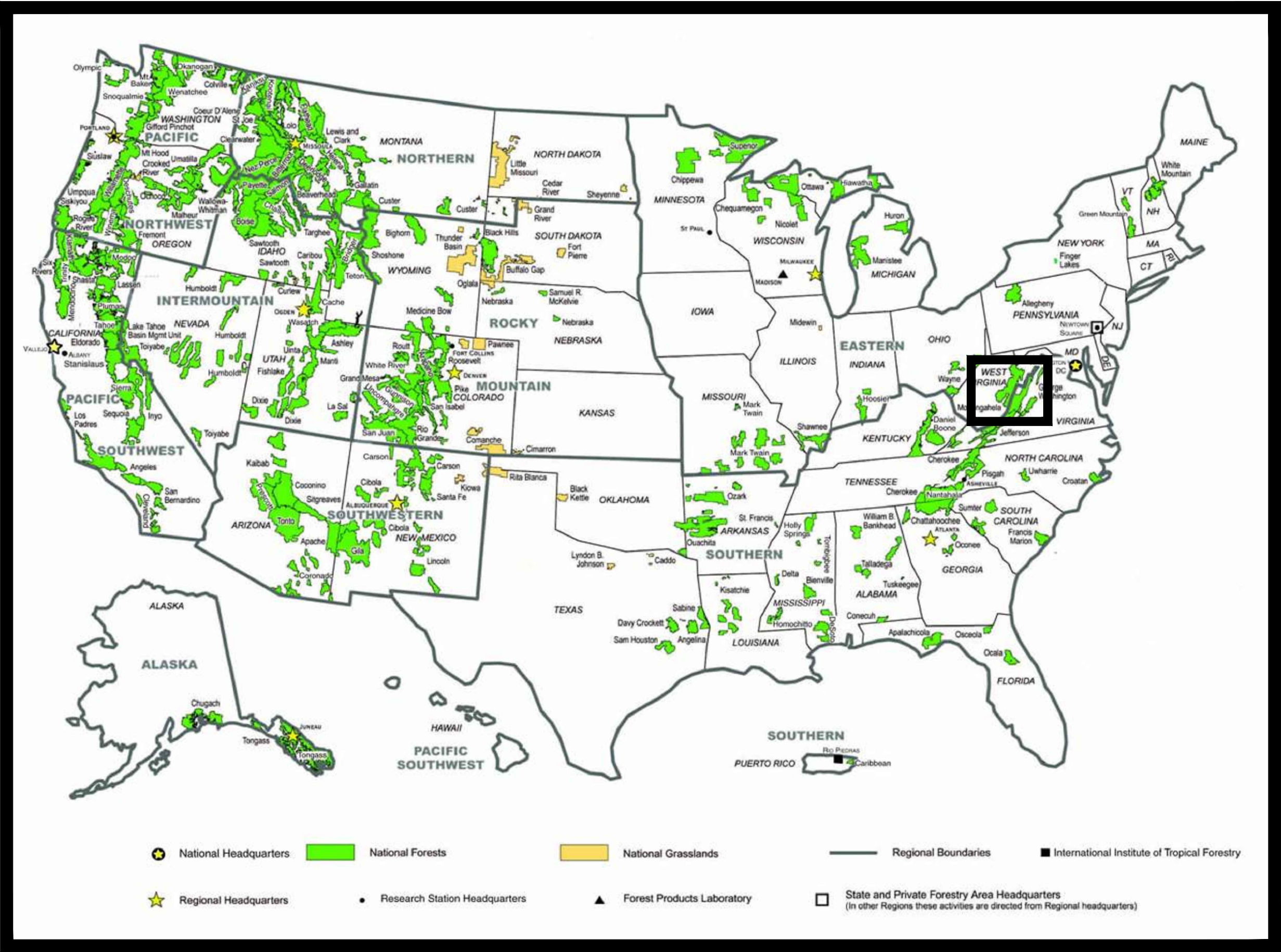


United States Department of Agriculture
Forest Service

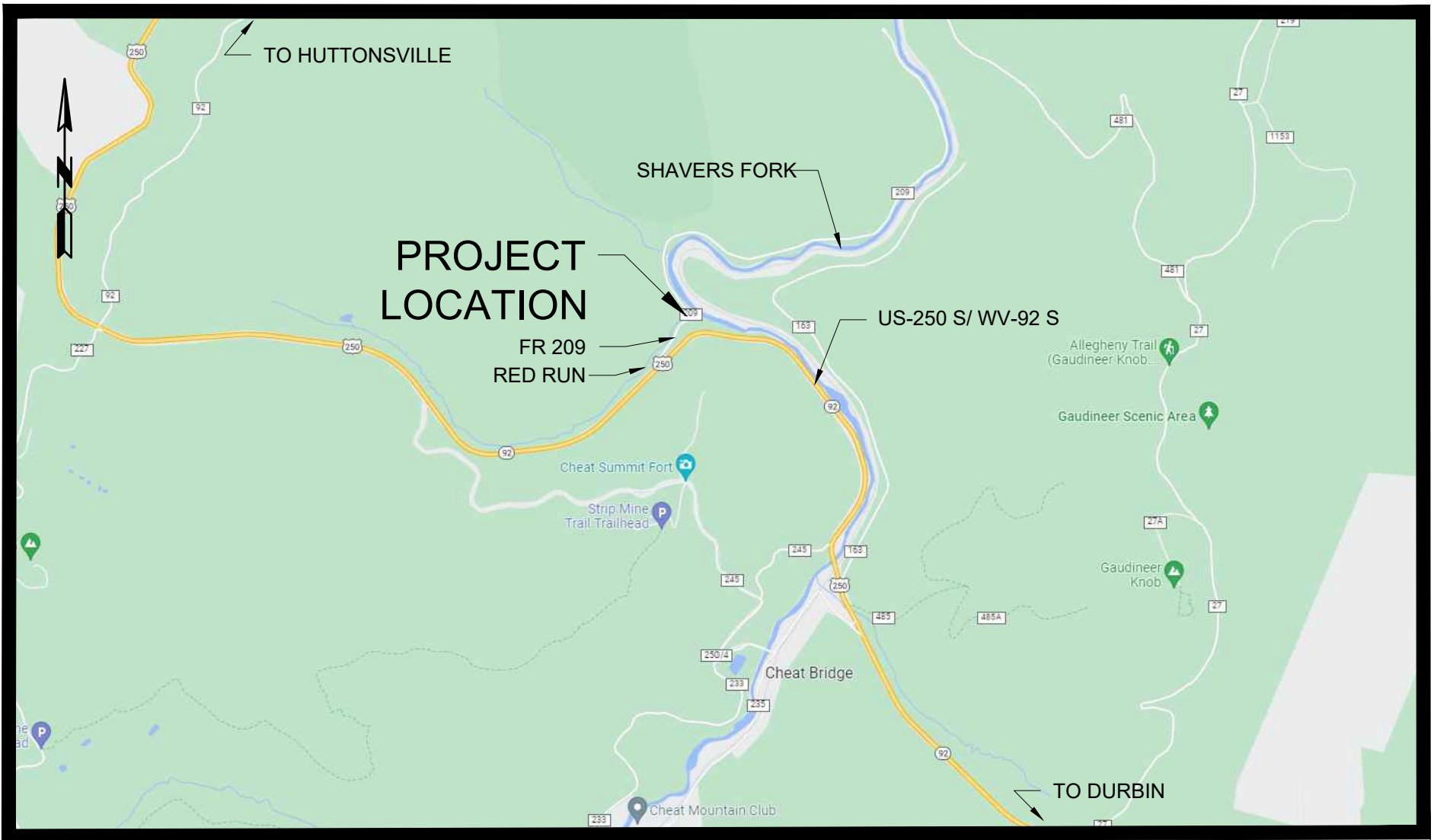
EASTERN REGION
MONONGAHELA NATIONAL FOREST - GREENBRIER RANGER DISTRICT
RANDOLPH COUNTY
WEST VIRGINIA

~~FR 209-0.2 OVER RED RUN~~
~~STRUCTURE REPLACEMENT~~

Forest Road 209 Culvert Replacement With Bridge
For Aquatic Organism Passage Improvement



PROJECT LOCATION



PROJECT SITE

PROJECT LOCATION: FROM US-219 S/ US-250 S (WV-92 S) INTERSECTION IN HUTTONSVILLE, WEST VIRGINIA HEAD SOUTH ON US-250 S (WV-92 S) FOR 11.2 MILES, THEN TURN LEFT ONTO FR 209 (SHAVERS FORK ROAD). CONTINUE ON FR 209 FOR 0.3 MILES TO THE BRIDGE LOCATION.

STRUCTURE NUMBER: 092103000035792 (LAT 38.631456, LONG -79.880432)

STRUCTURE DESCRIPTION:

76.5 FOOT (OVERALL LENGTH) SINGLE SPAN, SIDE-BY-SIDE PRESTRESSED CONCRETE BOX BEAM BRIDGE WITH CONCRETE ABUTMENTS, A SPREAD FOOTING ON THE NORTH, AND A MICROPILE FOUNDATION ON THE SOUTH.

DESIGN SPEED: 30 MPH

AADT: <200

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C-04	TYPICAL SECTIONS	5/11/2022
C-05	GENERAL PLAN	5/11/2022
C-06	GENERAL PROFILE	5/11/2022
C-07	PLAN OF STRUCTURE	5/11/2022
C-08	SOUTH ABUTMENT PLAN AND ELEVATION	5/11/2022
C-09	NORTH ABUTMENT PLAN AND ELEVATION	5/11/2022
C-10	MICROPILE LAYOUT PLAN	5/11/2022
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U.P. ENGINEERS & ARCHITECTS, INC.
ENGINEERING ARCHITECTURE PLANNING SURVEYING ENVIRONMENTAL



RECOMMENDED BY:

FOREST ENGINEER _____ DATE _____

DISTRICT RANGER _____ DATE _____

FOREST SUPERVISOR _____ DATE _____

R9 BRIDGE PROGRAM MANAGER _____ DATE _____

APPROVED:

R9 DIRECTOR OF ENGINEERING _____ DATE _____

DESIGN DATA:

LOAD RATING (RATING FACTORS):

HL-93 (FEDERAL)	
INVENTORY RATING (STRENGTH I, SHEAR).....	1.15
OPERATING RATING (STRENGTH I, SHEAR).....	1.29
LEGAL	
OPERATING RATING (STRENGTH I, SHEAR)(SU7).....	1.46

NOTE: THE LOAD RATING DOES NOT INCLUDE A FUTURE WEARING SURFACE.
LIVE LOAD DEFLECTION DOES NOT EXCEED 1/800 OF THE SPAN LENGTH.
BRIDGE RAILING MEETS TEST LEVEL 2 REQUIREMENTS OF NCHRP REPORT 350.

DEAD LOAD:

THE BRIDGE RAILING LOAD = 40 PLF (PER SIDE).

ULTIMATE DESIGN STRESSES:

STRUCTURAL CONCRETE CLASS A:

SUBSTRUCTURE (ABUTMENTS, FOOTINGS, WINGWALLS).....	f' c = 4,500 PSI
DECK CONCRETE	f' c = 4,500 PSI
TREMIE CONCRETE.....	f' c = 3,000 PSI
PRECAST CONCRETE (BOX BEAMS).....	f' ci = 6,000 PSI, f' c = 8,000 PSI
STEEL REINFORCEMENT (ALL NON-PRESTRESSED).....	fy = 60,000 PSI
PRESTRESSING STRANDS (LOW RELAX).....	fy = 270,000 PSI

HYDRAULIC DATA:

100 YEAR FREQUENCY	
DRAINAGE AREA.....	3.96 SQ MI
Q100.....	.893 CFS
VELOCITY THRU STRUCTURE.....	9.65 FPS
BRIDGE OPEN AREA THRU STRUCTURE.....	309.05 SQ FT
FLOW AREA THRU STRUCTURE.....	108.70 SQ FT
HIGH WATER ELEVATION.....	3542.77 FT
SCOUR CRITICAL CODE.....	8

GENERAL NOTES:

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS OR IN THE SUPPLEMENTAL SPECIFICATIONS, ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE FHWA STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14.

THE PROPOSED IMPROVEMENTS COVERED BY THESE PLANS ARE IN ACCORDANCE WITH:

FHWA STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, FP-14
AASHTO: "GUIDELINES FOR GEOMETRIC DESIGN OF VERY LOW-VOLUME LOCAL ROADS", 2ND EDITION, 2019
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020
FSH 7709.56b TRANSPORTATION STRUCTURES HANDBOOK (USDA FOREST SERVICE)

THE EXISTING STRUCTURE SHALL BE CHECKED AT THE TIME OF STARTING CONSTRUCTION TO SEE THAT ITS RELATIONSHIP TO THE PROPOSED WORK IS AS SHOWN ON THESE PLANS AND ANY DIFFERENCES REQUIRING CHANGES IN THE NEW WORK SHALL BE REPORTED TO THE PROJECT ENGINEER.

THE WORK COVERED BY THESE PLANS INCLUDES REMOVAL OF THE ENTIRE EXISTING CULVERT, INSTALLATION OF THE NEW BRIDGE AS SHOWN HEREIN CONSTRUCTION OF THE APPROACHES TO THE LIMITS SHOWN, SLOPE RESTORATION AND RIPRAP.

THE ROAD WILL BE CLOSED AND A DETOUR ROUTE IS NOT POSSIBLE.

THE STATIONING AS SHOWN ON THESE PLANS FOR REFERENCE POINTS "A" AND "B" (CENTERLINE OF PROPOSED BRIDGE AT THE BACK OF ABUTMENT BACKWALLS) ARE BELIEVED TO BE CORRECT. IT SHALL, HOWEVER, BE CHECKED AT THE TIME OF STARTING CONSTRUCTION, AND IF THE STATIONING SHOWN ON THE PLANS IS INCORRECT, IT SHALL BE REPORTED TO THE ENGINEER.

THE CONTRACTOR SHALL COORDINATE ALL OF THEIR WORK AND ANY UTILITY COMPANIES RELOCATION WORK AT NO ADDITIONAL COST TO THE PROJECT.

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 53, THE CONTRACTOR SHALL DIAL "811" A MINIMUM OF THREE FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS AND HOLIDAYS PRIOR TO BEGINNING EACH EXCAVATION IN AREAS WHERE PUBLIC UTILITIES HAVE NOT BEEN PREVIOUSLY LOCATED. MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "WEST VIRGINIA 811" ALERT SYSTEM.

ALL EXPOSED CONCRETE CORNERS SHOWN ON THE PLANS SHALL BE BEVELED WITH 3/4" TRIANGULAR MOLDINGS EXCEPT AS NOTED OTHERWISE.

UNLESS SHOWN OTHERWISE ON THE PLANS, PROVIDE MINIMUM CONCRETE CLEAR COVER FOR REINFORCEMENT ACCORDING TO THE FOLLOWING:
CONCRETE CAST AGAINST EARTH: 3 INCH
PRESTRESSED BEAMS: 1 INCH
ALL OTHER, UNLESS SHOWN ON THE PLANS: 2 INCH

WATER LEVEL IS SUBJECT TO CHANGE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXPECTED WATER LEVELS DURING CONSTRUCTION.

NO MATERIAL SHALL BE ALLOWED TO ERODE INTO THE WATER COURSE, NOR SHALL MATERIAL BE PLACED INTO THE WATER COURSE EXCEPT AS SHOWN ON THESE PLANS.

ALL EQUIPMENT SHALL BE CLEANED ACCORDING TO THE SPECIFICATIONS PRIOR TO USE ON THIS PROJECT. CONTRACTOR SHALL MAKE EQUIPMENT AVAILABLE TO THE CONTRACTING OFFICER FOR INSPECTION PRIOR TO MOBILIZATION ONTO FOREST SERVICE LANDS.

THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY THE CONTRACTING OFFICER IF HERITAGE RESOURCES OR HUMAN REMAINS ARE ENCOUNTERED.

NO WORK SHALL BE PERFORMED ON FEDERAL HOLIDAYS OR WEEKENDS WITHOUT PRIOR APPROVAL FROM THE CONTRACTING OFFICER.

THE CONTRACTOR SHALL PERFORM ALL IN-STREAM WORK BETWEEN JUNE 1ST AND SEPTEMBER 15TH.

TREES SHALL BE CUT BETWEEN NOVEMBER 15TH AND MARCH 31ST.

SCALES SHOWN ON THE PLANS ARE VALID ONLY FOR 22"X34" SHEETS.

MATERIAL & FABRICATION NOTES:

THE PRESTRESSED CONCRETE BEAMS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF SECTION 553 OF THE STANDARD SPECIFICATIONS.

MILD REINFORCEMENT:

ALL MILD REINFORCING STEEL SHALL BE GRADE 60, DEFORMED BILLET STEEL AND SHALL BE EPOXY COATED EXCEPT WHERE NOTED. ALL UNCOATED REINFORCING SHALL MEET THE REQUIREMENTS OF AASHTO M31. ALL EPOXY COATED REINFORCING SHALL MEET THE REQUIREMENTS OF AASHTO M284, EXCEPT WHERE AMENDED BY SECTION 433 OF THE STANDARD SPECIFICATIONS. ALL TENSION LAP SPLICES SHALL BE A CLASS B, CONTACT TYPE.

PRESTRESSING STRAND:

ALL PRESTRESSING STEEL SHALL BE 0.6" DIAMETER, GRADE 270, 7 WIRE UNCOATED, LOW-RELAXATION STRAND MEETING THE REQUIREMENTS OF AASHTO M203, SUPPLEMENT S1. ALL STRANDS SHALL BE ENCLOSED INSIDE THE STIRRUP CAGE FOR THE FULL LENGTH OF THE BEAM. ALL EXPOSED PRESTRESSING STRAND AT EACH BEAM END SHALL BE SHOP COATED WITH A LIQUID COLD-APPLIED BITUMINOUS ELASTOMERIC WATERPROOFING MEMBRANE. MATERIAL SHALL MEET ASTM C836-84.

CONCRETE:

ALL CONCRETE USED IN MANUFACTURING PRESTRESSED CONCRETE BEAMS SHALL MEET THE REQUIREMENTS OF SECTION 553 OF THE STANDARD SPECIFICATIONS. DESIGN STRENGTHS SHALL MEET OR EXCEED THE MINIMUM VALUES SET FORTH IN THESE PLANS.

ELASTOMERIC BEARING PADS:

ALL BEARING PADS SHALL MEET THE APPLICABLE REQUIREMENTS AS SET FORTH IN SECTION 14.7.6 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, 2020 EDITION WITH CURRENT INTERIMS. ALL BEARINGS SHALL BE STEEL REINFORCED LAMINATED BEARINGS. THE ELASTOMER MATERIAL SHALL BE 60 DUROMETERS WITH A MINIMUM LOW TEMPERATURE GRADE OF 3 (ZONE C). ALL STEEL REINFORCING SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 36.

WELDING:

TACK WELDING OF REINFORCEMENT IS NOT PERMITTED. REINFORCING CAGES AND LONGITUDINAL STEEL SHALL BE ADEQUATELY TIED WITH APPROVED MEANS TO PREVENT RACKING AND MISALIGNMENT. ALL WELDING OF FABRICATED ITEMS, AS SHOWN IN THESE PLANS SHALL BE IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF AASHTO/AWS D1.5, 2002.

POST-TENSIONING:

POST - TENSIONING STRANDS SHALL BE 0.5" DIAMETER, GRADE 270, 7 WIRE UNCOATED, LOW-RELAXATION STRAND MEETING THE REQUIREMENTS OF AASHTO M203, SUPPLEMENT S1. ALL POST-TENSIONING BEARING PLATES, COUPLERS, AND ANCILLARY HARDWARE SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M111. THE GALVANIZING PLANT SHALL ADMINISTER ADEQUATE QUALITY CONTROL MEASURES TO SAFEGUARD AGAINST HYDROGEN EMBRITTLEMENT. QUALITY CONTROL MEASURES SHALL COMPLY WITH ASTM A-143. CERTIFICATION FOR HOT-DIP GALVANIZING SHALL BE PROVIDED BY THE GALVANIZING PLANT. ALL POST-TENSIONING BEARING PLATES SHALL CONFORM TO AASHTO M270, GRADE 36.

SHEAR KEY GROUT:

SHEAR KEY GROUT SHALL BE A GROUT THAT IS RECOMMENDED BY THE MANUFACTURER FOR A POURABLE GROUT APPLICATION AND THAT BASED ON THE MANUFACTURER'S TEST DATA WILL ATTAIN A MINIMUM OF 4500 PSI COMPRESSIVE STRENGTH IN 3 DAYS UNDER CONDITIONS REPRESENTATIVE OF THE CONDITIONS TO BE EXPERIENCED AT THE SITE. THE GROUT MUST BE LISTED ON THE APPROVED LIST OF GROUTS PUBLISHED BY THE WEST VIRGINIA DIVISION OF HIGHWAYS, MATERIALS CONTROL, SOIL AND TESTING DIVISION. THE CONTRACTOR SHALL PRE-TEST THE PROPOSED GROUT FOR COMPRESSIVE STRENGTH AT 3 AND 7 DAYS AND SUBMIT THE RESULTS TO THE USFS CONTRACTING OFFICER FOR APPROVAL PRIOR TO INSTALLATION OF THE GROUT IN THE STRUCTURE. THE TESTS WILL BE BASED ON A POURABLE CONSISTENCY WITH THE SAME WATER/GROUT MIXTURE RATIO TO BE USED IN THE STRUCTURE.

THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT THE GROUT PRE-TEST RESULTS OBTAINED IN THE NOTE ABOVE. THE CONTRACTOR SHALL BE REQUIRED TO PERFORM A NEW PRE-TEST AND SUBMISSION FOR APPROVAL UNDER ANY OF THE FOLLOWING CONDITIONS:

- A PERIOD OF 18 MONTHS HAS ELAPSED SINCE LAST PRE-APPROVAL TESTING.
- GROUT MANUFACTURER HAS REVISED OR CHANGED THE GROUT SPECIFICATIONS.
- THE CONTRACTOR ALTERS THE WATER/GROUT MIXTURE RATIO.
- THE CONTRACTOR CHANGES GROUT MANUFACTURER.

TEST PROCEDURE FOR DETERMINING THE COMPRESSIVE STRENGTH OF GROUT SHALL USE CUBE SPECIMENS IN ACCORDANCE WITH ASTM C109, AS MODIFIED BY ASTM C1107. GROUT TESTING IN ACCORDANCE WITH AASHTO T23 (STANDARD CYLINDER TEST) IS NOT ACCEPTABLE.

