Report of
Geotechnical Exploration

Allegany College of Maryland (ACM)
Tennis Courts Renovation
Allegany County, Maryland

Triad Project No. 03-20-0760

Prepared for:

Mr. Adam Phipps
Allegany College of Maryland
112401 Willowbrook Road, SE
Cumberland, MD 21502

Prepared by:

TRIAD ENGINEERING, INC.

1075-D Sherman Avenue
Hagerstown, Maryland 21740
www.triadeng.com

December 16, 2020

December 16, 2020

Mr. Adam Phipps
Allegany College of Maryland
112401 Willbrook Road, SE
Cumberland, MD 21502

RE: Report of Geotechnical Exploration
ACM – Tennis Courts Renovation
Allegany County, Maryland
Triad Project No. 03-20-0760

Dear Mr. Phipps:

In accordance with your request, we have completed a geotechnical exploration at the existing tennis courts at Allegany College of Maryland (ACM) in Cumberland, Maryland. The work was authorized by signature of our Professional Services Agreement on October 28, 2020. The subsurface exploration was performed to evaluate the general subsurface conditions encountered at the proposed project for the limited purposes of preparing design and construction recommendations for geotechnical aspects of the project. It is emphasized that subsurface conditions may vary dramatically between test locations, and Triad makes no representations as to subsurface conditions other than those encountered at the specific test locations.

This report has been prepared for the exclusive use of Allegany College of Maryland for specific application to the tennis courts renovation at 12401 Willowbrook Road, Cumberland, Maryland. 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 in the event that 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 construction phase of the work.

We appreciate the opportunity to provide our services on this project. If you have any questions regarding this report, or you require any additional information, please do not hesitate to contact us.

Sincerely,

TRIAD ENGINEERING, INC.

Anthony R. King, E.I.T.
Staff Engineer

Stephen J. Gyurisin, P.E.
Geotechnical Services Manager

"Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 40821, Expiration Date: 6/16/2021.

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Report of Geotechnical Exploration
ACM – Tennis Courts Renovation
Allegany County, Maryland
Triad Project No. 03-20-0760

FOREWORD

This report has been prepared for the exclusive use of Allegany College of Maryland for specific application to evaluation of the existing tennis courts located at 12401 Willowbrook Road, Cumberland, Maryland. The work has been performed in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made.

This report should not be used for estimation of construction quantities and/or costs, and contractors should conduct their own exploration of site conditions for these purposes. Please note that Triad is not responsible for any claims, damages or liability associated with any other party's interpretation of the data or re-use of these data or engineering analyses without the express written authorization of Triad. Additionally, this report must be read in its entirety. Individual sections of this report may cause the reader to draw incorrect conclusions if considered in isolation from each other.

The conclusions and recommendations contained in this report are based, in part, upon our field observations and data obtained from the field exploration at the site. The nature and extent of variations may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations presented herein. Similarly, in the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained herein shall not be considered valid unless the changes are reviewed and the conclusions are modified or verified in writing by Triad.

SITE AND PROJECT DESCRIPTION

The project involves seven (7) existing tennis courts located at Allegany College of Maryland in Cumberland, Maryland (Figure 1). The tennis courts contain many areas of notable cracking, and water is seeping up through the cracks. It was requested that we perform testing to determine the most probable cause of the cracking and seeping water and provide recommendations for corrective measures. At the time of our exploration, cracking was observed on all the courts. The cracking was most severe on courts 3, 4 and 7 (eastern most courts). Drainage swales are located below the parking lot on the western side of the tennis courts and below the track to the east of the tennis courts. The perimeter drains for the tennis courts daylight to the swale to the east of the tennis courts. The site grading around the tennis courts generally slopes from west to east. Additionally, the grade to the north of the courts is sloped toward the courts.

FIELD EXPLORATION

The field exploration included coring the asphalt, performing Wildcat® Dynamic Cone Penetrometer (DCP) testing and hand augers at eight (8) test locations (Figure 2). Additionally, four (4) test pits were excavated around the outside edge of the tennis courts, and a camera was pushed into the four (4) outlet pipes. The test locations were selected by Triad, visually based on the existing site conditions. The ground surface elevations were not determined as part of the exploration. Refusal was encountered in all the test locations situated on the tennis courts. Considering that the exploration was limited to the use of hand equipment, the refusal depths should not be necessarily interpreted as bedrock.

Geotechnical personnel from our office were present full time during the field operations to log all recovered soil samples and observe groundwater and rock conditions. The recovered soil samples were transported to our laboratory for further testing. Detailed descriptions of materials encountered are provided in the Hand Auger Logs in the Appendix. The Wildcat® Dynamic Cone Logs are provided in the Appendix.

