


Request for Quote	 <p style="text-align: center;">Marshall University Office of Purchasing One John Marshall Drive Huntington, WV 25755-4100</p> <p style="text-align: center;">Direct all inquiries regarding this order to: (304) 696-2727</p>	Bid# R2501527 Addendum No. 02
--------------------------	--	--

Vendor:	For information call: Purchasing Contact: Michelle Wheeler Phone: (304) 696-2727 Email: michelle.wheeler@marshall.edu & purchasing@marshall.edu
----------------	--

Sealed requests to bid for furnishing the supplies, equipment or services described below will be received by the Institution. TO RECEIVE CONSIDERATION FOR AWARD, UNLESS OTHERWISE NOTED, THE BID WILL BE SUBMITTED ON THIS FORM AND UPLOADED INTO THE MU BONFIRE PORTAL ON OR BEFORE THE DATE AND TIME SHOWN FOR THE BID OPENING. When applicable, prices will be based on units specified; and Bidders will enter the delivery date or time for items contained herein. The Institution reserves the right to accept or reject bids on each item separately or as a whole, to reject any or all bids, to waive informalities or irregularities and to contract as the best interests of the Institution may require. BIDS ARE SUBJECT TO THE GENERAL TERMS AND CONDITIONS AS SET FORTH HEREIN.

DATE 1/31/2025		DEPARTMENT REQUISITION NO. R2501527	BIDS OPEN: February 10, 2025 @ 3:00 PM EST at the following link: https://tinyurl.com/R2501527-CF4-Bid-Opening	BIDDER MUST ENTER DELIVERY DATE FOR EACH ITEM BID
------------------------------	--	---	--	--

Item #	Quantity	Description	Unit Price	Extended Price
<p><u>ADDENDUM NO. 02</u></p> <p>Project Name: R2501527 – Marshall University CF4 - Subterranean Testing Facility</p> <p>Purpose: To respond to vendor’s technical questions, attach the mandatory pre-bid sign-in sheet, update Exhibit “D” Pricing Page, and include Attachment A: Report of Geotechnical Exploration, Attachment B: WVDNR OLS Permit Approval & Fish Spawning Waiver, Attachment C: USACE NWP No. 33 Verification, and Attachment D: CCBOE Lease Agreement and Grant of Easement.</p>				

Total

To the Office of Purchasing,
 In compliance with the above, the undersigned offers and agrees, if this offer is accepted within _____ calendar days (30 calendar days unless a different period is inserted by the purchaser) from the bid open date, specified above, to furnish any or all items upon which prices are offered, at the price set opposite each item, delivered at the designated point(s), within the time specified.

Bidder guarantees shipment from _____ within _____ days	Bidder’s name Vendor _____
FOB _____ After receipt of order at address shown	Signed By _____
Terms _____	Typed Name _____
	Title _____
	Email _____
	Street Address _____
	City/State/Zip _____
	Date _____ Phone _____
	Fein _____

SOLICITATION NUMBER: R2501527

Request for Quote
Marshall University
CF4 - Subterranean Testing Facility

Addendum Number: No. 02

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

- Modify bid opening date and time
- Modify specifications of product or service being sought
- Attachment of vendor questions and responses
- Attachment of pre-bid sign-in sheet
- Correction of error
- Other

Description of Modification to Solicitation:

Addendum issued to publish and distribute the attached documentation to the vendor community.

1. To respond to vendor's technical questions;
2. To attach the mandatory pre-bid sign-in sheet;
3. To update Exhibit "D" Pricing Page; and
4. To include Attachment A: Report of Geotechnical Exploration, Attachment B: WVDNR OLS Permit Approval & Fish Spawning Waiver, Attachment C: USACE NWP No. 33 Verification, and Attachment D: CCBOE Lease Agreement and Grant of Easement.

NO OTHER CHANGES.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

Addendum No. 02
R2501527
Marshall University
CF4 - Subterranean Testing Facility

Technical Question and Answers

- Q1.** The documents say 75% local workforce. Can we get a definition of local? Is that within 50 miles, state of WV, county, etc.
- A1.** WV Code §21-1C excludes improvements funded in whole or in part by federal funds. Since this project is federally funded, a 75% local workforce is not required.
- Q2.** The document says to permanently leave HDPE pipe in after boring the 36" hole with casing. But then says to leave partial openings and mentions shotcrete. What is the final configuration of the 36" tunnel after construction? Section 5-3.
- A2.** Note: The section being referenced in the question is Section 5.1.1.C.2 on page 5-3. The final configuration of the 36" LEG B tunnel is HDPE pipe. Partial openings and shotcrete are not required for the 36" LEG B.
- Q3.** Is there a required completion date?
- A3.** Final completion is 6 months from NTP. NTP is anticipated to occur around May 1st, 2025.
- Q4.** Will all power need to be provided (generator) by contractor?
- A4.** Yes, all power to be provided by Contractor.
- Q5.** Is there a water source nearby that the contractor can utilize or will the contractor need to truck in water?
- A5.** The nearest hydrant is located at 1035 Norway Ave in front of the CF1 tunnel site. The waterline is operated by WV American Water and the Contractor is responsible for arranging the water connection and paying all fees associated with the connection and water usage during construction. Contact: Henry R. Perkins, Engineering Project Manager, West Virginia American Water, 304-340-2986.
- Q6.** Are there schedule restrictions or can contractor work 24/7?
- A6.** All construction will need to comply with the attached lease agreement and grant of easement with the Cabell County Board of Education, which does not

Addendum No. 02
R2501527
Marshall University
CF4 - Subterranean Testing Facility

Technical Question and Answers

include time of day restrictions. When school is in session, expect heavy traffic along the roadway from 7:00-8:00am and 2:30-3:30pm. Construction will also need to comply with the Cabell County Noise Control Ordinance which can be found on the Cabell County Commission website.

Q7. If using accelerants are there limitations to when they can be utilized during the day/week?

A7. Accelerants can be used with no limitations.

Q8. Is there a specification on wood used to timber sets?

A8. The tunnel support, including timber specification, shall be determined by the Contractor's tunnel design engineer.

Q9. Is there a specification for the shotcrete: psi, fiber, etc.

A9. The tunnel support, including shotcrete, shall be determined by the Contractor's tunnel design engineer.

Q10. Will the 75% local workforce requirement be mandatory for the project?

A10. No – See response to Q1.

Q11. On the 36" shaft, will casing be allowed to remain in place when the shaft is not complete encapsulated in solid competent rock? There appears to be 100 feet of dirt/mixed face excavation that if the 36" casing is to be removed, would not be supported and risk collapse.

A11. A larger diameter steel casing pipe can be utilized and left in place from the portal to the rock interface. Steel is allowable in this specific location. Please refer to A17 below.

Addendum No. 02
R2501527
Marshall University
CF4 - Subterranean Testing Facility

Technical Question and Answers

Q12. Please confirm that all clearing and grubbing within the limits of disturbance at the 72" shaft work site and the 36" shaft work site will be completed prior the low bidder beginning work by others

A12. Select trees in front of the 72" and 36" portals will be cut by the Owner prior to the start of construction. Not all trees within the limits of disturbance will be cut. The contractor will be responsible for removal of any stumps necessary and the clearing and grubbing of smaller brush. No trees can be cut from April 1st to September 30th without permission from US Fish & Wildlife. It is recommended that the apparent low bidder visit the site following bid opening to determine if additional trees need to be cut prior to March 15th.

Q13. Regarding the \$200,000.00 allowance for additional ground support:

- a. Please clarify is that is for ground support in addition to the base bid required shotcrete/timber supports
- b. Please clarify if the bidder is to carry the allowance in the submitted bid number as a contingency, or will it be added to the submitted bids by the owner.

A13. The \$200,000.00 allowance is to be added into your bid. See the attached bid form issued with this Addendum.

Q14. The bid tab is 1 Lump Sum. Is the \$200,000.00 line item allowance discussed in Section 5.1.1, A 3.c. to be included or excluded from the total bid for ITEM #3.1 CFA – Subterranean Testing Facility? This same Allowance is discussed in Section 5.1.1.C.3 but again it is unclear if the \$200,000.00 should be included in the lump sum proposal or if it will be added to the bids by the owner.

A14. See the attached bid form issued with this Addendum. \$225,000.00 in allowances are to be added into your bid.

Q15. If Hand – Mining is selected for “Leg A” do the dimensions of 6’-0” Tall x 4’-8” Wide go to the inside or outside of the 8 x 8 timbers?

A15. Inside the timbers. Please see hand mined cross section detail on sheet T-02.

Addendum No. 02
R2501527
Marshall University
CF4 - Subterranean Testing Facility

Technical Question and Answers

Q16. Does the headwall for “Leg A” have to be a certain height above the opening?

A16. Approximately 1’ above the opening is anticipated.

Q17. Section 5.1.1, A, 4 – The secondary “Leg B” calls for all steel casing pipe to be removed. Can a larger diameter steel casing be utilized and left in place in the 70 to 80’ from the portal which is shown to be in dirt? What are allowable products for support of the 36” shaft through this area? Steel, No Steel, RCP, Plastic, Fiberglass, Concrete, ETC. it was noted that steel on the previous project was not allowed.

A17. A larger diameter steel casing pipe can be utilized and left in place from the portal to the rock interface. Steel is allowable in this specific location.
Please refer to A11 above.

Q18. Section 5.1.1, A, 5 – The access portal is to be excavated from the surface until a full rock face. What are allowable products for support of the tunnel through this area? Steel, No Steel, RCP, Plastic, Fiberglass, Concrete, ETC. it was noted that steel on the previous project was not allowed.

A18. Please be sure to reference this section as issued in Addendum No. 01. See section 5.1.1, A, 7. Installing a short run of HDPE piping similar to what was used on the CF1 project is also acceptable.

Q19. 5.1.6.B2. States that “Hazardous gas control measures specified herein are supplemental to OSHA requirements.” Where are these additional measures specified?

A19. No specific additional measures are specified.

Q20. Is there an Engineer’s estimate that can be shared and is there a limit above the estimate that can be awarded?

A20. No.

Addendum No. 02
R2501527
Marshall University
CF4 - Subterranean Testing Facility

Technical Question and Answers

Q21. Is there any estimate of quantities / schedule of values that were utilized by the Engineer that can be shared for our reference.

A21. A bid form which includes the quantities is being issued with this Addendum.

Q22. Does this fall under Davis Bacon Wages? The original packet had the Davis Bacon Wages marked, but not seeing it on the flash drive documents from the bid walk.

A22. Yes.

Q23. Detail (1/C-06) for the temporary stream crossing references 36-inch diameter steel pipes. Can 36-inch HDPE pipes be used instead of steel since the crossing is temporary?

A23. No. Steel pipe is required due to anticipated load and shallow cover.

Q24. Do we need to add the allowance value into our lump sum number or is the allowance figure as a separate item?

A24. The \$225,000.00 allowances are to be added into your bid. See the attached bid form issued with this Addendum.

Q25. On page 34/95 of the download it mentions attachments A, B & C. Can you please provide those attachments as soon as possible?

A25. These were provided on the flash drives distributed at the pre-bid meeting and were also uploaded to Bonfire on Addendum No. 1.

Q26. Will there be any more information on the facility other than what is available in Bonfire?

A26. No additional information will be distributed other than the flash drives distributed at the pre-bid meeting. Please see Addendum No. 1 for current plans and specifications.

Addendum No. 02
R2501527
Marshall University
CF4 - Subterranean Testing Facility

Technical Question and Answers

Q27. There were not Electrical drawings, is this just the bare bones building being erected? The inside will bid at a later date?

A27. No permanent electrical components are included with this project now, nor planned in the future.

R2501527
Marshall University
 CF4 - Subterranean Testing Facility
 Exhibit "D" Pricing Page

BID FORM
MU - CF4 SUBTERRANEAN TESTING FACILITY

CONTRACTOR SHALL VERIFY ALL QUANTITIES DURING BID PHASE

BID ITEM	SITE ITEM	QUANTITY	UNIT	UNIT COST	EXTENDED COST
1	MOBILIZATION / DEMOBILIZATION	1	LS		
2	CONSTRUCTION LAYOUT	1	LS		
3	CHAIN LINK FENCE TEMPORARY REMOVAL AND REPLACEMENT	1	LS		
4	CLEARING & GRUBBING	1	LS		
5	SMARTFENCE [®] 36	350	LF		
6	TOPSOIL, SEEDING AND MULCHING	10,000	SF		
7	SEPARATION FABRIC	7,900	SF		
8	AASHTO #57 STONE (DRIVE)	130	TON		
9	D50=12" MIN CLEAN/WASHED STONE	1,200	TON		
10	36" CULVERT PIPE - TEMPORARY	234	LF		
11	6" CULVERT PIPE - TEMPORARY	45	LF		
12	CULVERT REMOVAL, STONE REMOVAL, STREAM RESTORATION	1	LS		
13	LEG A: HAND-MINED (6' x 6') OR BORED SHAFT (72" DIAMETER)	323	LF		
14	LEG B: HORIZONTAL BORED SHAFT AND CUT & COVER LAUNCH PIT (36" DIAMETER LINED W/ PIPE)	340	LF		
15	LEG A LAUNCH PIT WITH BACKSTOP	1	LS		
16	LEG A: PARTIAL FACE EXCAVATION / ENTRANCE PORTAL, RETAINING WALLS & GRADING	1	EA		
17	LEG B: PARTIAL FACE EXCAVATION / ENTRANCE PORTAL, LAUNCHING BACKSTOP, RETAINING WALLS, SOE & GRADING	1	EA		
18	LEG A: ACCESS GATE & SAFETY FENCING	1	EA		
19	LEG B: ACCESS GATE & PIPE CAP	1	EA		
				SUBTOTAL	

20	CONTINGENCY ITEM: ASPHALT MILLING & REPLACEMENT, 1.5" THICKNESS	220	TON	ALLOW.	\$ 25,000.00
21	ALLOWANCE FOR LEG A & PORTAL FACE SUPPORT (SHOTCRETE OR TIMBER SETS)	1	LS	ALLOW.	\$ 200,000.00

TOTAL WITH ALLOWANCES

Attachment A

REPORT OF GEOTECHNICAL EXPLORATION

MARSHALL CF4 TUNNEL DESIGN
HUNTINGTON, CABELL COUNTY, WEST VIRGINIA

TRIAD PROJECT No. 04-23-0374

PREPARED FOR:

MARSHALL UNIVERSITY
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE
ONE JOHN MARSHALL DRIVE, WAEC 2301
HUNTINGTON, WEST VIRGINIA 25755

PREPARED BY:



10541 TEAYS VALLEY ROAD
SCOTT DEPOT, WEST VIRGINIA 25560
WWW.TRIADENG.COM

AUGUST 8, 2024

August 8, 2024

Ms. Brie Salmons
Marshall University College of Engineering and Computer Sciences
One John Marshall Drive, WAEC 2301
Huntington, WV 25755

RE: Report of Geotechnical Exploration
Marshall CF4 Tunnel Design
Huntington, WV
Triad Project No. 04-23-0374

Dear Ms. Salmons:

Authorization to proceed with this project was provided by receipt of Subconsultant Agreement dated September 7, 2023 between DLZ, Ohio, Inc. (DLZ) and Triad Engineering, Inc. (Triad), with an updated cost estimate submittal February 2, 2024. The subsurface exploration was performed to evaluate the subsurface conditions encountered near the proposed testing facility for the limited purposes of preparing a geotechnical data report to be used for design of the project. It is emphasized that subsurface conditions may vary between borings, and Triad makes no representations as to subsurface conditions other than those encountered at the specific test boring locations.

This report has been prepared for the exclusive use of Marshall University College of Engineering and Computer Sciences and DLZ for specific application to the evaluation of the Marshall CF4 Tunnel in Huntington, West Virginia. Triad's responsibilities and liabilities are limited to our client and apply only to their use of our report for the purposes described above. To observe compliance with design concepts and specifications, and to facilitate design changes if subsurface conditions differ from those anticipated prior to construction, it is recommended that Triad be retained to provide continuous engineering and testing services during the earthwork and foundation construction phases of the work.


We appreciate the opportunity to assist you on this project and trust this report satisfies your needs currently. Please feel free to contact us if you have questions concerning this report, or if we can provide further assistance.

Sincerely,

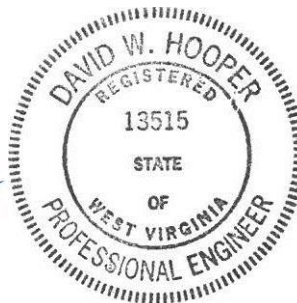
TRIAD ENGINEERING, INC.



Kelley Cusick
Staff Geologist



David W. Hooper, P.E.
Principal Engineer



Report of Geotechnical Exploration
Marshall CF4 Tunnel Design
Huntington, Cabell County, WV

TABLE OF CONTENTS

<u>Item</u>	<u>Page</u>
SITE AND PROJECT DESCRIPTION.....	1
GEOLOGY	1
Surficial Geology	1
Bedrock Geology	1
Coal Resources	2
SUBSURFACE EXPLORATION	2
SUBSURFACE CONDITIONS	2
LABORATORY TESTING	4
LIMITATIONS.....	5

APPENDICES

- Appendix A – Figures
- Appendix B – Field Exploration
- Appendix C – Laboratory Testing
- Appendix D – Rock Core Photographs

Report of Geotechnical Exploration
Marshall CF4 Tunnel Design
Huntington, Cabell County, WV

SITE AND PROJECT DESCRIPTION

It is our understanding that the US Army Corps of Engineers Engineering Research and Development Center (ERDC) has sponsored research in the area of subterranean mapping and detection of illicit tunnels. The objective is to deploy recently developed and to further develop additional geophysical technologies to be used in identifying, navigating, and mapping subterranean features in an urban environment. Tunnel CF4 is proposed to be constructed into the side of a slope near the intersection of Norway Avenue and Cabell County Vocational Center Road in Huntington, Cabell County, West Virginia. The approximate site location is illustrated on Figure A-1 in Appendix A.

It is our understanding that the structure will consist of two tunnels that will meet in the middle. The dimensions of the larger tunnel will be approximately 6 feet in diameter and 323 feet in length, while the dimensions of the smaller will be 3 feet in diameter and 340 feet in length.

Triad was contracted to perform the geotechnical exploration and testing and is assisting DLZ for the tunnel design, and development of construction drawings. The conceptual layout of the tunnel location and conceptual elevation view of the proposed tunnel can be seen in Figures A-2 included in Appendix A.

GEOLOGY

Surficial Geology

According to the *Geologic Map of West Virginia*, published in 1968 by the West Virginia Geological and Economic Survey (WVGES), the subject site is mapped within the boundaries of a Quaternary alluvium deposit. Alluvium is generally described as detrital deposits made by streams on riverbeds and floodplains. These deposits typically consist of unconsolidated and stratified clay, silt, sand, gravel, cobbles, and boulders.

Bedrock Geology

Although the bedrock unit underlying the site is concealed by alluvium on available geologic maps, we have inferred from coal bed elevations and the abovementioned geological map that the alluvium is likely underlain by the Conemaugh Group of the of the Pennsylvanian Subperiod. The Conemaugh Group consists of non-marine, cyclic sequences of red and gray shale, siltstone, and sandstone with thin limestones and

coals. It extends from the base of the Pittsburgh coal to the top of the Upper Freeport coal, both of which are economically important and heavily mined coal beds. The unit includes the Elk Lick, Harlem, Bakerstown, and Mahoning coals, as well as the Ames Limestone.

Coal Resources

We researched available mine maps provided by the WVGES to ascertain what minable coal beds are present below the site and to determine if past surface or underground mining operations have been conducted. In performing this evaluation, we could not identify any documented surface or underground mining at or beneath the project site.

It should be noted that the WVGES mine mapping database may be incomplete due to the limited number of years requiring permitting and mapping. As such, the lack of identified mines at the subject site does not constitute a guarantee of a mine free area.

SUBSURFACE EXPLORATION

Seven (7) test borings were drilled at the approximate location of the proposed tunnel between May 21 and June 26, 2024. The boring locations were determined by DLZ while on-site. Surface elevations of the borings were surveyed after completion of the borings. Figure A-2 in Appendix A depicts the locations of the test borings drilled for the project.

A representative of Triad was present full time during the drilling to direct the drilling crew, log all recovered soil samples, and observe groundwater and rock conditions. Triad transported the recovered soil samples to our laboratory for further testing. Detailed descriptions of materials encountered in the test borings are documented on the boring logs in Appendix B. Figures B-1 and B-2 in Appendix B describe the classification system and terminology utilized.

SUBSURFACE CONDITIONS

Detailed information and descriptions of the materials, as well as encountered groundwater levels, are contained on the boring logs in Appendix B. Boring log keys are provided as Figures B-1 and B-2 in Appendix B. The test boring logs were developed by visually classifying the samples obtained during the exploration and performing laboratory classification testing of select samples. The various substrata revealed by the borings are briefly described below.

Topsoil: Topsoil was encountered in all borings except B-5 and ranged from 0.2 to 0.7 feet thick.

Fill: Fill was encountered in boring B-5 at the surface to a depth of approximately 2.5 feet below existing grade. The fill consisted of a heterogeneous mixture of clay and sand. Standard Penetration Test (SPT) N-values obtained within the fill was 6 blows per foot, which indicates a medium stiff relative density, while the pocket penetrometer value indicated the fill was soft to medium stiff.

Alluvium: Alluvium was encountered beneath the topsoil in borings B-2, B-3, B-4, B-6, and B-7 extending to depths of 2.5 to 7.5 feet below existing grades. The alluvium consisted of clay, or clay with lesser amounts of sand, or clay with lesser amounts of sand and gravel, or sand with lesser amounts of clay. The Standard Penetration Test (SPT) N-value obtained within the sandy alluvium was 10 blows per foot (bpf), which indicates a loose relative density. Pocket penetrometer values obtained within the clayey alluvium indicate a medium stiff to stiff consistency.

Residuum: Residual soils were encountered at all borings underlying the topsoil (B-1), fill (B-5), or alluvium (B-2, B-3, B-4, B-5, B-6). The residual soils consisted of clay with lesser amounts of gravel or clay with lesser amounts of sand and gravel that extended to depths of approximately 6 to 21 feet below the ground surface, at which point weathered shale (B-1, B-2, B-6, B-7) or weathered claystone (B-3, B-4, B-5) was encountered. Sampler refusal was encountered in each boring at depths between 7.8 and 31.3 feet below existing grades.

Bedrock: Once sampler refusal was attained, borings B-2, B-3, B-4, B-5, and B-7 were advanced to a termination depth of 20.2 to 82.5 feet below existing grade utilizing rock coring techniques. The bottom elevation of each cored boring ranged from 559.4 to 581.5 feet, which corresponds to a depth of about 10 feet below the proposed bottom of tunnel grade.

The bedrock encountered below the residuum consisted of interbedded strata of shale, siltstone, sandstone, and claystone. Core recoveries ranged from 84 to 100 percent, and Rock Quality Designation (RQD) ranged from 0 to 100 percent. Unconfined compressive strength tests were performed on 28 samples of rock core recovered from borings B-2, B-3, B-4, B-5, and B-7.

Groundwater: Groundwater levels were measured both during and after drilling operations. Groundwater levels are documented on the boring logs in Appendix B. Water was encountered in borings B-1 and B-7 at depths of 15.0 and 7.5 feet, respectively; water was not encountered during drilling of borings B-2, B-3, B-4, B-5 or B-6. Water was present at depths ranging from 4.6 to 7.6 feet below existing grade immediately upon completion of drilling of B-2, B-3, B-4, B-5, and B-7, while borings B-1 and B-6 were dry. The table below summarizes the water level readings in each boring.

GROUNDWATER INFORMATION			
Boring	Water Depth First Noted (feet)	Water Depth at Completion (feet)	Water Depth at 24 Hours (feet)
B-1	15.0	Dry	*
B-2	n/a	7.6	*
B-3	n/a	6.1	7.1
B-4	n/a	6.8	9.3
B-5	n/a	5.7	8.4
B-6	n/a	Dry	*
B-7	7.5	4.6	*

*Borehole Backfilled

It is noted that the introduction of water was necessary for the coring of bedrock. It is emphasized that fluctuations in true groundwater levels can occur due to variations in seasonal and climatic conditions that were not evident at the time measurements were taken and recorded.

LABORATORY TESTING

Laboratory tests were performed on selected soil and rock samples to aid in classification and provide a basis for estimating their engineering properties. The laboratory tests were performed in general accordance with ASTM standard test methods. Individual test results are shown on the test boring logs in Appendix B, and detailed results are contained in Appendix C. The results are summarized in the following table:

TEST TYPE	TEST RESULTS
Moisture Content	5.13 to 26.27%
Atterberg Limits	Liquid Limit: 27 - 40 Plasticity Index: 7 - 17
Percent Passing No. 200 Sieve	53% - 97%
USCS Classification	CL and CL-ML
Unconfined Compressive Strength of Rock (psi)	Sandstone: 4306 - 9943 Claystone: 244 - 2794 Siltstone: 3729 - 7288 Shale: 5700 Limestone: 6347

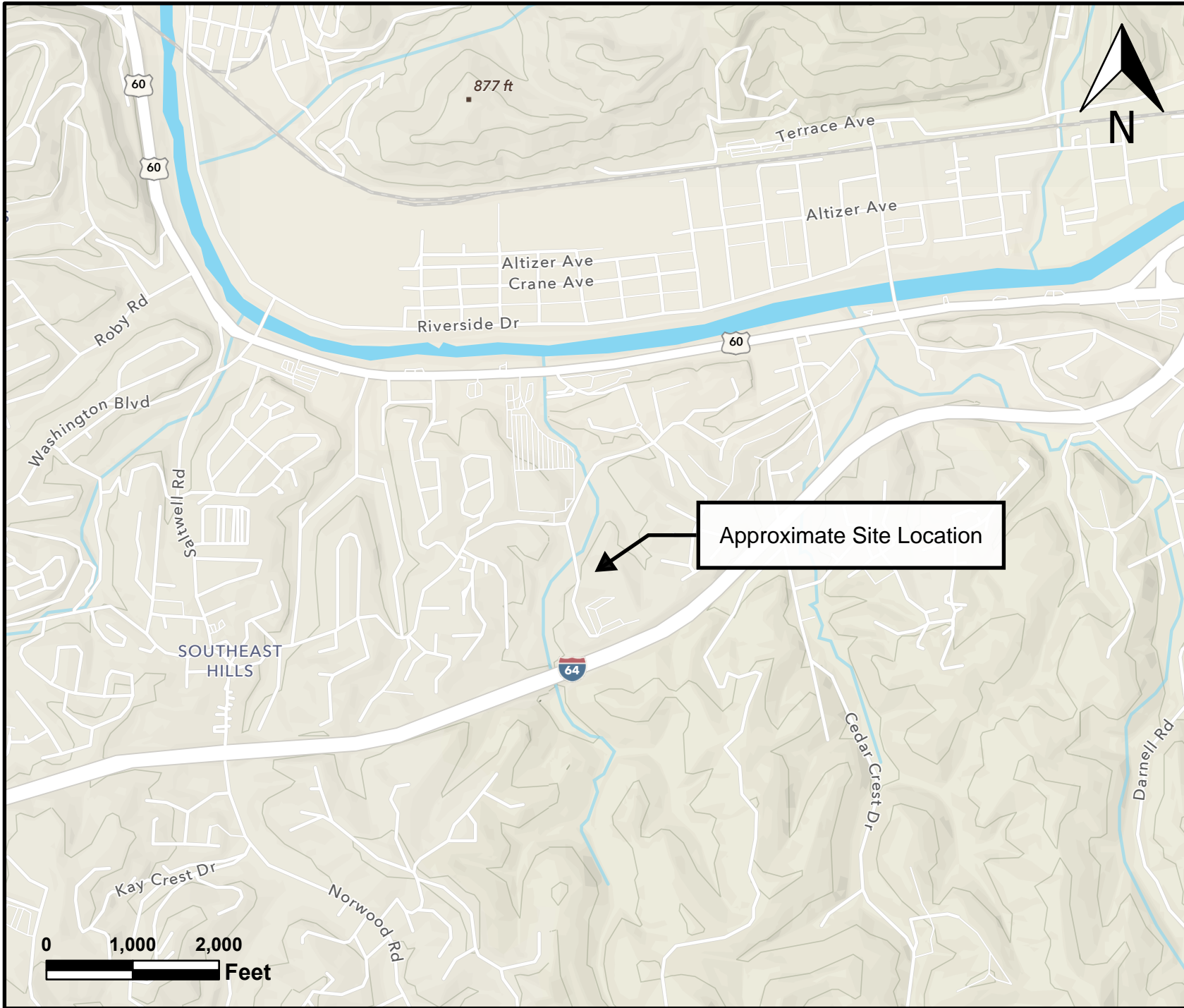
LIMITATIONS

This report has been prepared for the exclusive use of Marshall University College of Engineering and Computer Sciences and DLZ Ohio, Inc. for specific application to the Marshall CF4 Tunnel Design in Huntington, Cabell County, West Virginia. Triad's responsibilities and liabilities are limited to our client and apply only to their use of our report for the purposes described above.

It is emphasized that encountered conditions may vary dramatically across different areas of the site, and Triad makes no representations as to subsurface conditions other than those encountered at the specific testing locations.