SHOP DRAWINGS:

THE FABRICATOR SHALL BE RESPONSIBLE FOR THE PREPARATION OF SHOP DRAWINGS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

SUMMARY OF PROJECT QUANTITIES			
ITEM NO.	DESCRIPTION	UNITS	QUANTITY
15101	MOBILIZATION	LPSM	1
15201	CONSTRUCTION SURVEY AND STAKING, METHOD 1, TOLERANCE CLASS C	LPSM	1
15702	SILT SOCK	LNFT	285
20102	CLEARING AND GRUBBING, DISPOSAL METHOD A	ACRE	0.2
20304	REMOVAL OF OLD STRUCTURE, DISPOSAL METHOD A	LPSM	1
20401	ROADWAY EXCAVATION, COMPACTION METHOD B, FINISHING METHOD A	CUYD	280
20411	EMBANKMENT, PLACEMENT METHOD 1	CUYD	81
20801	STRUCTURE EXCAVATION	CUYD	292
20803	STRUCTURAL BACKFILL	CUYD	183
21101	ROADWAY OBLITERATION, METHOD 1	MILE	0.08
25101	RIPRAP, CLASS IV, MACHINE PLACED	CUYD	313
30103	AGGREGATE BASE, GRADING D, COMPACTION METHOD D	CUYD	184
30107	SUBBASE, GRADING B, COMPACTION METHOD D	CUYD	197
40312.1	ASPHALT CEMENT, WV BASE 1	TON	60
40312.2	ASPHALT CEMENT, WEARING IV	TON	30
41403	JOINT SEALANT, HOT POURED RUBBER	LNFT	36
55103	MICROPILE, LOAD TEST	EACH	1
55151	FURNISH PILE DRILLING EQUIPMENT	LPSM	1
55201	STRUCTURAL CONCRETE, CLASS A	CUYD	100
55210	TREMIE CONCRETE	CUYD	8
55302	PRECAST, PRESTRESSED CONCRETE BOX BEAM	LNFT	444
55404	EPOXY COATED REINFORCING STEEL	LBS	8176
55601	BRIDGE RAILING	LNFT	163
56401	BEARING DEVICE	EACH	12
56701	MICROPILE	LNFT	172
58701	POST-TENSIONING SYSTEM	LPSM	1
60501	UNDERDRAIN SYSTEM, 6 INCH	LNFT	100
61701	GUARDRAIL, CLASS I	LNFT	38
61702	GUARDRAIL, FLARED END TERMINAL	EACH	4
61706	GUARDRAIL ANCHORAGE	EACH	4
62404	PLACING CONSERVED TOPSOIL, 3 INCH	SQYD	870
62503	SEEDING, HYDRAULIC OR DRY METHOD	LPSM	1
62509	MULCHING, HYDRAULIC OR DRY METHOD	LPSM	1
62901	ROLLED EROSION CONTROL PRODUCT, TYPE 2 D	SQYD	870
63305	POSTS, STEEL, 3 LB	LNFT	40
63306	OBJECT MARKERS, TYPE 3	EACH	4
63501	TEMPORARY TRAFFIC CONTROL	LPSM	1



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
Replacement With Bridge
For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

QUANTITIES,
DESIGN DATA,
GENERAL NOTES

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

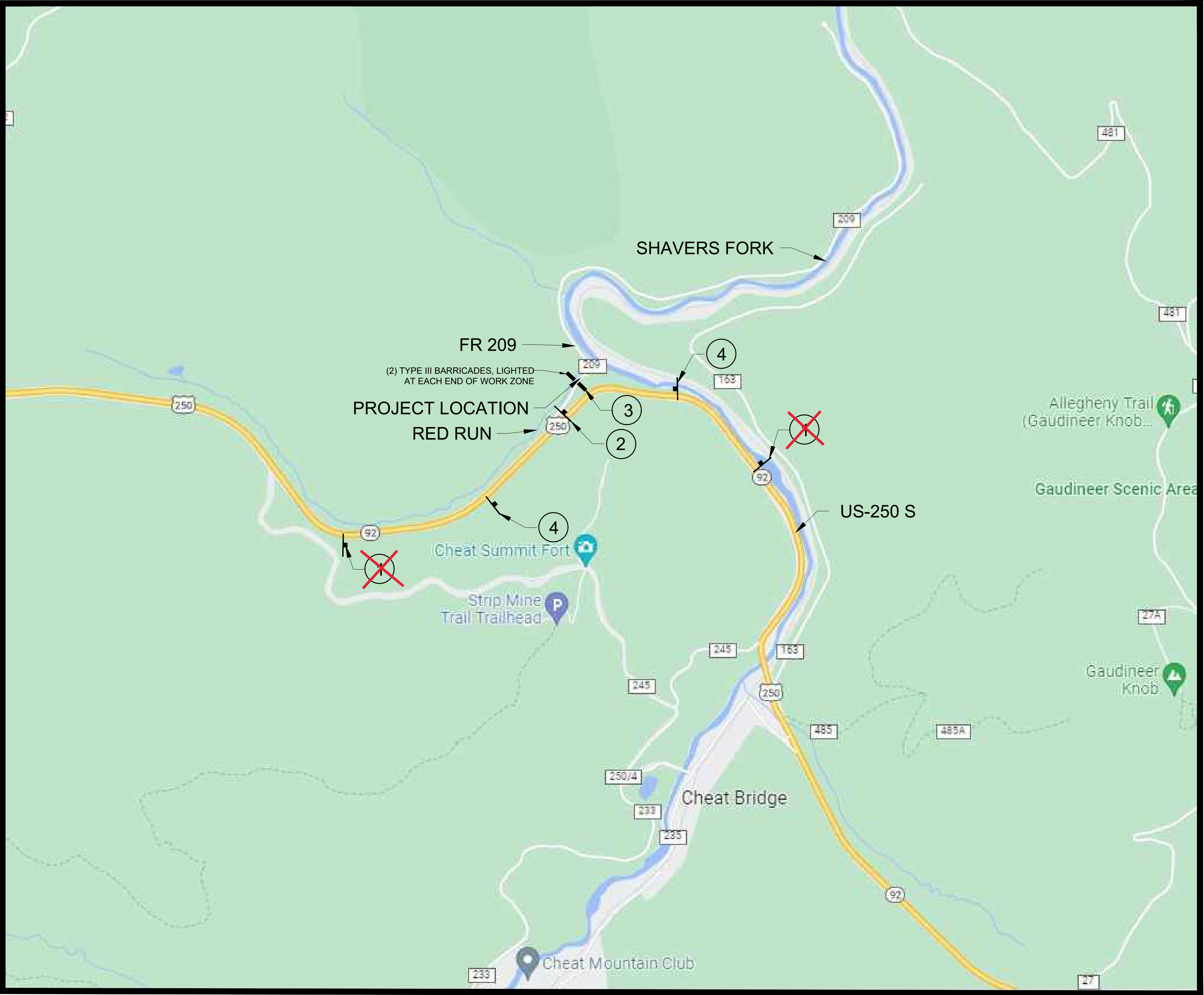
U28-01575

DWG SHEET NO.

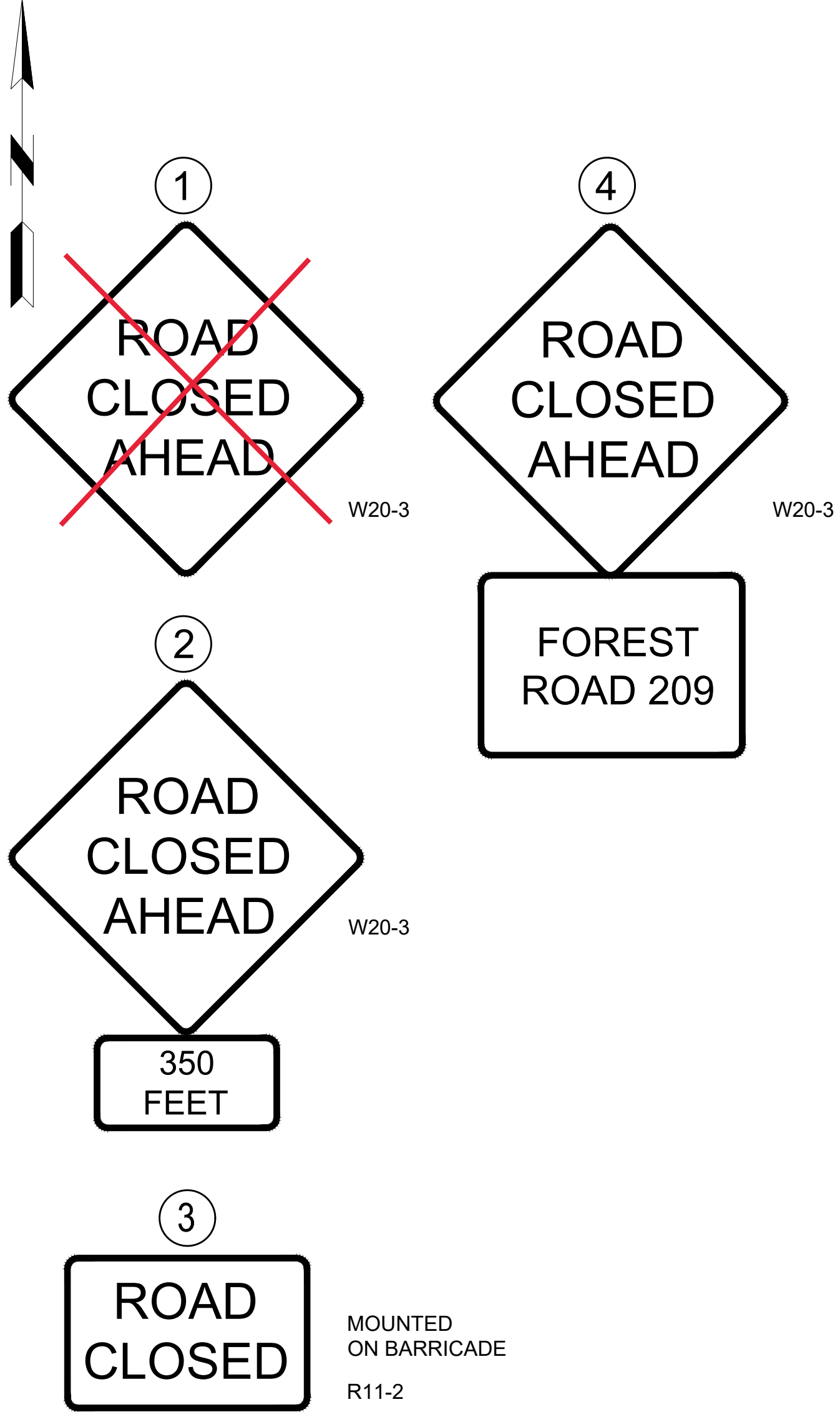
C-02

SHEET 2 OF 24

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R9 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



TRAFFIC CONTROL PLAN - ROAD CLOSURE / DETOUR



TRAFFIC CONTROL PLAN KEY

- SIGN
- TYPE III BARRICADE

ALL SIGNS, EXCEPT THOSE MOUNTED ON TYPE III BARRICADES SHALL BE MOUNTED ON DRIVEN POSTS AT A 7 FOOT BOTTOM HEIGHT.

NOTES:

NO DETOUR ROUTE IS AVAILABLE FOR THIS LOCATION.



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TEMPORARY
TRAFFIC
CONTROL PLAN

DATE

5/11/2022

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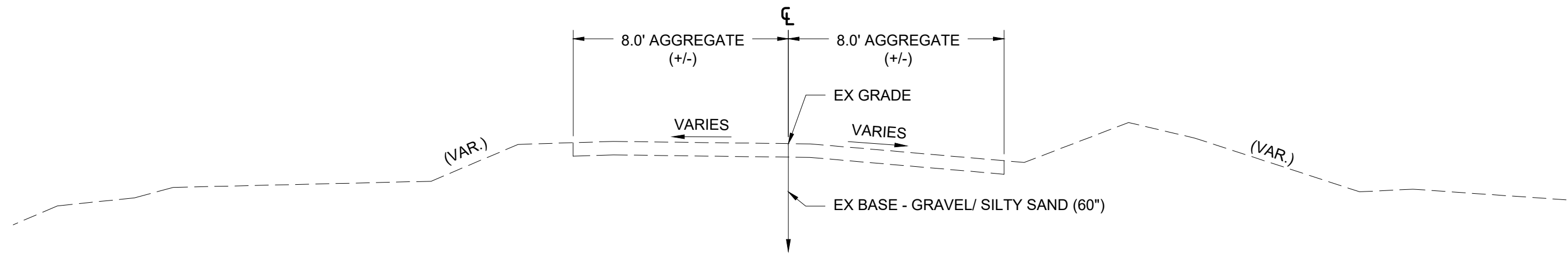
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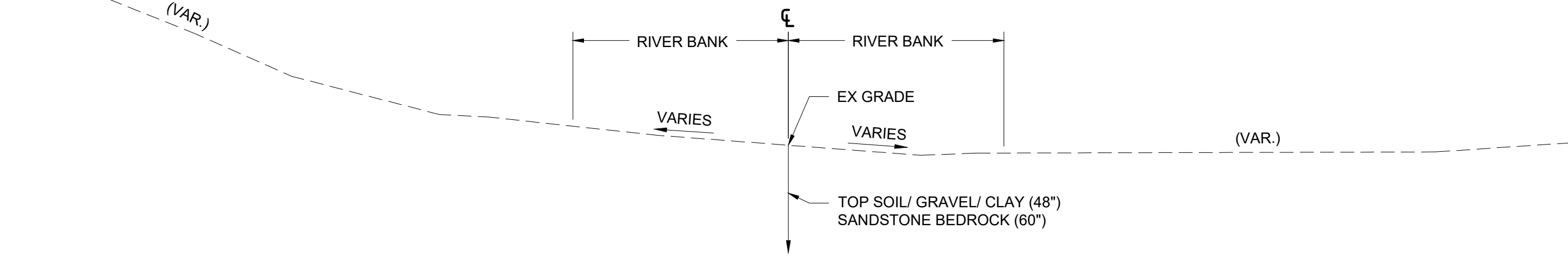
C-03

SHEET 3 OF 24

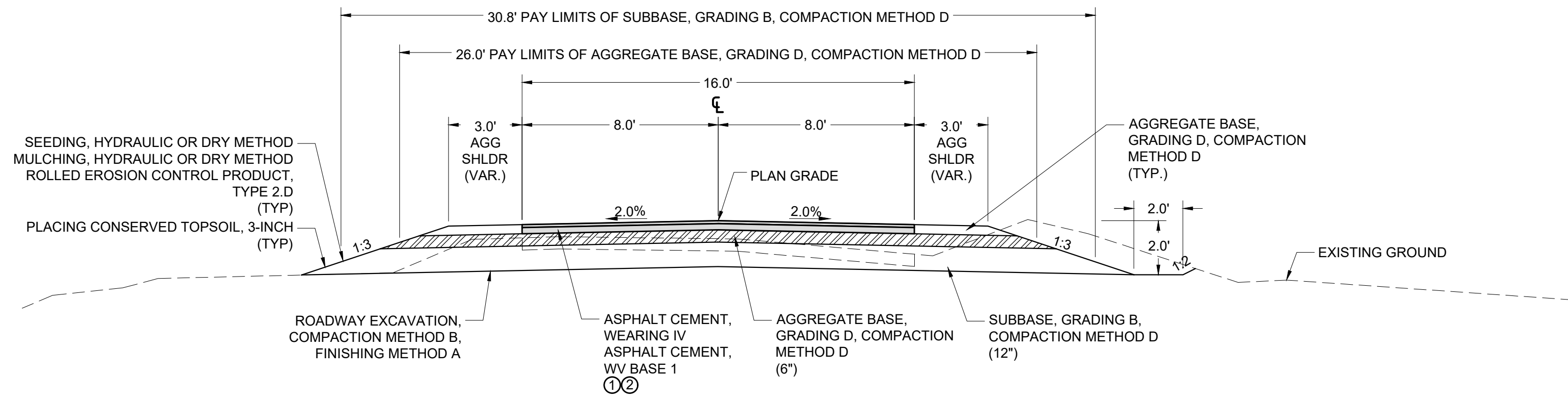
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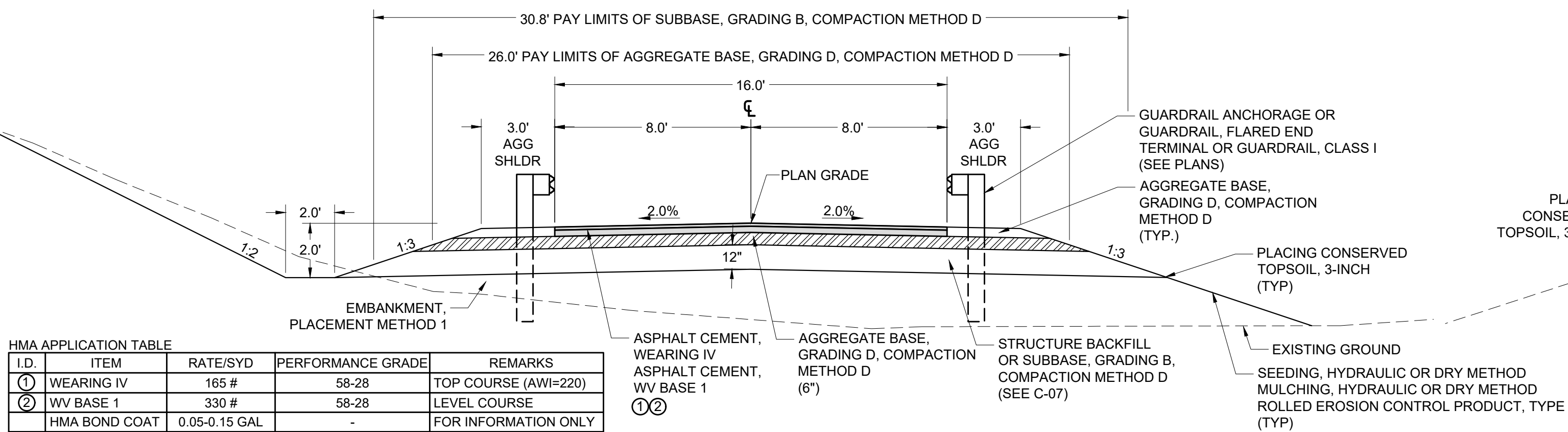
EXISTING TYPICAL SECTION (STA 8+25 - STA 9+40)
SCALE: 1:4
(STA. 11+40 - 12+00)



EXISTING TYPICAL SECTION (STA 9+40 - STA. 9+62.07)
SCALE: 1:4
(STA. 10+38.57 - 11+40)

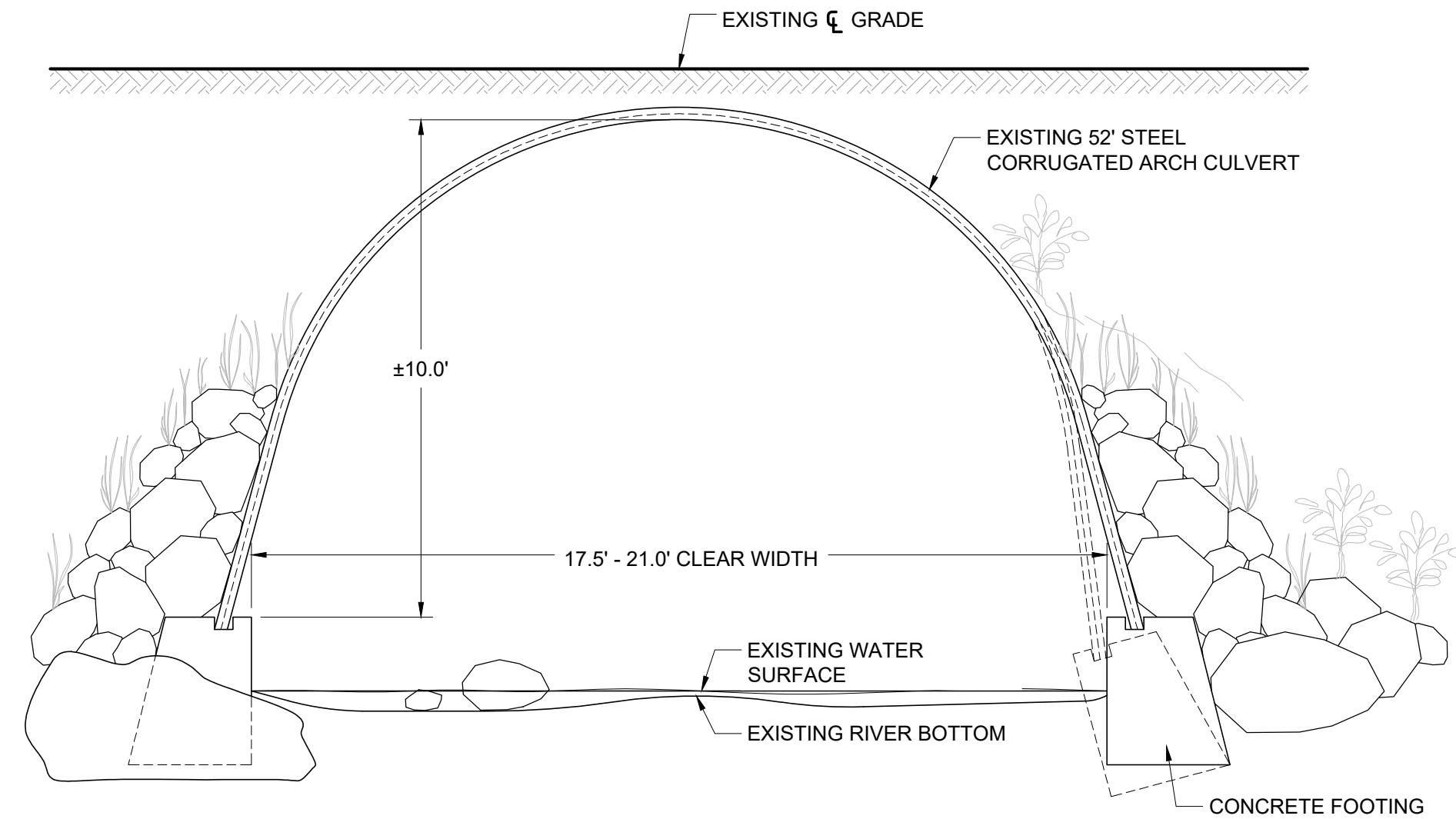


PROPOSED TYPICAL SECTION (STA 8+62.07 - STA 8+74)
SCALE: 1:4
(STA. 11+01 - STA. 11+38.57)

