PRELIMINARY ENGINEERING REPORT

OCTOBER 6, 2023

DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
ROCKLAND, MAINE

LANDMARK CORPORATION
SURVEYORS & ENGINEERS

16-012

CITY OF ROCKLAND, MAINE

DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS

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Downtown Waterfront Upland Improvements

1.1 DESCRIPTION OF PROJECT COMPONENTS

The City of Rockland (City) is located on Penobscot Bay in Knox County, Maine. The City owns nearly 7 acres of park land (Harbor and Buoy Park), 2 multi-use piers, and more than 1,000 feet of shore frontage in the heart of the downtown. The City is proposing to make improvements and upgrades to Harbor Park and Buoy Park. These improvements, in conjunction with waterfront infrastructure work to the Public Landing, the Harbor Park Seawall, and Middle Pier (see Preliminary Engineering Report, titled "Downtown Waterfront Infrastructure Project", dated March 15, 2023), will provide resiliency to sea level rise by raising the elevation of the parks, the harbor master's building, and the storm drain system. The project will provide community resiliency by providing accessibility, open space, and connectivity from the water, along the Harbor Walk, and to the Downtown area and beyond. The project is described below into four key components. Plans are included in Attachment A.

1. **Harbor Park** - Harbor Park serves as a public access point to and from Rockland Harbor and hosts numerous other community events. It is home to the Harbor Master's Building and is Rockland's gateway for transient boaters and cruise ship passengers. The Rockland Yacht Club's launch service, mooring holders, and the general public utilize Harbor Park on route to the Public Landing and the Harbor Walk. The current conditions of the park, however, are in need of repair and improvement to better serve the public now and into the future. The elevation of the park nearest the harbor ranges from 8.0' to 10.0' (NAVD88) which is not only well below the existing flood zone, but also non-compliant for ADA accessibility to the Public Landing and the Harbor Walk (See Figure 1). The Harbor Master's Building with a first floor elevation of 11.5' is below the current AE 12 flood zone and has become outdated for its intended use with regard to code and efficiency. Lastly, through an extensive public process, it was determined that the users of the park needed to strike a balance and that spaces in the

park should be better defined and allocated. It was also mandated that a 50-year design life be utilized and that a 2.7' intermediate expectation of sea level rise be considered.

Figure 1: Image showing low elevation of park and steepness of walk

To address the above concerns, the following improvements are proposed:

Accessibility and Resiliency – In conjunction with the marine infrastructure project the lower portion of the park will be filled approximately 4' to create flush surface conditions with the Public Landing and Harbor Walk. This will also serve to protect the park from flooding, erosion, and sea level rise. The weight of this fill may cause settling of underlying clay deposits, see Geotechnical Report in Appendix 1, this can be addressed with soil loading and monitoring during construction and will need to be considered during final design.

Harbor Master's Building – The existing Harbor Master's Building lies within both the VE15 and AE12 flood zones. Initially, it was planned to be moved back out of the VE15 flood zone and raised to prevent flood damage and increase resiliency. Upon investigation, it was determined that most of the historical features of the building have been modified or replaced and that bring the building to modern day codes would be more difficult and expensive than building a new building that is energy efficient and well suited for the multitude of uses required. As a result, a new 2,115 sf, one story building is proposed that will be well suited for the City of Rockland, the Harbor Master, the Yacht Club, transient boaters, and the general public. The building will be placed on a new frost wall and slab, with a finished floor elevation of 14.0 (NAVD 88). The frost wall will be resilient to erosion and the elevation will protect it from flooding and sea level rise. Lastly, placement of the building along with other elements of the site will provide ADA accessibility, public space, and multi-modal transportation access.

Space Allocation – Harbor Park has numerous and varied users, from large events to a simple picnic. With the extensive filling proposed it afforded the City the opportunity to gain input on equitable space allocation. The results are as follows:

- Relocate parking from center of park,
- Enhance park-like setting,
- Better utilize the grass slope with a formalized amphitheater

- Increase safety with access from a second entrance
- Provide for open space suited for public and large events
- Improve connectivity to downtown
- Dedicated zone for food trucks
- Balance the need of diverse users and provide waterfront access for all

As depicted on the site plan, this component includes filling, paving, and landscaping. Long lasting materials such as granite curbs, granite blocks, and concrete pavers will be utilized.

2. **Buoy Park** – Buoy Park is also a valued open space and harbor access point. It is the location of a City sewer pump station and a lobster cooker that serves the yearly Lobster Festival. Middle Pier is used for more commercial boating activities, and this would be enhanced upon its replacement and expansion. The park is mostly protected by a riprap revetment along its approximately 650' of shoreline. Unlike Harbor Park, most of Buoy Park lies above elevation 11.0' (NAVD 88). The exception to this is a low-lying beach and connector road with an elevation of 8.0'. The goals established for Buoy Park include raising grade for resiliency, accessibility for Middle Pier, extend the Harbor Walk, connection to the Downtown, accommodate bus drop off, incorporate living shoreline elements, and enhance personal watercraft launch facilities. An 8' wide, concrete paver Harbor Walk is proposed along the top of the bank leading from the proposed Harbor Park bridge all the way to the bottom of Gilbert & Adams Central Park. In some instances, granite blocks will be used to raise the grade and enhance resiliency along the bank. The walk will continue with an ADA accessible path for an important connection to Park Drive and continuation of the Harbor Walk to Downtown destinations. To balance resiliency with continued beach access, the connector road will be raised from elevation 8.0' to 11.0'. The slope of the road will be stabilized according to geotechnical recommendations determined during final design. Stone steps with a kayak rail will lead from a proposed boat rack to the beach, which will greatly improve the current conditions (see Figure 2). Based on an evaluation tool established by the Maine Geological Survey, the beach area of Buoy Park received a score of 32 out of 44 for suitability for living shoreline. A portion of the granite block/riprap slope needs repair which allows the opportunity to incorporate living shoreline adjacent and above the high-water line (see Figure 2). Plantings will be in accordance with Maine's Coastal Planting Guide for the "lower bank"

zone (see Figure 3). To preserve views, woody low shrubs, herbaceous grasses, and low perennials can be selected that are salt tolerant and prefer sun.

Figure 2: Existing kayak rack and Living Shoreline location

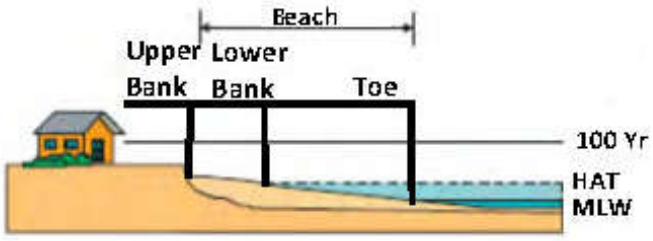

Figure 3:Maine Coastal Planting Guide-Planting Zones

3. **Utilities (Power, Water, Sewer)** – Both Harbor and Buoy Parks will have a need for permanent and seasonal utilities. The seasonal utilities are mostly needed for the outdoor festival and marina uses. The permanent utilities are needed for the Harbor Master Building, fire protection, and non-seasonal floats at Middle Pier. Current conditions require an excessive number of temporary facilities to accommodate the festival uses. Although it is manageable, the risk for injury or environmental damage is evident (see Figure 4, 5, and 6). Goals for the utilities are to eliminate overhead lines, increase personal and environmental safety, and plan for the future (including boat electrification).

   Harbor Park – Currently there are multiple service connections for power held by the City, the Lobster Festival, and the Blues Festival. The plan includes consolidating to one single 600 amp 3-phase service that will be fed overhead along the southern property line and then

distributed underground to the Harbor Master Building, the Public Landing, and seasonal outlets. Seasonal power will be fed to either a permanently mounted pedestal or to locked hand holes in which wire will be left for access by an electrician for appropriate temporary outlets.

Figure 4:Temp Electrical

Figure 5:Temp Wastewater

Figure 6:Temp Potable Water

Water service to Harbor Park is adequate, but it will be necessary to relocate a fire hydrant and upgrade the service connection to the Harbor Master's Building. Distribution to the Public Landing, frost free spigots, and seasonal spigots will be from Harbor Master's Building. Valve pits will be provided in order to drain seasonal spigots. Sanitary sewers are proposed to collect wastewater from food trucks and other seasonal locations. These connections will be made within a precast concrete basin and will greatly reduce the risk of environmental harm.

Buoy Park - Currently there are multiple service connections for power held by the City and the Lobster Festival. The plan includes providing infrastructure to allow up to one single 600 amp 3-phase service that will be fed underground through Harbor Park and then distributed underground to the Middle Pier, the Lobster Cooker, and seasonal outlets. A single-phase service may be adequate initially, prior to the demands of boat electrification. Seasonal power will be fed to either a permanently mounted pedestal or to locked hand holes in which wire

will be left for access by an electrician for appropriate temporary outlets. Water service to Buoy Park is inadequate and currently does not include fire protection by a hydrant. A water main will be extended from Park Drive down into the park to serve a fire hydrant, replace the service to the sewer pump station, and create as service in a meter pit for seasonal distribution. Sanitary sewers are proposed to collect wastewater seasonally from Middle Pier and other festival locations. These connections will be made within a precast concrete basin and will greatly reduce the risk of environmental harm.

4. **Stormwater Management and Resiliency** – Harbor Park currently has two storm drain outfalls that convey stormwater from nearby neighborhoods of the City. The elevation of these outfalls, 4.2' (NAVD 88), is well below the current Highest Annual Tide of 7.2'. This places the outfalls in a tail water condition and limits its capacity. With the fill placement mentioned above and the park being much lower than the surrounding area, this will allow a portion of the stormdrain within the park to be re-placed and raised. Likewise, an existing storm drain outfall will be replaced and raised. A higher outlet will increase resiliency from sea level rise by reducing the effect of tailwater conditions and preserving capacity. In accordance with the City's recent stormwater master plan, it is recommended that stormwater quality management be implemented within the parks by a proprietary "swirl concentrator" device. This will help eliminate grit, hydrocarbons, and floatables from the stormwater stream prior to discharge to the harbor. Three (3) Cascade Separator Devices and one (1) Continuous Deflective Separation Device is proposed for this project. These devices are placed in line with the stormdrain system and can be maintained with a standard vacuum truck. The Continuous Deflective Separation device (CDS) is a swirl concentrator hybrid technology that uses a combination of swirl concentration and indirect screening to screen, separate and trap debris, sediment, and hydrocarbons from stormwater runoff. The Cascade Separator is a hydrodynamic separator technology that captures and retains sediment while also removing hydrocarbons, trash, and debris from stormwater runoff.

Each of these components are integral to the City's Downtown Waterfront and important for its overall community resiliency and sea level rise resiliency.

1.2. INVESTMENT COMPLIANCY

The purpose of the Downtown Upland Improvement Project includes repairs and improvements that are necessary to continue providing open space and safe access to Rockland Harbor without adversely affecting its commercial use, private businesses or tourists. On top of the growing tourism trend in Maine, Rockland's need for this project is also based on its preparedness for sea level rise. The funding from this program would protect Rockland's harborfront by reducing the risk of flooding, maintaining public access, and protecting Harbor and Buoy Parks, including the Harbor Master Building. The project components as described in this PER are consistent with the investment project description found in the Governor's Office of Policy Innovation and the Future, Application RFA# 202207107, Community Resilience Partnership Community Action Grant.

1.3. PROJECT DRAWINGS

Refer to Attachment A for drawings showing the general layout of the project, existing site conditions, and the project components.

1.4 FEASIBILITY ANALYSIS

The project as proposed appears to be feasible with the acquisition of abutter agreements and environmental and local permitting. The owners of the land abutting Harbor and Buoy Parks are amenable to improvements, including grading and utilities on their property.

The project as described is in accordance with local practices with use of typical materials. The design was accomplished by competent and experienced consultants and vetted by a City staff, the Downtown Waterfront Committee, and the general public. The scope has gained public support and has addressed issues identified during public outreach.

1.5 PROPOSED METHOD OF CONSTRUCTION

This project will be a design-competitive bid-build construction project. The upland improvements, as described herein, are based on the Preliminary Engineering Design. The Preliminary Engineering for the marine portion of the project has also been completed.

Considering the need to raise the elevation of the waterfront infrastructure, for sea level resiliency purposes, it would be prudent to conduct the final design for the waterfront and upland portions of the project together. Likewise, it would be prudent to bid the waterfront and upland portions of the project together. Depending on funding, however, the project may have to be split into phases.

1.6 ANTICIPATED CONSTRUCTION CONTRACTS

As mentioned above, it would be prudent to bid and construct the waterfront and upland portion of the project together. The Waterfront Infrastructure Project could be split as follows (as long as the corresponding upland work were included):

1. Middle Pier and Buoy Park
2. Public Landing, Harbor Park Seawall, and Harbor Park
3. Bridge to Buoy Park

1.7 CONSTRUCTION COST ESTIMATE

See Attachment B for the Construction Cost breakdown and Section 1.11 for overall budgets.

1.8 PROPERTY ACQUISITION

No property acquisition is required for the Downtown Waterfront Infrastructure. However, agreements and/or construction easements will be required from Rockland Harbor Park, LLC and Mr. Joseph Reynolds. To the South an agreement and/or construction easement will be needed for grading and removals on property owned by Rockland Harbor Park, LLC. An agreement, license, and/or easement will be required with Mr. Joseph Reynolds for grading, utilities, and access across his property. The City has been in cooperative communication with both parties.

1.9 REQURED PERMITS

Based on review of local ordinances and discussion with State and Federal regulators, the project will be subject to following permits:

a. **City of Rockland:**

Building, Plumbing, and Electrical Permits will be required for the Upland Improvements Project. A Flood Hazard Development Permit will also be required for work within a VE/AE flood zones.

b. **State of Maine:**

Department of Environmental Protection (DEP)

Natural Resources Protection Act (NRPA): Wetland permitting for work within and adjacent to the Coastal Wetland will be required for the Upland Improvements Project. The level of permitting will be Tier 3 (Individual), which may require a Functional Assessment and a Public Informational Meeting.

c. **US Army Corps of Engineers**:

A Maine General Permit (Section 404) will be required for the beach slope stabilization within the resource. This permit would be applied for in conjunction with the DEP NRPA permit.

1.10 PROJECT SCHEDULE

The schedule for this project will be contingent on obtaining the necessary funding. The sources of funding and amounts will dictate how and if the project will be split into phases.

1.11 OVERALL PROJECT BUDGET

The project budget for the Upland Improvements broken down by component is as follows: Also, a more detailed itemized cost estimate is included in Attachment B.

Component 1: Harbor Park

Item	Description	Estimated Cost
1	Construction	$1,057,500.00
2	Site Work	$3,627,700.00
3	Equipment	$43,600.00
4	Design and Admin (10%)	$472,880.00
5	Contingency (10%)	$427,880.00
	Total	$5,6745,560.00

Component 2: Buoy Park

Item	Description	Estimated Cost
1	Construction	$0.00
2	Site Work	$1,098,315.00
3	Equipment	$36,700.00
4	Design and Admin (10%)	$113,510.00
5	Contingency (10%)	$113,510.00
	Total	$1,362,035.00

Component 3a: Utilities (Harbor Park)

Item	Description	Estimated Cost
1	Construction	$54,600.00
2	Site Work	$398,800.00
3	Equipment	$112,000.00
4	Design and Admin (10%)	$56,400.00
5	Contingency (10%)	$56,400.00
	Total	$678,480.00

Component 3b: Utilities (Buoy Park)

Item	Description	Estimated Cost
1	Construction	$44,000.00
2	Site Work	$345,580.00
3	Equipment	$103,300.00
4	Design and Admin (10%)	$49,288.00
5	Contingency (10%)	$49,288.00
	Total	$591,456.00

Component 4a: Stormwater (Harbor Park)

Item	Description	Estimated Cost
1	Construction	$0.00
2	Site Work	$455,000.00
3	Equipment	$0.00
4	Design and Admin (10%)	$45,500.00
5	Contingency (10%)	$45,500.00
	Total	$546,000.00

Component 4b: Stormwater (Buoy Park)

Item	Description	Estimated Cost
1	Construction	$0.00
2	Site Work	$119,220.00
3	Equipment	$0.00
4	Design and Admin (10%)	$11,922.00
5	Contingency (10%)	$11,922.00
	Total	$143,064.00

Components 1, 3a, & 4a: Total Harbor Park

Item	Description	Estimated Cost
1	Construction	$1,112,100.00
2	Site Work	$4,481,500.00
3	Equipment	$155,600.00
4	Design and Admin (10%)	$574,920.00
5	Contingency (10%)	$574,920.00
	Total	$6,899,040.00

Components 2, 3b, & 4b: Total Harbor Park

Item	Description	Estimated Cost
1	Construction	$44,000.00
2	Site Work	$1,563,115.00
3	Equipment	$140,000.00
4	Design and Admin (10%)	$174,720.00
5	Contingency (10%)	$174,720.00
	Total	$2,096,555.00

Components 1-4: Grand Total Harbor and Buoy Park

Item	Description	Estimated Cost
1	Construction	$1,156,100.00
2	Site Work	$6,044,615.00
3	Equipment	$295,600.00
4	Design and Admin (10%)	$749,640.00
5	Contingency (10%)	$749,640.00
	Total	$8,995,595.00

APPENDIX 1

Geotechnical Report

The key to success starts with a solid foundation.
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Geotechnical Report

Harbor Master Building
Harbor Park, Rockland, Maine

Client

Landmark Corporation
135 Rockland Street
Rockport, Maine 04856

Project #: 22330
Date: 9/8/2023

SUMMIT
GEOENGINEERING SERVICES

Mailing: PO Box 515, Gardiner, ME 04345
Office: 210 Maine Avenue, Farmingdale, ME 04344
www.summitgeoeng.com

September 8, 2023
Summit #22330

Michael J. Sabatini, P.E.
Landmark Corporation Surveyors & Engineers
135 Rockland Street
Rockport, ME 04856

Reference: Geotechnical Engineering Services
Harbor Master Building at Harbor Park – Rockland, Maine

Dear Mr. Sabatini;

Summit Geoengineering Services, Inc. (SGS) has completed a geotechnical investigation and this report for the new harbor master building at Harbor Park as part of improvements for resiliency to sea level rise in Rockland, Maine. The scope of services includes performing explorations at the site and preparing this report summarizing our geotechnical recommendations.

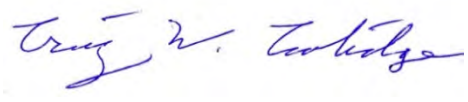
The subsurface conditions in footprint of the new harbor master building were explored by test borings (B-3 and B-4) performed by SGS. In summary, the subsurface conditions include; urban fill, and marine deposits. Groundwater is present at a depth range of 6 to 10 feet below ground surface (BGS) and is tidally influenced. Bedrock is present at depth range 41 to 43 feet BGS.

The new harbor master building is planned as a single-story wood framed structure in similar footprint to replace the existing building. As part of resiliency for sea level rise, the site in footprint of the new harbor master building will be raised in finish grade by approximately 4 to 5 ft. The existing building is planned for demolition. Other site improvements include site fill of 4 to 5 ft across harbor park for landscape and pavement areas along with new storm drain structures.

This report provides discussion of the geotechnical findings and recommendations for the new harbor master building foundations. This geotechnical evaluation is based on subsurface conditions observed by SGS and design information provided by Landmark Corporation Surveyors & Engineers.

SGS appreciates the opportunity to serve you during this phase of your project.

Sincerely yours,
Summit Geoengineering Services



Craig W. Coolidge, P.E.
Vice President & Principal Engineer

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1.0 Project and Site Description

Summit Geoengineering Services (SGS) was asked by Landmark Corporation Surveyors & Engineers to conduct a geotechnical investigation for the new harbor master building at Harbor Park. The new building is planned as part of improvements for resiliency to sea level rise in Rockland, Maine. The site is occupied by an existing harbor master building along with bituminous parking and open lawn space. The new building is planned slightly north of the existing building footprint.

Harbor Park Rockland, Maine (Google Earth 2014)

Topography at the site is relatively flat within the footprint of the harbor master building from elevations 8 to 10 feet. Finish floor of the existing building is 10.5 feet. The proposed finish floor elevation of the new harbor master building is 14.0 feet. Footprint of the new building is proposed at 45 by 47 feet (2,115 sf) constructed of timber framing upon a reinforced concrete foundation. It is recommended that SGS be made available to review final grading and structural foundation plans once they are available to verify the loads and elevations are within the design limits of the geotechnical recommendations provided in this report.

2.0 Subsurface Investigation

SGS observed the subsurface conditions for the harbor master building with the drilling of 2 test borings on March 7, 2023. Test borings were performed using a track mount AMS VTR drill rig by use of rotary wash with casing and hollow stem augers. Sampling was conducted with standard penetration tests (SPT-N) using a split spoon sampler and auto-drop hammer. One sample was obtained using a thin wall tube sampler (Shelby Tube). Field vane shear tests were performed at select intervals within soft clay. Rock core sampling was obtained using a N core barrel from a depth of 43 to 48 feet BGS at test boring B-4. Groundwater was measured within open boreholes and backfilled upon completion of drilling.

Rotary Wash w/Casing at Test Boring B-4

The test borings were approximately located by SGS prior to drilling for notification of Dig Safe. An Exploration Location Plan is included in Appendix A. Logs of the test borings are included in Appendix B. ProMark Utility Locating, Inc. was subcontracted by SGS to physically scan exploration locations prior to drilling with use of ground penetrating radar (GPR).

Test pits were performed adjacent to the existing granite block seawall to observe composition of the seawall blocks and backfill material retained by the seawall. The test pits were performed by the City of Rockland. SGS was onsite to coordinate and log the test pit explorations. Test pits were performed on March 10, 2023 using a Case 590 backhoe and backfilled and patched upon completion.

Excavation of Test Pit TP-2

3.0 Laboratory Testing

Laboratory testing was performed for a thin wall tube sample collected from test boring B-4. Additional moisture contents were performed for soil samples collected from the test borings with a moisture content range of 26.3 to 35.5 percent. A grain size analysis was performed for a sample of existing fill at test pit TP-2. Reports of the laboratory tests are in Appendix C. In summary, the following laboratory tests are included as part of this report:

- Grain Size Analysis (ASTM D6913)
- Atterberg Limit (ASTM D4318)
- Moisture Content (ASTM D2216)
- Unconfined Compressive Strength (ASTM D2166)
- One-Dimensional Consolidation (ASTM D2435)

Results of the laboratory tests for the thin wall tube sample are summarized as follows:

LABORATORY TEST SUMMARY – THIN WALL TUBE SAMPLE									
Boring /Tube	Depth	Atterberg Limit			Unit Weight	Shear Strength	Consolidation		
		LL	PI	MC	ϒ	S_u	P'c	C_c	C_r
B-4/UT-1	25'-27.5'	29	9	29.9	136 pcf	500 psf	2.5 ksf	0.25	0.02

4.0 Subsurface Conditions

The subsurface conditions within the test borings performed by SGS are summarized as follows:

TEST BORING SUMMARY TABLE				
Boring	Urban Fill	Marine Deposit	Refusal	Groundwater
B-1	0 to 14.0	--	14.0	12.3
B-2	0 to 12.0	12.0 to 24.5	24.5	5.8
B-3	0 to 7.5	7.5 to 41.2	41.2	9.5
B-4	0 to 8.2	8.2 to 42.5	42.5	6.3

Units are in Feet Below Ground Surface (BGS)

Topsoil encountered at the surface of test boring B-1 is 2 inches in thickness and described as dark brown silt with rootlets. The topsoil is classified as ML in accordance with the Unified Soil Classification System (USCS). The topsoil is soft and frozen to damp.

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Bituminous pavement encountered at the surface of test borings B-2 through B-4 and test pits TP-1 through TP-3 ranged from 4 to 8 inches in thickness.

Urban fill is encountered at all the explorations with a thickness range of 8 to 14 feet. The urban fill is described as brown sand with variable silt and gravel interbedded or mixed with olive silt with variable sand and clay. Occasional mixing of cobbles and debris are encountered to include brick, coal ash, and wood. Rock fill is present near the granite seawall. The urban fill is classified as SP, SM, or ML in accordance with USCS. The urban fill is compact to loose and damp to wet with depth.

