



nobis

May 11, 2022

File No. 097031.001

Town of Lincoln
C/O KV Partners, LLC
Mr. Ray Korber, PE, MSCE
Town Hall
148 Main St, P.O. Box 25
Lincoln, NH 03251

Re: Geotechnical Engineering Report
Proposed Riverfront Municipal Park
Lincoln, New Hampshire

Dear Mr. Korber:

Nobis Group® (Nobis) has completed geotechnical engineering services for the above-referenced project. Services were performed in general accordance with our proposal dated October 7, 2022, and your subsequent authorization. This geotechnical engineering report presents the results of the subsurface explorations and provides recommendations concerning earthwork and the design of flexible pavements for the main parking lot within the proposed development. This report is subject to the limitations contained in **Appendix A**.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
NOBIS GROUP®



Alfred Jones, PE
Vice President



Brien Waterman
Project Reviewer



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1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services performed for the proposed parking lot for the new Riverfront Municipal Park (Riverfront Park) located in Lincoln, New Hampshire. A Site Locus is included as **Figure 1**. A Site Plan With proposed redevelopment features depicting pertinent site features and proposed park features is included as **Figure 2**.

The purpose of our geotechnical study is to evaluate the pertinent soil conditions at the site to develop geotechnical parameters which will assist in the design and construction of flexible pavements associated with the proposed parking lot. Our scope of services included 17 test pits within the project area to depths ranging from approximately 4 to 14 feet below existing grade. The test pit locations are depicted in **Figure 2** and test pit logs are included in **Appendix B**.

Our geotechnical engineering services did not include design recommendations for the proposed skate park, restrooms, and natural playground; however, several test pits were performed in the area of these proposed structures.

2.0 PROJECT INFORMATION

The Site is an undeveloped portion of land located at 63 Recycle Road in Lincoln, New Hampshire and consists of two individual parcels located on the north side of the East Branch of the Pemigewasset River, immediately south of the Linwood Shopping Center and north of the Lincoln Transfer Station.

According to the Town of Lincoln Tax Assessor's Office, the Site is identified as follows:

Tax Map	Parcel Number	Lot	Address	Acreage
112	112-008000	008	Main Street – Land Near D	1.15
112	112-009000	009	63 Recycle Road	21



Both properties are owned by the Town of Lincoln. The Site is predominantly wooded and historically part of the former J.E. Henry/Franconia Paper Mill. A soil capped landfill known as the Burndy Landfill is located within the northwestern portion of the property.

The Site is targeted for design and construction of a new municipal park, which will likely be constructed in two or more phases. The proposed park will include a main parking lot (focus of this study), restrooms, a skate park, a kayak/canoe launch area, event spaces, a pavilion building, playground(s), a dog park, bike trails, and numerous pathways and lawn/green spaces.

A grassy greenspace area is planned in the portion of the site containing the former Burndy Landfill, which received industrial waste streams generated by the Burndy Corporation manufacturing processes. The landfill area is located to the west of the proposed parking area.

A paper mill was located east of the Burndy Landfill Site and reportedly used part of the proposed parking area as an industrial solid waste disposal area. Wastes deposited in this area consisted of metal wire and auto parts, wood, and ash. Historical documentation indicates the paper mill was constructed in 1893 and operated under various owners until 1980. NHDES regulations classify this area of the site as a pre-1981 landfill, exempt from solid waste regulations.

Based on a review of the “Riverfront Park Phase 1 Development Project” plan dated April 25, 2020 and prepared by KV Partners, proposed grading will roughly match existing grades in the southern parking area and up to about 9 feet of cut is proposed for the northern portion of the parking. Cut slopes are planned at 2 horizontal to 1 vertical (2H:1V). Retaining walls are not anticipated for site grading.

3.0 SUBSURFACE CONDITIONS

3.1 Typical Subsurface Profile

Based on the results of the explorations, subsurface conditions can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description
Topsoil/ Forest Mat	0.2 to 0.8 (2 to 9 inches)	Topsoil and/or forest mat was encountered in test pits TP-01, -02, -03, -08, -09, and -13. Trace to little ash were encountered in the topsoil in test pits TP-08, -09, and -13)

Fill	3 to 14+	<p>Landfill material was encountered in the majority of test pits in the proposed parking area (TP-07, TP-10 through TP-12, and TP-14 through TP-17). The landfill material, where encountered, ranged from 3 to over 14 feet in thickness. The bottom of the landfill material was not encountered in test pits TP-11, TP-12, and TP-14 through TP-17. The landfill material generally consisted of granular material near the surface, but with depth contained more debris and other deleterious materials including styrofoam, masonry block, rope, plastic, bricks, rubber hoses, glass, scrap metal, die, paper waste, and organics. Occasional cobbles and boulders were also encountered within this layer.</p> <p>Granular fill consisting of sand and gravel with cobbles/boulders, some roots, ash, and occasional paper waste was encountered in the test pits performed within the proposed restroom and skate park areas (TP-04, -05 and -06). The depth of granular fill in these areas ranged from 2 to 3.5 feet in thickness.</p>
Sand/ Gravel	Bottom of test pit depths ranging from 4 to 9, where encountered	<p>Sand and gravel was encountered at the surface or below the topsoil in test pits TP-01, -02, -03, -08, -09, and -13 to bottom of test pit depths ranging from 4 to 5 feet below the existing ground surface. Sand/gravel was also encountered beneath the fill material in test pits TP-04, TP-05, TP-06, TP-07, and TP-10 at depths ranging from 2 to 6 feet below the ground surface. Numerous cobbles and boulders were encountered within the sand/gravel stratum.</p>

Visual soil classifications and conditions encountered at each test pit location are indicated on the individual test pit logs included in **Appendix B**. Stratification boundaries on the logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. A discussion of field sampling procedures is also included in **Appendix B**.

3.2 Groundwater

Groundwater was encountered in 6 of the 17 test pits (TP-1, -2, -3, -7, -8, -10) at depths ranging from 2.3 to 7.5 feet below existing grades. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the



explorations were performed. Therefore, groundwater levels during construction or at other times in the life of the project may be higher or lower than the levels indicated on the exploration logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

4.0 EVALUATION OF SUBSURFACE CONDITIONS

As presented above, subsurface conditions within the proposed parking area generally consist of up to 14+ feet of landfill material in the northwesterly two-thirds of the proposed parking lot and natural sand gravel in the remaining southeasterly areas. The landfill material contains debris and deleterious materials and does not appear to be in a dense condition. Also, there is the potential for voids to exist in the landfill material. As a result, the landfill material has the potential to cause excessive settlement of proposed pavement areas and associated utilities in the pavement. Therefore, we have developed the following three options for pavement construction:

1. *Full removal and replacement of fill* – This option consists of removing the existing landfill material beneath the pavement in its entirety and replacing it with suitable compacted fill material. This option presents the least risk of post-construction settlement but is likely cost prohibitive due to the depth of the fill (up to 14+ feet). Disposal of landfill material would also present a challenge if it were required to be disposed of off-site.
2. *Partial over-excavation and replacement of fill* - This option involves removing existing fill material to at least 2 feet beneath proposed bottom of pavement and utility subgrade elevation and replacement with suitable fill material combined with the use of 2 layers of geogrid. Heavy proofrolling of existing fill with a large vibratory roller would be required over the existing fill subgrade. Note that this method includes some risk of post construction settlement as most of the fill material would remain in place.
3. *Ground Improvement* - Performing ground improvement to increase suitability of the existing fill is another option. Aggregate piers (i.e. stone columns) and Rapid Impact Compaction (RIC) are ground improvement options that would densify the fill such that the potential for future settlement would be reduced. In our opinion, Rapid Impact Compaction would be the more cost-effective ground improvement method as opposed to Aggregate Piers. RIC is performed by dropping a several ton weight repeatedly on the



ground surface in a grid pattern providing densification to a depth of approximately 10+ feet.

Based on discussions with the project team, partial over-excavation and replacement of the fill material (Option 2) has been selected. However, it should be noted that the owner must understand and accept the risks associated with constructing utilities and pavement over existing fill. There is an inherent risk that compressible fill/organics or voids within the fill may exist and have the potential to cause both long-term total settlements and differential settlements. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill.

5.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

Geotechnical engineering recommendations for the design of flexible pavement sections are outlined below. The recommendations contained in this report are based upon the results of field testing, engineering analyses and our current understanding of the proposed development.

5.1 Flexible Pavement

Flexible pavement designs are based on the American Association of State Highway and Transportation Officials' (AASHTO) Guide for Design of Pavement Structures (1993). The thickness of each course is a function of subgrade strength, anticipated traffic volume, design period, serviceability factors, and frost susceptibility. In the design process, we used our engineering judgment, a design period of 20 years, and an 18-kip equivalent single axle load (ESAL) of 100,000. Reference is made to materials described by the *New Hampshire Department of Transportation (NHDOT) Standard Specification for Road and Bridge Construction*. Minimum flexible pavement design recommendations are as follows:

Flexible Pavement Material	Minimum Thickness (in)
Hot Mix Asphalt 1/2-Inch Wearing Mix (NHDOT Table 401-2)	1.5
Hot Mix Asphalt Binder Mix (NHDOT Table 401-2)	2.0
Base Course - Crushed Gravel (NHDOT Item 304.3)	12.0
Subbase Course – Gravel (NHDOT Item 304.2)	12.0



To reduce the potential for differential settlements, where landfill material is present, we recommend utilizing a layer of geogrid (Tensar BX1500 or equivalent) at the bottom of the Subbase Course and at the bottom of the Base Course (i.e., 12 and 24 inches beneath the bottom of proposed pavement). The base and subbase course and associated geogrid should extend a minimum of 2 lateral feet outside the edge of pavement.