APPENDIX A

Figures

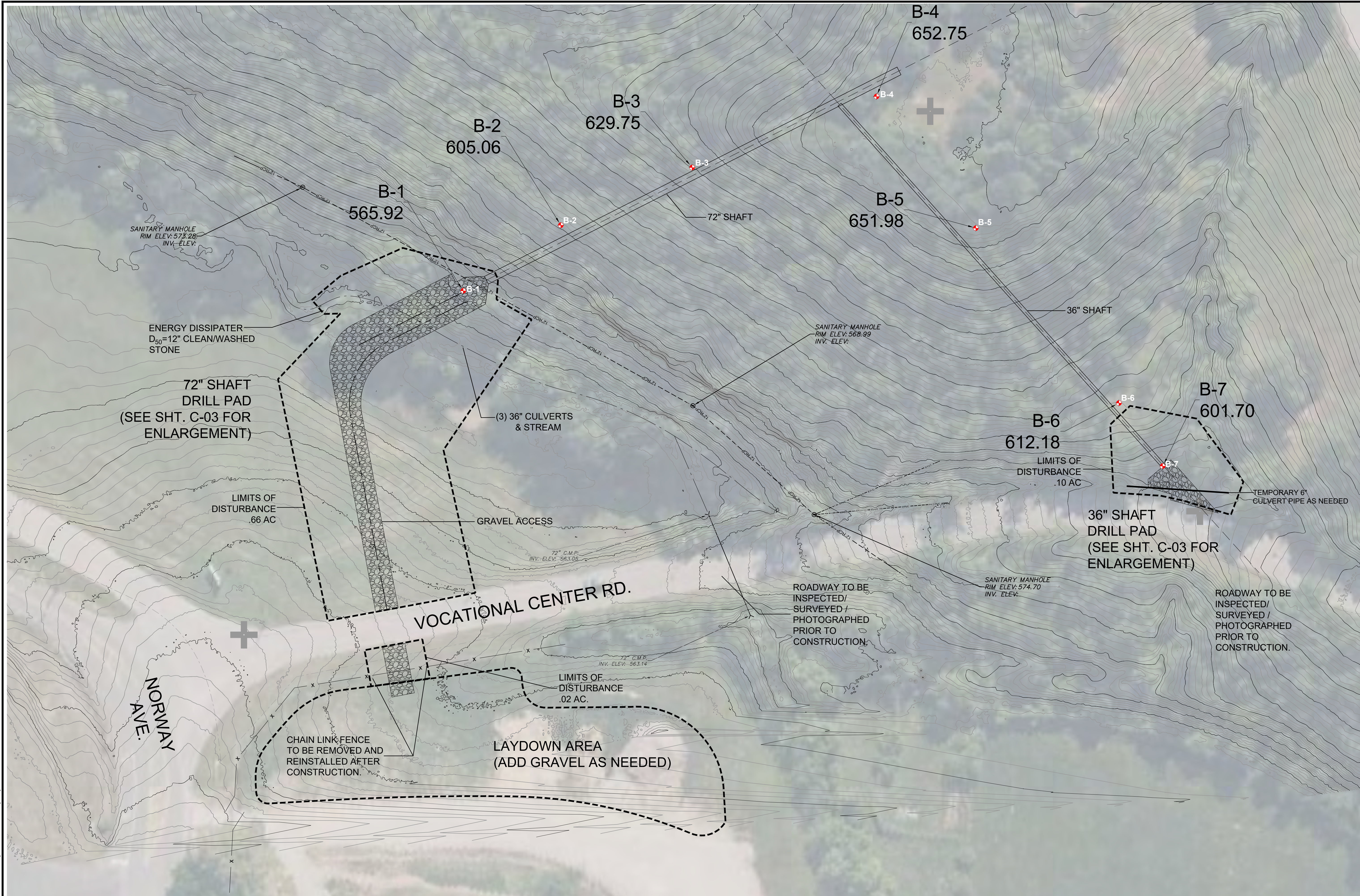


GENERAL SITE VICINITY
 Marshall CF4 Tunnel Design
 Cabell County, West Virginia
 Outdoor Map (ESRI)

PREPARED BY:	CHECKED BY:
MAR	DWH
PROJECT NUMBER:	
04-23-0374	

FIGURE
A-1

Plotted by jyoung
 y:\w_04_23_0374_3_04-23-0374_03_burne_design\cadd\04-23-0374 design.dwg



OVERALL SITE PLAN



TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PH: 304.755.0721 FAX: 304.755.1880
 OFFICE LOCATIONS
 MARYLAND • PENNSYLVANIA • VIRGINIA • WEST VIRGINIA • OHIO

REV. #	DATE	DESCRIPTION

CADD FILE: 23-0374 DESIGN.dwg	CHECKED BY: dm	SCALE: 1" = 30'
DRAWN BY: jhy	DATE: 8/8/2024	

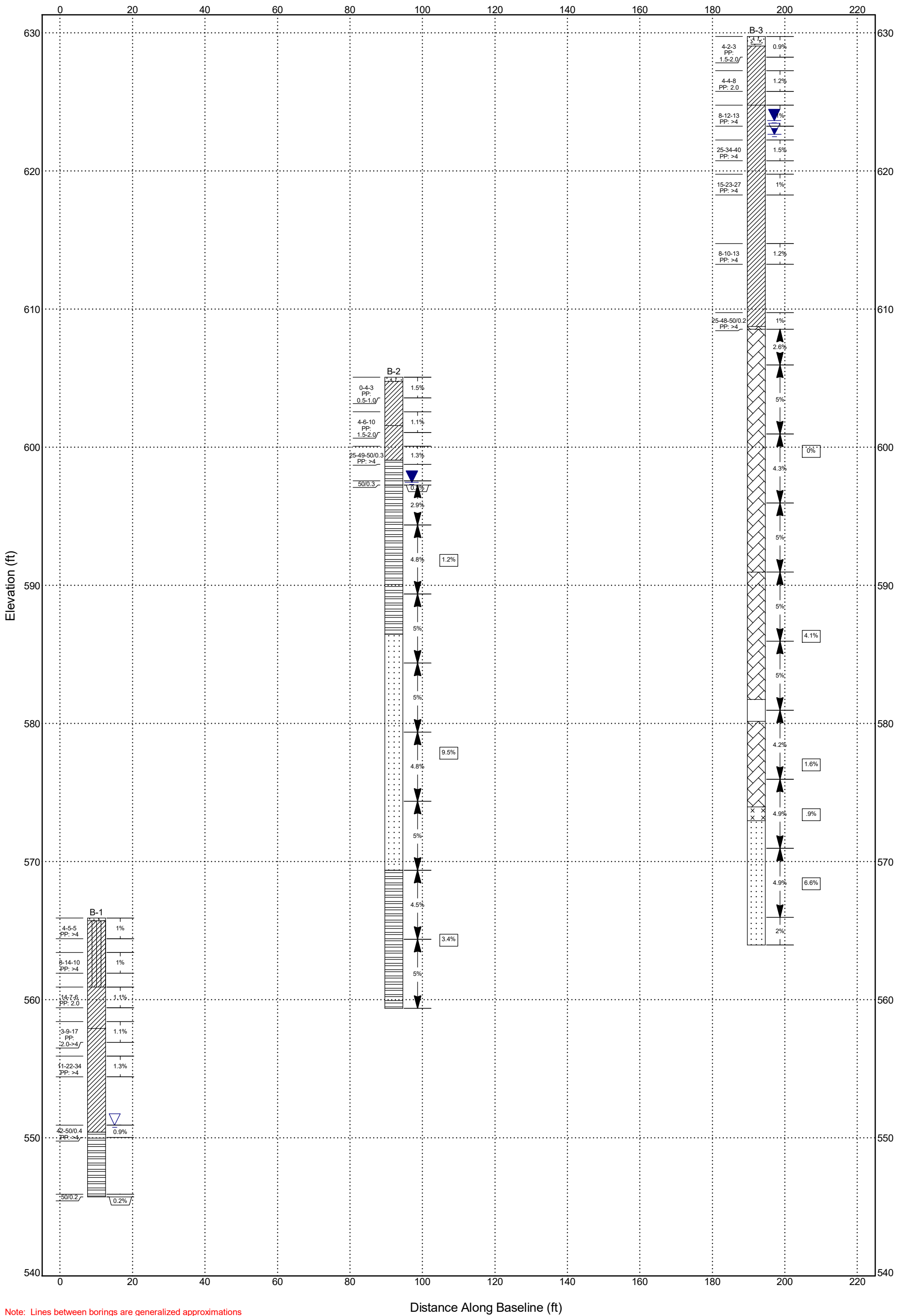


MARSHALL CF4
 CABELL, WV

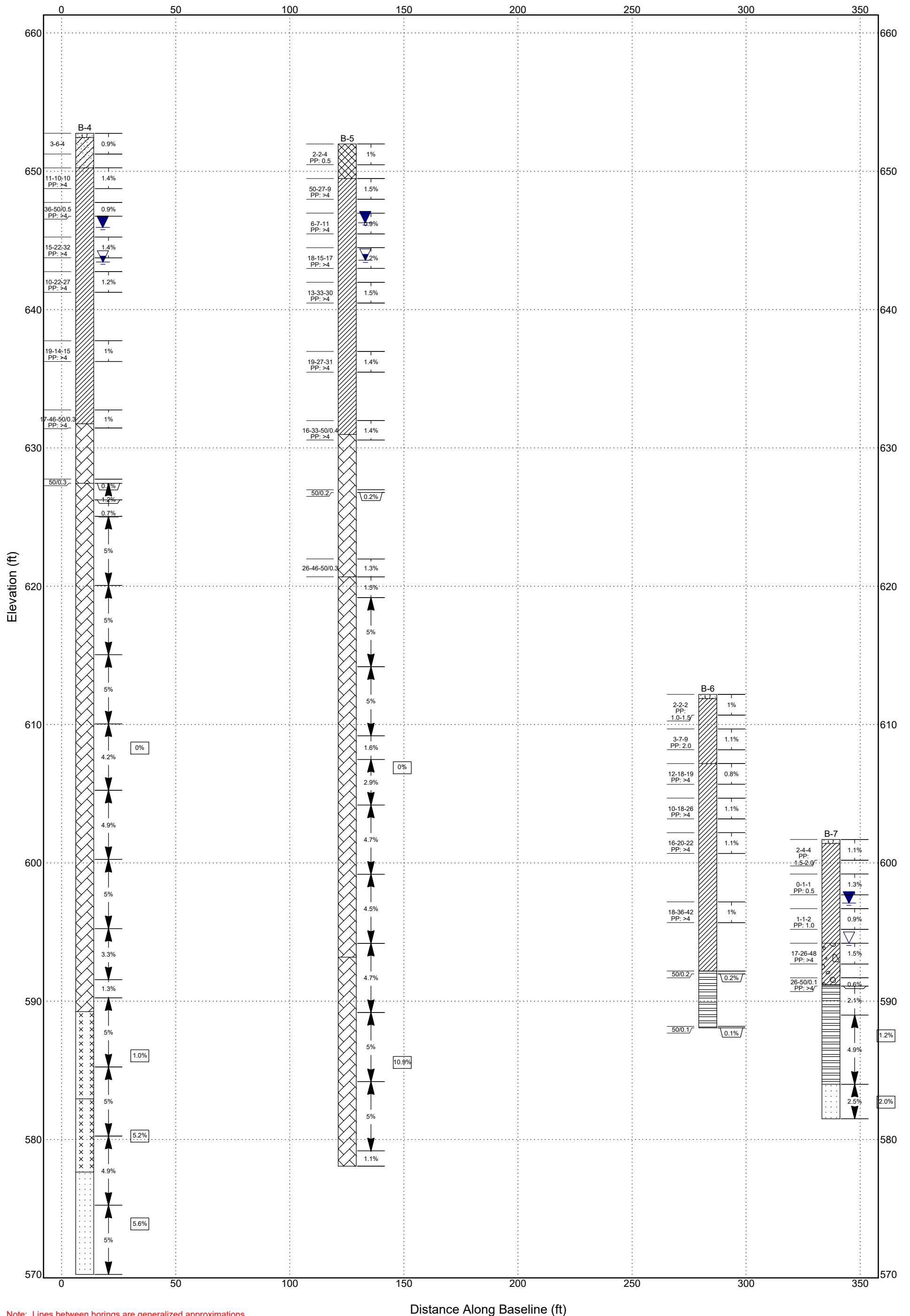
OVERALL SITE PLAN



SHEET NUMBER:
A-2
 PROJECT No.: 04-23-0374



Note: Lines between borings are generalized approximations



Note: Lines between borings are generalized approximations

Distance Along Baseline (ft)

APPENDIX B

Field Exploration

KEY TO IDENTIFICATION OF SOIL AND WEATHERED BEDROCK SAMPLES

Descriptor Sequence		1. Color		2. Primary Component		3. Fractions	
1	Color	Gray	Tan	Component	Grain Size (USCS)	And	≥ 35%
2	Primary Component	Brown	Black			Boulders	≥ 12 inches
3	Fractions	Orange	Red	Cobbles	3 to 12 inches	Little	10 to 20%
4	Moisture	Green	Yellow	Gravel	#4 to 3 inches	Trace	< 10%
5	Descriptors	Purple	Blue	Sand	#200 to #4	4. Moisture	
6	Plasticity	Modifiers		Silt/Clay	≤ #200	Dry	Dry to touch
7	Consistency/ Relative Density	Light	Lighter side of color range			Damp	Slightly moist
8	Deposition Type	Dark	Darker side of color range			Moist	No visible free water
		Mottled	Irregularly marked with spots of different colors			Wet	Visible free water
		Banded	Alternating shades or colors				

5. Descriptors	
Fissile	Splits easily along closely spaced parallel planes (breaks into plates)
Hackly	Jagged or irregular fracture planes
Slickensided	Polished and striated surfaces that result from friction along a fault plane
Laminated	Alternating thin layers of varying material or colors less than ¼" thick
Lensed	Inclusion of small pockets of different soils
Saprolitic	Completely weathered rock that retains the appearance of the original rock structure but has only a trace of the original bond strength
Micaceous	Containing mica minerals
Varved	Laminated sediment consisting of alternating layers of fine sand and silt or clay deposited in still water

6. Plasticity of Fine-Grained Soils						7a. Relative Density of Granular Coarse-Grained Soils	
Fine-Grained Component	Plasticity	Estimated Plasticity Index (PI)	Smallest Thread Diameter	Thread Characteristics	Dilatancy	Descriptor	N-Value
Primarily Silt	Non-Plastic	0 - 2%	Ball cracks	Dries rapidly; a 1/8-inch thread cannot be rolled at any water content	Moist ball sheds water when shaken giving a glossy appearance	Very Loose	≤ 4
	Low Plasticity	3 - 10%	1/8 to 1/4 inch	Feels powdery when drying out during rolling; thread can barely be rolled	Moist ball retains water or sheds water slowly when shaken	Loose	5 - 10
Primarily Clay	Medium Plasticity	> 10 - 20%	1/16 inch	Thread cannot be rerolled after reaching plastic limit		Medium Dense	11 - 30
	High Plasticity	> 20%	1/32 inch	Thread can be rerolled after reaching plastic limit		Dense	31 - 50
						Very Dense	> 50

7b. Consistency of Fine-Grained Soils			8. Type of Deposit	
Descriptor	Pocket Penetrometer (tons/ft ²)	N-Value		
Very Soft	≤ 0.25	≤ 2	Alluvium	Sediment deposited by moving water
Soft	≥ 0.25 - 0.5	3 - 4	Colluvium	Sediment deposited by gravity
Medium Stiff	> 0.5 - 1.0	5 - 8	Fill	Manmade deposit
Stiff	> 1.0 - 2.0	9 - 15	Fluviomarine	Stratified materials formed by the combined action of river and sea processes
Very Stiff	> 2.0 - 4.0	16 - 30	Glacial Outwash	Sediment deposited by glacial meltwater; commonly sand and gravel
Hard	> 4	≥ 31	Glacial Till	Unsorted sediment deposited by glacier
			Glacial Drift	Collective term for all sediment transported and deposited by a glacier or glacial meltwater
			Residuum	Insoluble material remaining from weathered rock
			Weathered Bedrock	Bedrock that has been weathered

FIGURE B-1

KEY TO IDENTIFICATION OF HARD BEDROCK SAMPLES

Descriptor Sequence		1. Color		2. Rock Type		3. Interbedding/Fractions	
1	Color	Gray	Tan	Common Regional Rocks		And	≥ 50%
2	Rock Type	Brown	Black				
3	Interbedding	Orange	Red	Sandstone	Siltstone	Some	15 to 40%
4	Descriptors	Green	Yellow	Mudstone	Shale		
5	Weathering	Purple	Blue	Coal	Claystone	Few	0 to 15%
6	Fracturing	Modifiers					
7	Fracture Angle	Light	Lighter side of color range	Limestone	Dolostone		
8	Hardness	Dark	Darker side of color range				
		Mottled	Irregularly marked with spots of different colors				
		Banded	Alternating shades or colors				

4. Descriptors		5. Degree of Weathering	
Arenaceous	Sedimentary rock containing sand sized particles	Descriptor	Criteria
Argillaceous	Pertaining to a sedimentary rock which contains an appreciable amount of clay	Fresh	No visible sign of weathering, discoloration, or oxidation
Calcareous	Containing calcium carbonate; when applied to a rock name, it implies that as much as 50% of the rock is calcium carbonate	Slightly Weathered	Slight weathering, discoloration, or oxidation impacting <20% of rock mass
Carbonaceous	A rock rich in carbon	Weathered	Significant weathering, discoloration, or oxidation impacting 20 to 60% of rock mass
Cross Bedded	Original depositional layering is inclined	Highly Weathered	Major weathering, discoloration, or oxidation impacting >60% of rock mass
Ferruginous	A rock having a red or rusty color due to the presence of ferric oxide		
Fissile	Splits easily along closely spaced parallel planes		
Fossiliferous	Containing fossils		
Hackly	Jagged or irregular fracture planes		
Micaceous	Containing mica minerals		
Nodule	A small rounded mass of a mineral or mineral aggregate different in composition from the enclosing rock		
Pyritic	Containing the mineral pyrite		
Slickenside	Polished and striated surface that results from friction along a fault plane		
Vein	An epigenetic mineral filling of a fault or other fracture		
Vuggy	Containing voids usually lined with crystals of a different mineral composition from the enclosing rock		

6. Degree of Fracturing	
Descriptor	Spacing
Very Broken	≤ 2 inches
Broken	2 to 8 inches
Blocky	8 inches to 2 feet
Slightly Fractured	2 to 6 feet

7. Angle of Fracture Planes		8. Rock Hardness	
Fracture Planes	Degrees	Descriptor	Test Criteria for Hand Specimen
Flat	< 5°	Very Soft	Indented with thumb or scratched by fingernail
Shallow	5 to 15°	Soft	Gouged deeply or carved with a knife blade
Moderate	15 to 30°	Medium Hard	Readily scratched by knife blade, scratch leaves heavy trace of dust
Steep	30 to 45°	Hard	Scratched by knife blade with difficulty, scratch produces little powder and is faintly visible
Very Steep	45 to 60°	Very Hard	Not scratched by a knife blade
Sheer	60 to 90°		
Vertical	90°		

FIGURE B-2

Triad Engineering, Inc.

Field Exploration

A representative of Triad was present to direct the drill crew, log recovered samples and observe groundwater conditions. The borings were drilled utilizing a CME-55 rotary auger drill rig. Samples of in-situ soil and weathered bedrock were obtained using a split-barrel sampler while performing Standard Penetration Tests (ASTM D 1586). The results of these tests (N-values) are commonly interpreted to provide an index to strength, consistency or relative density of the sampled materials and their ability to support foundations.

Once auger or sampler refusal on harder rock was encountered, select borings were further advanced using rock coring techniques. Continuous rock core samples were obtained from auger/sampler refusal depth to the boring termination depth. The harder rock materials were penetrated and sampled using a conventional, double-tubed core barrel and diamond coring bit, producing a rock core sample a nominal two (2) inches in diameter. The rock coring was performed to assess the type, quality and continuity of the bedrock at the drilled locations. The Rock Quality Designation (RQD) noted on the logs provides an indication of the relative quality and soundness of a specific bedrock stratum by measuring the lengths of intact rock core (unbroken core samples) that are larger than twice the core sample diameter for a specific rock stratum and/or core run and dividing the sum of the cumulative lengths by the thickness of the stratum and/or core run.

Groundwater levels were checked both during and after drilling operations and are recorded on the individual logs. Water levels indicated after rock coring operations are not considered representative of true groundwater levels, due to the introduction of water into the borehole during rock coring. It is emphasized that groundwater levels typically vary and are dependent upon climatic conditions and other environmental factors.

It is also emphasized that the lines shown on the logs are estimates of the changes in material. Actual changes may be gradual and may vary from those indicated on the logs, and the subsurface conditions between the borings may differ from those depicted on the logs. The boreholes were backfilled upon completion of the drilling with auger cuttings. Samples were transported to our office for temporary storage and additional analysis. The samples will be discarded after a period of 60 days unless other arrangements are made.

TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 6/26/24
 Date Completed: 6/26/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-1**
 Ground Elev.: 565.92

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> Shelby Tube </div> <div style="display: flex; align-items: center;"> Core Sample </div> </div> <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> Standard Split Spoon </div> <div style="display: flex; align-items: center;"> Auger Probe </div> </div> </div>		Water Level First Noted	RQD (Strata)	Water Level	Graphic Log	Strata Elevation		
							MATERIAL DESCRIPTION								
						0.2	TOPSOIL								565.7
	S-1	X	4-5-5 PP: >4	67%			Brown, tan, and gray SILTY CLAY , some sand, little gravel, moist, saprolitic, micaceous, low to medium plasticity, hard, residuum - From 0.0 to 1.5 feet: W=11.0% - From 2.5 to 4.0 feet: W=11.9%, LL=27, PL=20, PI=7, Gravel=10%, Sand=25%, Fines=65%, CL-ML								
	S-2	X	8-14-10 PP: >4	67%											
5.0						5.0	Tan, brown, and red CLAY , some sand, little to some gravel, damp, low to medium plasticity, very stiff, residuum - From 5.0 to 6.5 feet: W=5.1%, LL=30, PL=19, PI=11, Gravel=20%, Sand=27%, Fines=53%, CL								560.9
	S-3	X	14-7-6 PP: 2.0	73%											
	S-4	X	3-9-17 PP: 2.0->4	73%		8.0	Brown and tan CLAY , some sand, little gravel, moist to wet, saprolitic, low to medium plasticity, hard, residuum - From 7.5 to 9.0 feet: W=26.30%								
10.0							- Gray from 10.0 feet - From 10.0 to 11.5 feet: W=10.5%								
	S-5	X	11-22-34 PP: >4	87%											
15.0						15.5	- Wet from 15.0 feet				▽				550.4
	S-6	X	42-50/0.4 PP: >4	100%			Gray and brown SHALE , wet, very dense, weathered bedrock								
20.0						20.2	- Dry from 20.0 feet								545.7
	S-7	X	50/0.2	100%			Boring terminated at 20.2 feet								
25.0															

Remarks: Boring dry upon completion.



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/31/24
 Date Completed: 5/31/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-2**
 Ground Elev.: 605.06

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-around; font-size: small;"> Shelby Tube Standard Split Spoon </div>		Water Level Upon Completion	7.6 ft.	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							<div style="display: flex; justify-content: space-around; font-size: small;"> Core Sample Auger Probe </div>	MATERIAL DESCRIPTION						
0.3	S-1	X	0-4-3 PP: 0.5-1.0	100%		0.3								604.8
							TOPSOIL							
							Brown CLAY , moist, medium plasticity, medium stiff to stiff, alluvium							
3.5	S-2	X	4-6-10 PP: 1.5-2.0	73%		3.5								601.6
							Brown and tan CLAY , some sand, little gravel, moist, saprolitic, low to medium plasticity, stiff to hard, residuum							
6.0	S-3	X	25-49-50/0.3 PP: >4	100%		6.0								599.1
							Tan and gray SHALE , dry, very dense, weathered bedrock							
7.8	S-4	X	50/0.3	100%		7.8								597.3
							Brown, gray, and tan SHALE , few claystone interbeds, fissile, weathered to highly weathered, very broken to broken, flat to shallow fracture planes, very soft to soft							
10.0	R-1			100%	0%									
15.0	R-2			96%	8%									
18.6	R-3			100%	26%	18.6								586.5
							Gray, tan, and brown SANDSTONE , some shale interbeds, slightly weathered to highly weathered, very broken to blocky, flat fracture planes, medium hard to hard							
20.0							- Highly weathered, very broken from 18.6 to 26.7 feet							
25.0	R-4			100%	38%									

Remarks:

TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/31/24
 Date Completed: 5/31/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-2**
 Ground Elev.: 605.06

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> Shelby Tube Core Sample </div> <div style="text-align: center;"> Standard Split Spoon Auger Probe </div> <div style="text-align: center;"> Water Level Upon Completion <u>7.6 ft.</u> </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							MATERIAL DESCRIPTION						
30.0	R-5			100% 96%	38% 74%		Gray, tan, and brown SANDSTONE , some shale interbeds, slightly weathered to highly weathered, very broken to blocky, flat fracture planes, medium hard to hard (continued) - From 26.7 to 27.3 feet: UCS=4,306 psi - From 29.6 to 30.1 feet: UCS=7,145 psi - From 30.7 to 31.2 feet: UCS=7,348 psi - From 31.2 to 31.6 feet: CAI=1.9 - From 33.7 to 34.1 feet: UCS=9,943 psi			56%			
35.0	R-6			100%	68%	35.7	Dark gray interbedded SILTSTONE and SHALE , fissile, carbonaceous, slightly weathered, very broken to broken, flat fracture planes, very soft to medium hard - From 36.0 to 36.4 feet: UCS=5,158 psi - From 39.3 to 39.8 feet: UCS=5,700 psi			34%		569.4	
40.0	R-7			90%	34%		- From 36.0 to 36.4 feet: UCS=5,158 psi - From 39.3 to 39.8 feet: UCS=5,700 psi						
45.0	R-8			100%	22%	45.7	Boring terminated at 45.7 feet					559.4	
50.0													

Remarks:



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/29/24
 Date Completed: 5/30/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-3**
 Ground Elev.: 629.75

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: black; margin-right: 5px;"></div> Shelby Tube </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; border: 1px solid black; margin-right: 5px;"></div> Core Sample </div> </div> <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; border: 1px solid black; margin-right: 5px; position: relative;"> X </div> Standard Split Spoon </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; border: 1px solid black; margin-right: 5px; position: relative;"> X </div> Auger Probe </div> </div> </div>		Water Level Upon Completion <u>6.1 ft.</u>	Water Level After 24 Hours <u>7.1 ft.</u>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							MATERIAL DESCRIPTION							
	S-1	X	4-2-3 PP: 1.5-2.0	60%		0.7	TOPSOIL Brown CLAY , little sand, moist, low to medium plasticity, stiff, alluvium						629.1	
	S-2	X	4-4-8 PP: 2.0	80%		5.0								
5.0	S-3	X	8-12-13 PP: >4	67%		5.0	Tan, brown, and gray CLAY , little to some sand, trace to little gravel, damp, saprolitic, hard, residuum - Micaceous from 10 feet - Red from 15 feet					624.8		
	S-4	X	25-34-40 PP: >4	100%										
10.0	S-5	X	15-23-27 PP: >4	67%										
15.0	S-6	X	8-10-13 PP: >4	80%								608.8		
20.0	S-7	X	25-48-50/0.2 PP: >4	83%		21.9	Brown and gray CLAYSTONE , damp, very dense, weathered bedrock Brown, gray, and tan CLAYSTONE , few shale interbeds, weathered to highly weathered, very broken to broken, moderate fracture planes, very soft to medium hard					608.6		
	R-1	█		100%	0%									
25.0				100%	0%									

Remarks: Boring offset 7 feet to the east due to tree and driller needing room to work.

TEST BORING LOG

Project Number: **04-23-0374**

Project Name: **Marshall CF4 Tunnel Design**

Boring No.: **B-3**

Logger: CW

Boring Location: See Boring Location Plan

Date Started: 5/29/24

Drill/Method: CME-55

Date Completed: 5/30/24

Driller: HL (TRIAD)

Ground Elev.: 629.75

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-around; font-size: small;"> <div style="display: flex; align-items: center;"> Shelby Tube </div> <div style="display: flex; align-items: center;"> Standard Split Spoon </div> <div style="display: flex; align-items: center;"> Core Sample </div> <div style="display: flex; align-items: center;"> Auger Probe </div> </div>		Water Level Upon Completion ▼ 6.1 ft.	Water Level After 24 Hours ▼ 7.1 ft.	RQD (Strata)	Water Level	Graphic Log	Strata Elevation				
							MATERIAL DESCRIPTION											
	R-2			100%	0%													
30.0																		
	R-3			86%	0%													
35.0																		
	R-4			100%	0%													
40.0						38.8												591.0
	R-5			100%	54%													
45.0																		
	R-6			100%	44%													
50.0						48.0												581.8
						49.6												580.2
				84%	22%													

Brown, gray, and tan **CLAYSTONE**, few shale interbeds, weathered to highly weathered, very broken to broken, moderate fracture planes, very soft to medium hard (continued)

Gray interbedded **CLAYSTONE** and **SHALE**, few sandstone interbeds, fissile, slightly weathered to highly weathered, very broken to broken, flat to moderate fracture planes, very soft to soft

- From 45.8 to 46.3 feet: UCS=1,953 psi

Tan and gray **SANDSTONE**, weathered, very broken to broken, flat to moderate fracture, hard
- From 48.5 to 48.8 feet: UCS=7,720 psi

Remarks: Boring offset 7 feet to the east due to tree and driller needing room to work.



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/29/24
 Date Completed: 5/30/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-3**
 Ground Elev.: 629.75

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-around; font-size: small;"> <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> Shelby Tube </div> <div style="display: flex; align-items: center;"> Core Sample </div> </div> <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> Standard Split Spoon </div> <div style="display: flex; align-items: center;"> Auger Probe </div> </div> </div>		Water Level Upon Completion <u>6.1 ft.</u>	Water Level After 24 Hours <u>7.1 ft.</u>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							MATERIAL DESCRIPTION							
55.0	R-7			84%	22%	55.8	- From 48.8 to 49.1 feet: UCS=9,664 psi Gray interbedded CLAYSTONE and SHALE , few sandstone interbeds, fissile, slightly weathered to highly weathered, very broken to broken, flat to moderate fracture planes, very soft to soft (continued) - From 52.2 to 52.8 feet: UCS=244 psi		26%			574.0		
60.0	R-8			98%	50%	56.8	Gray SILTSTONE , weathered, very broken to broken, flat to moderate fracture planes, medium hard to hard - From 55.8 to 56.8 feet: UCS=5,062 psi, CAI=0.7 Gray SANDSTONE , fresh to slightly weathered, very broken to blocky, flat fracture planes, hard - From 57.6 to 58.1 feet: UCS=8,004 psi - From 58.3 to 58.5 feet: CAI=1.5 - From 59.0 to 59.6 feet: UCS=7,428 psi		90%			573.0		
65.0	R-9			98%	94%		- From 62.8 to 63.3 feet: UCS=7,606 psi		73%					
65.0	R-10			100%	90%	65.8	Boring terminated at 65.8 feet					564.0		
70.0														
75.0														

Remarks: Boring offset 7 feet to the east due to tree and driller needing room to work.