SPT Split Spoon Sample S-1 at Test Boring B-4 (1 to 3 ft BGS)

Marine deposit is encountered beneath the urban fill described as olive gray silty clay with sand overlying gray silty clay with sand seams and black organics streaks. The marine deposit is classified as CL in accordance with USCS. The marine deposit becomes firm to soft and moist to wet with depth. The marine deposit is considered slightly over-consolidated to normally consolidated with depth. Shear strength of the marine deposit ranges from 1,500 to 500 psf.

SPT Split Spoon Sample S-5 at Test Boring B-3 (10 to 12 ft BGS)

SPT Split Spoon Sample S-6 at Test Boring B-3 (15 to 17 ft BGS)

SPT Split Spoon Sample S-9 at Test Boring B-3 (30 to 32 ft BGS)

Bedrock is described as fine-grained gray schist with quartz, biotite, and muscovite minerals. Portions of the bedrock appear weathered and/or fractured based upon drill penetration. Rock coring was performed at test boring B-4 through a boulder or fractured bedrock at a depth of 37 to 38 feet BGS. Soil or fractured bedrock is present from 36 to 43 feet. Rock core sampling (N) was obtained at B-4 within competent bedrock at a depth of 43 to 48 feet BGS. The joints are shallow to dipping (0° - 45°) close and tight. The rock quality designation (RQD) of the rock core is 41 percent.

Rock Core Sample at Test Boring B-4 (43 to 48 ft BGS)

Groundwater was observed at a depth range of 6 to 12 feet BGS consisting of subunits. In general, seasonal groundwater in the form of surface runoff flows downslope towards Rockland Harbor. The surface runoff becomes perched above the marine deposits due to its low permeability flowing within the urban fill. Permanent groundwater resides within the marine deposits and drains slowly toward Rockland Harbor during pore water pressure dissipation. Given the close proximity of the site to Rockland Harbor, groundwater depth may fluctuate at lower terrain during tidal ebb and flow. Groundwater can also rise during flood or storm surge by Rockland Harbor.

5.0 Geotechnical Evaluation

This report is focused on the design and construction of the new harbor master building foundation as detailed in Section 6. A general discussion of site fill associated with pavement and landscape areas is provided in Section 7. A discussion of earthwork considerations is provided in Section 8.

Limitation for development at the site is the presence of variable urban fill and compressible marine deposits (soft clay). As such, building loads should be limited for conventional foundations based upon potential for settlement. Additionally, import site fill of 4 to 5 feet is planned to raise grade for Harbor Park as part of resiliency to sea level rise including the new harbor master building. Weight of the new fill will create consolidation settlement of the underlying soft clay.

To better evaluate potential for a spread footing foundation system, settlement is estimated for the building foundation loads and fill loads independently. Consolidation settlement caused by import fill is estimated at 3 to 5 inches based upon the extent and weight of conventional fill. Time rate for consolidation is estimated at 1 to 2 years upon loading by the weight of new fill.

Settlement for the building loads is evaluated for elastic settlement, consolidation settlement, and secondary settlement. Elastic settlement occurs immediately upon applied loading and is related to the footings bearing upon the urban fill. As such, elastic settlement is associated with live loading during operation of the building. Consolidation settlement is related to long-term loading of the building foundation which is associated with the dead loads and weight of import fill. The time rate for consolidation settlement is estimated at 1 to 2 years upon loading. Secondary settlement is related to soil creep upon the completion of consolidation settlement over a period of 50 years. Estimates for the 3 phases of settlement for building foundation and associated fill include:

- Elastic settlement is estimated at ½ inch for live loads upon the building foundation
- Consolidation settlement is estimated at 5 inches for dead loads and fill weight
- Secondary settlement is estimated at ½ inch for dead loads and fill weight

The combined settlement estimate for foundation and fill loading is 6 inches which is unsuitable for conventional spread footing foundations. To reduce the total amount of settlement beneath the new harbor master building, the following options are considered:

- Use of preload with surcharge to pre-consolidate the soft clay prior to building construction
- Use of lightweight fill in building footprint to reduce settlement caused by fill weight
- Use of ground improvements to reduce compressibility of the underlying soil
- Use of deep foundations to support building foundation to reduce settlement

Of the options considered, the use of preload with surcharge provides the most economical solution. If the time required for a preload with surcharge is not an option because of schedule, utilization of lightweight fill or a pile support foundation system are provided as alternatives.

6.0 Geotechnical Recommendations

Summit Geoengineering Services, Inc. (SGS) anticipates the new harbor master building will be constructed upon the existing urban fill. Discussion and limitations are presented as follows:

- Building footprint is prepared with a preload/surcharge prior to construction
- Foundation consists of continuous strip footings with no isolated column footings
- Foundation design bearing pressure of 2,000 psf at a footing width of 2 to 3 feet
- Foundation footings constructed upon 12 inches of crushed stone overlying geotextile
- Foundation slab is reinforced with rebar at minimum thickness of 6 inches

It is recommended that SGS be made available to review final building layout and design loads to better assist with suitable foundation options for consideration of bearing capacity and settlement.

The following soil and rock parameters can be used for design of foundation systems:

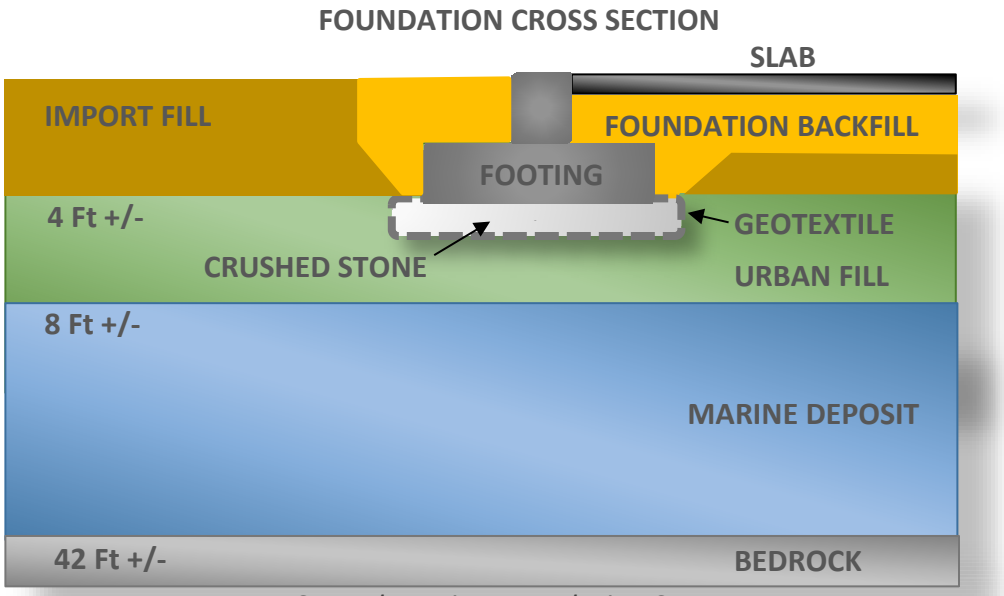
PARAMETER	FOUNDATION BACKFILL	URBAN FILL	MARINE DEPOSIT	BEDROCK
Total Natural (moist) Unit Weight (Υ_t)	135 pcf	125 pcf	135 pcf	160 pcf
Saturated (buoyant) Unit Weight (Υ_s)	73 pcf	63 pcf	73 pcf	--
Friction Coefficient (f_c) for Concrete	0.55	0.35	0.30	0.70
Friction Coefficient (f_s) for Steel	0.40	0.25	0.20	--
Passive Earth Pressure Coefficient (K_p)	3.54	3.00	--	--
Active Earth Pressure Coefficient (K_a)	0.28	0.33	--	--
At Rest Pressure Coefficient (K_o)	0.44	0.50	0.50	--
Effective Friction Angle (ϕ')	34^0	30^0	0^0	28°
Cohesion (c')	--	--	--	50 psi
Undrained Shear Strength (S_u)	--	--	600 psf	--

6.1 Spread Footing Foundation

Spread footings are considered suitable to support the harbor master building upon completion of a preload with surcharge. For design, SGS recommends the foundation elements be proportioned using an allowable bearing pressure of 2,000 psf for compressive loads. Total settlement associated with this bearing pressure is estimated at 1 inch or less. It is recommended that strip footings have a minimum width of 2 feet and maximum width of 3 feet. The foundation slab can be designed using a coefficient of subgrade reaction (k_v) of 100 tons/ft^3.

The frost penetration depth based on a design air-freezing index of 1,200-degree days for Rockland is 4 feet. Exterior footings should be constructed at a minimum depth of 4 feet and be backfilled with Foundation Backfill. The Foundation Backfill should extend a minimum of 24 inches laterally from the base of the foundation footing or walls. Foundation Backfill should also have a minimum thickness of 12 inches beneath the interior building slab. Foundation footings should be constructed upon 12 inches of Crushed Stone overlying geotextile such as Mirafi FW404 or equivalent where bearing upon urban fill to provide a suitable subgrade and prevent disturbance during construction. The following materials are recommended for a conventional spread footing foundation as follows:

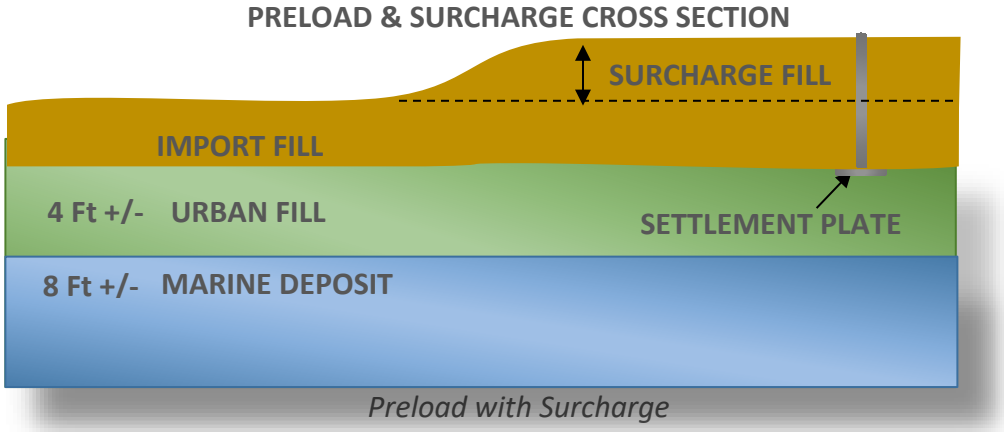
210 Maine Avenue Farmingdale, Maine 04344 | PO Box 515 Gardiner, Maine 04345 (Corporate)
64 Augusta Road Washington, Maine 04574 (Drilling Operations)
www.summitgeoeng.com



Spread Footing Foundation System

6.2 Preload with Surcharge

To reduce consolidation settlement upon the new harbor master building, SGS recommends the building footprint be backfilled to finish grade with compacted Granular Borrow. A surcharge load of 4 feet is recommended above finish grade for the building footprint consisting of temporary Granular Borrow. The surface of the Granular Borrow should extent a minimum of 10 ft laterally from the edge of the building footprint and then be sloped at 4H to 1V or flatter.

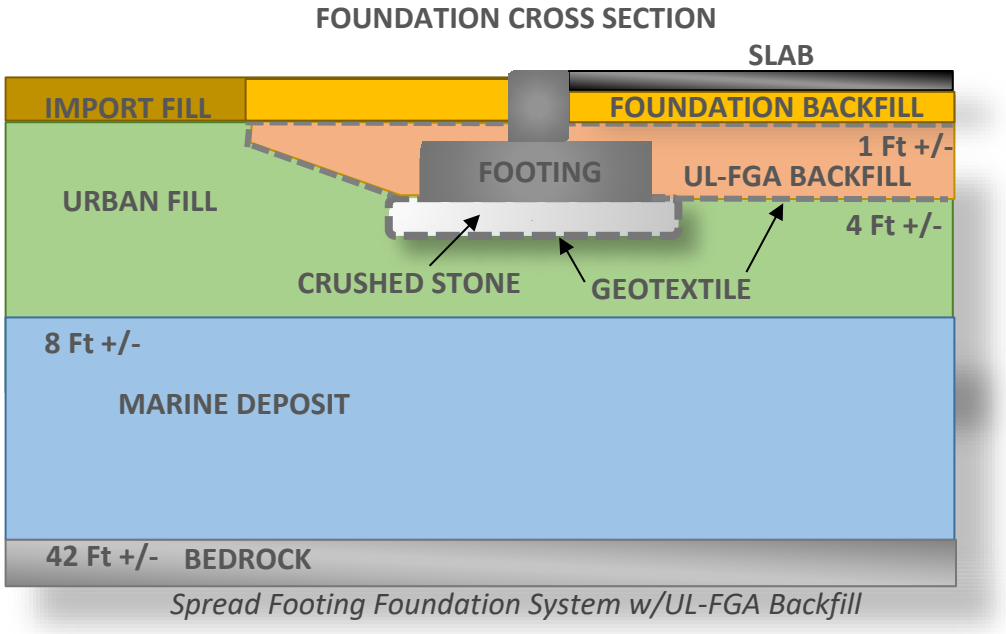


Preload with Surcharge

The surcharge should be left in place for a minimum time period of 6 months prior to the construction of new foundations. Monitoring is recommended by the use of settlement plates, estimated at a total of 3 to 4, to evaluate time rate of consolidation. Adjustment in the time required for the surcharge will be made based upon the results of the field monitoring. It is recommended that SGS conduct the settlement monitoring to measured actual field conditions.

6.3 Ultra Lightweight Foamed Glass Aggregate (UL-FGA)

As an alternative to preload with surcharge, lightweight fill such as Ultra-Lightweight Foamed Glass Aggregate (UL-FGA) or similar is recommended for backfill of the foundation and slab as follows:



Spread Footing Foundation System w/UL-FGA Backfill

The UL-FGA Backfill should extend a minimum of 4 feet laterally from the base of the foundation footing or walls. UL-FGA Backfill placed adjacent to footings or walls in should be installed in 12-inch lifts and be compacted by a minimum of 4 passes using a vibratory plate compactor with an operating weight between 110 to 220 lbs.

UL-FGA Backfill should have a minimum thickness of 3 feet beneath the building slab and 12 inches of Foundation Backfill. UL-FGA Backfill placed beneath the slab can be installed in 12-inch lifts and be compacted by a minimum of 4 passes using a vibratory plate compactor with an operating weight between 110 to 220 lbs. Alternatively, UL-FGA Backfill placed beneath the slab can be installed in 24-inch lifts and be compacted by a tracked excavator or bulldozer having an operating weight between 625 and 1,025 psf, where access permits.

UL-FGA Backfill should be placed upon geotextile fabric such as Mirafi HP370 or equivalent overlying clay subgrade. Geotextile fabric should have a minimum overlap of 2 feet and be protected from damage during installation.

Product information sheets and installation guidelines for UL-FGA along with product sheet for Mirafi HP370 geotextile are provide in Appendix D.

6.4 Pile Support Foundation

A mat slab supported by driven timber piles may be used to reduce settlement. Resistance to compressive loads distributed across the foundation is the bearing resistance of the subgrade soil along with frictional and end bearing resistance of the piles. Resistance to lateral loads are the frictional resistance of the foundation bearing upon soil and earth pressure resistance upon the foundation walls and lateral resistance of the piles. Resistance to uplift loads are the dead weight of the concrete foundation along with pullout resistance of the piles.

Refusal within test borings B-3 and B-4 was encountered at a depth range of 41 to 42 feet BGS. To provide adequate end bearing capacity of the pile foundation, we recommend piles be end bearing upon bedrock. Timber piles for permanent foundation systems should consist of southern pine, douglas fir or similar pile material meeting ASTM Standard D25 class A or B. Piles should be tapered and have a minimum but diameter of 8-inchs and tip diameter of 12 inches. The estimated allowable pile capacity is 40 kips having a factor of safety of 3. The following soil parameters can be used for design of the pile foundation:

PARAMETER	URBAN FILL	MARINE DEPOSIT
Total Natural (moist) Unit Weight (Υ_t)	125 pcf	135 pcf
Saturated (buoyant) Unit Weight (Υ_s)	63 pcf	73 pcf
Friction Angle (ϕ')	30°	0°
Undrained Shear Strength (S_u)	--	600 psf
Soil Modulus Parameter (k)	40 pci	100 pci
Soil Strain Parameter ε_{50}	--	0.01

Piles should be designed for permanent application within a saltwater marine environment such as the American Wood Protection Association (AWPA) class UC5 or similar.

To prevent pile damage during installation, SGS recommends that wave equation method of analysis (GRLWEAP or similar) be used to estimate drivability for both driving stresses and net displacement per blow at ultimate load. Analysis should be performed specific to the pile driver model and energy efficiency, driving cushion during installation, and specifications for pile type.

It is recommended that SGS be made available to review final building layout and design loads to better assist with suitable pile options. Piles should be designed to accommodate the potential for negative skin friction or down drag forces caused by consolidation of the marine deposit (soft clay) caused by weight of the import site fill. The mat slab foundation supported by piles should be designed as rigid to prevent cracking or deflection caused by potential settlement of the import fill.

6.5 Backfill Recommendations

Foundation Backfill should be placed in maximum of 12-inch lifts and be compacted to 95 percent of its maximum dry density in accordance with ASTM D1557. Foundation Backfill should have a maximum particle size limited to 6 inches and portion passing a 3-inch sieve meet the following:

FOUNDATION BACKFILL	
Sieve Size	**Percent Passing**
½ inch	35 to 80
¼ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type D (2014)

Crushed Stone should be tamped to lock the stone structure together and meet the following:

CRUSHED STONE ¾ INCH	
Sieve Size	**Percent finer**
1 inch	100
¾ inch	90 to 100
½ inch	20 to 55
⅜ inch	0 to 15
No. 4	0 to 5

Reference: MDOT Specification 703.13, Crushed Stone ¾-Inch (2014)

Geotextile should consist of Mirafi FW404 or similar placed between the bottom of the Crushed Stone layer and top of the urban fill.

Site fill beyond the limits of the building footprint for landscape areas or beneath new pavement sections should consist of Granular Borrow. Granular Borrow is also recommended for use as temporary surcharge fill within footprint of the new harbor master building. Granular Borrow should be placed in maximum of 12-inch lifts and be compacted to 95 percent of its maximum dry density in accordance with ASTM D1557. Granular Borrow should consist of granular material with a maximum particle size of 3 inches meeting the following gradation:

GRANULAR BORROW	
Sieve Size	**Percent Passing**
3 Inch	100
No. 40	0 to 70
No. 200	0 to 7

Reference: MDOT Specification 703.19, Granular Borrow (2020)

6.6 Seismic Design

Results of the test borings indicate the site classifies as Site Class E in accordance with ASCE 7-10 as referenced by the 2015 International Building Code. The following seismic site coefficients should be used for a risk category II and seismic design category B:

SUBGRADE SITE SEISMIC DESIGN COEFFICIENTS – ASCE 7-10	
Seismic Coefficient	**Site Class E**
Peak Ground Acceleration (PGA)	0.090
Modified Peak Ground Acceleration (PGA_M)	0.225
Short period spectral response (S_S)	0.182
1 second spectral response (S_1)	0.069
Maximum short period spectral response (S_{MS})	0.456
Maximum 1 second spectral response (S_{M1})	0.243
Design short period spectral response (S_{DS})	0.304
Design 1 second spectral response (S_{D1})	0.162

7.0 Pavement Recommendations

New bituminous pavement is planned for parking and access drives. Subgrade is anticipated as urban fill. The mean annual freezing index for Rockland is estimated at 750-degree days. Based on the subgrade and mean freezing index, the anticipated mean frost penetration depth is 42 inches. Based on this, SGS recommends a minimum total pavement section thickness of 21 inches for light-duty pavement areas. For heavy truck loadings heavy-duty pavement section with a minimum total thickness of 25 inches is recommended. Further recommend that the pavement section consist of the following materials:

MATERIAL	THICKNESS (in) Light Duty	THICKNESS (in) Heavy Duty	SPECIFICATION
Asphalt Surface Course	1	1.5	MDOT 703.09 Type 9.5 mm
Asphalt Binder Course	2	2.5	MDOT 703.09 Type 19 mm
Base Soil	3	3	MDOT 703.06 Type A
Subbase Soil	15	18	MDOT 703.06 Type D
Geotextile	--	--	Mirafi HP370

The following specifications are for MDOT base and subbase gravel:

Sieve Designation	Percent Passing a 3-inch Sieve	
	MDOT Type A (Base)	MDOT Type D (Subbase)
3 Inch	100	100
2 Inch	100	--
½ Inch	45 – 70	35 – 80
¼ Inch	30 – 55	25 – 65
No. 40	0 – 20	0 – 30
No. 200	0 – 6	0 – 7

Reference: MDOT Specification 703.06, Aggregate for Base and Subbase (2020)

Additional fill needed to meet grade at the site beneath the pavement sections should consist of Granular Borrow. Granular Borrow should be placed in maximum 12-inch lifts and compacted to 95 percent of its maximum dry density determined in accordance with ASTM D1557. Granular subgrade should be proof-rolled prior to placement of Granular Borrow. Proof rolling should consist of a minimum of five passes in a north-south direction and then five passes in an east-west direction using a minimum 5-ton operating weight vibratory roller.

8.0 Earthwork Considerations

A subgrade inspection program should be implemented by the geotechnical engineer in collaboration with the owner and earthwork contractor to inspect areas where buried debris might be present for new structures. It is recommended the existing building structure and associated foundations be removed in its entirety where in footprint of the planned harbor master building.

To construct new utilities at depths beyond 4 feet BGS, engineered trench boxes and/or braced excavation such as driven sheet piles may be required. Excavation for utilities should consider the need for groundwater dewatering, presence of loose urban fill and/or soft marine deposits, and its proximity to adjacent structures. An excavation plan should be prepared by a qualified engineer in collaboration with the contractor and geotechnical engineer. Depending upon location and depth of new utilities, additional test borings and/or tests pits might be prudent to further profile subgrade for the design of excavation support.

New and utilities such as storm drains and sewer mains located below areas of new site fill should be evaluated for potential settlement caused by consolidation of the underlying marine deposits (soft clay). It is recommended that flexible piping structures be utilized as best practical and that preload, lightweight fill, or similar methods be considered to reduce settlement of utilities.

It is recommended that a qualified testing agency inspect soil materials gradation and compaction during construction for conformance to the project specifications. Soil materials testing reports should be made available to the geotechnical engineer for review.

9.0 Closure

The recommendations provided in this report are based on professional judgment and generally accepted principles of geotechnical engineering and project information provided by others. No other warranty is expressed or implied. Our evaluations and recommendations are based on discrete and widely spaced data points. Some changes in subsurface conditions from those presented in this report are anticipated to occur. Should these conditions differ materially from those described in this report, SGS should be notified so that the provided recommendations may be re-evaluated.

SGS should be retained to review final construction documents relevant to the recommendations in this report. SGS appreciates the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

APPENDIX A

EXPLORATION LOCATION PLAN

LEGEND

- B-1 — SUMMIT TEST BORING (MARCH 7, 2023)
- TP-1 — SUMMIT TEST PIT (MARCH 10, 2023)
- GROUND PENETRATING RADAR (GPR) RUNS

SCALE: 1" = 60'

0 30 60 120 180

PLAN REFERENCE

"PRELIMINARY GRADING & UTILITY PLAN, CITY OF ROCKLAND, MILDRED MERRILL PARK & HARBOR PARK", DATED JULY 20, 2022, PREPARED BY LANDMARK CORPORATION.

PROJECT: HARBOR PARK IMPROVEMENTS
ROCKLAND, MAINE

CLIENT: LANDMARK CORPORATION

TITLE: EXPLORATION LOCATION AERIAL PLAN

SCALE: 1" = 60' | DRAWN BY: KRF

DATE: MARCH 17, 2023 | APPR. BY: CRS

SUMMIT GEOENGINEERING SERVICES
MAIL: P.O. BOX 515 GARDINER, ME 04345
OFFICE: 210 MAINE AVENUE FARMINGDALE, MAINE
TEL.: (207) 588-1519

PROJ.#: 22330

FIGURE: 1

SCALE: 1" = 40'

0 20 40 80 120

NORTH

PLAN REFERENCE

"PRELIMINARY GRADING & UTILITY PLAN, CITY OF ROCKLAND, MILDRED MERRILL PARK & HARBOR PARK", DATED JULY 20, 2022, PREPARED BY LANDMARK CORPORATION.

