Worcester County Administration Office
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Addendum # 1 Lewis Road Gravity Sewer System and Pump Station

Date of Addendum: 1/3/2025

NOTICE TO ALL BIDDERS AND PLANHOLDERS
The Bid Documents for the above-referenced Project are modified as set forth in this Addendum. The original Bid Documents and any previously issued addenda remain in full force and effect, except as modified by this Addendum, which is hereby made part of the Bid Documents. Vendors will take this Addendum into consideration when preparing and submitting a bid, and shall acknowledge receipt of this Addendum in the space provided in the Bid Documents.

BID SUBMITTAL DEADLINE
The bid submittal time has not been changed.

PRE-BID MEETING DATE AND TIME
The pre-bid meeting has been changed from 10am on Thursday, January 9, 2025 to 11am on Thursday, January 9, 2025.

1.0 – ATTACHMENTS

Item	Description
1.1	Subsurface Investigation and Geotechnical Analysis – dated 4/1/2022
1.2	Record of Soil Exploration – dated 3/8/2022

END OF ADDENDUM

HARDIN
KIGHT
ASSOCIATES,
INC.

April 1, 2022

Project No.: 22527

EA ENGINEERING, SCIENCE & TECHNOLOGY, INC.
11200 Racetrack Road
Unit 101A
Berlin, Maryland 21811

Attention: Mr. Darl Kolar

Reference: Subsurface Investigation and Geotechnical Analysis
Lewis Road Sewer Pump Station
Worcester County – Berlin, Maryland

Dear Mr. Kolar:

In accordance with our proposal (#126 dated October 8, 2021) we have completed our evaluation of the subsurface conditions for the Pump Station proposed for construction on Lewis Road in Berlin, Maryland. This investigation was performed to evaluate the general soil and groundwater conditions on the project site, and prepare recommendations for design and construction of the proposed structure. Our findings, analysis, and recommendations are presented herein.

For this investigation we were provided with an electronic copy of a site plan entitled *Worcester County Department of Public Works Sanitary Sewer Upgrades – Lewis Road*, prepared by EA Engineering, Science, & Technology, Inc. (EA), dated March 2022. The site plan illustrates the existing conditions, topography, and the location of the proposed pump station.

SITE DESCRIPTION

The Pump Station is proposed on the east side of Lewis Road, between Whitetail Lane and Fawn Lane in Berlin, Maryland. The site is primarily wooded. The site surface is relatively flat, with surface elevations ranging from approximately 7 to 8 feet above mean sea level (MSL). The pump station is proposed approximately 100 feet east of Lewis Road. At the time of this investigation, the site surface conditions were dry.

PROPOSED CONSTRUCTION

The proposed construction will include a new sanitary sewer pump station for the Lewis Road service area. Construction drawings were unavailable at the time of the preparation of this report, however, from review of the previously referenced site plan we

understand that the pump station will consist of a 60-inch diameter, precast concrete structure with an invert at El. -6.90. Considering an existing surface elevation of 8.0, and an invert at El. -6.9, an excavation of approximately 15 feet will be required for construction. The pump station will include a concrete slab at the surface, with a finished grade at EL. 8.6.

INVESTIGATION

In order to evaluate the subsurface conditions, two (2) standard penetration test (SPT) borings were drilled. The borings were drilled within the proposed pump station location, which was established by survey provided by EA. Ground surface elevations were also provided by EA, for the boring locations. The test borings are labeled as Borings B-1 and B-2 and were drilled to a depth of 26.5 feet below the existing ground surface, with standard penetration tests taken at close intervals from the surface to 10 feet below the surface, and at 5-foot intervals thereafter. Standard penetration testing involves driving a 2-inch O.D., 1-inch I.D., split spoon sampler with a 140-pound hammer, free-falling 30-inches. The SPT N-value, given as blows per foot (BPF), is defined as the total number of blows required to drive the sampler from 6-inches to 18-inches. Split spoon samples were obtained and transported to our laboratory for review and classification. The samples were visually identified in general accordance with *Standard Practice for Description and Identification of Soils* (Visual-Manual Procedure) ASTM Designation: D-2488. The location of the boring is shown on the attached Boring Location Plan, labeled as Figure 1. The Boring Location Plan is an altered version of the site plan provided by EA, modified to illustrate the boring location.