Surface drainage should be provided away from the edge of paved areas to reduce the potential for lateral moisture transmission into the subgrade. Hot mix asphalt materials should be placed in accordance with NHDOT standard specifications.

The above flexible pavement section represents minimum thicknesses and, as such, maintenance should be anticipated, especially as the majority of existing landfill material will be left in place. Preventative maintenance should be planned and provided through an ongoing pavement management program in order to enhance future pavement performance. Preventative maintenance activities are intended to slow the rate of pavement deterioration, and to preserve the pavement investment.

5.2 Utilities

Similar to the pavement construction, to reduce the potential for differential settlements where landfill material is present, we recommend a 2-foot over excavation below the bottom of proposed utilities and replacement with Crushed Gravel (NHDOR 304.3). We also recommend placement of geogrid (Tensar BX1500 or equivalent) below utilities (including manholes and catch basins). The geogrid should be placed at both a 2-foot and 1-foot depth beneath the utilities. The Crushed Gravel Fill and associated geogrid should extend a minimum of 3 lateral feet beyond the limits of the utilities (including manholes and catch basins).

6.0 GENERAL CONSTRUCTION CONSIDERATIONS

We understand the gravel section may be constructed as part of a phased approach to the project, and it may be several months or longer before the bituminous layers are installed. Over time, the surface of the gravel will become fouled with silt and other debris from vehicular traffic. By installing a sacrificial layer of base course gravel, it can be removed just prior to paving to provide a clean subgrade to receive the binder course pavement. If a significant period of time is planned between placement of base/subbase course and the bituminous layers courses, we recommend



adding an additional 3.5 inches of base course crushed stone to achieve design finish pavement grade. Just prior to paving, the surficial 3.5 inches of base course crushed stone can be removed and the pavement subgrade, consisting of the design base course thickness, can be proof-rolled as discussed herein.

Earthwork on the project should be evaluated by the geotechnical engineer of record (GER). The evaluation of earthwork should include review of engineered fill, subgrade preparation, and other geotechnical conditions exposed during construction. The observation and testing of engineered fill and other construction materials should be accomplished by a qualified testing agency.

6.1 Initial Site Preparation

Initial site preparation should commence with stripping of existing vegetation and roots, and organic topsoil/forest mat to depths required for construction of the new pavement section. Minimum stripping depths on the order of 6 to 12 inches should be anticipated to remove the existing organic topsoil/forest mat, localized deeper excavation may be required to remove stumps and large root masses and to achieve subgrade elevations. A Nobis representative or a qualified testing agency should monitor the stripping operations to observe that any unsuitable materials (if encountered) have been adequately removed.

6.2 Soil Subgrade Preparation

Following the required stripping and excavation to the pavement section subgrade elevation, and before placing new fill and geogrid, soil subgrades should be proof-rolled with at least six passes in perpendicular directions using a minimum 10-ton vibratory roller.

The geotechnical engineer of record (GER) or his/her representative should review subgrades during the proof-rolling process. Where soft/unstable subgrades are encountered, they should be reviewed by the GER to evaluate suitable stabilization/mitigation options which may include over-excavation to competent material and replacement with suitable material. Fill or pavement materials should not be placed when the subgrade surface is wet or soft/unstable. Following acceptable proof-rolling, pavement subbase and base course layers can be placed and compacted to achieve design grades.

Where site filling is required, the onsite soil that is free of organics, debris or other deleterious material may be used as Common Fill to achieve design pavement section subgrade elevation



below the subbase course provided it is stable and can be adequately compacted and meets the required gradation.

6.3 Fill Material and Placement

All fill placed below and within the 1H:1V zone of influence of the pavements should be compacted to at least 95 percent of the maximum dry density as determined by Modified Proctor Tests (ASTM D-1557, Method C). Protect subgrades from frost at all times during construction. Fill should not be placed over frozen soil. Fill should be placed in loose lift thicknesses of no greater than 12 inches.

Existing Fill: Excavated onsite soil is anticipated to consist primarily of existing landfill material. Due to the variability of the fill and observed deleterious material within the existing fill, excavated onsite soil is generally not suitable for reuse as Common Fill. However, some minimal amounts of existing fill may be suitable for reuse as Common Fill, but it could still require processing or screening. This material will need to be disposed of in accordance with appropriate environmental regulations.

Base Coarse (NHDOT 304.3 - Crushed Gravel): Recommended as base coarse for paved parking and driveway areas. The base coarse should be imported and meet the following gradation:

Sieve Size	Percent Passing by Weight
3-inch	100
2-inch	95-100
1-inch	55-85
No. 4	27-52
No. 200	0-12*
* in sand portion (fraction passing the #4 sieve).	

Subbase Coarse (NHDOT 304.2 - Gravel): Recommended as subbase coarse for paved parking and driveway areas beneath the base coarse. The base coarse should be imported and meet the following gradation:



Sieve Size	Percent Passing by Weight
6-inch	100
No. 4	25-70
No. 200	0-12*
* in sand portion (fraction passing the #4 sieve).	

Crushed Stone: Recommended in wet areas as necessary for utility construction to protect the subgrade from disturbance. Crushed Stone shall meet the requirements defined by the New Hampshire Department of Transportation (NHDOT) Standard Specifications for Road and Bridge Construction, Table 304-1, Material 304.4 (Crushed Stone (Fine)). Crushed Stone, where used, should be separated from soil subgrades, excavation sidewalls, and soil backfill with a geotextile separation fabric such as Mirafi 140N, or equivalent. Crushed Stone should meet the requirements of NHDOT Material 304.4 (Crushed Stone (Fine)) and be compacted to a non-yielding condition.

Common Fill: May be used as fill material beneath the pavement subbase coarse. Common fill should have a maximum particle size no greater 6 inches and should have no more than 30 percent by weight passing the No. 200 sieve.

6.4 Dewatering

Based on groundwater observations, anticipated finish grades and anticipated excavation depths, dewatering is not anticipated for construction of pavements. However, some dewatering could be required for the installation of utilities depending upon their depth. Regardless of excavation depths, limited construction dewatering may be required to maintain a stable subgrade during construction and prevent surface water runoff from collecting in excavations. If dewatering becomes necessary, the contractor should select a dewatering method to lower groundwater at least 2 feet below the excavation subgrade in order to minimize bearing surface disturbance during fill placement and compaction, and construction of footings and utilities.

The contractor should be required to maintain a dewatered and stable subgrade during construction. Efforts should be made to prevent surface water runoff from collecting and ponding. Subgrade soil that becomes unstable should be replaced with Crushed Stone or Crushed Gravel as necessary. Crushed stone, if used, should be enveloped with a geotextile to avoid