LEGEND

- B-1 — SUMMIT TEST BORING (MARCH 7, 2023)
- TP-1 — SUMMIT TEST PIT (MARCH 10, 2023)
- GROUND PENETRATING RADAR (GPR) RUNS

PROJECT: HARBOR PARK IMPROVEMENTS
ROCKLAND, MAINE

CLIENT: LANDMARK CORPORATION

TITLE: EXPLORATION LOCATION PLAN

DRAWN BY: KRF
APPR. BY: CRS
SCALE: 1" = 40'
DATE: MARCH 17, 2023

SUMMIT GEOENGINEERING SERVICES
MAIL: P.O. BOX 515 GARDINER, ME 04345
OFFICE: 210 MAINE AVENUE FARMINGDALE, MAINE
TEL.: (207) 588-7579

PROJ.#: 22330

FIGURE: 2

APPENDIX B

EXPLORATION LOGS

EXPLORATION COVER SHEET

The exploration logs are prepared by the geotechnical engineer from both field and laboratory data. Soil descriptions are based upon the Unified Soil Classification System (USCS) per ASTM D2487 and/or ASTM D2488 as applicable. Supplemental descriptive terms for estimated particle percentage, color, density, moisture condition, and bedrock may also be included to further describe conditions.

Drilling and Sampling Symbols:

SS = Split Spoon Sample
UT = Thin Wall Shelby Tube
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RW = Rotary Wash
SV = Shear Vane
PP = Pocket Penetrometer
RC = Rock Core Sample
FV = Field Vane Shear Test
PS = Concrete Punch Sample
Hyd = Hydraulic Advancement of Drilling Rods
Push = Direct Push of Drilling Rods
WOH = Weight of Hammer
WOR = Weight of Rod
PI = Plasticity Index
LL = Liquid Limit
W = Natural Water Content
USCS = Unified Soil Classification System
Su = Undrained Shear Strength
Su(r) = Remolded Shear Strength

Water Level Measurements:

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable groundwater levels. In impervious soils, the accurate determination of groundwater elevations may not be possible, even after several days of observations. Groundwater monitoring wells may be required to record accurate depths and fluctuation.

Gradation Description and Terminology:

Boulders:	Over 12 inches	Trace:	Less than 5%
Cobbles:	12 inches to 3 inches	Little:	5% to 15%
Gravel:	3 inches to No.4 sieve	Some:	15% to 30%
Sand:	No.4 to No. 200 sieve	Silty, Sandy, etc.:	Greater than 30%
Silt:	No. 200 sieve to 0.005 mm		
Clay:	less than 0.005 mm		

Density of Granular Soils and Consistency of Cohesive Soils:

CONSISTENCY OF COHESIVE SOILS		DENSITY OF GRANULAR SOILS	
SPT N-value blows/ft	**Consistency**	**SPT N-value blows/ft**	**Relative Density**
0 to 2	Very Soft	0 to 4	Very Loose
2 to 4	Soft	5 to 10	Loose
5 to 8	Firm	11 to 30	Compact
9 to 15	Stiff	31 to 50	Dense
16 to 30	Very Stiff	>50	Very Dense
>30	Hard		

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Harbor Park Improvements	Boring #:	**B-1**
Location:	Harbor Park	Project #:	22330
City, State:	Rockland, Maine	Sheet:	1 of 1
		Chkd by:	CWC

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	14 ft +/-
Driller:	J. Legendre	Reference:	Estimated from Preliminary Grading & Utility Plan Dated 7-22-22 by Landmark Corp.
Summit Staff:	C. Sullivan, E.I.	Date started: 3/7/2023	Date Completed: 3/7/2023

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Track	Length:	24" SS
Model:	9500 VTR	Diameter:	2"OD/1.5"ID
Method:	2-1/4" HSA	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
3/7/2023	12.3 ft	2 ft +/-	Measured in 15' of augers at 10:30AM

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/16	0 - 2	5		Dark brown SILT, trace fine Sand, rootlets, soft,		TOPSOIL
1				2		frozen-damp, ML		0.2'
				7	14+/-	Brown-olive brown SILT, little fine Sand, trace Gravel,		MISCELLANEOUS FILL
2				2		misc. debris (glass from 0.2'-0.8' & 1"-coal ash pocket		
						at 2' +/-), soft-firm, damp, ML		
3								
4								
5								
	S-2	24/8	5 - 7	3		Brown medium-fine SAND mixed with black coal ash,		5' +/-
6				4		trace Gravel & Silt, occasional brick fragments, loose,		
				2		damp, SP		
7				3				
8								
9								
10								
	S-3	24/12	10 - 12	7		Brown Silty medium-fine SAND, 1"-crushed cobble at		
11				8		10.5', brick fragments, lime ash from 10'-10.3', slightly		
				9		mottled, compact, moist-wet, SM		
12				2				
13								
14								
					0+/-	End of Exploration at 14', Auger Refusal on Probable		14'
15						Bedrock		PROBABLE BEDROCK
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Boring #: **B-2**

Project:	Harbor Park Improvements	Project #:	22330
Location:	Harbor Park	Sheet:	1 of 1
City, State:	Rockland, Maine	Chkd by:	CWC

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	10 ft +/-
Driller:	J. Legendre	Reference:	Estimated from Preliminary Grading & Utility Plan Dated 7-22-22 by Landmark Corp.
Summit Staff:	C. Sullivan, E.I.	Date started: 3/7/2023	Date Completed: 3/7/2023

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Track	Length:	24" SS
Model:	9500 VTR	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
3/7/2023	5.8 ft	4 ft +/-	Measured in 10' of augers at 11:15AM

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	SP-1	12/12	0 - 1	PUSH		5" Bituminous Pavement		PAVEMENT
1				PUSH	10+/-			0.4' +/-
	S-1	24/8	1 - 3	7		Olive brown Silty medium-fine SAND, occasional reclaim		MISCELLANEOUS FILL
2				7		pieces & lime ash throughout, 3"-crushed cobble at 1.4',		
				8		pushed cobble in spoon tip, compact, damp, SM		
3				4				
	S-2	24/9	3 - 5	4		Brown-gray medium-fine SAND, little Silt & Gravel,		3' +/-
4				5		compact, damp, SP-SM		
				8		Black coal ash intermixed with medium-fine SAND		3.3' +/-
5				8		Crushed cobble intermixed with probable lime ash		3.5' +/-
	S-3	24/12	5 - 7	4		Tan medium-fine SAND, trace Silt & Gravel, occasional		
6				2		lime ash throughout, very loose-loose, moist-wet, SP		
				2				
7				1				
	S-4	24/8	7 - 9	5		Brown-gray fine SAND, trace Silt & Gravel, occasional		
8				4		shells, 1"-crushed cobble at 7.7', loose, wet, SP		
				3				
9				2				
						Possible wood at 9' +/- based on auger resistance		9' +/-
10								
	S-5	24/24	10 - 12	12		Olive gray Silty fine SAND, trace Gravel, occasional		10' +/-
11				25		shell & wood fragments, compact, wet, SM		
				13				
12				8		Wood encountered at 11.5' - 12' +/-		11.5'
						2½-inch Solid Stem Auger Advanced to Refusal		
13								
14								
15								
16								
17								
18								
19								
20								
						*Change in depth scale		
*24								
25					-15+/-	End of Exploration at 24.5', Auger Refusal on Probable		24.5'
						Bedrock		PROBABLE BEDROCK

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SOIL BORING LOG

SUMMIT GEOENGINEERING SERVICES

Project:	Harbor Park Improvements	Boring #:	B-3
Location:	Harbor Park	Project #:	22330
City, State:	Rockland, Maine	Sheet:	1 of 2
		Chkd by:	CWC

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	8 ft +/-
Driller:	J. Legendre	Reference:	Estimated from Preliminary Grading & Utility Plan Dated 7-22-22 by Landmark Corp.
Summit Staff:	C. Sullivan, E.I.	Date started: 3/7/2023	Date Completed: 3/7/2023

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Track	Length:	24" SS
Model:	9500 VTR	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
3/7/2023	9.5 ft	-1.5 ft +/-	Measured in 15' of augers at 2:30 PM

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	SP-1	12/12	0 - 1	PUSH		4" Bituminuous Pavement		PAVEMENT
1				PUSH	8+/-			0.3'
	S-1	24/8	1 - 3	10		Brown-olive brown Silty SAND, little-some Gravel, 3"-		MISCELLANEOUS FILL
2				9		crushed cobble at 1.3'+/-, loose-compact, damp,		
				5		SM		
3				4				
	S-2	24/6	3 - 5	4		Gray-brown medium-fine SAND, little Gravel, trace-		3'
4				3		little Silt, loose, damp, SP to SP-SM		
				3				
5				2				
	S-3	24/12	5 - 7	1		Olive gray Clayey SILT, some fine Sand, little Gravel,		5' +/-
6				2		trace coal ash, brick fragments & wood fibers		
				1		throughout, soft, moist, ML		
7				2				
	S-4	24/12	7 - 9	1		Olive gray Silty CLAY, little-some fine Sand, trace-little		
8				2		Gravel, slightly mottled, trace coal ash, soft, moist, CL		7.5'
				1	1+/-	Olive gray Silty CLAY, trace fine Sand, blocky, slightly	PP = 3,000 psf	GLACIAL MARINE
9				1		mottled, soft, moist-wet, CL		DEPOSIT
10								
	S-5	24/24	10 - 12	WOH		Olive gray Silty CLAY, little fine Sand, trace Gravel,	PP = 1,000 psf	
11				WOH		slightly mottled, very soft, wet, CL	to 1,500 psf	
				WOH				
12				WOH				
13								
14								
						Attempted field vane at 14', vane push refusal on		14'
15						probable Sand-Silt seam		
	S-6	24/24	15 - 17	2		Dark gray SAND, little Gravel, trace-little Silt, shell		
16				4		fragments, loose-compact, wet, SP to SP-SM		
				5		Black Organic SILT, trace fine Sand, Organic odor,	MC = 35.5%	16'
17				7		occasional shell fragments, stiff, wet, OL		
18								
19								
20								
	S-7	24/24	20 - 22	WOH		Gray Silty CLAY, trace Gravel & fine Sand, occasional	PP = 500 psf	20' +/-
21				WOH		black Organic streaks, very soft, wet, CL	to 750 psf	
				WOH			MC = 30.7%	
22				WOH				

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Boring #: **B-3**

Project:	Harbor Park Improvements	Project #:	22330
Location:	Harbor Park	Sheet:	2 of 2
City, State:	Rockland, Maine	Chkd by:	CWC

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	8 ft +/-
Driller:	J. Legendre	Reference:	Estimated from Preliminary Grading & Utility Plan Dated 7-22-22 by Landmark Corp.
Summit Staff:	C. Sullivan, E.I.	Date started: 3/7/2023	Date Completed: 3/7/2023

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Track	Length:	24" SS
Model:	9500 VTR	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
3/7/2023	9.5 ft	-1.5 ft +/-	Measured in 15' of augers at 2:30 PM

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
23	FIELD VANES							GLACIAL MARINE DEPOSIT
			Tip of Vane					
24	FV-1		24			S_u = >1,500 psf, Su(r) = N/A		
						(>30 ft-lbs, N/A)		
25						Vane push refusal at 24.9', probable Sand-Silt seam		
	S-8	24/20	25 - 27	5		Gray Silty CLAY, trace Sand & Gravel, black Organic	PP = 2,000 psf	25' +/-
26				3		streaks, firm, wet, CL	to 3,000 psf	
				3			MC = 30.4%	
27				3		Gray SILT-CLAY, little-some Sand, trace-little Gravel,		26.7'
						firm, wet, ML-CL		
28								
29								
30								
	S-9	24/24	30 - 32	WOH		Gray Silty CLAY, trace fine Sand, occasional black	PP = 750 psf	30' +/-
31				1		Organic streaks, 2"-cobble at 31'+/-, soft, wet, CL	to 1,000 psf	
				1			MC = 26.3%	
32				1				
						Solid stem rod probe to refusal		
33								
34								
35								
36								
37								
38								
39								
40								
41								
					-33+/-	End of Exploration at 41.2', Refusal on Probable		41.2'
42						Bedrock		BEDROCK
43								
44								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Boring #: **B-4**

Project: Harbor Park Improvements | Project #: 22330
Location: Harbor Park | Sheet: 1 of 3
City, State: Rockland, Maine | Chkd by: CWC

Drilling Co: Summit Geoengineering Services
Driller: C. Coolidge, P.E.
Summit Staff: C. Sullivan, E.I.

Boring Elevation: 8 ft +/-
Reference: Estimated from Preliminary Grading & Utility Plan Dated 7-22-22 by Landmark Corp.
Date started: 3/7/2023 Date Completed: 3/7/2023

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Track	Length:	24" SS
Model:	9580 VTR	Diameter:	2"OD/1.5"ID
Method:	4" Casing w/RW	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
3/7/2023	6.3 ft	2 ft +/-	Measured in open hole while drilling at 9AM
3/7/2023	10.1 ft	-2 ft +/-	Measured in casing at 4PM

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	SP-1	12/12	0 - 1	PUSH		4" Intact Bituminous Pavement		PAVEMENT
1				PUSH		2" Former Pavement		0.5'
	S-1	24/24	1 - 3	7	8+/-	Brown Gravelly SAND, little Silt, 1"-cobble at 1.8'+/-,		MISCELLANEOUS FILL
2				12		compact, damp, SP-SM		
				11		Crushed cobbles intermixed with soil and lime ash		2'
3				8				
	S-2	24/2	3 - 5	2		Brown medium-fine SAND, little Silt, pushed cobble		3'
4				3		in spoon tip, loose, damp, SP-SM		
				2				
5				4				
	S-3	24/3	5 - 7	2		Olive gray medium-fine SAND, little Silt, trace Gravel,		
6				2		slightly mottled, pushed cobble in spoon tip, very		
				1		loose, damp, SP-SM		
7				2				
	S-4	24/16	7 - 9	2		Same as above, very loose, moist-wet, SP-SM		
8				3		Olive gray SILT-CLAY, some Sand, misc. debris		7.5'
				1		(asphalt & brick fragments), soft, wet, ML-CL	MC = 31.1%	
9				1	0+/-	Gray Silty CLAY, little-some Sand, slightly mottled,	PP = 1,500 psf	8.2'
						soft, wet, CL		GLACIAL MARINE
10								DEPOSIT
	S-5	24/0	10 - 12	11		No recovery, pushed cobble in spoon tip		
11				2				
				3				
12				2				
13								
14								
15								
	S-6	24/8	15 - 17	2		Gray Silty CLAY, black Organic streaks, soft, wet, CL	PP = 1,000 psf	
16				1			MC = 32.8%	
				2				
17		FIELD VANES		1				
			Tip of Vane					
18	FV-1		18			S_u = 600 psf, $S_{u(r)}$ = 200 psf		
						(12 ft-lbs, 4 ft-lbs)		
19								
20	FV-2		20			S_u = 600 psf, $S_{u(r)}$ = 200 psf		
						(12 ft-lbs, 4 ft-lbs)		
21								
22	FV-3		22			S_u = 600 psf, $S_{u(r)}$ = 250 psf		
						(12 ft-lbs, 5 ft-lbs)		

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Harbor Park Improvements	Boring #:	**B-4**
Location:	Harbor Park	Project #:	22330
City, State:	Rockland, Maine	Sheet:	2 of 3
		Chkd by:	CWC

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	8 ft +/-
Driller:	C. Coolidge, P.E.	Reference:	Estimated from Preliminary Grading & Utility Plan Dated 7-22-22 by Landmark Corp.
Summit Staff:	C. Sullivan, E.I.	Date started: 3/7/2023	Date Completed: 3/7/2023

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Track	Length:	24" SS
Model:	9580 VTR	Diameter:	2"OD/1.5"ID
Method:	4" Casing w/RW	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
3/7/2023	6.3 ft	2 ft +/-	Measured in open hole while drilling at 9AM
3/7/2023	10.1 ft	-2 ft +/-	Measured in casing at 4PM

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
23	FIELD VANES							GLACIAL MARINE DEPOSIT
			Tip of Vane					
24	FV-4		24			S_u = 800 psf, $S_{u(r)}$ = 200 psf (16 ft-lbs, 4 ft-lbs)		
25							LL = 29	
	UT-1	30/27	25 - 27.5	PUSH		Gray Silty CLAY, trace fine Sand & Gravel, black	PI = 9	
26						Organic streaks, occasional dropstones, soft, wet, CL	MC = 29.9%	
							S_u = 500 psf	
27						Gray Gravelly SAND, little-some Silt, loose, wet, SP-SM to SM		26.8' +/-
28	FV-5		28			S_u = 550 psf, $S_{u(r)}$ = 250 psf (11 ft-lbs, 5 ft-lbs)		27.5' +/-
29						Vane push refusal at 29.5', probable Sand-Silt seam		
30								
	S-7	24/24	30 - 32	2		Gray Silty CLAY, trace Gravel & Sand, black Organic	PP = 500 psf	
31				1		streaks, soft, wet, CL	to 1,000 psf	
				1			MC = 28.4%	
32				1				
33								
34								
35								
	S-8	20/18	35 - 36.7	3		Same as above, soft, wet, CL	PP = 500 psf	
36				2			to 1,000 psf	
				2		Gray SILT-CLAY, some Sand, little Gravel, firm, wet,		36'
37				50/2"		ML-CL		
38						Boulder encountered from 37' - 38'		
39								
40								
41								
42								
	ROCK CORE DATA							
43	RUN	RECOVERY	DEPTH	RQD	-34+/-	Refusal on Bedrock at 42.5'		42.5'
	C-1	100%	43' - 48'	41%		Medium hard to soft, fresh to moderately weathered,	Mohs Hardness = 4	BEDROCK
44						slightly to moderately fractured, fine grained, gray SCHIST with quartz, bitote, and muscavite minerals.		
						(Continued on Next Page)		

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SOIL BORING LOG

SUMMIT GEOENGINEERING SERVICES

Project:	Harbor Park Improvements	Boring #:	B-4
Location:	Harbor Park	Project #:	22330
City, State:	Rockland, Maine	Sheet:	3 of 3
		Chkd by:	CWC

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	8 ft +/-
Driller:	C. Coolidge, P.E.	Reference:	Estimated from Preliminary Grading & Utility Plan Dated 7-22-22 by Landmark Corp.
Summit Staff:	C. Sullivan, E.I.	Date started: 3/7/2023	Date Completed: 3/7/2023

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Track	Length:	24" SS
Model:	9580 VTR	Diameter:	2"OD/1.5"ID
Method:	4" Casing w/RW	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
3/7/2023	6.3 ft	2 ft +/-	Measured in open hole while drilling at 9AM
3/7/2023	10.1 ft	-2 ft +/-	Measured in casing at 4PM

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
45						(Continued Rock Description) Joints are very close, shallow to dipping (0°-45°), undulating, rough, and tight		BEDROCK
46								
47								
48								
49					-40+/-	End of Exploration at 48'		48'
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								
60								
61								
62								
63								
64								
65								
66								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT GEOENGINEERING SERVICES	**TEST PIT LOG**	Test Pit # **TP-1**
	Project: Harbor Park Improvements Harbor Park Improvements Rockland, Maine	Project #: 22330 Groundwater: 7 ft +/- Tide at 11:00 AM
Contractor: City of Rockland	Ground Surface Elevation: 8 ft +/-	
Equipment: Case 590 Backhoe	Location: Top of pavement near sidewalk & seawall	
Summit Staff: C. Coolidge, P.E.	Date: 3/10/2023	Weather: Clear

Depth (ft)	DESCRIPTION	
	ENGINEERING	**GEOLOGIC/GENERAL**
	Bituminous Pavement (8" Total, 4" new & 4" old) Top of pavement is 0.5 ft below seawall (sidewalk)	PAVEMENT
1	Dark brown to brown Gravelly SAND, little Silt, compact, damp, SP-SM (S-1; Gravel = 29%, Sand = 40%, Fines = 11%) Observed sinkhole or void near seawall at 1.4' with width of 16" and depth of 8 "	0.7' GRANULAR FILL
2	Granite Blocks at seawall variable, typical 1' by 1.5' by 2.5' Granite blocks are cut flat and rectangular, extend inbound to edge of sidewall +/- 1 ft	
3		
4	Light gray Crushed Stone grading to ROCK Fill mixed (6" to 18" diameter) with Gravel Stone (1" to 3" diameter) occasional brick debris, loose, damp, GP	3' ROCK FILL
5		
6		
7	Groundwater & tidewater at 7'	
	End of Exploration at 7' due to sidewall caving	7'
8		

SUMMIT GEOENGINEERING SERVICES	**TEST PIT LOG**	Test Pit # **TP-2**
	Project: Harbor Park Improvements Harbor Park Improvements Rockland, Maine	Project #: 22330 Groundwater: 9 ft +/- Tide at 9:45 AM
Contractor: City of Rockland	Ground Surface Elevation: 8 ft +/-	
Equipment: Case 590 Backhoe	Location: Top of pavement in front of seawall	
Summit Staff: C. Coolidge, P.E.	Date: 3/10/2023	Weather: Clear

Depth (ft)	DESCRIPTION	
	ENGINEERING	**GEOLOGIC/GENERAL**
	Bituminous Pavement (6" thick +/- 1") Top of pavement is 2 ft below top of seawall	PAVEMENT
1	Concrete mud mat (slab) 8" to 12" thick (unreinforce) extending inboard 5 ft from back of seawall Geotextile fabric (woven) beneath concrete	0.5' CONCRETE
2	Dark brown Gravelly SAND, little to trace Silt, compact, damp, SP-SM (rounded rocks/bank run or screened)	1.3' GRANULAR FILL (GRANITE BLOCKS at seawall extend 1 to 2 ft inbound from back of seawall)
3	GRAVEL (1' to 3" diameter) with some to little Sand, occasional pockets of Coal Ash, compact, damp, GP grading to angular ROCK Fill (6 to 18" diameter), trace debris (brick or ash), little Sand, damp, GP	2' ROCK FILL
4	ROCK Fill (1" to 24" diameter, average 3"), little Sand, compact, damp, GP	
5		
6		
7	ROCK Fill (12" to 18" diameter) trace Sand, compact to loose, damp to moist, GP	
8	Sidewall Caving at 8', No Groundwater	
	End of Exploration at 8' due to sidewall caving	8' Tide (seawater) at 9 ft below top of pavement (TP-1)

SUMMIT
GEOENGINEERING SERVICES

TEST PIT LOG

Test Pit # **TP-3**

Project: Harbor Park Improvements
Harbor Park Improvements
Rockland, Maine

Project #: 22330

Groundwater: 6 ft +/-
Tide at 12:35 PM

Contractor: City of Rockland
Equipment: Case 590 Backhoe
Summit Staff: C. Coolidge, P.E.