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/22/24
 Date Completed: 5/24/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-4**
 Ground Elev.: 652.75

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 40%;"> <p> Shelby Tube</p> <p> Core Sample</p> </div> <div style="width: 40%;"> <p> Standard Split Spoon</p> <p> Auger Probe</p> </div> </div>		Water Level Upon Completion <u>6.8 ft.</u>	Water Level After 24 Hours <u>9.3 ft.</u>	RQD (Strata)	Water Level	Graphic Log	Strata Elevation		
							MATERIAL DESCRIPTION									
						0.3	TOPSOIL									652.5
	S-1	X	3-6-4	60%			Tan and brown SAND and CLAY , moist, loose, alluvium									
	S-2	X	11-10-10 PP: >4	93%		2.5	Tan, gray, and orange CLAY , little to some sand, trace to little gravel, damp, saprolitic, micaceous, low plasticity, hard, residuuum									650.3
5.0	S-3	X	36-50/0.5 PP: >4	90%												
	S-4	X	15-22-32 PP: >4	93%												
10.0	S-5	X	10-22-27 PP: >4	80%												
15.0	S-6	X	19-14-15 PP: >4	67%												
20.0	S-7	X	17-46-50/0.3 PP: >4	77%		21.0	Gray, brown, and red CLAYSTONE , dry, very dense, weathered bedrock									631.8
25.0																

Remarks:

TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/22/24
 Date Completed: 5/24/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-4**
 Ground Elev.: 652.75

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> <div> Shelby Tube Core Sample </div> <div> Standard Split Spoon Auger Probe </div> <div> Water Level Upon Completion <u>6.8 ft.</u> Water Level After 24 Hours <u>9.3 ft.</u> </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							MATERIAL DESCRIPTION						
	S-8	⊗	50/0.3	100%		25.3							627.5
	R-1			100%	0%		Brown, gray, and red interbedded CLAYSTONE and SILTSTONE , weathered to highly weathered, very broken to broken, hackly fracture planes, very soft to medium hard						
	R-2			58%	0%								
30.0	R-3			100%	0%								
35.0	R-4			100%	0%								
40.0	R-5			100%	0%								
45.0	R-6			88%	0%								
50.0				98%	0%								

Remarks:

TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/22/24
 Date Completed: 5/24/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-4**
 Ground Elev.: 652.75

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> <div> Shelby Tube Core Sample </div> <div> Standard Split Spoon Auger Probe </div> <div> Water Level Upon Completion <u>6.8 ft.</u> Water Level After 24 Hours <u>9.3 ft.</u> </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION							
55.0	R-7			98%	0%		Brown, gray, and red interbedded CLAYSTONE and SILTSTONE , weathered to highly weathered, very broken to broken, hackly fracture planes, very soft to medium hard (continued)							
				100%	0%									
	R-8			100%	0%									
				89%	0%					- Mostly medium hard from 57.5 to 61.2 feet - From 58.1 to 58.5 feet: UCS=713 psi				
	R-9			89%	0%					- From 60.6 to 61.0 feet: UCS=529 psi				
				100%	0%									
	R-10			100%	0%	63.5	- From 62.8 to 63.2 feet: UCS=2,794 psi					589.3		
				100%	20%		Gray SILTSTONE , some gray shale interbeds, weathered to highly weathered, very broken to broken, hackly fracture planes, very soft to medium hard - From 63.9 to 64.4 feet: UCS=5,086 psi - From 65.8 to 66.1 feet: CAI=1.2							
	R-11			100%	20%									
				100%	50%	69.8	Gray interbedded SILTSTONE and CLAYSTONE , fissile, slightly weathered to weathered, broken, flat to shallow fracture planes, soft (claystone) to hard (siltstone) - From 69.8 to 70.2 feet: UCS=7,288 psi - From 72.0 to 72.5 feet: UCS=1,379 psi					583.0		
	R-12			100%	50%									
				98%	54%									
75.0														

Remarks:



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/22/24
 Date Completed: 5/24/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-4**
 Ground Elev.: 652.75

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> <div> Shelby Tube Core Sample </div> <div> Standard Split Spoon Auger Probe </div> <div> Water Level Upon Completion <u>6.8 ft.</u> Water Level After 24 Hours <u>9.3 ft.</u> </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							MATERIAL DESCRIPTION						
80.0	R-13			98%	54%	75.1	Gray SANDSTONE , fresh, blocky to slightly fractured, flat fracture planes, hard - From 75.1 to 75.8 feet: UCS=7,154 psi - Vertical fracturing at 76.0 feet - From 76.9 to 77.5 feet: UCS=6,238 psi			76%		577.7	
82.5	R-14			100%	100%	82.5				Boring terminated at 82.5 feet			
100.0													

Remarks:



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/28/24
 Date Completed: 5/29/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-5**
 Ground Elev.: 651.98

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> <div> Shelby Tube Core Sample </div> <div> Standard Split Spoon Auger Probe </div> <div> Water Level Upon Completion <u>5.7 ft.</u> Water Level After 24 Hours <u>8.4 ft.</u> </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation	
							MATERIAL DESCRIPTION							
	S-1	X	2-2-4 PP: 0.5	67%		2.5	Brown CLAY , some sand, moist, low to medium plasticity, medium stiff, fill					▾		649.5
	S-2	X	50-27-9 PP: >4	100%			Brown and tan CLAY , little sand, trace gravel, moist, saprolitic, micaceous, low plasticity, hard, residuum					▾		
5.0	S-3	X	6-7-11 PP: >4	60%								▾		
	S-4	X	18-15-17 PP: >4	80%								▾		
10.0	S-5	X	13-33-30 PP: >4	100%			- No longer micaceous from 10.0 feet					▾		
15.0	S-6	X	19-27-31 PP: >4	93%			- Red and tan from 15.0 feet					▾		
20.0	S-7	X	16-33-50/0.4 PP: >4	100%		21.0	Tan, red, and brown CLAYSTONE , moist, very dense, weathered bedrock					▾		631.0
25.0												▾		

Remarks: Boring offset 20 feet to the northwest due to instructions on BLP. Elevation estimated from Google Earth DEM data.



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/28/24
 Date Completed: 5/29/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-5**
 Ground Elev.: 651.98

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <p>■ Shelby Tube</p> <p>□ Core Sample</p> </div> <div style="width: 30%;"> <p>⊠ Standard Split Spoon</p> <p>⊠ Auger Probe</p> </div> <div style="width: 30%;"> <p>▼ Water Level Upon Completion <u>5.7 ft.</u></p> <p>▼ Water Level After 24 Hours <u>8.4 ft.</u></p> </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							MATERIAL DESCRIPTION						
30.0	S-8	⊠	50/0.2	100%		31.3	Tan, red, and brown CLAYSTONE , moist, very dense, weathered bedrock (continued)					620.7	
	S-9	⊠	26-46-50/0.3	100%									
35.0	R-1	■		100%	0%	- Gray from 49.4 feet	Gray, brown, and red CLAYSTONE , weathered to highly weathered, very broken to broken, hackly fracture planes, very soft to soft			0%	↑		
	R-2	■		100%	0%								
40.0	R-3	■		100%	0%								
	R-4	■		94%	0%								
45.0	R-5	■		88%	0%								
50.0		■		94%	0%								

Remarks: Boring offset 20 feet to the northwest due to instructions on BLP. Elevation estimated from Google Earth DEM data.



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/28/24
 Date Completed: 5/29/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-5**
 Ground Elev.: 651.98

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> <div> Shelby Tube Core Sample </div> <div> Standard Split Spoon Auger Probe </div> <div> Water Level Upon Completion <u>5.7 ft.</u> Water Level After 24 Hours <u>8.4 ft.</u> </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation
							MATERIAL DESCRIPTION						
55.0	R-6			94%	0%		Gray, brown, and red CLAYSTONE , weathered to highly weathered, very broken to broken, hackly fracture planes, very soft to soft (continued) - Very soft to medium hard from 51.0 feet - From 53.7 to 54.0 feet: UCS=1,846 psi - From 55.1 to 55.7 feet: Limestone interbed, UCS=6,347 psi	0%					
60.0	R-7			90%	0%	58.8	Gray interbedded CLAYSTONE and SILTSTONE , fissile, weathered, very broken to broken, flat fracture planes, very soft to soft - From 59.1 to 59.6 feet: UCS=1,829 psi - From 61.9 to 62.3 feet: UCS=2,590 psi - From 62.3 to 62.8 feet: CAI=0.9 - From 64.7 to 65.2 feet: UCS=4,075 psi - From 66.1 to 66.5 feet: UCS=3,729 psi	72%			593.2		
65.0	R-8			94%	56%								
70.0	R-9			100%	76%								
75.0	R-10			100%	86%								
	R-11			100%	0%	73.9	Boring terminated at 73.9 feet				578.1		

Remarks: Boring offset 20 feet to the northwest due to instructions on BLP. Elevation estimated from Google Earth DEM data.



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/22/24
 Date Completed: 5/22/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-6**
 Ground Elev.: 612.18

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						0.3	TOPSOIL Red, brown, and tan CLAY , little sand, little gravel, damp to moist, medium plasticity, stiff to very stiff, alluvium - From 2.5 to 4.0 feet: W=15.8%			611.9	
	S-1	X	2-2-2 PP: 1.0-1.5	67%						611.9	
	S-2	X	3-7-9 PP: 2.0	73%						611.9	
5.0						5.0	Red and brown CLAY , trace to little sand, trace gravel, damp to moist, medium plasticity, saprolitic, hard, residuum - From 5.0 to 6.5 feet: W=12.6%, LL=34, PL=22, PI=12, Gravel=0%, Sand=6%, Fines=94%, CL - From 7.5 to 9.0 feet: W=12.6%, LL=40, PL=23, PI=17, Gravel=2%, Sand=1%, Fines=97%, CL - From 10.0 to 11.5 feet: W=10.1%			607.2	
	S-3	X	12-18-19 PP: >4	53%						607.2	
	S-4	X	10-18-26 PP: >4	73%						607.2	
10.0										607.2	
	S-5	X	16-20-22 PP: >4	73%						607.2	
15.0										607.2	
	S-6	X	18-36-42 PP: >4	67%						607.2	
20.0						20.0	Tan and gray SHALE , dry, very dense, weathered bedrock			592.2	
	S-7	X	50/0.2	100%						592.2	
25.0						24.1	Boring terminated at 24.1 feet			588.1	
	S-8	X	50/0.1	100%						588.1	

Remarks: Boring offset 9.0 feet to the northeast due to utilities.
 Boring dry upon completion.



TEST BORING LOG

Project Number: **04-23-0374**
 Logger: CW
 Date Started: 5/21/24
 Date Completed: 5/21/24

Project Name: **Marshall CF4 Tunnel Design**
 Boring Location: See Boring Location Plan
 Drill/Method: CME-55
 Driller: HL (TRIAD)

Boring No.: **B-7**
 Ground Elev.: 601.70

Depth (feet)	Sample No.	Sample Type	Blow Counts	Recovery (%)	RQD (RUN)	Strata Depth (ft)	<div style="display: flex; justify-content: space-between; font-size: small;"> <div> Shelby Tube Core Sample </div> <div> Standard Split Spoon Auger Probe </div> <div> Water Level First Noted Water Level Upon Completion </div> </div>			RQD (Strata)	Water Level	Graphic Log	Strata Elevation		
							7.5 ft.	4.6 ft.	MATERIAL DESCRIPTION						
0.0	S-1	X	2-4-4 PP: 1.5-2.0	73%		0.3	TOPSOIL Brown and tan CLAY , little to some sand, trace to little gravel, moist, medium plasticity, soft to stiff, alluvium - From 0.0 to 1.5 feet: W=17.0% - From 2.5 to 4.0 feet: W=17.8%, LL=38, PL=21, PI=17, Gravel=4%, Sand=22%, Fines=74%, CL - From 5.0 to 6.5 feet: W=17.7%, LL=36, PL=22, PI=14, Gravel=14%, Sand=15%, Fines=71%, CL						601.4		
2.5	S-2	X	0-1-1 PP: 0.5	87%											
5.0	S-3	X	1-1-2 PP: 1.0	60%											
7.5	S-4	X	17-26-48 PP: >4	100%		7.5				Brown and tan CLAY , little sand, little gravel, moist to wet, hard, residuum - From 7.5 to 9.0 feet: W=17.5%					594.2
10.0	S-5	X	26-50/0.1 PP: >4	100%		10.5				Tan and gray SHALE , dry, very dense, weathered bedrock Gray and brown SHALE , some gray sandstone interbeds, fissile, weathered to highly weathered, very broken to broken, flat to shallow fracture planes, soft					591.2
15.0	R-2	█		98%	24%										
17.7	R-3	█		100%	80%										
20.0	Boring terminated at 20.2 feet														

Remarks:



APPENDIX C

Laboratory Testing

Triad Engineering, Inc.

Laboratory Testing

The samples obtained from the test borings were visually classified in the field by geotechnical engineering personnel from Triad. The recovered soils were further evaluated by laboratory testing. Laboratory soils tests were conducted in accordance with applicable ASTM Standards as listed below:

1. Moisture content tests were performed in accordance with ASTM D 2216.
2. Atterberg Limits tests, consisting of the liquid limit, plastic limit, and plasticity index, were performed in accordance with ASTM D 4318.
3. Sieve analyses with washed No. 200 sieve tests were performed in accordance with ASTM D 1140.
4. Hydrometer analyses were performed in accordance with ASTM D 422.
5. Rock core compression tests were performed in accordance with ASTM D 7012.
6. Cerchar Abrasivity tests were performed in accordance with ASTM D 7625.

A summary and details of the laboratory test results are included on the following pages of this appendix.

TRIAD ENGINEERING, INC.

LABORATORY DATA SUMMARY

SAMPLE ID	SAMPLE DEPTH (ft)	SAMPLE TYPE	NATURAL MOISTURE (%)	ATTERBERG LIMITS			GRADATION			USCS SOIL CLASS.	Unconfined Compressive Strength (PSI)	Cerchar Abrasivity Index (CAI)
				LL	PL	PI	% GRAVEL	% SAND	% FINES			
B-1	0.0 - 1.5	SS	11.0									
B-1	2.5 - 4.0	SS	11.9	27	20	7	10	25	65	CL-ML		
B-1	5.0 - 6.5	SS	5.1	30	19	11	20	27	53	CL		
B-1	7.5 - 9.0	SS	26.3									
B-1	10.0 - 11.5	SS	10.5									
B-6	2.5 - 4.0	SS	15.8									
B-6	5.0 - 6.5	SS	12.6	34	22	12	0	6	94	CL		
B-6	7.5 - 9.0	SS	12.6	40	23	17	2	1	97	CL		
B-6	10.0 - 11.5	SS	10.1									
B-6	15.0 - 16.5	SS	9.2	38	21	17	6	12	82	CL		
B-7	0.0 - 1.5	SS	17.0									
B-7	2.5 - 4.0	SS	17.8	38	21	17	4	22	74	CL		
B-7	5.0 - 6.5	SS	17.7	36	22	14	14	15	71	CL		
B-7	7.5 - 9.0	SS	17.5									
Rock Description												
B-2	26.7 - 27.3	RC									4306	
B-2	29.6 - 30.1	RC									7145	
B-2	30.7 - 31.2	RC									7348	
B-2	31.2 - 31.6	RC										1.9
B-2	33.7 - 34.1	RC									9943	
B-2	36.0 - 36.4	RC									5158	
B-2	39.3 - 39.8	RC									5700	
B-3	45.8 - 46.3	RC									1953	
B-3	48.5 - 48.8	RC									7720	
B-3	48.8 - 49.1	RC									9664	
B-3	52.2 - 52.8	RC									244	
B-3	55.8 - 56.8	RC									5062	0.7
B-3	57.6 - 58.1	RC									8004	
B-3	58.3 - 58.5	RC										1.5
B-3	59.0 - 59.6	RC									7428	
B-3	62.8 - 63.3	RC									7606	
B-4	58.1 - 58.5	RC									713	
B-4	60.6 - 61.0	RC									529	
B-4	62.8 - 63.2	RC									2794	
B-4	63.9 - 64.4	RC									5086	
B-4	65.8 - 66.1	RC										1.2
B-4	69.8 - 70.2	RC									7288	
B-4	72.0 - 72.5	RC									1379	
B-4	75.1 - 75.8	RC									7154	
B-4	76.9 - 77.5	RC									6238	
B-5	53.7 - 54.0	RC									1846	
B-5	55.1 - 55.7	RC									6347	
B-5	59.1 - 59.6	RC									1829	
B-5	61.9 - 62.3	RC									2590	
B-5	62.3 - 62.8	RC										0.9
B-5	64.7 - 65.2	RC									4075	
B-5	66.1 - 66.5	RC									3729	

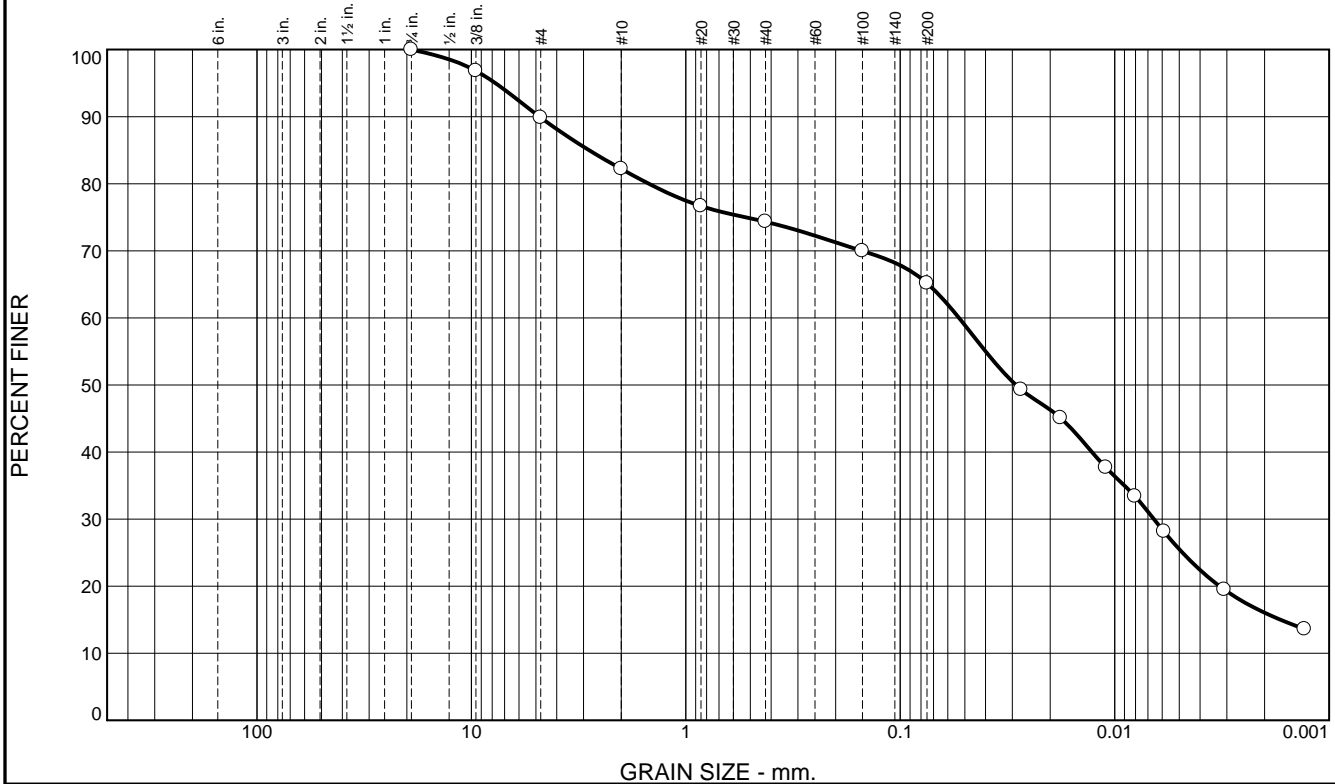


Notes: 1) Soil tests performed in accordance with recognized ASTM testing standards.
 2) SS = Split Spoon
 RC = Rock Core
 3) Rock Description based on boring logs and labs

PROJECT NUMBER: 04-23-0374
PROJECT NAME: Marshall CF4 Tunnel Design
LOCATION: Cabell County, West Virginia

FIG. C-1

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	10	8	8	9	39	26

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100		
3/8"	97		
#4	90		
#10	82		
#20	77		
#40	74		
#100	70		
#200	65		
0.0273 mm.	49		
0.0179 mm.	45		
0.0110 mm.	38		
0.0080 mm.	33		
0.0059 mm.	28		
0.0031 mm.	19		
0.0013 mm.	14		

Soil Description

BROWN SANDY SILTY CLAY

Atterberg Limits

PL= 20 LL= 27 PI= 7

Coefficients

D₈₅= 4.8131 D₆₀= 0.0532
D₅₀= 0.0289 D₃₀= 0.0066 D₁₅= 0.0017
D₁₀= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(3)

Remarks

* (no specification provided)

Location: B-1 Sample Number: S-2 Depth: 2.5' - 4.0'

Date: 7/16/24

Triad Engineering, Inc.

Client: DLZ OHIO INC
Project: CF-4 TUNNEL DESIGN

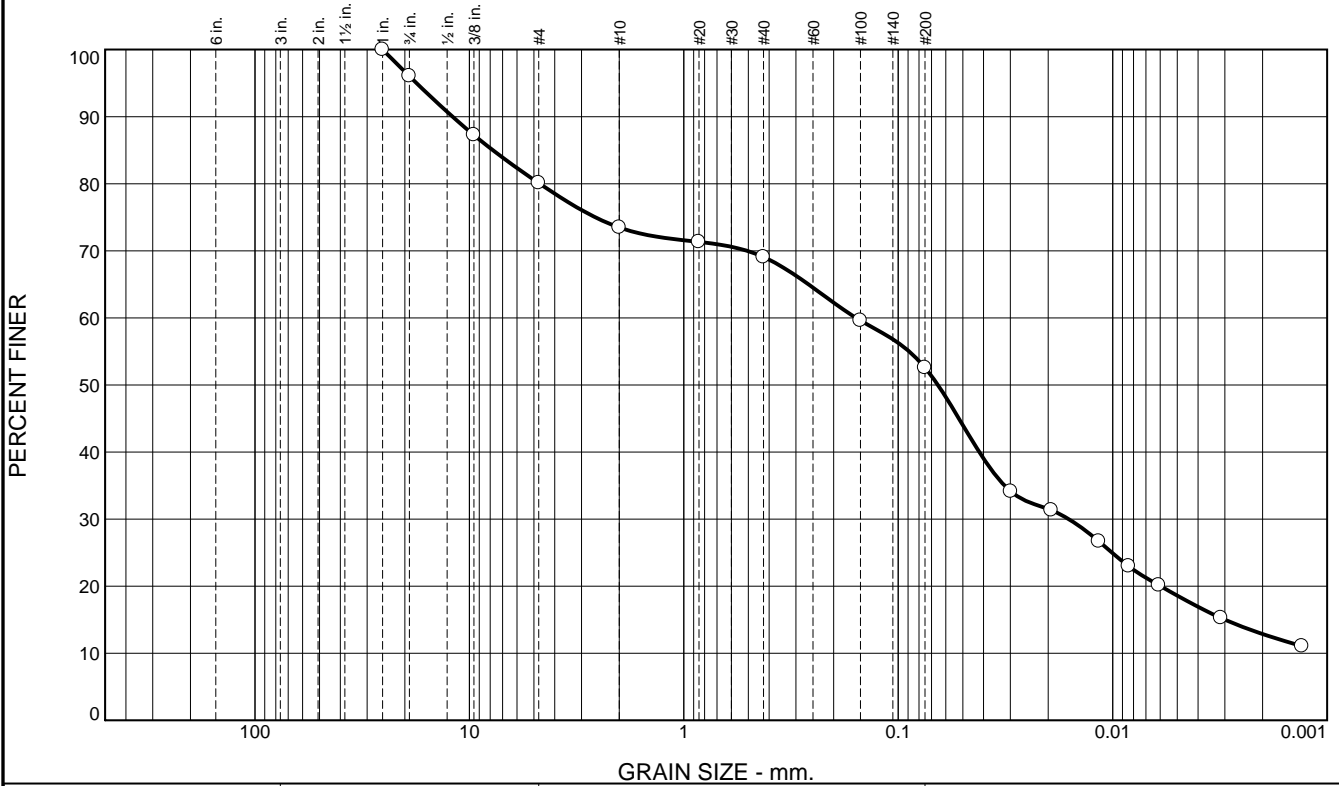
St. Albans, WV

Project No: 04-23-0374

Figure C-2

Tested By: NRC Checked By: BRETT MORRIS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	16	7	4	16	34	19

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0"	100		
3/4"	96		
3/8"	87		
#4	80		
#10	73		
#20	71		
#40	69		
#100	60		
#200	53		
0.0298 mm.	34		
0.0193 mm.	31		
0.0116 mm.	27		
0.0084 mm.	23		
0.0061 mm.	20		
0.0031 mm.	15		
0.0013 mm.	11		

Soil Description
REDDISH BROWN SANDY LEAN CLAY WITH GRAVEL

Atterberg Limits
 PL= 19 LL= 30 PI= 11

Coefficients
 D₉₀= 11.9826 D₈₅= 7.7641 D₆₀= 0.1571
 D₅₀= 0.0654 D₃₀= 0.0160 D₁₅= 0.0030
 D₁₀= C_u= C_c=

Classification
 USCS= CL AASHTO= A-6(3)

Remarks

* (no specification provided)

Location: B-1 Sample Number: S-3 Depth: 5.0' - 6.5' Date: 7/16/24

Triad Engineering, Inc.

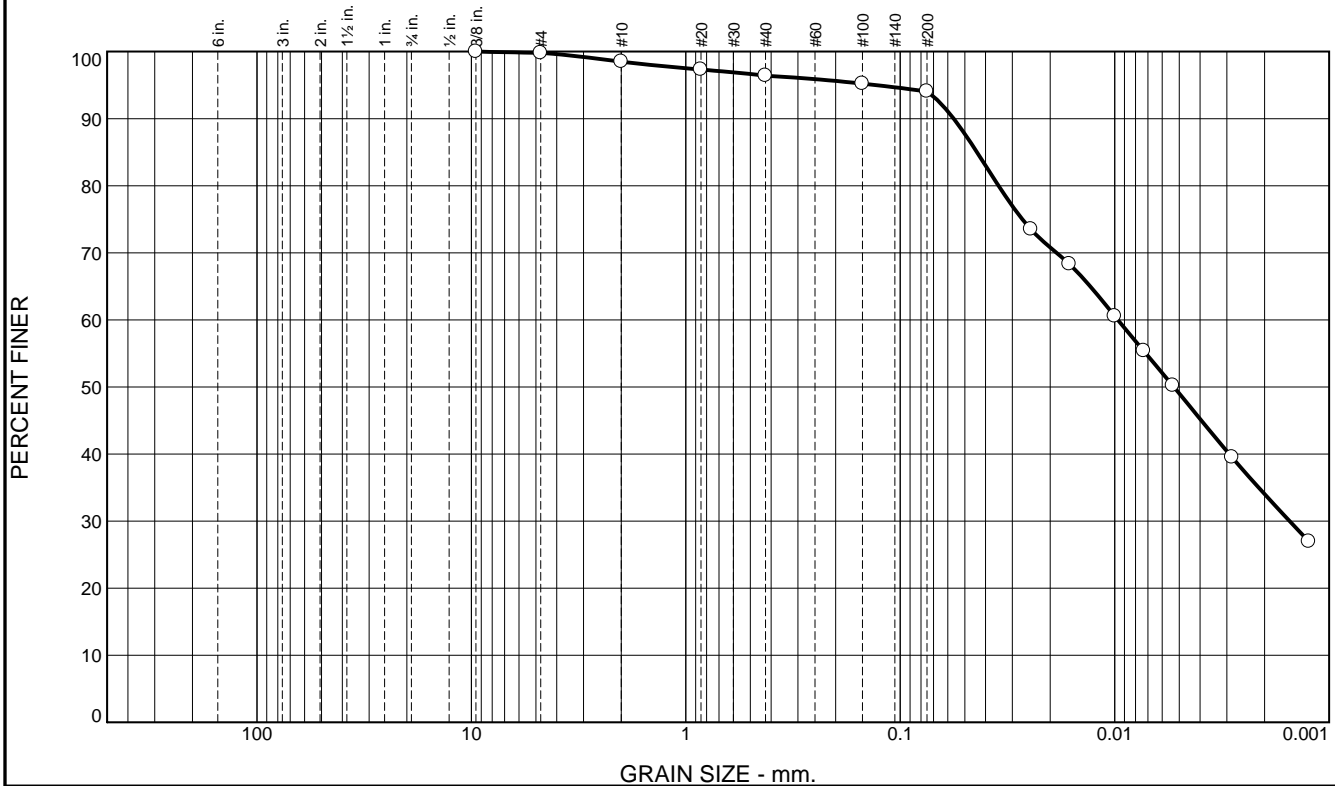
St. Albans, WV

Client: DLZ OHIO INC
 Project: CF-4 TUNNEL DESIGN
 Project No: 04-23-0374

Figure C-2

Tested By: NRC Checked By: BRETT MORRIS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	0	2	2	2	45	49

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100		
#4	100		
#10	98		
#20	97		
#40	96		
#100	95		
#200	94		
0.0246 mm.	74		
0.0163 mm.	68		
0.0100 mm.	61		
0.0073 mm.	55		
0.0054 mm.	50		
0.0028 mm.	40		
0.0012 mm.	27		

Soil Description

REDDISH BROWN LEAN CLAY

Atterberg Limits

PL= 22 LL= 34 PI= 12

Coefficients

D₉₀= 0.0564 D₈₅= 0.0439 D₆₀= 0.0097
D₅₀= 0.0053 D₃₀= 0.0015 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(12)

Remarks

* (no specification provided)

Location: B-6 Sample Number: S-3 Depth: 5.0' - 6.5'

Date: 7/16/24

Triad Engineering, Inc.

Client: DLZ OHIO INC
Project: CF-4 TUNNEL DESIGN

St. Albans, WV

Project No: 04-23-0374

Figure C-2

Tested By: NRC Checked By: BRETT MORRIS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	2	0	0	1	43	54

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100		
3/8"	98		
#4	98		
#10	98		
#20	98		
#40	98		
#100	98		
#200	97		
0.0246 mm.	75		
0.0161 mm.	71		
0.0097 mm.	65		
0.0071 mm.	60		
0.0052 mm.	55		
0.0028 mm.	43		
0.0012 mm.	29		

Soil Description

REDDISH BROWN LEAN CLAY

Atterberg Limits

PL= 23 LL= 40 PI= 17

Coefficients

D₉₀= 0.0497 D₈₅= 0.0403 D₆₀= 0.0070
D₅₀= 0.0040 D₃₀= 0.0013 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(18)

Remarks

* (no specification provided)

Location: B-6 Sample Number: S-4 Depth: 7.5' - 9.0'

Date: 7/16/24

Triad Engineering, Inc.