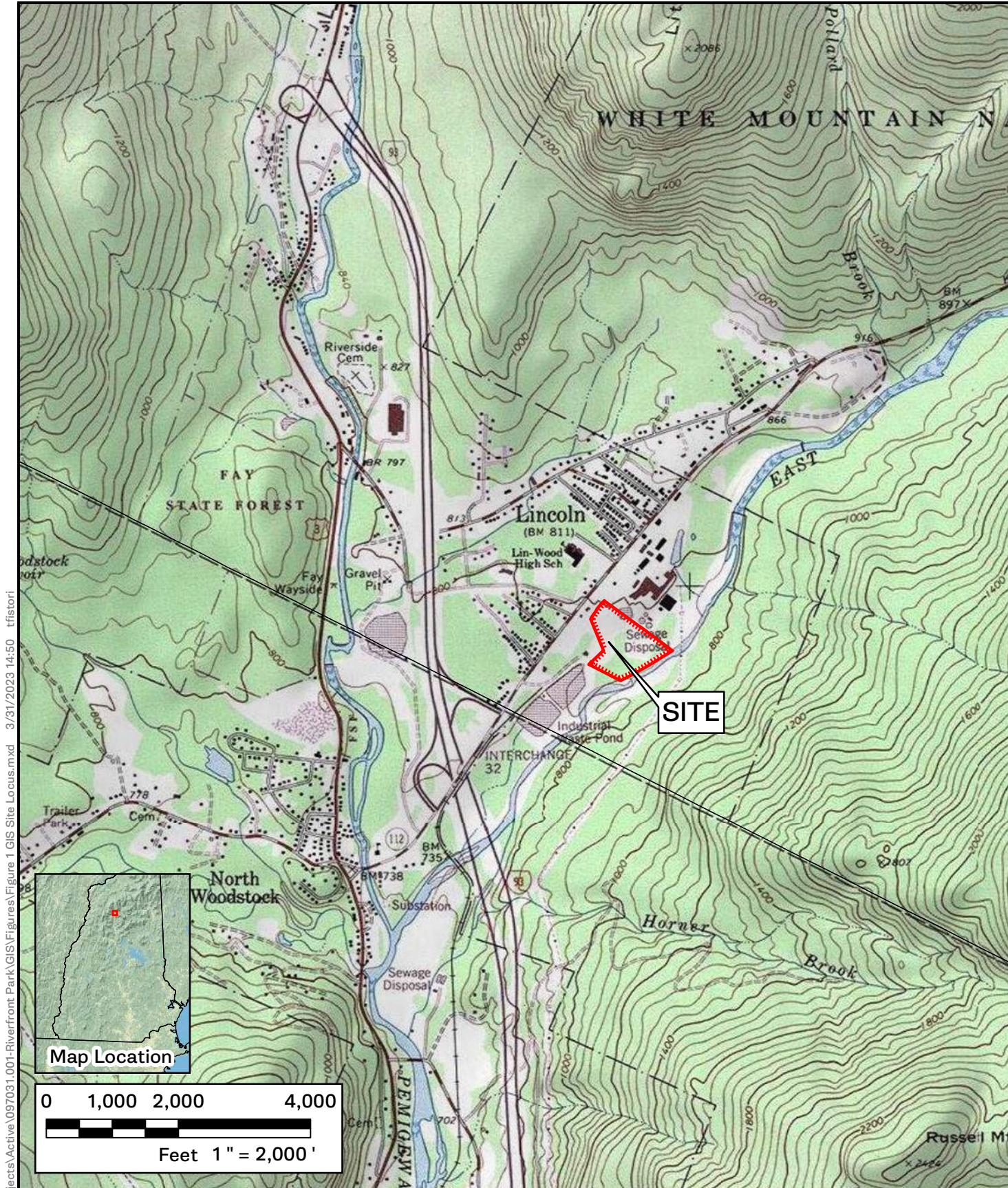


separation of fines from the subgrade and backfill. Discharged water should be managed in accordance with local, state and federal government requirements.

7.0 DESIGN SERVICES AND CONSTRUCTION OBSERVATION

Nobis should be retained to review final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. The GER and an independent testing agency should also be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

FIGURES



USGS Topographic Map
Lincoln, New Hampshire
Revised 1967



Nobis Group® - 18 Chenell Drive
Concord, NH 03301 - (603) 224-4182
www.nobis-group.com

FIGURE 1

SITE LOCUS
RIVERFRONT PARK
LINCOLN, NEW HAMPSHIRE

PREPARED BY: TF

CHECKED BY: TA

PROJECT NO. 097031.001

DATE: MARCH 2023

J:\93203.00 - START Contract - Task Order 03\Closed_TDDs\93203.20 - Lincoln Riverfront Park TBA\GIS\Figure 2 Site Plan_2.mxd 5/2/2023 11:43 tfistori

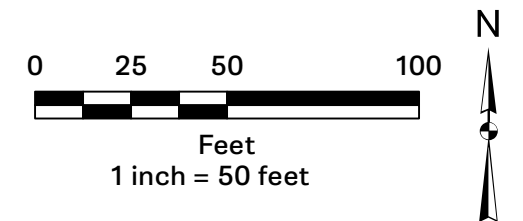


Notes:

1. Locations of site features depicted hereon are approximate and given for illustrative purposes only.
2. The defined boundary of the "Site" is for planning and construction purposes to separate proposed park redevelopment from the Transfer Station. The Site exists within the larger boundary of the properties owned by the Town of Lincoln (Tax Map 112, Lots 008 and 009).

Legend

- 2022 Nobis Test Pit
- Proposed Riverfront Park Feature
- Site Outline
- Parcel Boundaries



FIGURE

NOBIS TEST PIT LOCATIONS
RIVERFRONT PARK
LINCOLN, NEW HAMPSHIRE

PREPARED BY: TF	CHECKED BY: TA
PROJECT NO. 97031.001	DATE: MAY 2023



Nobis Group® - 18 Chenell Drive
Concord, NH 03301 - (603) 224-4182
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APPENDIX A

Limitations

GEOTECHNICAL LIMITATIONS

Explorations and Subsurface Conditions

1. The analyses and design recommendations submitted in this report are based in part upon the data obtained from subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

In preparing this report, Nobis relied on certain information provided by the Client and other parties referenced therein which were made available to Nobis at the time of our evaluation. Nobis did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more erratic. For specific information, refer to the exploration logs.
3. Water level readings have been made in the explorations at times and under conditions stated on the logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other factors occurring since the time measurements were made. The water table encountered in the course of the work may differ from that indicated in the Report.

Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

4. Nobis' geotechnical services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

Additional Services

5. Nobis recommends that we be retained to provide services during future site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our recommendations, design concepts and/or opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design recommendations; and iv) assess the consequences of changes in technologies and/or regulations.

Use of Report

6. Nobis prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in our proposal and/or report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to Nobis.

This report is for design purposes only and is not sufficient to prepare an accurate construction bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to design considerations only.

7. Nobis' findings and conclusions are based on the work conducted as part of the scope of work set forth in our proposal and/or report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions considering the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the project design has been altered in any way, Nobis shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions.
8. Nobis' services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

Compliance with Codes and Regulations

9. Nobis used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

Opinion of Cost

10. This report may contain or be based on comparative cost opinions for the purpose of evaluating alternative foundation schemes. These opinions may also involve approximate quantity evaluations. It should be noted that quantity estimates may not be accurate enough for construction bids. In addition, since we are not professional estimators of labor and materials cost, the evaluation of construction costs should be considered as approximate guidelines and could vary significantly from actual costs. Nobis does not guarantee the accuracy of our cost opinions as compared to contractor's bids for construction costs.

END OF LIMITATION

APPENDIX B
Description of Field Explorations
Nobis Test Boring Logs



DESCRIPTION OF FIELD EXPLORATIONS

In total, 17 test pits (TP-1 through TP-17) were advanced in the project area on November 3 and 4, 2022. Eleven of the test pits (TP-7 through TP-17) were performed in the proposed parking area. Test pits were advanced to depths ranging from 4 to 14 feet below the existing ground surface by the Lincoln Department of Public Works using a Caterpillar 303.5E backhoe. Explorations were located in the field by GPS survey methodologies.

Visual classifications of soil are shown on test pit logs included in **Appendix B**. Groundwater conditions were evaluated in each exploration at the time of site explorations.

TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-01

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Sandy Gravel ▼	Approximately 2 inches of TOPSOIL/FOREST MAT.	E	-	
2		Brown, fine to coarse GRAVEL & fine to coarse Sand, little Silt, numerous cobbles and boulders. Moist.	M-D	10A, 1B	
3		Redoximorphic staining present starting at approximately 2 ft bgs. Decrease in percentage of sand beneath the groundwater table			
4					
5		Exploration terminated at approximately 4 feet bgs due to presense of groundwater.			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

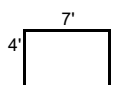
Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater encountered at approximately 2.3 ft bgs.

Plan View

WATER SYMBOLS

▼ Groundwater

▽ Estimated Seasonal High Groundwater



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-01
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

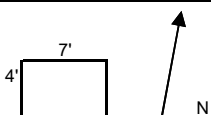


Notes: 1.) Photo of TP-01 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-02

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Topsoil	Approximately 6 inches of TOPSOIL/FOREST MAT.	E	-	
2	Sandy Gravel ▽	Dark brown, fine to coarse GRAVEL, some fine to coarse Sand, little Silt, numerous cobbles and boulders. Moist.	M-D	25A	
3		Cobbles and boulders increase with depth. Slight color change observed at 2.2 feet bgs, indicating a possible seasonal high water table. Redoximorphic staining present on gravel and cobbles.			
4					
5		Exploration terminated at approximately 4 feet bgs due to presense of groundwater.			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.

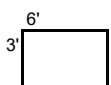
2.) Groundwater encountered at approximately 3.8 ft bgs.

