



# REPORT

26-0092 S

February 11, 2026

## Explorations and Geotechnical Engineering Services

Proposed Building Addition  
Community Connector Cold Storage Facility  
511 Maine Avenue  
Bangor, Maine

**Prepared For:**

City of Bangor, Maine  
Attention: Hannah Peasley, E.I.  
73 Harlow Street  
Bangor, ME 04401

**Prepared By:**

S. W. Cole Engineering, Inc.  
37 Liberty Drive  
Bangor, ME 04401  
Tel: (207) 848-5714

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February 11, 2026

City of Bangor, Maine  
Attention: Hannah Peasley, E.I.  
73 Harlow Street  
Bangor, ME 04401

Subject: Explorations and Geotechnical Engineering Services  
Proposed Building Addition  
Community Connector Cold Storage Facility  
511 Maine Avenue  
Bangor, Maine

Dear Hannah:

In accordance with our Proposal, dated January 16, 2026, we have performed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Appendix A.

## **1.0 INTRODUCTION**

### **1.1 Scope and Purpose**

The purpose of our services was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to foundations and earthwork associated with the proposed construction. Our scope of services included completion test boring explorations, soils laboratory testing, a geotechnical analysis of the subsurface findings and preparation of this report.

### **1.2 Site and Proposed Construction**

The site is located at the existing Community Connector Cold Storage Facility at 511 Maine Avenue in Bangor, Maine. The overall site currently includes the existing cold storage building which generally includes bus storage areas and miscellaneous areas occupied by the City of Bangor. We understand the proposed development area is

located west of the facility, which generally consists of open landscaped areas with a bisecting paved access drive. Based on available aerial imagery, we understand a relic on-grade slab and likely foundations exist in the proposed development area from a building that was demolished around 1996. Based on the provided Bus Barn Renovation & Training Center Addition Plan (Plan), dated December 17, 2025, from Artifex Architects & Engineers, we understand the site generally slopes downward from west to east from about elevation 157 to 151 feet (project datum).

Based on our conversations and the Plan, we understand development plans call for construction of a new building addition for a training center and community connector offices along the western corner of the existing building. We understand the building addition will occupy a footprint of about 6,000 square feet. We anticipate the building addition will be one-story and wood-framed with an on-grade floor slab and spread footing foundations. We understand the building addition will match the Finish Floor Elevation (FFE) of the existing building at 154 feet. Based on the existing grading shown on the Plan, we anticipated tapered site grading fills up to about 3 feet will be required to achieve the proposed FFE. Details regarding proposed structural loading information are not available at this time. Additionally, we understand new paved parking areas and access drives, and stormwater management areas are proposed in association with the building addition.

Existing and proposed site features are shown on the “Exploration Location Plan” attached in Appendix B.

## **2.0 EXPLORATION AND TESTING**

### **2.1 Explorations**

Six test borings (B-1 through B-6) were made at the site on February 4, 2026, by Seaboard Drilling, LLC under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). The exploration locations were selected by S.W.COLE and established in the field at accessible locations by S.W.COLE using a mapping grade GPS unit. The approximate exploration locations are shown on the “Exploration Location Plan” attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C. The elevations shown on the logs were estimated based on topographic information shown on the “Exploration Location Plan.”

## **2.2 Field Testing**

The test borings were drilled using hollow-stem auger techniques. The soils were sampled at 2-to-5-foot intervals using a split-spoon sampler and Standard Penetration Testing (SPT) methods. Pocket Penetrometer Tests (PPT) were performed where stiffer cohesive soils were encountered. SPT blow counts and PPT results are shown on the logs.

## **2.3 Laboratory Testing**

Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. Laboratory testing included two moisture contents, one gradation test and one Atterberg Limits test. The results of the moisture content and Atterberg Limits tests are noted on the logs. The gradation and Atterberg Limits test results are attached in Appendix D.

## **3.0 SUBSURFACE CONDITIONS**

### **3.1 Soil and Bedrock**

Below a surficial layer of topsoil or pavement, the test borings encountered a subsurface profile generally consisting of granular fill overlying native glaciomarine soils and glacial till. The following summarizes the strata encountered during the explorations. Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

Underlying surficial topsoil or pavement, the test borings encountered granular fill generally consisting of medium dense silty gravelly sand to depths of about 2 to 4 feet. Underlying the granular fill, the test borings encountered glaciomarine soils generally consisting of very stiff to stiff clayey silt to depths ranging from about 16 to 20 feet. Underlying the glaciomarine soils, the test borings encountered glacial till generally consisting of medium dense silty gravelly sand with varying portions of cobbles. Test boring B-6 was terminated on a refusal surface (probable bedrock) at a depth of about 19.4 feet. Test borings B-1 through B-5 were terminated in glacial till at depths ranging from about 17 to 22 feet.

Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

### **3.2 Groundwater**

Free water was observed at test borings B-2 and B-5 at depths of about 10 and 15 feet, respectively. The soils at test borings B-3 and B-4 were observed to be wet below depths of about 15 feet. Groundwater likely becomes perched on the relatively impervious glaciomarine soils and glacial till encountered at the explorations. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

## **4.0 EVALUATION AND RECOMMENDATIONS**

### **4.1 General Findings**

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principal geotechnical considerations include:

- The site has been previously developed and filled. The proposed building addition site is underlain by granular fill extending to depths varying from about 2 to 4 feet and may extend deeper in areas not explored. Granular fills must be over-excavated and removed if encountered below foundations. The over-excavated areas below foundations should be backfilled with compacted Structural Fill. We recommend the granular fills below on-grade slab areas be densified with a smooth drum roller having a static weight of at least 10-tons prior to the placement of subgrade fills or Structural Fill.
- Spread footing foundations and slab-on-grade floors bearing on properly prepared subgrades appear suitable for the proposed structures. Spread footings should bear on at least 6 inches of compacted Crushed Stone. On-grade floor slabs should bear on at least 12-inches of properly compacted Structural Fill overlying properly densified and prepared subgrades.
- Subgrades across the site will consist of moisture-sensitive soils. Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer or Fall. Rubber tired construction equipment should not operate directly on the native glaciomarine soils.