Client: DLZ OHIO INC
Project: CF-4 TUNNEL DESIGN

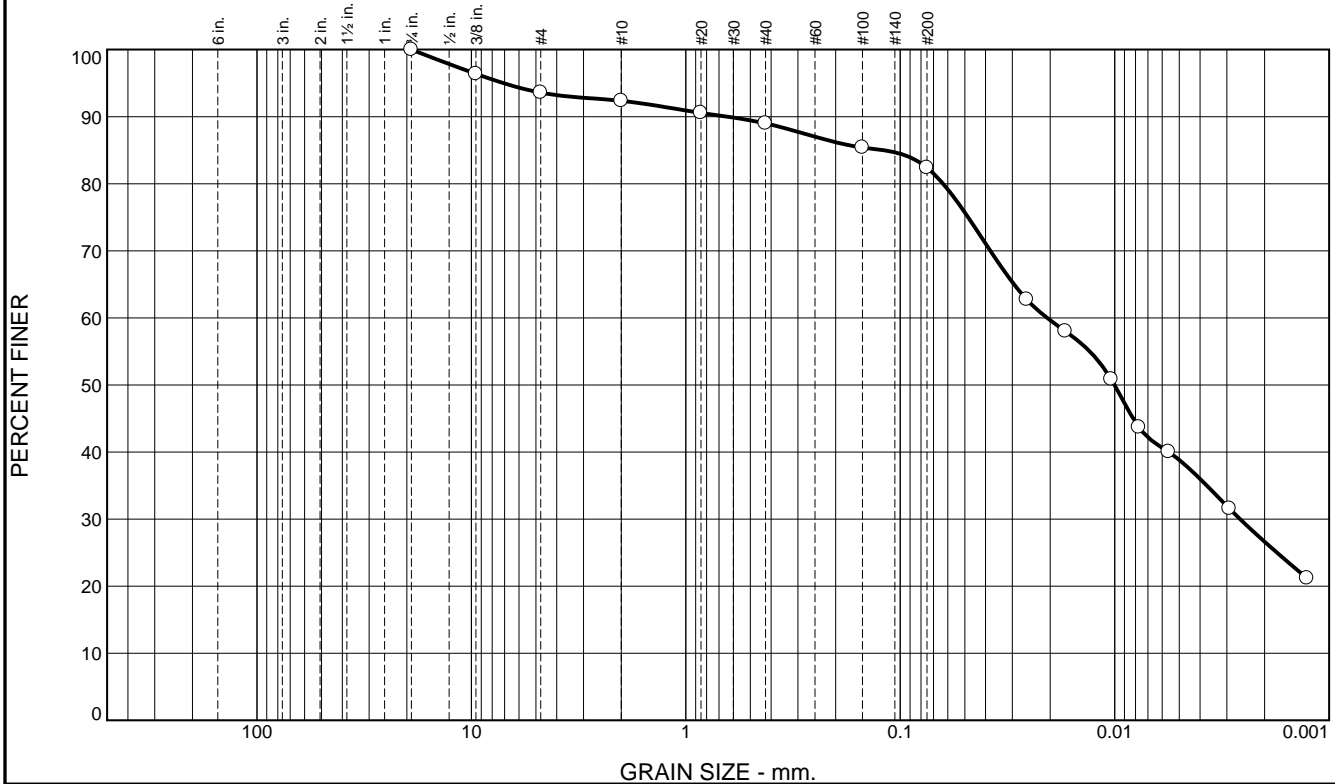
St. Albans, WV

Project No: 04-23-0374

Figure C-2

Tested By: NRC Checked By: BRETT MORRIS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	6	2	3	7	43	39

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100		
3/8"	96		
#4	94		
#10	92		
#20	91		
#40	89		
#100	85		
#200	82		
0.0257 mm.	63		
0.0170 mm.	58		
0.0104 mm.	51		
0.0077 mm.	44		
0.0056 mm.	40		
0.0029 mm.	32		
0.0013 mm.	21		

Soil Description
TANNISH BROWN LEAN CLAY WITH SAND

Atterberg Limits
 PL= 21 LL= 38 PI= 17

Coefficients
 D₉₀= 0.6432 D₈₅= 0.1200 D₆₀= 0.0207
 D₅₀= 0.0100 D₃₀= 0.0026 D₁₅=
 D₁₀= C_u= C_c=

Classification
 USCS= CL AASHTO= A-6(14)

Remarks

* (no specification provided)

Location: B-6 Sample Number: S-6 Depth: 15.0' - 16.5' Date: 7/16/24

Triad Engineering, Inc.

St. Albans, WV

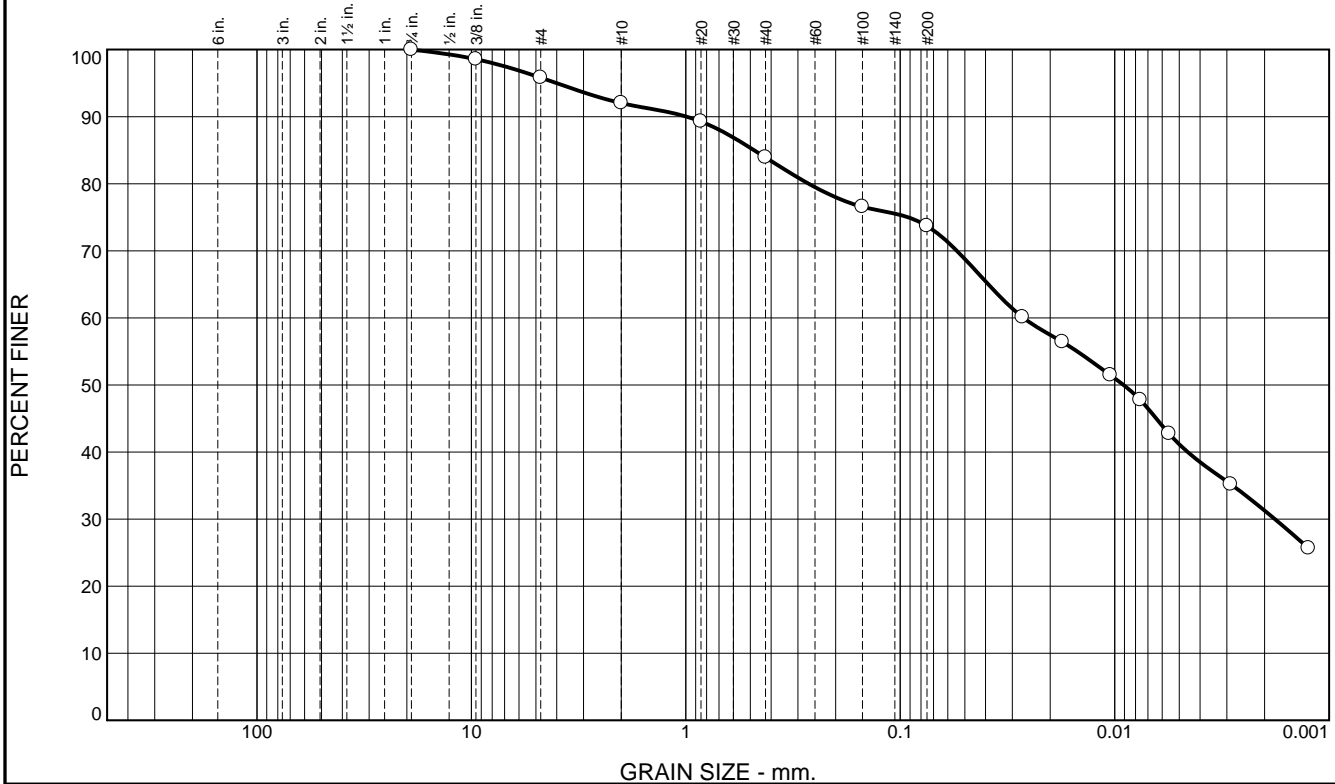
Client: DLZ OHIO INC
Project: CF-4 TUNNEL DESIGN

Project No: 04-23-0374

Figure C-2

Tested By: NRC Checked By: BRETT MORRIS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	4	4	8	10	33	41

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100		
3/8"	99		
#4	96		
#10	92		
#20	89		
#40	84		
#100	77		
#200	74		
0.0269 mm.	60		
0.0175 mm.	56		
0.0105 mm.	51		
0.0076 mm.	48		
0.0056 mm.	43		
0.0029 mm.	35		
0.0012 mm.	26		

Soil Description

BROWN LEAN CLAY WITH SAND

Atterberg Limits

PL= 21 LL= 38 PI= 17

Coefficients

D₉₀= 0.9911 D₈₅= 0.4804 D₆₀= 0.0266
D₅₀= 0.0091 D₃₀= 0.0018 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(12)

Remarks

* (no specification provided)

Location: B-7 Sample Number: S-2 Depth: 2.5' - 4.0'

Date: 7/16/24

Triad Engineering, Inc.

Client: DLZ OHIO INC
Project: CF-4 TUNNEL DESIGN

St. Albans, WV

Project No: 04-23-0374

Figure C-2

Tested By: NRC Checked By: BRETT MORRIS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	3	11	4	5	6	32	39

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0"	100		
3/4"	97		
3/8"	90		
#4	86		
#10	82		
#20	80		
#40	77		
#100	73		
#200	71		
0.0253 mm.	59		
0.0167 mm.	55		
0.0102 mm.	48		
0.0074 mm.	45		
0.0055 mm.	41		
0.0028 mm.	33		
0.0012 mm.	25		

Soil Description

BROWN LEAN CLAY WITH SAND

Atterberg Limits

PL= 22 LL= 36 PI= 14

Coefficients

D₉₀= 9.2543 D₈₅= 3.5883 D₆₀= 0.0273
D₅₀= 0.0117 D₃₀= 0.0021 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(9)

Remarks

* (no specification provided)

Location: B-7 Sample Number: S-3 Depth: 5.0' - 6.5' Date: 7/16/24

Triad Engineering, Inc. St. Albans, WV	Client: DLZ OHIO INC Project: CF-4 TUNNEL DESIGN Project No: 04-23-0374
Figure C-2	

Tested By: NRC Checked By: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



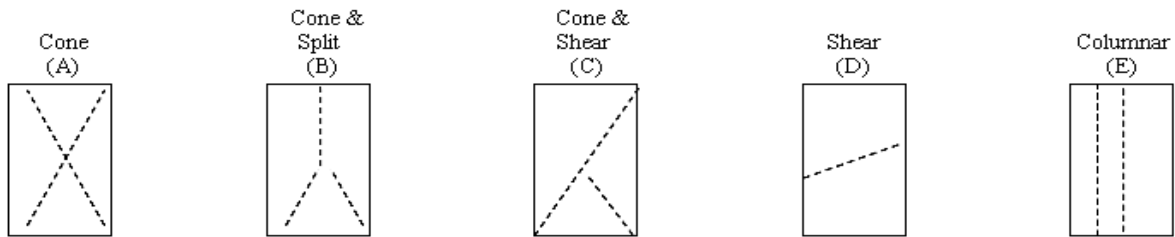
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-2 Depth: 26.7' - 27.3'
 Sample Description: BROWN SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.979	1.946
#2	3.976	1.948
#3	3.977	1.949
Avg.	3.977	1.948

Length to Diameter Ratio :	<u>2.04</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9793</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>12830</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>4306</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>310</u> tons/ft ²	Deformation Rate:	<u>103</u> s
Corrected Strength :	<u>4306</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>310</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



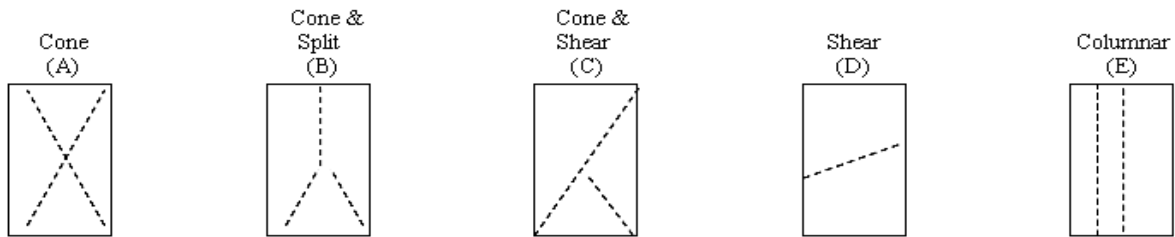
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-2 Depth: 29.6' - 30.1'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	4.005	1.955
#2	4.007	1.953
#3	4.006	1.953
Avg.	4.006	1.954

Length to Diameter Ratio :	<u>2.05</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9977</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>21420</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>7145</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>514</u> tons/ft ²	Deformation Rate:	<u>116</u> s
Corrected Strength :	<u>7145</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>514</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



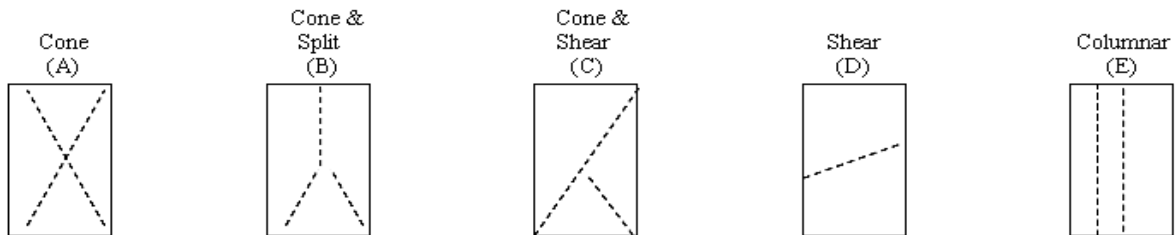
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-2 Depth: 30.7' - 31.2'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.962	1.953
#2	3.962	1.953
#3	3.964	1.954
Avg.	3.963	1.953

Length to Diameter Ratio :	<u>2.03</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9967</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>22020</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>7348</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>529</u> tons/ft ²	Deformation Rate:	<u>118</u> s
Corrected Strength :	<u>7348</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>529</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS Figure C

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



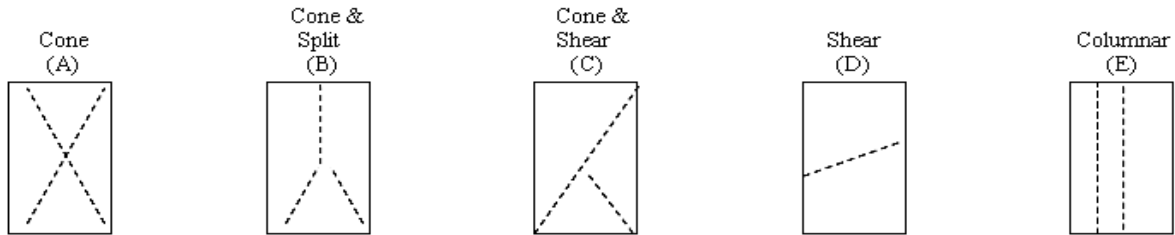
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-2 Depth: 33.7' - 34.1'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.905	1.958
#2	3.902	1.958
#3	3.903	1.958
Avg.	3.903	1.958

Length to Diameter Ratio :	<u>1.99</u>	Correction Factor:	<u>1</u>
Area:	<u>3.0110</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>29940</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>9943</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>716</u> tons/ft ²	Deformation Rate:	<u>121</u> s
Corrected Strength :	<u>9943</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>716</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



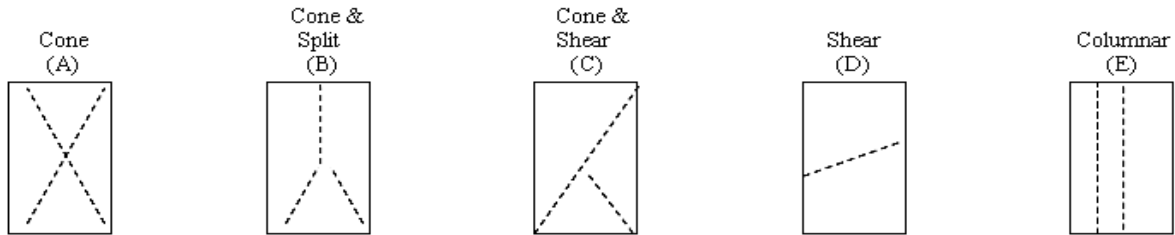
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-2 Depth: 36.0' - 36.4'
 Sample Description: GRAY SILTSTONE

Measurements (inches)		
	Length	Diameter
#1	3.985	1.944
#2	3.983	1.944
#3	3.986	1.944
Avg.	3.985	1.944

Length to Diameter Ratio :	<u>2.05</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9681</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>15310</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>5158</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>371</u> tons/ft ²	Deformation Rate:	<u>114</u> s
Corrected Strength :	<u>5158</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>371</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS Figure C

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



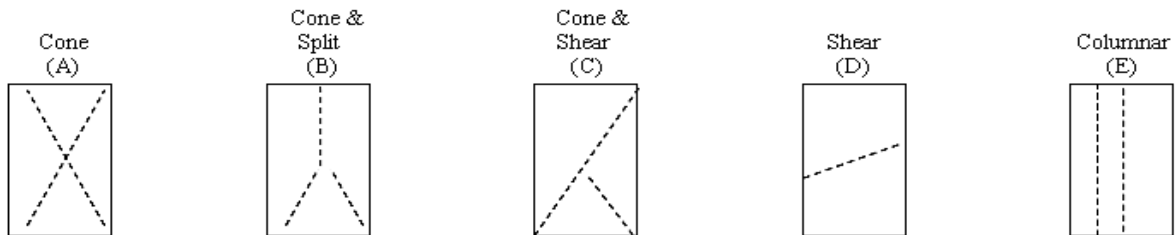
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-2 Depth: 39.3' - 39.8'
 Sample Description: DARK GRAY SHALE

Measurements (inches)		
	Length	Diameter
#1	4.084	1.949
#2	4.083	1.952
#3	4.086	1.947
Avg.	4.084	1.949

Length to Diameter Ratio :	<u>2.10</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9844</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>17010</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>5700</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>410</u> tons/ft ²	Deformation Rate:	<u>116</u> s
Corrected Strength :	<u>5700</u> lbs/in ²	Type of Break:	<u>D</u>
Corrected Strength :	<u>410</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS Figure C

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



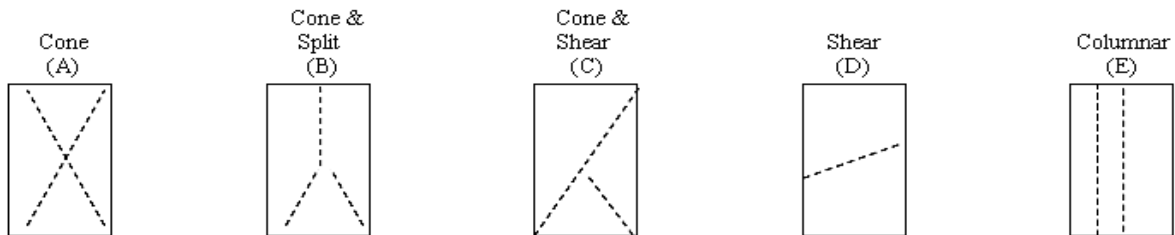
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 45.8' - 46.3'
 Sample Description: GRAY CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	4.230	1.955
#2	4.234	1.952
#3	4.233	1.956
Avg.	4.232	1.954

Length to Diameter Ratio :	<u>2.17</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9998</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>5860</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>1953</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>141</u> tons/ft ²	Deformation Rate:	<u>82</u> s
Corrected Strength :	<u>1953</u> lbs/in ²	Type of Break:	<u>D</u>
Corrected Strength :	<u>141</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



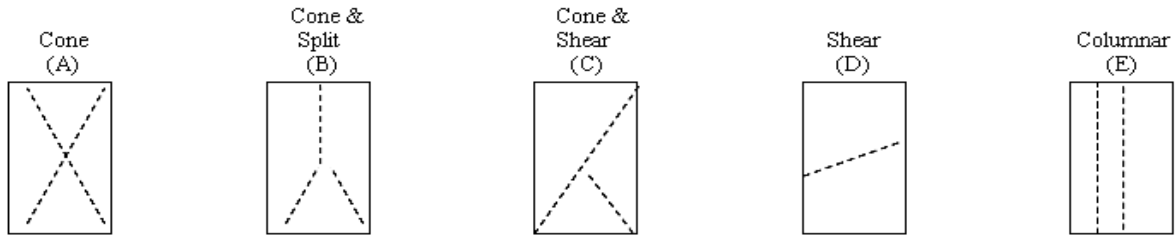
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 48.5' - 48.8'
 Sample Description: BROWN SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.045	1.966
#2	3.041	1.962
#3	3.042	1.964
Avg.	3.043	1.964

Length to Diameter Ratio :	<u>1.55</u>	Correction Factor:	<u>0.964</u>
Area:	<u>3.0295</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>24260</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>8008</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>577</u> tons/ft ²	Deformation Rate:	<u>113</u> s
Corrected Strength :	<u>7720</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>556</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



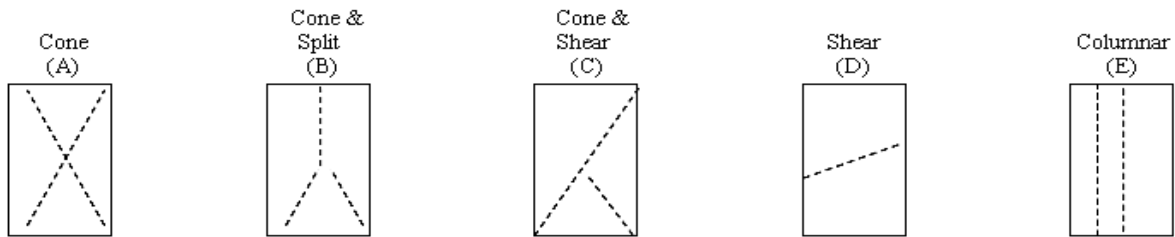
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 48.8' - 49.1'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	2.502	1.965
#2	2.498	1.961
#3	2.499	1.963
Avg.	2.500	1.963

Length to Diameter Ratio :	<u>1.27</u>	Correction Factor:	<u>0.932</u>
Area:	<u>3.0264</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>31380</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>10369</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>747</u> tons/ft ²	Deformation Rate:	<u>121</u> s
Corrected Strength :	<u>9664</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>696</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



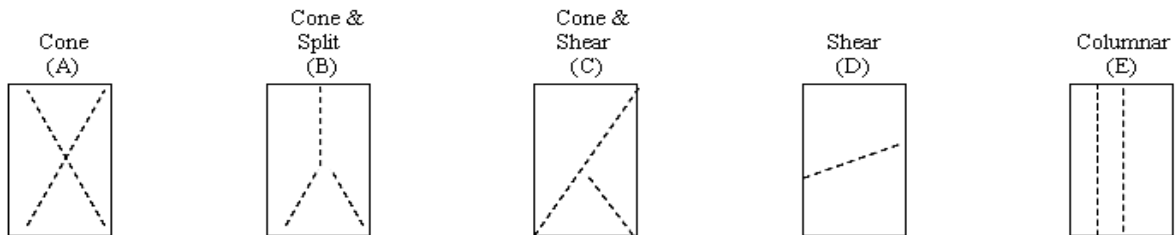
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 52.2' - 52.8'
 Sample Description: GRAY CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	2.628	2.044
#2	2.623	2.045
#3	2.625	2.047
Avg.	2.625	2.045

Length to Diameter Ratio :	<u>1.28</u>	Correction Factor:	<u>0.934</u>
Area:	<u>3.2856</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>860</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>262</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>19</u> tons/ft ²	Deformation Rate:	<u>74</u> s
Corrected Strength :	<u>244</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>18</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



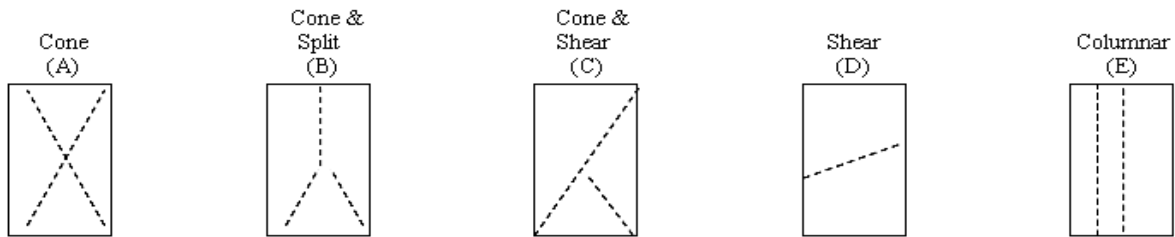
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 56.0' - 56.5'
 Sample Description: GRAY SILTSTONE

Measurements (inches)		
	Length	Diameter
#1	3.374	1.957
#2	3.370	1.955
#3	3.372	1.959
Avg.	3.372	1.957

Length to Diameter Ratio :	<u>1.72</u>	Correction Factor:	<u>0.978</u>
Area:	<u>3.0080</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>15570</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>5176</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>373</u> tons/ft ²	Deformation Rate:	<u>98</u> s
Corrected Strength :	<u>5062</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>364</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



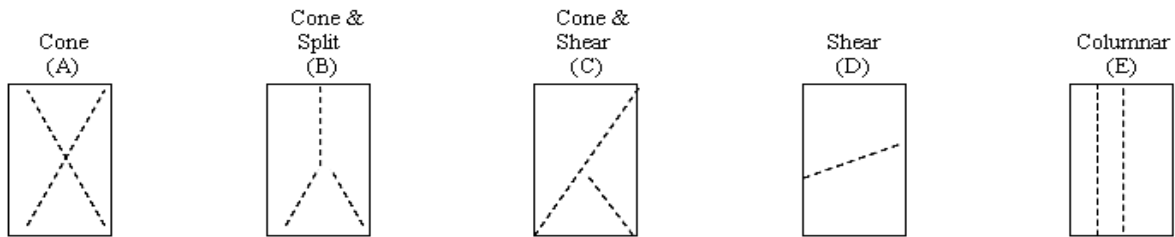
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 57.6' - 58.1'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.956	1.958
#2	3.953	1.954
#3	3.953	1.956
Avg.	3.954	1.956

Length to Diameter Ratio :	<u>2.02</u>	Correction Factor:	<u>1</u>
Area:	<u>3.0049</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>24050</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>8004</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>576</u> tons/ft ²	Deformation Rate:	<u>115</u> s
Corrected Strength :	<u>8004</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>576</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



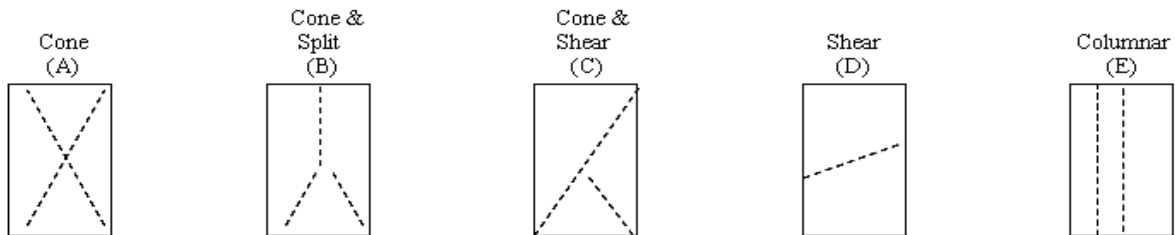
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 59.0' - 59.6'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.830	1.952
#2	3.827	1.951
#3	3.828	1.949
Avg.	3.828	1.951

Length to Diameter Ratio :	<u>1.96</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9885</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>22200</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>7428</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>535</u> tons/ft ²	Deformation Rate:	<u>112</u> s
Corrected Strength :	<u>7428</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>535</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



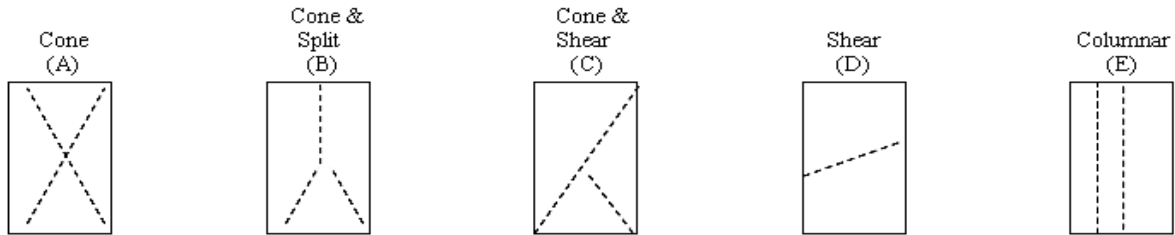
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-3 Depth: 62.8' - 63.3'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	4.046	1.948
#2	4.047	1.951
#3	4.044	1.953
Avg.	4.046	1.951

Length to Diameter Ratio :	<u>2.07</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9885</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>22730</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>7606</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>548</u> tons/ft ²	Deformation Rate:	<u>107</u> s
Corrected Strength :	<u>7606</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>548</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS Figure C

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



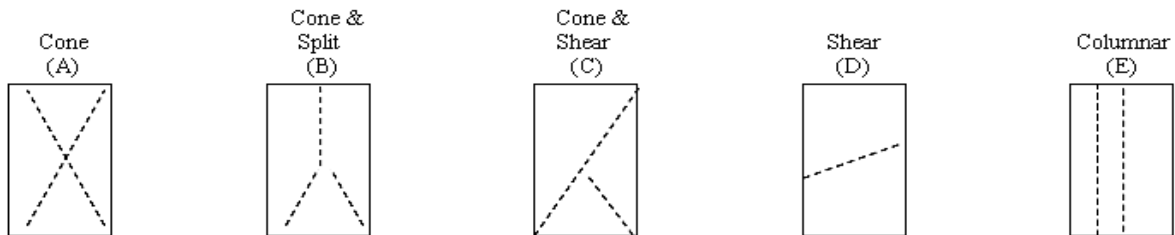
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 58.1' - 58.5'
 Sample Description: GRAY AND BROWN SILTSTONE AND CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	3.316	1.930
#2	3.310	1.925
#3	3.313	1.931
Avg.	3.313	1.929

Length to Diameter Ratio :	<u>1.72</u>	Correction Factor:	<u>0.978</u>
Area:	<u>2.9215</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>2130</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>729</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>52</u> tons/ft ²	Deformation Rate:	<u>82</u> s
Corrected Strength :	<u>713</u> lbs/in ²	Type of Break:	<u>D</u>
Corrected Strength :	<u>51</u> tons/ft ²		