GEOLOGY

According to the *Geologic Map of Worcester County, Maryland* (Owens and Denny, 1978), the geologic unit underlying the site is the Sinepuxent Formation. Three (3) lithofacies are recognized In the Sinepuxent Formation. The uppermost is a light colored, fine to medium grained, poorly graded Sand. These sands are underlain in places by a 3-to 5-foot bed of peaty sand to peaty clay. The peats are best developed on Sinepuxent Neck. The peats and, where absent, the light-colored sand facies, are underlain by the lowest and thickest facies, a dark gray micaceous silty medium sand, with thin dark clay beds, that is locally fossiliferous. The maximum thickness of the formation is 70 feet at the coast, and thins westward. In the site area, the Sinepuxent overlies the Beaverdam Formation.

The Beaverdam Formation is described by various sources as a heterogeneous unit ranging from very coarse sand with pebbles to silty clay. The predominant lithologies at the land surface are white to mottled light gray and reddish brown, silty to clayey, fine to coarse sand. The subsurface consists of laminae and beds of very coarse sand with pebbles to gravel, layered with laminae, and beds of bluish-gray to light-gray silty clay.

In a few places near the land surface, but more commonly in the subsurface, beds ranging from 2 to 20 feet thick of finely laminated, very fine sand and silty clay are present. Peat, peaty sand, and clay are rare.

SUBSURFACE CONDITIONS

The soil conditions identified on the site are generally consistent with the geology section of this report. Topsoil at the ground surface was found to range from 4 to 12 inches in thickness. Below the topsoil, the subsurface soils are generally variable density sand, with underlying layers of silt and clay. A layer of organic silt and clay was encountered at a depth of approximately 7 feet below the surface. The organic silt was estimated to be approximately 3 feet in thickness. Below the organic silt and clay we encountered sand that extended to the bottom of the borings. The sands become micaceous at a depth of approximately 15 feet below the surface. Based on the SPT resistance N values, the sands can be characterized as very loose to medium dense. The organic silt and clay are very soft.

Water was encountered during drilling at a depth of 2.5 feet below the surface. At completion of test drilling, the depth to water was recorded at a depth of 3 to 3.5 feet below the surface, corresponding to approximately El. 5.0. Both of the test boring holes caved at a depth of 3 feet,

ANALYSIS AND DISCUSSION

Based on our findings, the site is satisfactory for the proposed construction. The subsurface soil conditions are satisfactory to support the new pump station foundations. Based on our evaluation of the SPT data, the subsurface conditions at the design bottom of the pump station foundation are satisfactory to support foundations proportioned for a soil contact pressure equal to 1,500 pounds per square foot (PSF). Saturated/unstable conditions will be encountered at the bottom of the pump station excavation. Stone bedding will likely be required to stabilize loose/saturated conditions that may develop at the bottom of the excavation. Twenty-four (24) inches of #57 stone, wrapped in filter fabric, placed at the bottom of the pump station excavation, should be anticipated for budgeting purposes.

The organic silt and clay, as well as the micaceous sands, which will be obtained from the pump station excavation below a depth of approximately 7 feet, are not ideal for use as backfill for the proposed structure. We recommend that the structure be backfilled with granular fill meeting the AASHTO classification of A-2-4 or more granular. The organic silt and micaceous soils should be separated from the granular soils, and replaced with granular fill.

Considering that the pump station will be constructed at a depth of approximately 15 feet below the existing surface, and that the depth to groundwater was recorded at 3 feet, groundwater will impact the pump station construction. Groundwater will be encountered in excavations made below a depth of about 2 to 3 feet during the excavation for the structure. De-watering will be required for the pump station foundation construction.

In view of the depth to groundwater relative to the proposed pump station bottom, the design of the structure should take into consideration the potential for uplift issues associated with groundwater. The uplift should be based on an estimated high groundwater level roughly 2 feet below the current surface, or approximately El. 6.0.

Considering that construction of the pump station will require an excavation of approximately 15 feet below the existing surface, an open cut excavation to accommodate construction may not be practical without a temporary sheeting and shoring system. We recommend that the shoring system be provided as a design build application provided by the contractor. We recommend that the sheeting and shoring contractor be a specialty contractor, with experience in temporary shoring applications, who can provide a design build submittal for review by the Geotechnical and Structural Engineers.

Based on our findings we have prepared the following preliminary recommendations for your review and consideration. These recommendations are considered preliminary pending our review of the final construction drawings.