- Imported Granular Borrow, Structural Fill, and Crushed Stone will be needed for construction. The native soils are unsuitable for reuse below the proposed building addition or as backfill for foundations, however they may be reused in landscape areas. The existing granular fills may be suitable for re-use as Granular Borrow, provided it is carefully excavated and deleterious materials are removed, if encountered.

#### **4.2 Site and Subgrade Preparation**

We recommend site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. Existing topsoil and soils with organics must be completely removed below the proposed building addition footprint. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance.

As discussed, the site was previously developed and filled. Existing granular fills are present at the site, extending to depths varying from about 2 to 4 feet at the boring locations and may extend deeper in areas not explored. Granular fills must be completely removed from beneath the proposed building addition foundations. We anticipate foundation excavations will generally extend through the existing granular fills. However, if fills are encountered below footings, the extent of removal should extend 1 foot laterally outward from the outside edge of perimeter footings for every 1-foot of excavation depth (1H:1V bearing splay). The over-excavated areas should be backfilled with compacted Structural Fill.

Based on the composition of the granular fills, some risk of future settlement may be incurred if the granular fills remain in-place below on-grade slabs, however, this may be warranted based on the high cost for removal. We recommend the existing fills below the on-grade slab area be densified before placing Structural Fill or subgrade fill. The densification efforts should be performed under the direction of S.W.COLE. The densification should be performed with a smooth drum roller having a static weight of at least 10-tons. Areas that become soft or continue to yield after densifying must be removed and replaced with compacted Structural Fill.

In general, subgrades for the proposed foundation construction will consist of native glaciomarine soils. We recommend that excavation to subgrades be completed with a smooth-edged bucket to lessen disturbance of subgrade soils. We recommend that

foundations be underlain with at least 6 inches of Crushed Stone wrapped in geotextile fabric (Mirafi 160N, or equivalent) overlying properly prepared subgrades.

#### **4.3 Excavation and Dewatering**

Excavations will generally encounter surficial topsoil and pavement, granular fill and glaciomarine soils. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should ideally occur during drier, non-freezing weather of Spring, Summer, and Fall. Rubber tired construction equipment should not operate directly on the native glaciomarine soils. Final cuts to soil subgrades should be performed with a smooth-edged bucket to help reduce strength loss from soil disturbance.

Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining the adjacent structures, utilities and roadways. The design and planning of excavations, excavation support systems, and dewatering are the responsibility of the contractor.

#### **4.4 Foundations**

Based on the subsurface findings and our understanding of the proposed construction, spread footing foundations bearing on properly prepared subgrades appear suitable for the proposed building addition. For foundations bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

<b>Geotechnical Parameters for Spread Footings and Foundation Walls</b>	
Design Frost Depth (100-year AFI)	5.0 feet
Net Allowable Soil Bearing Pressure	2.5 ksf
Base Friction Factor (Crushed Stone)	0.35
Total Unit Weight of Backfill	125 pcf
At-Rest Lateral Earth Pressure Coefficient	0.5
Internal Friction Angle of Backfill	30°
Seismic Soil Site Class	D (IBC 2021)
Total Settlement	1-inch
Differential Settlement	½-inch over 40 feet

#### **4.5 Foundation Drainage**

We recommend an underdrain system be installed on the outside edge of perimeter footings. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drainpipe bedded in Crushed Stone and wrapped in non-woven geotextile fabric, Mirafi 160N or equal. The underdrain pipe must have a positive gravity outlet protected from freezing, clogging and backflow. Surface grades should be sloped away from the buildings for positive surface water drainage. General underdrain details are illustrated on the “Foundation Detail Sketch” attached in Appendix B.

#### **4.6 Slab-On-Grade**

On-grade slabs in heated areas may be designed using a subgrade reaction modulus of 120 pci (pounds per cubic inch) provided the slab is underlain by at least 12 inches of compacted Structural Fill placed over properly prepared subgrades. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function, as well as prevention of slab cracking and curling.

We recommend a sub-slab vapor retarder particularly in areas of the building addition where the concrete slab will be covered with an impermeable surface treatment or floor covering that may be sensitive to moisture vapors. The vapor retarder must have a permeance that is less than the floor cover or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand direct contact with the sub-slab base material and construction activity. The vapor retarder material should be placed according to the manufacturer’s recommended method, including the taping and lapping of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

The floor slab should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring, and adhesive materials.

#### **4.7 Entrance Slabs and Sidewalks**

Entrance slabs and sidewalks adjacent to the building addition must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that non-frost susceptible Structural Fill be provided to a depth of at least 5 feet below the top of entrance slabs. This thickness of Structural Fill should extend the full footprint of the entrance slab and, thereafter, transition up to the bottom of the adjacent sidewalk or pavement gravels at a 3H:1V or flatter slope. General details of this frost transition zone are shown on the “Foundation Detail Sketch” attached in Appendix B.

#### **4.8 Fill, Backfill and Compaction**

We recommend the following fill and backfill materials: recycled products must also be tested in accordance with applicable environmental regulations and approved by a qualified environmental consultant.

Granular Borrow: Fill to raise grades in building addition areas, as well as to repair soft areas, should be sand or silty sand meeting the requirements of 2020 MaineDOT Standard Specification 703.19 Granular Borrow.

Structural Fill: Fill to raise grades in building addition areas and backfill for foundations, over-excavated areas and material below exterior entrances slabs and sidewalks should be clean, non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below:

<b>Structural Fill</b>	
<b>Sieve Size</b>	<b>Percent Finer by Weight</b>
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 6

Crushed Stone: Crushed Stone, used beneath footings and for underdrain aggregate, should be washed ¾-inch crushed stone meeting the requirements of 2020 MaineDOT Standard Specification 703.13 Crushed Stone ¾-Inch.

Reuse of Site Soils: The native soils are unsuitable for reuse in building addition areas but may be suitable for reuse in landscape areas. The existing granular fills may be suitable for re-use as Granular Borrow, provided it is carefully excavated and deleterious materials are removed, if encountered.