Ground Surface Elevation: N/E
Location: Top of pavement at Middle Pier
Date: 3/10/2023
Weather: Clear

Depth (ft)	DESCRIPTION	
	ENGINEERING	**GEOLOGIC/GENERAL**
	Bituminous Pavement (3" to 6" thick)	PAVEMENT
1	Shim layer of 1.5-inch Crushed Stone overlying geotextile fabric (woven)	0.5' ASSORTED FILL
2	Grading to Olive Silty CLAY, little Sand (reworked) occasional cobbles or debris, firm, damp to moist, CL	
3		
4	Black coal ash mixed with Sandy Silt, debris (iron, brick) some loam, firm, damp, OL to ML	3' 
5		
6	Tide (seawater) at 6 ft Heavy groundwater seepage at 6 ft	
7	End of Exploration at 6 ft due to sidewall caving 	6' 
8		

APPENDIX C

LABORATORY TEST RESULTS

SUMMIT
GEOENGINEERING SERVICES

Laboratory Determination of Water (Moisture) Content of Soil ASTM D2216

PROJECT NAME:	Harbor Park Improvements	PROJECT #:	22330
PROJECT LOCATION:	Harbor Park, Rockland, Maine	DRYING METHOD:	Oven Dried
CLIENT:	Landmark Corporation	DESCRIPTION:	Glacial Marine
SOURCE:	Borings & Test Pits	TECHNICIAN:	Colleen Sullivan, E.I.
COLLECTION DATE:	03/07/23	TESTING DATE:	03/13/23

Location	Sample No.	Depth	Moisture Content	Remarks
B-3	S-6	15' - 17'	35.5%	Silt, little Sand
B-3	S-7	20' - 22'	30.7%	Silty Clay
B-3	S-8	25' - 27'	30.4%	Silty Clay
B-3	S-9	30' - 32'	26.3%	Silty Clay
B-4	S-4b	7.5' - 9'	31.1%	Silt-Clay, little Gravel & Sand
B-4	S-6	15' - 17'	32.8%	Silty Clay
B-4	UT-1	25' - 27.5'	29.9%	(Atterberg Limit)
B-4	S-7	30' - 32'	28.4%	Silty Clay
TP-2	S-1	1' +/-	7.7%	(Grain Size Analysis)

REMARKS:

Reviewed By: ELS

Mailing: PO Box 515, Gardiner, ME 04345
Office: 210 Maine Avenue, Farmingdale, ME 04344

SUMMIT
GEOENGINEERING SERVICES

GRAIN SIZE ANALYSIS - ASTM D6913

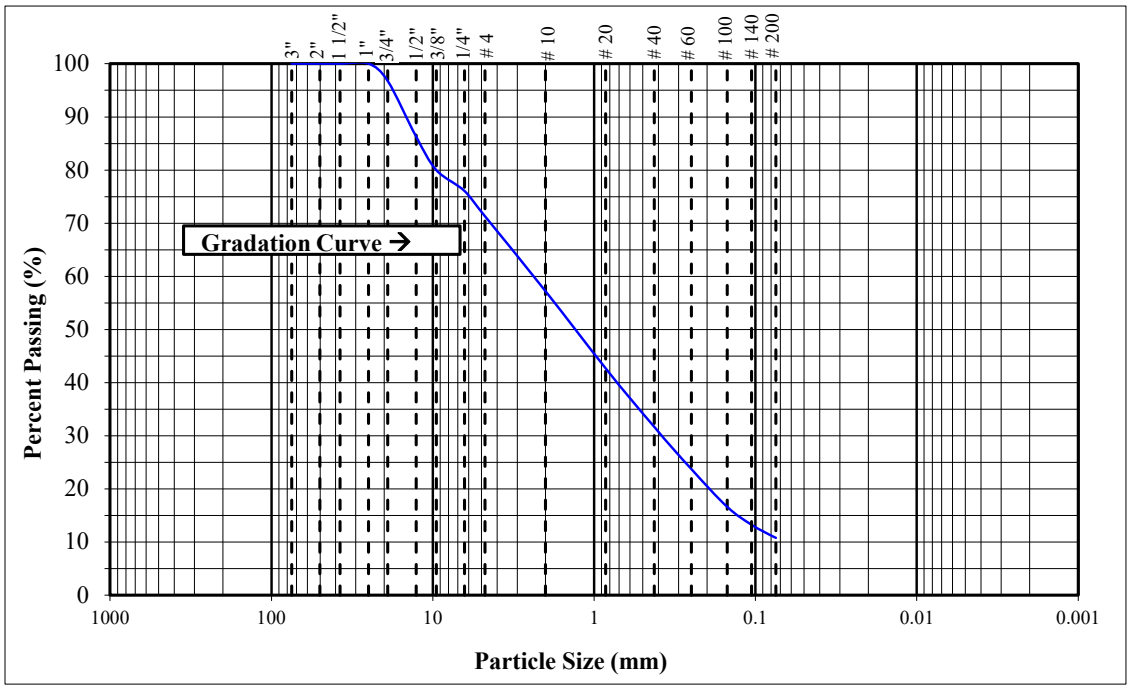
PROJECT NAME:	Harbor Park Improvements	PROJECT #:	22330
PROJECT LOCATION:	Harbor Park, Rockland, Maine	EXPLORATION #:	TP-2
CLIENT:	Landmark Corporation	SAMPLE #:	S-1
TECHNICIAN:	Colleen Sullivan, E.I.	SAMPLE DEPTH:	1' +/-
SOIL DESCRIPTION:	SAND, some Gravel, little Silt, SP-SM	TEST DATE:	3/21/2023

TEST PROCEDURE

Sample Source: Test Pit	**Sieve Stack:** Composite	**Specimen Procedure:** Moist
Test Method: Method A	**Separating Sieve(s):** 3/8 Inch	**Dispersion Type:** (NaPO3)6 Solution

DATA

STANDARD SIEVE DESIGNATION (mm)	ALTERNATIVE SIEVE DESIGNATION (in)	PERCENT PASSING (%)
75	(3 in)	100
50	(2 in)	100
37.5	(1-1/2 in)	100
25.0	(1 in)	100
19.0	(3/4 in)	97
12.7	(1/2 in)	86
9.5	(3/8 in)	80
6.35	(1/4 in)	76
4.75	(No. 4)	71
2.00	(No. 10)	57
0.850	(No. 20)	43
0.425	(No. 40)	32
0.250	(No. 60)	24
0.150	(No. 100)	17
0.106	(No. 140)	13
0.075	(No. 200)	11



REMARKS: Moisture Content = 7.7%

Reviewed By: ELS

Mailing: PO Box 515, Gardiner, ME 04345
Office: 210 Maine Avenue, Farmingdale, ME 04344

SUMMIT
GEOENGINEERING SERVICES

THIN WALLED TUBE SAMPLING - ASTM D1587

PROJECT NAME:	Harbor Park Improvements	PROJECT #:	22330
PROJECT LOCATION:	Harbor Park, Rockland, Maine	CLIENT:	Landmark Corporation
COLLECTION DATE:	3/7/2023	SAMPLE #:	UT-1
TEST DATE:	3/14/2023	TECHNICIAN:	Colleen Sullivan, E.I.

Test Boring Information

Boring Number: B-4
Drilling Method: Rotary Wash
Drilling Tooling: 4-inch Casing
Sampling Method: Tube Push

Sample Information

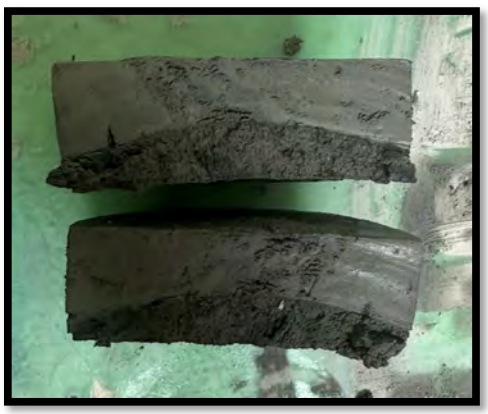
Tube Length: 30"
Recovery: 27"
Tube Diameter: 3"
Depth: 25' - 27.5'

Trial / Specimen Number	Moisture Content	Unit Weight	Torvane
1	30.1%	136 pcf	400 psf
2	21.1%	138 pcf	500 psf
3	24.0%	135 pcf	400 psf
Average	25.1%	136 pcf	440 psf

Visual Description (ASTM D2488):

25'-26.8' +/- Gray Silty CLAY, trace fine Sand & Gravel, black Organic streaks, occasional dropstones, soft, wet, CL
26.8'-27.5' +/- Gray Gravelly SAND, little-some Silt, loose, wet, SP-SM to SM

Photograph of cross sectional sample view.



Photograph of longitudinal sample view.

REMARKS: Unit weights, moistures, and torevanes were performed on clay portion of sample only.

Reviewed By: ELS

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SUMMIT
GEOENGINEERING SERVICES

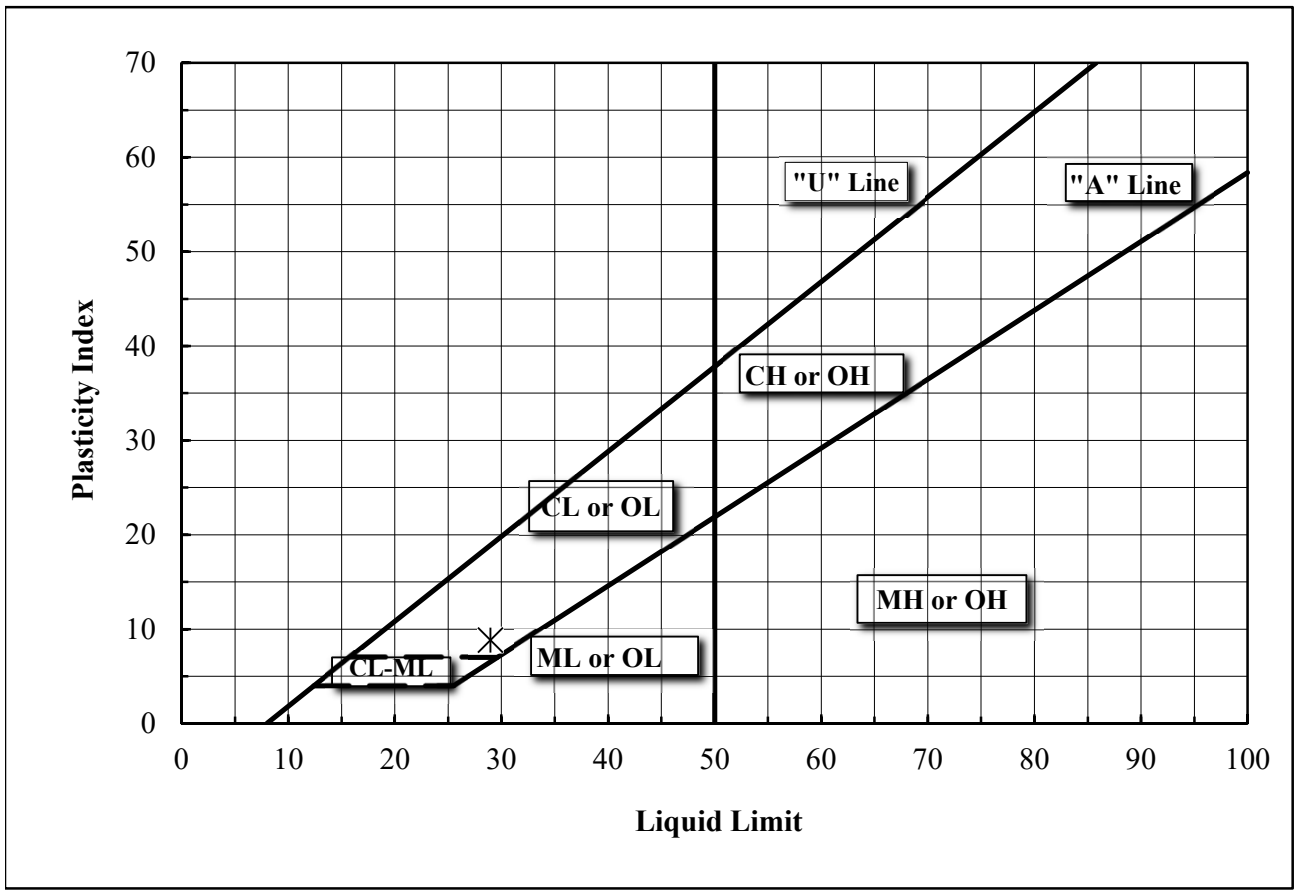
ATTERBERG LIMIT TEST - ASTM D4318

Method "A" (Multi-point)

PROJECT NAME:	Harbor Park Improvements	PROJECT NUMBER:	22330
LOCATION:	Harbor Park, Rockland, Maine	SAMPLE NUMBER:	UT-1
CLIENT:	Landmark Corporation	DEPTH:	25' - 26.8'
TEST DATE:	3/16/2023	TECHNICIAN:	Colleen Sullivan, E.I.

DATA

Source	Depth	LL	PL	PI	Classification
B-4	25' - 26.8'	29	20	9	Gray Silty CLAY, trace fine Sand & Gravel, black Organic streaks, CL



Notes: Moisture Content = 29.9%

Reviewed By: ELS

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GEOENGINEERING SERVICES

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS - ASTM D2166

PROJECT NAME:	Harbor Park Improvements	PROJECT #:	22330
PROJECT LOCATION:	Harbor Park, Rockland, Maine	CLIENT:	Landmark Corporation
COLLECTION DATE:	3/7/2023	TECHNICIAN:	Colleen Sullivan, E.I.
TEST DATE:	3/14/2023	CHECKED BY:	Erika Stewart, P.E.

Sample & Testing Information

Boring Number:	B-4	**Trimming Method:**	Tube	
Sample Number:	UT-1	**Liquid Limit (LL):**	29	
Sample Depth:	25' - 26.8'	**Plasticity Index (PI):**	9	
Sample Type:	Tube	**Rate of Strain:**	0.1	in/min
Sample State:	Intact	**H/D Ratio:**	2.2	

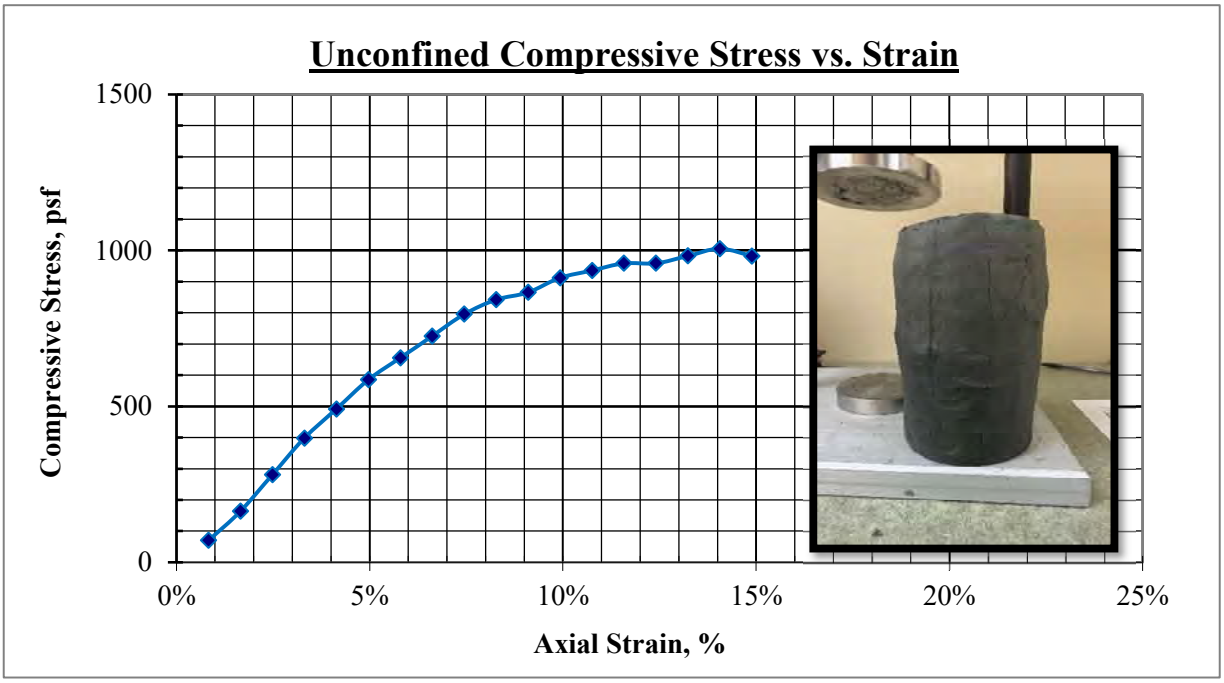
Sample Height:	6.05	in	**Sample Mass:**	1314.7 g
Sample Diameter:	2.80	in	**Moisture Content:**	22.8%
Sample Volume:	37.20	in^3	**Moist Unit Weight:**	135 pcf
Cross Sectional Area:	6.15	in^2	**Dry Density:**	110 pcf

Sample Description & Classification

Gray Silty CLAY, trace Gravel & Sand, black Organic streaks, occasional dropstones and Gravelly Sand lenses, soft, wet, CL

Test Results

Unconfined Compressive Strength:	1000	psf	**Strain at Failure:**	14%
Shear Strength:	500	psf	**Failure Type:**	Bulge



REMARKS:

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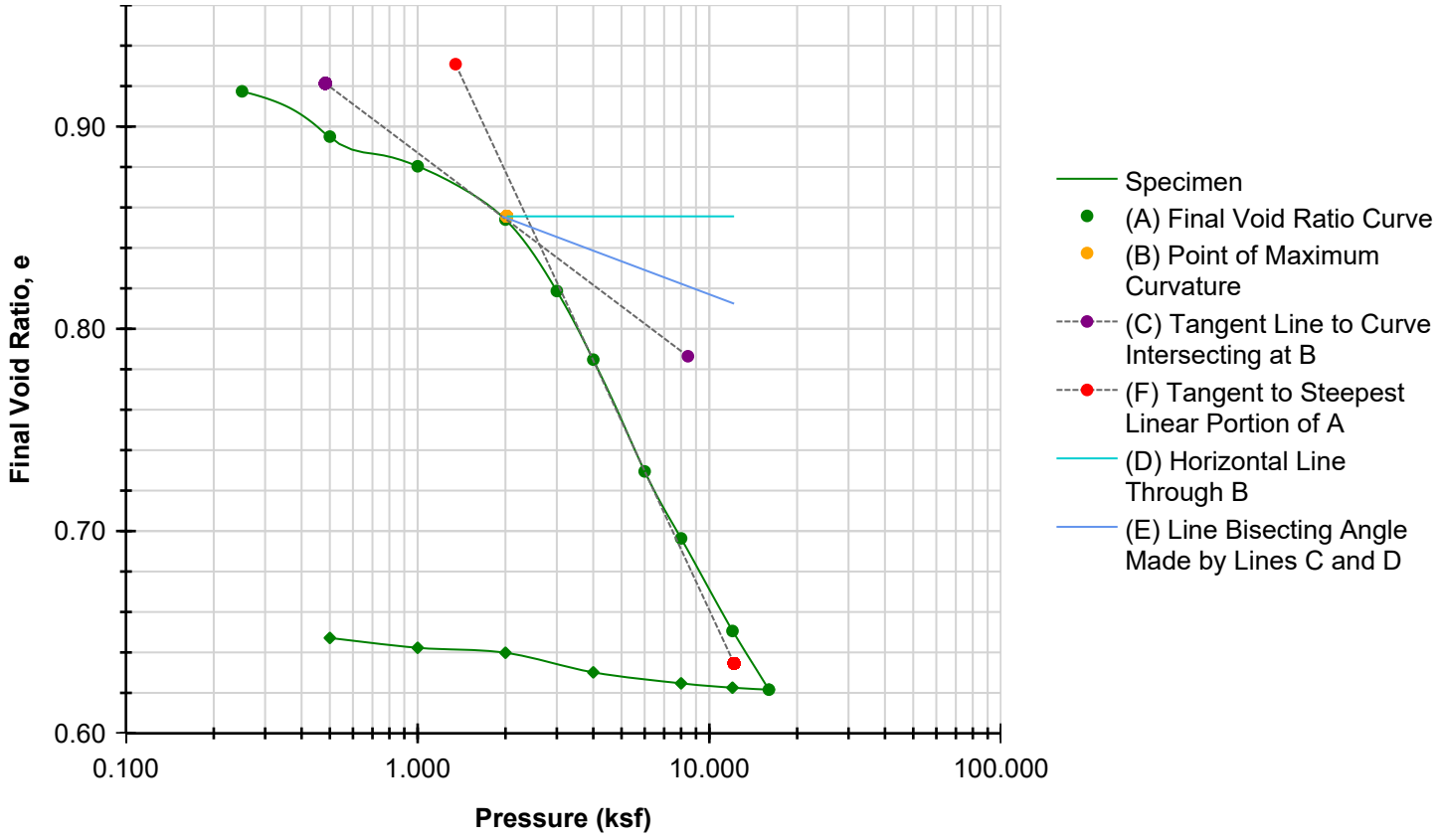
Office: 210 Maine Avenue, Farmingdale, ME 04344

SUMMIT GEOENGINEERING SERVICES

Final Voids [Log]

ASTM D2435



Preconsolidation Stress (ksf)	2.455	**Cc**	0.248	**Cr**	0.018

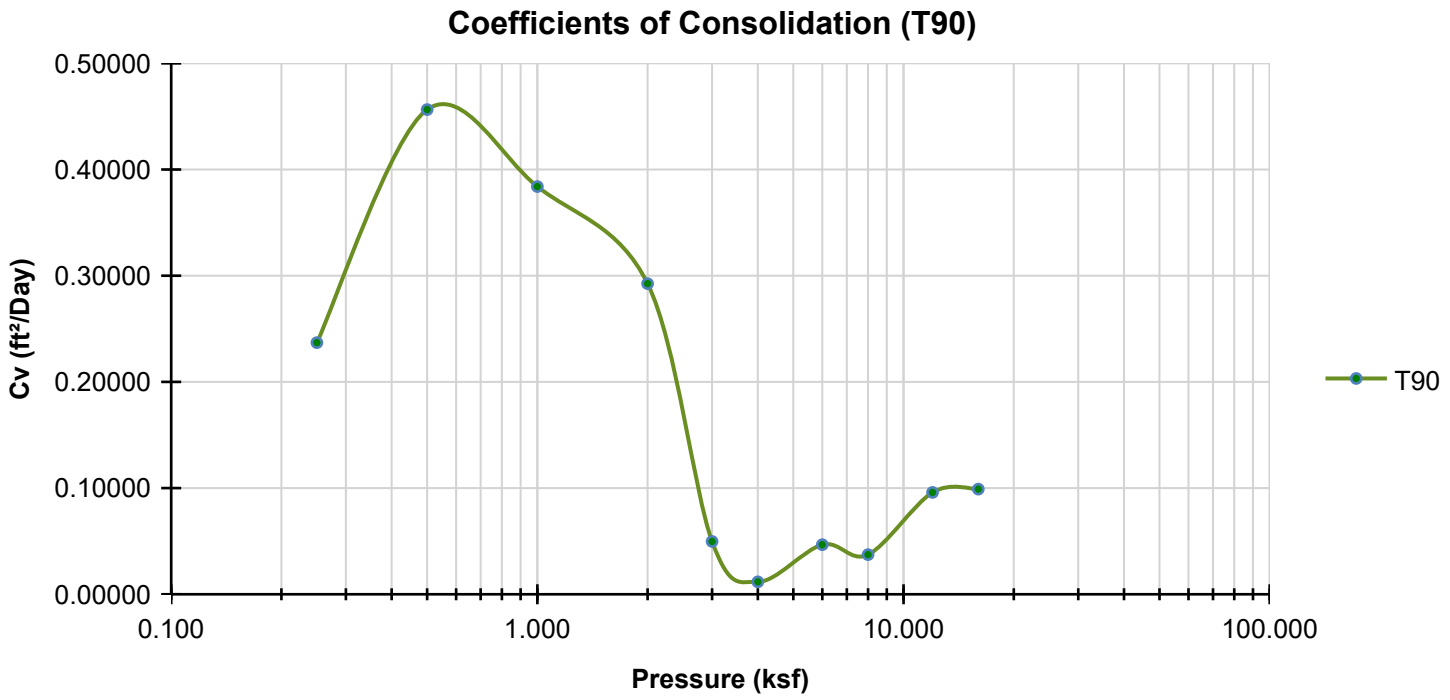
	BEFORE	AFTER			
			Liquid Limits	29	**Test Date** 3/14/2023
Moisture (%)	34.6	25.5	**Plastic Limits**	20	
Dry Density (pcf)	89.2	103.6			
Saturation (%)	102.9	106.7			
Void Ratio	0.93	0.66	**Specific Gravity**	2.75	ASSUMED

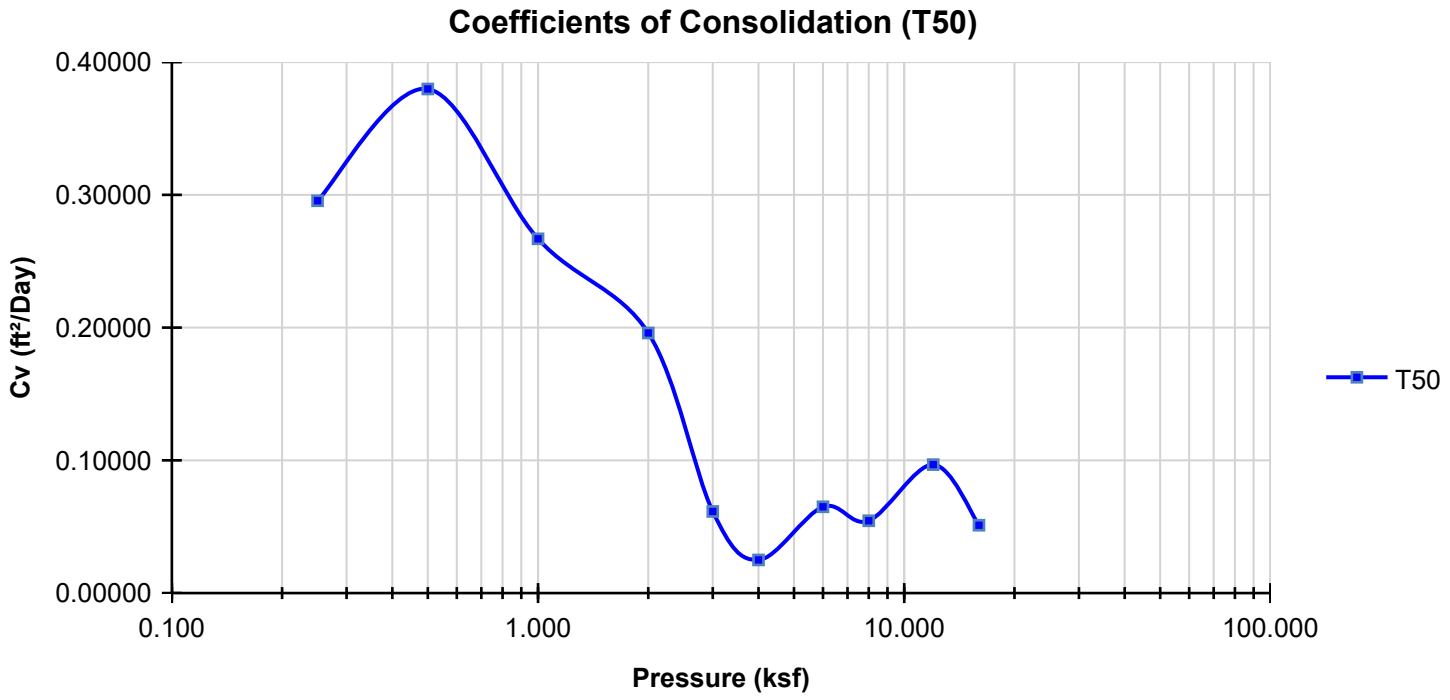
Sample Description	Gray Silty CLAY, trace fine Sand & Gravel, black Organic streaks, occasional dropstones,			
Project Number	22330	**Depth (ft)**	25-27.5	**Remarks**
Sample Number	UT-1	**Boring Number**	B-4	
Project	Harbor Park Improvements			
Client	Landmark Corporation Surveyors & Engineers			
Location	Harbor Park, Rockland, Maine			

SUMMIT
GEOENGINEERING SERVICES

Coefficients of Consolidation

ASTM D2435





Project Name: Harbor Park Improvements Project Number: 22330

Technician: Colleen Sullivan, E.I. Test Date: 3/14/2023 Checked By: _____ Date: _____

APPENDIX D

PRODUCT SPECIFICATION SHEETS

MIRAFI FW404

MIRAFI® FW404 is composed of high-tenacity monofilament polypropylene yarns, which are woven into a stable network such that the yarns retain their relative position. MIRAFI FW404 geotextile is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

TenCate Geosynthetics Americas (A Solmax Company) is accredited by Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).