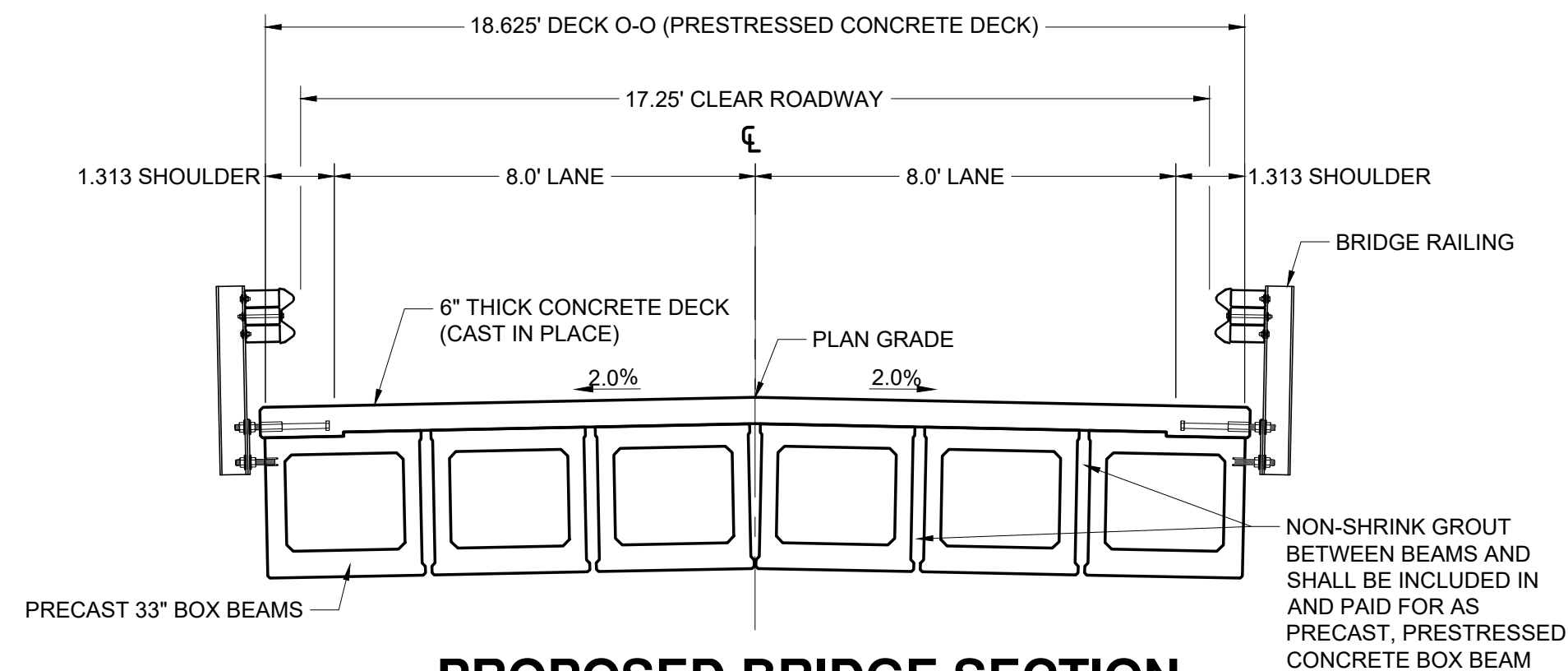


HMA APPLICATION TABLE				
I.D.	ITEM	RATE/SYD	PERFORMANCE GRADE	REMARKS
①	WEARING IV	165 #	58-28	TOP COURSE (AWI=220)
②	WV BASE 1	330 #	58-28	LEVEL COURSE
	HMA BOND COAT	0.05-0.15 GAL	-	FOR INFORMATION ONLY

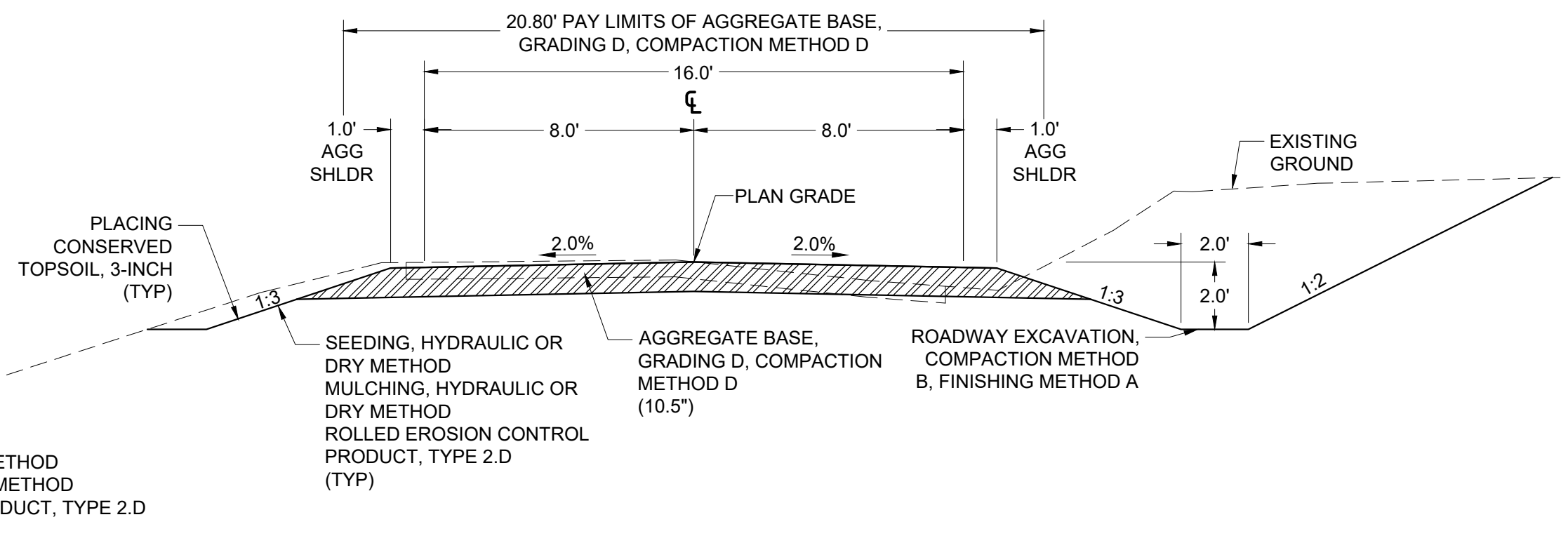
PROPOSED APPROACH SECTION (STA 8+74 - STA 9+62.07)
SCALE: 1:4
(STA. 10+38.57 - STA. 11+01)



EXISTING BRIDGE SECTION
SCALE: 1:3



PROPOSED BRIDGE SECTION
SCALE: 1:3



PROPOSED TYPICAL SECTION (STA 8+25 - STA 8+62.07)
SCALE: NTS
(STA 11+38.57 - STA 12+00)



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DRAWING TITLE

TYPICAL
SECTIONS

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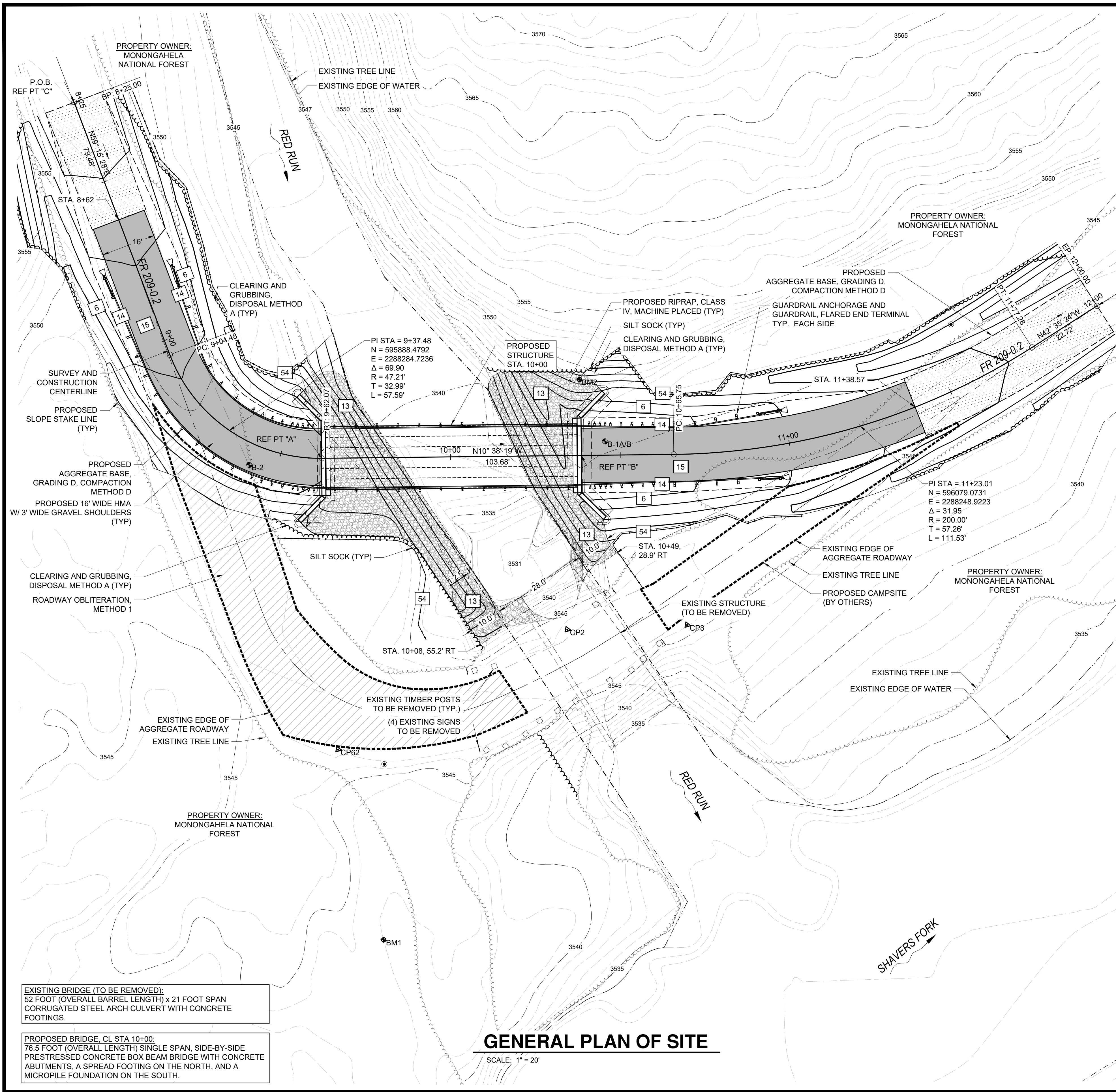
U28-01575

DWG SHEET NO.

C-04

SHEET 4 OF 24

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R3 10-BRIDGE DESIGN\WGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



HORIZONTAL AND VERTICAL CONTROL					
POINT	LOCATION		ELEVATION	DESCRIPTION	
	STA / OFFSET				
CP1	BEYOND P.O.E. 137'	596230.6768	2288092.9982	3543.10	NAIL
CP2	10+33.54 / 51.27' RT	596000.9266	2288315.7723	3546.64	NAIL
CP3	10+68.15 / 50.34' RT	596035.4372	2288308.3163	3546.11	NAIL
CP62	9+65.65 / 85.84' RT	595940.5926	2288362.2807	3547.41	NAIL
BM1	9+78.44 / 141.98' RT	595963.5239	2288415.0917	3545.03	BENCHMARK
BM1	10+37.89 / 22.34' LT	595991.6212	2288242.6210	3550.16	BENCHMARK

LEGEND

● DRILL HOLE ▲ CONTROL POINT

— PROPOSED — EXISTING

— RIGHT OF WAY

— TREE LINE

— EDGE OF GRAVEL

— EDGE OF BIT

— SILT FENCE

PAVEMENT RIPRAP

AGGREGATE BASE (9" DEPTH)

SOIL EROSION CONTROL REQUIREMENTS

KEY	DETAIL	CHARACTERISTICS
6	SEEDING WITH MULCH AND/ OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER. EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY. EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL. SHOULD INCLUDE PREPARED TOPSOIL BED. EROSION MAT WITH NETTING IS PROHIBITED.
13	RIPRAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED. EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS. PERMITS RUNOFF TO INFILTRATE SOIL. DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS.
14	AGGREGATE COVER	STABILIZES SOIL SURFACE THUS MINIMIZING EROSION. PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER. MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS.
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED BUT INCREASES RUNOFF VOLUME AND VELOCITY.
54	SILT SOCK	FILTERS AND DETAINS RUNOFF.

GENERAL NOTES:

- THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO ENSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES FOR TEMPORARY AND PERMANENT RELOCATIONS FOR CONSTRUCTION OPERATIONS SUCH THAT UTILITIES DO NOT INTERFERE WITH THE TEMPORARY OR PERMANENT WORK TO BE COMPLETED.
- WATER LEVEL IS SUBJECT TO CHANGE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION OF WATER LEVELS THAT WILL EXIST DURING CONSTRUCTION.
- MEASURES SHALL BE TAKEN TO PREVENT DEBRIS FROM FALLING FROM THE EXISTING OR PROPOSED STRUCTURE. IF DEBRIS FALLS INTO THE WATERWAY IT SHALL BE REMOVED WITHIN 24 HOURS.
- INSTALL THE SPECIFIED QUANTITY OF ROLLED EROSION CONTROL PRODUCT (EMAT) AND THEN ANY ADDITIONAL AREAS THAT ARE DISTURBED BY THE CONTRACTOR SHALL BE SEEDED AND MULCHED UNDER THE LUMP SUM PAY ITEMS.
- COORDINATE SYSTEM REFERS TO NAD83 WEST VIRGINIA STATE PLAINS, SOUTH ZONE. DATUM REFERS TO NAVD88.
- REFERENCE POINTS "A" AND "B" REFER TO FINISH GRADE AT CENTERLINE AT THE BACK FACE OF THE ABUTMENT BACK WALLS.
- PROVIDE SMOOTH TRANSITION FROM EXISTING TO PROPOSED ROADWAY AT REFERENCE POINTS "C" AND "D". FADE OR EXTEND PROFILE SLIGHTLY AS REQUIRED.
- SURVEY WAS COMPLETED BY KELLY SURVEYING FOR THIS PROJECT ON 9-22-2021.
- ALL TREE REMOVAL TO BE INCIDENTAL TO CLEARING AND GRUBBING, DISPOSAL METHOD A.

United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert Replacement With Bridge For Aquatic Organism Passage Improvement

MONONGAHELA NATIONAL FOREST

GREENBRIER RANGER DISTRICT

DRAWING TITLE

GENERAL PLAN OF SITE

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DWG SHEET NO.

C-05

DRAWN

J.ALLEN

CHECKED

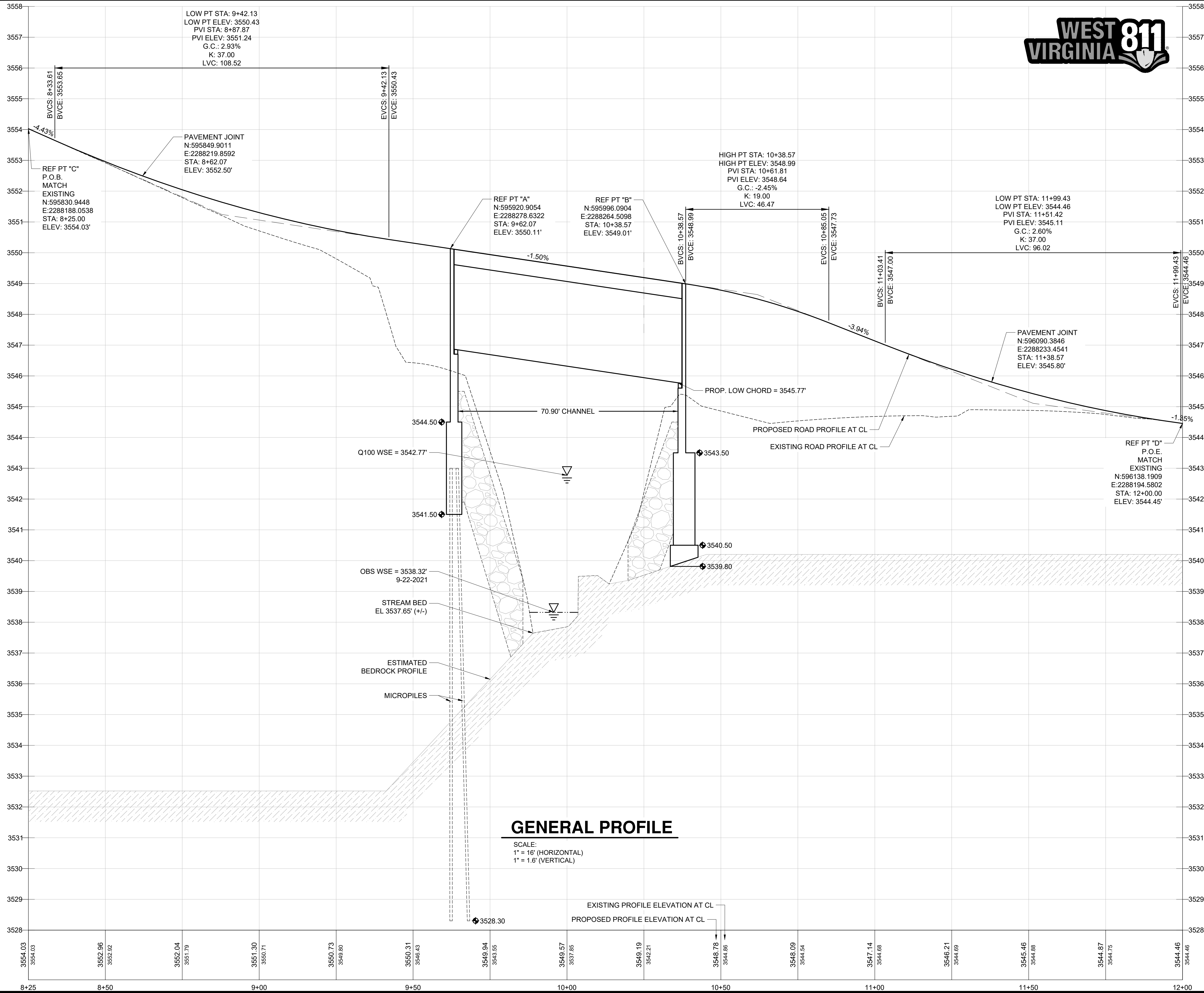
S. WRIGHT

PROJECT NO.

U28-01575

SHEET 5 OF 24

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R3 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
Replacement With Bridge
For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

GENERAL PROFILE

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

U28-01575

DWG SHEET NO.

C-06

SHEET 6 OF 24



SCALE: NTS



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert Replacement With Bridge For Aquatic Organism Passage Improvement

**MONONGAHELA
NATIONAL FOREST**

**GREENBRIER
RANGER DISTRICT**

DRAWING TITLE

SOUTH ABUTMENT PLAN AND ELEVATION

DATE _____

5/11/2022

ARCHIVE NO.

DESIGNER
G.JUNTTILA

DRAWN
J.ALLEN

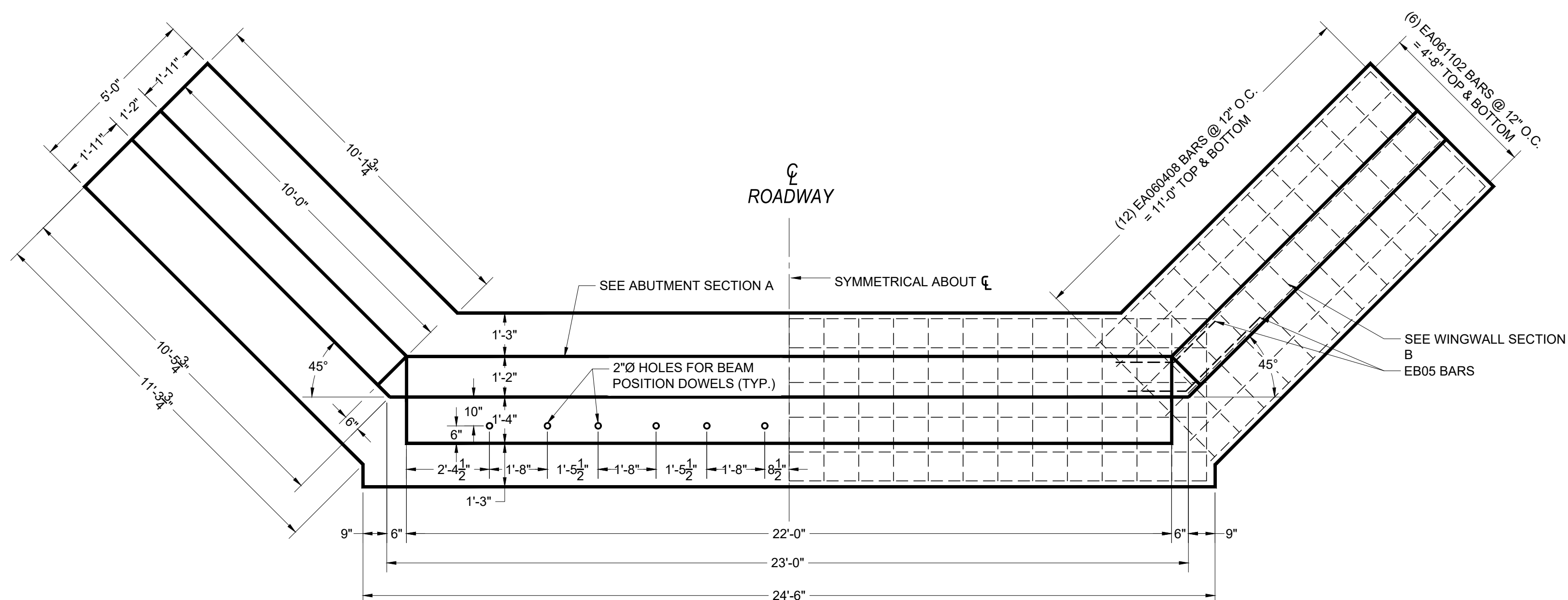
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S. WRIGHT

PROJECT NO.
U28-01575

DWG SHEET NO.