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building addition areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted with 3 to 5 passes of a vibratory plate compactor having a static weight of at least 500 pounds.

#### **4.9 Weather Considerations**

The site soils are moisture-sensitive and therefore, construction activity should be limited during wet and freezing weather and the site soils may require drying before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades and foundations must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

#### **4.10 Design Review and Construction Testing**

S.W.COLE should be retained to review the construction documents to determine that our earthwork and foundation recommendations have been properly interpreted and implemented.

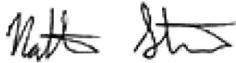
A construction material testing, and quality assurance program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe earthwork activities, including over-excavations and densification operations, and the preparation of foundation bearing surfaces, as well as to provide testing and IBC Special Inspection services for soils, concrete and asphalt construction materials.

## 5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

**S. W. Cole Engineering, Inc.**



Nathan D. Strout, P.E.  
Senior Geotechnical Engineer

NDS:rec



## **Appendix A Limitations**

This report has been prepared for the exclusive use of the City of Bangor, Maine for specific application to the proposed Building Addition at the Community Connector Cold Storage Facility at 511 Maine Avenue in Bangor, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

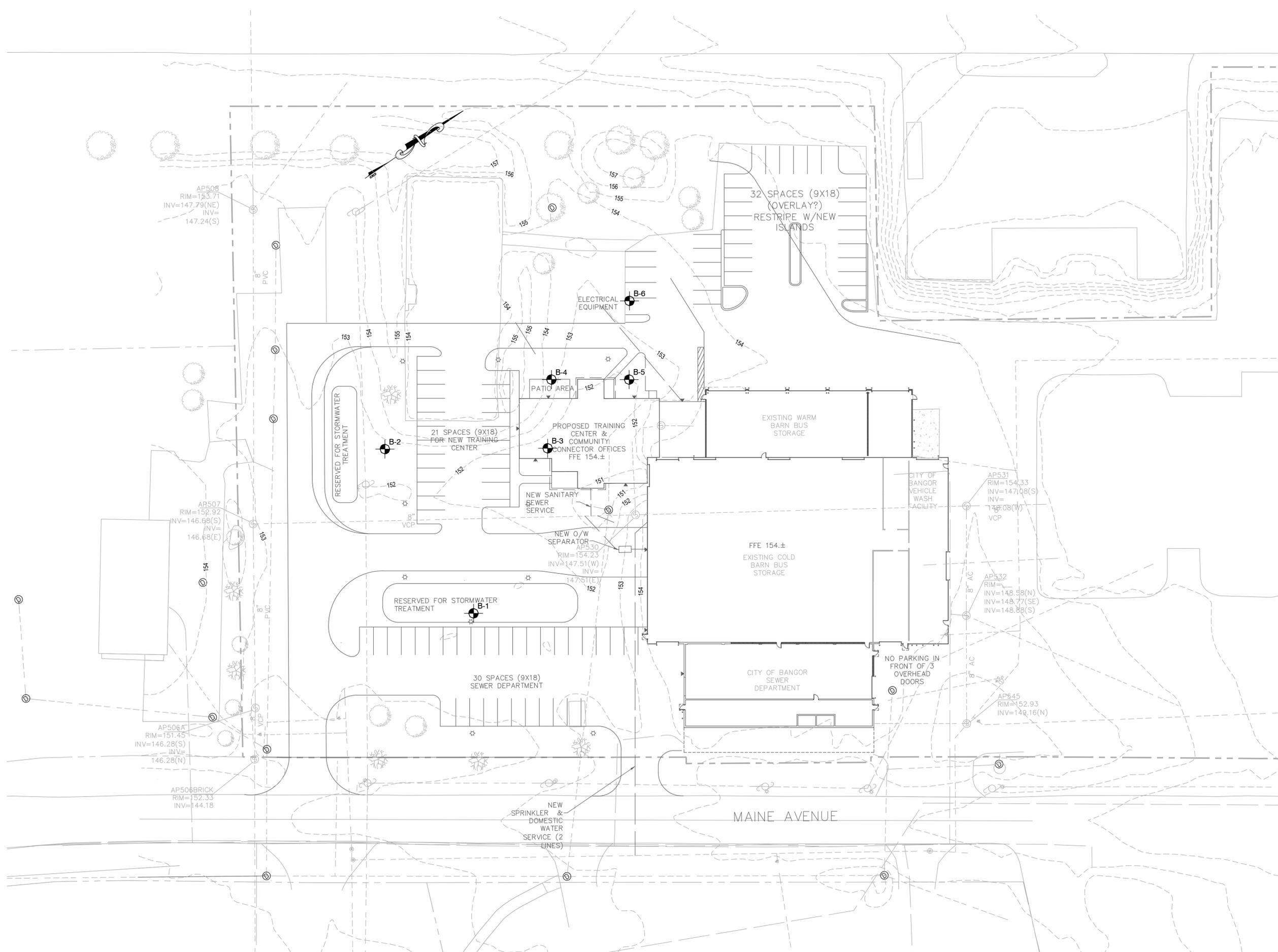
Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