Plan View

WATER SYMBOLS

▽ Groundwater

▽ Estimated Seasonal High Groundwater



BOULDER

12" - 24"

24" - 36"

>36"

CLASS

A

B

C

PROPORTIONS USED

0-10% Trace

10-20% Little

20-35% Some

35-50% And

EXCAVATION EFFORT

E = Easy

M = Moderate

D = Difficult

TEST PIT LOG



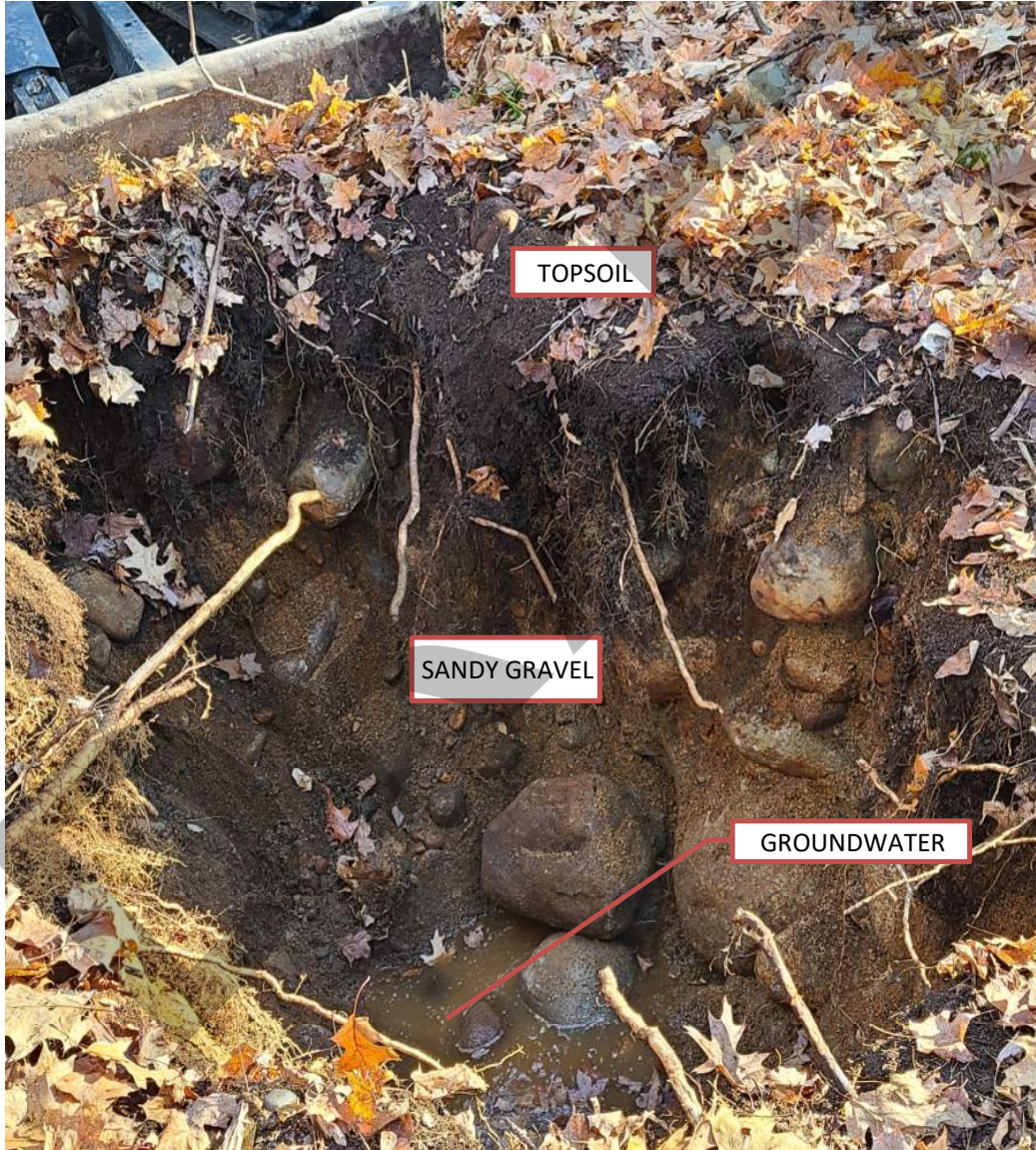
PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-02
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

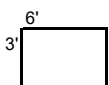


Notes: 1.) Photo of TP-02 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-03

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

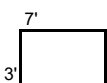
Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Topsoil	Approximately 9 inches TOPSOIL/FOREST MAT.	E	-	
2	<div> <div>▽</div> <div>▽</div> </div> Sand and Gravel	Brown and red, fine to coarse SAND, some fine to coarse Gravel, little Silt. Moist.	M	-	
3		Color change observed at 2.2 feet bgs, indicating a possible seasonal high water table.			
4		Increase in number of cobbles and boulders with depth.	D	10A, 4B	
5					
6		Exploration terminated at approximately 5 feet bgs due to presense of groundwater.			
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater was encountered at approximately 2.5 feet bgs.

WATER SYMBOLS

▽ Groundwater
▽ Estimated Seasonal High Groundwater

Plan View



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



nobis

PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-03

SHEET 2 of 2

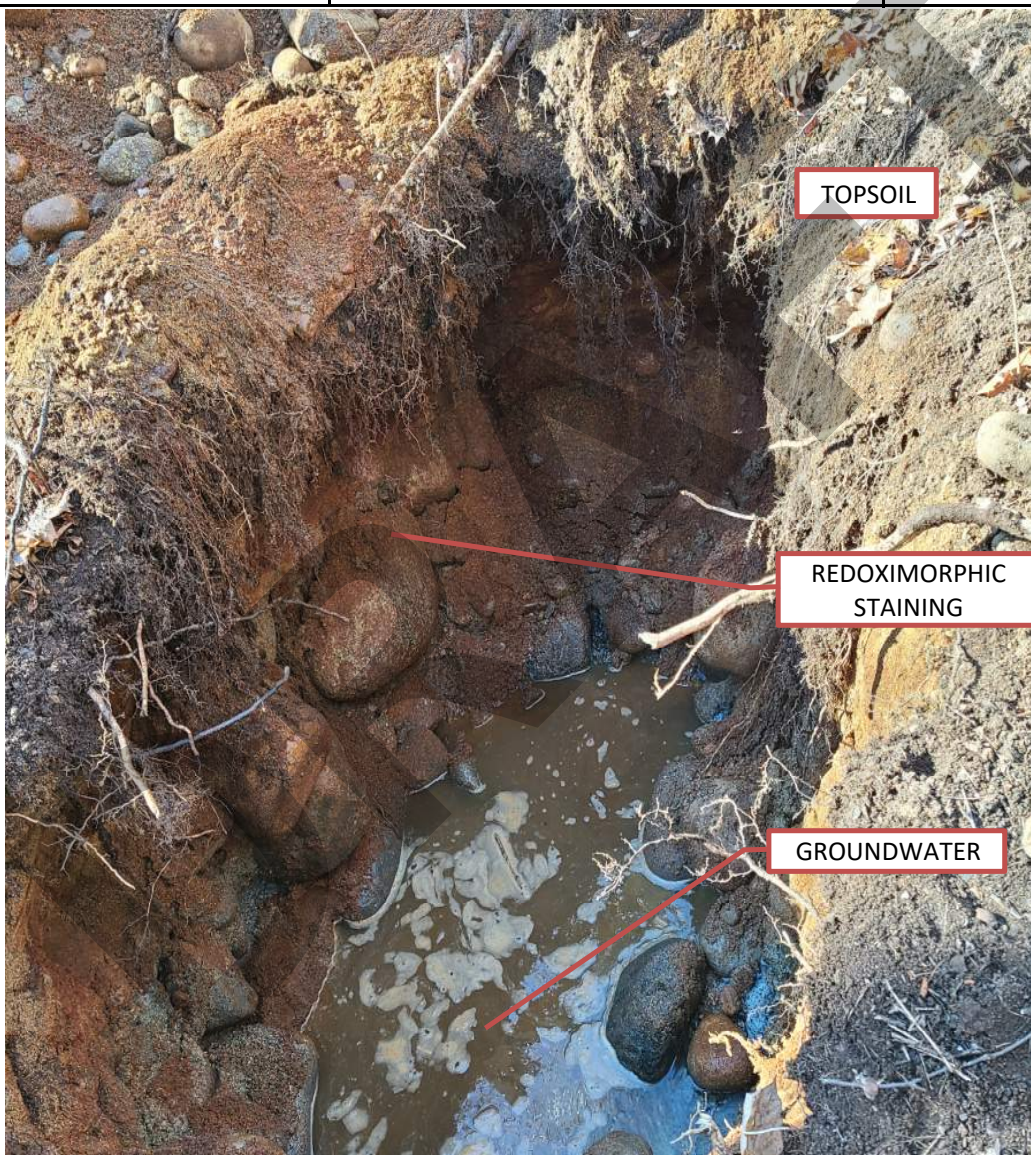
FILE NO. 97031.001

CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

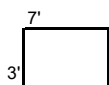


Notes: 1.) Photo of TP-03 in progress.

WATER SYMBOLS

▼ Groundwater
▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-04

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El. _____
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Gray-tan, fine to coarse Sand, little Silt, numerous roots, contains a significant percentage of ash. Dry to moist. (FILL)	E	-	
2		Dark gray-brown, fine to coarse GRAVEL, some fine to coarse Sand, contains some ash, numerous cobbles and boulders. Dry to moist. (FILL)	M-D	5A	
3					
4	Sandy Gravel <u>▽</u>	Red and brown, fine to coarse GRAVEL, some fine to coarse Sand, little Silt, numerous cobbles and boulders. Moist. Redoximorphic staining observed around 5 to 6 ft bgs indicating a possible seasonal high groundwater table.	D	10A, 1B	
5					
6					
7		Exploration terminated at approximately 6 feet bgs due to presense of large boulders and hole collapsing.			
8					
9					
10					
11					
12					
13					
14					
15					

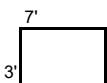
Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

▽ Groundwater

▽ Estimated Seasonal High Groundwater



BOULDER

12" - 24"

24" - 36"

>36"

CLASS

A

B

C

PROPORTIONS USED

0-10% Trace

10-20% Little

20-35% Some

35-50% And

EXCAVATION EFFORT

E = Easy

M = Moderate

D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-04
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

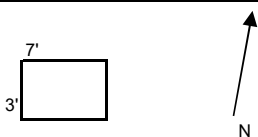


Notes: 1.) Photo of TP-04 in progress.