MIRAFI FW404 meets Build America, Buy America Act, Pub. L. No. 117-58, div. G §§ 70901-52.

MECHANICAL PROPERTIES	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUE	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	400 (1780)	320 (1424)
Grab Tensile Elongation	ASTM D4632	%	15	15
Trapezoid Tear Strength	ASTM D4533	lbs (N)	150 (668)	165 (734)
CBR Puncture Strength	ASTM D6241	lbs (N)	1150 (5118)	

			MINIMUM ROLL VALUE
Percent Open Area	COE-02215	%	1
Permittivity	ASTM D4491	sec^{-1}	0.9
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	70 (2852)

			MAXIMUM OPENING SIZE
Apparent Opening Size (AOS)	ASTM D4751	U.S. Sieve (mm)	40 (0.425)

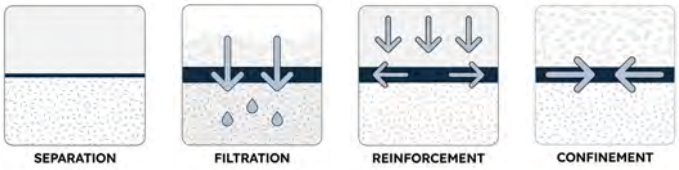
			MINIMUM TEST VALUE
UV Resistance (at 500 Hours)	ASTM D4355	% strength retained	90

PHYSICAL PROPERTIES	UNIT	TYPICAL ROLL VALUE
Roll Dimensions (width x length)	ft (mm)	15 x 300 (4.57 x 91.4)
Roll Area	yd^2 (m^2)	500 (418)
Roll Weight	lbs (kg)	285 (130)

365 South Holland Drive Pendergrass, GA 30567

Tel +1 706 693 2226 www.tencategeo.us

SOLMAX



MIRAFI HP370

MIRAFI® HP370 geotextile is composed of high-tenacity monofilament polypropylene yarns, which are woven into a network such that the yarns retain their relative position. MIRAFI HP370 geotextile is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

TenCate Geosynthetics Americas (A Solmax Company) is accredited by Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).

MIRIFI HP370 meets Build America, Buy America Act, Pub. L. No. 117-58, div. G §§ 70901-52.

MECHANICAL PROPERTIES	TEST METHOD	UNIT	MINIMUM AVERAGE ROLL VALUE	
			MD	CD
Tensile Strength (at ultimate)	ASTM D4595	lbs/ft (kN/m)	3600 (52.5)	3240 (47.3)
Tensile Strength (at 5% strain)	ASTM D4595	lbs/ft (kN/m)	1500 (21.9)	1560 (22.8)
Grab Tensile Strength	ASTM D4632	lbs (N)	400 (1780)	300 (1335)
Grab Tensile Elongation	ASTM D4632	%	10	6
Trapezoid Tear Strength	ASTM D4533	lbs (N)	135 (601)	125 (556)
CBR Puncture Strength	ASTM D6241	lbs (N)	1450 (6453)	

			MINIMUM ROLL VALUE
Flow Rate	ASTM D4491	gal/min/ft^2 (l/min/m^2)	60 (2444)
Permittivity	ASTM D4491	sec^{-1}	0.9

			MAXIMUM OPENING SIZE
Apparent Opening Size (AOS)	ASTM D4751	U.S. Sieve (mm)	30 (0.60)

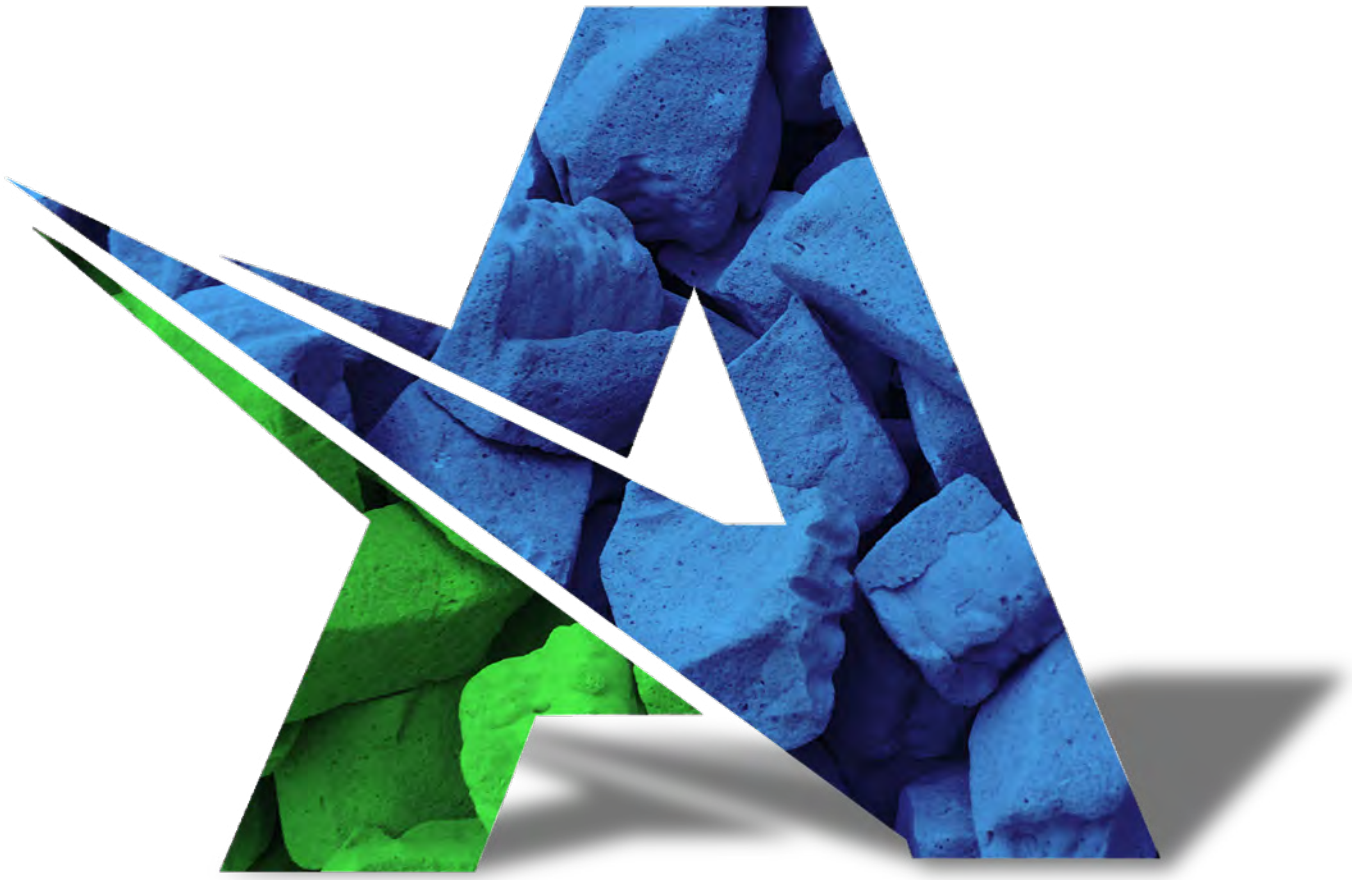
			MINUMUM TEST VALUE
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	80

PHYSICAL PROPERTIES	UNIT	ROLL SIZE
Roll Dimensions (width x length)	ft (m)	15 x 300 (4.5 x 91)
Roll Area	yd^2 (m^2)	500 (418)
Estimated Roll Weight	lbs (kgs)	270 (122.5)

365 South Holland Drive Pendergrass, GA 30567

Tel +1 706 693 2226 www.tencategeo.us

SOLMAX



AERO® AGGREGATES

Ultra-Lightweight

Foamed Glass Aggregate (UL-FGA®)

MATERIAL & APPLICATIONS

HIGHLY FRICTIONAL • NON-LEACHING • ROT-RESISTANT • NON-FLAMMABLE • DURABLE • SAFE

made from recycled container glass

made from recycled container glass

aeroaggregates.com

UL-FGA®

AeroAggregates produces ultra-lightweight foamed glass aggregate (UL-FGA) from recycled container glass

The idea of foaming waste glass to create a building material has been known for decades but it wasn't until the 1980s when full scale production began in Europe. These aggregates are 85-90% lighter than quarried aggregates, have a high friction angle, and are good insulators due to their closed cell structure. The manufacturing process converts glass cullet into a chemically stable, non-leaching, rot-resistant, non-flammable and durable construction material.

The initial use of UL-FGA was to prevent frost heave in frost susceptible soils throughout Scandinavia. However, the low unit weight and high frictional properties of the material led to other applications and the demand for UL-FGA has continued to increase.

Current civil engineering challenges require construction on soft soils, reduction of lateral earth pressures, decreased loads on structures, and the protection of tunnels and underground utilities. The unique properties of UL-FGA can address these challenges and be a sustainable solution through the beneficial reuse of glass containers.

APPLICATIONS	UL-FGA has been successfully used in building and infrastructure construction projects for over 25 years.

INFRASTRUCTURE

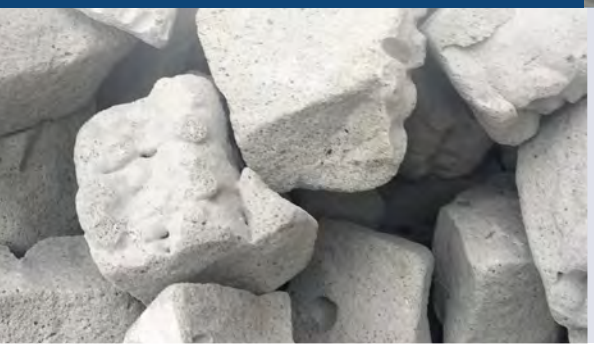
- Embankments
- Retaining Walls & Bridge Abutments
- Roadway Widening
- Tunnels & Culverts
- Utilities
- Load Distribution

COMMERCIAL CONSTRUCTION

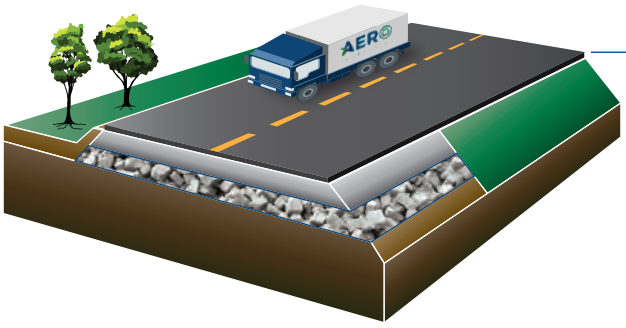
- Foundation Walls & Slabs
- Greenroofs
- Plaza Decks

HIGHLY FRICTIONAL • NON-LEACHING • ROT-RESISTANT • NON-FLAMMABLE • DURABLE • SAFE

INFRASTRUCTURE



Ultra-lightweight aggregate provides solutions for the challenges of today's infrastructure projects. Foamed glass aggregate is ideal for projects that require fill to be placed over soft compressible soils or over areas with underground utilities. Large embankments can be built with low net surcharge due to the low unit weight and high friction angle of UL-FGA.

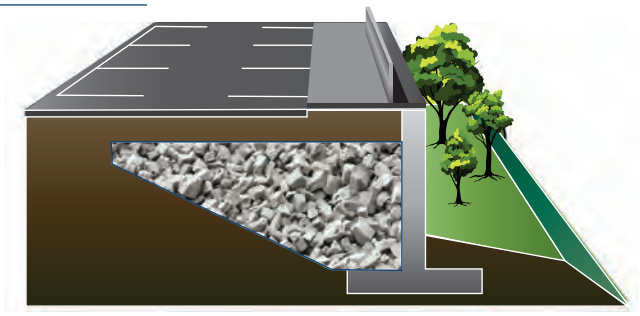


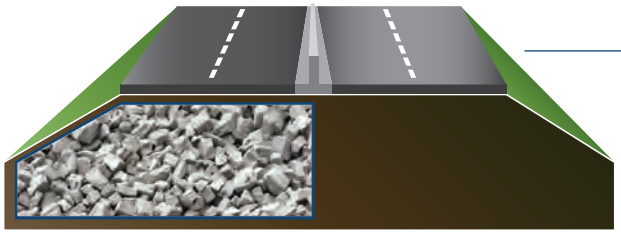
EMBANKMENTS

- Lightweight fill over compressible soils and/or utilities
- Insulating fills for frost susceptible soils
- Resiliency projects requiring fill on soft soil
- Reduced excavation for soil balancing
- Less soil removal and disposal
- Potential to stay out of the water table

RETAINING WALLS & BRIDGE ABUTMENTS

- Lightweight fill behind retaining walls and wing walls
- Greatly reduces lateral load
- Easily excavated for placement or repair of utilities
- Pullout testing completed on various types of reinforcement
- Free draining material
- Reduces settlement of embankments for bridge approaches



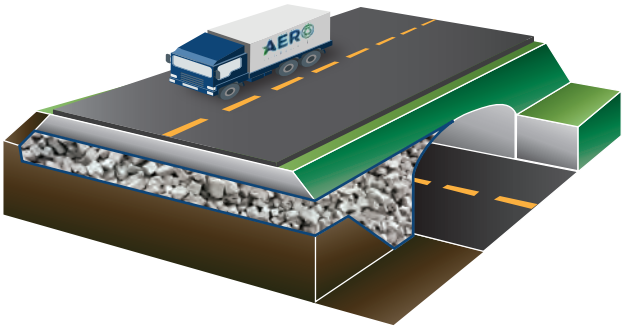


ROADWAY WIDENING

- Roadway widening and shoulder repair
- Slopes up to 1:1 can be built without additional reinforcement
- Increased slope inclination helps with right-of-way limitations

TUNNELS & CULVERTS

- Lightweight backfill over and around tunnels and culverts

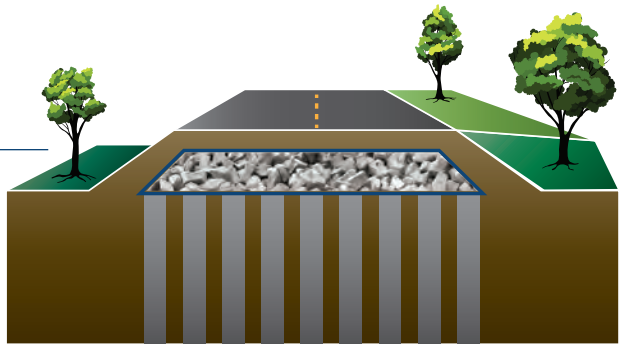


UTILITIES

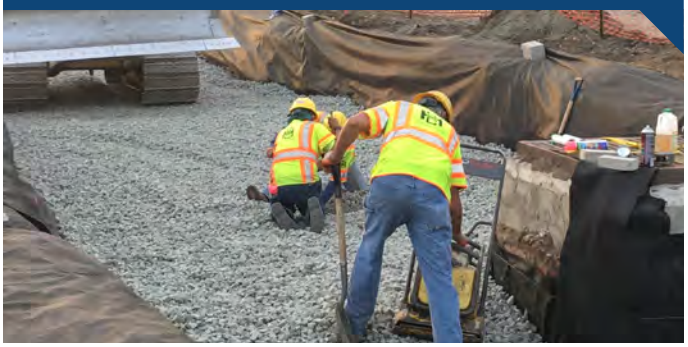
- Lightweight backfill for sensitive utilities
- Bedding layer for utilities on soft compressible soils
- Insulating backfill for frost protection
- High friction angle creates soil arching to further reduce loads on utilities
- Heat resistant up to 800° F

LOAD DISTRIBUTION

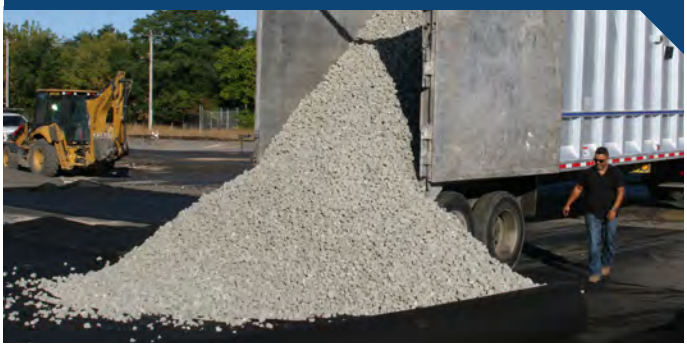
- Reduced weight of embankment fill over load distribution platforms
- Optimize number of piles
- Use in locations where in situ ground improvement is not possible due to underground utilities



ACCELERATED CONSTRUCTION DUE TO LIFT THICKNESS

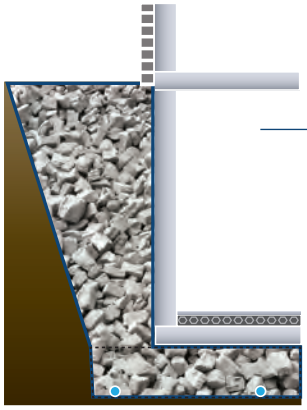


UP TO 100 CUBIC YARDS PER TRUCK



COMMERCIAL

AeroAggregates UL-FGA provides multiple functions in commercial construction applications. Foamed glass aggregate is lightweight against foundation walls or under slabs and provides excellent insulation and drainage. In addition, UL-FGA is not flammable, will not rot or decay, and is easy to place, especially in difficult to reach areas or confined spaces.

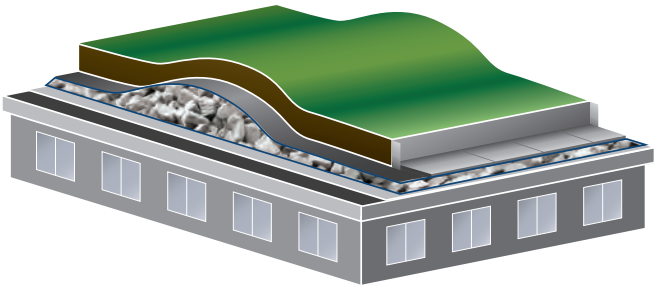


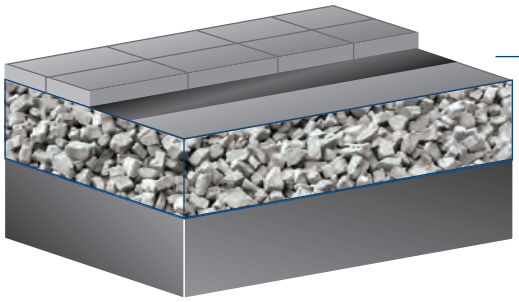
FOUNDATION WALLS & SLABS

- Support of excavation backfill and retaining walls
- Under concrete slabs – as a capillary break and insulator
- Vertical backfill for insulation drainage, and reduced load
- Rot-resistant, non-flammable
- Insulation protection against frost heave

GREENROOFS

- Easily contours and shapes due to friction angle of aggregate
- Insulating and draining layer on roofs
- Reduces load on roof structure





PLAZA DECKS

- Insulates substructure or protects against frost heave
- Free draining
- Reduces load on roof structure or soft soils

AERO® AGGREGATES

TECHNICAL DATA

AERO AGGREGATES

AeroAggregates UL-FGA G15

Ultra-Lightweight Foamed Glass Aggregate

Density (Unit Weight)	
Uncompacted dry bulk density (ASTM C29/C29M/ AASHTO T 19)[1]	12-15 pcf
Estimated compacted dry density	
1.11 Compression Ratio (10% Compaction of Each Lift)	13.3-16.7 pcf
1.25 Compression Ratio (20% Compaction of Each Lift)	15-18.8 pcf
Estimated buoyant unit weight	-15 pcf

Typical Gradation Characteristics (uncompacted) [ASTM C136/ AASHTO T 27] [1]	
D85	2.5” (maximum)
D15	0.375” (minimum)

Physical Characteristics	
Hydraulic Conductivity (ASTM D 2434-68)	3.0 cm/sec typical
Moisture Content	
Volumetric (%)	0-10 (6% typical)
Gravimetric (%) [ASTM C566/ AASHTO T 255][1]	0-60 (25% typical)
Particle Specific Gravity (AASHTO T 85)	0.4 (typical)
Porosity	
Uncompacted	0.5
1.25 Compression Ratio	0.38
Soundness (% Loss)	
Magnesium Sulfate (ASTM C88/AASHTO T 104[1])	4.1-14
Sodium Sulfate (ASTM C88/AASHTO T 104[1])	3.1- 6.9
Stability	
Angle of internal friction – loose	45°
Angle of internal friction – up to 1200 psf (ASTM D3080[1])	55°
Angle of internal friction – up to 3000 psf (ASTM D3080[1])	41°

[1]Modified test method due to particle size/density

Physical Characteristics (cont.)	
Impurities	
Clay lumps (ASTM C142)	0
Organic impurities (ASTM C40)	0
Popouts (ASTM C151)	0
Electrical Resistance	
Lab (AASHTO T 288)	15,600 ohm-cm

Chemical Characteristics	
Ignition loss (ASTM C114)	0
Sulfates (ppm) [AASHTO T 290]	11
Chlorides (ppm) [AASHTO T 291]	<10
TCLP (SW-846)	Non-leaching

Daily Quality Control Testing	
Bulk dry density, maximum [EN 1097-3][1]	15 pcf
Compressive Strength at 20% Deformation, minimum [EN 1097-11][1]	15,000 psf

Advantages

Good Insulator	Capillary Break	Freeze-Thaw Stable	Rodent Resistant
Highly-Permeable	Volume Stable	Non-Flammable	Accelerated Construction