## APPENDIX B

### Figures



**LEGEND:**

 APPROXIMATE BORING LOCATION

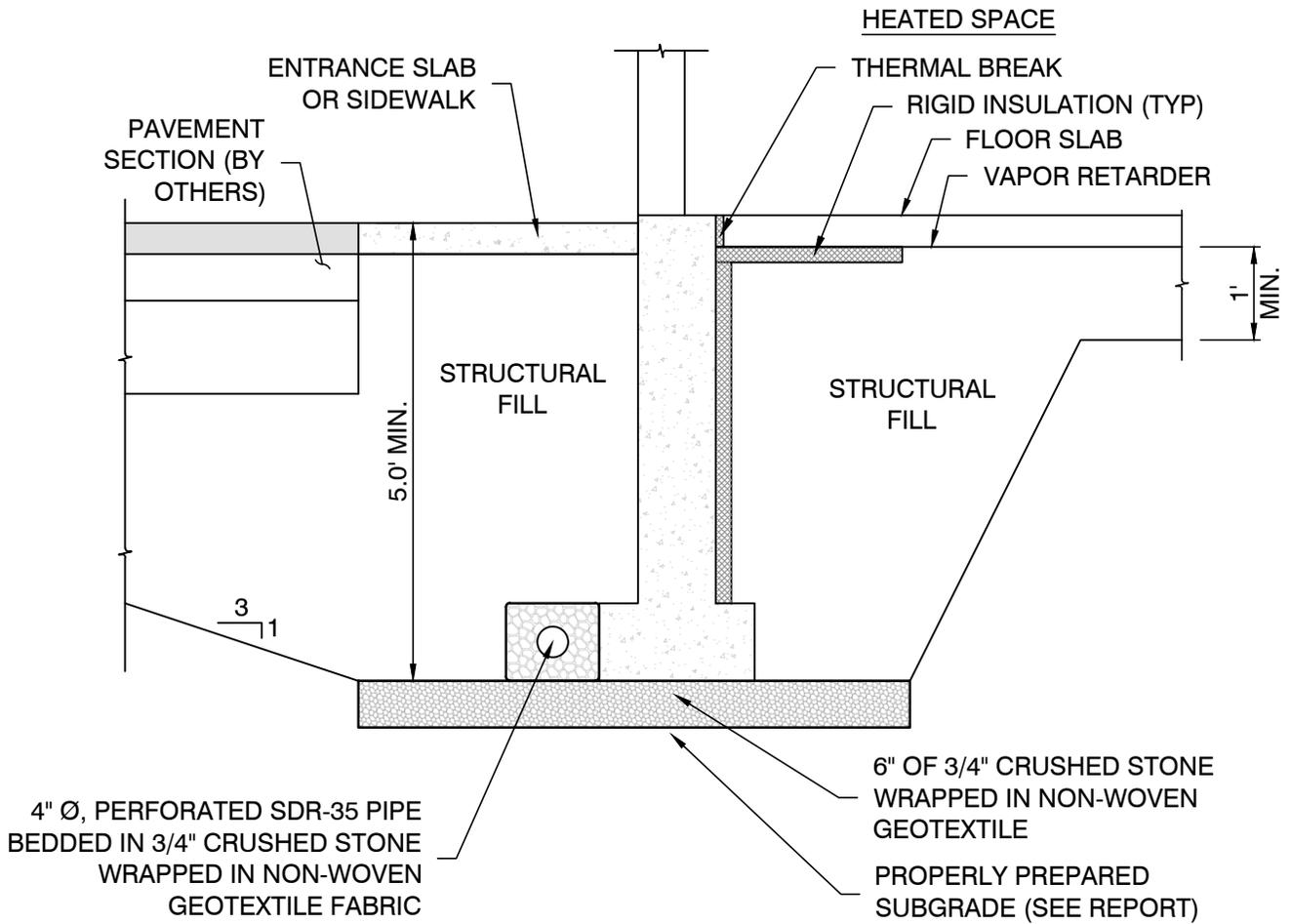
**NOTES:**

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A SCALE PLAN OF THE SITE PROVIDED BY ARTIFEX, RECEIVED 2/10/2026.
2. THE BORING LOCATIONS WERE SELECTED BY THE CITY OF BANGOR AND SUBSEQUENTLY ESTABLISHED IN THE FIELD BY S. W. COLE ENGINEERING, INC. USING A MAPPING GRADE GPS RECEIVER.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.



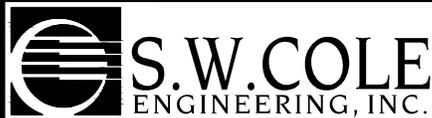
 <b>S.W. COLE</b> ENGINEERING, INC.	
CITY OF BANGOR, MAINE <b>EXPLORATION LOCATION PLAN</b> PROPOSED BUILDING ADDITION COMMUNITY CONNECTOR COLD STORAGE FACILITY 511 MAINE AVENUE, BANGOR, MAINE	
Job No.: 26-0092 Date: 02/11/2026	Scale: 1" = 30' Sheet: 1

P:\2026\02-09\26-0092\CD\Drawings\26-0092-EE.dwg, 2/11/2026, 9:52:33 AM, CBA, S. W. Cole Engineering, Inc.



**NOTE:**

1. UNDERDRAIN INSTALLATION AND MATERIAL GRADATION RECOMMENDATIONS ARE CONTAINED WITHIN THIS REPORT.
2. DETAIL IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY, NOT FOR CONSTRUCTION.



CITY OF BANGOR, MAINE

**FOUNDATION DETAIL SKETCH**

PROPOSED BUILDING ADDITION  
COMMUNITY CONNECTOR COLD STORAGE FACILITY  
511 MAINE AVENUE, BANGOR, MAINE

Job No.:	26-0092	Scale:	Not to Scale
Date :	02/11/2026	Sheet:	2

## APPENDIX C

### Exploration Logs and Key



# BORING LOG

**BORING NO.:** B-1  
**SHEET:** 1 of 1  
**PROJECT NO.:** 25-0092  
**DATE START:** 2/4/2026  
**DATE FINISH:** 2/4/2026

**CLIENT:** City of Bangor, Maine  
**PROJECT:** Proposed Building Addition  
**LOCATION:** Community Connector Cold Storage Facility, 511 Maine Avenue, Bangor, Maine

## Drilling Information

**LOCATION:** See Exploration Location Plan      **ELEVATION (FT):** 152' +/-      **TOTAL DEPTH (FT):** 22.0      **LOGGED BY:** Alex Carroll  
**DRILLING CO.:** Seaboard Drilling, LLC      **DRILLER:** Ryan Hackett      **DRILLING METHOD:** Hollow Stem Auger  
**RIG TYPE:** Track Mounted Diedrich D-50      **AUGER ID/OD:** 2 1/4 in / 5 5/8 in      **SAMPLER:** Standard Split-Spoon  
**HAMMER TYPE:** Automatic      **HAMMER WEIGHT (lbs):** 140      **CASING ID/OD:** N/A /N/A      **CORE BARREL:** N/A  
**HAMMER CORRECTION FACTOR:** 1.011      **HAMMER DROP (inch):** 30  
**WATER LEVEL DEPTHS (ft):** No free water observed