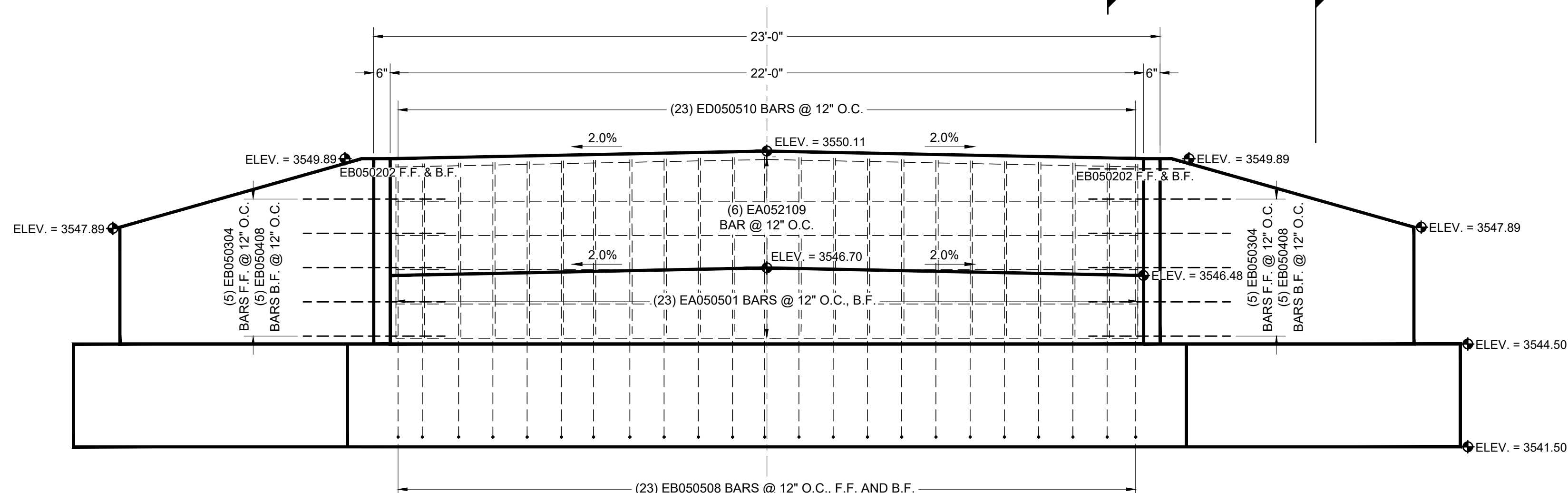
C-08

SHEET 8 OF 24



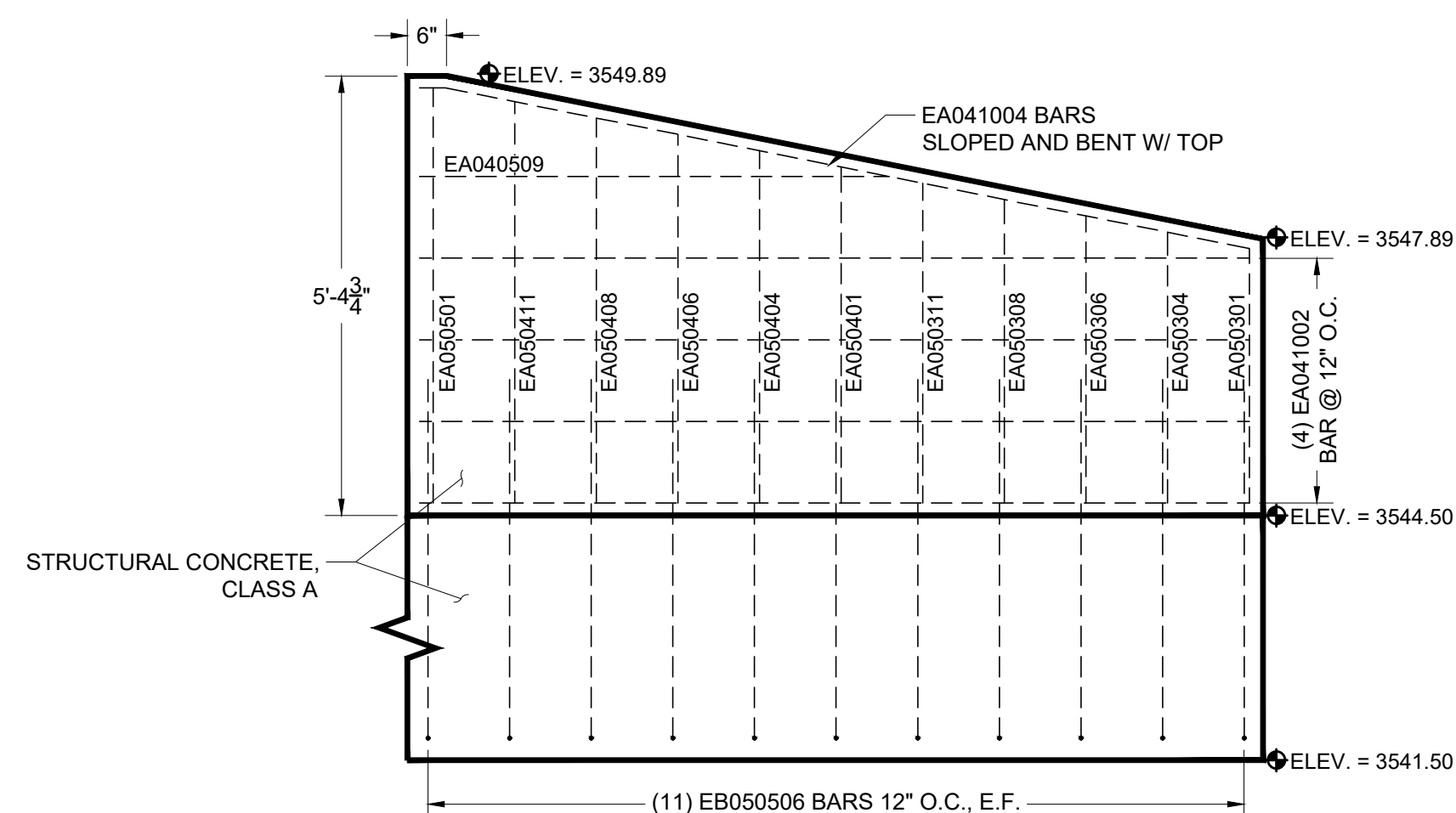
SOUTH ABUTMENT PLAN VIEW

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



SOUTH ABUTMENT ELEVATION

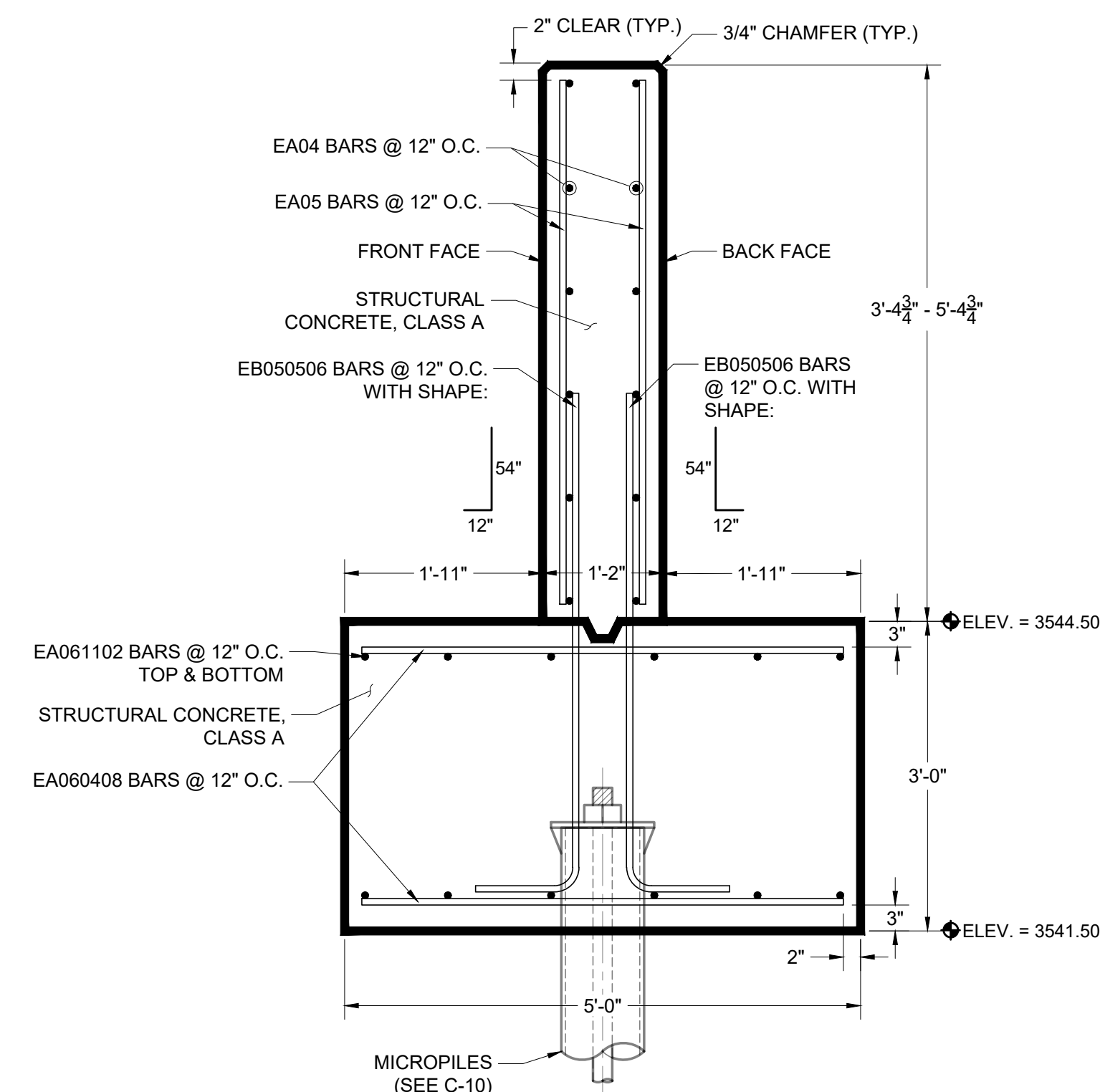
SCALE: 3/8" = 1'-0"



SOUTH WINGWALL ELEVATION

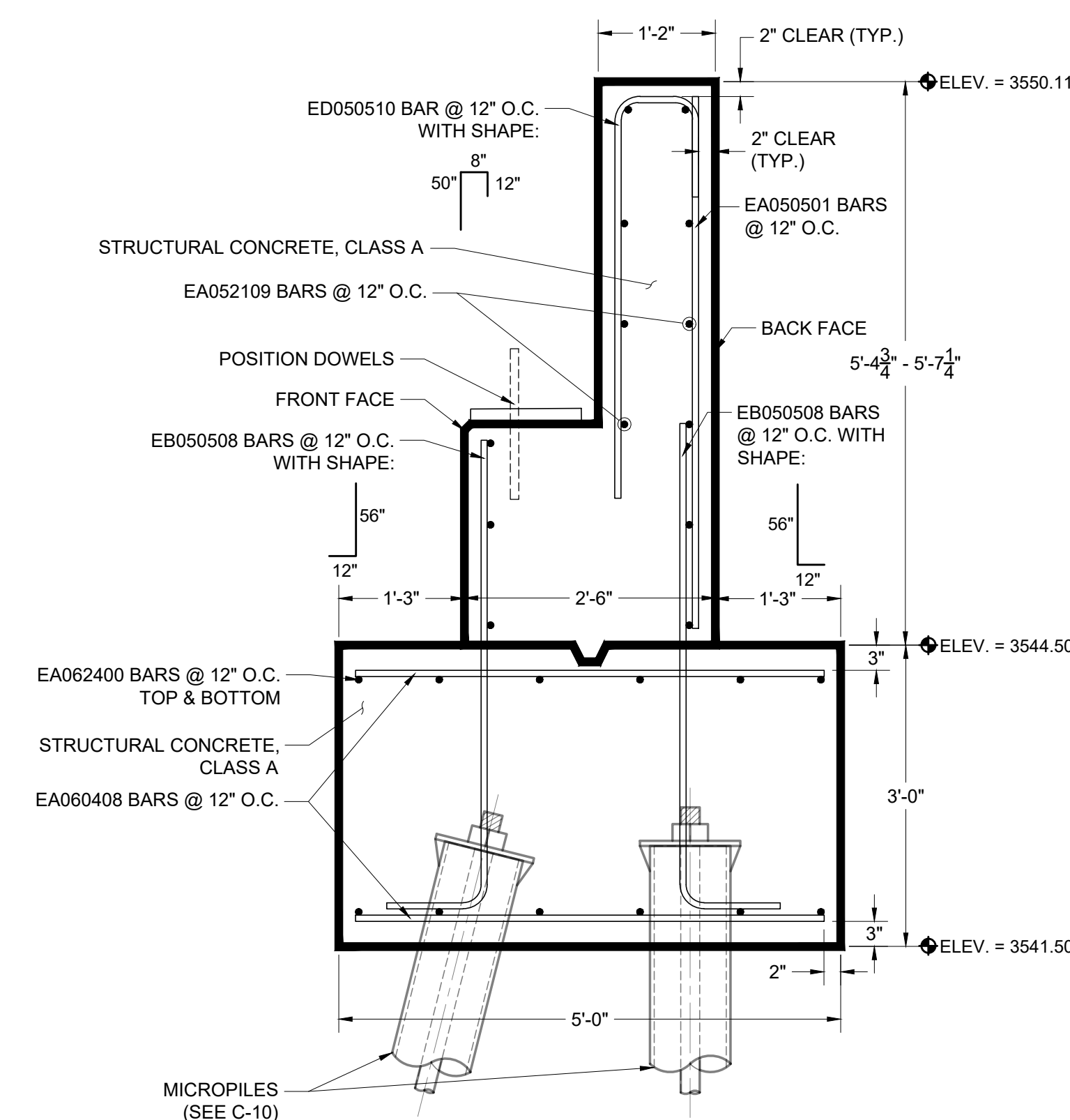
SCALE: 1/2" = 1'-0"

CONCRETE QUANTITIES		
DESCRIPTION	UNITS	QUANTITY
FOOTING	CUYD	24.13
ABUTMENT STEM	CUYD	8.13
WING WALL STEMS	CUYD	4.03
	TOTAL	36.29



WINGWALL SECTION

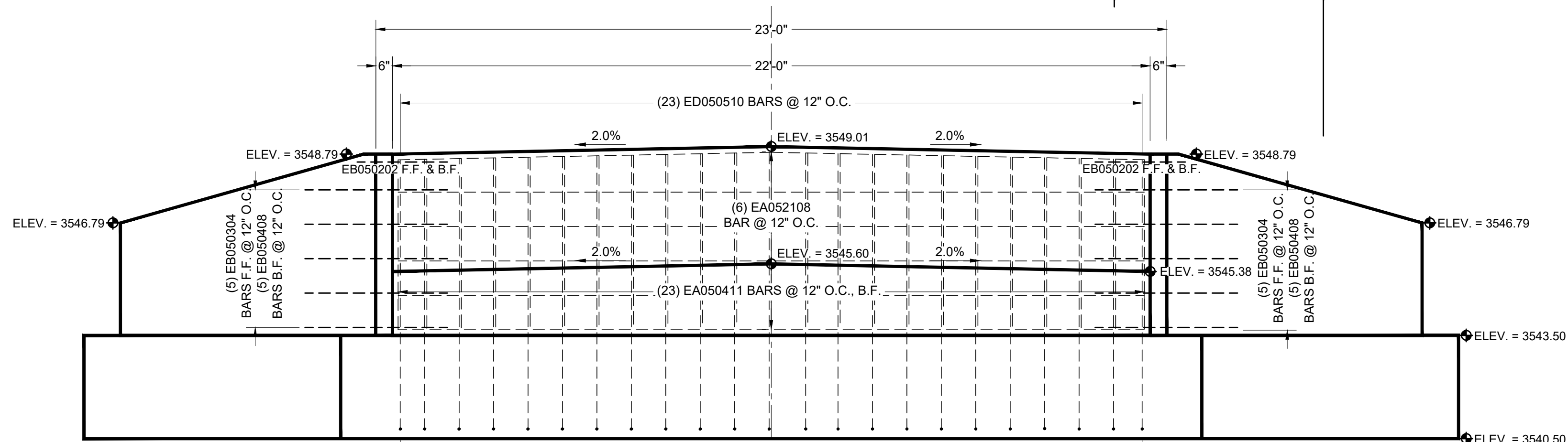
SCALE: 1" = 1'-0"



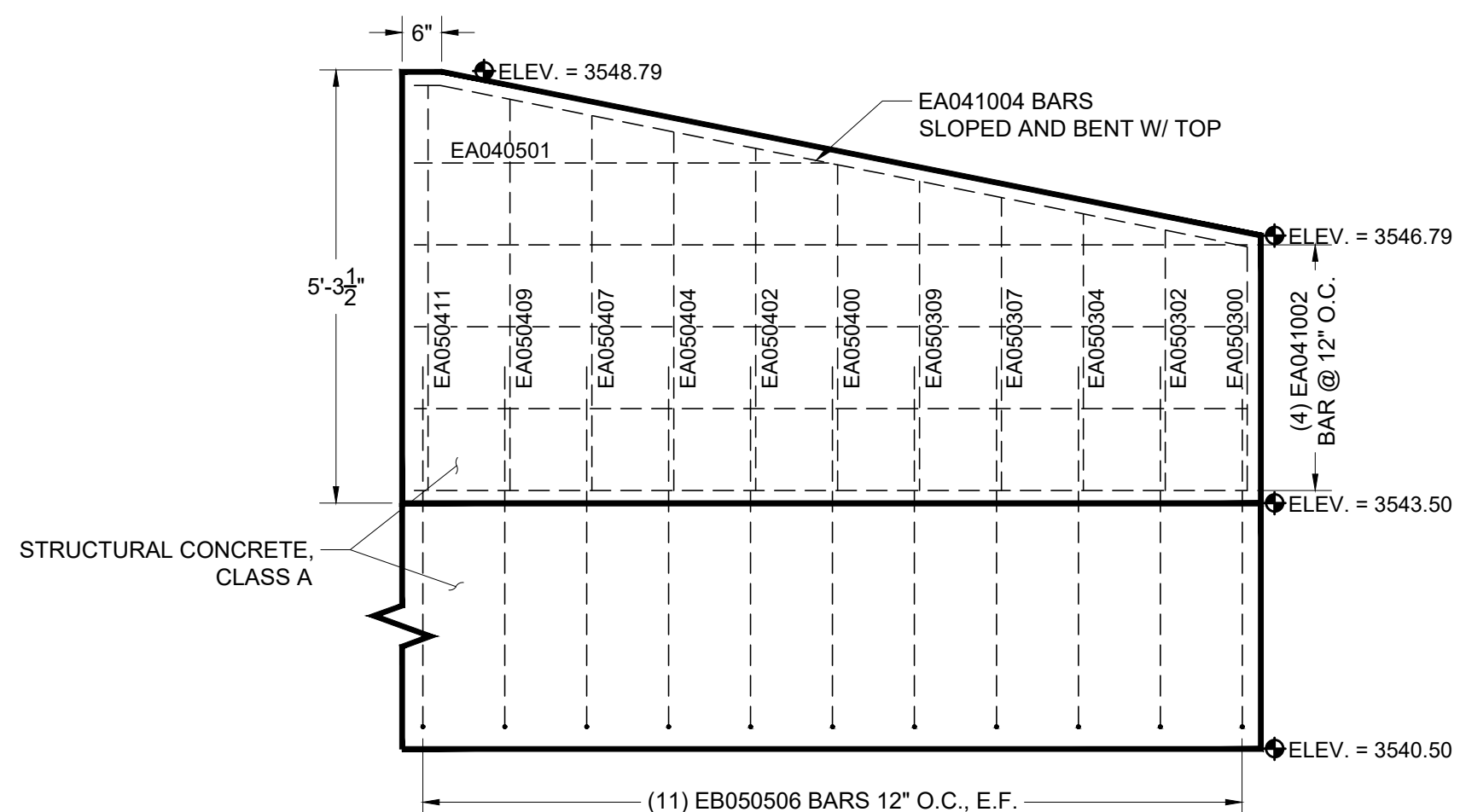
ABUTMENT SECTION

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

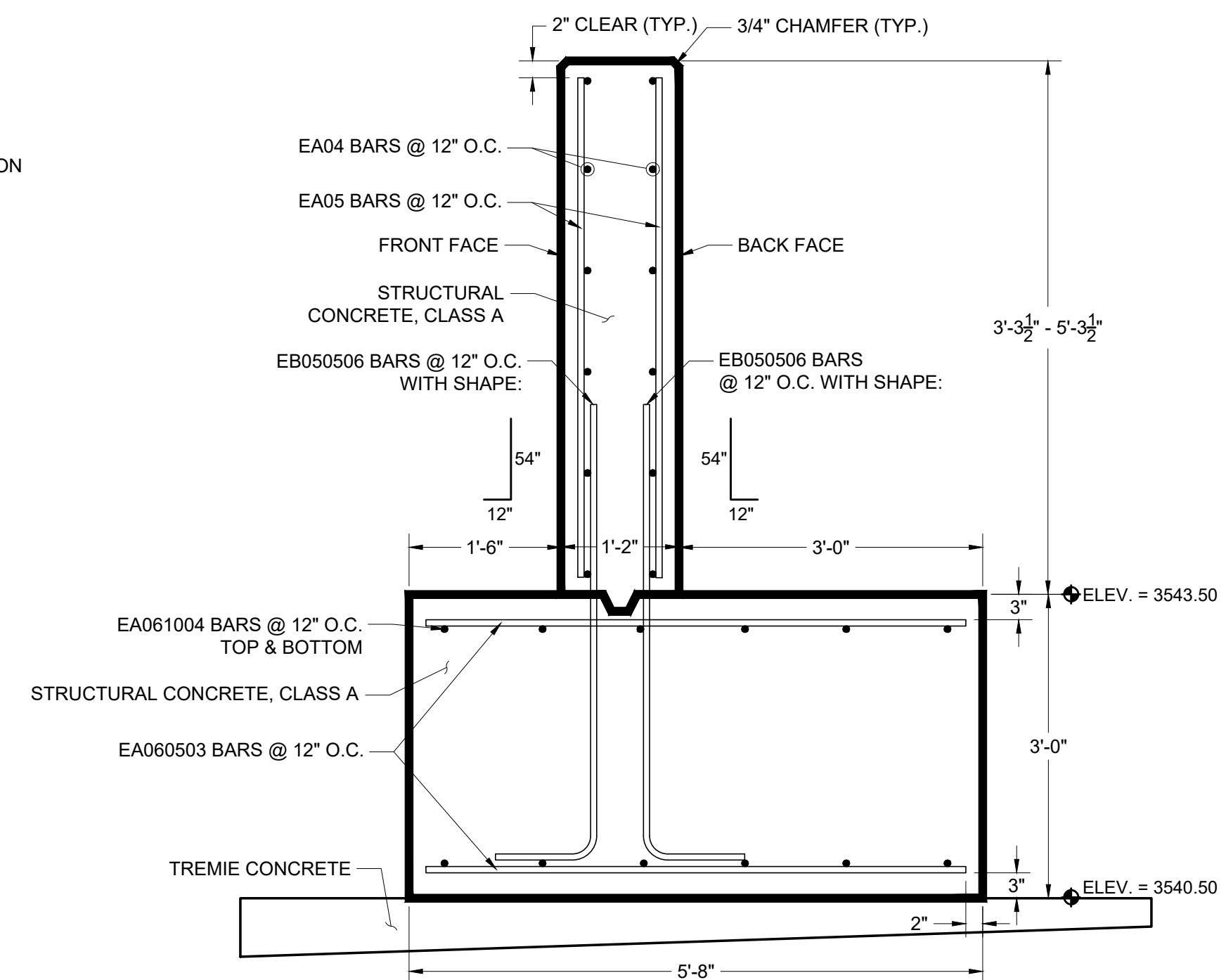
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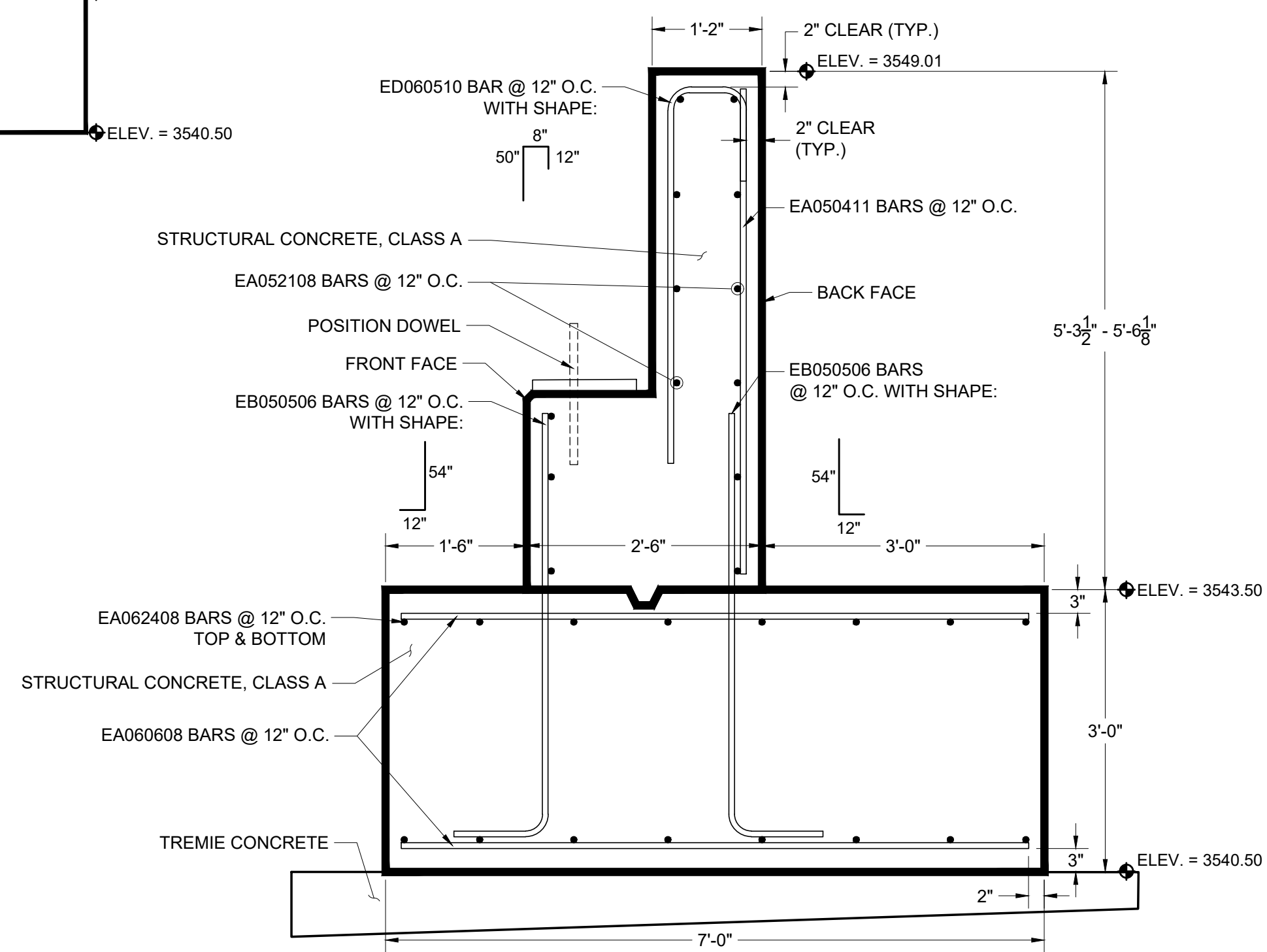
SCALE: 3/8" = 1'-0"