Remarks: SHEARED ALONG LINE SEPARATING CLAYSTONE AND SILTSTONE

Tested by: NRC Checked by: BRETT MORRIS Figure C

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



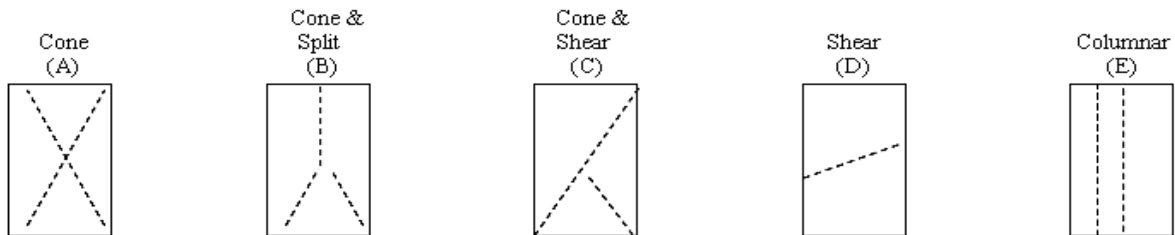
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 60.6' - 61.0'
 Sample Description: GRAY CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	2.967	1.933
#2	2.965	1.932
#3	2.969	1.932
Avg.	2.967	1.932

Length to Diameter Ratio :	<u>1.54</u>	Correction Factor:	<u>0.963</u>
Area:	<u>2.9326</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>1610</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>549</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>40</u> tons/ft ²	Deformation Rate:	<u>78</u> s
Corrected Strength :	<u>529</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>38</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



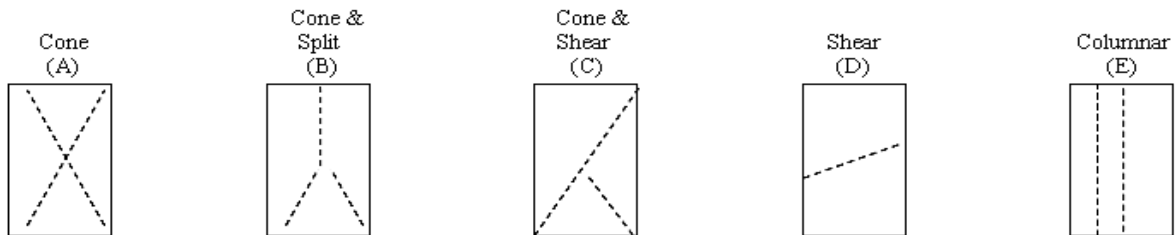
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 62.8' - 63.2'
 Sample Description: GRAY CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	3.681	1.956
#2	3.685	1.955
#3	3.682	1.955
Avg.	3.683	1.955

Length to Diameter Ratio :	<u>1.88</u>	Correction Factor:	<u>0.994</u>
Area:	<u>3.0028</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>8440</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>2811</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>202</u> tons/ft ²	Deformation Rate:	<u>95</u> s
Corrected Strength :	<u>2794</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>201</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



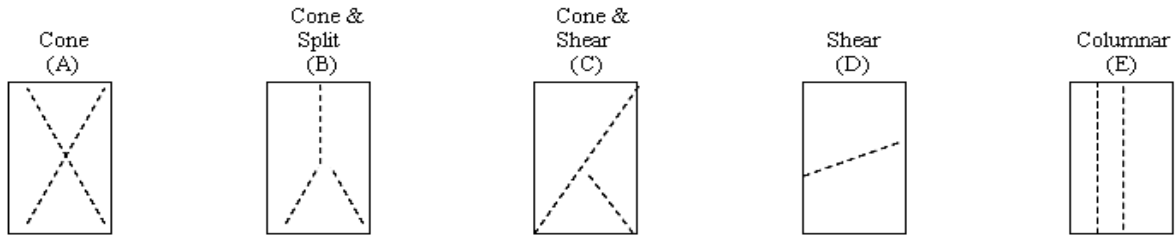
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 63.9' - 64.4'
 Sample Description: GRAY SILTSTONE

Measurements (inches)		
	Length	Diameter
#1	3.185	1.956
#2	3.188	1.956
#3	3.187	1.955
Avg.	3.187	1.956

Length to Diameter Ratio :	<u>1.63</u>	Correction Factor:	<u>0.97</u>
Area:	<u>3.0039</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>15750</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>5243</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>378</u> tons/ft ²	Deformation Rate:	<u>98</u> s
Corrected Strength :	<u>5086</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>366</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



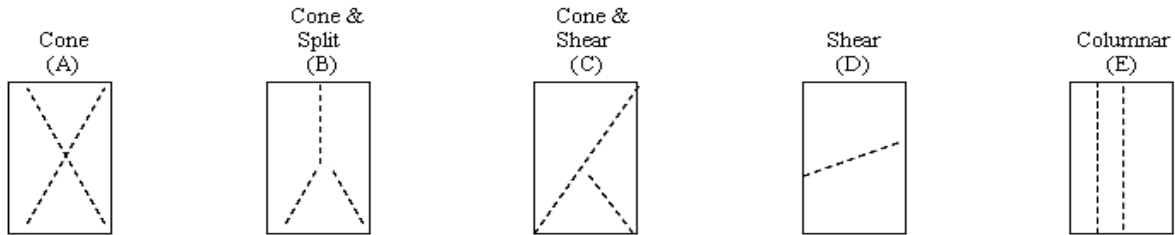
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 69.8' - 70.2'
 Sample Description: GRAY SILTSTONE

Measurements (inches)		
	Length	Diameter
#1	3.828	1.957
#2	3.826	1.959
#3	3.824	1.956
Avg.	3.826	1.957

Length to Diameter Ratio :	<u>1.95</u>	Correction Factor:	<u>1</u>
Area:	<u>3.0090</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>21930</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>7288</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>525</u> tons/ft ²	Deformation Rate:	<u>108</u> s
Corrected Strength :	<u>7288</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>525</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



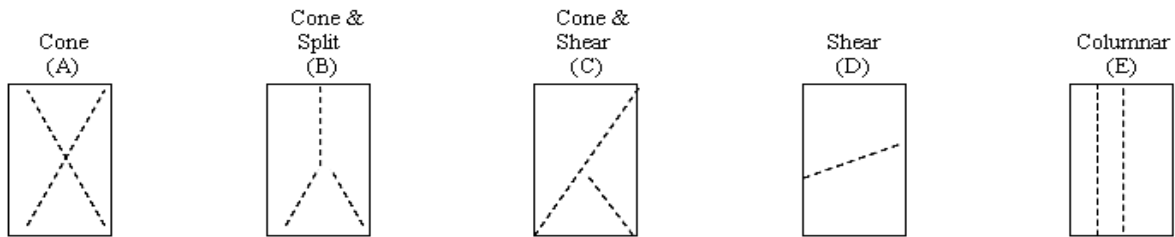
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 72.0' - 72.5'
 Sample Description: GRAYISH BROWN CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	3.916	1.959
#2	3.912	1.956
#3	3.914	1.957
Avg.	3.914	1.957

Length to Diameter Ratio :	<u>2.00</u>	Correction Factor:	<u>1</u>
Area:	<u>3.0090</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>4150</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>1379</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>99</u> tons/ft ²	Deformation Rate:	<u>87</u> s
Corrected Strength :	<u>1379</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>99</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



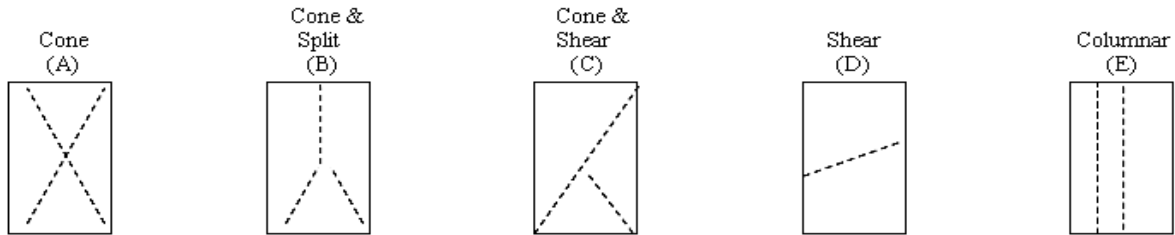
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 75.1' - 75.8'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.911	1.956
#2	3.909	1.957
#3	3.910	1.954
Avg.	3.910	1.956

Length to Diameter Ratio :	<u>2.00</u>	Correction Factor:	<u>1</u>
Area:	<u>3.0039</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>21490</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>7154</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>515</u> tons/ft ²	Deformation Rate:	<u>107</u> s
Corrected Strength :	<u>7154</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>515</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS Figure C

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



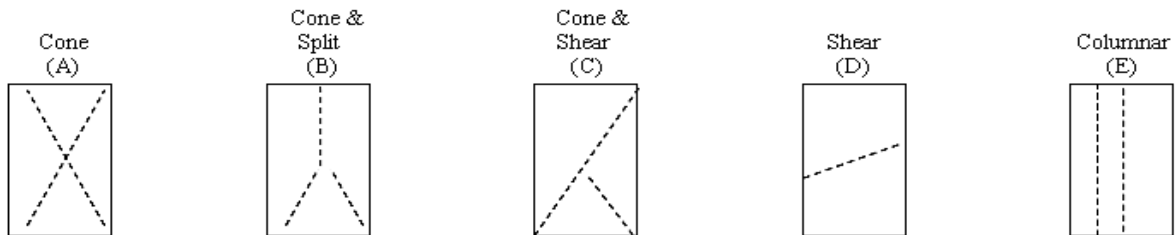
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-4 Depth: 76.9' - 77.5'
 Sample Description: GRAY SANDSTONE

Measurements (inches)		
	Length	Diameter
#1	3.919	1.940
#2	3.916	1.938
#3	3.914	1.942
Avg.	3.916	1.940

Length to Diameter Ratio :	<u>2.02</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9559</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>18440</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>6238</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>449</u> tons/ft ²	Deformation Rate:	<u>102</u> s
Corrected Strength :	<u>6238</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>449</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



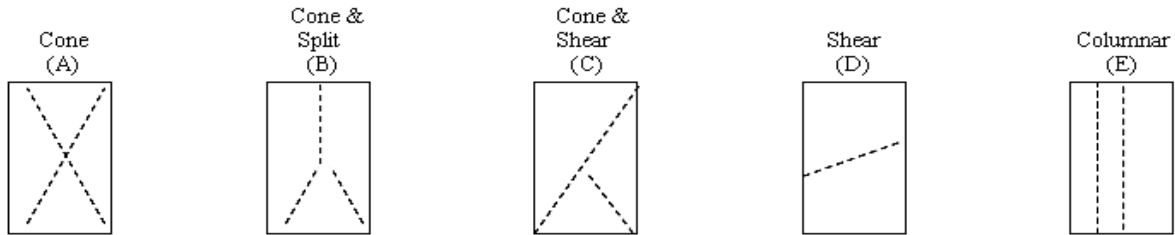
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-5 Depth: 53.7' - 54.0'
 Sample Description: GRAY CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	3.477	1.942
#2	3.476	1.942
#3	3.479	1.944
Avg.	3.477	1.943

Length to Diameter Ratio :	<u>1.79</u>	Correction Factor:	<u>0.984</u>
Area:	<u>2.9641</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>5560</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>1876</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>135</u> tons/ft ²	Deformation Rate:	<u>89</u> s
Corrected Strength :	<u>1846</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>133</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



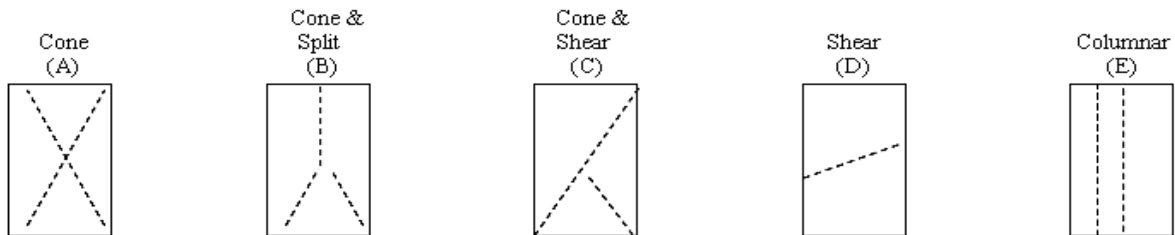
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-5 Depth: 55.1' - 55.7'
 Sample Description: GRAYISH BROWN LIMESTONE

Measurements (inches)		
	Length	Diameter
#1	3.999	1.960
#2	3.994	1.960
#3	3.996	1.960
Avg.	3.996	1.960

Length to Diameter Ratio :	<u>2.04</u>	Correction Factor:	<u>1</u>
Area:	<u>3.0172</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>19150</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>6347</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>457</u> tons/ft ²	Deformation Rate:	<u>105</u> s
Corrected Strength :	<u>6347</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>457</u> tons/ft ²		



Remarks: NORMAL HCL REACTION, FOSSIL FRAGMENTS PRESENT

Tested by: NRC Checked by: BRETT MORRIS Figure C

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



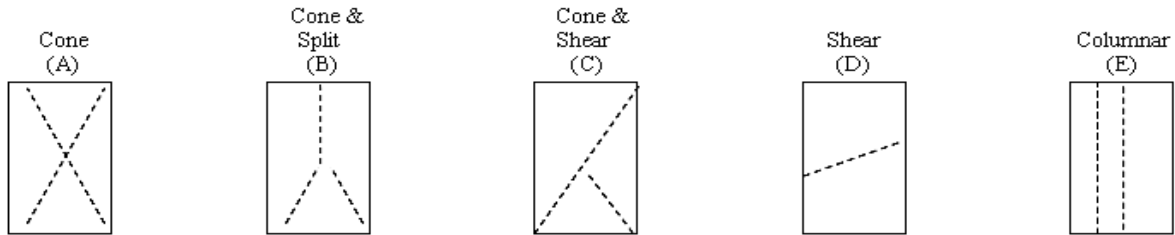
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-5 Depth: 59.1' - 59.6'
 Sample Description: GRAY CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	4.117	1.943
#2	4.115	1.943
#3	4.114	1.942
Avg.	4.115	1.943

Length to Diameter Ratio :	<u>2.12</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9641</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>5420</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>1829</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>132</u> tons/ft ²	Deformation Rate:	<u>90</u> s
Corrected Strength :	<u>1829</u> lbs/in ²	Type of Break:	<u>C</u>
Corrected Strength :	<u>132</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



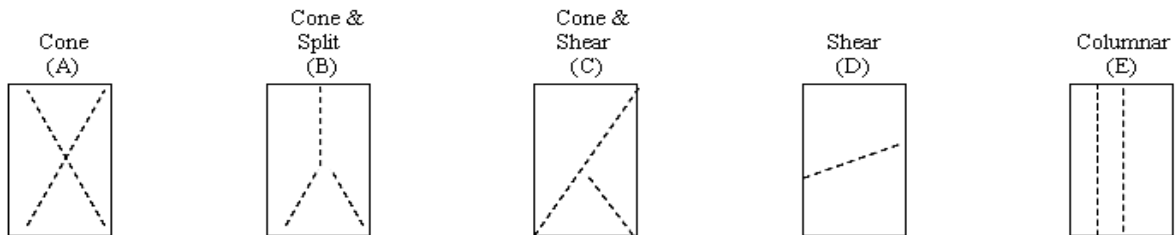
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-5 Depth: 61.9' - 62.3'
 Sample Description: GRAY CLAYSTONE

Measurements (inches)		
	Length	Diameter
#1	4.273	1.943
#2	4.271	1.948
#3	4.269	1.946
Avg.	4.271	1.946

Length to Diameter Ratio :	<u>2.20</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9732</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>7700</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>2590</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>186</u> tons/ft ²	Deformation Rate:	<u>92</u> s
Corrected Strength :	<u>2590</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>186</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



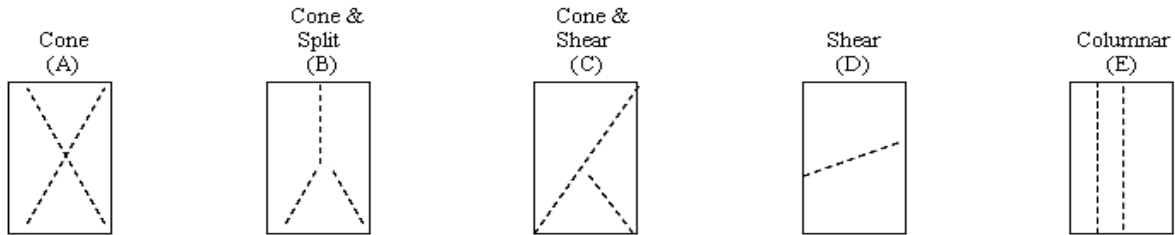
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-5 Depth: 64.7' - 65.2'
 Sample Description: GRAY SILTSTONE

Measurements (inches)		
	Length	Diameter
#1	3.799	1.940
#2	3.796	1.936
#3	3.797	1.938
Avg.	3.797	1.938

Length to Diameter Ratio :	<u>1.96</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9498</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>12020</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>4075</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>293</u> tons/ft ²	Deformation Rate:	<u>101</u> s
Corrected Strength :	<u>4075</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>293</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

TRIAD ENGINEERING, INC.
 10541 TEAYS VALLEY ROAD
 SCOTT DEPOT, WV 25560
 PHONE NO. (304) 755-0721
 FAX NO. (304) 755-1880



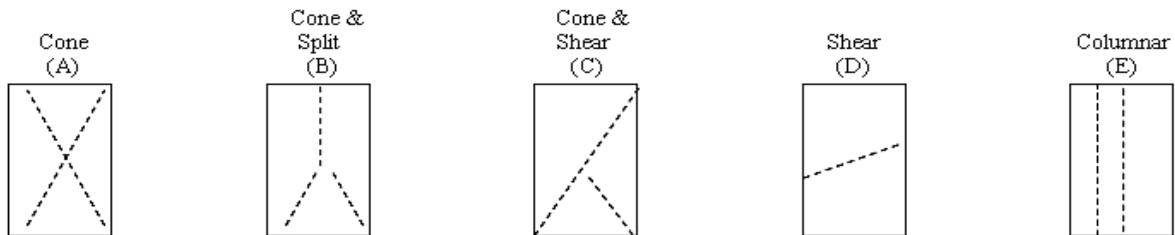
Rock Core Compressive Strength Worksheet

ASTM D7012

Project Name: CF-4 TUNNEL DESIGN
 Project # : 04-23-0374 Date : 7/16/2024
 Core # : B-5 Depth: 66.1' - 66.5'
 Sample Description: GRAY SILTSTONE

Measurements (inches)		
	Length	Diameter
#1	4.079	1.944
#2	4.081	1.946
#3	4.080	1.945
Avg.	4.080	1.945

Length to Diameter Ratio :	<u>2.10</u>	Correction Factor:	<u>1</u>
Area:	<u>2.9712</u> in ²	Flatness of Sample:	<u>FLAT</u>
Load:	<u>11080</u> lbs	Surface Straightness:	<u>STRAIGHT</u>
Compressive Strength:	<u>3729</u> lbs/in ²	Moisture Condition:	<u>DRY</u>
Compressive Strength:	<u>268</u> tons/ft ²	Deformation Rate:	<u>100</u> s
Corrected Strength :	<u>3729</u> lbs/in ²	Type of Break:	<u>B</u>
Corrected Strength :	<u>268</u> tons/ft ²		



Remarks: _____

Tested by: NRC Checked by: BRETT MORRIS

Earth Mechanics Institute

Client: Triad Engineering

Project: 765

Date: 7/10/2024



Colorado School of Mines

Mining Engineering Department

Cerchar Abrasivity Test

ASTM D7625

Sample ID	Rock Type	Cerchar Abrasivity Index (CAIs)*
B-2 31.2' - 31.6'	Sedimentary	1.89
B-3 55.8' - 56.8'	Sedimentary	0.70
B-3 58.3' - 58.5'	Sedimentary	1.45
B-4 65.8' - 66.1'	Sedimentary	1.24
B-5 62.3' - 62.8'	Sedimentary	0.87

* CERCHAR tests have been run on saw cut surface. No correction factor has been added to the results.



Pictures of Sample Before and After
Cerchar Abrasivity Index

Client Name: Triad Engineering
Project Name: CF4 Tunnel Design
Sample ID: B-2 31.2' - 31.6'

EMI# 765
Date: 7/10/2024



Before



After

Operator: DL, RA
Supervisor/QA: KZ
Principal Investigator: -

Date: 7/10/2024
Date: 7/18/2024
Date: -



Pictures of Sample Before and After
Cerchar Abrasivity Index

Client Name: Triad Engineering

EMI# 765

Project Name: CF4 Tunnel Design

Date: 7/10/2024

Sample ID: B-3 55.8' - 56.8'



Before



After

Operator: DL, RA

Date: 7/10/2024

Supervisor/QA: KZ

Date: 7/18/2024

Principal Investigator: -

Date: -



Pictures of Sample Before and After
Cerchar Abrasivity Index

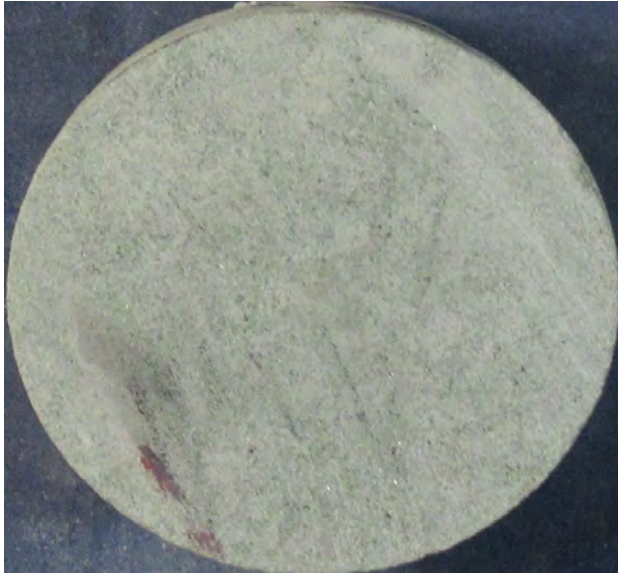
Client Name: Triad Engineering

EMI# 765

Project Name: CF4 Tunnel Design

Date: 7/10/2024

Sample ID: B-3 58.3' - 58.5'



Before



After

Operator: DL, RA

Date: 7/10/2024

Supervisor/QA: KZ

Date: 7/18/2024

Principal Investigator: -

Date: -



Pictures of Sample Before and After
Cerchar Abrasivity Index

Client Name: Triad Engineering

EMI# 765

Project Name: CF4 Tunnel Design

Date: 7/10/2024

Sample ID: B-4 65.8' - 66.1'



Before



After

Operator: DL, RA

Date: 7/10/2024

Supervisor/QA: KZ

Date: 7/18/2024

Principal Investigator: -

Date: -



Pictures of Sample Before and After
Cerchar Abrasivity Index

Client Name: Triad Engineering
Project Name: CF4 Tunnel Design
Sample ID: B-5 62.3' - 62.8'

EMI# 765
Date: 7/10/2024



Before



After

Operator: DL, RA
Supervisor/QA: KZ
Principal Investigator: -

Date: 7/10/2024
Date: 7/18/2024
Date: -

APPENDIX D

Rock Core Photographs

ROCK CORE PHOTOGRAPHS



Boring B-2: Box 1 of 3



Boring B-2: Box 2 of 3

Marshall CF4 Tunnel Design
 Cabell County, West Virginia
 Triad Project No. 04-23-0374
 Appendix D- Rock Core Photographs



ROCK CORE PHOTOGRAPHS



Boring B-2: Box 3 of 3



Boring B-3: Box 1 of 3

Marshall CF4 Tunnel Design
 Cabell County, West Virginia
 Triad Project No. 04-23-0374
 Appendix D- Rock Core Photographs



ROCK CORE PHOTOGRAPHS



Boring B-3: Box 2 of 3



Boring B-3: Box 3 of 3

Marshall CF4 Tunnel Design
Cabell County, West Virginia
Triad Project No. 04-23-0374
Appendix D- Rock Core Photographs



ROCK CORE PHOTOGRAPHS



Boring B-4: Box 1 of 4



Boring B-4: Box 2 of 4

Marshall CF4 Tunnel Design
 Cabell County, West Virginia
 Triad Project No. 04-23-0374
 Appendix D- Rock Core Photographs



ROCK CORE PHOTOGRAPHS



Boring B-4: Box 3 of 4



Boring B-4: Box 4 of 4

Marshall CF4 Tunnel Design
Cabell County, West Virginia
Triad Project No. 04-23-0374
Appendix D- Rock Core Photographs



ROCK CORE PHOTOGRAPHS



Boring B-5: Box 1 of 3

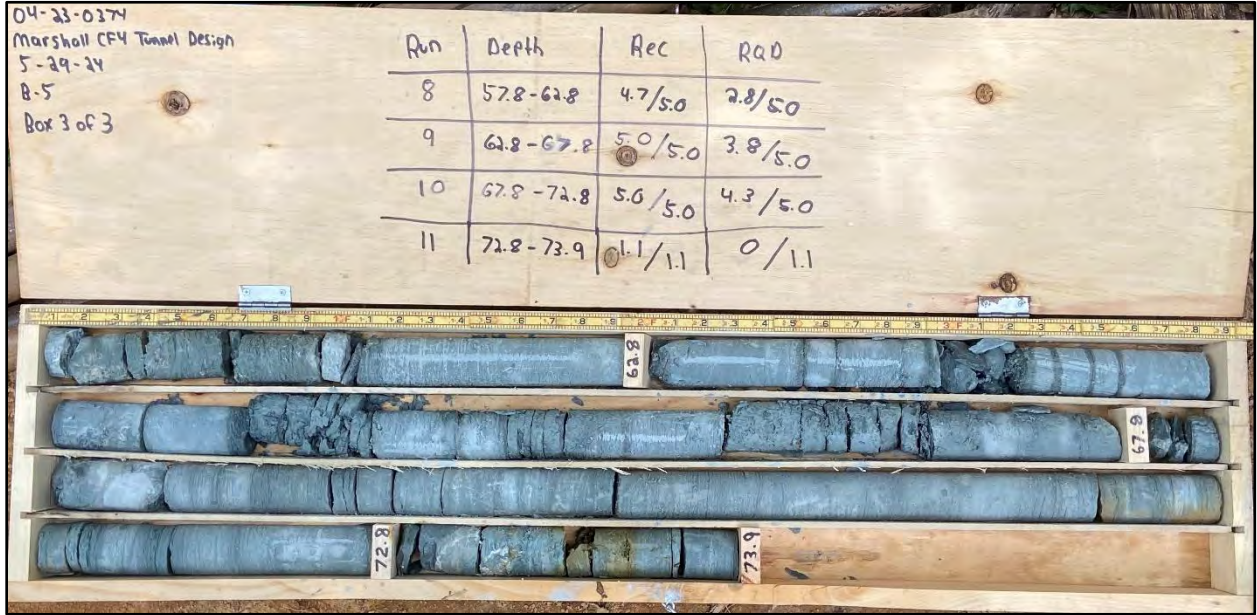


Boring B-5: Box 2 of 3

Marshall CF4 Tunnel Design
Cabell County, West Virginia
Triad Project No. 04-23-0374
Appendix D- Rock Core Photographs



ROCK CORE PHOTOGRAPHS



Boring B-5: Box 3 of 3



Boring B-7: Box 1 of 1

Marshall CF4 Tunnel Design
Cabell County, West Virginia
Triad Project No. 04-23-0374
Appendix D- Rock Core Photographs



Attachment B



Governor Jim Justice

Director Brett W. McMillion

September 4, 2024

Office of Land and Streams
RIGHT OF ENTRY

Marshall University
Attention: Grant Wooten
Triad Engineering, Inc.
10541 Teays Valley Road
Scott Depot, WV 25560

Re: R-2024-V-06-17323

To Whom It May Concern:

The West Virginia Division of Natural Resources (WVDNR) hereby authorizes for a term of 25 years, from the date hereof, a Right of Entry for the purpose of cleaning out the stream and stabilizing the stream banks for 110' (Marshall CF4), along Guyandotte River, near Huntington, in Cabell County, West Virginia.

The issuance of this Right of Entry by the WVDNR does not preclude the necessity to obtain permits from the U.S. Army Corps of Engineers (USACE), W.V. Department of Environmental Protection (WVDEP), or the W.V. Division of Homeland Security and Emergency Management (WVDHSEM). This Right of Entry does not negate the need to comply with the West Virginia Water Pollution Control Act and/or the State Environmental Quality Board's administrative regulations.

It is advised to contact the following agencies for additional guidelines and/or regulations:

1. The USACE [Huntington District (304-399-5210) or the Pittsburgh District (412-395-7155)] may require either an Individual Clean Water Act 404 permit or a Nationwide Permit.
<http://www.lrh.usace.army.mil/Missions/Regulatory.aspx>
2. The WVDNR Environmental Coordination Unit (304-637-0245) should be contacted for the Mussel survey requirements for streams with mussel populations as described in the West Virginia Mussel Survey Protocol
<http://www.wvdnr.gov/Mussels/West%20Virginia%20Mussel%20Survey%20Protocols%20APR2016.pdf>

3. The WVDEP (304-926-0499) may require the following permits:
 - a. A Clean Water Act Section 401 Water Quality Certification
<http://www.dep.wv.gov/WWE/Programs/Pages/401Certification.aspx>
 - b. Construction Stormwater Site Registration and Notice of Intent. Not needed if disturbance less than (1) acre.
http://dep.wv.gov/WWE/Programs/stormwater/Pages/sw_home.aspx
4. The Division of Water and Waste Management, (304-926-0495) should be contacted for the WVDEP Erosion and Sediment Control Best Management Practice Manual, Revised 2016, that it requires to be followed.
http://www.dep.wv.gov/WWE/Programs/stormwater/csw/Pages/ESC_BMP.aspx
5. The WVDHSEM (304-957-2571) may require a Floodplain Permit.
6. The U.S. Fish and Wildlife Service Field Office (304-636-6568) should be contacted for any activity in waterways listed in Appendix A of the 2017 USACE Nationwide Permits for threatened or endangered aquatic species identified by the U.S. Fish and Wildlife Service.
<http://www.lrp.usace.army.mil/Portals/72/docs/regulatory/2017%20Public%20Notices/West%20Virginia%20-%20NWP%20March%202017%20PN.pdf?ver=2017-03-22-095505-870>
7. The local Conservation District for the district where the work is to be performed should be contacted for technical support.

This Right of Entry does not allow in-stream work to be performed during the cold-water fish spawning season (September 15- March 31) and warm-water fish spawning season (April 1 - June 30). Spawning waivers may be obtained from the WVDNR Environmental Coordination Unit (304-637-0245).

This Right of Entry does not allow work outside the requested boundaries. The WVDNR does not assume any liability for your construction activities. By accepting this Right of Entry, you assume liability for any and all damage caused by this activity to both upstream and downstream landowners.

This Right of Entry does not authorize any rights or privileges, or permission to enter upon, or to cross the property of any other person, nor does it authorize removal of any material that lies upon the property of another person.

All work authorized under this Right of Entry should be completed as soon as possible, but no longer than one year from the date hereof.