## GENERAL NOTES:

**KEY TO NOTES AND SYMBOLS:**  
 Water Level  
 At time of Drilling  
 At Completion of Drilling  
 After Drilling  
D = Split Spoon Sample      Pen. = Penetration Length  
U = Thin Walled Tube Sample      Rec. = Recovery Length  
R = Rock Core Sample      bpf = Blows per Foot  
V = Field Vane Shear      mpf = Minute per Foot  
WOR = Weight of Rods      S<sub>v</sub> = Field Vane Shear Strength, kips/sq.ft.  
WOH = Weight of Hammer      q<sub>u</sub> = Unconfined Compressive Strength, kips/sq.ft.  
RQD = Rock Quality Designation      Ø = Friction Angle (Estimated)  
PID = Photoionization Detector      N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION					Graphic Log	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD				
			1D		0-2	24/8	4-5-6-7		0.2	Topsoil	
										Medium dense, brown silty sandy GRAVEL (Fill)	
			2D		2-4	24/12	6-5-5-5	q <sub>p</sub> =7 ksf	2.0	Hard to stiff, brown clayey SILT	
	5		3D		5-7	24/24	2-3-3-3	q <sub>p</sub> =3 ksf			
	145										
	10		4D		10-12	24/24	2-3-2-4				
	140										
	15		5D		15-17	24/24	WOH/12" 1-1				
	135										
	20		6D		20-22	24/10	3-9-10-12		20.0	Medium dense, brown silty gravelly SAND (Glacial Till)	
	130										

Bottom of Exploration at 22.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**BORING NO.:** B-1



# BORING LOG

**BORING NO.:** B-2  
**SHEET:** 1 of 1  
**PROJECT NO.:** 25-0092  
**DATE START:** 2/4/2026  
**DATE FINISH:** 2/4/2026

**CLIENT:** City of Bangor, Maine  
**PROJECT:** Proposed Building Addition  
**LOCATION:** Community Connector Cold Storage Facility, 511 Maine Avenue, Bangor, Maine

## Drilling Information

**LOCATION:** See Exploration Location Plan      **ELEVATION (FT):** 153' +/-      **TOTAL DEPTH (FT):** 22.0      **LOGGED BY:** Alex Carroll  
**DRILLING CO.:** Seaboard Drilling, LLC      **DRILLER:** Ryan Hackett      **DRILLING METHOD:** Hollow Stem Auger  
**RIG TYPE:** Track Mounted Diedrich D-50      **AUGER ID/OD:** 2 1/4 in / 5 5/8 in      **SAMPLER:** Standard Split-Spoon  
**HAMMER TYPE:** Automatic      **HAMMER WEIGHT (lbs):** 140      **CASING ID/OD:** N/A /N/A      **CORE BARREL:** N/A  
**HAMMER CORRECTION FACTOR:** 1.011      **HAMMER DROP (inch):** 30  
**WATER LEVEL DEPTHS (ft):** ∇ 10 ft Free water observed at 10 feet +/-

## GENERAL NOTES:

**KEY TO NOTES AND SYMBOLS:**  
 Water Level ∇ At time of Drilling      D = Split Spoon Sample      Pen. = Penetration Length      WOR = Weight of Rods      S<sub>v</sub> = Field Vane Shear Strength, kips/sq.ft.  
 ∇ At Completion of Drilling      U = Thin Walled Tube Sample      Rec. = Recovery Length      WOH = Weight of Hammer      q<sub>u</sub> = Unconfined Compressive Strength, kips/sq.ft.  
 ∇ After Drilling      R = Rock Core Sample      bpf = Blows per Foot      RQD = Rock Quality Designation      Ø = Friction Angle (Estimated)  
 V = Field Vane Shear      mpf = Minute per Foot      PID = Photoionization Detector      N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION					Graphic Log	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks	
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD					Field / Lab Test Data
			1D		0-2	24/10	4-7-7-6		0.3	Topsoil		
			2D		2-4	24/12	7-5-4-4		2.5	Medium dense, brown silty gravelly SAND (Fill)		
150	5		3D		5-7	24/24	4-4-3-4	q <sub>p</sub> =5 ksf		Very stiff to stiff, brown clayey SILT		
145												
140	10		4D		10-12	24/24	3-3-5-6	q <sub>p</sub> =4 ksf			∇	
135	15		5D		15-17	24/24	1-1-1-4			... with occasional sand seams		
130												
125	20		6D		20-22	24/20	5-8-10-12		20.0	Medium dense, gray gravelly SAND and SILT (Glacial Till)		

Bottom of Exploration at 22.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**BORING NO.:** B-2



# BORING LOG

**BORING NO.:** B-3  
**SHEET:** 1 of 1  
**PROJECT NO.:** 25-0092  
**DATE START:** 2/4/2026  
**DATE FINISH:** 2/4/2026

**CLIENT:** City of Bangor, Maine  
**PROJECT:** Proposed Building Addition  
**LOCATION:** Community Connector Cold Storage Facility, 511 Maine Avenue, Bangor, Maine

## Drilling Information

**LOCATION:** See Exploration Location Plan    **ELEVATION (FT):** 152' +/-    **TOTAL DEPTH (FT):** 22.0    **LOGGED BY:** Alex Carroll  
**DRILLING CO.:** Seaboard Drilling, LLC    **DRILLER:** Ryan Hackett    **DRILLING METHOD:** Hollow Stem Auger  
**RIG TYPE:** Track Mounted Diedrich D-50    **AUGER ID/OD:** 2 1/4 in / 5 5/8 in    **SAMPLER:** Standard Split-Spoon  
**HAMMER TYPE:** Automatic    **HAMMER WEIGHT (lbs):** 140    **CASING ID/OD:** N/A /N/A    **CORE BARREL:** N/A  
**HAMMER CORRECTION FACTOR:** 1.011    **HAMMER DROP (inch):** 30  
**WATER LEVEL DEPTHS (ft):** Soils observed wet below 15 feet +/-