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



SCALE: 1" = 1'-0"



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



CONCRETE QUANTITIES		
DESCRIPTION	UNITS	QUANTITY
TREMIÉ	CUYD	6.62

5/10/22 16:00 JALLEN.Z:U28-01575 USDA FS-FY21 R3 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN\DWG;



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
Replacement With Bridge
For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

MICROPILE LAYOUT
PLAN

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

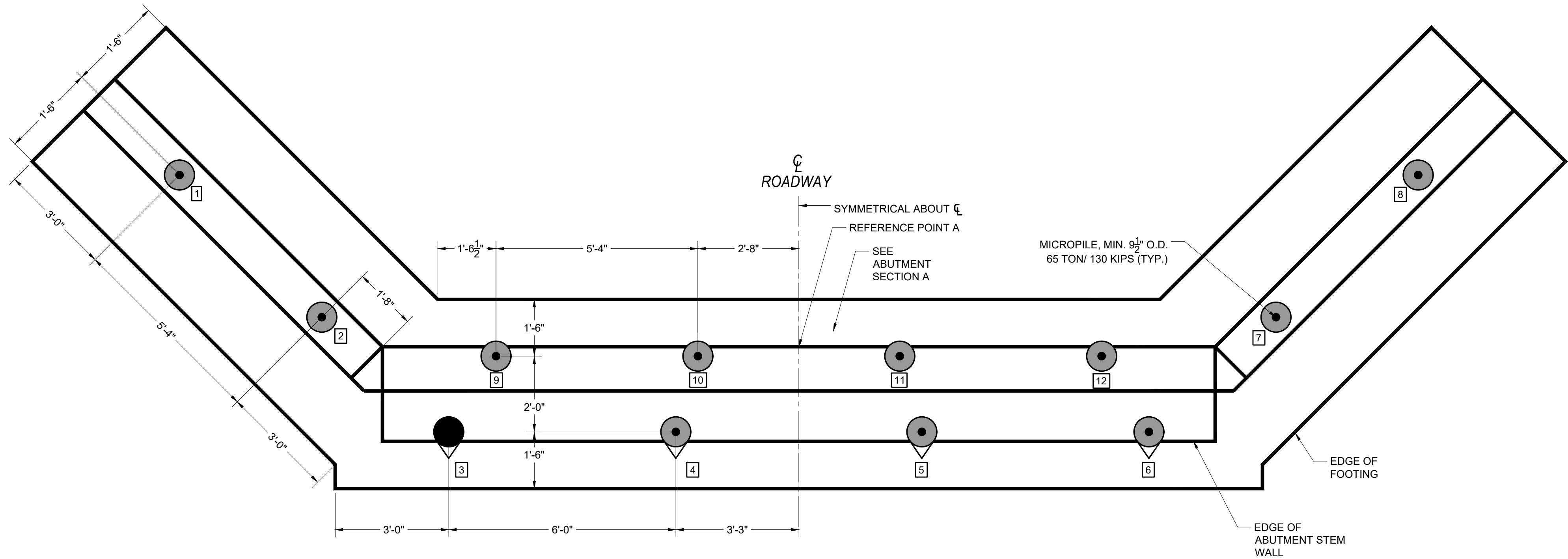
PROJECT NO.

U28-01575

DWG SHEET NO.

C-10

SHEET 10 OF 24



SOUTH ABUTMENT PILE LAYOUT PLAN

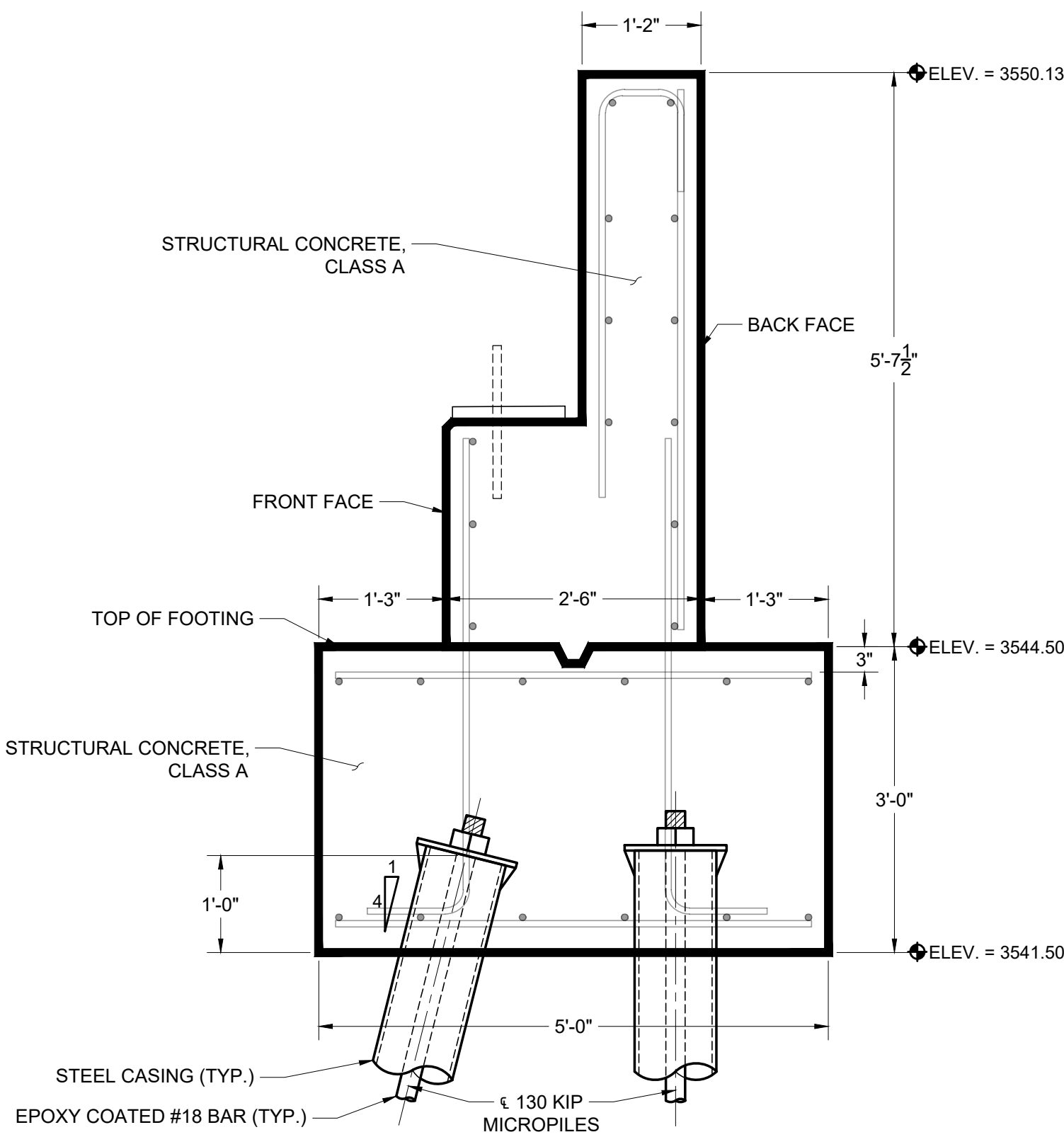
SCALE: 1/2" = 1'-0"

NOTES:

- DENOTES VERTICAL PILE.
- DENOTES BATTERED PILE.
- DENOTES VERIFICATION LOAD TEST PILE (SACRIFICIAL).
- DENOTES PROOF LOAD TEST PILE.
- FACTORED NOMINAL VERTICAL RESISTANCE OF MICROPILES SHALL BE 130 KIPS.
- ALL PILES SHALL BE INSTALLED TO THE ESTIMATED BOTTOM OF SHAFT ELEVATION.
- BATTERED PILES FOR ABUTMENTS SHALL BE DRIVEN TO A 4V:1H BATTER ANGLE.
- PILES ARE TO BE INSTALL TO SUCH ACCURACY THAT THE CONSTRUCTION TOLERANCES IN THE SPECIAL PROVISIONS HAVE BEEN MET.
- PILES SHALL BE CLOSELY INSPECTED/MONITORED DURING INSTALLATION TO ENSURE ADEQUATE STRUCTURAL INTEGRITY. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ANY PILES THE C.O. DEEMS DAMAGED.
- THE STEEL CASING SHALL BE A MINIMUM OF 0.5" NOMINAL WALL THICKNESS (N-80), 9 5/8" O.D. AND HAVE A MINIMUM YIELD STRESS OF 80 KSI.
- THE MICROPILE REINFORCING BAR SHALL BE AN EPOXY COATED #18 BAR GRADE 75 WILLIAMS ALL-THREAD REBAR (OR EQUIVALENT) CONFORMING TO ASTM A-615. LENGTH OF COUPLE BAR SECTIONS SHALL BE DETERMINED BASED ON THE OVERHEAD CLEARANCE AVAILABLE AT EACH PILE LOCATION.
- THE MICROPILE REINFORCING BARS ARE NOT PAID FOR SEPARATELY, BUT INCLUDED IN THE BID ITEM "MICROPILE" OR "MICROPILE, LOAD TEST".
- FURNISH ASTM A572 GRADE 50 STEEL BEARING PLATES AND SIDE STIFFENERS. STEEL SHALL NOT BE PAID FOR SEPARATELY, BUT INCLUDED IN THE BID ITEM "MICROPILE" OR "MICROPILE, LOAD TEST".

130 KIP CAPACITY 9 5/8" Ø MICROPILES						
LOCATION	PILE TYPE	NUMBER OF PILES	EST. LENGTH FURN. & DRIVEN		CUT-OFF ELEV.	EST. TIP ELEV.
			EACH LFT	TOTAL LFT		
SOUTH ABUTMENT	VERTICAL	4	14.2	56.8	3542.50	3528.30
	BATTERED	3	14.6	43.8	3542.50	3528.50
	PROOF	1	14.2	14.2	3542.50	3528.50
SOUTH ABUTMENT WINGWALLS	VERTICAL	4	14.2	56.8	3542.50	3528.30
			TOTAL	171.6		
			ROUNDED	172.0		

S. ABUTMENT MICROPILES COORDINATES		
PILE NO.	NORTHING	EASTING
1	595919.4668	2288295.5505
2	595922.4667	2288291.1630
3	595924.8240	2288287.3076
4	595923.7163	2288281.4107
5	595922.5166	2288275.0232
6	595921.4091	2288269.1263
7	595917.8131	2288266.3886
8	595913.4256	2288263.3887
9	595922.6278	2288286.4495
10	595921.6436	2288281.2078
11	595920.6590	2288275.9662
12	595919.6739	2288270.7226



A ABUTMENT SECTION

SCALE: 5/8" = 1'-0"

PROJECT NAME

Forest Road 209 Culvert Replacement With Bridge For Aquatic Organism Passage Improvement

**MONONGAHELA
NATIONAL FOREST**

**GREENBRIER
RANGER DISTRICT**

DRAWING TITLE

MICROPILE DETAILS

DATE _____

5/11/2022

ARCHIVE NO.

DESIGNER
G.JUNTTILA

DRAWN
J.ALLEN

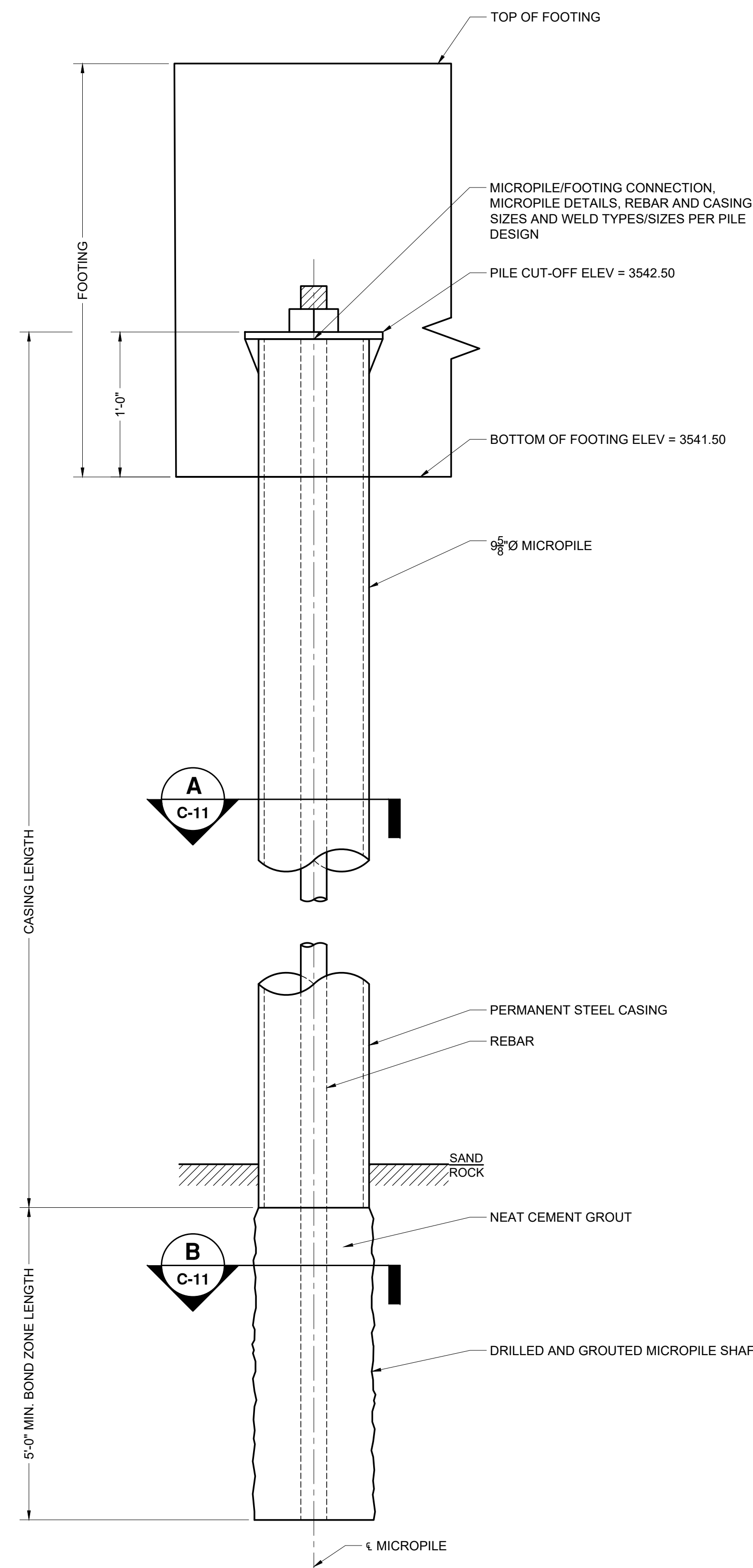
CHECKED
S. WRIGHT

PROJECT NO.
U28-01575

DWG SHEET NO.