There is no fee for this Right of Entry.

Please notify the Office of Land and Streams in writing when the in-stream work is complete.

Sincerely,



Brett W. McMillion
Director

BWM: lp

Nathan Dickman, P.E.

From: Dave Meadows <dmeadows@triadeng.com>
Sent: Tuesday, October 15, 2024 12:57 PM
To: Joe Young; John Haynes; Lloyd Kirk; Caleb Wise; Greg Michaelson; Nathan Dickman, P.E.; Jeffrey Coffey; Salmons, Brie; Mark Kessinger; Arka Chattopadhyay; Brian E. Mott, P.G.; Dave Meadows; Grant Wooten
Subject: Fw: Marshall CF4 - Fish Spawning Waiver
Attachments: FishSpawningWaiver.xlsx

EXTERNAL: Message origin is from an external network. Use proper judgment and caution when opening attachments, clicking links, or responding to this email.

FYI - See below

David F. Meadows, P.E., P.S., F.ASCE, F.SAME
ASCE Region 4 Governor
Chief Technical Officer / Triad Engineering, Inc.
304-546-3481

From: Joe Young <jyoung@triadeng.com>
Sent: Tuesday, October 15, 2024 12:55 PM
To: Dave Meadows <dmeadows@triadeng.com>
Subject: Fwd: Marshall CF4 - Fish Spawning Waiver

Fish spawning approved.
Sent from my iPhone

Begin forwarded message:

From: "Wakeford, Anne M" <anne.m.wakeford@wv.gov>
Date: October 15, 2024 at 12:44:18 PM EDT
To: Grant Wooten <gwooten@triadeng.com>, Joe Young <jyoung@triadeng.com>, Jeff L Hansbarger <jeff.l.hansbarger@wv.gov>
Subject: Fwd: Marshall CF4 - Fish Spawning Waiver

CAUTION: This email originated from an external sender. Do not click any links or open any attachments unless you recognize the sender and know the content is safe!

Your fish spawning waiver request is approved.

This email serves as your approval.

Please contact me if you have any questions or concerns.

Regards,

Anne

Anne M. Wakeford
Coordination Biologist
WVDNR/EOC
738 Ward Rd.
PO Box 67
Elkins, WV 26241
304-630-0360 (direct)
304-637-0245 ext 00360
Anne.M.Wakeford@wv.gov

----- Forwarded message -----

From: **Grant Wooten** <gwooten@triadeng.com>
Date: Tue, Oct 15, 2024 at 11:55 AM
Subject: RE: Marshall CF4 - Fish Spawning Waiver
To: Wakeford, Anne M <anne.m.wakeford@wv.gov>
Cc: Joe Young <jyoung@triadeng.com>

See attached. Please let us know if you have any questions or if additional information is needed.

Thanks, Grant

From: Wakeford, Anne M <anne.m.wakeford@wv.gov>
Sent: Thursday, October 10, 2024 1:20 PM
To: Grant Wooten <gwooten@triadeng.com>; Joe Young <jyoung@triadeng.com>
Subject: Re: Marshall CF4 - Fish Spawning Waiver

CAUTION: This email originated from an external sender. Do not click any links or open any attachments unless you recognize the sender and know the content is safe!

Attached are the fish spawning waiver excel spreadsheet and instructions.

Please fill out the form and email it back to me.

Thanks

Anne

Anne M. Wakeford
Coordination Biologist
WVDNR/EOC
738 Ward Rd.
PO Box 67
Elkins, WV 26241
304-630-0360 (direct)
304-637-0245 ext 00360
Anne.M.Wakeford@wv.gov

On Tue, Oct 8, 2024 at 9:28 AM Grant Wooten <gwooten@triadeng.com> wrote:

Hello,

I recently spoke with someone from the Elkins office regarding the process for obtaining a fish spawning waiver. We have received a Right of Entry permit from the Office of Land and Streams, but it does not allow in-stream work between September 15-March 15 and April 1-June 30. How can we obtain approval for in-stream work during these months?

Thanks, Grant

Grant Wooten
Staff Engineer

Triad Engineering, Inc.

304-755-0721 (Office)

304-610-8103 (Mobile)

[LinkedIn](#) | [Facebook](#) | www.triadeng.com

This email is only for the intended recipient, and may contain information that is privileged, confidential, or exempt from disclosure under law. If you received this message in error, or are not the intended recipient, please notify the sender and destroy this message.

Attachment C



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HUNTINGTON DISTRICT
502 8TH STREET
HUNTINGTON, WV 25701-2018

October 15, 2024

Regulatory Division
Energy Resource Branch
LRH-2024-00643-GUY-UNT Guyandotte River

NATIONWIDE PERMIT NO. 33 VERIFICATION

Caleb Wise
Marshall University
1 John Marshall Drive
Huntington, West Virginia 25755

Dear Caleb Wise:

I refer to the pre-construction notification (PCN) requesting a Department of the Army (DA) authorization for the discharge of dredged and/or fill material into waters of the United States (U.S.) in association with the construction of the MU Subterranean Testing Facility Project. The project is located in the city of Huntington, Cabell County, West Virginia. The proposed activity is located at approximately 38.405556°N, 82.373397°W. Your PCN has been assigned the following file number: LRH-2024-00643-GUY-UNT Guyandotte River. Please reference this number on all future correspondence related to this project.

The U.S. Army Corps of Engineers' (Corps) authority to regulate waters of the U.S. is based on the definitions and limits of jurisdiction contained in 33 CFR 328 and 33 CFR 329. Section 404 of the Clean Water Act (Section 404) requires a DA permit be obtained prior to discharging dredged and/or fill material into waters of the U.S., including wetlands. Section 10 of the Rivers and Harbors Act of 1899 (Section 10) requires a DA permit be obtained for any work in, on, over or under a navigable water.

The proposed project, as described in the submitted information, has been reviewed in accordance with Section 404 and Section 10. Based on your description of the proposed work, and other information available to us, it has been determined that this project will not involve activities subject to the requirements of Section 10. However, this project will include the discharge of dredged and/or fill material into waters of the U.S. subject to the requirements of Section 404.

In the submitted PCN materials, you have requested a DA authorization for the temporary discharge of dredged and/or fill material into 110 linear feet (0.04 acre) of one (1) stream, in association with construction of the MU Subterranean Testing Facility Project. The proposed project would include the temporary installation of three (3) culverts and clean engineered fill in an unnamed tributary of the Guyandotte River to facilitate access for the construction of a subterranean testing facility. The culverts and engineered fill will be removed once construction

of the tunnel is completed. All work will be conducted in accordance with the PCN received in this office on August 8, 2024.

Based on the provided information, it has been determined the proposed project meets the criteria for Nationwide Permit (NWP) No. 33 (enclosed) under the December 27, 2021 Federal Register (FR), Issuance and Reissuance of NWPs (86 FR 73522) provided you comply with all terms and conditions of the enclosed material, the enclosed special conditions, and the Section 401 Water Quality Certifications (401 WQC) issued by the West Virginia Department of Environmental Protection.

Please be aware this NWP verification does not obviate the requirement to obtain other local, state, and/or federal authorizations required by law for these activities. This verification is valid until the expiration date of the NWPs, unless the NWP authorization is modified, suspended, or revoked. The verification will remain valid if the NWP authorization is reissued without modification or the activity complies with any subsequent modification of the NWP authorization. The 2021 NWPs are scheduled to be modified, reissued, or revoked on March 14, 2026. Prior to this date, it is not necessary to contact this office for re-verification of your project unless the plans for the proposed activity are modified. Furthermore, if you commence or under contract to commence this activity before March 14, 2026, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

Enclosed is a copy of the NWPs and the 401 WQC to be kept at the project site during construction. You shall supply a copy of these documents to your project engineer responsible for construction activities.

Upon completion of the work, the enclosed certification must be signed and returned to this office. If you have any questions concerning the above, please contact Rachel McCarty of the Energy Resource Branch at 304-399-5207, by mail at the above address, or by email at: rachel.a.mccarty@usace.army.mil.

Sincerely,

Kimberly Courts-Brown

Kimberly Courts-Brown
Regulatory Project Manager
Energy Resource Branch

Enclosures

**Nationwide Permit No. 33 Verification Special Conditions for the
Marshall University – MU Subterranean Testing Facility Project
LRH-2024-00643-GUY-UNT Guyandotte River**

1 of 2

1. All work will be conducted in accordance with the submitted pre-construction notification (PCN) for the MU Subterranean Testing Facility Project received in this office on August 8, 2024.
2. Enclosed is a copy of Nationwide Permit 33, which will be kept at the site during construction. A copy of the nationwide permit verification, special conditions, and the attached construction plans must be kept at the site during construction. The permittee will supply a copy of these documents to their project engineer responsible for construction activities.
3. Upon completion of the activity authorized by this Nationwide Permit verification, the enclosed certification must be signed and returned to this office along with as-built drawings showing the location and configuration, as well as all pertinent dimensions and elevations of the activity authorized under this Nationwide Permit verification.
4. Construction activities will be performed during low flow conditions to the maximum extent practicable. Additionally, appropriate site-specific best management practices for sediment and erosion control will be fully implemented during construction activities at the site.
5. No area for which grading has been completed will be unseeded or unmulched for longer than 14 days. All disturbed areas will be seeded and/or revegetated with native species and approved seed mixes (where practicable) after completion of construction activities for stabilization and to help preclude the establishment of non-native invasive species.
6. All water resources and their buffers, which are to be avoided on-site, must be clearly indicated on the site plans and drawings, demarcated in the field, and protected with suitable material prior to site disturbance. These materials must remain in place and be maintained throughout the construction process.
7. In the event any previously unknown historic or archaeological sites or human remains are uncovered while accomplishing the activity authorized by this nationwide permit authorization, the permittee must cease all work in waters of the U.S. immediately and contact local, state and county law enforcement offices (only contact law enforcement on findings of human remains), the Corps at 304-399-5610 and Ohio State Historic Preservation Office at 614-298-2000. The Corps will initiate the Federal, state and tribal coordination required to comply with the National Historic Preservation Act and applicable state and local laws and regulations. Federally recognized tribes are afforded a government-to-government status as sovereign nations and consultation is required under Executive Order 13175 and 36 CFR Part 800.

**Nationwide Permit No. 33 Verification Special Conditions for the
Marshall University – MU Subterranean Testing Facility Project
LRH-2024-00643-GUY-UNT Guyandotte River
2 of 2**

8. The project site lies within the range of the Indiana bat (*Myotis sodalis*). Several factors have contributed to the species decline, including habitat loss, fragmentation of habitat and the disease White Nose Syndrome. During winter, the bat species hibernate in caves and abandoned mines. Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags \geq three (3) inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. The permittee shall preserve wooded/forested habitats exhibiting any of the characteristics listed above wherever possible. Should suitable habitat be present that cannot be saved during construction activities, any trees \geq three (3) inches dbh shall only be cut between November 15 – March 31.
9. This Department of the Army Permit authorization does not authorize the “take” of a threatened or endangered species as defined under the Endangered Species Act (ESA). In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the United States Fish and Wildlife Service (USFWS), both lethal and non-lethal “takes” of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS or their World Wide Web page at <http://www.fws.gov/r9endspp/endspp.html>.
10. Section 7 obligations under the Endangered Species Act (Section 7) must be reconsidered if new information reveals impacts of the project that may affect Federally-listed species or critical habitat in a manner not previously considered, the proposed project is subsequently modified to include activities which were not considered during Section 7 consultation with the United States Fish and Wildlife Service, or new species are listed or critical habitat designated that might be affected by the subject project.
11. Should new information regarding the scope and/or impacts of the project become available that was not submitted to this office during our review of the proposal, the permittee will submit written information concerning proposed modification(s) to this office for review and evaluation, as soon as practicable.

COMPLETION OF WORK FORM

Permit: LRH-2024-00643-GUY-UNT Guyandotte River
MU Subterranean Testing Facility Project

Name of Permittee: Caleb Wise
Marshall University
1 John Marshall Drive
Huntington, West Virginia 25755

Date of Issue: October 15, 2024

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

Huntington District
U.S. Army Corps of Engineers
502 8th Street
Huntington, WV 25701-2070
Attn: Rachel A. McCarty RDE

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

NATIONWIDE PERMITS FOR THE STATE OF WEST VIRGINIA

U.S. ARMY CORPS OF ENGINEERS (CORPS) REGULATORY PROGRAM REISSUANCE AND ISSUANCE OF NATIONWIDE PERMITS WITH WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION (WV DEP) SECTION 401 WATER QUALITY CERTIFICATION

NATIONWIDE PERMIT (NWP) 33

NWP 33. Temporary Construction, Access, and Dewatering. Temporary structures, work, and discharges of dredged or fill material, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites, provided that the associated primary activity is authorized by the Corps of Engineers or the U.S. Coast Guard. This NWP also authorizes temporary structures, work, and discharges of dredged or fill material, including cofferdams, necessary for construction activities not otherwise subject to the Corps or U.S. Coast Guard permit requirements. Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding. Fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. The use of dredged material may be allowed if the district engineer determines that it will not cause more than minimal adverse environmental effects. Following completion of construction, temporary fill must be entirely removed to an area that has no waters of the United States, dredged material must be returned to its original location, and the affected areas must be restored to pre-construction elevations. The affected areas must also be revegetated, as appropriate. This permit does not authorize the use of cofferdams to dewater wetlands or other aquatic areas to change their use. Structures left in place after construction is completed require a separate section 10 permit if located in navigable waters of the United States. (See 33 CFR part 322.)

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if the activity is conducted in navigable waters of the United States (*i.e.*, section 10 waters) (see general condition 32). The preconstruction notification must include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. (Authorities: Sections 10 and 404)

Corps NWP 33 Specific Regional Condition:

- The applicant must submit a PCN to the Corps in accordance with NWP General Condition 32 whenever the work is conducted in a perennial tributary or is expected to take more than one (1) year to complete to allow the Corps to consider the temporal effects of the regulated activity.

NWP 33 West Virginia Section 401 Water Quality Certification Special Condition:

An individual water quality certification is required for use of this permit to construct temporary causeways in Section 10 waters, or for fills in any water anticipated to exceed one (1) year. This condition is required to ensure that the activity has no significant adverse impact to water resources, fish and wildlife, recreation, critical

habitats, wetlands and other natural resources in accordance with; Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1, et seq. (2016), the Antidegradation Implementation Procedures, W.Va. C.S.R. §60-5-1, et seq. (2008), and Individual State Certification of Activities Requiring a Federal Permit, W.Va. C.S.R. §47-5A-1, et seq (2014).

Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for a NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. *Navigation.*

- (a) No activity may cause more than a minimal adverse effect on navigation.
- (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
- (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. *Aquatic Life Movements.* No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. *Spawning Areas.* Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical

destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Structures and Fills. Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued.

Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers.

(a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species.

(a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or

critical habitat has been completed. See 50 CFR 402.02 for the definition of “effects of the action” for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding “activities that are reasonably certain to occur” and “consequences caused by the proposed action.”

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWP.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap,

capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or [http:// www.fws.gov/ipac](http://www.fws.gov/ipac) and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. *Migratory Birds and Bald and Golden Eagles.* The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. *Historic Properties.*

(a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section

106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre- construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties.

Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)).

When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: No historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non- Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally

significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/ THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre- construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre- construction notification, the district engineer may determine on a case-by- case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre- construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre- construction notification, the district engineer may determine on a case-by- case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult- to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWP, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWP. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWP.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality.

(a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer.

The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification

must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

- (a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and
- (c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a “USACE project”), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification.

(a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer;

or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) Form of Pre-Construction Notification: The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination:

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity’s compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity’s adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) All NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater

than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or email that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on

the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45

calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) That the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term “discharge” means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water’s surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National

Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has surface water flowing continuously year-round during a typical year.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: Re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term “single and complete project” is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of “independent utility”). Single and complete non-linear projects may not be “piecemealed” to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized jurisdictional stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: (1) Held in trust by the United States for the benefit of any Indian tribe or individual; or (2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWP, a waterbody is a "water of the United States." If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)).

Nationwide Permits Regional General Conditions for the State of West Virginia

1. **Threatened and Endangered Species:** Section 7(a)(2) of the Endangered Species Act (ESA) states that each federal agency shall, in consultation with the Secretary, ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the continued existence of any federally or proposed federally listed species. Consistent with NWP General Condition 18, information for federally threatened and endangered species must be provided in the PCN to determine the proposed

activity's compliance with NWP General Condition 18 and to facilitate project-specific coordination with the USFWS. All relevant information obtained from the USFWS must be submitted with the PCN.

2. All regulated activities located in high-quality waterways listed below require PCN in accordance with NWP General Condition 32:
 - New River, which includes all river miles contained in the boundaries of the New River Gorge National Park and Preserve;
 - Bluestone River from the upstream boundary of Pipestem Park to Bluestone Reservoir;
 - Meadow River from an area near the US 19 Bridge to its junction with the Gauley River;
 - All streams within the Monongahela National Forest designated as National Wild and Scenic Study Rivers;
 - All streams and other bodies of water in State and National Forests and Recreation Areas (included are streams and bodies of water located within the Spruce Knob, Seneca Rocks and Gauley River National Recreation Areas); and
 - Streams and their tributaries as contained within the boundaries of the designated National Wilderness Areas or the headwaters of such rivers and their tributaries, including but not limited to: Cranberry River, Red Creek, Laurel Fork and Otter Creek.

The Corps will consult, as necessary, with the National Park Service and/or the U.S. Forest Service upon receipt of the PCN.

3. Due to the ecological significance of the following waterways protection under the Natural Streams Preservation Act (WV Code Chapter 22 Article 13), all regulated activities located in these waterways require PCN in accordance with NWP General Condition 32:
 - Greenbrier River from its confluence with Knapps Creek to its confluence with the New River;
 - Anthony Creek from its headwaters to its confluence with the Greenbrier River;
 - Cranberry River from its headwaters to its confluence with the Gauley River;
 - Birch River from Cora Brown Bridge in Nicholas County to its confluence with the Elk River; and
 - New River from its confluence with the Greenbrier River to its confluence with the Gauley River, which includes the length of the New River contained in the boundaries of the New River Gorge National Park and Preserve.

The Corps will consult, as necessary, with the National Park Service and/or the U.S. Forest Service upon receipt of the PCN.

4. **Historic Properties:** Under the National Historic Preservation Act (NHPA), the Corps must ensure no federal undertaking, including a Corps permit action, which may affect historic resources, is commenced before the impacts of such action are considered and the Advisory Council on Historic Preservation and the State Historic Preservation Office (SHPO) are provided an opportunity to comment as required by the NHPA, 36 CFR 800, and 33 CFR 325, Appendix C. Consistent with NWP General Condition 20, historic properties information must be provided in the PCN if the proposed undertaking might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. All relevant information obtained from the SHPO must be submitted with the PCN.

HELPFUL INFORMATION FOR COMPLIANCE WITH THE 2021 NWP GENERAL CONDITIONS

DISCLAIMER: The below information is intended to provide helpful contact information and other submittal recommendations. Contact the appropriate local, state, or federal agency for the most updated links to ensure compliance with the NWP General Conditions.

General Condition 1 (Navigation)

List of Section 10 Navigable Waters of the United States:

Huntington District –

<https://www.lrh.usace.army.mil/Missions/Regulatory/Section-10-Streams/>

Pittsburgh District –

<https://www.lrp.usace.army.mil/Portals/72/docs/regulatory/RegulatoryBoundaries/PN12-2.pdf>

Navigation Charts:

Huntington District –

<https://www.lrh.usace.army.mil/Missions/Civil-Works/Navigation/>

Pittsburgh District –

<https://www.lrp.usace.army.mil/Missions/Navigation/Navigation-Charts/>

Locks and Dams:

Huntington District

<https://www.lrh.usace.army.mil/Missions/Civil-Works/Locks-and-Dams/>

Pittsburgh District

<https://www.lrp.usace.army.mil/Missions/Navigation/Locks-and-Dams/#:~:text=Locks%20and%20Dams%20%20%20Allegheny%20River%20,Locks%20%26%20Dam%20%205%20more%20rows%20>

Notice to Navigation Interests Request Sheets:

Huntington District

<https://www.lrh.usace.army.mil/Portals/38/docs/navigation/Notice%20Info%20sheet.pdf>

Pittsburgh District

<https://www.lrp.usace.army.mil/Portals/72/docs/regulatory/NavNoticeRequestForm.pdf>

General Condition 3 (Spawning Areas)

In stream work in designated warm water streams and their adjacent tributaries during the fish spawning season, April - June and trout waters and their adjacent tributaries during the trout water fish spawning season September 15 to March 31 requires a spawning season waiver from the West Virginia Division of Natural Resources Coordination Unit, at (304) 637-0245. For information about specific stream designations contact West Virginia Department of Environmental Protection, Water Quality Standards Section at (304) 926-0495.

General Condition 5 (Shellfish Beds)

Shellfish beds in West Virginia include concentrations of freshwater mussels. All mussels are protected in the State of West Virginia pursuant to West Virginia §20-2-4 and CSR 58-605.11. In addition, nine (9) federally endangered freshwater mussel species are known to occur in the state. These species are protected by the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). All streams that contain mussels or potential mussel habitat must be surveyed prior to any proposed streambed disturbance. Please contact the West Virginia Department of Natural Resources (WVDNR) and/or the USFWS for assistance in determining if a mussel survey is or is not required. The WVDNR contact information can be found at: <http://www.wvdnr.gov/contact.shtm>. Currently accepted protocol and supporting materials can be found at the WVDNRs' website: <http://www.wvdnr.gov/Mussels/Main.shtm>

General Condition 7 (Water Supply Intakes)

Locations of public water supply intakes can be found at the following link:

<http://gis.wvinfrastructure.com/>

General Condition 10 (Fills Within 100-year Floodplains)

The following website provides a statewide listing of Floodplain Managers in West Virginia: <http://www.dhsem.wv.gov/MitigationRecovery/Pages/Floodplain-Management.aspx>

General Condition 16 (Wild and Scenic Rivers)

The following website provides information on wild and scenic rivers within West Virginia:

<https://www.rivers.gov/west-virginia.php>

General Condition 18 (Endangered Species)

To obtain the most up to date information on federally threatened and endangered species applicants are encouraged to utilize the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation System (IPaC) found at <https://ecos.fws.gov/ipac/>

Prior to the submittal of a PCN, applicants may also contact the USFWS, West Virginia Field Office, Ecological Services at:

Address: 6263 Appalachian Highway
Davis, West Virginia 26260

Email: fw5_wvfo@fws.gov

The West Virginia Mussel Survey Protocol may be found at the following link:

<http://www.wvdnr.gov/Mussels/Main.shtm>

General Condition 4 (Migratory Bird Breeding Areas) and General Condition 19 (Migratory Birds and Bald and Golden Eagles)

Prior to the submittal of a PCN, information to assist in complying with NWP General Conditions 4 and 19 may be obtained from the USFWS, West Virginia Field Office, Ecological Services at:

Address: 6263 Appalachian Highway
Davis, West Virginia 26260

Email: fw5_wvfo@fws.gov

The West Virginia Division of Natural Resources Coordination Unit may be contacted at (304) 637-0245.

General Condition 20 (Historic Properties)

The West Virginia National Register of Historic Places can be found at the following link: <https://wvculture.org/research/national-register-of-historical-places/>

The West Virginia State Historic Preservation Office (SHPO) Interactive Map Viewer can be found at the following link: <https://mapwv.gov/shpo/>

When reviewing a PCN, the Corps will scope appropriate historic property identification efforts and if applicable work with the applicant to take into account the effect of the proposed activity on historic properties. In these instances, information and coordination may include:

- Requesting comments directly from the West Virginia Division of Culture and History SHPO on the effect the proposed regulated activity may have on historic properties. The West Virginia Division of Culture and History SHPO may be contacted at:

Address: 1900 Kanawha Blvd E
Charleston, West Virginia 25305
Phone: (304) 558-0220

- To identify potential historic properties that may be affected by a proposed project, the following historic properties information may be reviewed and/or provided with the PCN when applicable:
 - A detailed description of the project site in its current condition (i.e. prior to construction activities) including information on the terrain and topography of the site, the acreage of the site, the proximity of the site to major waterways, and any known disturbances within the site.
 - A detailed description of past land uses in the project site.
 - Photographs and mapping showing the site conditions and all buildings or structures within the project site and on adjacent parcels are useful. Photographs and maps supporting past land uses should be provided as available.
 - Information regarding any past cultural resource studies or coordination pertinent to the project area, if available.
 - U.S. Geological Survey (USGS) 7.5' series topographic maps;
 - West Virginia Division of Culture and history files including:
 - Historic Property Inventory Form;
 - Archaeological Site Forms;
 - Cemetery Inventory Forms;
 - National Register of Historic Places nomination forms including Historic Districts; and
 - County atlases, histories and historic USGS 15' series topographic map(s).
- When needed to evaluate effects to historic properties, the applicant is encouraged to consult with professionals meeting the Professional Qualification Standards as set forth in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716) during this data gathering process. These professionals can assist with compiling the project information discussed above and should provide recommendations as to whether the proposal has the potential to affect historic properties and if further effort is needed to identify or assess potential effects to historic properties. These professionals can also compile preliminary review information to submit to the district engineer as part of the PCN.

General Condition 23 (Mitigation)

Information pertaining to mitigation can be found at the following link:

<https://www.lrh.usace.army.mil/Missions/Regulatory/Mitigation.aspx>

General Condition 25 (Water Quality)

The West Virginia Department of Environmental Protection may be contacted at:

Address: 601 57th Street
Charleston, West Virginia 25304

Phone: (304) 926-0440

Information pertaining to the West Virginia Department of Environmental Protection water quality certification (WQC) program, including the Section 401 Clean Water Act WQC application form, can be obtained at the following link:

<https://dep.wv.gov/WWE/Programs/Pages/401Certification.aspx>

General Condition 32 (Pre-Construction Notification)

The nationwide permit pre-construction notification form (Form ENG 6082) may be obtained at the following link:

https://www.publications.usace.army.mil/Portals/76/Eng_Form_6082_2019Oct.pdf?ver=2019-10-22-081550-710/

A checklist of information that must be provided in a pre-construction notification can be obtained at the following link:

<https://www.lrh.usace.army.mil/Missions/Regulatory/How-to-Apply-for-a-Permit/Nationwide-Permits/>

Electronic Submittal:

- PCNs should be saved as a PDF document, and then submitted as an attachment in an email to the appropriate Regulatory Office:

Huntington District – LRH.permits@usace.army.mil
Pittsburgh District – Regulatory.Permits@usace.army.mil
- Electronic documents must have sufficient resolution to show project details. The PCN and supporting documents submitted electronically must not exceed 10 megabytes (10MB) per email. Multiple emails may be required to transmit documents to ensure the 10MB limit is not exceeded. Alternatively, use of the Department of Defense Secure Access File Exchange (DoD SAFE) service to transfer large files may be requested in your email.
- For tracking and processing purposes, the email should include the following:
 - Email Subject Line: include the name of the applicant, type of NWP request, and location (County and State). Example: RE: Doe, John, NWP (or Pre-Construction Notification) and Section 401 WQC

Request, Cabell County, West Virginia;

- Email Body: 1) Brief description of the proposed project, 2) contact information (phone number, mailing address, and email address) for the applicant and/or their agent, and 3) the project location: Address and Latitude/Longitude in decimal degrees (e.g. 42.92788°, - 88.36257°).
- If you do not have internet access, information may be submitted through the U.S. Postal Service to the appropriate Regulatory Office:

U.S. Army Corps of Engineers, Huntington District
ATTN: Regulatory Division
502 Eighth Street
Huntington, West Virginia 25701-2070
Phone: (304) 399-5610
Fax: (304) 399-5805

U.S. Army Corps of Engineers, Pittsburgh District
ATTN: Regulatory Division
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, Pennsylvania 15222-4186
Phone: (412) 395-7155
Fax: (412) 644-4211

Standard Conditions of State 401 Water Quality Certification Applicable to the 2021 Nationwide Permits

1. To ensure project compliance with state water quality requirements applicable to these Nationwide Permits, notification is to be provided prior to construction to West Virginia Department of Environmental Protection (WV DEP) for any permitted activity for which the U.S. Army Corps of Engineers (USACE) requires pre-construction notification (PCN), in accordance with Nationwide Permit General Condition 32. This condition is required through authority provided in State Certification of Activities Requiring a Federal License or Permit, 40 C.F.R §121.3 (2020) and WV Water Pollution Control Act, W.Va. Code §22-11-1, et seq. (2014).
2. To compensate for unavoidable impacts to aquatic resources as a result of the discharge of dredge or fill material, the applicant must provide proof of compensatory mitigation (as outlined in Standard Condition 16 below) to WV DEP prior to construction, for an activity resulting in cumulative permanent impacts to streams greater than 300 linear feet or causing the loss of greater than 1/10 acre of wetlands. This condition is required in accordance with the following; Rules for Individual State Certification of Activities Requiring a Federal Permit, W.Va. C.S.R. §47-5A-6 (2014), Antidegradation Implementation Procedures, W.Va. C.S.R §60-5-1, et seq. (2008), and Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1 et seq. (2016).

3. To protect the biological integrity of the aquatic ecosystem, culverted crossings shall be sized and installed in a manner to allow the passage of aquatic life and freely pass bankfull flows. Exceptions to this requirement would be when culvert placement is on bedrock, or when stream gradient is equal to or greater than 4%, or when bankfull elevation is greater than final surface elevation. This condition is required in accordance with Antidegradation Implementation Procedures, W.Va. C.S.R §60-5-1, et seq. (2008), and Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1, et seq. (2016).
4. To protect the designated uses of waters of the state, the permittee shall investigate for the presence of water supply intakes or other activities within 1/2 mile downstream of the activity, which may be affected by increased suspended solids and turbidity, caused by work in the watercourse. The permittee shall give notice to operators of any such water supply intakes and such other water quality dependent activities as necessary before beginning work in the watercourse in sufficient time to allow preparation for any change in water quality. This condition is required in accordance with Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-7.2.a.2 (2016) and Antidegradation Implementation Procedures, W.Va. C.S.R §60-5-1, et seq (2008).
5. To ensure that temporary stream and wetland crossings have no significant adverse impact to aquatic resources, the following procedures and requirements shall be followed and met in accordance with Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3.2 (2016) and Antidegradation Implementation Procedures, W.Va. C.S.R. §60-5-1, et seq. (2008). At each stream crossing, substrate in the channel will be removed and stockpiled separately from other excavated material. This native material must be reused in restoration of the stream channel, which is to be completed within 72 hours or as soon as practicable after completion of the crossing. Upon final stream bed restoration, the stream must have similar physical characteristics to include substrate, pattern, profile, dimension and embeddedness of the original stream channel. At each wetland crossing, any excavated material from the top 12 inches of soil will be removed and stockpiled separately from other excavated material. This native material must be reused in restoration of the wetlands temporarily impacted by the open cut crossing and restoration must be completed within 72 hours or as soon as practicable after completion of the crossing. Stream crossings will be conducted as close to a right angle to the watercourse as practicable and the area of in stream activity will be limited to reduce disturbance.
6. Spoil materials from the watercourse or onshore operations, including sludge deposits, shall not be dumped in the watercourse, or deposited in wetlands or other areas where the deposit may adversely affect the surface waters of the state consistent with the requirements set forth in WV Water Pollution Control Act, W.Va. Code §22-11-4.a.16 (2014) and Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1, et seq. (2016).
7. To protect aquatic resources from unauthorized discharge of pollutants, storage and refueling areas shall not be located within any surface water body. All spills shall be promptly reported to the State Center for Pollution, Toxic Chemical and

Oil Spills, 1-800-642-3074. This condition is required in accordance with; Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3 (2016) and WV Water Pollution Control Act, W.Va. Code §22-11-8 (2014).