WATER SYMBOLS

▼ Groundwater
▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-05

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	FILL	Black and gray, fine to medium SAND, numerous cobbles, numerous roots. Dry to moist. (FILL) Contains several ash particles.	E	-	
2					
3	Sand and Gravel	Orange-brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, moist.	M-D	3B	
4					
5					
6	9.0'±	Increase in number of boulders with depth.	D	3B, 1C	
7		Exploration terminated at approximately 5.5 feet bgs due to presense of large boulders and hole collapsing.			
8					
9					
10					
11					
12					
13					
14					
15					

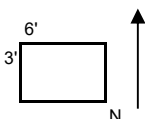
Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

Groundwater

Estimated Seasonal High Groundwater



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



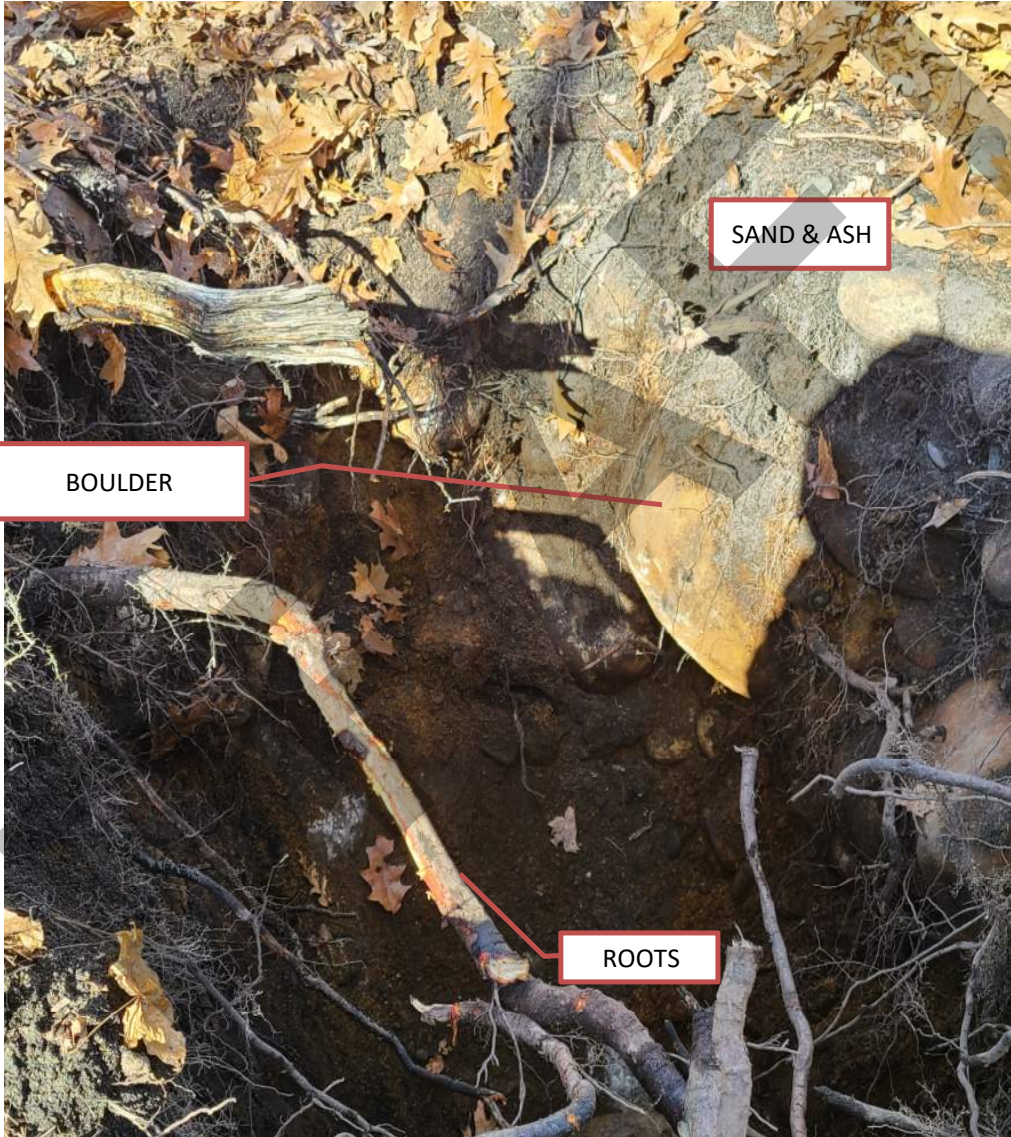
PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-05
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

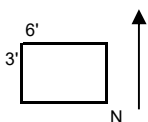


Notes: 1.) Photo of TP-05 in progress.

WATER SYMBOLS

▼ Groundwater
▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-06

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El. _____
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Approximately 1 to 5 inches of TOPSOIL/FOREST MAT.	E	-	
2		Light brown, fine to medium SAND, little Silt. Dry to moist. (FILL) Contains chunks of grayish paper waste.	E	-	
3		Contains few ash particles.			
4	Sand and Gravel	Redoximorphic staining present approximately 2.5 feet bgs.			
5		Brown, fine to coarse SAND and fine to coarse Gravel, little Silt, several cobbles and boulders. Moist.	M-D	10A, 2B	
6		Exploration terminated at approximately 5.5 feet bgs due to presense of large boulders and hole collapsing.			
7					
8					
9					
10					
11					
12					
13					
14					
15					

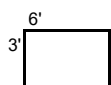
Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

▼ Groundwater

▽ Estimated Seasonal High Groundwater



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-06
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

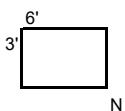


Notes: 1.) Photo of TP-06 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-07

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El. _____
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

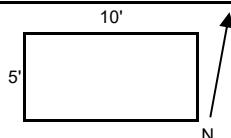
Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Gray-tan, fine to coarse Sand, little Silt, numerous roots, contains a significant percentage of ash, numerous roots. Dry to moist. (FILL)	E	-	
2					
3		Dark brown - gray, fine to coarse SAND, some fine to coarse Gravel, little ash, little Silt, numerous cobbles. Moist. (FILL)	M	2A	
4	Sand and Gravel ▼	Brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, numerous cobbles and boulders. Moist to wet.	M-D	1B, 5A	
5					
6					
7		Exploration terminated at approximately 6 feet bgs due to presense of groundwater and hole collapsing.			
8					
9					
10					
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater encountered at approximately 5.75 ft.

WATER SYMBOLS

▼ Groundwater
▽ Estimated Seasonal High Groundwater

Plan View



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



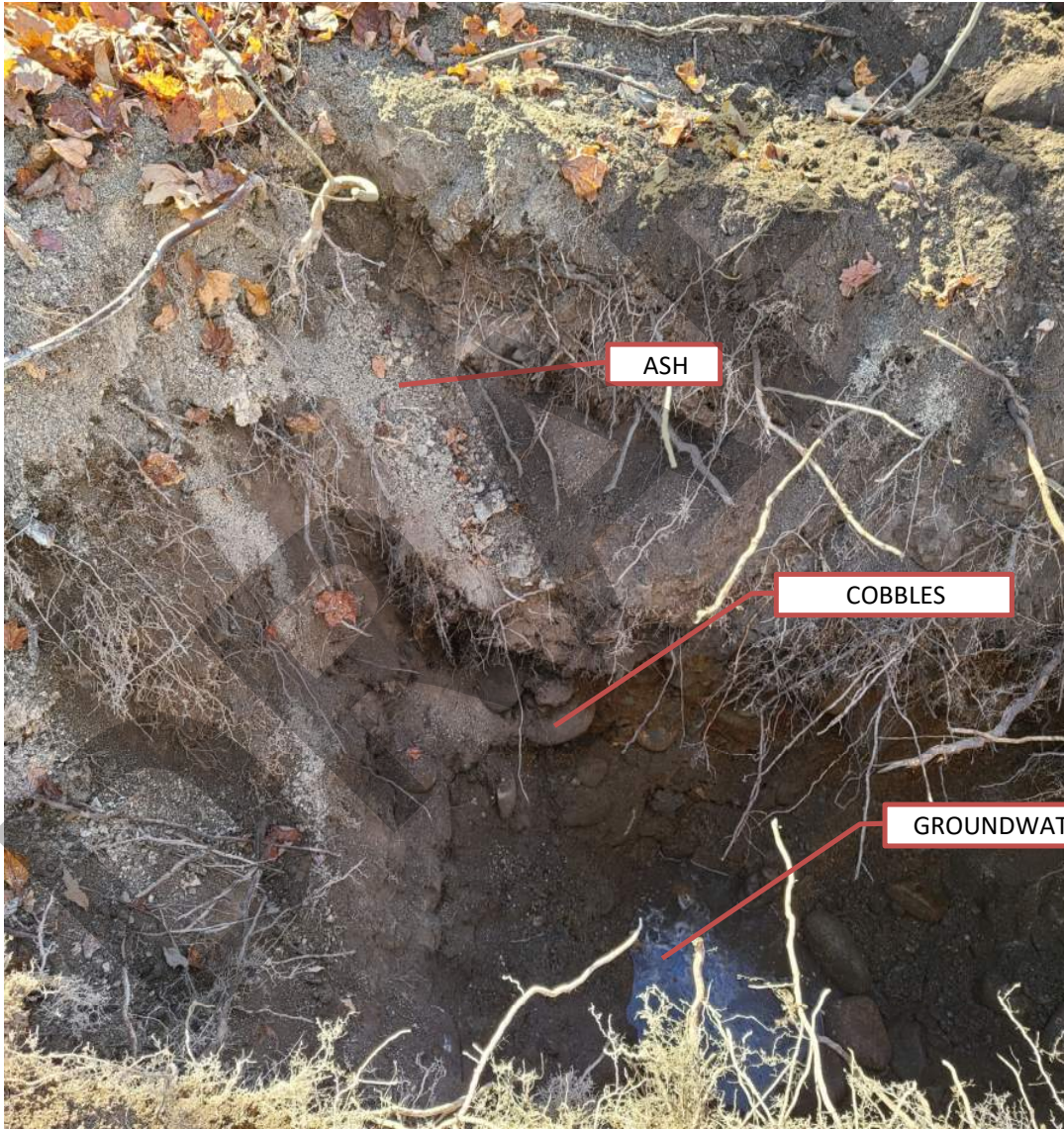
PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-07
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