DISCUSSION

The results of the hand augers and Wildcat® (DCP) testing indicate that the materials were generally in a medium stiff to very stiff condition. The testing performed indicated that the upper 4 to 8 inches of subgrade material was considered loose or medium stiff, based on the N' values derived from the DCP testing, but we did not detect any void space beneath the asphalt. However, our testing was limited to the depths explored. Monitoring and testing records during construction were not provided for our review. Therefore, we cannot comment on the condition of subsurface materials below the depths explored. The asphalt cores indicated that the majority of the asphalt is in a poor condition, and in several of the test locations, the asphalt condition was worse with increasing depth. The asphalt was underlain by tan silty clay. The soils encountered in all of the hand auger locations were saturated. Groundwater readings were taken upon completion of the coring, and 24 hour readings were also measured. It should be noted that our exploration was completed within a day after a significant rain event.

Test Location	Groundwater After Coring (Depth below ground surface)	24-Hour Groundwater Reading (Depth below ground surface)
B-1	2 in.	6 in.
B-2	2 in.	6 in.
B-3	DRY	DRY
B-4	7 in.	7 in.
B-5	5 in.	7 in.
B-6	5 in.	7 in.
B-7	7 in.	7 in.
B-8	7 in.	7 in.

Test pits were excavated along the outside edge of the tennis courts to observe the subsurface conditions. In test pits TP-1, TP-2 and TP-4, a pipe was encountered at 16 inches, 12 inches and 3 feet below the existing ground surface, respectively. Water was perched on the soil below the pipe and stone in test pits TP-1 and TP-4. The pipe in test pits TP-1 and TP-2 was 4 inch corrugated plastic pipe. Generally, the grooves of the corrugated pipe were plugged with soil/aggregate fines. The pipe encountered in test pit TP-4 consisted of a 4 inch smooth pipe with holes drilled on the underside of the pipe. Each of the pipes was surrounded with gravel. While imaging the inside of the northern most pipe, ponded water was encountered in portions of the pipe. There were no punctures or clogs encountered during imaging of any of the pipes. The imaging of the pipes was limited to 140 feet from the outlets.

RECOMMENDATIONS

Based on the field exploration and our experience with similar projects, we recommend that the following options be considered. The options presented below are presented in order of most economical and lowest probability of log-term success (Option 1) to most expensive and highest probability of long-term success (Option 3)

Option 1 should involve installing finger drains between each of the tennis courts as indicated on the Finger Drain Plan, Figure 3. The finger drains should all be sloped toward the center of the courts and tied into a central discharge pipe that daylights east of the courts. Any existing major failing areas of the courts, such as those observed at courts 3, 4 and 7, should be saw cut and replaced with new asphalt and base stone, and a finger drain should be installed from the area and tied into the discharge pipe. The finger drains should include corrugated, perforated HDPE pipe surrounded by #57 stone wrapped completely in non-woven filter fabric. The main discharge pipe should not be perforated. After all the finger drains, saw cuts and replacements are complete, the courts should be resurfaced utilizing hot mix asphalt or they can be resurfaced by a specialty resurfacing contractor. In addition to the above mentioned repair, the perimeter drain should also be reconstructed to allow proper drainage and conveyance of surface water away from the tennis courts. The perimeter drain should be constructed in a manner similar to the finger drains, including perforated pipe and #57 stone wrapped with filter fabric.

Option 2 should involve installing finger drains and perimeter drains as described in Option 1, and then overlaying the entire surface with a minimum of 2 inches of MDSHA Graded Aggregate Base and then a minimum of 2 inches of hot mix asphalt. It should be noted that this option will raise the finished surface elevation. Due to the raised elevation of the playing surfaces, the existing fencing, gates and netting will need to be adjusted accordingly. The edges of the overlay may be sloped down to match existing elevations to potentially limit the amount of adjustment to the existing perimeter fencing and light poles. This option will still require the saw cut and replacement of any failing areas prior to the overlay. In addition, the perimeter drain should also be reconstructed.

Option 3 should involve complete reconstruction of the existing tennis courts. This option would also include reconstruction of the perimeter drain system. In addition, complete removal of any existing asphalt will be required as well as placement of a new pavement section. The new pavement section should include base stone under the hot

mix asphalt to allow for proper drainage. We recommend that the subgrade be sloped to drain prior to placement of base stone. We suggest that the budget include costs for construction of finger drains to maintain adequate drainage of the new base course aggregate. In addition, over-excavation and replacement of soft/wet clay soils may be required.

