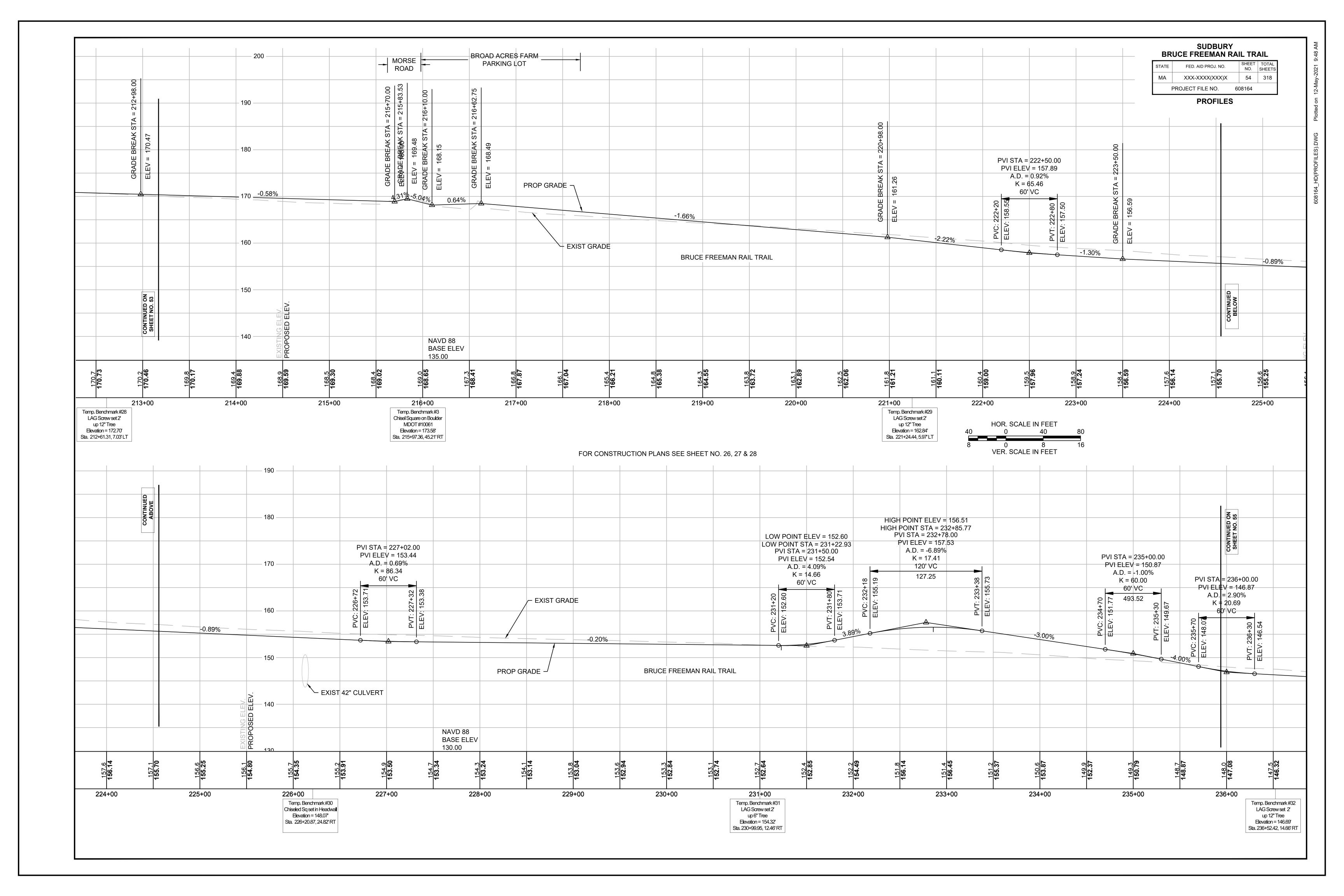


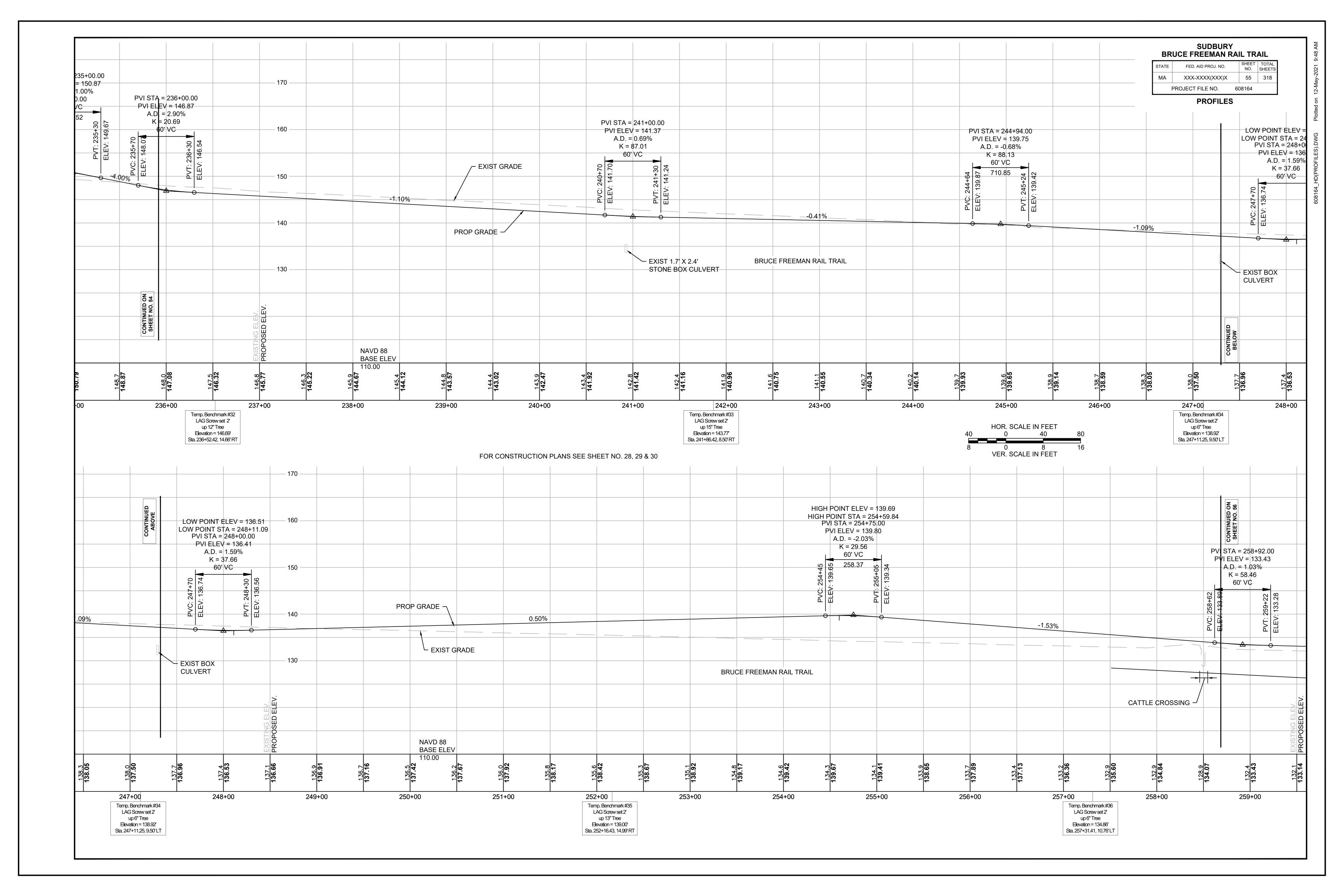


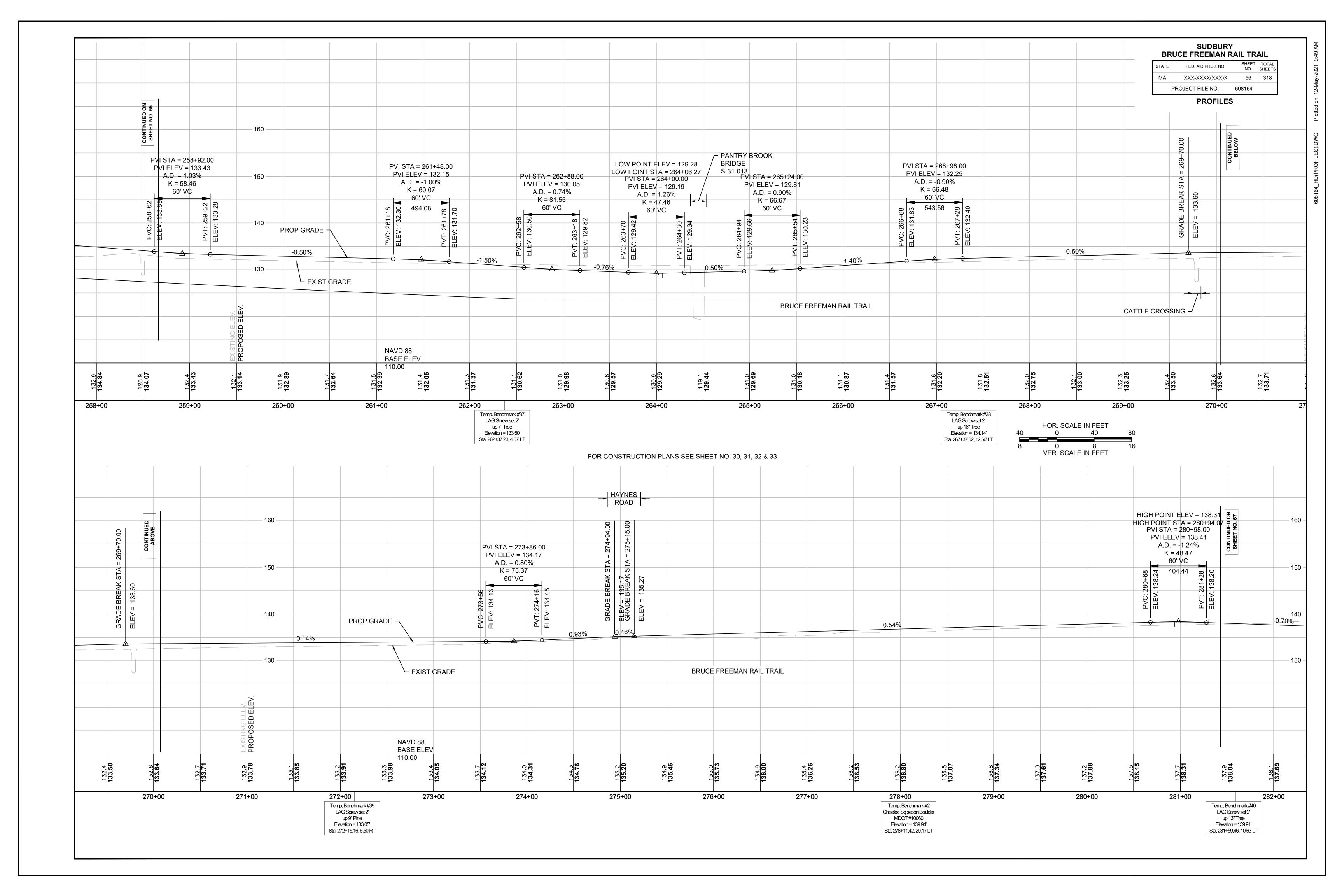


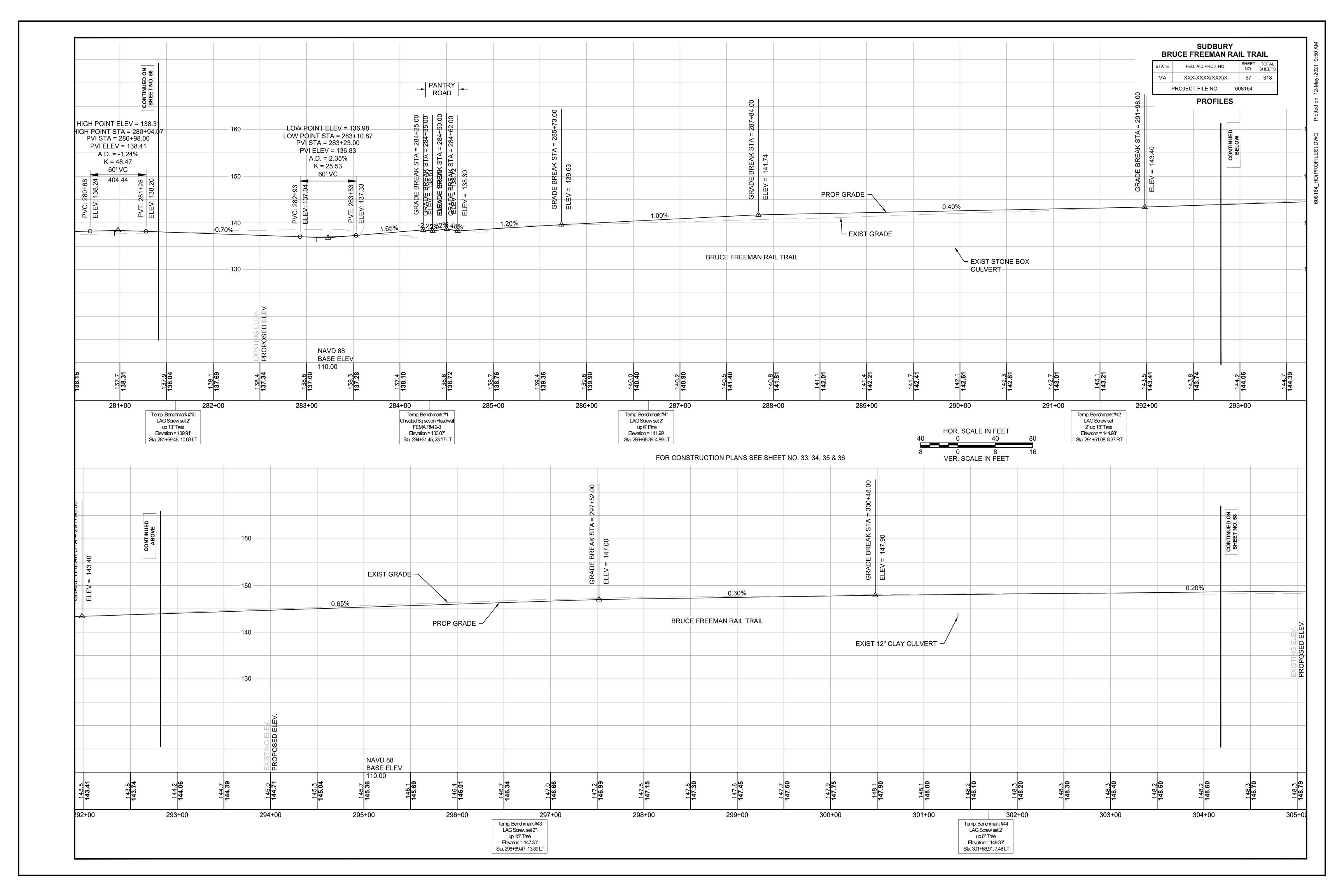


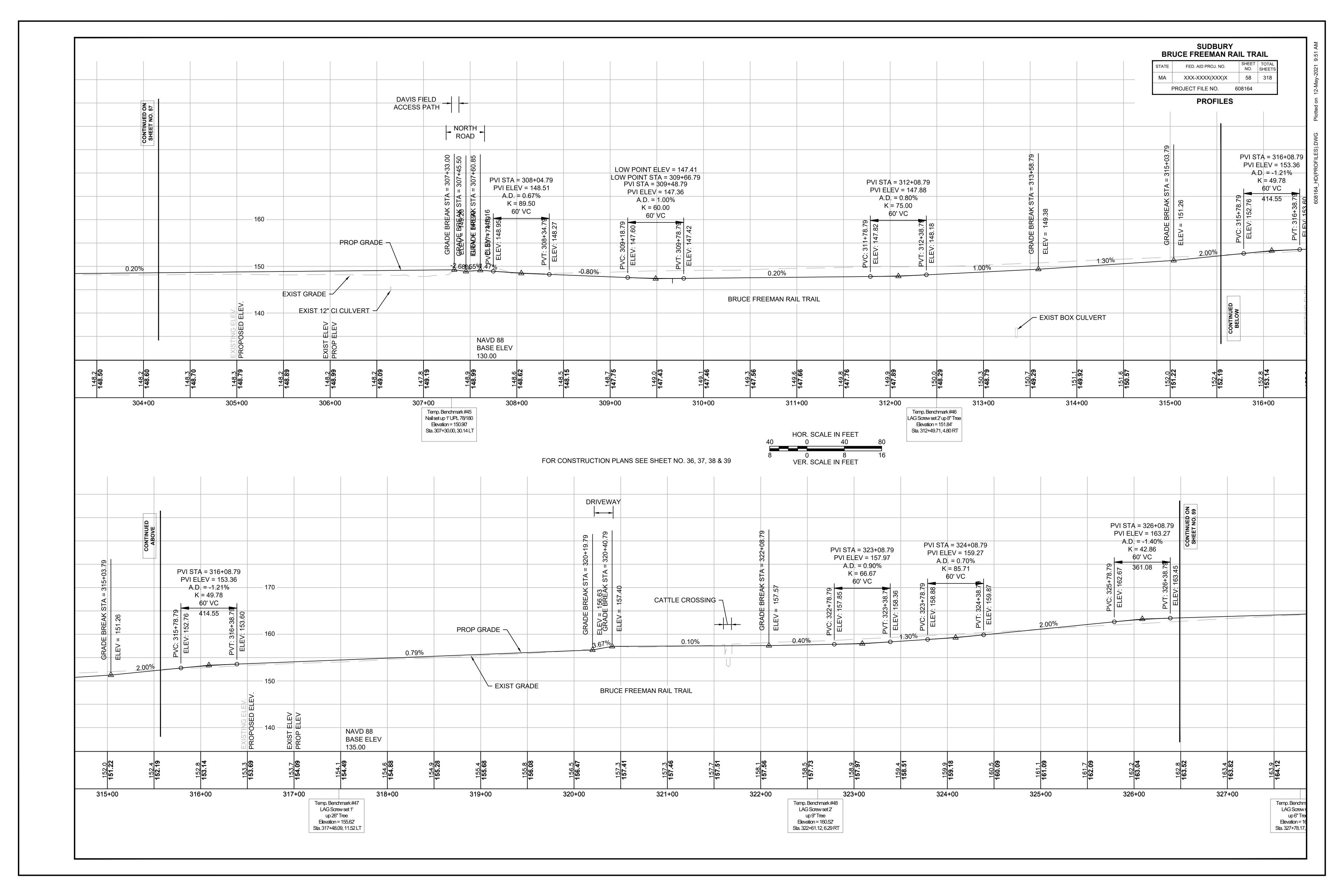