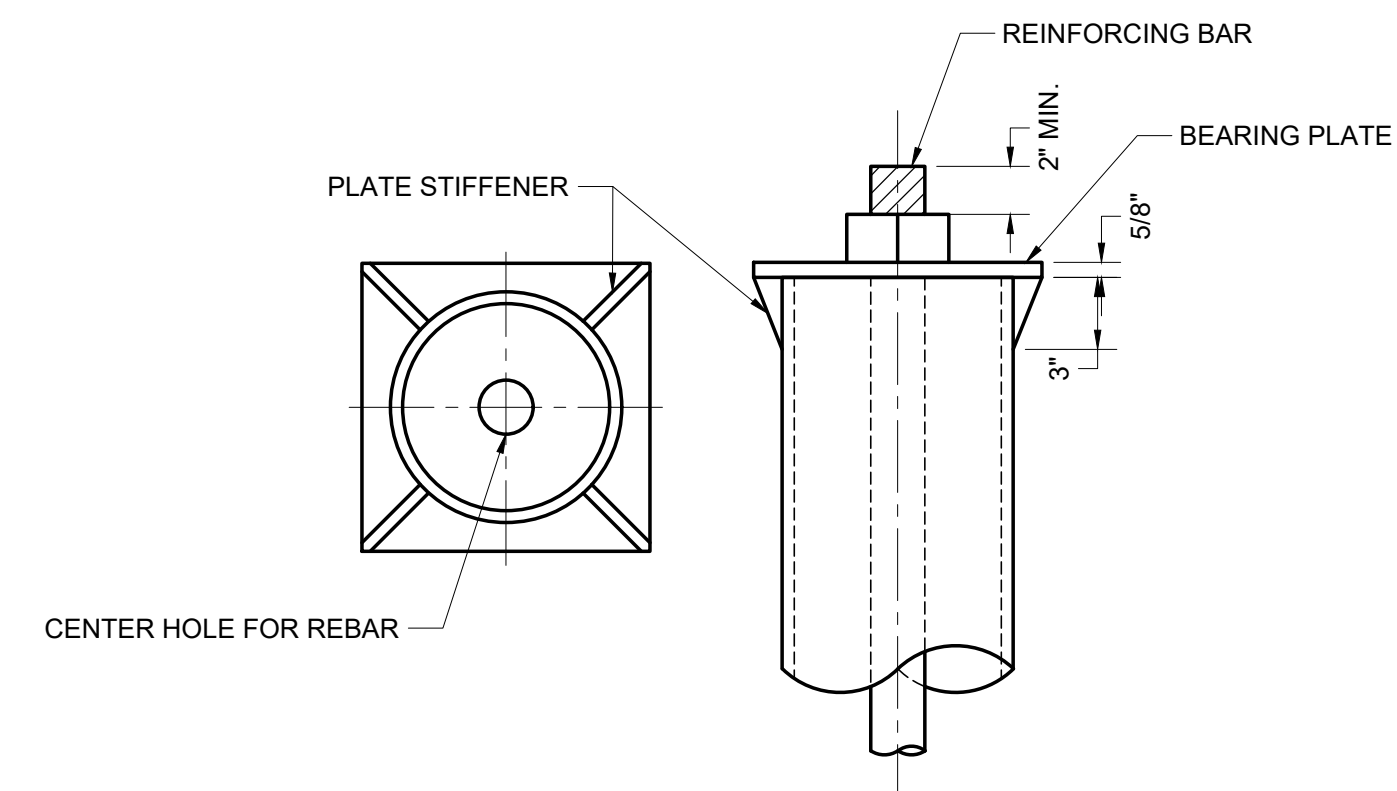
C-11

SHEET 11 OF 24



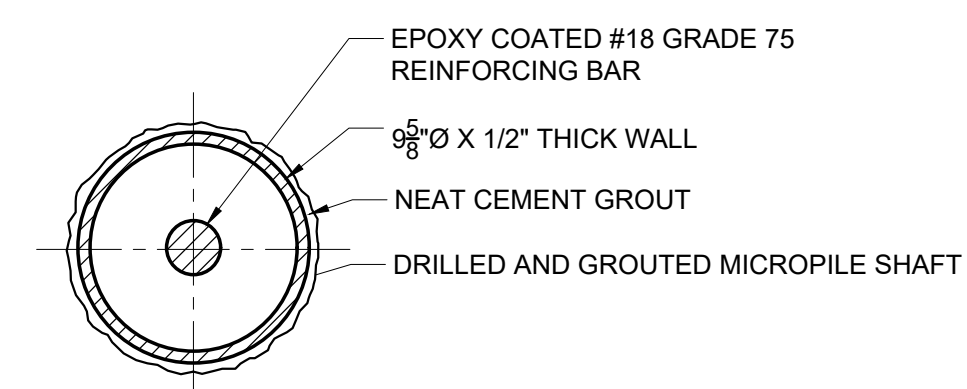
MICROPILE ELEVATION

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



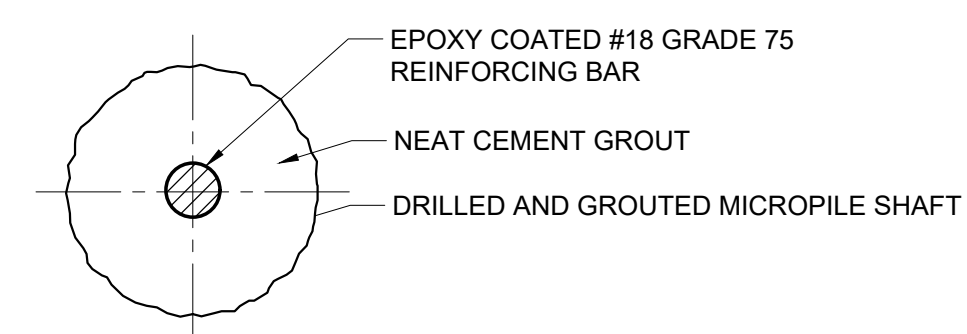
MICROPILE DETAIL

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



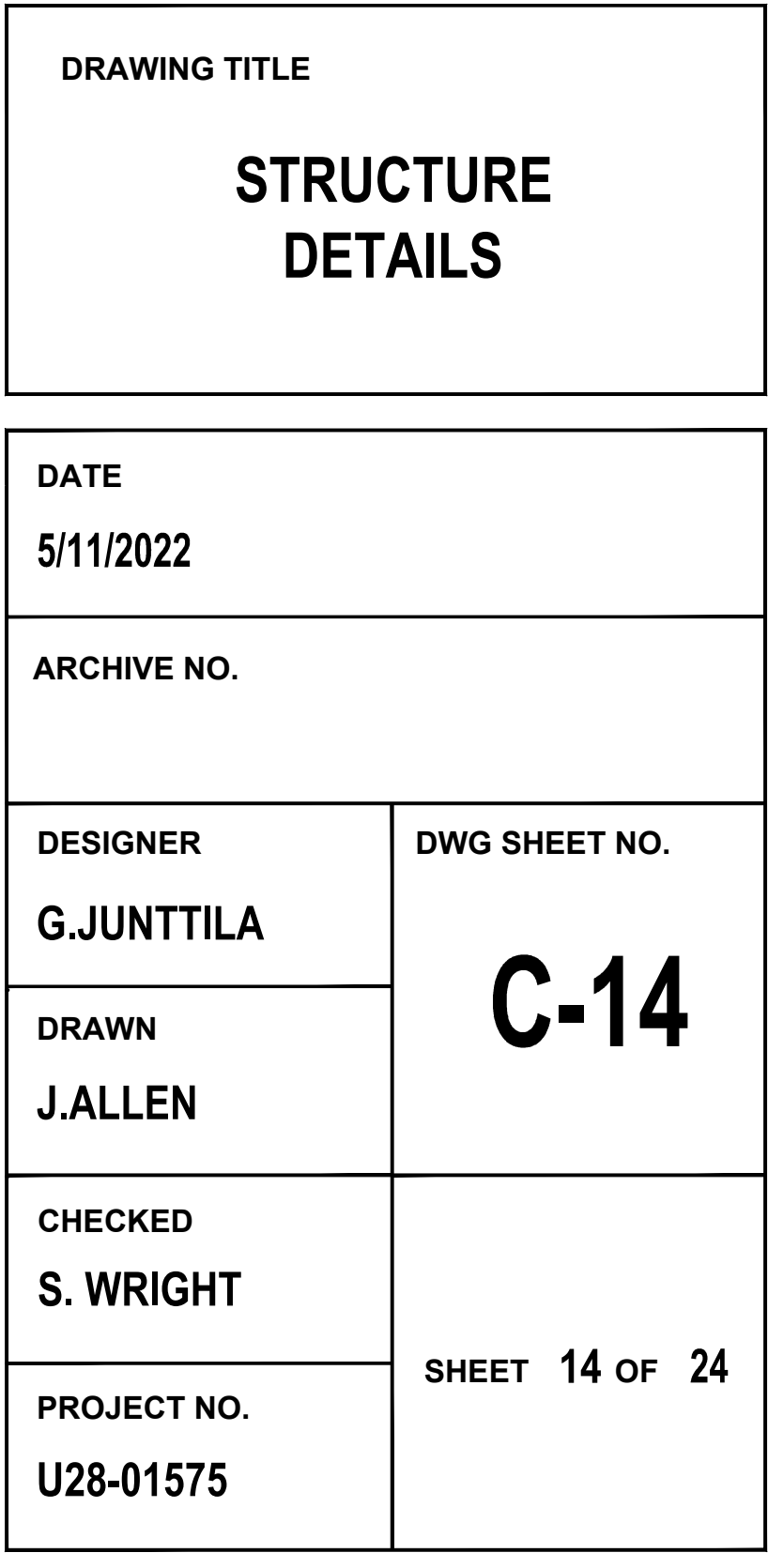
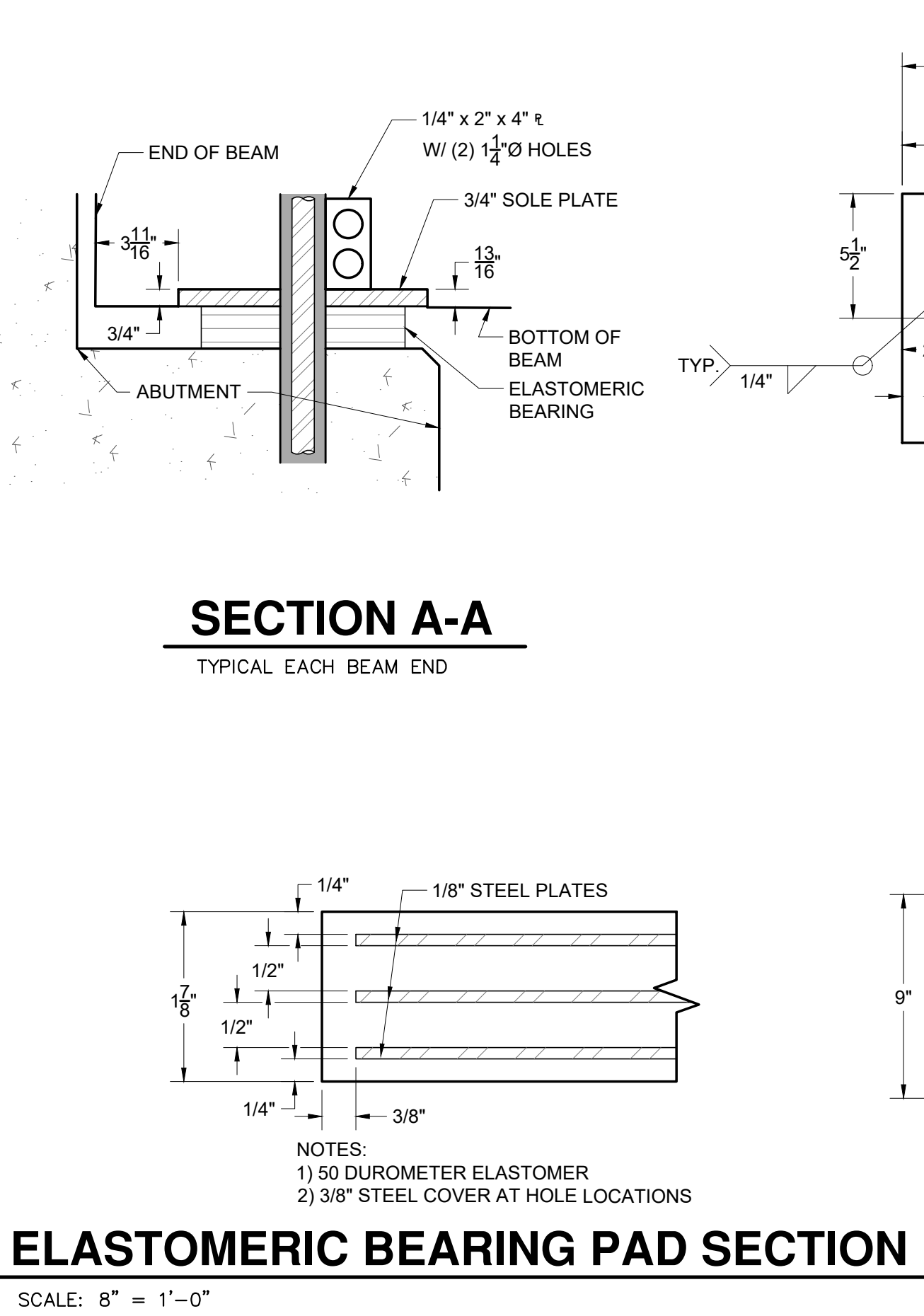
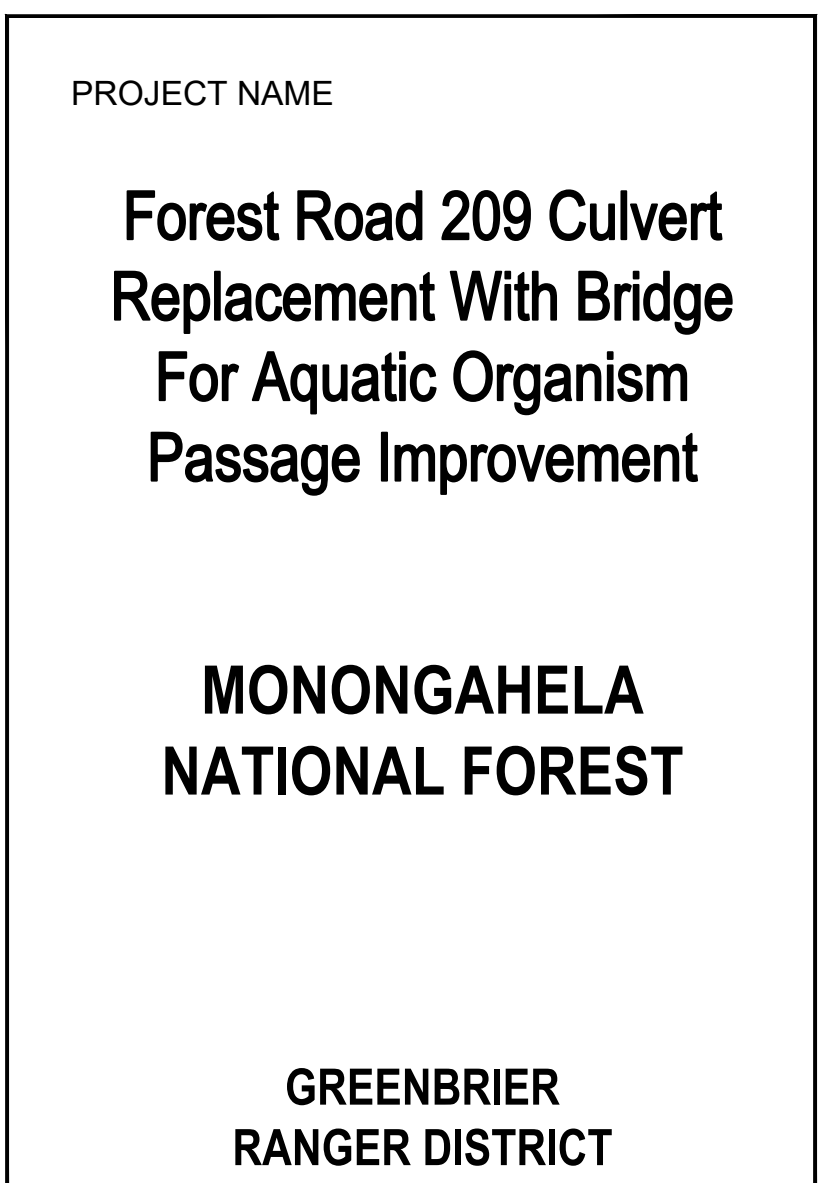
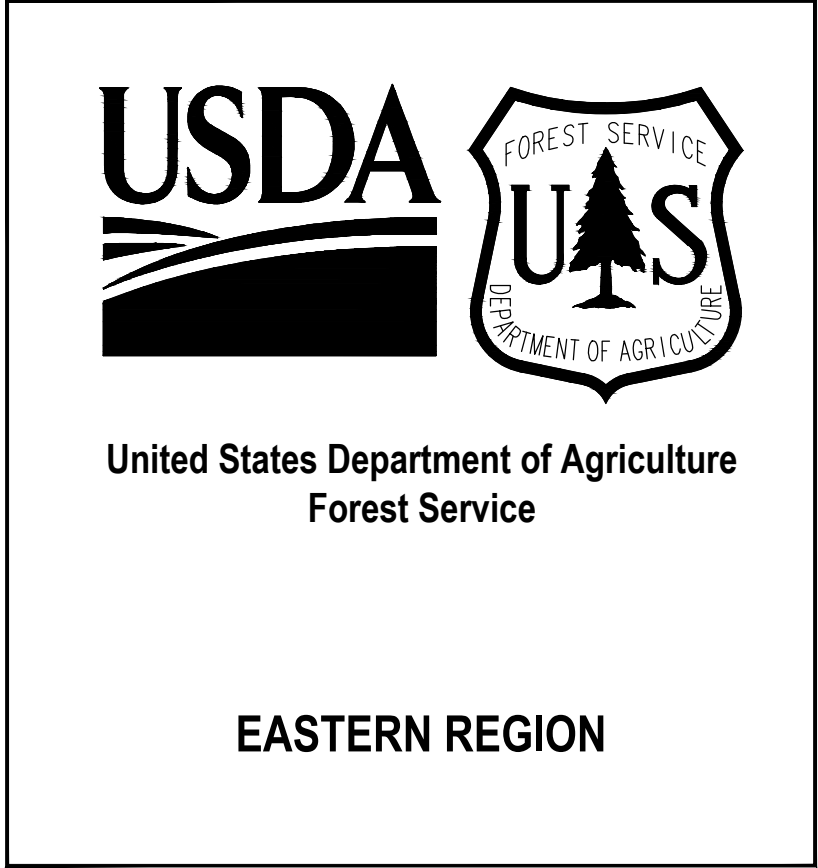
A MICROPILE SECTION
SCALE: 1-1/2" = 1'-0"

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



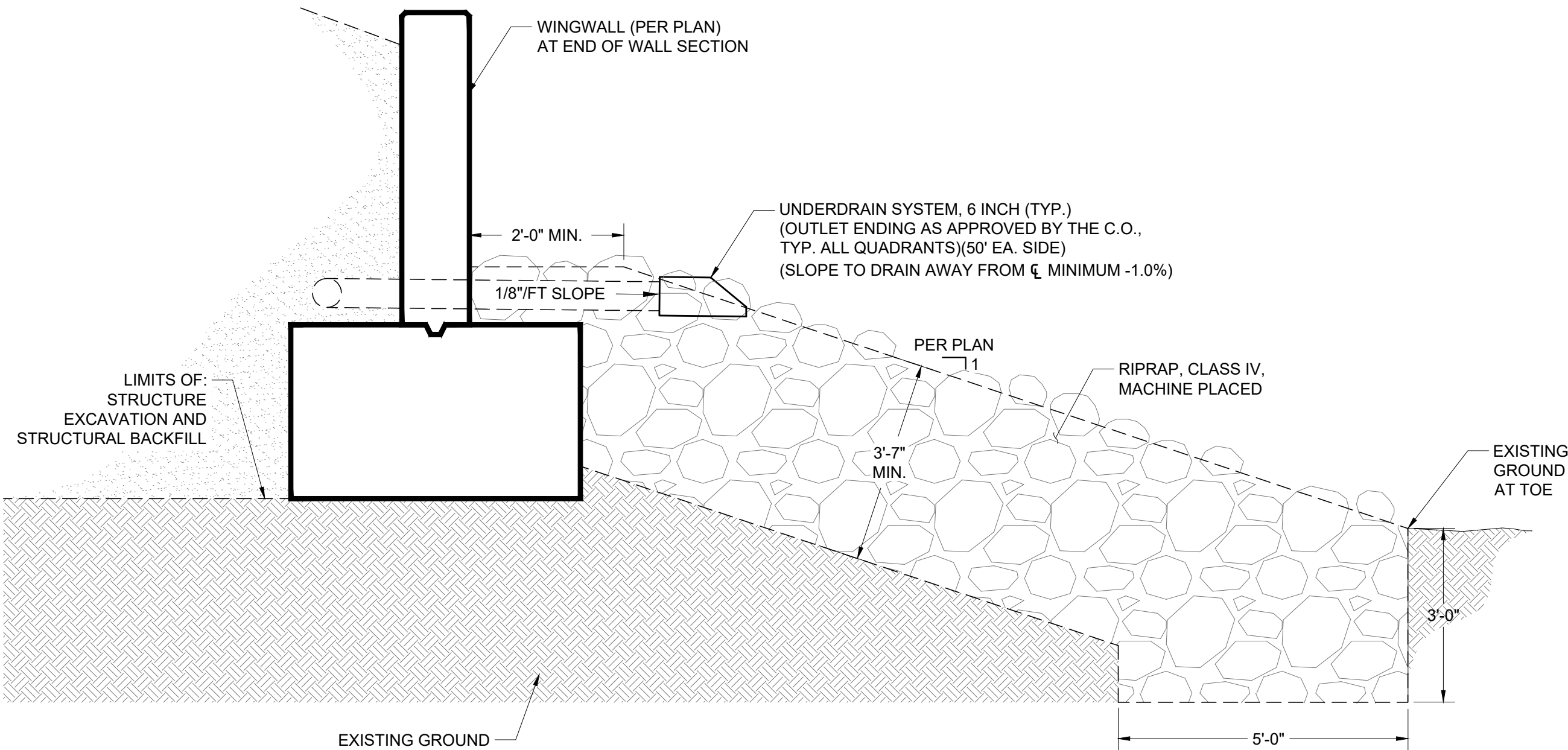
B MICROPILE SECTION

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



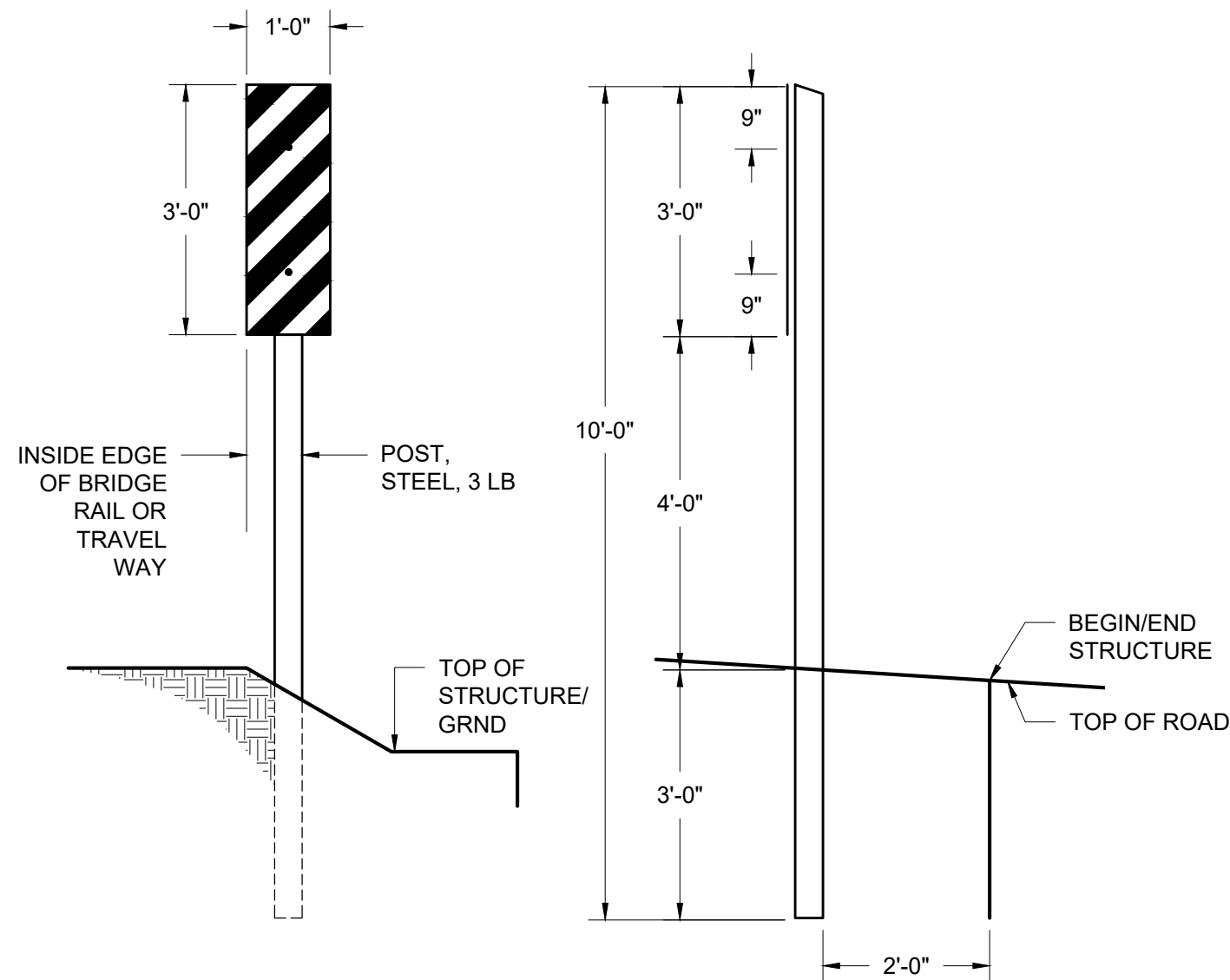
5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R9 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R9 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN\DWG;



UNDERDRAIN OUTLET DETAIL

SCALE: 1" = 2'



OBJECT MARKER

SCALE: 1" = 2'-0"