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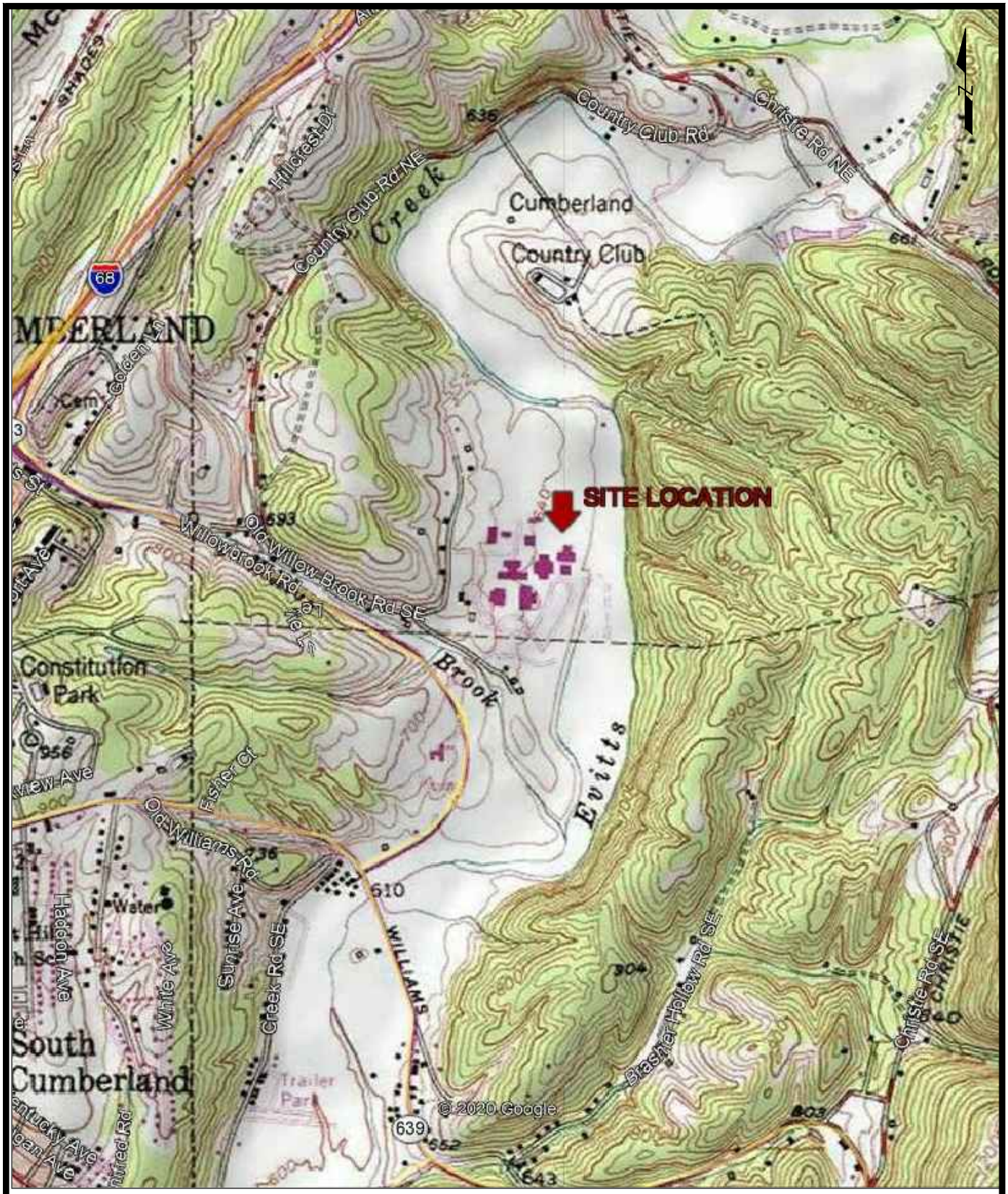