8. To reduce sedimentation of aquatic resources and increased turbidity, it is required that proper stabilization of all disturbances below the ordinary high-water mark of waters shall be installed within 24 hours or as soon as practicable to prevent erosion. Where possible, stabilization shall incorporate revegetation using bioengineering as an alternative to riprap. If riprap is utilized, it must be of such weight and size that bank stress or slump conditions shall not be created due to its placement. Fill must be clean, nonhazardous and of such composition that it shall not adversely affect the biological, chemical or physical properties of the receiving waters. Unsuitable materials include but are not limited to: copper chromium arsenate (CCA) and creosote treated lumber, car bodies, tires, large household appliances, and asphalt. To reduce potential slope failure and/or erosion behind the material, fill containing concrete must be of such weight and size that promotes stability during expected high flows. Loose large slab placement of concrete sections from demolition projects greater than thirty-six (36) inches in its longest dimension are prohibited. Rebar or wire in concrete shall not protrude further than one (1) inch. All activities require the use of clean and coarse non-erodible materials with 15% or less of like fines that is properly sized to withstand expected high flows. This condition is required in accordance with; Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3 (2016), WV Water Pollution Control Act, W.Va. Code §22-11-8 (2014) and Antidegradation Implementation Procedures, W.Va. C.S.R. §60-5-1, et seq. (2008).
9. To protect the water quality of aquatic resources, runoff from any storage areas or spills shall not be allowed to enter storm sewers without acceptable removal of solids, oils and toxic compounds. Discharges from retention/detention ponds must comply with permit requirements of the National Pollutant Discharge Elimination System permit program of the WV DEP. This condition is required in accordance with; WV Water Pollution Control Act, W.Va. Code §22-11-4.a.16 (2014) and Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1, et seq. (2016).
10. To protect aquatic resources from discharge associated with land disturbance activities, which are one (1) acre or greater in total area, the project proponent must comply with the National Pollutant Discharge Elimination System or other state stormwater permit requirements as established by the WV DEP, if applicable. Any land disturbances are required to use Best Management Practices for Sediment and Erosion Control, as described in the latest West Virginia Department of Environmental Protection's Erosion and Sediment Control Best Management Practice Manual, or similar documents prepared by the West Virginia Division of Highways. These handbooks are available from the respective agency offices. This condition is required in accordance with; WV Water Pollution Control Act, W.Va. Code §22-11-4.a.16 (2014) and Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3 (2016).

11. To protect aquatic resources from unpermitted discharges consistent with the requirements of WV Water Pollution Control Act, W.Va. Code §22-11-4.a.16 (2014) and Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1, et seq. (2016), concrete shall not be permitted to enter the watercourse unless contained by tightly sealed forms or cells. Concrete handling equipment shall not discharge waste washwater into wetlands or watercourses at any time without adequate wastewater treatment as approved by the WV DEP.
12. To maintain the biological integrity of the state's fisheries, a spawning waiver is required for in-stream work in designated warm water streams and their adjacent tributaries during the fish spawning season of April to June and for trout waters and their adjacent tributaries during the trout water fish spawning season of September 15 to March 31. Fish spawning waivers may be requested from West Virginia Division of Natural Resources (WV DNR) Coordination Unit, at (304) 637-0245. For information about specific stream designations contact West Virginia Department of Environmental Protection, Water Quality Standards Section at (304) 926-0440. This condition is required in accordance with Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3.2 (2016) and Wildlife Resources Declaration of Policy, W.Va. Code §20-2-4 (2017).
13. To protect stream stability and avoid unnecessary degradation of aquatic resources, the project proponent should avoid removal of riparian vegetation to the greatest extent practicable. This condition is required in accordance with Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3 (2016) and Antidegradation Implementation Procedures, W.Va. C.S.R. §60-5-1, et seq. (2008).
14. To protect aquatic life and reduce turbidity and disturbance to aquatic resources, the operation of equipment in-stream shall be minimized and accomplished during low flow periods when practical. Ingress and egress for equipment outside the immediate work area requires prior approval of the WV DNR Office of Land and Stream. This condition is required in accordance with; Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3 (2016) and Wildlife Resources Declaration of Policy, W.Va. Code §20-2-4 (2017).
15. To ensure the protection of West Virginia's high quality and special aquatic resources, notification must be provided to the WV DEP 60-days prior to construction describing the project purpose, location, and impacts for use of any Nationwide Permit(s) resulting in work in streams set forth in Sections A, B, and C below. The WV DEP will provide applicant coordination within 15 days of receipt of a complete notification.
 - A. Tier 3 Protection is provided for aquatic resources in accordance with West Virginia Code of State Regulations, Requirements Governing Water Quality Standards, Antidegradation Policy, Title 47, Series 2, Section 4 for Outstanding National Resource Waters to include, but are not limited to, all streams and rivers within the boundaries of Wilderness Areas designated by The Wilderness Act (16 U.S.C. §1131, et seq.) within the state, all federally designated rivers under the Wild and Scenic Rivers Act, 16 U.S.C. §1271, et

seq.; all streams and other bodies of water in state parks which are high quality waters or naturally reproducing trout streams; waters in national parks and forests which are high quality waters or naturally reproducing trout streams; waters designated under the National Parks and Recreation Act of 1978, as amended; and pursuant to W.Va. C.S.R. §§60-5-6, 7 (2008) those waters whose unique character, ecological or recreational value, or pristine nature constitutes a valuable national or state resource. This condition is required in accordance with Tier 3 Protection Review Procedures, W.Va. C.S.R. §§60-5-6, 7 (2008). The listing of Tier 3 streams is located at: https://dep.wv.gov/WWE/Programs/wqs/Documents/Tier%203%20Info/WVTier_3_Nov2013_web.xlt

- B. Naturally-Reproducing Trout Streams are protected to ensure the continued propagation and maintenance of naturally-reproducing trout. For information about specific streams contact WV DEP, Water Quality Standards, at 304-926-0440. This condition is required in accordance with Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1, et seq. (2016) and Antidegradation Implementation Procedures, W.Va. C.S.R. §60-5-1, et seq. (2008).
 - C. West Virginia Natural Stream Preservation Act identifies the following streams or rivers as protected from activities that would impound, divert or flood the body of water: Greenbrier River from its confluence with Knapps Creek to its confluence with the New River, Anthony Creek from its headwaters to its confluence with the Greenbrier River, Cranberry River from its headwaters to its confluence with the Gauley River, Birch River from Cora Brown Bridge in Nicholas County to the confluence of the river with the Elk River, and New River from its confluence with the Greenbrier River to its confluence with the Gauley River. This condition is required consistent with the authority and requirements of the Natural Streams Preservation Act, W.Va. Code §22-13-1, et seq. (2011).
16. The following mitigation guidelines are established to ensure no significant adverse impact to the chemical, physical, hydrologic, or biological integrity of wetlands and streams without compensating for the aquatic resource functions that will be lost as a result of the permitted activity. The discharge of dredged or fill material into a stream or wetland is authorized based upon the following criteria:
- A. Greater than one-tenth (1/10) acre of cumulative permanent impact to wetland(s) (including wetland type conversion) requires prior notification describing the project location, impacts, and plan for mitigation to be submitted to the WV DEP.
 - B. The amount of fill in a wetland, wetland complex or wetland system without mitigation is not to cumulatively exceed 1/10 acre.
 - C. Cumulative permanent impacts to stream(s) greater than 300 linear feet requires prior notification describing the project location, impacts, and plan for mitigation to be submitted to the WV DEP. The West Virginia Stream Wetland

Valuation Metric (SWVM) is the preferred assessment methodology to assist with the determination of required mitigation. The metric is available at the Huntington and Pittsburgh USACE web sites.

In all instances, mitigation for all impacts incurred through use of these Nationwide Permits must first be directed to elimination of the impacts, then minimization of the impacts and lastly through compensatory mitigation. In many cases, the environmentally preferable compensatory mitigation may be provided through an approved mitigation bank or the West Virginia In-Lieu Fee Program. Permittee responsible compensatory mitigation may be performed using the methods of; restoration, enhancement, establishment, and in certain circumstances, preservation. In general, the required compensatory mitigation should be located in the same watershed as the impact site and located where it is most likely to successfully replace lost functions and services as the impacted site. However, the use of mitigation banks or in-lieu fee for in-kind replacement is not restricted to the same watershed in which the impact has occurred until such time as mitigation banks or in-lieu projects are developed in each major watershed.

Wetlands. When permittee responsible in-kind replacement mitigation is used, it is to be accomplished at the following ratios until such time an approved functional assessment methodology is established for the state of West Virginia.

Permanent impacts to open water wetlands are to be one (1) acre replaced for one (1) acre impacted.

Permanent impacts to wet meadow/emergent wetlands are to be two (2) acres replaced for one (1) acre impacted.

Permanent impacts to scrub-shrub and forested wetlands are to be three (3) acres replaced for one (1) acre impacted.

In instances where compensatory in-kind mitigation is completed 12 months prior to the impact of the aquatic resource, the replacement ratio may be reduced to as low as one (1) acre created/restored to every one (1) acre impacted.

NOTE: The ratio of created/restored wetlands to impacted wetlands not only ensures no net loss but assures the adequate replacement of the impacted wetlands functions and values at the level existing prior to the impact. For many of the more complicated type wetlands, such as scrub-shrub and forested, the values and functions cannot readily be replaced through creation. Furthermore, not all wetland creation is successful.

In certain instances, the WV DEP DWWM may consider the acquisition of existing wetlands. Acquisition ratios include the following:

Five (5) to one (1) for open water wetlands;

Ten (10) to one (1) for wet meadow/emergent wetlands; and

Fifteen (15) to (1) for scrub-shrub and forested wetlands.

Under extenuating circumstances, the Secretary may accept lower ratios for high quality wetlands under significant threat of development.

All wetlands acquired, using the acquisition method of mitigation, shall either be deeded to the WVDNR Public Land Corporation for management by the Wildlife Resources Section or placed under a conservation easement and be protected from disturbance by the permittee or their designee. Third party oversight of the conservation easement by a non-profit conservation organization is preferred.

Streams. When proposing permittee responsible compensatory mitigation, projects shall attempt to replace lost functions for permanent stream impacts. Mitigation shall be determined on a case-by-case basis based on the pre- and post- condition stream quality and complexity of the mitigation project preferably utilizing the most current version of the SWVM worksheets. Compensatory mitigation may require protection through deed restrictions or conservation easements by the permittee or their designee.

These requirements are established in accordance with; Antidegradation Implementation Procedures, W.Va. C.S.R. §60-5-1, et seq, (2008), Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-3 (2016), WV Water Pollution Control Act, W.Va. Code §22-11-1, et seq. (2014), Rules for Individual State Certification of Activities Requiring a Federal Permit, W.Va. C.S.R. §47-5A-6 (2014), and Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, 33 C.F.R. §332 (2008).

17. To protect mussel populations in accordance with state and federal requirements, should native freshwater mussels be encountered during the use of any Nationwide Permit, all activity reasonably expected to jeopardize the population is to cease immediately and the WV DNR Wildlife Resources Section, Wildlife Diversity Program is to be contacted (304-637-0245) to determine significance of the mussel population and the action to be taken. This condition is required in accordance with; Rules for Individual State Certification of Activities Requiring a Federal Permit, W.Va. C.S.R. §47-5A-3.1 (2014), Requirements Governing Water Quality Standards, W.Va. C.S.R. §47-2-1, et seq. (2016), Possession of Wildlife, W.Va. Code §20-2-4 (2017) and Fishing Regulations W.Va. C.S.R. §58-60-5.11 (2020).

Attachment D

LEASE AGREEMENT AND GRANT OF EASEMENT

THIS LEASE AGREEMENT AND GRANT OF EASEMENT ("Agreement"), dated as of the 16th (2nd) day of January, 2025, ("Instrument Date") is entered into by CABELL COUNTY BOARD OF EDUCATION, a municipality of the State of West Virginia (hereinafter referred to as "Landlord"), and MARSHALL UNIVERSITY BOARD OF GOVERNORS, an instrumentality of the State of West Virginia (hereinafter referred to as "Tenant").

WITNESSETH:

WHEREAS, Tenant wishes to lease and obtain an easement for ingress and egress to and from, from Landlord certain real property, for the purpose of construction and operation of tunnels pursuant to the Marshall University Subterranean Testing Facility Project, described more fully herein below and within the documents appended hereto as Exhibits;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which being hereby acknowledged, and in consideration of the mutual covenants herein made, and intending to be legally bound hereby, the parties agree as follows:

1. Demised Premises.

- a. **The Property:** Landlord hereby leases to Tenant and Tenant hereby leases from Landlord that certain parcel of real property containing approximately 4.787 acres, located in Huntington, Cabell County, West Virginia, as described within the Triad Engineering, Inc. Boundary Description attached hereto as **Exhibit B**, and as further designated as the "Proposed Lease Area" on the Triad Engineering, Inc. Survey drawing attached hereto as **Exhibit C**, together with and including all rights of access to and use of the surface and subsurface to a depth sufficient to construct, place and maintain the tunnels pursuant to the Marshall University Subterranean Testing Facility Project which constitute the Permitted Use under this Agreement, which is collectively referred to herein as "The Property."
- b. **The Easement:** Landlord hereby grants an Easement across its property on which Tenant shall be permitted to construct and maintain a gravel access road of approximate dimensions identified on the above-referenced Exhibit C, ("The Easement") for purposes of ingress and egress to the Property.
- c. **The Premises:** Collectively, The Property and The Easement shall constitute, and herein may be collectively referred to as, "The Premises."

2. Term and Termination.

The initial term of this Agreement will commence on the Lease Commencement Date, which shall be the date on which Landlord delivers possession of the Premises in compliance with the requirements set forth in Paragraph 4, and shall consist of three consecutive but separate phases, the "Construction Phase," the "Occupancy Phase" and the "Closure Phase."

- a. **Construction Phase:** The "Construction Phase" shall commence on the Lease Commencement Date and shall continue for a reasonable period of time projected to approximate up to one hundred eighty (180) days therefrom, which period of time may be extended by Landlord at request of Tenant, which request shall not be unreasonably denied by Landlord. During the Construction Phase, Tenant shall cause to be constructed a tunnel to facilitate the discharge of dredged and/or fill material into one (1) stream, in association with the Marshall University Subterranean Testing Facility Project, including construction of gravel road access to the tunnel site and the temporary installation of three (3) culverts and clean engineered fill in an unnamed tributary of the Guyandotte River to facilitate access for the construction of a subterranean testing facility pursuant to the Easement granted under this Agreement. The date on which the Construction Phase is completed shall be the Occupancy Commencement Date. Landlord and Tenant agree that when the actual Lease Commencement Date is determined, they will execute, upon the request

of either party, a Commencement Agreement in the form and content as set forth in **Exhibit A**.

- i. The culverts and engineered fill shall be removed following completion of construction of the tunnel at a date to be agreed upon by the Parties, which date may be at the conclusion of the Construction Phase or later up until the Expiration Date, depending upon the agreement of the Parties yet to be determined.
- b. **Occupancy Phase:** The Occupancy Phase shall begin on the Occupancy Commencement Date. The term of the Occupancy Phase shall continue for a term of five (5) years following the Occupancy Commencement Date, expiring at midnight of the day before the fifth anniversary of the Occupancy Commencement Date. During the Occupancy Phase, the Tenant shall utilize the tunnel system constructed during the Construction Phase to conduct data collection activities under the Permitted Use, and shall continue to enjoy the rights of access to the Premises granted under this Agreement.
- c. **Closure Phase:** The Closure Phase shall commence on the next day following the expiration of the Occupancy Phase, and shall continue for a reasonable period of time projected to approximate up to ninety (90) days therefrom, which period of time may be extended by Landlord at request of Tenant, which request shall not be unreasonably denied by Landlord. During the Closure Phase, Tenant shall close the tunnel, including:
 - a. closing both ends of the tunnel with concrete or block walls;
 - b. installing any support structures necessary, in Tenant's judgment, to stabilize the tunnel; and
 - c. returning the road and Premises to a condition and at least as good as that of the quality in which the road and Premises existed as of the Lease Commencement Date.
- d. **Termination:** This Agreement shall expire at midnight on the final day of the Closure Phase, hereinafter the "Expiration Date," unless sooner terminated as herein provided.
- e. **Extension:** The Term shall not be extended unless by way of mutual express written consent of the Parties.

3. Rental.

As good and valuable consideration for entering into this Agreement, and commencing with the Lease Commencement Date, Tenant shall pay Landlord, on or before the tenth (10th) day following the Lease Commencement Date or, after the first year, the anniversary of the Lease Commencement Date, annual Rent in advance, in the amount of **One Dollar (\$1.00) per year** ("Rent").

4. Delivery of Possession.

Landlord will deliver possession of the Premises to Tenant on the Lease Commencement Date. The parties agree to sign an acknowledgement of the Lease Commencement Date (**Exhibit A**).

5. Taxes and Assessments.

Landlord shall continue to pay when due all real property taxes and assessments upon the Premises.

6. Use.

Tenant shall use and occupy the Premises for all purposes necessary for and in furtherance of the "Permitted Use", which Permitted Use shall be defined as: the construction, placement, maintenance, utilization and access to certain underground tunnels pursuant to the Marshall University Subterranean Testing Facility Project, as referenced within Paragraphs 1 and 2 herein and as further described within the following attached **Exhibit D** (Nationwide Permit No. 33 Verification issued on October 15, 2024 by the U.S. Army Corps of Engineers, Huntington District) and **Exhibit E** (West Virginia Department of Natural Resources Office of Land and Streams Right of Entry dated Sept. 4, 2024). The scope of the Permitted Use shall include not only non-destructive testing inside the subject tunnel but also in and around the exterior of the tunnel and surface land above the tunnel. Tenant shall not use or occupy the Premises for any use or purpose other than Permitted Use without the prior written consent of the Landlord.

7. Compliance with Legal Requirements.

a. Tenant will comply with all applicable laws, statutes, ordinances, rules, and regulations of all federal, state, county, city and local departments and agencies having jurisdiction over the Premises ("Legal Requirements") insofar as they pertain solely to the use of the Premises by Tenant.

b. Tenant shall not cause or permit to occur:

i. Any violation of any federal, state or local law, ordinance, or regulation now or hereafter enacted, related to environmental conditions on, under or about the Premises, arising from Tenant's use or occupancy of the Premises; or

ii. The use, generation, release, manufacture, refining, production, processing, storage or disposal of any Hazardous Substance on, under or about the Demised Premises, or the transportation to or from the Premises of any Hazardous Substance.

iii. The term "Hazardous Substances", as used in this Agreement, shall include, without limitation, flammables, explosives, radioactive materials, asbestos, polychlorinated biphenyls (PCB's), chemicals known to cause cancer or reproductive toxicity, pollutants, contaminants, hazardous wastes, toxic substances or related materials, petroleum and petroleum products, and substances declared to be hazardous or toxic under any law or regulation now or hereafter enacted or promulgated by any governmental authority.

8. Repairs and Maintenance.

a. During the Term, Landlord will, subject to the provisions of Paragraph 8(b), continue to perform at its sole cost and expense and in a good and workmanlike manner all normal, routine maintenance and care of the Premises that is customary and necessary in the course of Landlord's ownership of the Premises prior to the Lease Commencement Date.

b. During the Term, to the extent that Tenant's operations on the Premises create the necessity for maintenance and care of the Premises that is greater than or in addition to that normal, routine maintenance and care for which Landlord was already responsible prior to the Term, Tenant will at its sole cost and expense be responsible for performing - or alternatively as the Parties may agree, reimburse Landlord for the expense of - only that additional maintenance and care of the Premises necessitated by Tenant's operations of the Premises. Tenant shall be responsible for removal of all trash or refuse resulting from Tenant's operations on the Premises, *provided* that Tenant may place said refuse and trash in receptacles provided or owned by Landlord, if the consent of Landlord is first obtained.

9. Services and Utilities.

Tenant will be responsible for furnishing and shall pay for all electricity, telephone and other communications, data, internet, and other like services or utilities required by Tenant for carrying out the Permitted Use.

10. Alterations.

a. Landlord shall not be obligated to make any alterations to the Premises during the Term of this Agreement other than as may be expressly agreed and memorialized in writing by the parties. Tenant may, at its own cost and expense, (1) with Landlord's prior written consent, make non-structural changes, alterations, additions or improvements to the Premises ("Tenant Alterations"), and (2) without Landlord's prior consent, bring onto and use upon the Premises Tenant's removable personal property and equipment as will, in the judgment of Tenant, best adapt the Premises for its needs, provided that Tenant, in each case, complies with the following provisions:

i. The Tenant Alterations will not result in a violation of law or cause an increase in the premium cost of the Landlord's then existing insurance coverage on the Premises.

ii. The appearance of the Premises will not be adversely affected; and, such Tenant Alterations will not weaken or impair the structure of, or lessen the value of, the Premises.

b. Tenant agrees that all Tenant Alterations will at all times comply with all applicable legal requirements and that Tenant, at its expense, will (i) obtain all necessary municipal and other governmental permits, authorizations, approvals and certificates for the commencement and prosecution of such Tenant Alterations, (ii) deliver copies of all governmental permits, authorizations, approvals and certificates to Landlord and (iii) cause all improvements to be performed in a good and workmanlike manner. Tenant, at its expense, will promptly procure the cancellation or discharge of all notices of violation arising from or otherwise connected with Tenant Alterations issued by any public authority having or asserting jurisdiction.

c. Throughout the making of all Tenant Alterations (other than mere decorations), Tenant, at its sole cost and expense, will carry or cause its contractors and subcontractors to carry (i) workers' compensation insurance in statutory limits covering all persons employed in connection with such Tenant Alterations, (ii) comprehensive liability insurance covering any occurrence in or about the Premises in connection with such Tenant Alterations which complies with the requirements of Paragraph 12.

d. Tenant will not subject Landlord's interest in the Property to any mechanic's lien or any other lien whatsoever. If any mechanic's lien or other lien, charge or order for payment of money will be filed as a result of the act or omission of Tenant, Tenant will cause such lien, charge or order to be discharged or appropriately bonded or otherwise reasonably secured ("Secured") within sixty (60) days after notice from Landlord thereof. If Tenant will fail to cause the lien or encumbrance to be Secured within the sixty (60) day period, then Landlord will be entitled, but not obligated, to discharge or bond same. If Tenant fails to cause any such lien to be discharged within the period aforesaid, then, in addition to any other right or remedy, Landlord may discharge the same either by paying the amount claimed to be due or by deposit or bonding proceedings. Any amount so paid by Landlord, and all costs and expenses incurred by Landlord in connection therewith, will be payable by Tenant within thirty (30) days of demand.

e. Upon the termination or expiration of this Agreement, all improvements, Tenant Alterations, and additions placed on the Premises or affixed thereto by Tenant (other than Tenant's signage, trade fixtures, and equipment) shall become the property of Landlord without any obligation of further payment on the part of Landlord. Notwithstanding the foregoing, at the termination or expiration of this Agreement, Tenant may remove all of Tenant's trade fixtures and equipment which can be removed without costly injury to or undue defacement of the Premises; provided, that all Rents stipulated in the Agreement are paid in full and Tenant is not otherwise in default under this Agreement. Any and all damage to the Premises resulting from or caused by such removal shall be promptly repaired at Tenant's sole expense.

11. Assignment and Sublease.

Tenant shall not transfer or assign this Agreement or sublet the Premises without the express written consent of the Landlord, except that Tenant reserves the right to assign this Agreement to another State agency, board or commission upon thirty (30) days written notice to Landlord. Landlord shall not sell, assign or otherwise transfer its interest in this Agreement without first obtaining Tenant's prior written consent, which consent shall not be unreasonably denied.

12. Insurance.

a. Landlord will maintain, at its own cost and expense, during the Term, fire insurance, with standard "all risk" coverage for the Property on terms and in amounts determined by Landlord.

b. Tenant will maintain, at its own cost and expense, during the Term, commercial general liability insurance having a minimum limit of liability of \$1,000,000 combined single limit for bodily injury or death/property damage arising out of any one occurrence and Workers' Compensation Insurance as required by law. Tenant will name the Landlord as an additional insured under its general liability policy. Tenant will require its insurance company to give at least thirty (30) days prior written notice of termination or cancellation of the policy or reduction in coverage to the additional insured, except for termination or cancellation for non-payment of premium, which notice will be ten (10) days. Tenant will, at its own cost and expense, maintain a policy of standard fire and extended coverage insurance on all of Tenant's personal property and Tenant's improvements and alterations in, on, or about the Premises, in such amounts and on such terms as Tenant may elect, in its sole discretion. Tenant acknowledges that Landlord has no obligation to provide such insurance on Tenant's property.

By no later than the Lease Commencement Date, the Tenant shall submit to the Landlord insurance certificates demonstrating the required policies.

13. Subordination and Non-Disturbance

This Agreement is subject and subordinate to all Deeds of Trust which may now or hereafter affect the Premises, and to all renewals, modifications, consolidations, replacements and extensions thereof. This clause shall be self-operative, and no further instrument or subordination shall be required; provided, however, that the Tenant shall execute promptly any instrument that the Landlord may request confirming such subordination.

15. Landlord's Right of Entry.

a. Landlord has the right to enter the Premises at any reasonable time upon at least twenty-four (24) hours prior notice to Tenant, or without notice in case of emergency, provided however, Tenant is notified as soon thereafter as practicable, for the purpose of performing maintenance, repairs, and replacements to the Premises as are permitted under this Agreement.

b. In exercising its rights under this Paragraph, Landlord will not interfere with or disrupt the normal operation of Tenant's Permitted Use.

16. Signs.

Tenant shall not place signage on the Premises or the Building except in compliance with applicable laws and regulations, including zoning laws. Upon vacating the Premises, Tenant shall remove any and all signage placed by the Tenant and repair any damage caused by such placement or removal.

17. Security of Premises.

Landlord and Tenant agree that the Tenant shall have the right, at Tenant's sole expense, to secure the Premises by any reasonable means which in Tenant's reasonable opinion will successfully secure the operations of Tenant. Tenant shall provide the Landlord with a copy of all keys, cards, and passcodes.

18. Rules and Regulations.

Landlord reserves the right to establish written rules and regulations applicable to the Premises; provided that all such rules and regulations will not unreasonably interfere with Tenant's Permitted Use of the Premises and will not materially modify or alter the rights of Tenant granted by this Agreement.

19. Waiver.

The waiver by Landlord or Tenant of any breach of any term, covenant or condition herein contained will not be deemed to be a waiver of such term, covenant or condition on any subsequent breach of the same or any other term, covenant or condition herein contained. The subsequent acceptance of Rent by Landlord will not be deemed to be a waiver of any preceding breach by Tenant of any term, covenant or condition of this Agreement, regardless of Landlord's knowledge of such preceding breach at the time of acceptance of such Rent. Additionally, no covenant, term or condition of this Agreement will be deemed to have been waived by Landlord or Tenant, unless such waiver be in writing signed by the party to be bound thereby.

20. Tenant's Default: Rights and Remedies.

a. The occurrence of any one or more of the following constitutes an "Event of Default" by Tenant under this Agreement:

i. failure by Tenant to pay Rent within thirty (30) business days after Tenant's receipt of written notice from the Landlord of such failure to pay when due.

ii. failure by Tenant to observe or perform any other covenant, agreement, condition or provision of this Agreement, if such failure continues for thirty (30) days after receipt of written notice from Landlord to Tenant, except that if such default cannot be cured within such thirty (30) day period, it will not be considered a default if Tenant commences to cure such default within such thirty (30) day period and proceeds diligently thereafter to seek to effect such cure.

b. If an Event of Default by Tenant occurs, then the Landlord may terminate this Agreement, by giving

Tenant not less than thirty (30) days written notice of the Landlord's election to do so, in which event the Term will end, and all right, title and interest of the Tenant hereunder will expire, on the date stated in such notice.

c. If this Agreement and the Term and estate hereby granted are terminated for an Event of Default, as provided in Paragraph 20(b), then Landlord and Landlord's agents may thereupon reenter the Premises or any part thereof and may repossess the Premises and dispossess Tenant and any other persons therefrom and remove any and all of its or their property and effects from the Premises.

21. Landlord's Default; Rights and Remedies.

The occurrence of the following constitutes an "Event of Default" by Landlord under this Agreement: failure by Landlord to observe or perform any covenant, agreement, condition or provision of this Agreement, if such failure continues for thirty (30) days after receipt of written notice from Tenant to Landlord, except that if such default cannot be cured within such thirty (30) day period, this period will be extended, provided that Landlord commences to cure such default within such thirty (30) day period and proceeds diligently thereafter to seek to effect such cure. In the event Landlord shall fail to timely cure the default as aforesaid, then Tenant may thereafter, as its sole remedy, elect to terminate this Agreement upon giving at least thirty (30) days written notice to Landlord of Tenant's intention to terminate the Agreement and the grounds for termination, in which event this Agreement shall terminate upon the date fixed in the notice unless Landlord shall have meanwhile cured such default.

22. Quiet Enjoyment.

Landlord covenants that if and for so long as Tenant pays the Rent and performs the covenants and conditions of the Agreement, Tenant will have peaceful and quiet enjoyment and possession of the Premises for the Term.

23. Mutual Representation of Authority.

a. Landlord and Tenant represent and warrant to each other that they have full right, power and authority to enter into this Agreement without the consent or approval of any other entity or person and make these representations knowing that the other party will rely thereon, except that Tenant's acceptance of the terms of this Agreement are subject to review and approval by the Office of the Attorney General prior to execution.

b. The signatories on behalf of Landlord and Tenant further represent and warrant that they have full right, power and authority to act for and on behalf of Landlord and Tenant in entering into this Agreement.