### GENERAL NOTES:

**KEY TO NOTES AND SYMBOLS:**  
 Water Level: At time of Drilling, At Completion of Drilling, After Drilling  
 D = Split Spoon Sample, U = Thin Walled Tube Sample, R = Rock Core Sample, V = Field Vane Shear  
 Pen. = Penetration Length, Rec. = Recovery Length, bpf = Blows per Foot, mpf = Minute per Foot  
 WOR = Weight of Rods, WOH = Weight of Hammer, RQD = Rock Quality Designation, PID = Photoionization Detector  
 S<sub>v</sub> = Field Vane Shear Strength, kips/sq.ft., q<sub>u</sub> = Unconfined Compressive Strength, kips/sq.ft., Ø = Friction Angle (Estimated), N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION					Graphic Log	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD				
			1D		0-2	24/10	8-6-5-6		0.3	Topsoil	
			2D		2-4	24/16	4-4-3-3	q <sub>p</sub> =4 ksf	2.0	Medium dense, brown silty gravelly SAND (Fill)	
	5		3D		5-7	24/24	3-2-3-4	q <sub>p</sub> =3 ksf		Very stiff to stiff, brown gravelly silty SAND	
	10		4D		10-12	24/24	2-1-3-4	q <sub>p</sub> =1 ksf			
	15		5D		15-17	24/20	1-2-3-12				
	20		6D		20-22	24/0	5-7-8-11		16.5	Medium dense, gray silty gravelly SAND (Glacial Till)	
	130		Bottom of Exploration at 22.0 feet								

BORING / WELL 10-12-2022 26-0092.GPJ SWCE TEMPLATE.GDT 2/11/26

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**BORING NO.:** B-3



# BORING LOG

**BORING NO.:** B-4  
**SHEET:** 1 of 1  
**PROJECT NO.:** 25-0092  
**DATE START:** 2/4/2026  
**DATE FINISH:** 2/4/2026

**CLIENT:** City of Bangor, Maine  
**PROJECT:** Proposed Building Addition  
**LOCATION:** Community Connector Cold Storage Facility, 511 Maine Avenue, Bangor, Maine

## Drilling Information

**LOCATION:** See Exploration Location Plan      **ELEVATION (FT):** 153.5' +/-      **TOTAL DEPTH (FT):** 22.0      **LOGGED BY:** Alex Carroll  
**DRILLING CO.:** Seaboard Drilling, LLC      **DRILLER:** Ryan Hackett      **DRILLING METHOD:** Hollow Stem Auger  
**RIG TYPE:** Track Mounted Diedrich D-50      **AUGER ID/OD:** 2 1/4 in / 5 5/8 in      **SAMPLER:** Standard Split-Spoon  
**HAMMER TYPE:** Automatic      **HAMMER WEIGHT (lbs):** 140      **CASING ID/OD:** N/A /N/A      **CORE BARREL:** N/A  
**HAMMER CORRECTION FACTOR:** 1.011      **HAMMER DROP (inch):** 30  
**WATER LEVEL DEPTHS (ft):** Soils observed wet below 15 feet +/-

## GENERAL NOTES:

**KEY TO NOTES AND SYMBOLS:**  
 Water Level  
 At time of Drilling  
 At Completion of Drilling  
 After Drilling  
D = Split Spoon Sample      Pen. = Penetration Length  
U = Thin Walled Tube Sample      Rec. = Recovery Length  
R = Rock Core Sample      bpf = Blows per Foot  
V = Field Vane Shear      mpf = Minute per Foot  
WOR = Weight of Rods      S<sub>v</sub> = Field Vane Shear Strength, kips/sq.ft.  
WOH = Weight of Hammer      q<sub>u</sub> = Unconfined Compressive Strength, kips/sq.ft.  
RQD = Rock Quality Designation      Ø = Friction Angle (Estimated)  
PID = Photoionization Detector      N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION					Graphic Log	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD				
			1D		0-2	24/14	2-7-12-15		0.4	Topsoil	
			2D		2-4	24/10	7-5-6-6	ID 34527B w = 4.9 %	2.5	Medium dense, brown silty gravelly SAND (Fill)	
	5		3D		5-7	24/24	3-3-4-5	q <sub>p</sub> = 8 ksf		Very stiff to stiff, brown clayey SILT	
	10		4D		10-12	24/24	2-3-3-3	q <sub>p</sub> = 5 ksf			
	15		5D		15-17	24/18	1-2-6-5	q <sub>p</sub> = 3 ksf			
	20		6D		20-22	24/10	6-7-9-11		16.0	Medium dense, brown silty gravelly SAND with occasional cobbles (Glacial Till)	

Bottom of Exploration at 22.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**BORING NO.:** B-4



# BORING LOG

**BORING NO.:** B-5  
**SHEET:** 1 of 1  
**PROJECT NO.:** 25-0092  
**DATE START:** 2/4/2026  
**DATE FINISH:** 2/4/2026

**CLIENT:** City of Bangor, Maine  
**PROJECT:** Proposed Building Addition  
**LOCATION:** Community Connector Cold Storage Facility, 511 Maine Avenue, Bangor, Maine

## Drilling Information

**LOCATION:** See Exploration Location Plan      **ELEVATION (FT):** 152' +/-      **TOTAL DEPTH (FT):** 22.0      **LOGGED BY:** Alex Carroll  
**DRILLING CO.:** Seaboard Drilling, LLC      **DRILLER:** Ryan Hackett      **DRILLING METHOD:** Hollow Stem Auger  
**RIG TYPE:** Track Mounted Diedrich D-50      **AUGER ID/OD:** 2 1/4 in / 5 5/8 in      **SAMPLER:** Standard Split-Spoon  
**HAMMER TYPE:** Automatic      **HAMMER WEIGHT (lbs):** 140      **CASING ID/OD:** N/A /N/A      **CORE BARREL:** N/A  
**HAMMER CORRECTION FACTOR:** 1.011      **HAMMER DROP (inch):** 30  
**WATER LEVEL DEPTHS (ft):** ∇ 15 ft Free water observed at 15 feet +/-