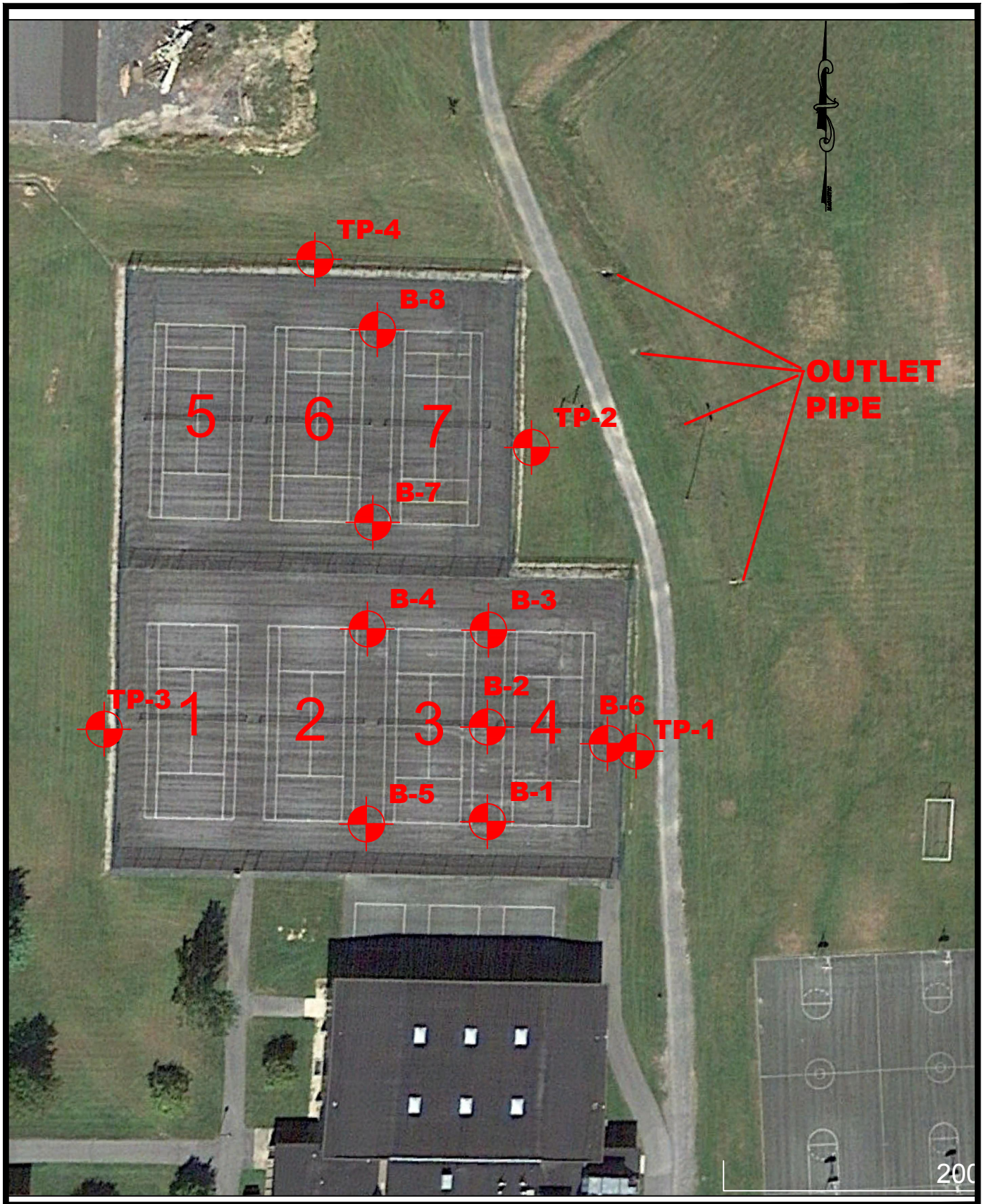
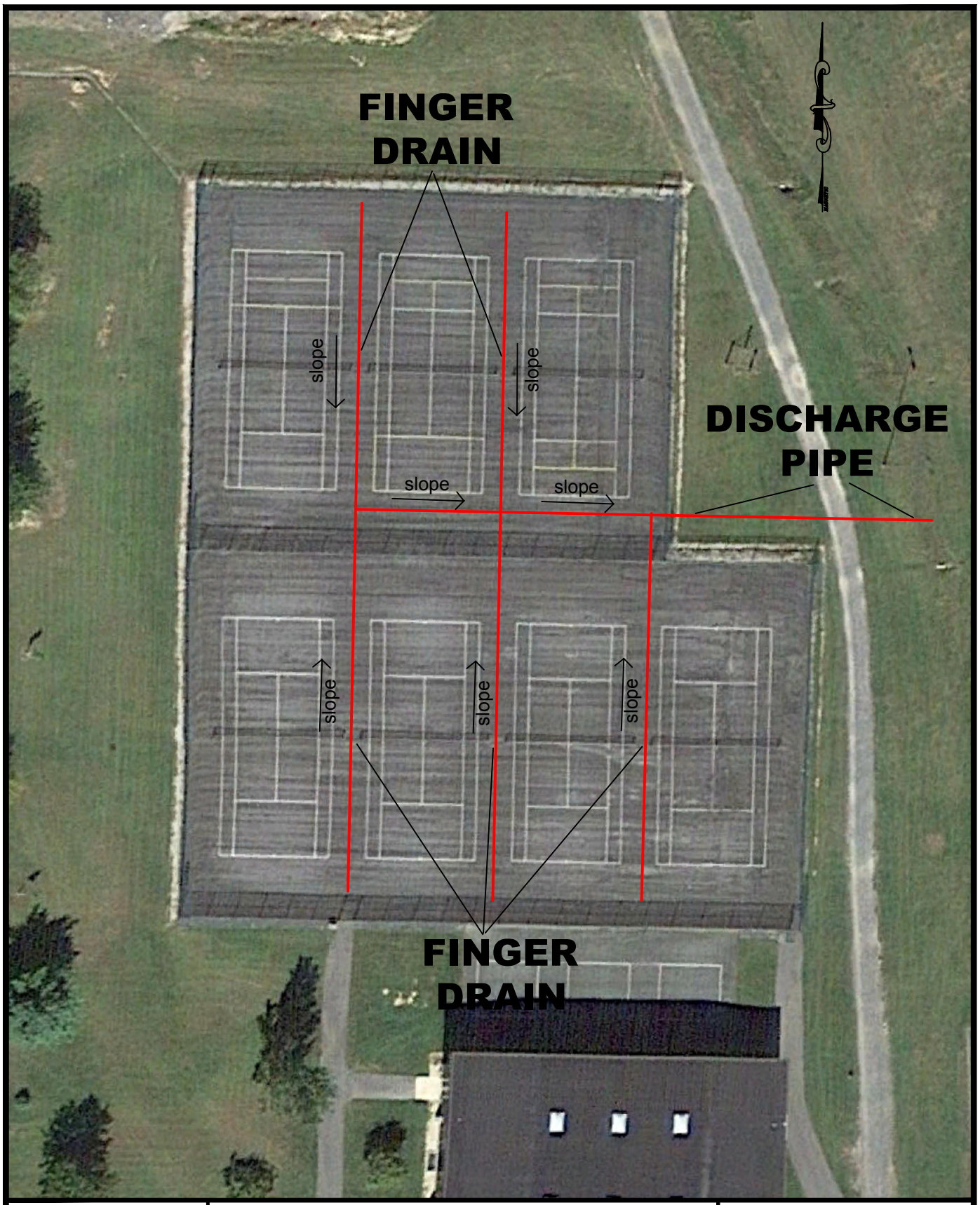
APPENDIX