Shipping & Handling 100 CY/Truckload

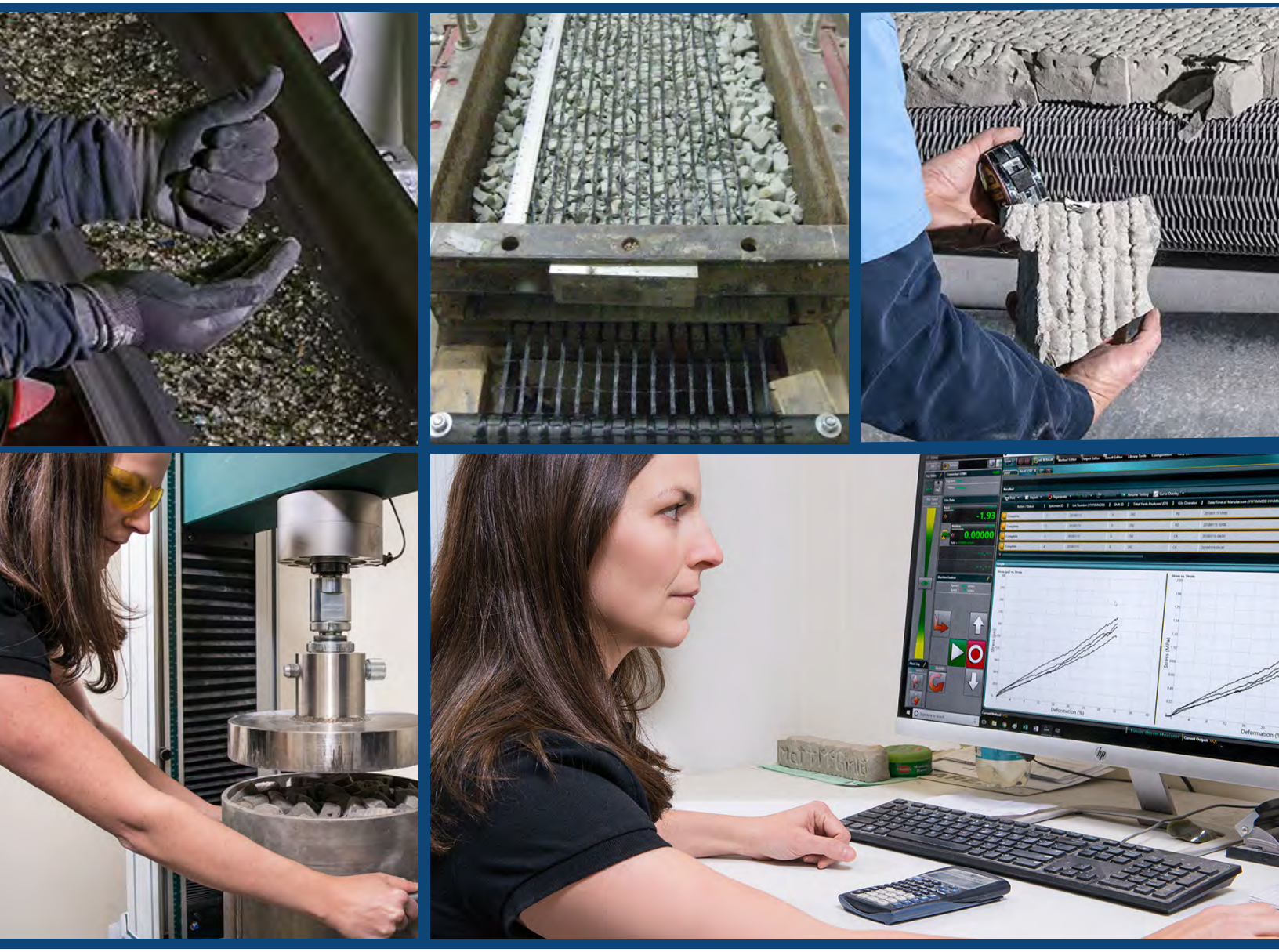
By shipping up to 100 CY per truckload, we are not only reducing the number of trucks on the road, helping logistics, but we also are reducing the carbon footprint of your aggregate needs.

Material can also be supplied in super sacks for easy placement on sites with confined access.

[1]Modified test method due to particle size/density

For more information, please visit aeroaggregates.com or call (833) 261-8499.

AeroAggregates of North America, LLC
1500 Chester Pike | Eddystone, PA 19022
(833) 261-8499 | **www.aeroaggregates.com**



TECHNICAL SUPPORT

AeroAggregates offers in-house technical support for designers and contractors working with foamed glass aggregate. Our facility includes state-of-the-art testing equipment for both quality control, performance testing, and research and development.

AERO® AGGREGATES

QUALITY CONTROLLED

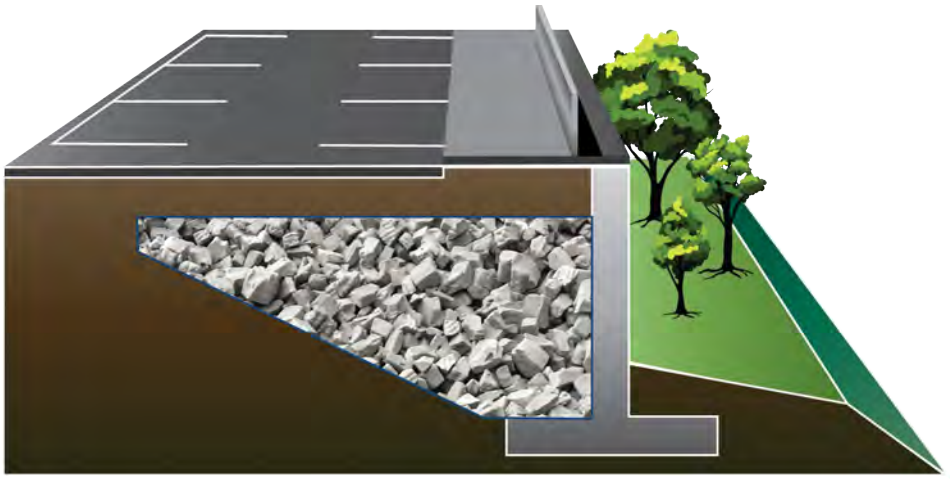
PERFORMANCE TESTED

aeroaggregates.com

06-2019

AERO AGGREGATES

AeroAggregates of North America, LLC
1500 Chester Pike | Eddystone, PA 19022
(833) 261-8499 | **www.aeroaggregates.com**



LIGHTWEIGHT BACKFILL

V 1.4 | UPDATED APRIL 2020

AERO® AGGREGATES

Ultra-Lightweight
Foamed Glass Aggregate (UL-FGA)

INSTALLATION GUIDELINES

HIGHLY FRICTIONAL • NON-LEACHING • ROT-RESISTANT • NON-FLAMMABLE • DURABLE • SAFE

MADE IN USA
100% RECYCLED CONTAINER GLASS

Installation of Ultra-Lightweight Foamed Glass Aggregate (UL-FGA)

Aero Aggregates AeroFill or G15 For Lightweight Backfill

A | PRODUCT HANDLING

1. Protect the UL-FGA before, during, and after installation, and protect the work and materials of all other trades.

B | INSTALLATION

1. Place UL-FGA at locations indicated on the drawings. The area to be filled shall not have any standing water (including ice) in it prior to placement of the UL-FGA.

2. Construction equipment, other than for placement and compaction, should avoid operating on the exposed UL-FGA. If construction sequencing necessitates trafficking on the UL-FGA layer, minimize construction traffic to the extent possible and contact Aero Aggregates for guidance.

3. Foamed glass aggregate for use as lightweight backfill (e.g. against structures or behind retaining walls) may be placed in maximum lift thicknesses of 12 inches and compaction shall be performed with a plate compactor weighing between 110 and 220 lbs. Compaction shall be completed by making a minimum of four (4) full passes with the plate compactor. One (1) full pass is defined as a minimum of 100% coverage of the plate passing over the top of the lift.

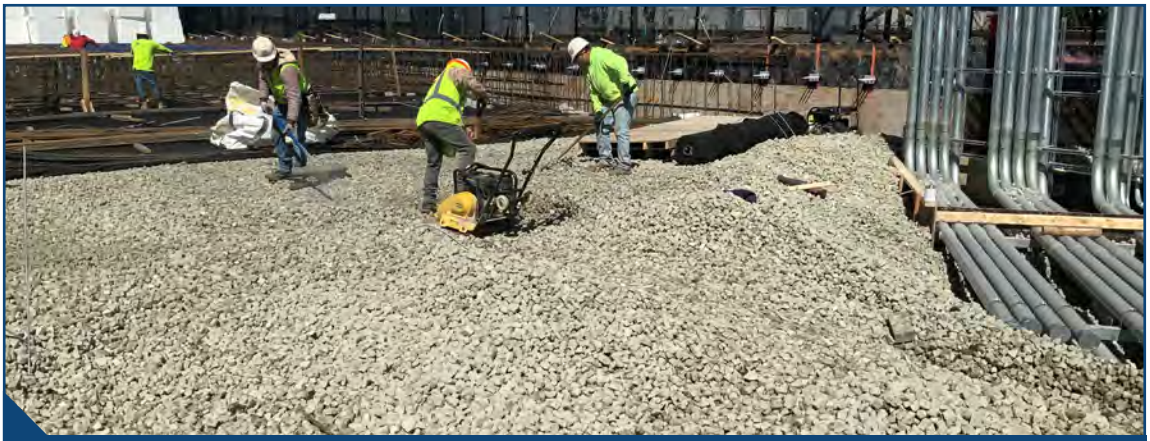


FIG. 1: Compaction of UL-FGA with a plate compactor.

4. For compaction using tracked equipment, foamed glass aggregate shall be placed in uncompacted lift thicknesses of 24 inches and compaction shall be performed with a tracked excavator or dozer with ground pressures of between 625 psf and 1,025 psf. Compaction using tracked equipment shall be completed by placing the initial lift thickness, and then raising the blade or bucket and tracking over the layer for a total of four (4) full passes. One (1) full pass is defined as a minimum of 100% coverage of the tracks passing over the top of the lift.

5. If the Contractor must vary the method described in B.3 or B.4 (i.e., differing lift thickness or equipment), the Contractor should reach out to Aero Aggregates for installation guidance.

6. For areas that will not experience typical highway loading, the number of passes used to compact the foamed glass aggregate lift may be reduced in accordance with the Project Documents.

FIG. 2: Spreading and compaction of UL-FGA with a dozer.

FIG. 3: Compaction of UL-FGA with an excavator.

7. Lifts of UL-FGA can be built with 1:1 side slopes without additional reinforcement.

8. A nonwoven geotextile is recommended as a separator between subgrade and the initial lift of foamed glass aggregates as well as above the final lift and on side slopes as a separator between the foamed glass aggregates and capping layer. A 6 oz./yd^2 (minimum) needle punched nonwoven with a grab tensile strength of 160 lbs. per ASTM D4632 is recommended. The geotextile shall be sewn together or overlapped 12 inches or greater at geotextile seams. The geotextile shall not be left exposed for longer than 14 days.

9. Capping material or subbase is placed above the final lift of UL-FGA in accordance with Project Documents.

FIG. 4: Placement of capping material on UL-FGA.

C | TESTING & SUBMITTALS

1. The Contractor will test each truckload of delivered UL-FGA for loose bulk density to ensure it meets specifications. If necessary, this value should be adjusted by the moisture content of the UL-FGA to determine the dry, loose bulk density. Bulk density testing shall be performed in the presence of the Owner's Representative if required.

2. The Contractor shall submit a Foamed Glass Aggregate Installation Plan to the Owner's Representative prior to foamed glass aggregate installation. At a minimum, the Installation Plan shall identify the area(s) to be filled, the equipment that shall be used for the compaction of the UL-FGA (include equipment data sheets to verify weight/ground pressures), the proposed number of passes (four [4] full passes unless otherwise specified in the design documents), and the approximate number of lifts that will be required in each area.

3. Compaction shall be performed in the presence of the Owner's Representative in order to observe and verify construction in accordance with the Foamed Glass Aggregate Installation Plan.

AERO AGGREGATES

Aero Aggregates of North America, LLC
1500 Chester Pike | Eddystone, PA 19022
(833) 261-8499 | **www.aeroaggregates.com**

ATTACHMENT A

Preliminary Engineering Plans

CITY OF ROCKLAND
DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
AT
HARBOR AND BUOY PARKS

SITE LOCATION MAP

SCALE: 1" = 200'

SHEET INDEX

PRELIMINARY ENGINEERING DRAWINGS
(NOT FOR CONSTRUCTION)

OCTOBER 6, 2023

CIVIL ENGINEER

LANDMARK CORPORATION
SURVEYORS & ENGINEERS
135 Rockland Street Rockport, Maine 04856 Phone: (207) 236-6757 www.landmarkmaine.com

ELECTRICAL ENGINEER

MAFFETT LOFTIS ENGINEERING, LLC

ARCHITECT

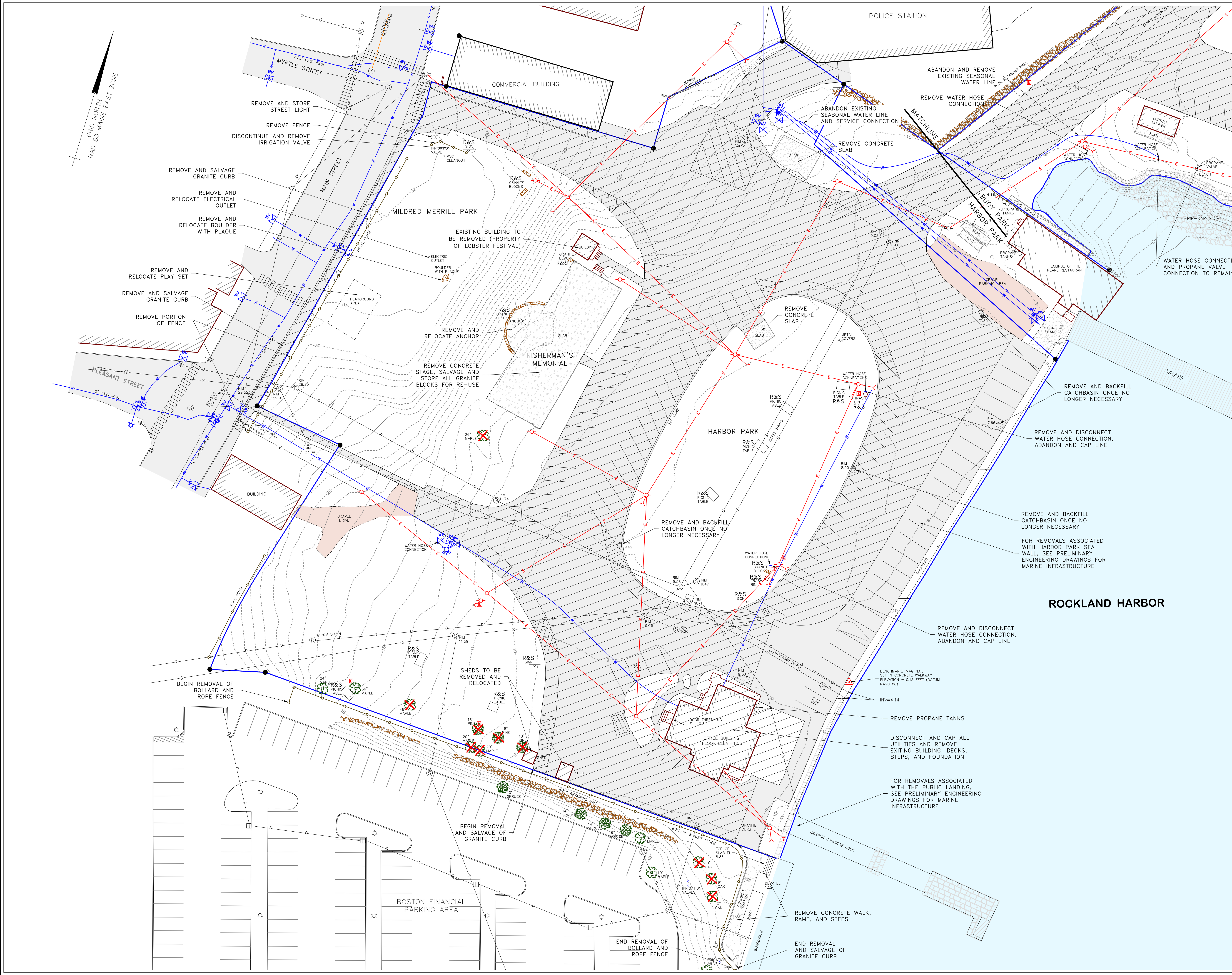
MERRIAM architects
www.merriamarchitects.com

LANDSCAPE ARCHITECT

RS LEONARD
Landscape Architecture
29 Bridge Street – Topsham, ME 04086
Tel. 207-450-9700 – www.rslla.com

SHEET DESIGNATION:

C0



LEGEND:

- IRON PIN FOUND
- EXISTING UTILITY POLE
- EXISTING GUY ANCHOR
- CONIFEROUS TREE
- DECIDUOUS TREE
- EXISTING DRAINAGE
- EXISTING OVERHEAD UTILITY
- EXISTING WATER MAIN
- EXISTING SEWER MAIN
- EXISTING WATER VALVE
- EXISTING HYDRANT
- EXISTING SEWER MANHOLE
- EXISTING CATCH BASIN
- EXISTING CATCHBASIN
- EXISTING ELECTRIC PANEL
- EXISTING CONTOUR
- BOUNDARY LINE (BEAL)
- REMOVE EX. OVERHEAD UTILITY
- REMOVE EX. UTILITY POLE
- REMOVE EX. ELECTRIC PANEL
- R&S REMOVE AND STORE
- REMOVE CONIFEROUS TREE
- REMOVE DECIDUOUS TREE
- PAVEMENT REMOVAL

REMOVAL NOTES:

1. UNLESS OTHERWISE NOTED, REMOVED ITEMS SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND FEDERAL REGULATIONS.
2. CONTRACTOR IS RESPONSIBLE FOR ALL TRANSPORTATION AND DISPOSAL FEES AND PERMITS.
3. FOR ALL ITEMS LABELED R&S (REMOVE & STORE), CONTRACTOR TO COORDINATE WITH THE CITY OF ROCKLAND HARBOR MASTER FOR STORAGE LOCATION.
4. CONTRACTOR TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES IF SOIL DISTURBANCE OCCURS DURING REMOVAL.

SURVEYOR'S NOTES:

PROPERTY LINES IN SOLID BLUE ARE BASED UPON "REAL ESTATE BOUNDARY SURVEY FOR THE CITY OF ROCKLAND" BY F.E. BEAL SURVEYING COMPANY, DATED DECEMBER 2010, RECORDED IN PLAN CABINET 21 SHEET 117.

CONTOUR INTERVAL IS 1 FOOT. VERTICAL DATUM IS NAVD 1988.

ORIENTATION IS REFERENCED TO GRID NORTH, NAD 83 DATUM, MAINE STATE PLANE EAST ZONE.

LANDMARK CORPORATION
SURVEYORS & ENGINEERS
135 ROCKLAND STREET ROCKPORT, MAINE 04856 PHONE: (207) 236-6757 WWW.LANDMARKMAINE.COM

FIELD WORK DATE: 4/2022
FIELD WORK BY: KMB/EST
DRAFTED BY: KBM/MJS
CHECKED BY: MJS
PLAN DATE: **OCTOBER 6, 2023**

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

EXISTING CONDITIONS AND REMOVAL PLAN
HARBOR PARK

STATE OF MAINE
MICHAEL J. SABATINI
9053
LICENSED PROFESSIONAL ENGINEER
10/6/23

CITY OF ROCKLAND

DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: 1"=30'
JOB No.: 16 - 012

SHEET DESIGNATION:
C1

LEGEND:

- IRON PIN FOUND
- EXISTING UTILITY POLE
- EXISTING GUY ANCHOR
- CONIFEROUS TREE
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- EXISTING DRAINAGE
- EXISTING OVERHEAD UTILITY
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1 inch = 30 ft.

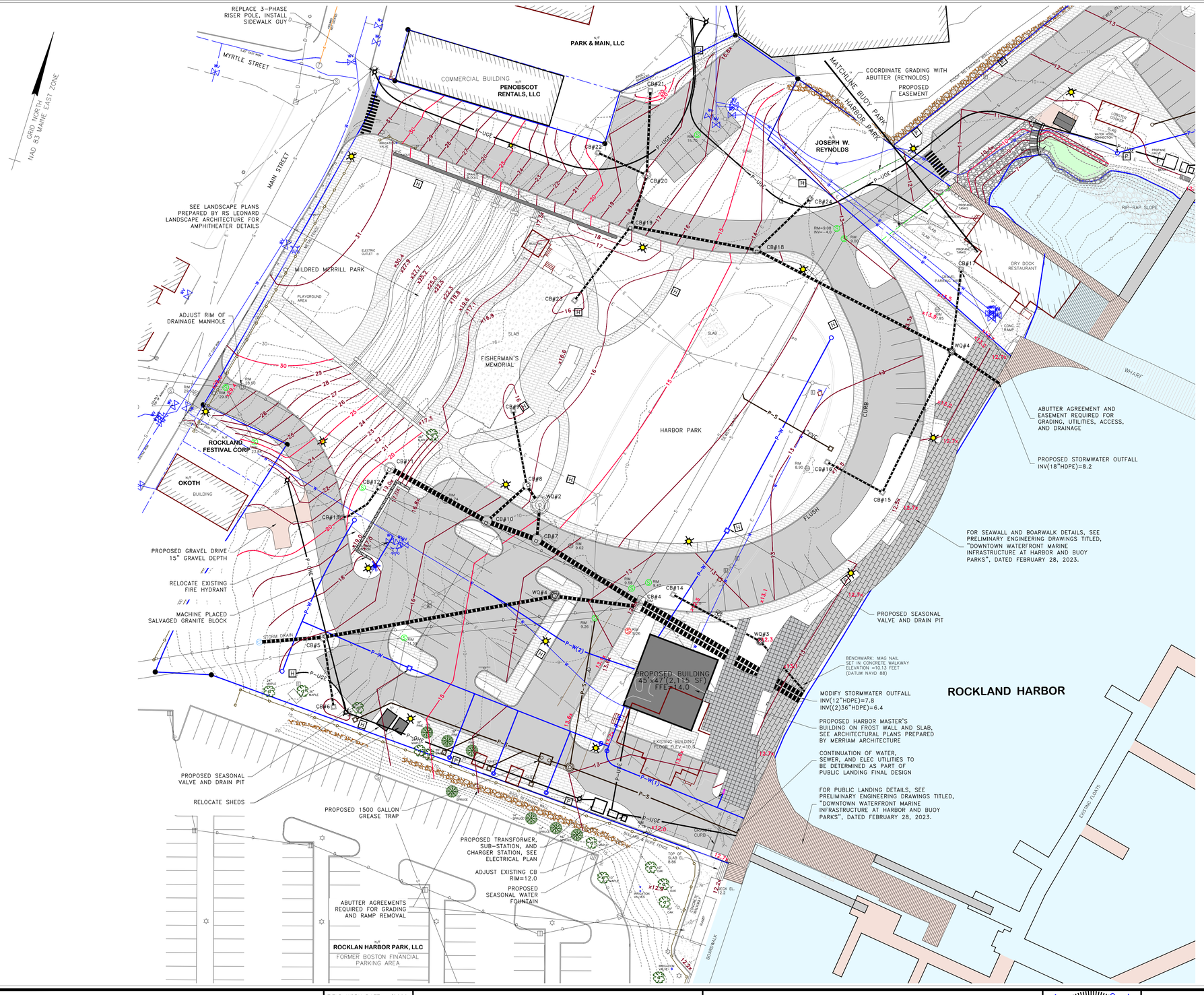
EXISTING CONDITIONS AND REMOVAL PLAN
BUOY PARK

STATE OF MAINE
MICHAEL J. SABATINI 9053
LICENSED PROFESSIONAL ENGINEER
10/6/23

CITY OF ROCKLAND
DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: 1"=30' JOB No.: 16 - 012

SHEET DESIGNATION: **C2**



LEGEND:

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- EXISTING GUY ANCHOR
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- DECIDUOUS TREE
- EXISTING DRAINAGE
- EXISTING OVERHEAD UTILITY
- EXISTING WATER MAIN
- EXISTING SEWER MAIN
- EXISTING WATER VALVE
- EXISTING HYDRANT
- EXISTING SEWER MANHOLE
- ADJUST RIM OF EXISTING MANHOLE TO PROP. GRADE
- EXISTING CATCH BASIN
- EXISTING CATCHBASIN
- EXISTING PLANTING BED
- EXISTING ELECTRIC PANEL
- EXISTING CONTOUR
- BOUNDARY LINE (BEAL)
- TAX MAP LINE
- PROPOSED SEWER
- PROPOSED SEWER CONNECTION PIT
- PROPOSED WATER LINE
- PROPOSED WATER VALVE
- PROPOSED WATER SPIGOT
- PROPOSED SEASONAL WATER SPIGOT
- PROPOSED UNDERGROUND UTILITY
- PROPOSED OVERHEAD UTILITY
- PROPOSED UTILITY POLE
- PROPOSED ELECTRIC PEDESTAL
- PROPOSED ELECTRIC HANDHOLE
- PROPOSED STORMDRAIN
- PROPOSED CATCH BASIN (4' DIA.)
- PROPOSED CATCH BASIN (TYPE F)
- PROPOSED SPOT ELEVATION
- PROPOSED CONTOURS
- PROPOSED SITE LIGHT
- PROPOSED PAVER PATH

SITE NOTES:

1. THIS PLAN IN CONJUNCTION WITH ARCHITECTURAL, LANDSCAPE, AND ELECTRICAL PLANS BY OTHERS (SEE COVER SHEET) IS INTENDED TO SHOW PRELIMINARY ENGINEERING (30% DESIGN, NOT FOR CONSTRUCTION) OF UPLAND IMPROVEMENTS AT HARBOR PARK AND BUOY PARK. THE IMPROVEMENTS ARE IN ACCORDANCE WITH A MASTER PLAN VETTED AND ESTABLISHED BY THE ROCKLAND DOWNTOWN WATERFRONT AD HOC COMMITTEE. THESE UPLAND IMPROVEMENTS ARE COORDINATED WITH MARINE IMPROVEMENTS TO THE PUBLIC LANDING, HARBOR PARK SEAWALL, AND MIDDLE PIER AS SHOWN ON PRELIMINARY ENGINEERING PLANS TITLED"DOWNTOWN WATERFRONT MARINE INFRASTRUCTURE AT HARBOR AND BUOY PARKS", DATED FEBRUARY 28, 2023.