**PROFILES** 

PROJECT FILE NO. 608164

PROJ. NO. 608164 LIMITS PHASE 2B STA. 335+50.42 BEGIN PHASE 2C IN CONCORD 200 ₽ STA. 1+00.00 ශි N 2979582.3567 E 684148.3645 190 PVI STA = 332+74.79 PVI ELEV = 167.27 A.D. = 1.60% PVI STA = 326+08.79 K = 37.59PVI ELEV = 163.27 A.D. = -1.40% K = 42.86 60' VC - 180 – 180 2.20% EXIST GRADE ¬ – 170 *–* 170 0.60% 2.00% - PROP GRADE - 160 – 160 BRUCE FREEMAN RAIL TRAIL 150 – 150 – 140 130 120 NAVD 88 BASE ELEV 160.5 **160.09** 325+00 326+00 327+00 328+00 329+00 330+00 331+00 332+00 333+00 334+00 335+00 336+00 Temp. Benchmark #49 Temp. Benchmark #50 LAG Screw set 2' LAG Screw set 2' up 10" Tree up 6" Tree Elevation = 166.20' Elevation = 169.70' Sta. 332+42.93, 11.68 LT Sta. 327+78.17, 6.18 RT

HOR. SCALE IN FEET

VER. SCALE IN FEET