Allegany County Maryland		SITE LOCATION PLAN	TRIAD ENGINEERING, INC.
PREPARED BY: JRW	REVIEWED BY: SJG	ACM - TENNIS COURTS RENOVATION	www.triadeng.com
DATE: 12/16/2020	SCALE: N/A	PROJECT NO:03-20-0760 Figure: 1	1075-D SHERMAN AVENUE HAGERSTOWN, MD 21740



B/TP-# Approximate Test Location		TEST LOCATION PLAN	TRIAD ENGINEERING, INC.
PREPARED BY: ARK	REVIEWED BY: SJG	ACM - TENNIS COURTS RENOVATION	www.triadeng.com
DATE: 11/30/2020	SCALE: N/A	PROJECT NO:03-20-0760 Figure: 2	1075-D SHERMAN AVENUE HAGERSTOWN, MD 21740



Approximate Finger Drain Location

FINGER DRAIN PLAN

ACM - TENNIS COURTS RENOVATION

PREPARED BY:	REVIEWED BY:
JRW	SJG
DATE: 12/14/2020	SCALE: N/A

PROJECT NO:03-20-0760 Figure: 3

TRIAD ENGINEERING, INC.
www.triadeng.com
1075-D SHERMAN AVENUE
HAGERSTOWN, MD 21740

TRIAD ENGINEERING, INC.

KEY TO IDENTIFICATION OF SOIL AND WEATHERED ROCK SAMPLES

The material descriptions on the logs indicate the visual identification of the soil and rock recovered from the exploration and are based on the following criteria. Major soil components are designated by capital letters and minor components are described by terms indicating the percentage by weight of each component. Standard Penetration Testing (SPT) and sampling was conducted in accordance with ASTM D1586. N-values in blows per foot are used to describe the *relative density* of coarse-grained soils or the *consistency* of fine-grained soils.