### GENERAL NOTES:

**KEY TO NOTES AND SYMBOLS:**  
 Water Level ∇ At time of Drilling  
 At Completion of Drilling ▽ After Drilling  
 D = Split Spoon Sample  
 U = Thin Walled Tube Sample  
 R = Rock Core Sample  
 V = Field Vane Shear  
 Pen. = Penetration Length  
 Rec. = Recovery Length  
 bpf = Blows per Foot  
 mpf = Minute per Foot  
 WOR = Weight of Rods  
 WOH = Weight of Hammer  
 RQD = Rock Quality Designation  
 PID = Photoionization Detector  
 S<sub>v</sub> = Field Vane Shear Strength, kips/sq.ft.  
 q<sub>u</sub> = Unconfined Compressive Strength, kips/sq.ft.  
 Ø = Friction Angle (Estimated)  
 N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION					Graphic Log	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks	
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD					Field / Lab Test Data
			1D	⊗	0-0.3	4/0	50/4"		0.5	Bituminous Pavement		
			2D	⊗	2-2.4	5/5	50/5"		2.0	Frozen, brown silty gravelly SAND (Fill)		
	5		3D	⊗	5-7	24/24	4-4-5-7	q <sub>p</sub> =3 ksf	4.0	Stiff, brown clayey SILT		
	10		4D	⊗	10-12	24/24	2-1-2-2	ID 34528B w =30 % W <sub>L</sub> =33 W <sub>p</sub> =21				
	15		5D	⊗	15-17	24/14	2-2-4-4				∇	
	20		6D	⊗	20-22	24/14	41-15-15-24		16.0	Medium dense to dense, brown gravelly SAND and SILT with occasional cobbles (Glacial Till)		
Bottom of Exploration at 22.0 feet												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**BORING NO.:** B-5



# BORING LOG

**BORING NO.:** B-6  
**SHEET:** 1 of 1  
**PROJECT NO.:** 25-0092  
**DATE START:** 2/4/2026  
**DATE FINISH:** 2/4/2026

**CLIENT:** City of Bangor, Maine  
**PROJECT:** Proposed Building Addition  
**LOCATION:** Community Connector Cold Storage Facility, 511 Maine Avenue, Bangor, Maine

## Drilling Information

**LOCATION:** See Exploration Location Plan    **ELEVATION (FT):** 153' +/-    **TOTAL DEPTH (FT):** 19.4    **LOGGED BY:** Alex Carroll  
**DRILLING CO.:** Seaboard Drilling, LLC    **DRILLER:** Ryan Hackett    **DRILLING METHOD:** Hollow Stem Auger  
**RIG TYPE:** Track Mounted Diedrich D-50    **AUGER ID/OD:** 2 1/4 in / 5 5/8 in    **SAMPLER:** Standard Split-Spoon  
**HAMMER TYPE:** Automatic    **HAMMER WEIGHT (lbs):** 140    **CASING ID/OD:** N/A /N/A    **CORE BARREL:** N/A  
**HAMMER CORRECTION FACTOR:** 1.011    **HAMMER DROP (inch):** 30  
**WATER LEVEL DEPTHS (ft):** No free water observed

## GENERAL NOTES:

**KEY TO NOTES AND SYMBOLS:**  
 Water Level: ▽ At time of Drilling, ▾ At Completion of Drilling, ▿ After Drilling  
 D = Split Spoon Sample, U = Thin Walled Tube Sample, R = Rock Core Sample, V = Field Vane Shear  
 Pen. = Penetration Length, Rec. = Recovery Length, bpf = Blows per Foot, mpf = Minute per Foot  
 WOR = Weight of Rods, WOH = Weight of Hammer, RQD = Rock Quality Designation, PID = Photoionization Detector  
 S<sub>v</sub> = Field Vane Shear Strength, kips/sq.ft., q<sub>u</sub> = Unconfined Compressive Strength, kips/sq.ft., Ø = Friction Angle (Estimated), N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION					Graphic Log	Sample Description & Classification	H <sub>2</sub> O Depth	Remarks
			Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD				
			1D		0-2	24/24	25-16-16-12		0.2	Topsoil	
			2D		2-4	24/12	9-6-4-4		1.5	Frozen to dense, brown gravelly silty SAND with occasional cobbles (Fill)	
									3.0	Medium dense, brown silty gravelly SAND (Fill)	
	5		3D		5-7	24/24	6-4-5-5	q <sub>p</sub> =3 ksf		Stiff, brown clayey SILT	
	10		4D		10-12	24/24	2-2-3-3	q <sub>p</sub> =1 ksf			
	15		5D		15-17	24/12	1-10-10-11		15.5	Medium dense, brown silty gravelly SAND (Glacial Till)	

Auger Refusal at 19.4 feet  
(Probable Bedrock)

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**BORING NO.:** B-6

BORING / WELL 10-12-2022 26-0092.GPJ SWCE TEMPLATE.GDT 2/11/26

## **KEY TO THE NOTES & SYMBOLS**

### **Test Boring and Test Pit Explorations**

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

#### **Key to Symbols Used:**

w	-	water content, percent (dry weight basis)
q <sub>u</sub>	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S <sub>v</sub>	-	field vane shear strength, kips/sq. ft.
L <sub>v</sub>	-	lab vane shear strength, kips/sq. ft.
q <sub>p</sub>	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W <sub>L</sub>	-	liquid limit - Atterberg test
W <sub>P</sub>	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ <sub>T</sub>	-	total soil weight
γ <sub>B</sub>	-	buoyant soil weight

#### **Description of Proportions:**

Trace:	0 to 5%
Some:	5 to 12%
“Y”	12 to 35%
And	35+%
With	Undifferentiated

#### **Description of Stratified Soils**

Parting:	0 to 1/16” thickness
Seam:	1/16” to 1/2” thickness
Layer:	1/2” to 12” thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