REINFORCEMENT

NORTH ABUTMENT

BAR	DIMENSIONS			ANGLE		NO. REQ'D	TOTAL WT.	LOCATION
	a	b	c	α	β			
EA050411	4'-11"					23	118	ABUT STEM, VERT, BF
ED050510	4'-2"	0'-8"	1'-0"	90	90	23	140	BACKWALL, TOP STIRRUP
EA052108	21'-8"					12	271	ABUT STEM, HORIZ, BF & FF
EB050202	1'-1"	1'-1"		135		4	9	ABUT STEM INTO WW, FF & BF
EB050304	1'-8"	1'-8"		135		10	35	ABUT STEM INTO WW, FF
EB050408	2'-4"	2'-4"		135		10	49	ABUT STEM INTO WW, BF
EB050506	4'-6"	1'-0"		90		46	264	ABUT FOOTING DOWELS, FF & BF
EA060608	6'-8"					54	541	ABUT FOOTING, TRANSVERSE
EA062408	24'-8"					16	593	ABUT FOOTING, LONGIT
EA050411	4'-11"					4	21	WW STEM, VERT, FF & BF
EA050409	4'-9"					4	20	WW STEM, VERT, FF & BF
EA050407	4'-7"					4	19	WW STEM, VERT, FF & BF
EA050404	4'-4"					4	18	WW STEM, VERT, FF & BF
EA050402	4'-2"					4	17	WW STEM, VERT, FF & BF
EA050400	4'-0"					4	17	WW STEM, VERT, FF & BF
EA050309	3'-9"					4	16	WW STEM, VERT, FF & BF
EA050307	3'-7"					4	15	WW STEM, VERT, FF & BF
EA050304	3'-4"					4	14	WW STEM, VERT, FF & BF
EA050302	3'-2"					4	13	WW STEM, VERT, FF & BF
EA050300	3'-0"					4	13	WW STEM, VERT, FF & BF
EA041004	10'-4"					4	13	WW STEM, HORIZ, FF & BF
EA040501	5'-1"					4	13	WW STEM, HORIZ, FF & BF
EA041002	10'-2"					16	28	WW STEM, HORIZ, FF & BF
EB050506	4'-6"	1'-0"		90		44	16	WW FOOTING DOWELS
EA061004	10'-4"					24	109	WW FOOTING, LONGIT
EA060503	5'-3"					44	252	WW FOOTING, TRANSVERSE

2634

SOUTH ABUTMENT

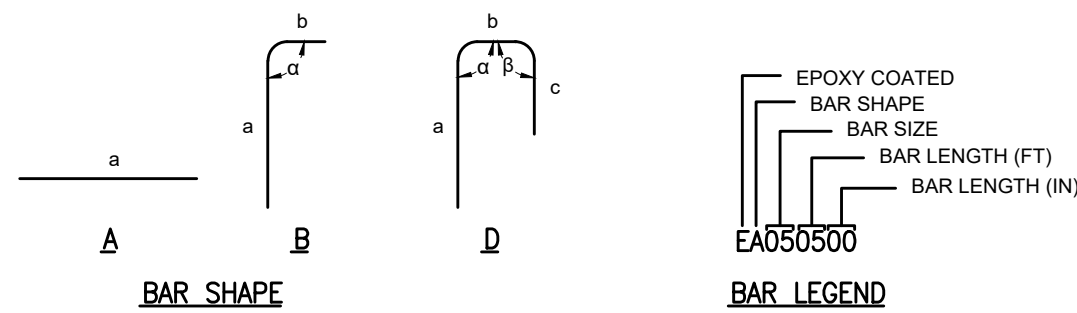
BAR	DIMENSIONS			ANGLE		NO. REQ'D	TOTAL WT.	LOCATION
	a	b	c	α	β			
EA050501	5'-1"					23	122	ABUT STEM, VERT, BF
ED050510	4'-2"	0'-8"	1'-0"	90	90	23	140	BACKWALL, TOP STIRRUP
EA052109	21'-9"					12	272	ABUT STEM, HORIZ, BF & FF
EB050202	1'-1"	1'-1"		135		4	9	ABUT STEM INTO WW, FF & BF
EB050304	1'-7"	1'-7"		135		10	35	ABUT STEM INTO WW, FF
EB050408	2'-4"	2'-4"		135		10	49	ABUT STEM INTO WW, BF
EB050508	4'-8"	1'-0"		90		46	272	ABUT FOOTING DOWELS, FF & BF
EA060408	4'-8					50	350	ABUT FOOTING, TRANSVERSE
EA062400	24'-0"					12	433	ABUT FOOTING, LONGIT
EA050501	5'-1"					4	21	WW STEM, VERT, FF & BF
EA050411	4'-11"					4	21	WW STEM, VERT, FF & BF
EA050408	4'-8"					4	19	WW STEM, VERT, FF & BF
EA050406	4'-6"					4	19	WW STEM, VERT, FF & BF
EA050404	4'-4"					4	18	WW STEM, VERT, FF & BF
EA050401	4'-1"					4	20	WW STEM, VERT, FF & BF
EA050311	3'-11"					4	16	WW STEM, VERT, FF & BF
EA050308	3'-8"					4	15	WW STEM, VERT, FF & BF
EA050306	3'-6"					4	15	WW STEM, VERT, FF & BF
EA050304	3'-4"					4	14	WW STEM, VERT, FF & BF
EA050301	3'-1"					4	13	WW STEM, VERT, FF & BF
EA041004	10'-4"					4	28	WW STEM, HORIZ, FF & BF
EA040509	5'-9"					4	15	WW STEM, HORIZ, FF & BF
EA041002	10'-2"					16	109	WW STEM, HORIZ, FF & BF
EB050506	4'-6"	1'-0"		90		44	252	WW FOOTING DOWELS
EA061102	11'-2"					24	403	WW FOOTING, LONGIT
EA060408	4'-8"					48	336	WW FOOTING, TRANSVERSE

3016

DECK

BAR	DIMENSIONS			ANGLE		NO. REQ'D	TOTAL WT.	LOCATION
	a	b	c	α	β			
EA041803	18'-3"					148	1804	TRANSVERSE
EA031311	13'-11"					138	722	LONGITUDINAL

2526



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
Replacement With Bridge
For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

REINFORCEMENT AND
MISCELLANEOUS
DETAILS

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

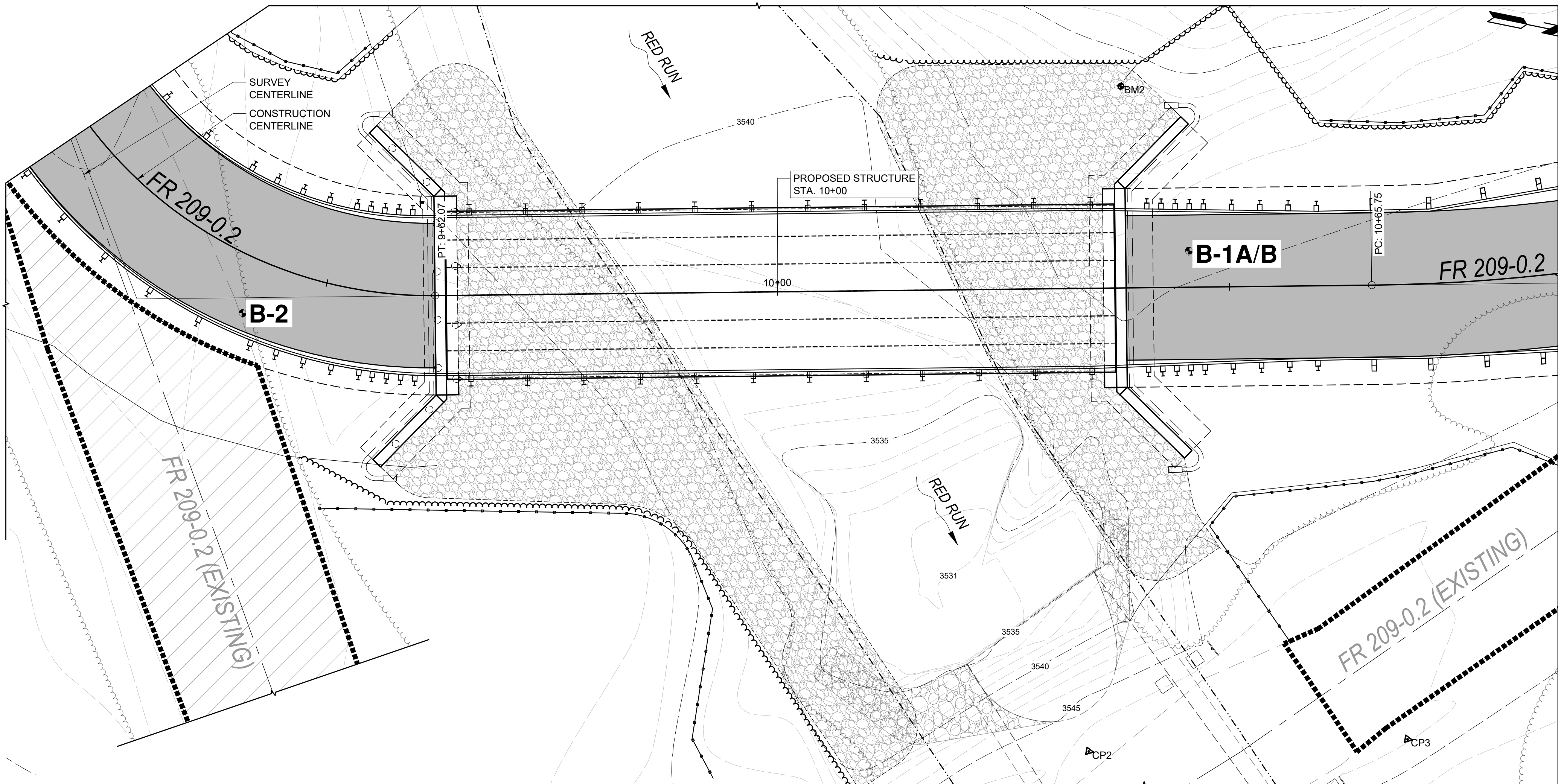
U28-01575

DWG SHEET NO.

C-15

SHEET 15 OF 24

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R3 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



SOIL BORINGS BY:

GEOTECH ENGINEERING, INC.
4031 ALLPORT CUTOFF
MORRISDALE, PA, 16858
BORING DATES: SEPTEMBER 7, 2021

NOTES:

NUMBER IN CIRCLES DENOTE THE 'N' VALUE IN BLOWS PER FOOT BY USING A 2" O.D. SPLIT SPOON SAMPLER AND A 140 POUND HAMMER FALLING 30". WATER LEVELS MAY BE INFLUENCED BY RESIDUAL BORING WATER. BLOW COUNTS AT 6".

THE SOIL BORING LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY IMPLIES THAT SUB-SURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN THE EXACT LOCATION OF THE BORING.

TOTAL SCOUR DEPTH SHOWN ON BORINGS IS AS CALCULATED BY UPEA WITH HEC-RAS SOFTWARE BASED ON CONDITIONS WITHOUT THE RIPRAP SCOUR COUNTERMEASURES SHOWN WITHIN THIS PLAN.

B.O.T. - BOTTOM OF TREMIE

B.O.F. - BOTTOM OF FOOTING

T.O.F. - TOP OF FOOTING

M.P.P. - MINIMUM PILE PENETRATION ELEVATION

E.P.P. - ESTIMATED PILE PENETRATION ELEVATION

T.S. - TOTAL SCOUR



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
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For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

SOIL BORINGS

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

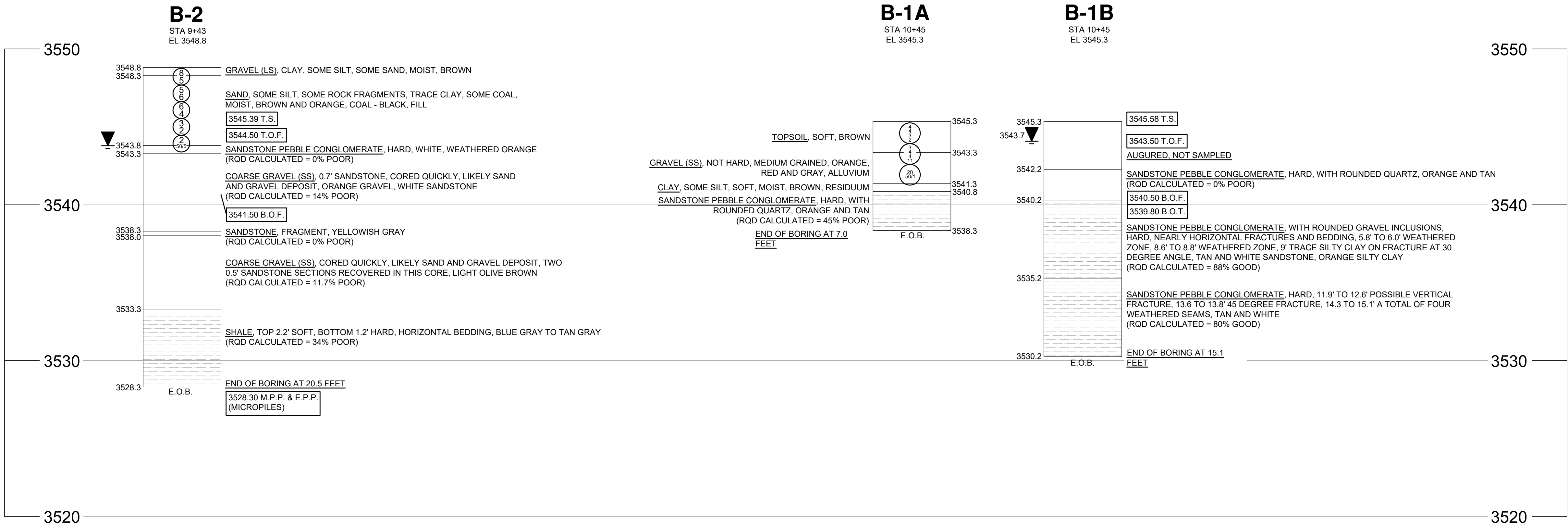
PROJECT NO.

U28-01575

DWG SHEET NO.

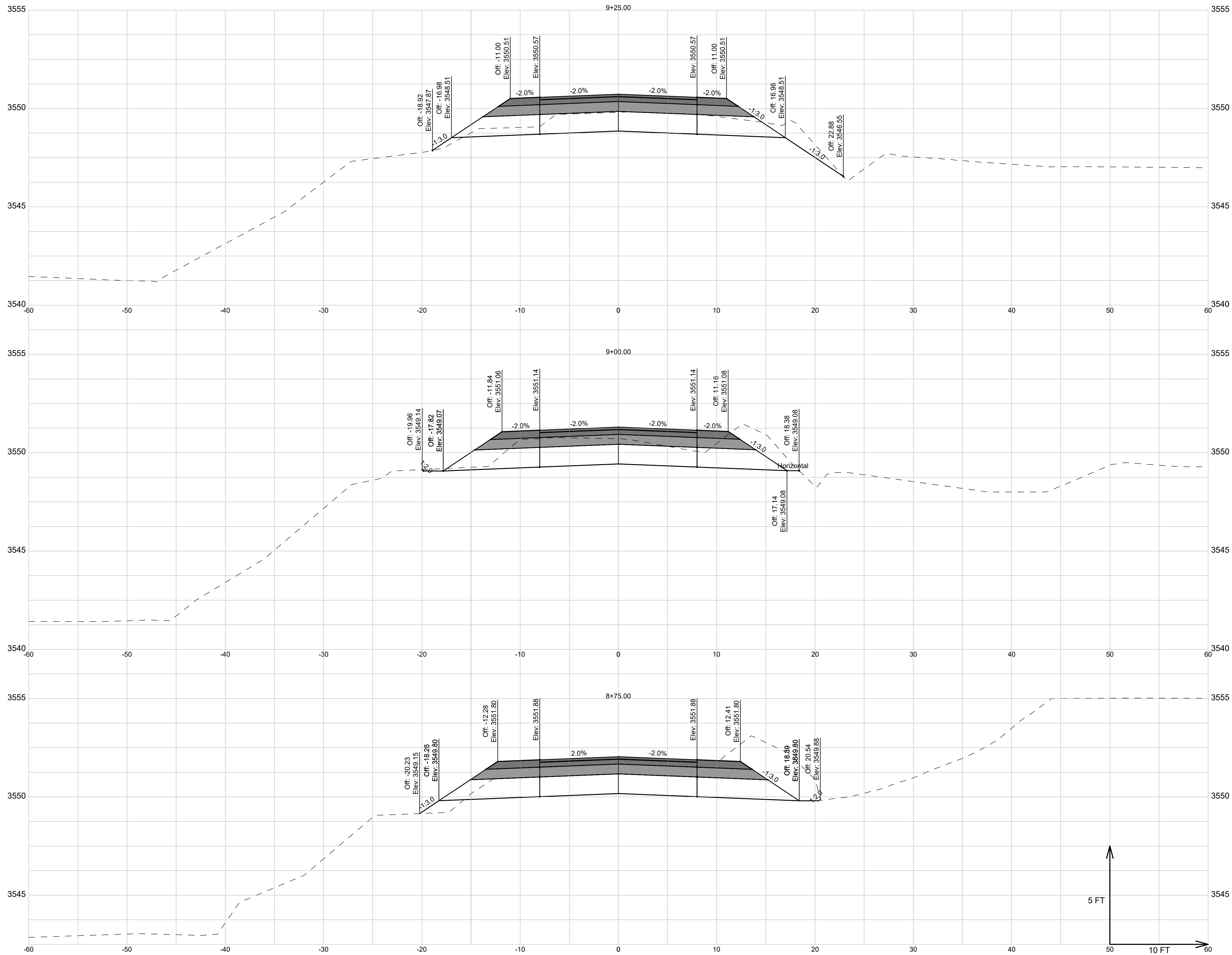
C-16

SHEET 16 OF 24





5/10/22 16:00 JALLEN.Z:\U28-01575 USDA FS-FY21 R9 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
Replacement With Bridge
For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

CROSS SECTIONS

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

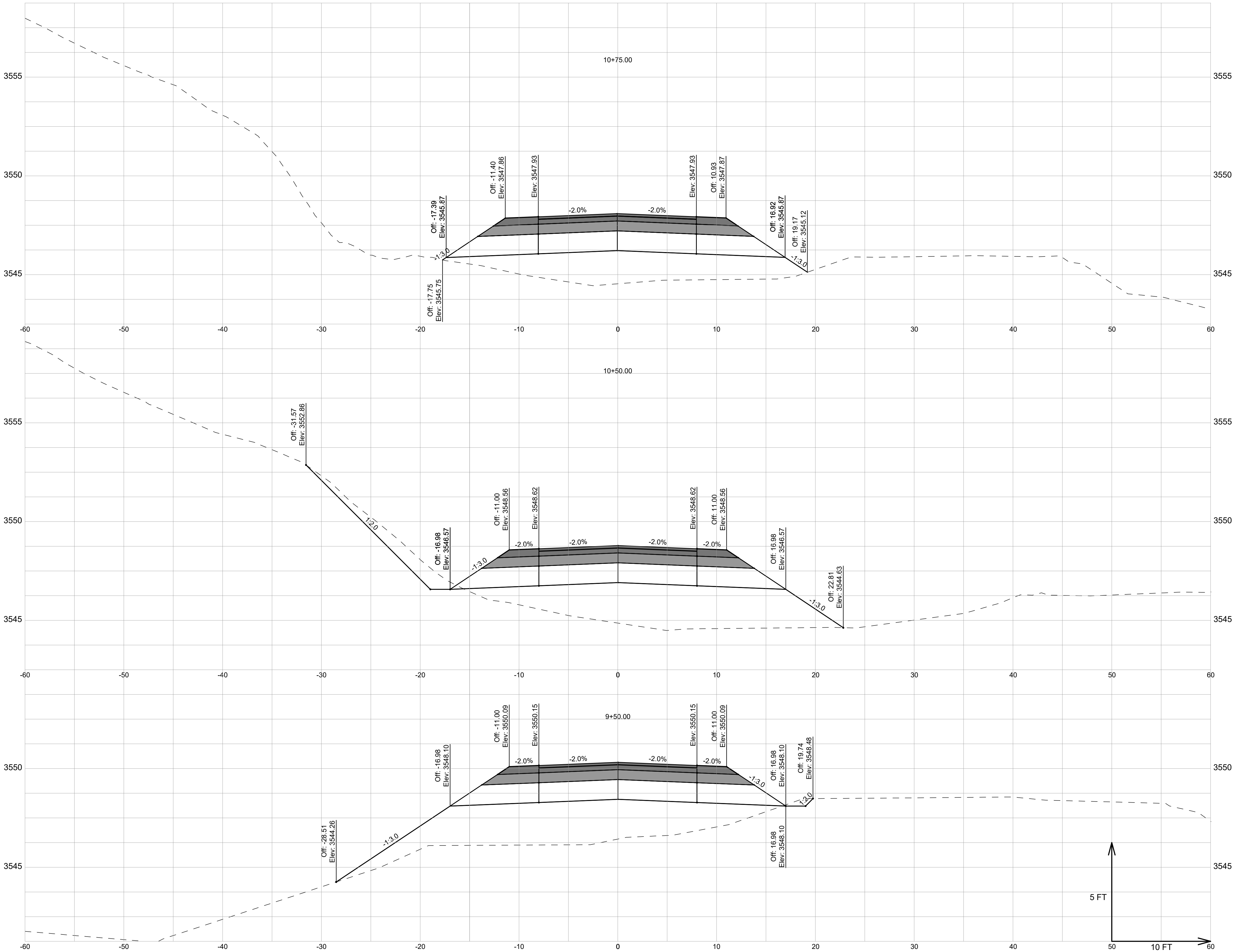
U28-01575

DWG SHEET NO.

C-18

SHEET 18 OF 24

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R9 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



United States Department of Agriculture
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Forest Road 209 Culvert
Replacement With Bridge
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CROSS SECTIONS

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S. WRIGHT

PROJECT NO.