The MAJOR components constitute more than 50% of the sample and have the following size designation.		The MINOR components have the following percentage designation.	
COMPONENT	**PARTICLE SIZE**	**ADJECTIVE**	**PERCENTAGE**
Boulders	12 inches plus		
Cobbles	3 to 12 inches	and	35 - 50
Gravel -coarse	¾ to 3 inches		
-fine	#4 to ¾ inches	some	20 - 35
Sand -coarse	#10 to #4		
-medium	#40 to #10	little	10 - 20
-fine	#200 to #40		
Silt or Clay	Minus #200 (fine-grained soil)	trace	0 - 10

Relative Density – Coarse-grained Soils		**Consistency – Fine-grained Soils**	
Term	***N-Value***	***Term***	***N-Value***
Very Loose	#4	Very Soft	#2
Loose	5 to 10	Soft	3 to 4
Medium Dense	11 to 30	Medium Stiff	5 to 8
Dense	31 to 50	Stiff	9 to 16
Very Dense	>50	Very Stiff	>16

Soil Plasticity	**Plasticity Index (PI)**	**Rock Hardness**	
None	Nonplastic	***Term***	***N-Value***
Low	1 to 5	Very Weathered	#50/.5
Medium	5 to 20	Weathered	50/.4
High	20 to 40	Soft	50/.3
Very High	over 40	Medium hard	50/.2 to 50/.1
Moisture Description		Hard	Auger Refusal
Dry - Dusty, dry to touch		**FIGURE NO. 1**	
Slightly Moist - damp			
Moist - no visible free water		TRIAD ENGINEERING, INC.	
Wet - visible free water, saturated			

BORING LOG

Sheet 1 of 1

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 1**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/24/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Water Level Upon Completion 0.2 ft. | Water Level 24 hrs 0.5 ft.

Core Sample | Auger Probe

Depth (feet)	Sample No.	Sample Type	Penetration Blows/6 inches	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						0.3	4.0" ASPHALT				
						0.7	Degraded asphalt				
						2.5	Tan silty **CLAY**, trace gravel, trace sand, very moist to wet, trace rounded gravel - ALLUVIUM -				
							REFUSAL AT 2.5 FEET				
5.0											
10.0											
15.0											
20.0											
25.0											
30.0											

Remarks:

TRIAD ENGINEERING, INC.

BORING LOG

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 2**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/24/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Water Level Upon Completion 0.2 ft. | Core Sample | Auger Probe | Water Level 24 hrs 0.5 ft.

Depth (feet)	Sample No.	Sample Type	Penetration Blows/6 inches	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						0.3	4.0" ASPHALT core broke while trying to remove				
						0.7	Degraded asphalt				
						2.0	Tan silty **CLAY**, trace gravel, little sand, very moist to wet, trace rounded gravel - ALLUVIUM - REFUSAL AT 2.0 FEET				

5.0
10.0
15.0
20.0
25.0
30.0

Remarks:

TRIAD ENGINEERING, INC.

BORING LOG

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 3**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/23/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Core Sample | Auger Probe

Depth (feet)	Sample No.	Sample Type	Penetration Blows/6 inches	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						1.0	12.0" ASPHALT entire core was degraded				
						3.0	Tan silty **CLAY**, trace gravel, trace sand, very moist to wet, trace rounded gravel, mottling - ALLUVIUM -				
							REFUSAL AT 3.0 FEET				

5.0 10.0 15.0 20.0 25.0 30.0

Remarks: Hand auger probe dry during and upon completion of augering.

TRIAD ENGINEERING, INC.

BORING LOG

Sheet 1 of 1

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 4**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/24/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Water Level Upon Completion 0.6 ft. | Water Level 24 hrs 0.6 ft.

Core Sample | Auger Probe

Depth (feet)	Sample No.	Sample Type	Penetration Blows/6 inches	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						0.8	10.0" ASPHALT				
							Tan silty **CLAY**, trace gravel, trace sand, wet, trace rounded gravel, mottling				
						4.0	- - little sand - ALLUVIUM -				
5.0							PROBE TERMINATED AT 4.0 FEET				
10.0											
15.0											
20.0											
25.0											
30.0											

Remarks:

TRIAD ENGINEERING, INC.

BORING LOG

Sheet 1 of 1

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 5**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/24/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Water Level Upon Completion 0.4 ft. | Water Level 24 hrs 0.6 ft.