**REFUSAL: Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

**REFUSAL: Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

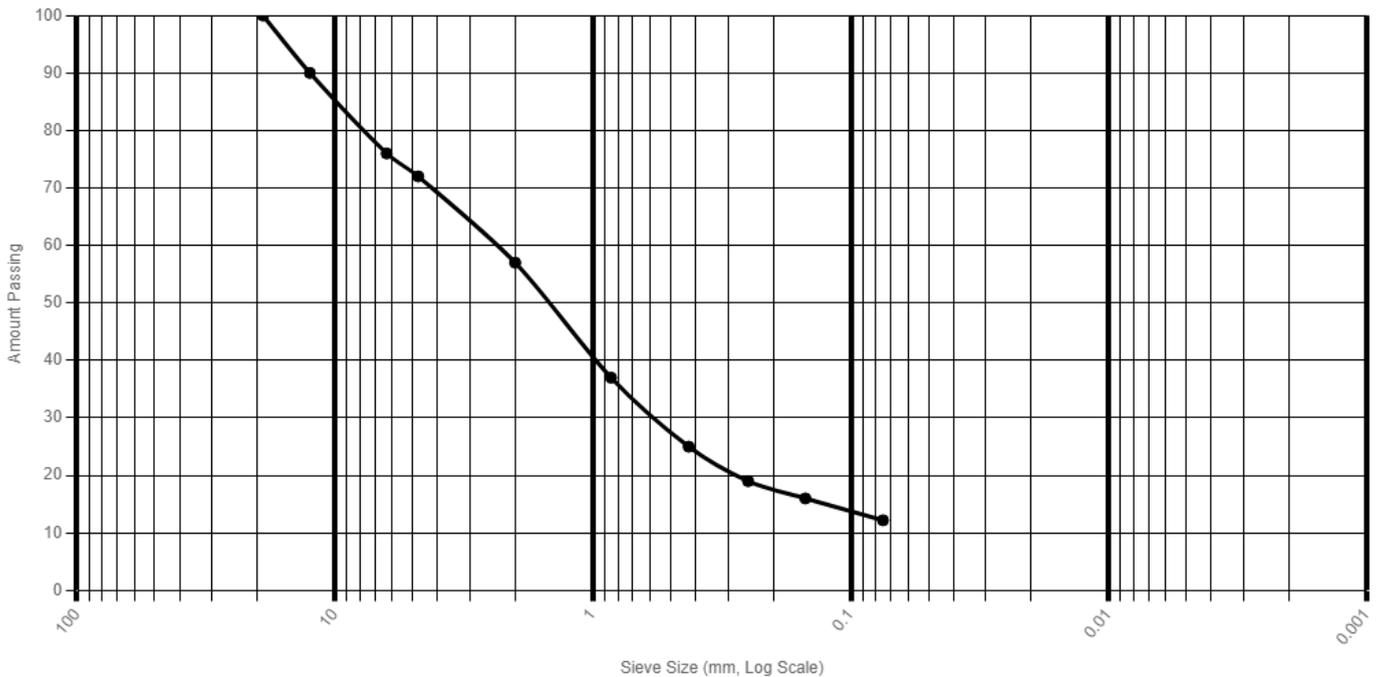
## APPENDIX D

### Laboratory Test Results

**Project Name:** Bangor ME - Proposed  
Community Connector Cold  
Storage Facility Addition -  
Geotechnical Engineering  
Services  
**Client:** City of Bangor, Maine  
**Sample Description:** Test Boring Sample  
**Material Source:** B-4, 1D 0.4-2'

**Project #:** 26-0092  
**Lab ID:** 34527B  
**Date Received:** 2/5/2026  
**Date Completed:** 2/6/2026  
**Tested By:** Harry Averill

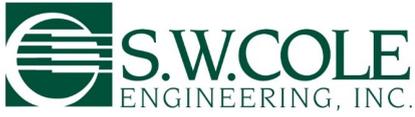
Standard Designation (mm/μm)	Sieve Size	Amount Passing (%)	
19 mm	3/4"	100%	
12.5 mm	1/2"	90%	
6.3 mm	1/4"	76%	
4.75 mm	No. 4	72%	28% Gravel
2 mm	No. 10	57%	
850 μm	No. 20	37%	
425 μm	No. 40	25%	59.82% Sand
250 μm	No. 60	19%	
150 μm	No. 100	16%	
75 μm	No. 200	12.2%	12.2% Fines



**Remarks:**

*Nate Strout*

Reviewed By



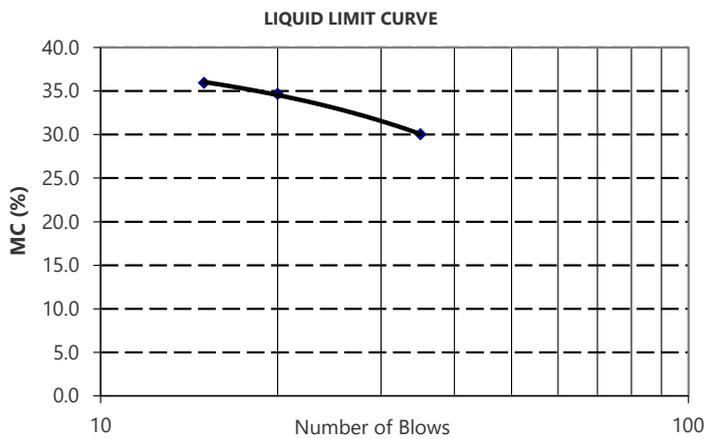
# Report of Liquid Limit, Plastic Limit, and Plasticity Index of Soils

ASTM D4318/AASHTO T89, T90

**Project Name:** Bangor ME - Proposed  
Community Connector Cold  
Storage Facility Addition -  
Geotechnical Engineering  
Services  
**Client:** City of Bangor, Maine  
**Sample Description:** Test Boring Sample  
**Material Source:** B-5, 4D, 10'-12'

**Project #:** 26-0092  
**Lab ID:** 34528B  
**Date Received:** 2/5/2026  
**Date Completed:** 2/10/2026  
**Tested By:** Logan Henderson

**Liquid Limit**                    **33**  
**Plastic Limit**                    **21**  
**Plasticity Index**                **12**



Material Retained On the No. 40 Sieve:            1%  
As-received Moisture Content:                    30%

Comments:

*Nate Strout*

Reviewed By