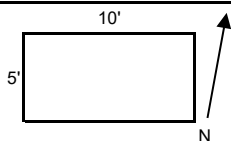


Notes: 1.) Photo of TP-07 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-08

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
 Contractor Lincoln DPW
 Operator R. Smith
 Weather 20-30s, Sunny

Make CAT
 Model 303.5E CR
 Capacity 0.6 CY
 Reach 12 ft

Ground El. _____
 Datum NAVD88
 Date Start 11/3/2022
 Date Finish 11/3/2022

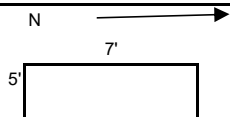
Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Sand	Approximately 4 to 5 inches of TOPSOIL, little ash.	E	-	
2		Brown, fine to medium SAND, some fine to coarse Gravel, some Silt. Moist.	E	-	
3	Sand and Gravel	Brown, fine to coarse GRAVEL and fine to coarse SAND, little Silt, numerous cobbles. Moist to wet.	D	6A, 2B	
4					
5					
6		Exploration terminated at approximately 5 feet bgs due to presense of groundwater and hole collapsing.			
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
 2.) Groundwater encountered at approximately 4.5 feet.

WATER SYMBOLS

▼ Groundwater
 ▽ Estimated Seasonal High Groundwater

Plan View



BOULDER

12" - 24"
 24" - 36"
 >36"

CLASS

A
 B
 C

PROPORTIONS USED

0-10% Trace
 10-20% Little
 20-35% Some
 35-50% And

EXCAVATION EFFORT

E = Easy
 M = Moderate
 D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-08
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

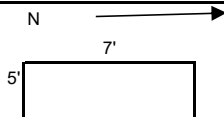


Notes: 1.) Photo of TP-08 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-09

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El. _____
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Topsoil/Fill	Approximately 6 to 9 inches of TOPSOIL, trace Ash. Dry to moist.	E	-	
2	Sand and Gravel	Red-brown, fine to coarse SAND and GRAVEL, trace Silt, numerous cobbles. Moist.	D	15A, 2B	
3					
4		Contains more cobbles and boulders with depth. Occasional redoximorphic staining on gravel, cobbles, and boulders.			
5		Exploration terminated at approximately 4.5 feet bgs due to presense of large boulders and hole collapsing.			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

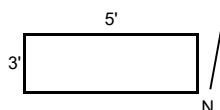
Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

▼ Groundwater

▽ Estimated Seasonal High Groundwater



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-09
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/3/2022
Date Finish 11/3/2022

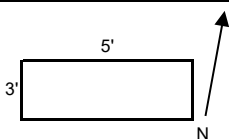


Notes: 1.) Photo of TP-09 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-10

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
 Contractor Lincoln DPW
 Operator R. Smith
 Weather 20-30s, Sunny

Make CAT
 Model 303.5E CR
 Capacity 0.6 CY
 Reach 12 ft

Ground El. _____
 Datum NAVD88
 Date Start 11/4/2022
 Date Finish 11/4/2022

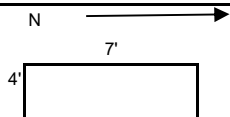
Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Gray-tan, fine to coarse Sand, little Silt, contains a significant percentage of ash. Dry to moist. (FILL)	E	2A	
2					
3					
4					
5					
6					
7	Sandy Gravel	Brown, fine to coarse GRAVEL, some fine to coarse Sand, little Silt. Moist to wet.	D	3A, 1B	
8					
9		Exploration terminated at approximately 8 feet bgs due to presense of groundwater and hole collapsing.			
10					
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
 2.) Groundwater encountered at 7.5 ft.

WATER SYMBOLS

Groundwater
 Estimated Seasonal High Groundwater

Plan View



BOULDER

12" - 24"
 24" - 36"
 >36"

CLASS

A
 B
 C

PROPORTIONS USED

0-10% Trace
 10-20% Little
 20-35% Some
 35-50% And

EXCAVATION EFFORT

E = Easy
 M = Moderate
 D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-10
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

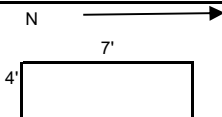


Notes: 1.) Photo of TP-10 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-11

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
 Contractor Lincoln DPW
 Operator R. Smith
 Weather 20-30s, Sunny

Make CAT
 Model 303.5E CR
 Capacity 0.6 CY
 Reach 12 ft

Ground El. _____
 Datum NAVD88
 Date Start 11/4/2022
 Date Finish 11/4/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Gray-tan, fine to coarse Sand, little Silt, contains a significant percentage of ash. Dry to moist. (FILL)	M	3A, 1B, 1C	
2					
3					
4		Contains numerous pieces of wood and man-made debris including styrofoam, rope, plastic, bricks, rubber hoses, scrap metal. Trace amounts of possible dye (purple in color) evident at ground surface and within fill. Strong inorganic odor encountered during excavation.			
5					
6					
7					
8		Contains more gravel, cobbles, and boulders with depth.			
9		Exploration terminated at approximately 8.5 feet bgs due to hole collapsing.			
10					
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
 2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

▼ Groundwater

▽ Estimated Seasonal High Groundwater

BOULDER		CLASS	PROPORTIONS USED		EXCAVATION EFFORT
	12" - 24"	A	0-10%	Trace	E = Easy
	24" - 36"	B	10-20%	Little	M = Moderate
	>36"	C	20-35%	Some	D = Difficult
			35-50%	And	

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-11
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

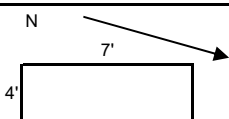


Notes: 1.) Photo of TP-11 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-12

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

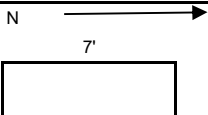
Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Gray-tan, fine to coarse Sand, little Silt, contains a significant percentage of ash. Dry to moist. (FILL) Contains several pieces of glass, few bricks.	M	-	
2					
3					
4					
5		Dark brown to black, fine to coarse SAND, some Silt, little fine to coarse Gravel, numerous cobbles. Moist. Contains several pieces of wood and buried organics, numerous man-made debris including metal chains, rope, glass, bricks, rubber hoses, scrap metal. Strong inorganic odor encountered during excavation.	M	-	
6					
7					
8					
9					
10					
11		Exploration terminated at approximately 10.3 feet bgs due to hole collapsing.			
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

WATER SYMBOLS

▼ Groundwater
▽ Estimated Seasonal High Groundwater

Plan View



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-12
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

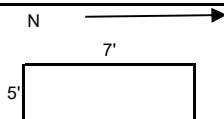


Notes: 1.) Photo of TP-12 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-13

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El. _____
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Topsoil/Fill	Approximately 5 to 6 inches of TOPSOIL with little ash.	E	-	
2	Sand and Gravel	Brown, fine to coarse SAND, some fine to coarse Gravel, little Silt, numerous cobbles and small boulders. Moist.	D	7A, 1B	
3					
4					
5					
6		Refusal encountered at 4.8 feet bgs on large boulders.			
7					
8					
9					
10					
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