Core Sample | Auger Probe

Depth (feet)	Sample No.	Sample Type	Penetration Blows/6 inches	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						0.5	6.0" ASPHALT				
						0.8	Degraded asphalt				
						2.5	Tan silty **CLAY**, trace gravel, trace sand, very moist to wet, trace rounded gravel - ALLUVIUM -				
							REFUSAL AT 2.5 FEET				
5.0											
10.0											
15.0											
20.0											
25.0											
30.0											

Remarks:

TRIAD ENGINEERING, INC.

BORING LOG

Sheet 1 of 1

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 6**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/24/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Water Level Upon Completion 0.4 ft. | Water Level 24 hrs 0.6 ft.

Core Sample | Auger Probe

Depth (feet)	Sample No.	Sample Type	Penetration Blows/6 inches	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						0.4	5.0" ASPHALT				
						0.7	Degraded asphalt				
						2.0	Tan silty **CLAY**, trace gravel, trace sand, very moist to wet, trace rounded gravel, mottling - ALLUVIUM -				
							REFUSAL AT 2.0 FEET				
5.0											
10.0											
15.0											
20.0											
25.0											
30.0											

Remarks:

TRIAD ENGINEERING, INC.

BORING LOG

Sheet 1 of 1

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 7**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/24/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Water Level Upon Completion 0.6 ft.

Core Sample | Auger Probe | Water Level 24 hrs 0.6 ft.

Depth (feet)	Strata Depth (ft)	MATERIAL DESCRIPTION
	0.3	4.0" ASPHALT
	1.2	Degraded asphalt
	2.5	Tan silty **CLAY**, little gravel, trace sand, very moist to wet, trace rounded gravel, mottling - ALLUVIUM -
		REFUSAL AT 2.5 FEET
5.0		
10.0		
15.0		
20.0		
25.0		
30.0		

Sample No. | Sample Type | Penetration Blows/6 inches | Recovery (%) | RQD (RUN) | RQD (Strata) | Water Level | Graphic Log | Strata Elevation

Remarks:

TRIAD ENGINEERING, INC.

BORING LOG

Sheet 1 of 1

Project Number: **03-20-0760** Project Name: **ACM - Tennis Courts Renovation**

Inspector: ARK Boring Location: See Figure A-2 Boring No.: **B- 8**

Date Started: 11/23/20 Drilling Method: Hand Auger

Date Completed: 11/24/20 Driller: ARK Ground Elev.: N/A

Shelby Tube | Standard Split Spoon | Water Level Upon Completion 0.6 ft.

Core Sample | Auger Probe | Water Level 24 hrs 0.6 ft.

Depth (feet)	Sample No.	Sample Type	Penetration Blows/6 inches	Recovery (%)	RQD (RUN)	Strata Depth (ft)	MATERIAL DESCRIPTION	RQD (Strata)	Water Level	Graphic Log	Strata Elevation
						0.4	5.0" ASPHALT				
						0.8	Degraded asphalt				
						2.0	Tan silty **CLAY**, little gravel, trace sand, very moist, trace rounded gravel, mottling - ALLUVIUM -				
							REFUSAL AT 2.0 FEET				
5.0											
10.0											
15.0											
20.0											
25.0											
30.0											

Remarks:

TRIAD ENGINEERING, INC.

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-1
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: 2 inches
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
-	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
- 1 ft	23	102.1	••••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
-	24	106.6	••••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
-	22	97.7	••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
- 2 ft	23	102.1	••••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
-						
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-2
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: 2 inches
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
- 1 ft	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
-	14	62.2	••••••••••••••••••	17	MEDIUM DENSE	VERY STIFF
-	15	66.6	•••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
- 2 ft	21	93.2	••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
-	28	124.3	••••••••••••••••••••••••••••••••••	-	DENSE	HARD
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-3
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: n/a
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
1 ft	9	40.0	••••••••••	11	MEDIUM DENSE	STIFF
	13	57.7	••••••••••••••	16	MEDIUM DENSE	VERY STIFF
	14	62.2	••••••••••••••••	17	MEDIUM DENSE	VERY STIFF
2 ft	18	79.9	••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
	20	88.8	••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
3 ft						
1 m						
4 ft						
5 ft						
6 ft						
2 m						
7 ft						
8 ft						
9 ft						
3 m 10 ft						
11 ft						
12 ft						
4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-4
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: 7 inches
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
-	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
- 1 ft	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
-	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
- 2 ft	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-5
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: 5 inches
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	7	31.1	•••••••••	8	LOOSE	MEDIUM STIFF
-	4	17.8	•••••	5	LOOSE	MEDIUM STIFF
- 1 ft	11	48.8	••••••••••••••	13	MEDIUM DENSE	STIFF
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-	13	57.7	•••••••••••••••••	16	MEDIUM DENSE	VERY STIFF
- 2 ft	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
-	15	66.6	••••••••••••••••••	19	MEDIUM DENSE	VERY STIFF
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-6
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: 5 inches
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
	5	22.2	••••••	6	LOOSE	MEDIUM STIFF
1 ft	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
2 ft	17	75.5	••••••••••••••••••••	21	MEDIUM DENSE	VERY STIFF
	20	88.8	••••••••••••••••••••••••	25	MEDIUM DENSE	VERY STIFF
3 ft						
1 m						
4 ft						
5 ft						
6 ft						
2 m						
7 ft						
8 ft						
9 ft						
3 m 10 ft						
11 ft						
12 ft						
4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-7
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: 7 inches
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	10	44.4	••••••••••••	12	MEDIUM DENSE	STIFF
-	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
- 1 ft	14	62.2	••••••••••••••••••	17	MEDIUM DENSE	VERY STIFF
-	13	57.7	••••••••••••••	16	MEDIUM DENSE	VERY STIFF
-	23	102.1	•••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
- 2 ft	22	97.7	••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
-	30	133.2	••••••••••••••••••••••••••••••••••••	-	DENSE	HARD
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