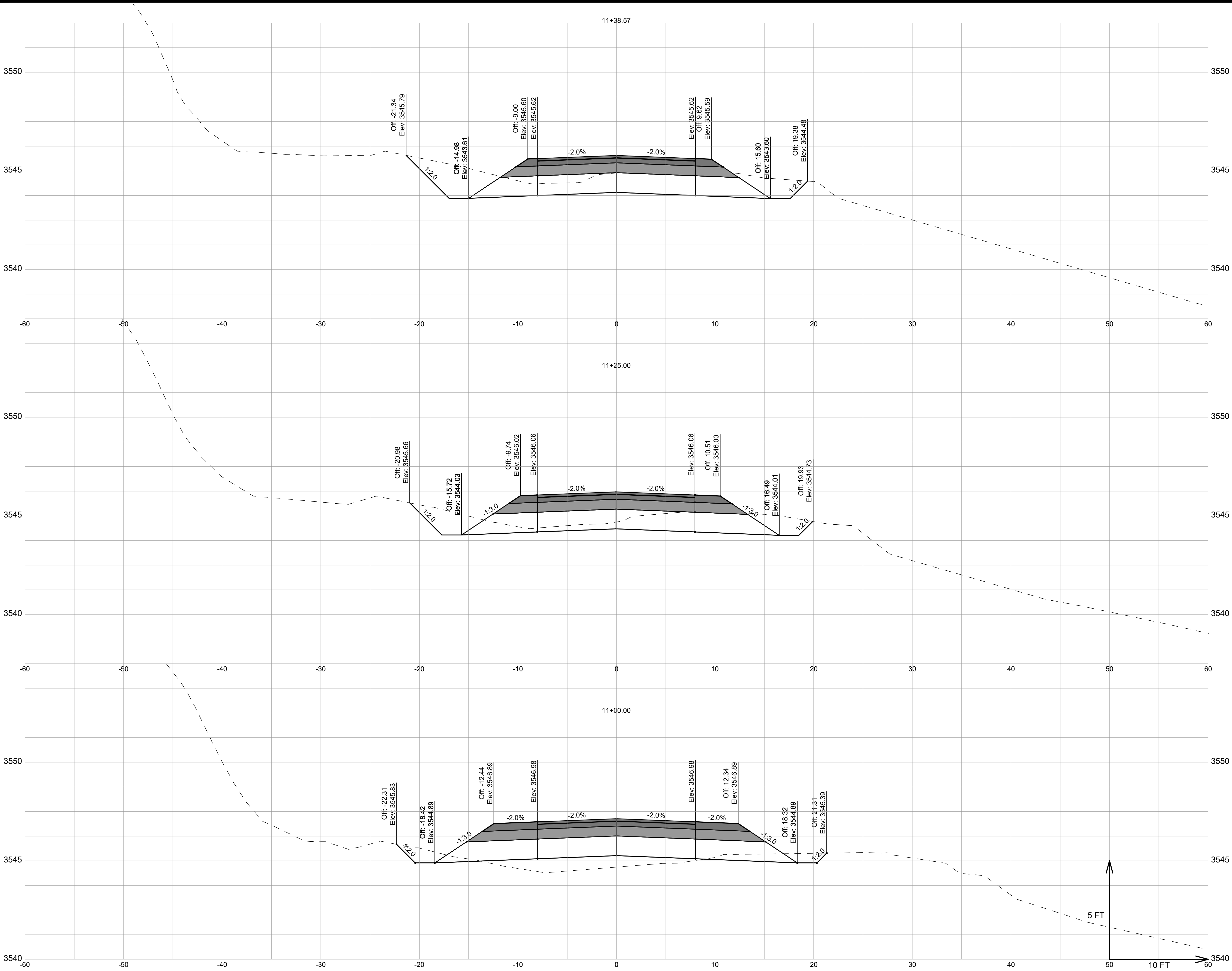
U28-01575

DWG SHEET NO.

C-19

SHEET 19 OF 24

5/10/22 16:00 JALLEN.Z\U28-01575 USDA FS-FY21 R9 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



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CROSS SECTIONS

DATE

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DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

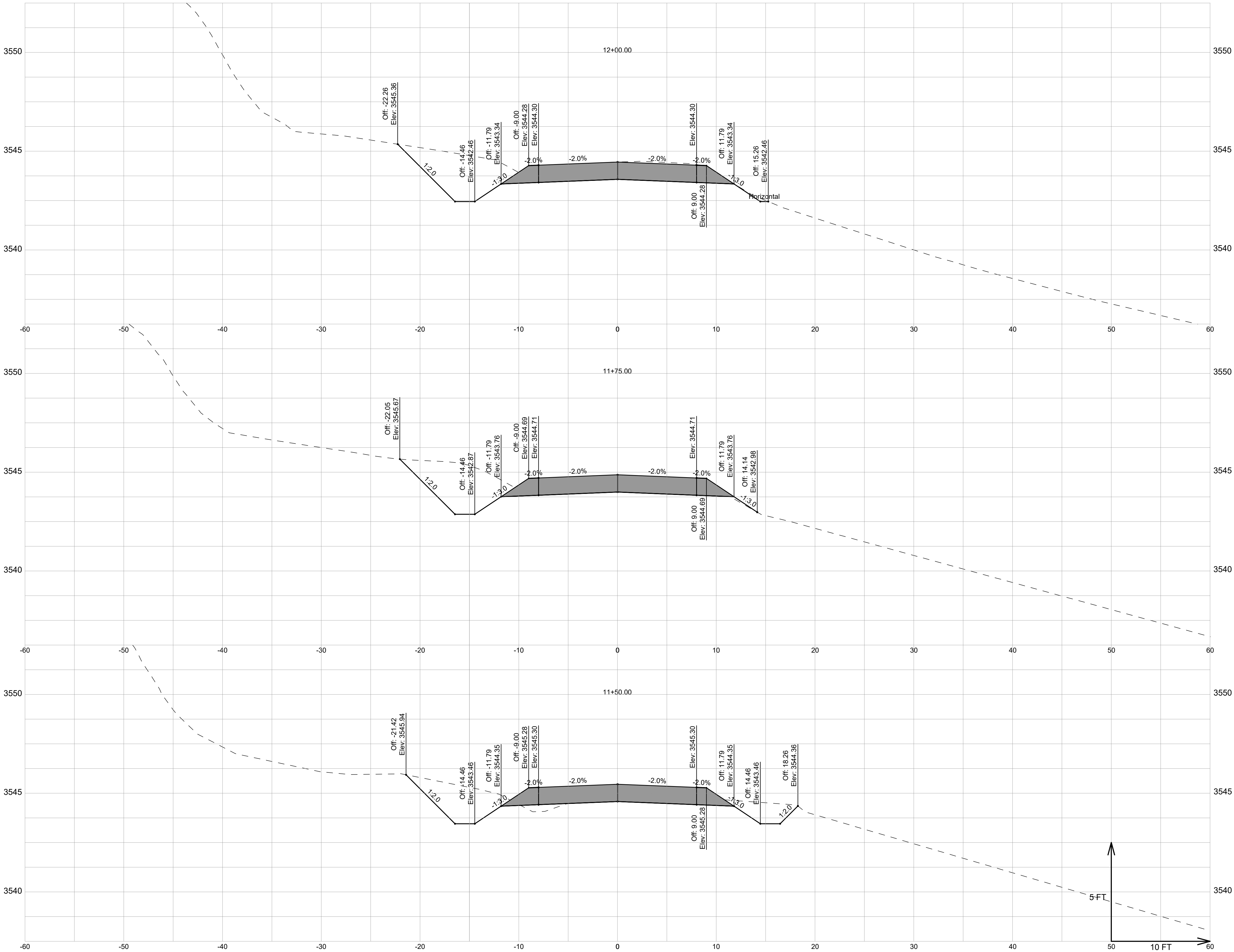
U28-01575

DWG SHEET NO.

C-20

SHEET 20 OF 24

5/10/22 16:00 JALLEN.Z\U28-01575 USDA FS-FY21 R3 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
Replacement With Bridge
For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

CROSS SECTIONS

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

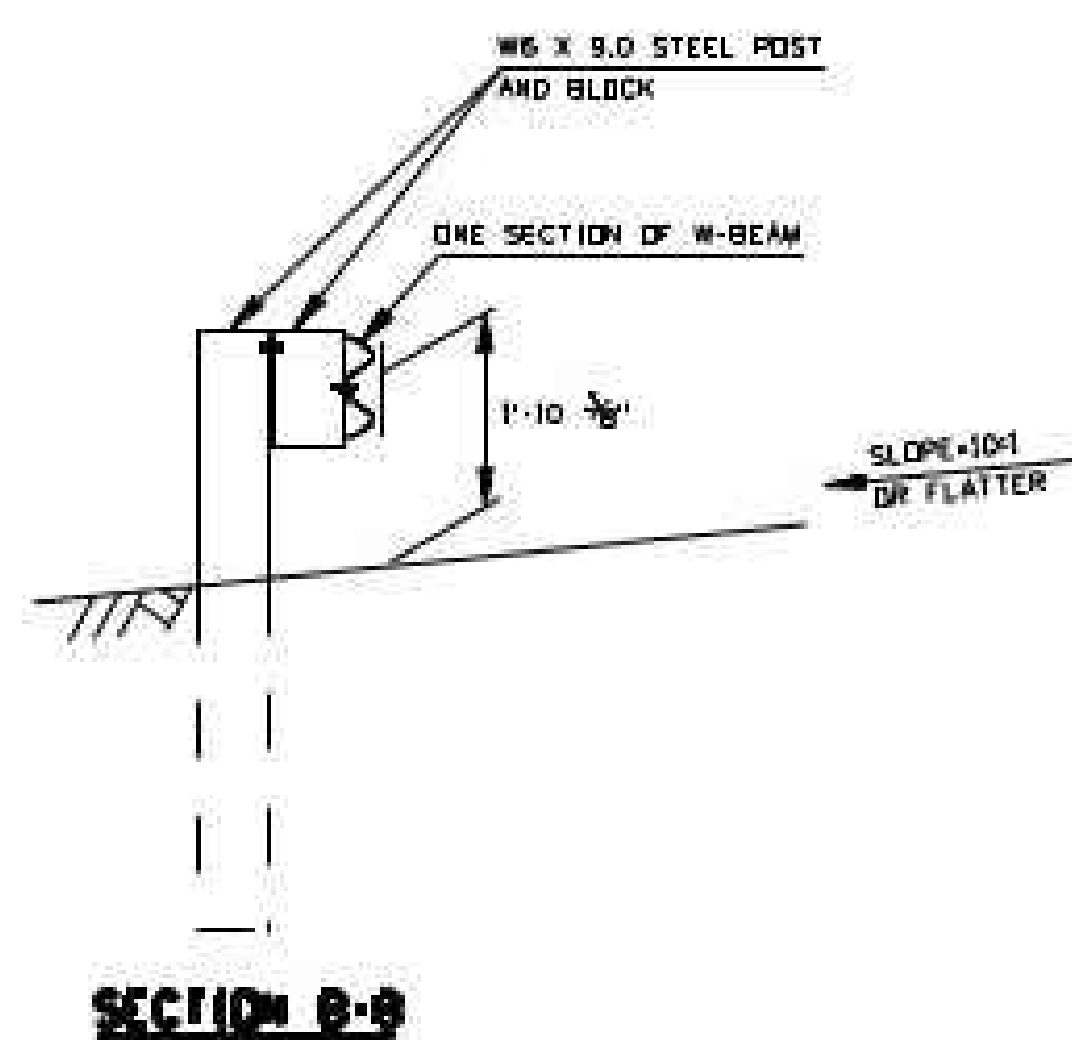
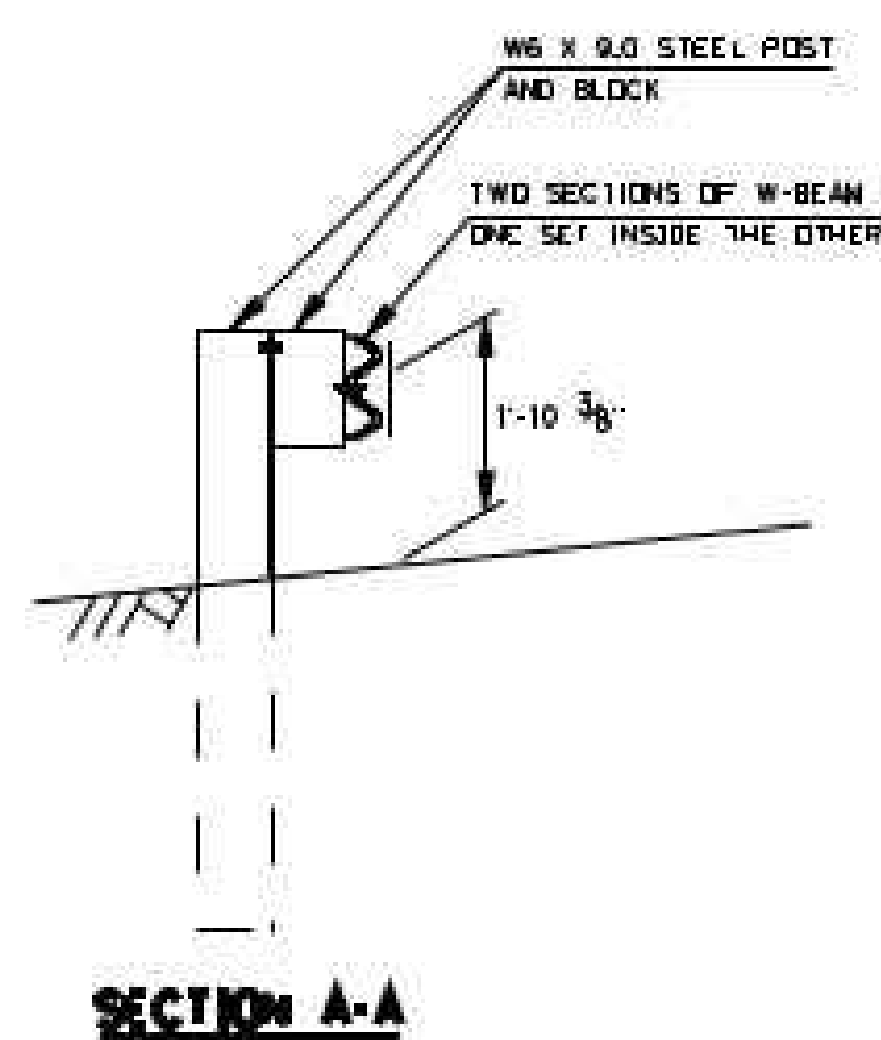
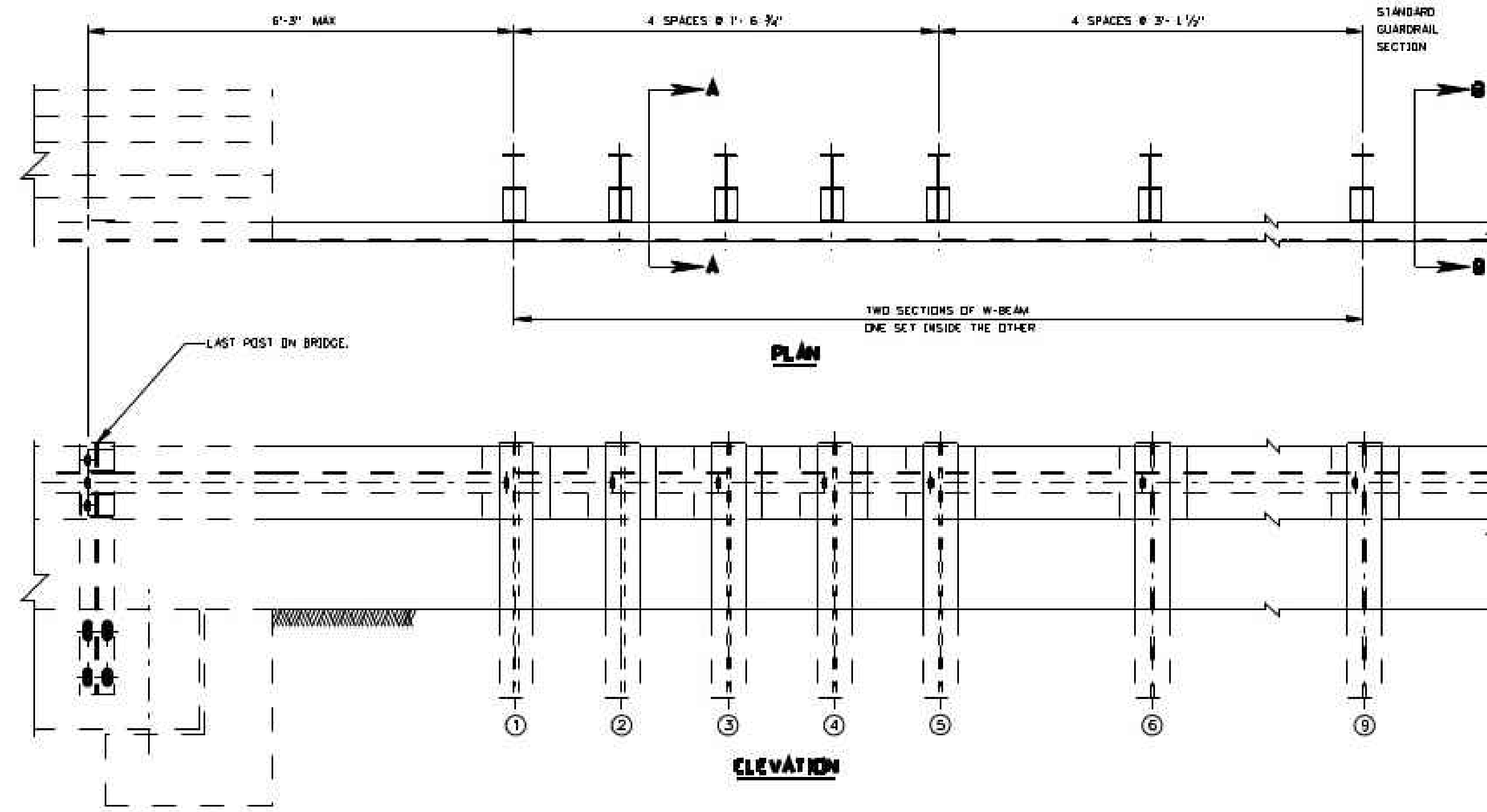
U28-01575

DWG SHEET NO.

C-21

SHEET 21 OF 24

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R3 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



PROJECT NUMBERS		DISTRICT	COUNTY	SHEET NO.	TOTAL
STATE	FEDERAL				

NOTES

1. THIS GUARDRAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO GUARDRAIL ON BRIDGE.
2. W-BEAM IS NOT BOLTED TO POSTS AT POSTS 2 THROUGH 4 AND POST 6.
3. SEE STANDARD SHEET BR-B104 FOR ANCHOR DETAILS.
4. THERE IS NO SEPARATE PAY ITEM FOR THIS CONNECTION AND ALL COMPONENTS AS DETAIL HEREIN SHALL BE INCLUDED IN THE CONTRACT PRICE FOR GUARDRAIL.

THIS SHEET SHALL BE USED IN CONJUNCTION WITH STANDARD SHEETS BR-B17A & B THRU BR-B42A & B, BR-B100, BR-B101, BR-B102A & B, BR-B103 AND BR-B104 AS APPLICABLE.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS ENGINEERING DIVISION

DESIGNED BY: TWJ	DATE: 07-02-07
DRAWN BY: TWJ	
CHECKED BY: TWJ	
REVIEWED BY: TWJ	
DATE:	
SCALE:	
SHEET OF	
BRIDGE NO.	

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

PREPARED BY: TWJ
DATE: 07-02-07

TYPE TL-2 GUARDRAIL TRANSITION



United States Department of Agriculture
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EASTERN REGION

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Forest Road 209 Culvert
Replacement With Bridge
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Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

GUARDRAIL
DETAILS

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G. JUNTILA

DRAWN

J. ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

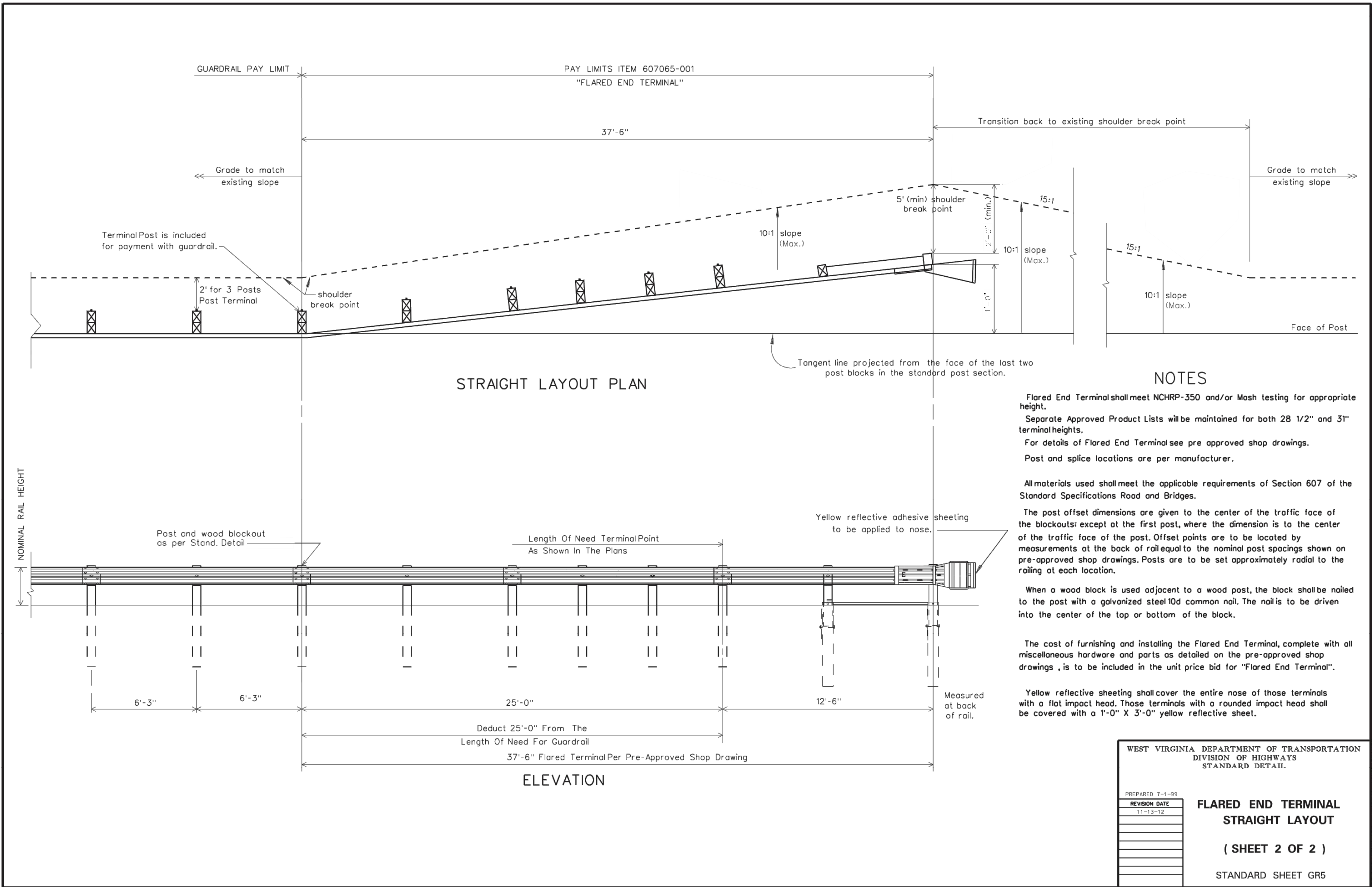
U28-01575

DWG SHEET NO.

C-23

SHEET 23 OF 24

5/10/22 16:00 JALLEN Z:\U28-01575 USDA FS-FY21 R9 10-BRIDGE DESIGN\DWGS\105 RED RUN ARCH\FR209-0.2 RED RUN.DWG;



United States Department of Agriculture
Forest Service

EASTERN REGION

PROJECT NAME

Forest Road 209 Culvert
Replacement With Bridge
For Aquatic Organism
Passage Improvement

MONONGAHELA
NATIONAL FOREST

GREENBRIER
RANGER DISTRICT

DRAWING TITLE

GUARDRAIL
DETAILS

DATE

5/11/2022

ARCHIVE NO.

DESIGNER

G.JUNTILA

DRAWN

J.ALLEN

CHECKED

S. WRIGHT

PROJECT NO.

U28-01575

DWG SHEET NO.

C-24

SHEET 24 OF 24