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5. STORMDRAIN AND STORMWATER QUALITY TREATMENT DEVICES SHOWN SHALL BE CONSIDERED PRELIMINARY AND WILL NEED ADDITIONAL HYDROLOGIC AND HYDRAULIC ANALYSIS UPON FURTHER DESIGN EFFORTS.

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1 inch = 30 ft.

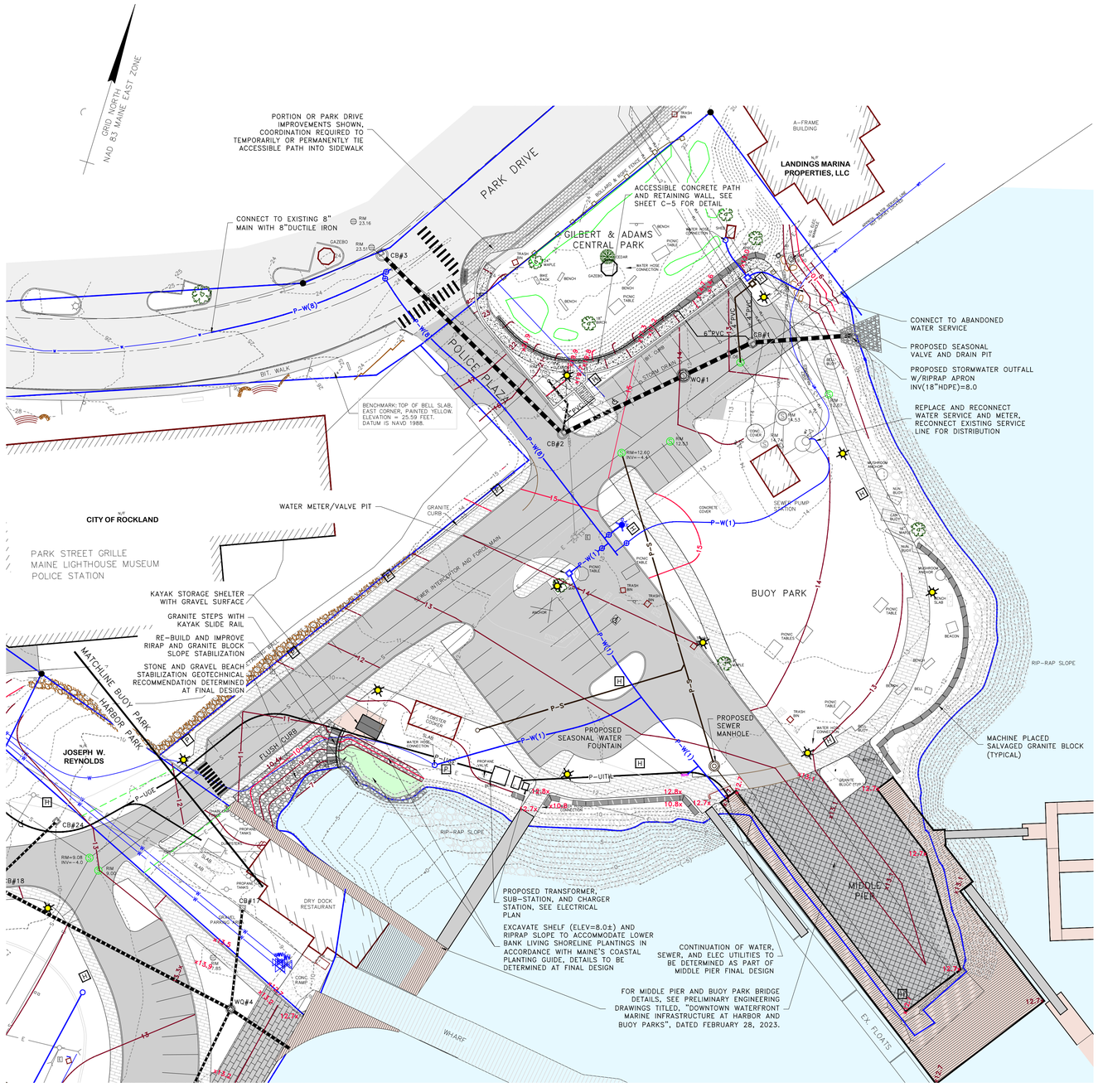
SITE PLAN
HARBOR PARK

STATE OF MAINE
MICHAEL J. SABATINI 9053
LICENSED PROFESSIONAL ENGINEER
10/6/23

CITY OF ROCKLAND
DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: 1" = 30'
JOB No.: 16 - 012

SHEET DESIGNATION:
C3



PRELIMINARY CATCH BASIN SCHEDULE

CB#	RIM	INV. IN	INV. OUT	NOTES:
1	12.6	8.6(24"HDPE)	8.5(24"HDPE)	4' DIAMETER, FLAT TOP 4" FRAME WITH STANDARD GRATE
2	15.3	11.3(24"HDPE)	11.2(24"HDPE)	4' DIAMETER, FLAT TOP 4" FRAME WITH STANDARD GRATE
3	23.6	19.8(8"PVC) 19.0(18"HDPE) 14.2(18"HDPE)	13.7(24"HDPE)	5' DIAMETER 6" FRAME WITH CASCADE GRATE
4	12.5	7.6(36"HDPE) 7.6(24"HDPE)	7.5(36"HDPE) 7.5(36"HDPE)	CAST IN PLACE, EXTENSION OF EXISTING TANK
5	16.7	TBD(24"HDPE) TBD(12"HDPE)	TBD(24"HDPE)	4' DIAMETER 6" FRAME WITH SOLID COVER
6	15.9	–	13.4(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
7	14.6	8.3(36"HDPE) 8.8(12"HDPE)	8.2(36"HDPE)	6' DIAMETER 6" FRAME WITH STANDARD GRATE
8	16.2	11.0(12"HDPE) 9.2(12"HDPE)	9.1(12"HDPE)	4' DIAMETER 6" FRAME WITH SOLID COVER
9	16.5		14.6(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
BLANK	–		–	– –
10	15.6	8.5(36"HDPE)	8.4(36"HDPE) TBD(12"HDPE)	6' DIAMETER FLOW SPLITTER 6" FRAME WITH STANDARD GRATE
11	19.5	8.4(36"HDPE) TBD(12"HDPE)	9.1(36"HDPE)	6' DIAMETER 6" FRAME WITH STANDARD GRATE
12	18.5	14.8(12"HDPE)	14.7(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
13	20.0	– –	15.8(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
14	12.0		9.5(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
15	12.0	9.7(12"HDPE)	9.6(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
16	12.1		10.0(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
17	13.0		10.0(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
18	13.8	9.8(12"HDPE) 9.7(15"HDPE)	9.6(24"HDPE)	4' DIAMETER 6" FRAME WITH CASCADE GRATE
19	17.6	12.7(15"HDPE) 12.8(12"HDPE)	12.5(15"PVC)	4' DIAMETER 6" FRAME WITH CASCADE GRATE
20	18.0	13.6(15"HDPE) 13.3(12"HDPE)	13.5(15"HDPE)	4' DIAMETER 6" FRAME WITH STANDARD GRATE
21	19.0		15.0(15"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
22	19.0		15.5(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
23	15.5		13.3(12" HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
24	13.0		10.2(12"HDPE)	TYPE F 6" FRAME WITH STANDARD GRATE
BLANK	–	–	–	– –
BLANK	–	–	–	– –

NOTE: ALL RIMS, INVIERTS, AND PIPE SIZES ARE PRELIMINARY AND SHALL BE VERIFIED DURING FINAL DESIGN

STORMWATER QUALITY BASIN SCHEDULE

WQ#	RIM	INV. IN	INV. OUT	NOTES:
1	14.0	9.0(24"HDPE)	8.9(24"HDPE)	6' DIAMETER CS–6 CASCADE SEPARATOR (CONTECH)
2	15.5	9.0(12"HDPE)	8.9(12"HDPE)	10' DIAMETER CDS–10 HYDRODYNAMIC SEPARATOR (CONTECH)
3	12.3	8.3(12"HDPE)	8.2(12"HDPE)	4' DIAMETER CS–6 CASCADE SEPARATOR (CONTECH)
4	13.0	8.6(12"HDPE) 8.6(18"HDPE) 8.6(12"HDPE)	8.5(24"HDPE)	4' DIAMETER CS–4 CASCADE SEPARATOR (CONTECH)

NOTE: ALL RIMS, INVERTS, AND WATER QUALITY STRUCTURE SIZES ARE PRELIMINARY AND SHALL BE VERIFIED DURING FINAL DESIGN

LEGEND:

- IRON PIN FOUND
- EXISTING UTILITY POLE
- EXISTING GUY ANCHOR
- CONIFEROUS TREE
- DECIDUOUS TREE
- EXISTING DRAINAGE
- EXISTING OVERHEAD UTILITY
- EXISTING WATER MAIN
- EXISTING SEWER MAIN
- EXISTING WATER VALVE
- EXISTING HYDRANT
- EXISTING SEWER MANHOLE
- ADJUST RIM OF EXISTING MANHOLE TO PROP. GRADE
- EXISTING CATCH BASIN
- EXISTING CATCHBASIN
- EXISTING PLANTING BED
- EXISTING ELECTRIC PANEL
- EXISTING CONTOUR
- BOUNDARY LINE (BEAL)
- TAX MAP LINE
- PROPOSED SEWER
- PROPOSED SEWER CONNECTION PIT
- PROPOSED WATER LINE
- PROPOSED WATER VALVE
- PROPOSED WATER SPIGOT
- PROPOSED SEASONAL WATER SPIGOT
- PROPOSED UNDERGROUND UTILITY
- PROPOSED OVERHEAD UTILITY
- PROPOSED UTILITY POLE
- PROPOSED ELECTRIC PEDESTAL
- PROPOSED ELECTRIC HANDHOLE
- PROPOSED STORMDRAIN
- PROPOSED CATCH BASIN (4' DIA.)
- PROPOSED CATCH BASIN (TYPE F)
- PROPOSED SPOT ELEVATION
- PROPOSED CONTOURS
- PROPOSED SITE LIGHT
- PROPOSED PAVER PATH

SITE NOTES:

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PLAN DATE: OCTOBER 6, 2023

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

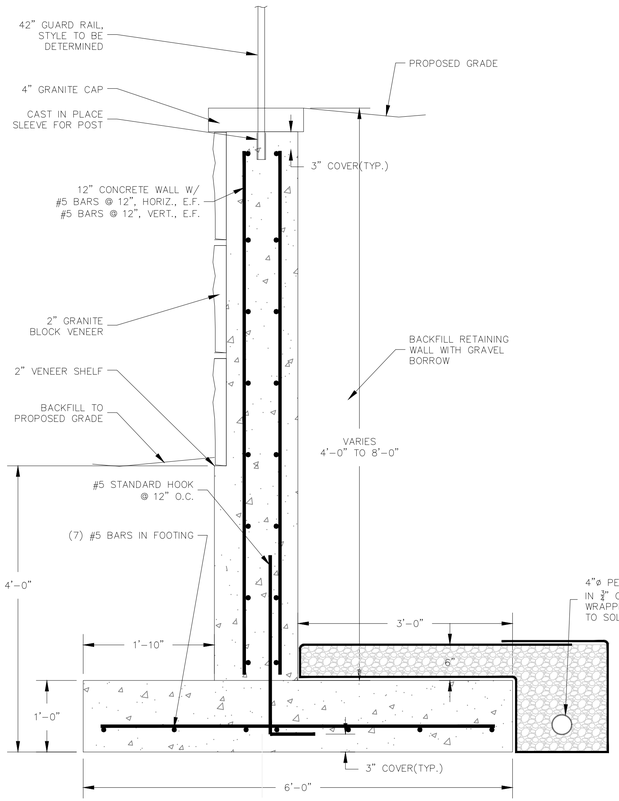
SITE PLAN
BUOY PARK

STATE OF MAINE
MICHAEL J. SABATINI 9053
LICENSED PROFESSIONAL ENGINEER
10/6/23

CITY OF ROCKLAND
DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

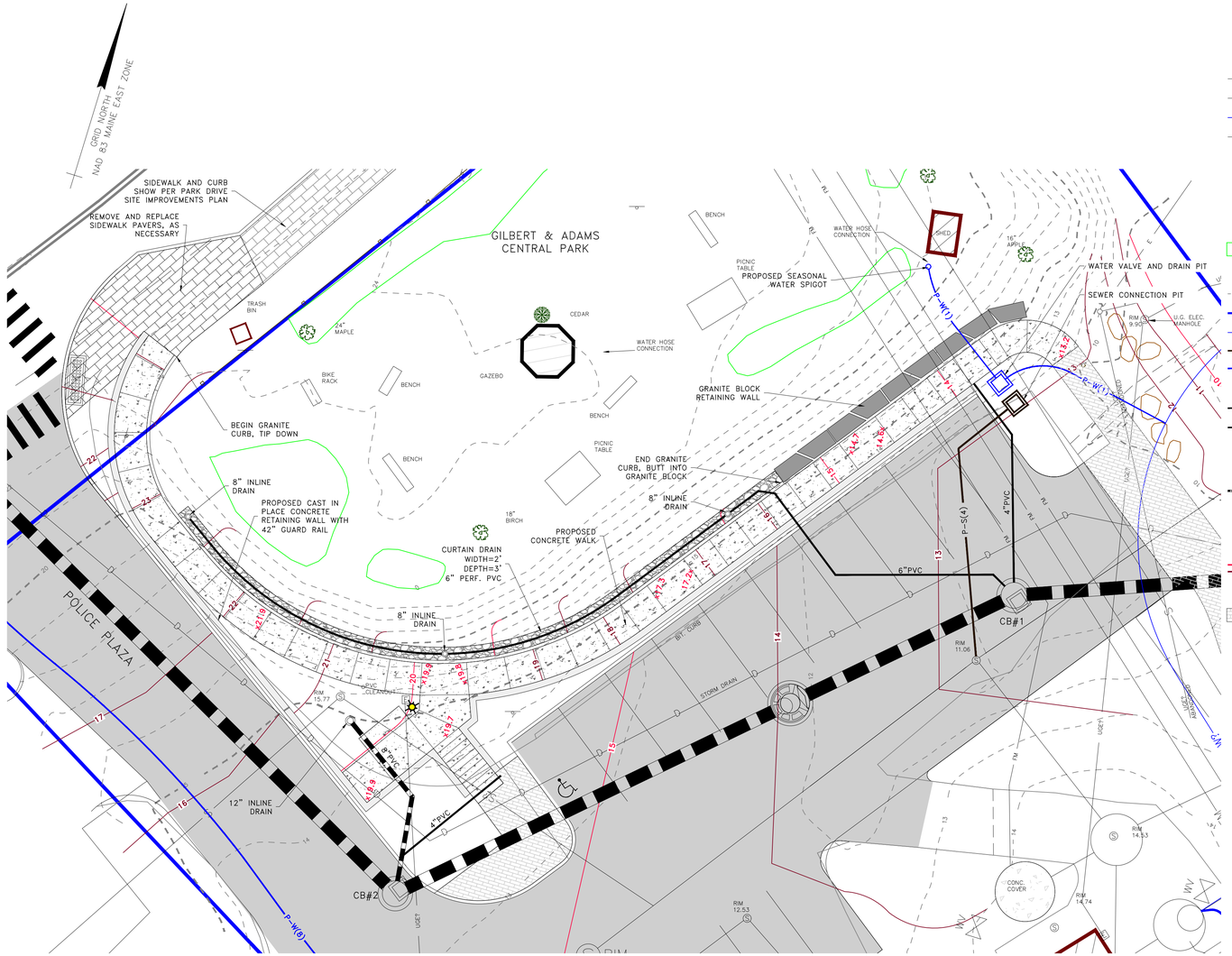
SCALE: 1" = 30'
JOB No.: 16 - 012

SHEET DESIGNATION: **C4**



FOUNDATION WALL TYPICAL SECTION

NOT TO SCALE



ACCESSIBLE PATH PLAN

SCALE: 1"=10'

LEGEND:

- EXISTING UTILITY POLE
- EXISTING GUY ANCHOR
- CONIFEROUS TREE
- DECIDUOUS TREE
- EXISTING DRAINAGE
- EXISTING OVERHEAD UTILITY
- EXISTING WATER MAIN
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- EXISTING WATER VALVE
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- EXISTING ELECTRIC PANEL
- EXISTING CONTOUR
- BOUNDARY LINE (BEAL)
- TAX MAP LINE
- PROPOSED SEWER
- PROPOSED WATER LINE
- PROPOSED SEASONAL WATER SPIGOT
- PROPOSED UNDERGROUND UTILITY
- PROPOSED OVERHEAD UTILITY
- PROPOSED ELECTRIC PEDESTAL
- PROPOSED ELECTRIC HANDHOLE
- PROPOSED STORMDRAIN
- PROPOSED CATCH BASIN (4' DIA.)
- PROPOSED CATCH BASIN (TYPE F)
- 13.5x PROPOSED SPOT ELEVATION
- PROPOSED CONTOURS
- PROPOSED SITE LIGHT
- PROPOSED PAVER PATH

LANDMARK CORPORATION
SURVEYORS & ENGINEERS
135 ROCKLAND STREET ROCKPORT, MAINE 04856 PHONE: (207) 236-6757 WWW.LANDMARKMAINE.COM

FIELD WORK DATE: 4/2022
FIELD WORK BY: KMB/EST
DRAFTED BY: KBM/MJS
CHECKED BY: MJS
PLAN DATE: OCTOBER 6, 2023

GRAPHIC SCALE
10 0 5 10 20
1 inch = 10 ft.

ACCESSIBLE PATH PLAN

STATE OF MAINE
MICHAEL J. SABATINI 9053 LICENSED PROFESSIONAL ENGINEER
10/6/23

CITY OF ROCKLAND

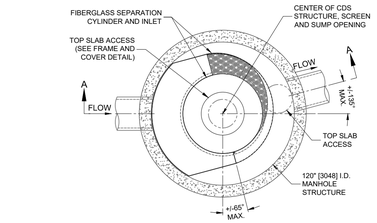
DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS AT HARBOR AND BUOY PARKS

ROCKLAND, MAINE

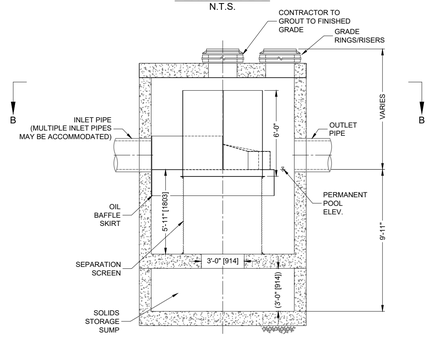
KNOX COUNTY

SCALE: AS SHOWN
JOB No.: 16 - 012

SHEET DESIGNATION:
C5



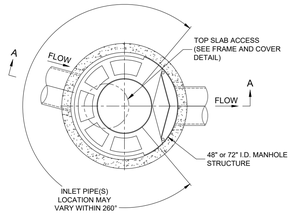
PLAN VIEW B-B
N.T.S.



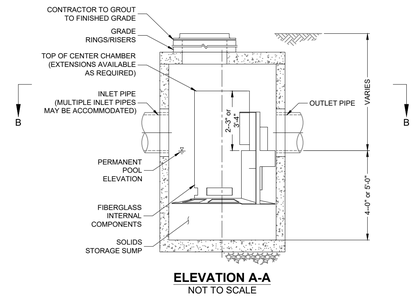
ELEVATION A-A
N.T.S.

NOTE: THE CONTINUOUS DEFLECTIVE SEPARATION DEVICE (CDS) IS A SWIRL CONCENTRATOR HYBRID TECHNOLOGY THAT USES A COMBINATION OF SWIRL CONCENTRATION AND INDIRECT SCREENING TO SCREEN, SEPARATE AND TRAP DEBRIS, SEDIMENT, AND HYDROCARBONS FROM STORMWATER RUNOFF.

CONTECH ENGINEERED SOLUTIONS LLC	CDS5653-10-C ONLINE CDS STANDARD DETAIL



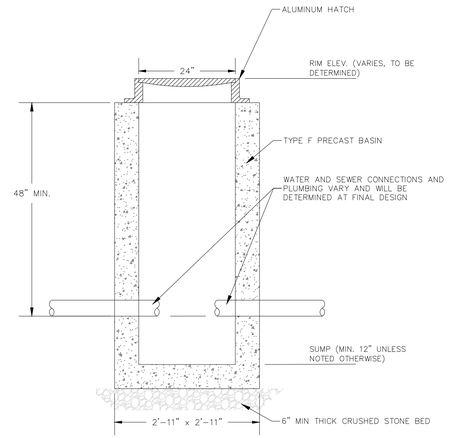
PLAN VIEW B-B
NOT TO SCALE



ELEVATION A-A
NOT TO SCALE

NOTE: THE CASCADE SEPARATOR IS A HYDRODYNAMIC SEPARATOR TECHNOLOGY THAT CAPTURES AND RETAINS SEDIMENT WHILE ALSO REMOVING HYDROCARBONS, TRASH, AND DEBRIS FROM STORMWATER RUNOFF.

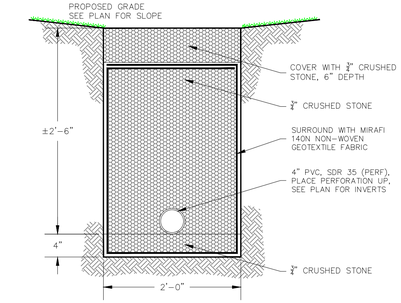
CONTECH ENGINEERED SOLUTIONS LLC	CS-6, 4 CASCADE SEPERATOR STANDARD DETAIL



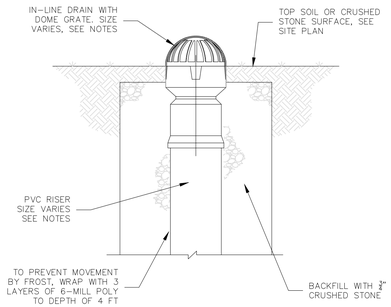
NOTES:

1. CONNECTION PIT RIM ELEVATIONS AND PIPE SIZES TO BE DETERMINED AT FINAL DESIGN.
2. ALUMINUM HATCH TO BE HINGED AND LOCKABALE .
3. CONCRETE: 4,000 PSI AFTER 28 DAYS.
4. SHOP DRAWINGS FOR CONNECTION PITS TO BE SUBMITTED TO THE ENGINEER FOR REVIEW.