WILDCAT DYNAMIC CONE LOG

Triad Engineering, Inc.
1075D Sherman Avenue
Hagerstown, MD 21740

PROJECT NUMBER: 03-20-0760
DATE STARTED: 11-23-2020
DATE COMPLETED: 11-23-2020

HOLE #: B-8
CREW: ARK, DC
PROJECT: ACM - Tennis Courts Renovation
ADDRESS: Willowbrook Rd.
LOCATION: Cumberland, Maryland

SURFACE ELEVATION: n/a
WATER ON COMPLETION: 7 inches
HAMMER WEIGHT: 35 lbs.
CONE AREA: 10 sq. cm

DEPTH	BLOWS PER 10 cm	RESISTANCE Kg/cm²	GRAPH OF CONE RESISTANCE 0 50 100 150	N'	TESTED CONSISTENCY SAND & SILT	CLAY
-	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
-	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
- 1 ft	12	53.3	••••••••••••••	15	MEDIUM DENSE	STIFF
-	18	79.9	••••••••••••••••••••••	22	MEDIUM DENSE	VERY STIFF
-	22	97.7	••••••••••••••••••••••••••	-	MEDIUM DENSE	VERY STIFF
- 2 ft	31	137.6	••••••••••••••••••••••••••••••••••••	-	DENSE	HARD
-	34	151.0	••	-	DENSE	HARD
-						
- 3 ft						
- 1 m						
-						
- 4 ft						
-						
-						
- 5 ft						
-						
-						
- 6 ft						
-						
- 2 m						
- 7 ft						
-						
-						
- 8 ft						
-						
-						
- 9 ft						
-						
-						
- 3 m 10 ft						
-						
-						
-						
- 11 ft						
-						
-						
- 12 ft						
-						
-						
- 4 m 13 ft						

TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-1

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

NOTE: This report shall not be construed as providing recommendations or certification by an engineer. Rather, it provides the results of the testing described herein and summarizes the observations of our personnel while on site

TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-1

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

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TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-1

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

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TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-2

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

NOTE: This report shall not be construed as providing recommendations or certification by an engineer. Rather, it provides the results of the testing described herein and summarizes the observations of our personnel while on site

TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-3

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

NOTE: This report shall not be construed as providing recommendations or certification by an engineer. Rather, it provides the results of the testing described herein and summarizes the observations of our personnel while on site

TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-4

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

NOTE: This report shall not be construed as providing recommendations or certification by an engineer. Rather, it provides the results of the testing described herein and summarizes the observations of our personnel while on site

TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-4

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

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TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

TP-4

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

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TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

Courts 3 and 4

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

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TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

East side of tennis courts

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

NOTE: This report shall not be construed as providing recommendations or certification by an engineer. Rather, it provides the results of the testing described herein and summarizes the observations of our personnel while on site

TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

East side of tennis courts

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

NOTE: This report shall not be construed as providing recommendations or certification by an engineer. Rather, it provides the results of the testing described herein and summarizes the observations of our personnel while on site

TRIAD ENGINEERING, INC.

03200760

ACM - Tennis Courts Renovation

11/24/2020

Triad Representative
Anthony King

Court 7

Reviewed By:
Stephen J. Gyurisin, PE

Date Reviewed
12/16/2020

NOTE: This report shall not be construed as providing recommendations or certification by an engineer. Rather, it provides the results of the testing described herein and summarizes the observations of our personnel while on site