24. Estoppel Certificate.

a. Tenant agrees, upon not less than ten (10) business days prior written request by Landlord, to deliver to Landlord a statement in writing signed by Tenant certifying (i) that this Agreement is unmodified and in full force and effect (or if there have been modifications, identifying the modifications); (ii) the date upon which Tenant began paying Rent and the dates to which the Rent has been paid; (iii) that, to the best of Tenant's knowledge, the Landlord is not in default under any provision of this Agreement, or, if in default, the nature thereof; and (iv) that there has been no prepayment of Rent other than that provided for in this Agreement.

b. Landlord, upon not less than ten (10) business days prior written request from Tenant, will furnish a statement in writing to Tenant covering the matters set forth in Paragraph 24(a), to the extent applicable to Landlord.

25. Partial Invalidity.

If any term, covenant or condition of this Agreement or the application thereof to any person or circumstance will to any extent be invalid or unenforceable, the remainder of this Agreement or the application of such term, covenant or condition to persons or circumstances other than those as to which it is held invalid or unenforceable will not be affected thereby and each term, covenant and condition of this Agreement will be valid and enforced to the fullest extent permitted by law.

26. Governing Law.

This Agreement will be construed and interpreted in accordance with the laws of the State of West Virginia without reference to its conflicts of law principles. The parties hereby irrevocably and exclusively submit to the jurisdiction of the State of West Virginia over any action or proceeding arising out of or relating to this Agreement.

27. Notices

Any notice, consent, approval or other communication given pursuant to the provisions of this Agreement will (except where otherwise expressly permitted by this Agreement) be in writing and will be (i) mailed by certified mail or registered mail, return receipt requested, postage prepaid, or (ii) delivered by a nationally recognized overnight courier, U.S. Post Office Express Mail, or similar overnight courier which delivers only upon signed receipt of the addressee, and addressed as follows:

If to Landlord: Tim Hardesty
 Superintendent
 Cabell County Schools
 2850 5th Avenue
 Huntington, West Virginia 25702

If to Tenant: H. Toney Stroud, Esq.
 Chief Legal Officer and Vice President of
 Strategic Initiatives and Corporate Relations
 Marshall University
 One John Marshall Drive
 Huntington, West Virginia 25545

The time of the giving of any notice will be the time of receipt by the addressee or any agent of the addressee, except that in the event the addressee or such agent of the addressee will refuse to receive any notice given by registered mail, certified mail, or by nationally recognized overnight courier or U.S. Post Office Express Mail or similar overnight courier which delivers only upon signed receipt of the addressee, as above provided, the time of the giving of such notice will be the time of such refusal. Any party hereto may, by giving five (5) days written notice to the other party hereto, designate any other address in substitution of the foregoing address to which notice will be given.

28. Captions.

The captions and paragraph numbers appearing in this Agreement are inserted only as a matter of convenience and in no way define, limit, construe, or describe the scope or intent of such paragraphs of this Agreement nor in any way affect this Agreement.

29. Use of Pronouns.

The use of the neutral singular pronoun to refer to Landlord or Tenant will be deemed a proper reference even though Landlord or Tenant may be an individual, a partnership, a limited liability company, a Corporation, or a group of two or more individuals or corporations. The necessary grammatical changes required to make the provisions of this Agreement apply in the plural sense where there is more than one Landlord or Tenant and to either corporations, associations, partnerships, limited liability companies, or individuals, males or females, will in all instances be assumed as though in each case fully expressed.

30. Counterparts.

This Agreement may be executed in multiple copies, each of which will be deemed an original, and all of such copies will together constitute one and the same instrument.

31. Force Majeure.

Notwithstanding anything to the contrary contained in this Agreement, if Landlord or Tenant is delayed or prevented from performing any act which it is obligated to perform (except for the payment of Rent) under this Agreement for causes beyond its reasonable control (including, without limitation, repair, restoration and/or maintenance obligations) related to acts of God, war, epidemics, pandemics, governmental restrictions, terroristic acts, or the inability to procure the necessary labor or materials, (hereinafter "Force Majeure"), then Landlord or Tenant's time for performance of such obligation(s) hereunder will be reasonably extended by the period during which Landlord or Tenant was unable to perform, and the non-performing party will have no liability to the other party, other than the payment of monies which shall not be thereby excused, (nor will either party be entitled to terminate this Agreement or claim any abatement under this Agreement) on account of any such delay.

32. Entire Agreement.

This Agreement constitutes the entire agreement between the parties, there being no other terms, oral or written, except as herein expressed. No modification of this Agreement will be binding on the parties unless it is in writing and signed by both parties hereto.

33. Construction and Interpretation.

Landlord and Tenant acknowledge having the opportunity to participate fully and equally in the negotiation and preparation of this Agreement and to have had the assistance of their respective legal counsel. This Agreement, therefore, shall not be more strictly construed, nor shall any ambiguities within this Agreement be resolved, against either party based on authorship. The words "include," "includes" and "including" when used herein shall be deemed in each case to be followed by the words "without limitation." The word "herein" and similar references mean, except where a specific Section or Paragraph reference is expressly indicated, the entire Agreement rather than any specific Section or Paragraph. All reference to "days" as used in this Agreement, will mean calendar days unless otherwise so designated in this Agreement. References to "business days" shall mean any day that is not a Saturday, Sunday, or other day on which national banks are authorized or required to be closed. In computing any period of time prescribed or allowed by this Agreement, the day of the notice, act or other event from which the period of time begins to run is not included, and the last day is included, unless it is a Saturday, Sunday, or a legal holiday for national banks in the United States, in which event the period runs until the close of business on the next day which is not one of such days. Otherwise, Saturdays, Sundays and legal holidays are included even though the time prescribed or allowed is less than seven days.

34. Survivability

The terms and provisions of this Agreement which are intended to survive, and all provisions related to the interpretation and enforcement thereof, shall survive the termination of this Agreement as necessary to give full force and effect thereto.

[signature blocks on next page; remainder of this page left intentionally blank]

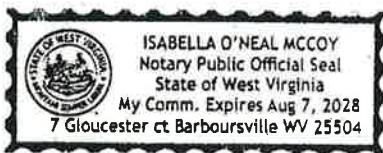
IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement as of the day and year first above written.

LANDLORD:

CABELL COUNTY BOARD OF EDUCATION

[Signature]
Title: Superintendent
Date: January 16, 2025

This Lease Agreement was sworn to or affirmed before me on the 16 day of January, 2025.



[Signature]
Notary Public/ Other Official

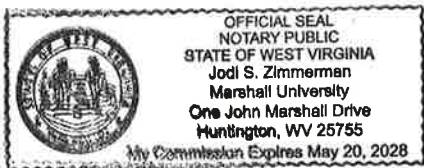
My commission expires: August 7th, 2028

TENANT:

MARSHALL UNIVERSITY BOARD OF GOVERNORS

[Signature]
Title: [Signature]
Date: 1-22-25

This Lease Agreement was sworn to or affirmed before me on the 20th day of January, 2025.



[Signature]
Notary Public/ Other Official

My commission expires: May 20, 2028

List of Exhibits:

Exhibit A - Commencement Agreement

Exhibit A

Commencement Agreement

ACKNOWLEDGEMENT OF COMMENCEMENT DATES

Landlord: Cabell County Board of Education

Tenant: Marshall University Board of Governors

Premises: As identified within Paragraph 1 of the Lease Agreement and Grant of Easement to which this Commencement Agreement is appended as Exhibit A.

Landlord and Tenant are the parties to the Lease Agreement and Grant of Easement dated January ^{16th (cwl)} 2025 (the "Agreement"). All capitalized terms used in this Acknowledgment are as defined in the Agreement. Landlord has tendered possession of the Premises to Tenant. The Lease Commencement Date shall be _____, 2025. The initial term of the Lease will terminate as set forth within Paragraph 2 of the Agreement.

Tenant acknowledges that Landlord has fulfilled all of Landlord's obligations regarding delivery of the Premises to Tenant.

LANDLORD:

CABELL COUNTY BOARD OF EDUCATION



Title: Superintendent

Date: January 16, 2025

TENANT:

MARSHALL UNIVERSITY BOARD OF GOVERNORS



Title: _____

Date: 1-22-25

EXHIBIT B



BOUNDARY DESCRIPTION

AS SURVEYED

A portion of that certain parcel of land situate in the Lower Guyandotte watershed, being the Cabell County Board of Education property described in Deed Book 781 at Page 586, of record in the office of the Cabell County Clerk, and lying in the Huntington-Guyandotte Corporate District of Cabell County, and also identified as Tax Parcel 1 as shown on Tax Map 106 as published by the Cabell County Assessor, said portion to be set aside for leasing and is more particularly described as follows:

FROM a bare 1/2-inch diameter iron pin found at a point-of-curvature in the southerly right-of-way line of Norwood Avenue and being also a common corner of the Marshall University Board of Governors property as described in Deed Book 1149 at Page 434, of record in the office of the Cabell County Clerk, and the aforementioned Cabell County Board of Education property, with said common corner being also the true POINT OF BEGINNING;

THENCE, with and as the southerly right-of-way line of Norway Avenue, as a curve to the left with a radius of 120.81 feet and an arc length of 149.59 feet, having a chord that bears N 59° 18' 39" E for a distance of 140.22 feet to a Mag Spike with a stainless-steel washer stamped Triad Engineering set in the asphalt of a paved access drive at the point-of-tangency in said right-of-way line;

THENCE, leaving the southerly right-of-way line of Norway Avenue, as new lines defining the portion of the property to be leased, the following three calls;

S 58° 18' 19" E for a distance of 237.15 feet to a point;

S 26° 54' 59" E for a distance of 443.59 feet to a point;

S 46° 38' 35" W for a distance of 593.51 feet to a 5/8" rebar with a plastic identification cap marked Triad Engineering set at a common corner of the aforementioned Marshall University Board of Governors property

THENCE, with and as the common line of the Marshall University Board of Governors property, N 24° 28' 33" E for a distance of 190.00 feet to a Mag Spike with a stainless-steel washer stamped Triad Engineering set in the asphalt of a paved access drive at another common corner of said Marshall University property;

THENCE, continuing as a common line of the Marshall University Board of Governors property, N 0° 38' 12" W for a distance of 165.17 feet to a Mag Spike with a stainless-steel washer stamped Triad Engineering set in the asphalt of a paved access drive at another common corner of said Marshall University property;

THENCE, continuing as a common line of the Marshall University Board of Governors property, N 13° 15' 35" W for a distance of 478.06 feet to a 5/8" rebar with a plastic identification cap marked Potesta, found at another common corner of said Marshall University property;

THENCE, continuing as a common line of the Marshall University Board of Governors property, N 48° 12' 24" W for a distance of 78.97 feet to the POINT OF BEGINNING and thus containing 208,509.41 square feet or 4.787 acres, as surveyed and depicted on a plat of survey entitled "BOUNDARY RETRACEMENT SURVEY SHOWING PROPOSED LEASE AREA FOR MARSHALL UNIVERSITY" prepared by Triad Engineering Inc., dated November 23, 2024, and bearing the signature and seal of the undersigned surveyor of record.

The preceding description was prepared by Lloyd A. Kirk, a West Virginia Professional Surveyor, and is a true and accurate representation of the subject property, as surveyed.

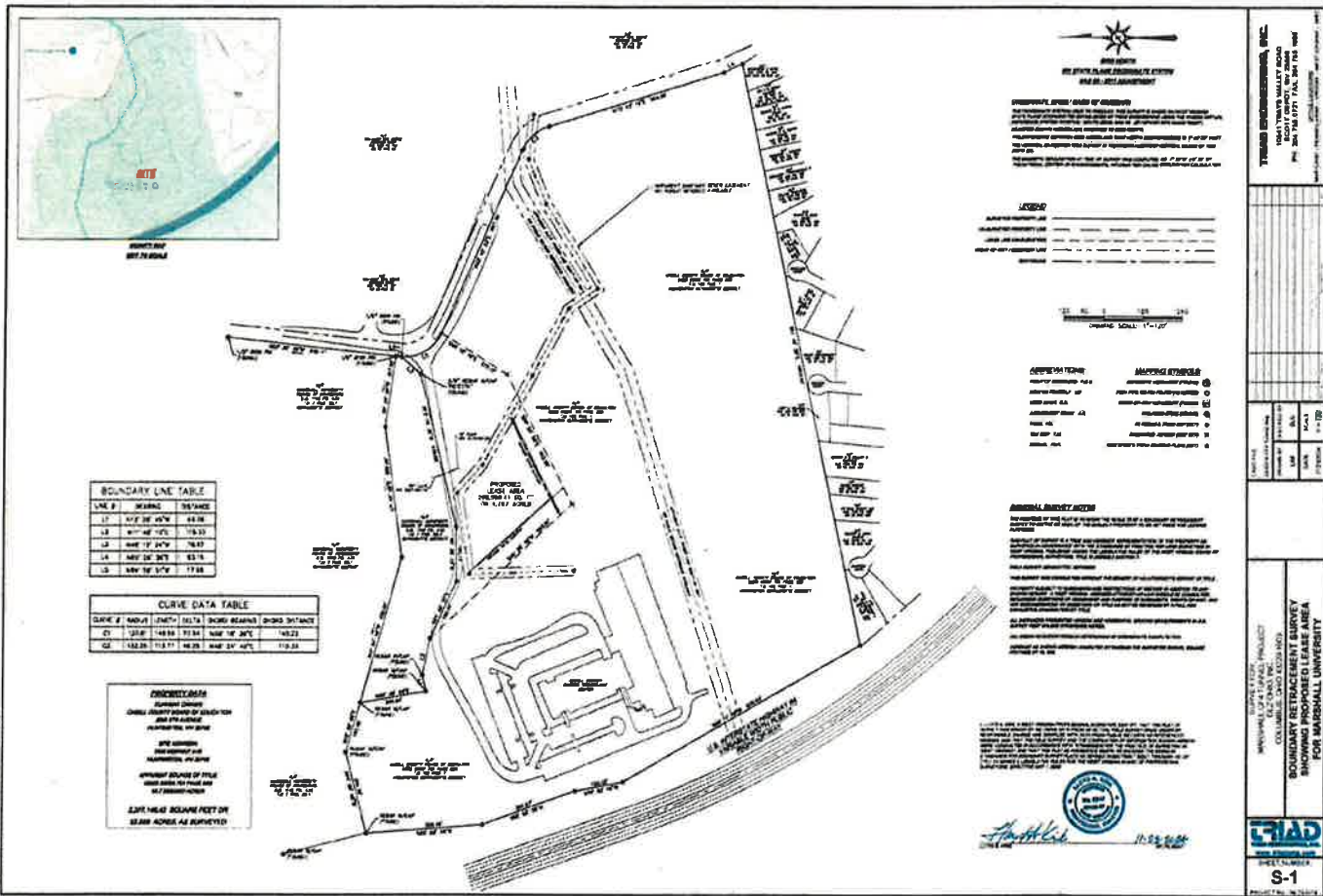


Lloyd A. Kirk 11.23.24

Lloyd A. Kirk, PS

WVPS #2247

EXHIBIT C



BOUNDARY LINE TABLE

LINE #	BEARING	DISTANCE
17	S 71° 05' 45"W	43.36
18	S 71° 05' 45"W	76.30
14	S 45° 00' 00"W	63.74
13	S 64° 10' 30"W	77.68

CURVE DATA TABLE

CURVE #	NO. OF POINTS	CHORD BEARING	CHORD DISTANCE
C1	22.0	S 48° 58' 33"W	143.23
C2	143.23	N 13° 27' 18"E	112.25

PRECEDENCE
 SURVEY CONTROL
 OVER ALL OTHER SURVEYS OF ANY KIND
 AND FOR RECORD
 THE SURVEY
 HEREON
 SUPERSEDES ALL
 PREVIOUS SURVEYS
 OF THIS
 TRACT AND OF THE
 ADJACENT TRACTS
 SHOWN HEREON AS SURVEYED

PROPOSED LEASE AREA OF MARSHALL UNIVERSITY
 MARSHALL UNIVERSITY
 1001 TRAVIS HALLWAY ROAD
 MARSHALL, WEST VIRGINIA 24701
 TEL: 304.243.2100 FAX: 304.243.2101

LEGEND
 BOUNDARY LINE
 PROPOSED LEASE AREA
 EXISTING ROAD

GRAPHIC SCALE 1" = 100'

ADVERSE TITLE
 NONE KNOWN TO SURVEYOR
 NONE KNOWN TO CLIENT
 NONE KNOWN TO ENGINEER

MARKING METHODS
 WOODEN PINE STAKES
 ALUMINUM PIPES
 IRON PIPES
 IRON BOLTS
 IRON NAILS
 IRON WIRE
 IRON RODS
 IRON PLATES
 IRON TUBES
 IRON CANNERS
 IRON BARS
 IRON RINGS
 IRON SCREWS
 IRON NUTS
 IRON WASHERS
 IRON BOLTS
 IRON NAILS
 IRON WIRE
 IRON RODS
 IRON TUBES
 IRON CANNERS
 IRON BARS
 IRON RINGS
 IRON SCREWS
 IRON NUTS
 IRON WASHERS

GENERAL SURVEY NOTES
 THIS SURVEY WAS MADE IN ACCORDANCE WITH THE SURVEYING ACT OF 1896 AND THE SURVEYING ACT OF 1932.
 THE SURVEYOR HAS USED THE MOST ACCURATE METHODS AND EQUIPMENT AVAILABLE AT THE TIME OF SURVEY.
 ALL MEASUREMENTS WERE MADE IN ACCORDANCE WITH THE SURVEYING ACT OF 1896 AND THE SURVEYING ACT OF 1932.
 THE SURVEYOR HAS USED THE MOST ACCURATE METHODS AND EQUIPMENT AVAILABLE AT THE TIME OF SURVEY.
 ALL MEASUREMENTS WERE MADE IN ACCORDANCE WITH THE SURVEYING ACT OF 1896 AND THE SURVEYING ACT OF 1932.

THIS SURVEY WAS MADE IN ACCORDANCE WITH THE SURVEYING ACT OF 1896 AND THE SURVEYING ACT OF 1932.
 THE SURVEYOR HAS USED THE MOST ACCURATE METHODS AND EQUIPMENT AVAILABLE AT THE TIME OF SURVEY.
 ALL MEASUREMENTS WERE MADE IN ACCORDANCE WITH THE SURVEYING ACT OF 1896 AND THE SURVEYING ACT OF 1932.

Professional Seal
 Surveyor's Seal
 State of West Virginia
 License No. 12345
 Date: 11/23/2024

TRIMBLE ENGINEERING, INC.
 1001 TRAVIS HALLWAY ROAD
 MARSHALL, WEST VIRGINIA 24701
 TEL: 304.243.2100 FAX: 304.243.2101

NO.	DATE	BY	REVISION

PROJECT TITLE
 BOUNDARY RETRACEMENT SURVEY
 SHOWING PROPOSED LEASE AREA
 FOR MARSHALL UNIVERSITY

CLIENT
 MARSHALL UNIVERSITY

DATE
 11/23/2024

SCALE
 1" = 100'

SHEET NUMBER
 S-1

EXHIBIT D



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HUNTINGTON DISTRICT
602 8TH STREET
HUNTINGTON, WV 25701-2018

October 15, 2024

Regulatory Division
Energy Resource Branch
LRH-2024-00643-GUY-UNT Guyandotte River

NATIONWIDE PERMIT NO. 33 VERIFICATION

Caleb Wise
Marshall University
1 John Marshall Drive
Huntington, West Virginia 25755

Dear Caleb Wise:

I refer to the pre-construction notification (PCN) requesting a Department of the Army (DA) authorization for the discharge of dredged and/or fill material into waters of the United States (U.S.) in association with the construction of the MU Subterranean Testing Facility Project. The project is located in the city of Huntington, Cabell County, West Virginia. The proposed activity is located at approximately 38.405556°N, 82.373397°W. Your PCN has been assigned the following file number: LRH-2024-00643-GUY-UNT Guyandotte River. Please reference this number on all future correspondence related to this project.

The U.S. Army Corps of Engineers' (Corps) authority to regulate waters of the U.S. is based on the definitions and limits of jurisdiction contained in 33 CFR 328 and 33 CFR 329. Section 404 of the Clean Water Act (Section 404) requires a DA permit be obtained prior to discharging dredged and/or fill material into waters of the U.S., including wetlands. Section 10 of the Rivers and Harbors Act of 1899 (Section 10) requires a DA permit be obtained for any work in, on, over or under a navigable water.

The proposed project, as described in the submitted information, has been reviewed in accordance with Section 404 and Section 10. Based on your description of the proposed work, and other information available to us, it has been determined that this project will not involve activities subject to the requirements of Section 10. However, this project will include the discharge of dredged and/or fill material into waters of the U.S. subject to the requirements of Section 404.

In the submitted PCN materials, you have requested a DA authorization for the temporary discharge of dredged and/or fill material into 110 linear feet (0.04 acre) of one (1) stream, in association with construction of the MU Subterranean Testing Facility Project. The proposed project would include the temporary installation of three (3) culverts and clean engineered fill in an unnamed tributary of the Guyandotte River to facilitate access for the construction of a subterranean testing facility. The culverts and engineered fill will be removed once construction

of the tunnel is completed. All work will be conducted in accordance with the PCN received in this office on August 8, 2024.

Based on the provided information, it has been determined the proposed project meets the criteria for Nationwide Permit (NWP) No. 33 (enclosed) under the December 27, 2021 Federal Register (FR), Issuance and Reissuance of NWPs (86 FR 73522) provided you comply with all terms and conditions of the enclosed material, the enclosed special conditions, and the Section 401 Water Quality Certifications (401 WQC) issued by the West Virginia Department of Environmental Protection.

Please be aware this NWP verification does not obviate the requirement to obtain other local, state, and/or federal authorizations required by law for these activities. This verification is valid until the expiration date of the NWPs, unless the NWP authorization is modified, suspended, or revoked. The verification will remain valid if the NWP authorization is reissued without modification or the activity complies with any subsequent modification of the NWP authorization. The 2021 NWPs are scheduled to be modified, reissued, or revoked on March 14, 2026. Prior to this date, it is not necessary to contact this office for re-verification of your project unless the plans for the proposed activity are modified. Furthermore, if you commence or under contract to commence this activity before March 14, 2026, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

Enclosed is a copy of the NWPs and the 401 WQC to be kept at the project site during construction. You shall supply a copy of these documents to your project engineer responsible for construction activities.

Upon completion of the work, the enclosed certification must be signed and returned to this office. If you have any questions concerning the above, please contact Rachel McCarty of the Energy Resource Branch at 304-399-5207, by mail at the above address, or by email at: rachel.a.mccarty@usace.army.mil.

Sincerely,

Kimberly Courts-Brown

Kimberly Courts-Brown
Regulatory Project Manager
Energy Resource Branch

Enclosures

**Nationwide Permit No. 33 Verification Special Conditions for the
Marshall University – MU Subterranean Testing Facility Project
LRH-2024-00643-GUY-UNT Guyandotte River**

1 of 2

1. All work will be conducted in accordance with the submitted pre-construction notification (PCN) for the MU Subterranean Testing Facility Project received in this office on August 8, 2024.
2. Enclosed is a copy of Nationwide Permit 33, which will be kept at the site during construction. A copy of the nationwide permit verification, special conditions, and the attached construction plans must be kept at the site during construction. The permittee will supply a copy of these documents to their project engineer responsible for construction activities.
3. Upon completion of the activity authorized by this Nationwide Permit verification, the enclosed certification must be signed and returned to this office along with as-built drawings showing the location and configuration, as well as all pertinent dimensions and elevations of the activity authorized under this Nationwide Permit verification.
4. Construction activities will be performed during low flow conditions to the maximum extent practicable. Additionally, appropriate site-specific best management practices for sediment and erosion control will be fully implemented during construction activities at the site.
5. No area for which grading has been completed will be unseeded or unmulched for longer than 14 days. All disturbed areas will be seeded and/or revegetated with native species and approved seed mixes (where practicable) after completion of construction activities for stabilization and to help preclude the establishment of non-native invasive species.
6. All water resources and their buffers, which are to be avoided on-site, must be clearly indicated on the site plans and drawings, demarcated in the field, and protected with suitable material prior to site disturbance. These materials must remain in place and be maintained throughout the construction process.
7. In the event any previously unknown historic or archaeological sites or human remains are uncovered while accomplishing the activity authorized by this nationwide permit authorization, the permittee must cease all work in waters of the U.S. immediately and contact local, state and county law enforcement offices (only contact law enforcement on findings of human remains), the Corps at 304-399-5610 and Ohio State Historic Preservation Office at 614-298-2000. The Corps will initiate the Federal, state and tribal coordination required to comply with the National Historic Preservation Act and applicable state and local laws and regulations. Federally recognized tribes are afforded a government-to-government status as sovereign nations and consultation is required under Executive Order 13175 and 36 CFR Part 800.

**Nationwide Permit No. 33 Verification Special Conditions for the
Marshall University – MU Subterranean Testing Facility Project
LRH-2024-00643-GUY-UNT Guyandotte River**

2 of 2

8. The project site lies within the range of the Indiana bat (*Myotis sodalis*). Several factors have contributed to the species decline, including habitat loss, fragmentation of habitat and the disease White Nose Syndrome. During winter, the bat species hibernate in caves and abandoned mines. Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags \geq three (3) inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. The permittee shall preserve wooded/forested habitats exhibiting any of the characteristics listed above wherever possible. Should suitable habitat be present that cannot be saved during construction activities, any trees \geq three (3) inches dbh shall only be cut between November 15 – March 31.
9. This Department of the Army Permit authorization does not authorize the “take” of a threatened or endangered species as defined under the Endangered Species Act (ESA). In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the United States Fish and Wildlife Service (USFWS), both lethal and non-lethal “takes” of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS or their World Wide Web page at <http://www.fws.gov/r9endspp/endspp.html>.
10. Section 7 obligations under the Endangered Species Act (Section 7) must be reconsidered if new information reveals impacts of the project that may affect Federally-listed species or critical habitat in a manner not previously considered, the proposed project is subsequently modified to include activities which were not considered during Section 7 consultation with the United States Fish and Wildlife Service, or new species are listed or critical habitat designated that might be affected by the subject project.
11. Should new information regarding the scope and/or impacts of the project become available that was not submitted to this office during our review of the proposal, the permittee will submit written information concerning proposed modification(s) to this office for review and evaluation, as soon as practicable.

EXHIBIT E



Governor Jim Justice

Director Brett W. McMillion

September 4, 2024

Office of Land and Streams RIGHT OF ENTRY

Marshall University
Attention: Grant Wooten
Triad Engineering, Inc.
10541 Teays Valley Road
Scott Depot, WV 25560

Re: **R-2024-V-06-17323**

To Whom It May Concern:

The West Virginia Division of Natural Resources (WVDNR) hereby authorizes for a term of 25 years, from the date hereof, a Right of Entry for the purpose of cleaning out the stream and stabilizing the stream banks for 110' (Marshall CF4), along Guyandotte River, near Huntington, in Cabell County, West Virginia.

The issuance of this Right of Entry by the WVDNR does not preclude the necessity to obtain permits from the U.S. Army Corps of Engineers (USACE), W.V. Department of Environmental Protection (WVDEP), or the W.V. Division of Homeland Security and Emergency Management (WVDHSEM). This Right of Entry does not negate the need to comply with the West Virginia Water Pollution Control Act and/or the State Environmental Quality Board's administrative regulations.

It is advised to contact the following agencies for additional guidelines and/or regulations:

1. The USACE [Huntington District (304-399-5210) or the Pittsburgh District (412-395-7155)] may require either an Individual Clean Water Act 404 permit or a Nationwide Permit.
<http://www.lrh.usace.army.mil/Missions/Regulatory.aspx>
2. The WVDNR Environmental Coordination Unit (304-637-0245) should be contacted for the Mussel survey requirements for streams with mussel populations as described in the West Virginia Mussel Survey Protocol
<http://www.wvdnr.gov/Mussels/West%20Virginia%20Mussel%20Survey%20Protocols%20APR2016.pdf>

3. The WVDEP (304-926-0499) may require the following permits:
 - a. A Clean Water Act Section 401 Water Quality Certification
<http://www.dep.wv.gov/WWE/Programs/Pages/401Certification.aspx>
 - b. Construction Stormwater Site Registration and Notice of Intent. Not needed if disturbance less than (1) acre.
http://dep.wv.gov/WWE/Programs/stormwater/Pages/sw_home.aspx
4. The Division of Water and Waste Management, (304-926-0495) should be contacted for the WVDEP Erosion and Sediment Control Best Management Practice Manual, Revised 2016, that it requires to be followed.
http://www.dep.wv.gov/WWE/Programs/stormwater/csw/Pages/ESC_BMP.aspx
5. The WVDHSEM (304-957-2571) may require a Floodplain Permit.
6. The U.S. Fish and Wildlife Service Field Office (304-636-6568) should be contacted for any activity in waterways listed in Appendix A of the 2017 USACE Nationwide Permits for threatened or endangered aquatic species identified by the U.S. Fish and Wildlife Service.
<http://www.lrp.usace.army.mil/Portals/72/docs/regulatory/2017%20Public%20Notices/West%20Virginia%20-%20NWP%20March%202017%20PN.pdf?ver=2017-03-22-095505-870>
7. The local Conservation District for the district where the work is to be performed should be contacted for technical support.

This Right of Entry does not allow in-stream work to be performed during the cold-water fish spawning season (September 15- March 31) and warm-water fish spawning season (April 1 - June 30). Spawning waivers may be obtained from the WVDNR Environmental Coordination Unit (304-637-0245).

This Right of Entry does not allow work outside the requested boundaries. The WVDNR does not assume any liability for your construction activities. By accepting this Right of Entry, you assume liability for any and all damage caused by this activity to both upstream and downstream landowners.

This Right of Entry does not authorize any rights or privileges, or permission to enter upon, or to cross the property of any other person, nor does it authorize removal of any material that lies upon the property of another person.

All work authorized under this Right of Entry should be completed as soon as possible, but no longer than one year from the date hereof.

Marshall University
Right of Entry # R-2024-V-06-17323
Page 3
September 4, 2024

There is no fee for this Right of Entry.

Please notify the Office of Land and Streams in writing when the in-stream work is complete.

Sincerely,



Brett W. McMillion
Director

BWM: lp

ADDENDUM ACKNOWLEDGEMENT

FORM SOLICITATION NO.: R2501527 Addendum No. 2

Marshall University

CF4 - Subterranean Testing Facility

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specifications, etc.

Addendum Numbers Received:

(Check the box next to each addendum received)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6 |
| <input checked="" type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7 |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8 |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9 |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any University personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Company

Authorized Signature

Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.