RECOMMENDATIONS

1. We recommend that the pump station foundation be designed for a soil contact pressure equal to 1,500 psf. We recommend that the design take into consideration the potential for uplift, based on post construction groundwater at approximately El. 6.0.

2. Prior to placement of the pump station foundation, we recommend that the bottom of the excavation be inspected and approved by a representative of the geotechnical engineer. Loose or soft areas should be stabilized as recommended by the geotechnical engineer. Unstable conditions present at the cut subgrade should be stabilized with #57 stone, wrapped in filter fabric (Mirafi 140 N or equal).

3. We recommend that the contractor be prepared to control groundwater during the time of pump station foundation excavation.

4. We recommend that the material used for backfill consist of granular fill meeting the AASHTO classification of A-2-4 or more granular. We recommend that silt/clay and micaceous soils removed from the pump station excavation be separated from the granular soils, and be replaced with off-site granular fill.

5. We recommend that backfill be placed and compacted in 8-inch uniform layers. We recommend that backfill be compacted to a minimum of 95% of the maximum dry density, as determined in accordance with the Standard Moisture Density Relationship (ASTM D-698/AASHTO T99).

6. We recommend that backfill placement and compaction be monitored by a geotechnical engineer or his representative. We recommend that in-place density tests be conducted on each layer of backfill placed and compacted. Areas that fail to meet the minimum compaction should be reworked and/or removed and replaced prior to placement of succeeding layers.

7. Upon completion of backfill, and prior to placement of the new slab-on-grade, we recommend that the prepared subgrade be inspected, tested and proof-rolled, and approved by the geotechnical engineer.

Construction Inspection and Testing

We recommend that the owner retain the services of a geotechnical engineer to:

1. Observe foundation construction including inspection of the foundation excavations and performance of modified penetration tests to confirm subfoundation soil suitability.

2. Monitor earthwork operations including approval of the ground surface prior to placement of fill, monitoring backfill operations, proofrolling, and performance of compaction tests.

3. Monitor slab subgrade preparation and slab construction.

CONCLUSIONS

Based on the findings of this investigation, the site is satisfactory for the proposed construction. We recommend that the pump station foundation be proportioned for an allowable soil contact pressure equal to 1,500 psf. We recommend that the design of the pump station take into consideration the potential for uplift, based on post construction groundwater at El. 6.0. We recommend that the contractor be prepared to control groundwater at the time of construction. We recommend that foundation, slab, and backfill operations be monitored by a geotechnical engineer or his representative.

LIMITATIONS

This report was prepared in accordance with generally accepted practice for geotechnical engineering in this area. It is intended for the use of the client for the specific site, as shown on the boring location plan. The recommendations are based on the general description of the construction as characterized above. If the project is substantially modified, this office should be notified so that we can review our recommendations to determine what impact the changes will have.

The soil and water conditions discussed herein represent the conditions encountered at the location of the boring as shown on the Boring Location Plan. Variations in the soils beyond the boring location and below the depth explored should be anticipated.

A copy of the boring logs and a location plan are enclosed for your reference. If you have any questions concerning this report, or if we can be of any further assistance at this time, please contact our office.

Very truly yours,

HARDIN-KIGHT ASSOCIATES, INC.

Paul M. Till

Justin A. Frizzell, P.E.

Cc: Steven Lemasters – EA via email
w/attachments

Hardin-Kight Associates, Inc.
12515 Caterpillar Lane
Bishopville, Maryland 21813

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Fax: 410-352-3228
www.hardin-kightassociates.com

Record of Soil Exploration

Contracted With: EA ENGINEERING
Projects Name: LEWIS ROAD SEWER PUMP STATION
Location: WORCESTER COUNTY, MARYLAND

Boring: B - 1
Job #: 22527

Datum	NAVD88	Hammer Wt.	140 Lbs.	Sampler Rock Core Dia.	-	Driller	EARTH MATTERS
Surf. Elev.	8.0+/-*	Hammer Drop	30 in.	Hole Diameter	4"	Inspector	PAUL TILL²
Date Started	3/8/2022	Pipe Size	2 in.	Boring Method	HSA/MD	Date Finished	3/8/2022