▼ Groundwater

▽ Estimated Seasonal High Groundwater

<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">3'</div> <div style="border: 1px solid black; width: 100px; height: 40px; position: relative;"> <div style="position: absolute; top: -10px; left: 0; right: 0; text-align: center;">7'</div> <div style="position: absolute; right: 0; top: 0; bottom: 0; text-align: center;">N</div> </div> </div>	<u>BOULDER</u>	<u>CLASS</u>	<u>PROPORTIONS USED</u>	<u>EXCAVATION EFFORT</u>
	12" - 24"	A	0-10% Trace	E = Easy
	24" - 36"	B	10-20% Little	M = Moderate
	>36"	C	20-35% Some	D = Difficult
			35-50% And	

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-13
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

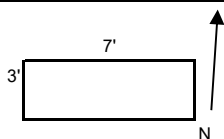


Notes: 1.) Photo of TP-13 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-14

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
 Contractor Lincoln DPW
 Operator R. Smith
 Weather 20-30s, Sunny

Make CAT
 Model 303.5E CR
 Capacity 0.6 CY
 Reach 12 ft

Ground El. _____
 Datum NAVD88
 Date Start 11/4/2022
 Date Finish 11/4/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Dark brown to black, fine to coarse SAND, some Silt, little fine to coarse Gravel, numerous roots, few cobbles. Moist. Few pieces of plastic and fabric, very few bricks.	M-D	2A, 1C	
2					
3					
4					
5					
6					
7		Exploration terminated at approximately 6 feet bgs due to large boulder. Inferred natural material observed at approximately 6 ft. composed of very gravelly/cobbley sand.			
8					
9					
10					
11					
12					
13					
14					
15					

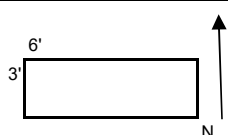
Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
 2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

▼ Groundwater

▽ Estimated Seasonal High Groundwater



BOULDER

12" - 24"
 24" - 36"
 >36"

CLASS

A
 B
 C

PROPORTIONS USED

0-10% Trace
 10-20% Little
 20-35% Some
 35-50% And

EXCAVATION EFFORT

E = Easy
 M = Moderate
 D = Difficult

TEST PIT LOG



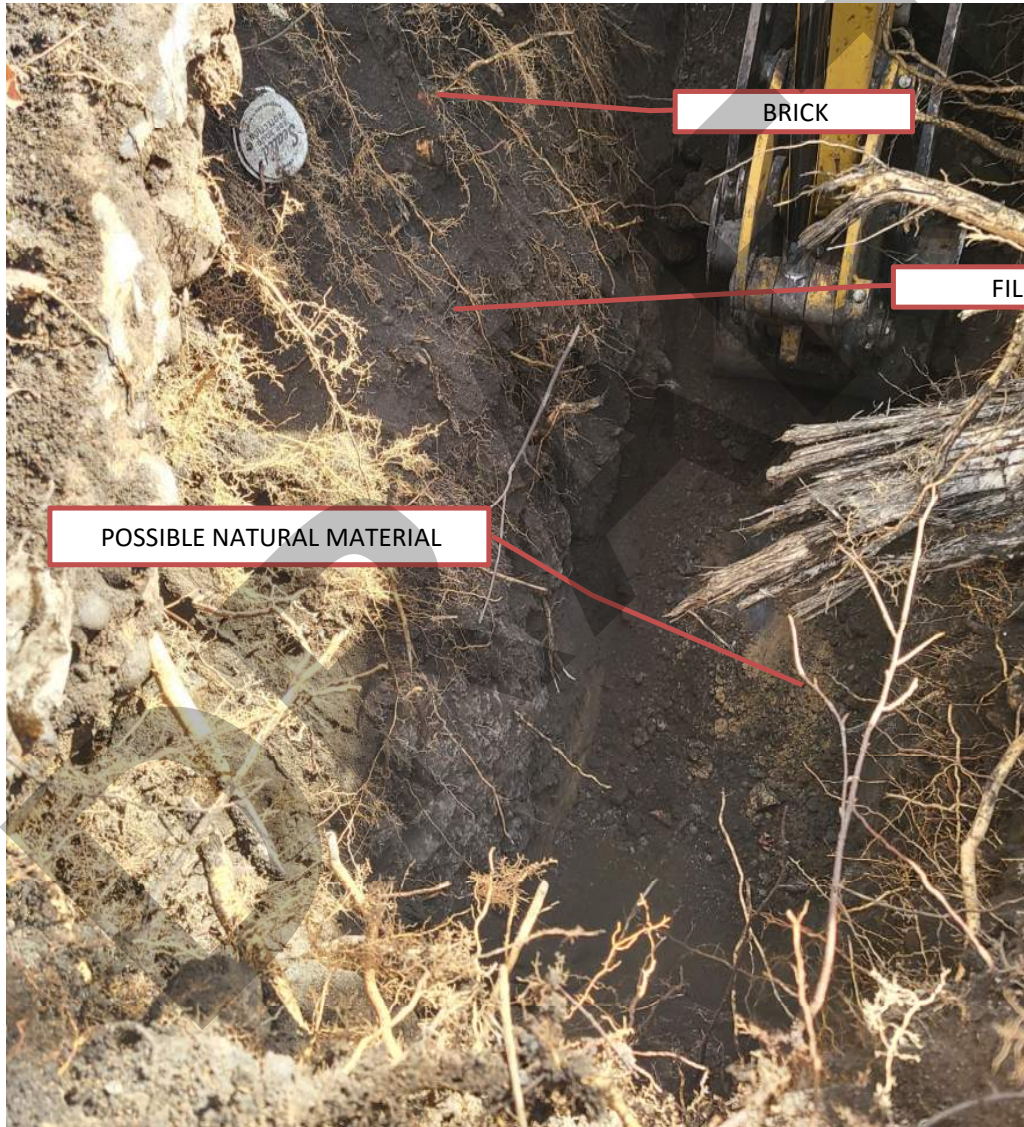
PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-14
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

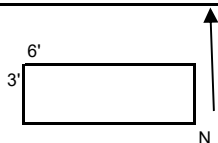


Notes: 1.) Photo of TP-14 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-15

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El. _____
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	FILL	Black and dark brown, fine to coarse SAND, some Silt, little fine to coarse Gravel, numerous cobbles. Moist. Contains few pieces of wood, very little man-made debris including metal chains, rope, glass, bricks, rubber hoses, scrap metal, paper waste. Strong inorganic odor encountered during excavation.	E	2A,1B	
2					
3					
4					
5					
6					
7					
8		Increase in cobbles and boulders with depth.	D	4A, 1B	
9					
10		Exploration terminated at approximately 8.8 feet bgs due to hole collapsing.			
11					
12					
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

WATER SYMBOLS

▼ Groundwater
▽ Estimated Seasonal High Groundwater

Plan View



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



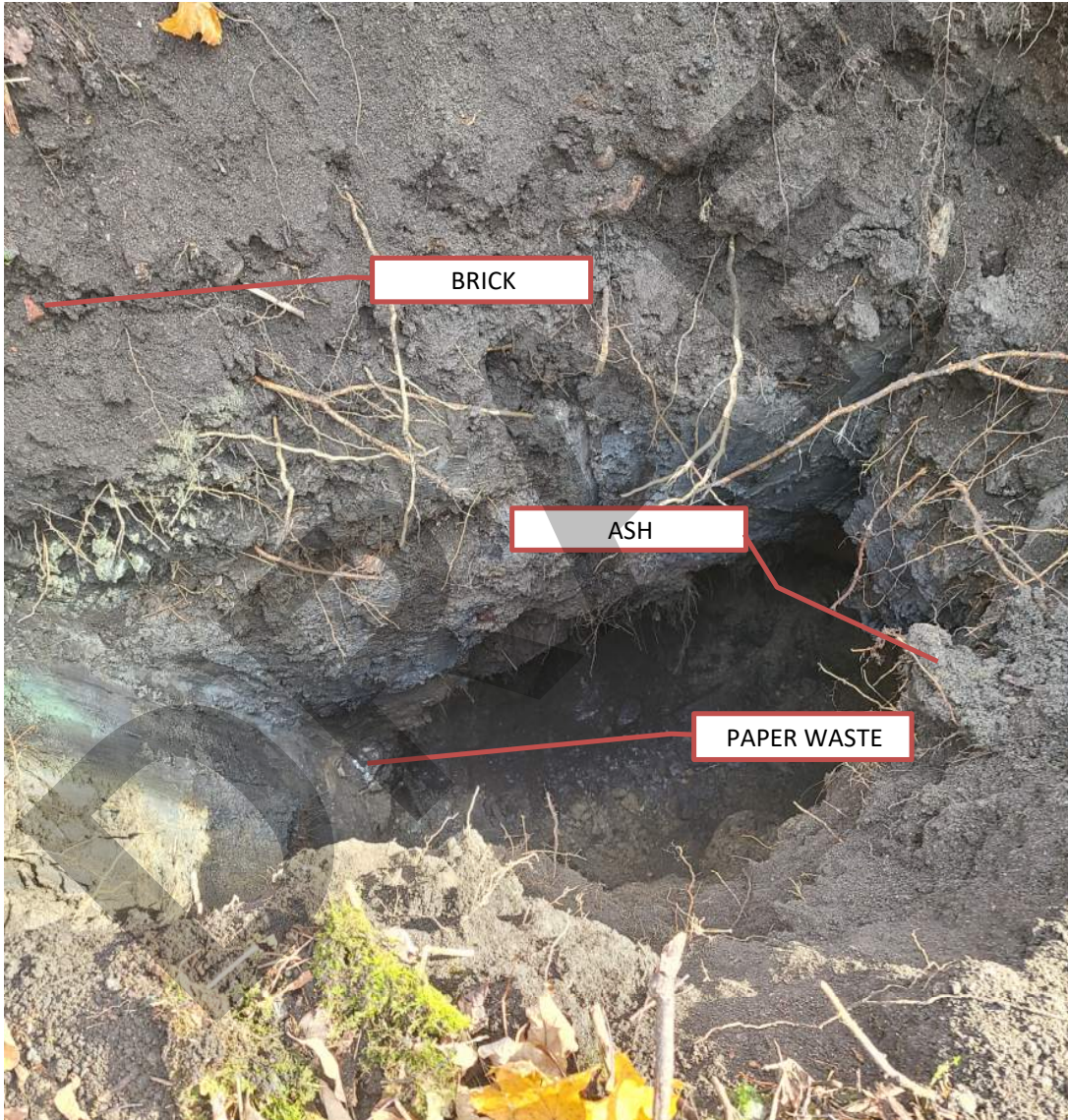
PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-15
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022