Elev.	Soil Description Color, Moisture, Density Plasticity, Size Proportions	Strata Depth	Depth Scale	Sample Cond	Blows / 6"	No.	Type	Rec.	Boring & Sample Notes
6.0	Tan/brown, very soft SILT (ML)	2.0		D	1-1-1	1	DS	12"	4 inches topsoil & rootmat at surface
	Tan/grey, wet, medium dense to loose, fine, silty SAND (SM)			D	4-7-8	2	DS	13"	rust mottles in S-2 at 3.0 feet
1.0		7.0	5	D	4-2-1	3	DS	18"	water encountered at 2.5 feet while drilling
-2.0	Dark brown, very soft, organic SILT with some fine sand (OL)	10.0		D	1-1/12"	4	DS	18"	
-5.0	Grey, wet, very loose, slightly plastic, fine, silty-clayey SAND (SC/SM)	13.0	10	D	1-1-2	5	DS	18"	
	Dark grey, wet, medium dense, micaceous silty, very fine SAND (SM)		15	D	3-4-6	6	DS	10"	cave at 4.0 feet upon completion, water at 3.5 feet
			20	D	1-2-3	7	DS	10"	
-18.5		26.5	25	D	4-4-6	8	DS	18"	
	Bottom of Boring at 26.5 feet		30			9	DS		
			35			10	DS		
			40			11	DS		*ground surface elevation estimated from EA site plan

Sampler Type
- DS - DRIVEN SPLIT SPOON
- PT - PRESSED SHELBY TUBE
- CA - CONTINUOUS FLIGHT AUGER
- RC - ROCK CORE

Sample Conditions
- D - DISINTEGRATED
- I - INTACT
- U - UNDISTURBED
- L - LOST

Ground Water Depth
- AT COMPLETION __3.5__FT
- AFTER____HRS_____FT
- AFTER____24 HRS_____FT

Boring Method
- HSA - HOLLOW STEM AUGERS
- CFA - CONTINUOUS FLIGHT AUGERS
- DC - DRIVEN CASING
- MD - MUD DRILLING

STANDARD PENETRATION TEST - DRIVING 2" OD SAMPLER WITH 140# HAMMER FALLING 30": COUNT MADE AT 6" INTERVALS

Hardin-Kight Associates, Inc.
12515 Caterpillar Lane
Bishopville, Maryland 21813

Office: 410-352-5001
Fax: 410-352-3228
www.hardin-kightassociates.com

Record of Soil Exploration

Contracted With: EA ENGINEERING
Projects Name: LEWIS ROAD SEWER PUMP STATION
Location: WORCESTER COUNTY, MARYLAND

Boring: B - 2
Job #: 22527

Datum	NAVD88	Hammer Wt.	140 Lbs.	Sampler Rock Core Dia.	-	Driller	EARTH MATTERS
Surf. Elev.	8.0+/-*	Hammer Drop	30 in.	Hole Diameter	4"	Inspector	PAUL TILL²
Date Started	3/8/2022	Pipe Size	2 in.	Boring Method	HSA/MD	Date Finished	3/8/2022

Elev.	Soil Description Color, Moisture, Density Plasticity, Size Proportions	Strata Depth	Depth Scale	Sample Cond	Sample Blows / 6"	Sample No.	Sample Type	Sample Rec.	Boring & Sample Notes
7.0	Topsoil	1.0		D	1-1-1	1	DS	16"	
	Tan/grey, wet, medium dense to very loose, fine, silty SAND (SM)			D	5-7-9	2	DS	13"	
1.0		7.0	5	D	3-2-1	3	DS	10"	water encountered at 2.5 feet while drilling
-2.0	Black, very soft, organic SILT with some fine sand (OL)	10.0		D	1/12"-1	4	DS	18"	
-5.0	Grey, very soft, silty CLAY with some fine sand (CL/ML)	13.0	10	I	2-1-1	5	DS	18"	
	Dark grey, wet, loose to medium dense, micaceous, silty, very fine SAND (SM)		15	D	3-3-4	6	DS	12"	cave at 3.0 feet upon completion, water at 3.0 feet
			20	D	2-6-6	7	DS	12"	
-18.5		26.5	25	D	4-5-6	8	DS	15"	
	Bottom of Boring at 26.5 feet		30			9	DS		
			35			10	DS		
			40			11	DS		*ground surface elevation estimated from EA site plan