Notes: 1.) Photo of TP-15 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-16

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY _____

Engineer K. Stanway
 Contractor Lincoln DPW
 Operator R. Smith
 Weather 20-30s, Sunny

Make CAT
 Model 303.5E CR
 Capacity 0.6 CY
 Reach 12 ft

Ground El. _____
 Datum NAVD88
 Date Start 11/4/2022
 Date Finish 11/4/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	FILL	Dark brown, fine to coarse SAND, some Silt, little fine to coarse Gravel. Moist. Contains few pieces of wood and buried organics, numerous pieces of man-made debris including bricks, rubber hoses, large pieces of scrap metal, plastic, fabric, and masonry blocks.	M	5A	
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12		Exploration terminated at approximately 11 feet bgs due to reach of excavator.			
13					
14					
15					

Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
 2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

▼ Groundwater
 ▽ Estimated Seasonal High Groundwater

<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">3'</div> <div style="border: 1px solid black; width: 100px; height: 40px; position: relative;"> <div style="position: absolute; top: -10px; left: 0; right: 0; text-align: center;">6'</div> <div style="position: absolute; bottom: -10px; left: 0; right: 0; text-align: center;">N</div> </div> </div>	<u>BOULDER</u>	<u>CLASS</u>	<u>PROPORTIONS USED</u>	<u>EXCAVATION EFFORT</u>
	12" - 24"	A	0-10% Trace	E = Easy
	24" - 36"	B	10-20% Little	M = Moderate
	>36"	C	20-35% Some	D = Difficult
			35-50% And	

TEST PIT LOG



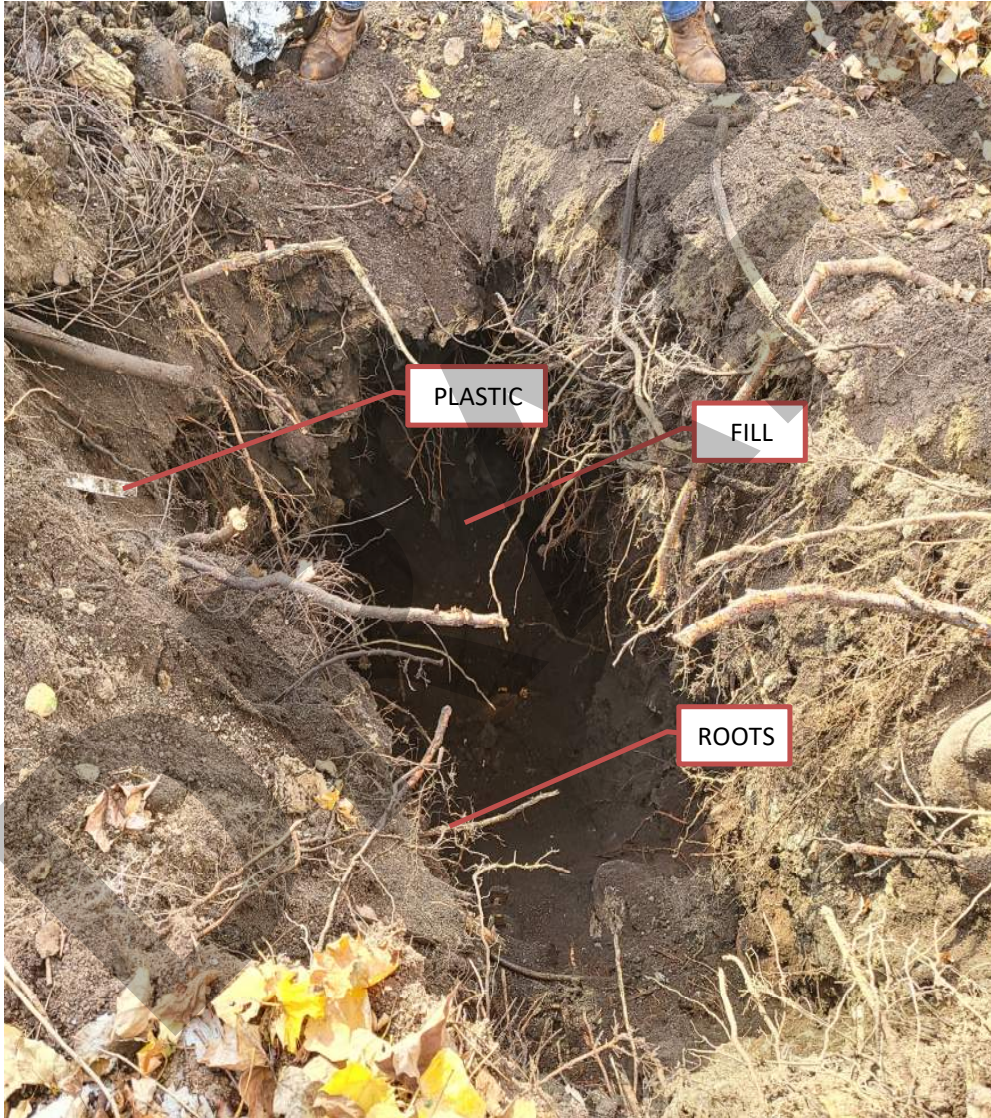
PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-16
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

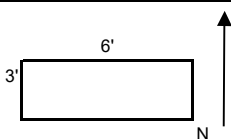


Notes: 1.) Photo of TP-16 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View



TEST PIT LOG



PROJECT

Riverfront Park

Lincoln, NH

TEST PIT NO. TP-17

SHEET 1 of 2

FILE NO. 97031.001

CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022

Depth Below Grade (ft)	Strata Change & Water Level	Subsurface Description	Excavation Effort	Boulder Qty/Class	USDA Textural Class
1	Fill	Gray-tan, fine to coarse Sand, little Silt, contains a significant percentage of ash. Dry to moist. (FILL) Contains numerous man-made debris including styrofoam, rope, plastic, bricks, rubber hoses, scrap metal.	E	2A	
2					
3		Brown, fine to coarse SAND, trace Silt. Moist. Topped by possible rubber liner under initial layer of fill.			
4					
5		Large deposits of gray possible paper waste. Very strong inorganic odor encountered during excavation.			
6					
7					
8					
9					
10		Dark brown to black, fine to coarse SAND, some Silt, several pieces of wood, numerous cobbles. Moist. Contains numerous man-made debris including wires, rubber hoses, large pieces of scrap metal, and paper waste.			
11					
12					
13					
14					
15		Exploration terminated at approximately 14 feet bgs due to reach of excavator.			

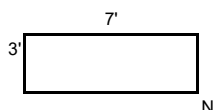
Notes: 1.) Test pit backfilled with excavated soils and compacted with excavator bucket in 1-foot lifts to surface.
2.) Groundwater not encountered.

Plan View

WATER SYMBOLS

Groundwater

Estimated Seasonal High Groundwater



BOULDER

12" - 24"
24" - 36"
>36"

CLASS

A
B
C

PROPORTIONS USED

0-10% Trace
10-20% Little
20-35% Some
35-50% And

EXCAVATION EFFORT

E = Easy
M = Moderate
D = Difficult

TEST PIT LOG



PROJECT
Riverfront Park
Lincoln, NH

TEST PIT NO. TP-17
SHEET 2 of 2
FILE NO. 97031.001
CHKD BY

Engineer K. Stanway
Contractor Lincoln DPW
Operator R. Smith
Weather 20-30s, Sunny

Make CAT
Model 303.5E CR
Capacity 0.6 CY
Reach 12 ft

Ground El.
Datum NAVD88
Date Start 11/4/2022
Date Finish 11/4/2022



Notes: 1.) Photo of TP-17 in progress.

WATER SYMBOLS

- ▼ Groundwater
- ▽ Estimated Seasonal High Groundwater

Plan View