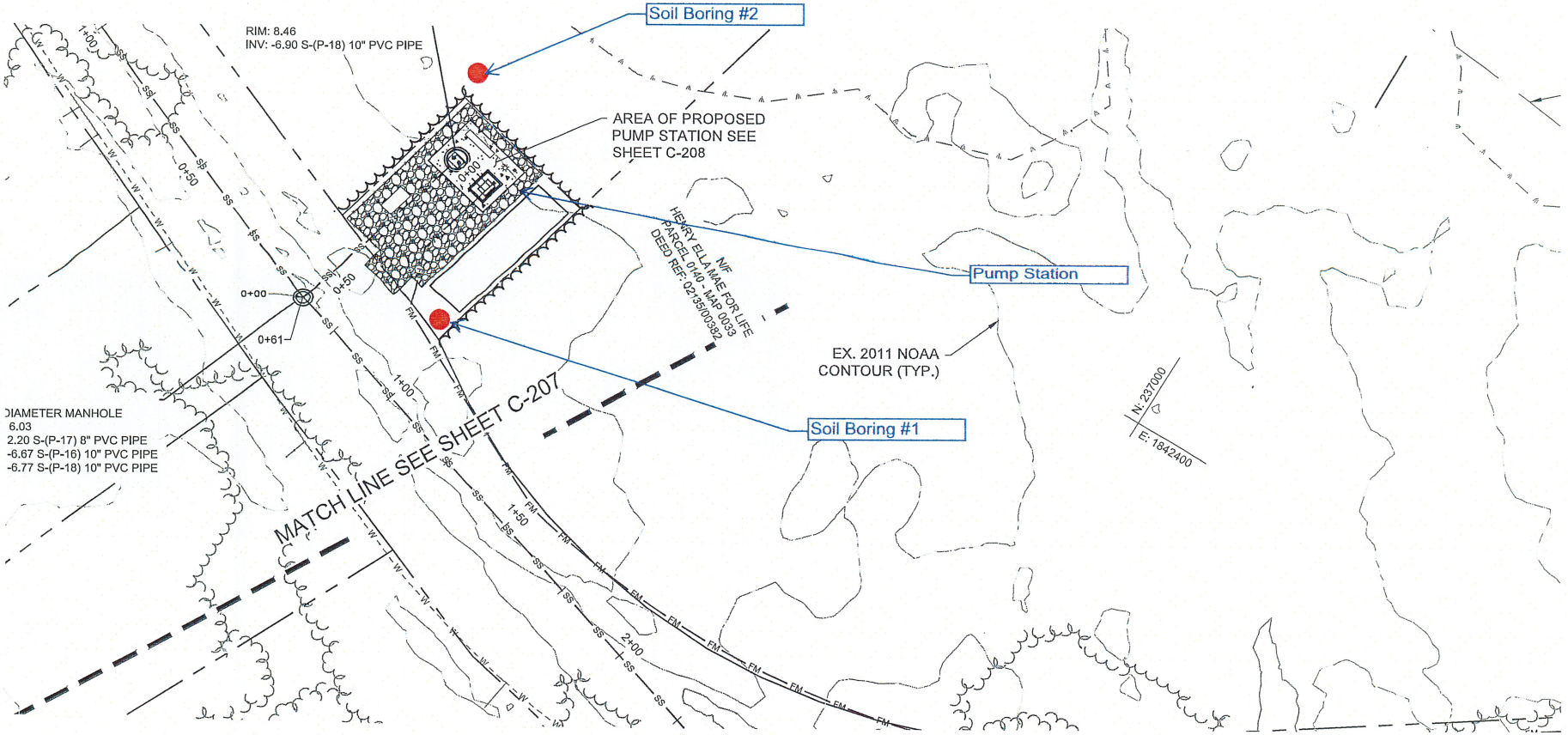
Sampler Type
DS - DRIVEN SPLIT SPOON
PT - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

Sample Conditions
D - DISINTEGRATED
I - INTACT
U - UNDISTURBED
L - LOST

Ground Water Depth
AT COMPLETION __3.5__FT
AFTER____HRS_____FT
AFTER____24 HRS_____FT

Boring Method
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVEN CASING
MD - MUD DRILLING

STANDARD PENETRATION TEST - DRIVING 2" OD SAMPLER WITH 140# HAMMER FALLING 30": COUNT MADE AT 6" INTERVALS



BORING LOCATIONS

FIGURE 1

PROJECT: 22527	LEWIS ROAD SEWER PUMP STATION BERLIN, MARYLAND BORING LOCATION PLAN	DATE: 03-2022
SCALE: N.T.S.		DRAWN BY: AB
		CHECKED BY: PT
DRAWING:	FILE:	HARDIN-KIGHT ASSOCIATES, INC. CONSULTING ENGINEERS