WATER AND SEWER CONNECTION PIT
NOT TO SCALE



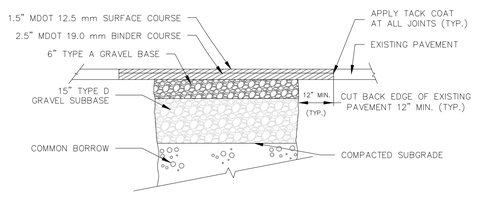
CUT-OFF DRAIN TRENCH
NOT TO SCALE



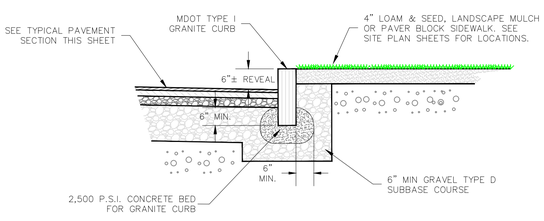
NOTES:

1. 8" IN-LINE DRAINS SHALL HAVE 6" RISERS.
2. 12" IN-LINE DRAINS SHALL HAVE 10" RISERS.
3. IN-LINE DRAINS ARE FOR NON-TRAFFIC INSTALLATION ONLY.

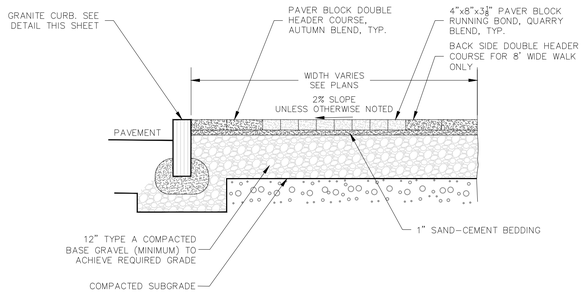
NYLOPLAST INLINE DRAIN DETAIL
NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT SECTION
NOT TO SCALE



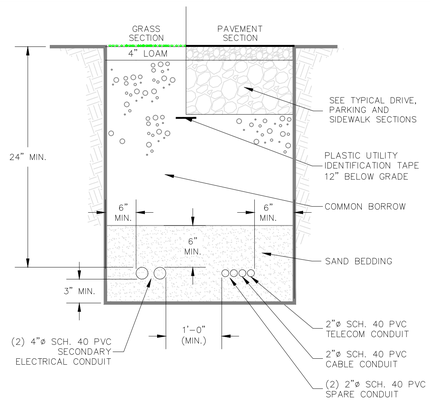
TYPICAL CURB SECTION
NOT TO SCALE



NOTE:

PAVER BLOCKS STYLE AND SIZE TO BE DETERMINED DURING FINAL DESIGN.

TYPICAL PAVER BLOCK SECTION
NOT TO SCALE



NOTES:

1. THIS DETAIL IS FOR GENERAL CONDUIT TRENCHING.
2. CONDUIT NUMBER AND SIZES SHALL BE VERIFIED WITH THE ELECTRICAL ENGINEER BEFORE INSTALLATION.

TYPICAL CONDUIT TRENCH SECTION
NOT TO SCALE

LANDMARK CORPORATION
SURVEYORS & ENGINEERS
135 ROCKLAND STREET ROCKPORT, MAINE 04856 PHONE: (207) 236-6757 WWW.LANDMARKMAINE.COM

FIELD WORK DATE:	4/2022
FIELD WORK BY:	KMB/EST
DRAFTED BY:	KBM/MJS
CHECKED BY:	MJS
PLAN DATE:	OCTOBER 6, 2023

NO.	REVISIONS	BY	DATE

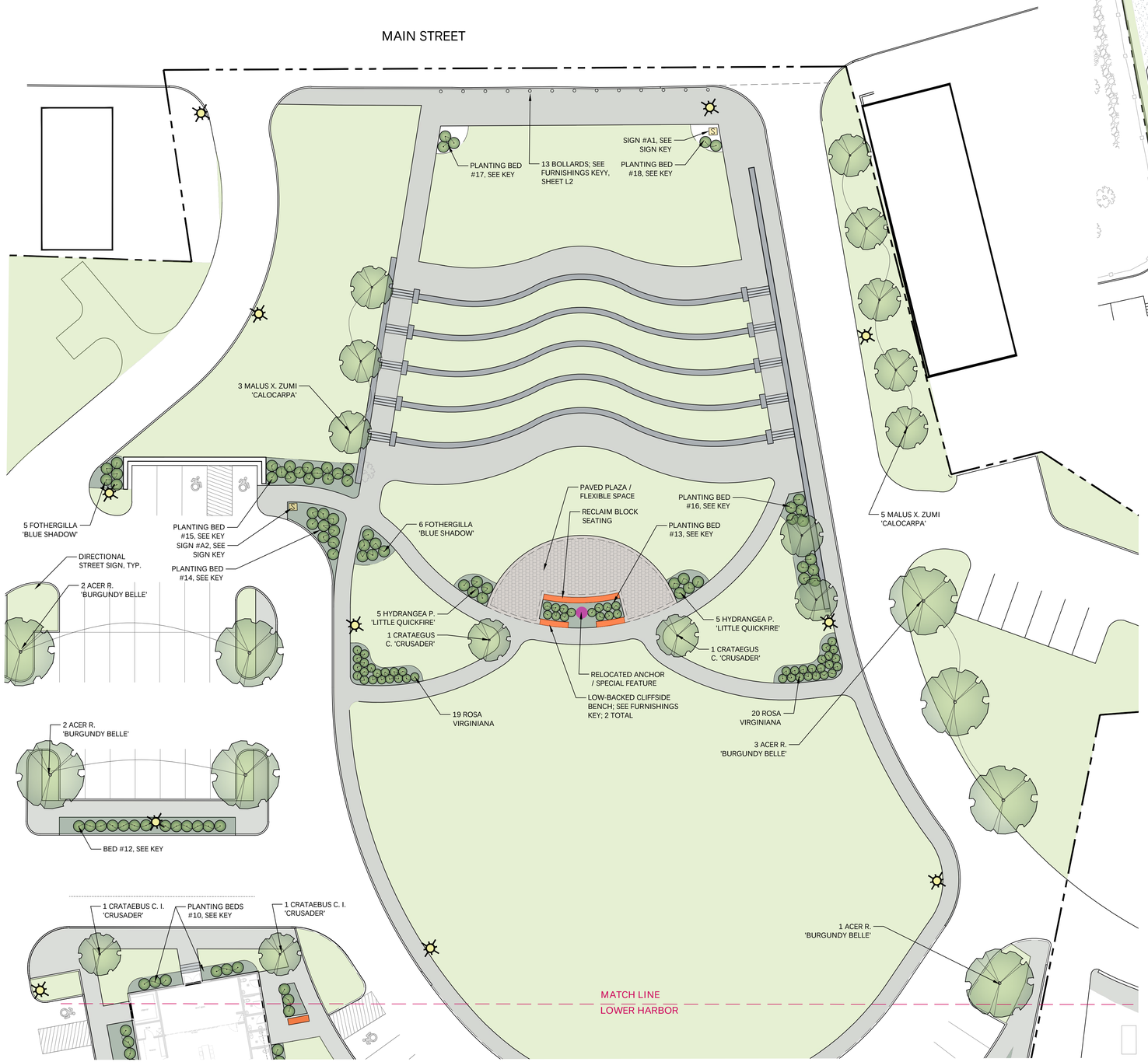
DETAIL SHEET

STATE OF MAINE — MICHAEL J. SABATINI 9053 — LICENSED PROFESSIONAL ENGINEER — 10/6/23

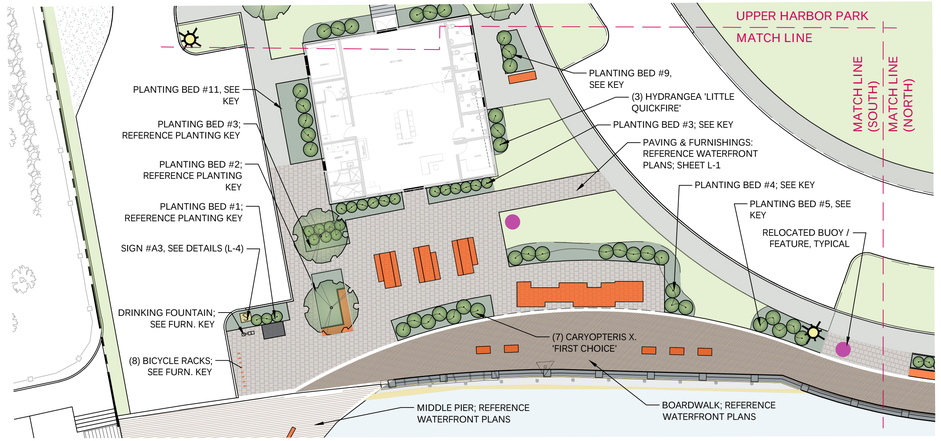
CITY OF ROCKLAND
DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: **AS SHOWN** JOB No.: **16 - 012**

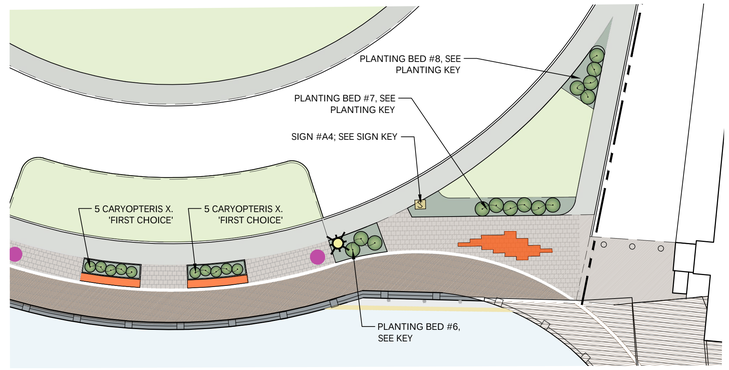
SHEET DESIGNATION: **C6**



PLANTINGS - UPPER HARBOR PARK



PLANTINGS - LOWER HARBOR PARK (SOUTH)



PLANTINGS - LOWER HARBOR PARK (SOUTH)

PLANTING SCHEDULE FOR NUMBERED BEDS

QTY.	BOTANICAL NAME	COMMON NAME	SIZE/COND.
BED #1 (UPDATED)			
5	DESCHAMPSIA C. 'GOLDTAU'	GOLDEN DEW TUFTED HAIR GRASS	#1 POT
9	NEPETA G. 'SUMMER MAGIC'	SUMMER MAGIC CATMINT	#1 POT
3	SPIRAEA B. 'PINK SPARKLER'	PINK SPARKLER BIRCHLEAF SPIREA	#3 POT
BED #2 (UPDATED)			
1	CRATAEGUS V. 'WINTER KING'	WINTER KING HAWTHORN	2-2.5" CAL
9	DESCHAMPSIA C. 'GOLDTAU'	GOLDEN DEW TUFTED HAIR GRASS	#1 POT
10	HEMEROCALLIS 'BIG TIME HAPPY'	BIG TIME HAPPY DAYLILY	#1 POT
15	NEPETA G. 'SUMMER MAGIC'	SUMMER MAGIC CATMINT	#1 POT
BED #3 (UPDATED)			
1	CRATAEGUS V. 'WINTER KING'	WINTER KING HAWTHORN	2-2.5" CAL
12	CARYOPTERIS X. 'FIRST CHOICE'	FIRST CHOICE BLUE MIST SPIREA	#3 POT
12	HEMEROCALLIS 'BIG TIME HAPPY'	BIG TIME HAPPY DAYLILY	#1 POT
12	NEPETA G. 'SUMMER MAGIC'	SUMMER MAGIC CATMINT	#1 POT
7	SPIRAEA B. 'PINK SPARKLER'	PINK SPARKLER BIRCHLEAF SPIREA	#3 POT
BED #4 (UPDATED)			
11	ROSA VIRGINIANA	VIRGINIA ROSE	#3 POT
5	HEMEROCALLIS 'BIG TIME HAPPY'	BIG TIME HAPPY DAYLILY	#1 POT
14	SALVIA N. 'PINK PROFUSION'	PINK PROFUSION SAGE	#1 POT
BED #5 (UPDATED)			
5	HYDRANGEA A. 'BAR HARBOR'	BAR HARBOR HYDRANGEA	#5 POT
5	NEPETA G. 'SUMMER MAGIC'	SUMMER MAGIC CATMINT	#1 POT
BED #6 (UPDATED)			
11	ROSA VIRGINIANA	VIRGINIA ROSE	#3 POT
5	NEPETA G. 'SUMMER MAGIC'	SUMMER MAGIC CATMINT	#1 POT
BED #7			
7	HYDRANGEA A. 'BAR HARBOR'	BAR HARBOR HYDRANGEA	#5 POT
3	HEMEROCALLIS 'BIG TIME HAPPY'	BIG TIME HAPPY DAYLILY	#1 POT
10	LEUCANTHEMUM 'LEMON PUFF'	LEMON PUFF SHASTA DAISY	#1 POT
7	SALVIA N. 'PINK PROFUSION'	PINK PROFUSION SALVIA	#1 POT
BED #8			
5	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	#3 POT
8	SYMPHOTRICHUM N. 'PURPLE DOME'	PURPLE DOME ASTER	#1 POT
BED #9			
3	PINUS S. 'NANA'	DWARF WHITE PINE	#5 POT
5	NEPETA G. 'EARLY BIRD'	EARLY BIRD CATMINT	#1 POT
3	SEDUM S. 'CARL'	AUTUMN STONECROP	#1 POT

PLANTING SCHEDULE FOR NUMBERED BEDS, CONT'D.

QTY.	BOTANICAL NAME	COMMON NAME	SIZE/COND.
BED #10			
6	SPIRAEA X. B. 'ANTHONY WATERER'	ANTHONY WATERER SPIREA	#5 POT
8	LIATRIS S. 'KOBOLD''	KOBOLD SPIKED GAYFEATHER	#1 POT
6	SEDUM S. 'CARL'	AUTUMN STONECROP	#1 POT
BED #11			
5	HYDRANGEA A. 'BAR HARBOR'	BAR HARBOR HYDRANGEA	#5 POT
7	SEDUM SIEBOLDII	OCTOBER DAPHNE STONECROP	#1 POT
15	STACHYS M. 'HUMMELO'	HUMMELO LAMBS EARS	#1 POT
BED #12			
13	RHUS A. 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	#3 POT
6	SEDUM S. 'CARL'	AUTUMN STONECROP	#3 POT
12	HEMEROCALLIS 'BIG TIME HAPPY'	BIG TIME HAPPY DAYLILY	#1 POT
12	NEPETA G. 'SUMMER MAGIC'	SUMMER MAGIC CATMINT	#1 POT
7	SPIRAEA B. 'PINK SPARKLER'	PINK SPARKLER BIRCHLEAF SPIREA	#3 POT
BED #13			
14	SPIRAEA J. 'BLUE KAZOO'	DOUBLE PLAY SPIREA	#3 POT
15	STACHYS M. 'HUMMELO'	HUMMELO LAMBS EARS	#1 POT
BED #14			
9	HYDRANGEA P. 'LITTLE LIME'	LITTLE LIME HYDRANGEA	#5 POT
15	STACHYS M. 'HUMMELO'	HUMMELO LAMBS EARS	#1 POT
BED #15			
14	RHUS A. 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	#3 POT
10	STACHYS M. 'HUMMELO'	HUMMELO LAMBS EARS	#1 POT
BED #16			
2	CRATAEGUS C. I. 'CRUSADER'	CRUSADER HAWTHORN	1.5-2" CAL.
10	FOTHERGILLA X. 'BLUE SHADOW'	BLUE SHADOW FOTHERGILLA	#5 POT
3	HEMEROCALLIS 'BIG TIME HAPPY'	BIG TIME HAPPY DAYLILY	#1 POT
10	LEUCANTHEMUM 'LEMON PUFF'	LEMON PUFF SHASTA DAISY	#1 POT
7	SALVIA N. 'PINK PROFUSION'	PINK PROFUSION SALVIA	#1 POT
BED #17			
5	HYDRANGEA A. 'BAR HARBOR'	BAR HARBOR HYDRANGEA	#5 POT
5	NEPETA G. 'EARLY BIRD'	EARLY BIRD CATMINT	#1 POT
3	SEDUM S. 'CARL'	AUTUMN STONECROP	#1 POT
BED #18			
5	HYDRANGEA A. 'BAR HARBOR'	BAR HARBOR HYDRANGEA	#5 POT
5	NEPETA G. 'EARLY BIRD'	EARLY BIRD CATMINT	#1 POT
3	SEDUM S. 'CARL'	AUTUMN STONECROP	#1 POT

RS LEONARD Landscape Architecture

		REVISIONS	
DRAFTED BY:	RSL	DATE	XX
CHECKED BY:	MJS	DESCR.	XX
PLAN DATE:	OCTOBER 5, 2023	DATE	
		DESCR.	

GRAPHIC SCALE
20 0 10 20 40
1 inch = 20 ft.

HARBOR PARK LANDSCAPE & MATERIALS PLAN

PRELIM. DESIGN

REGINA S. LEONARD 3123 10/05/23 LICENSED LANDSCAPE ARCHITECT STATE OF MAINE

DOWNTOWN WATERFRONT MARINE INFRASTRUCTURE
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: **AS SHOWN** | JOB No.: **16-012** | SHEET **1** OF **4**

L1

20046\12MG\20046.DWG

PLANTINGS - BUOY PARK

PLANTING NOTES

1. ALL MATERIALS SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
2. IN THE CASE OF ANY DISCREPANCIES BETWEEN SPECIES AND QUANTITIES CALLED OUT IN THE PLANTING KEY AND THOSE SHOWN ON THE PLAN, QUANTITIES AND SPECIES SHOWN ON THE PLAN SHALL OVER-RIDE.
3. ALL PLANTING SHALL BE DONE IN ACCORDANCE WITH ACCEPTABLE HORTICULTURAL PRACTICES.
4. ALL PLANTS SUBJECT TO APPROVAL BY LANDSCAPE ARCHITECT. ALL SUBSTITUTIONS MUST BE SUBMITTED FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO ORDERING OR DELIVERY OF PLANT MATERIAL ON SITE. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANTINGS THAT DO NOT CONFORM TO THE DRAWINGS OR SPECIFICATIONS OUTLINED HEREIN.
5. LANDSCAPE ARCHITECT SHALL APPROVE FINAL PLACEMENT OF ALL PLANT MATERIALS AND RESERVES THE RIGHT TO MAKE FIELD ADJUSTMENTS TO PLANTINGS AS NECESSARY BASED ON SITE CONDITIONS.
6. NO GRADING, SOIL DISTURBANCE, OR STORAGE OF MATERIALS OR EQUIPMENT SHALL OCCUR WITHIN THE DRIP-LINE OF EXISTING TREES UNLESS OTHERWISE SHOWN ON PLANS. ANY EXCAVATION WITHIN SUCH AREAS SHALL BE PERFORMED WITH SPECIAL CARE.
7. PLANTING PITS AND BEDS SHALL CONSIST OF 3 PARTS FERTILE, FRIABLE LOAM AMENDED WITH 1 PART ORGANIC COMPOST, AS APPROVED BY THE LANDSCAPE ARCHITECT. PLANTING BEDS SHALL BE A MINIMUM DEPTH OF 12" OF PREPARED SOIL, AS NOTED.
8. FINISH GRADE OF PLANTINGS SHALL MATCH ADJACENT FINISH GRADES UNLESS OTHERWISE NOTED ON DRAWINGS OR DIRECTED AND/OR APPROVED BY THE LANDSCAPE ARCHITECT.
9. NO PLANT SHALL BE PUT INTO THE GROUND BEFORE ROUGH GRADING HAS BEEN FINISHED AND APPROVED BY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE.
10. ALL PLANTS SHALL BE SET PLUMB UNLESS OTHERWISE SPECIFIED.
11. ALL PLANTINGS SHALL BE TOPPED WITH 3" OF SCREENED, COMPOSTED PINE BARK MULCH. SEE WRITTEN SPECIFICATIONS.
12. ALL DISTURBED AREAS NOT OTHERWISE PLANTED SHALL BE SEEDED WITH THE SEED MIX AND APPLICATION RATE SPECIFIED IN THE SITE PLANTINGS KEY. ALL AREAS TO RECEIVE SEED SHALL RECEIVE 4" CLEAN TOPSOIL. AREAS SHALL BE FINE RAKED AND ALL DEBRIS REMOVED FROM SITE.
13. CONTRACTOR SHALL WATER ALL PLANTS THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS AND NEWLY GRASSED AREAS SHALL BE WATERED AS REQUIRED THEREAFTER TO ENSURE SURVIVAL AND GROWTH THROUGH THE FIRST GROWING SEASON.
14. PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF INSTALLATION. DURING THE ONE YEAR GUARANTEE, THE CONTRACTOR SHALL REPLACE, IN KIND, ANY DEAD, DISEASED, OR SUBSTANDARD PLANT MATERIAL AT NO COST TO THE OWNER. THE CONTRACTOR SHALL RECEIVE FINAL ACCEPTANCE FROM THE OWNER FOLLOWING THE ONE YEAR GUARANTEE, PROVIDED THE PROVISIONS OF THE PLANT GUARANTEE HAVE BEEN SATISFACTORILY MET.
16. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY TO ENSURE THAT ALL WORK IS PERFORMED IN COMPLIANCE WITH ALL STATE AND LOCAL REQUIREMENTS.
17. SPECIFIC DESIGN OF THE LIVING SHORELINE SEGMENT WILL BE DETERMINED DURING FINAL DESIGN IN CONSULTATION WITH THE MAINE STATE COASTAL PROGRAM AND GOVERNING AUTHORITIES.

FURNISHINGS KEY & NOTES:

KEY TYPE/NAME	QTY.	MODEL NO.	NOTES/ SPECIFICATIONS
NAME / TYPE			
CLIFFHANGER BENCH, LOW BACK	12	CHP-FL18-264-TH	FREE-STANDING, LOW-BACK; FSC HARDWOOD, GALVANIZED STEEL BASE
BICYCLE RACKS	4	ARC RACK MODEL	SURFACE MOUNTED, GALVANIZED STEEL FINISH
BOLLARDS	5	BOLLARD R-7551	DUCTILE IRON, BLACK FINISH; REMOVABLE (PREM. RETRACTABLE)
DRINKING FOUNTAIN	2	3611 + 670 + 3660	OUTDOOR ADA PEDESTAL WITH BOTTLE FILLER, DOG BOWL, LOCKABLE HOSE BIB

1. MANUFACTURER FOR BENCHES & PICNIC TABLES (A-D): STREETLIFE AMERICA LLC; PHILADELPHIA, PA; US T 1-215-247-0148
2. MANUFACTURER FOR BICYCLE RACKS: DERO; NE REP: BOSTON, MA, T 1-617-869-5408
3. MANUFACTURER FOR BOLLARDS: RELIANCE FOUNDRY; SURRY, BC CANADA; T 1-877-789-3245
4. MANUFACTURER FOR DRINKING FOUNTAIN: HAWS COMPANY; T 1-888-640-4297; E: CUSTOMERSERVICE@HAWSCO.COM
5. SHOP DRAWINGS TO BE PREPARED FOR REVIEW & APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO ORDERING AND FABRICATION

SIGN KEY & NOTES:

SIGN NO.	PANEL SIZE	SIGN LOCATION	DESCRIPTION
SIGN #A1	1'-11" L X 11 1/2" W	MILDRED MERRILL	PARK ENTRANCE & DIRECTIONAL SIGN: MILDRED MERRILL PARK
SIGN #A2	1'-11" L X 11 1/2" W	HARBOR PARK	AMPHITHEATER ENTRANCE
SIGN #A3	1'-11" L X 11 1/2" W	PUBLIC LANDING	ENTRANCE & DIRECTIONAL SIGN: PUBLIC LANDING & HARBOR TRAIL
SIGN #A4	1'-11" L X 11 1/2" W	HARBOR PARK	"BOARDWALK AT HARBOR PARK" ENTRANCE SIGN
SIGN #B1	1'-11" L X 11 1/2" W	BUOY PARK	PARK ENTRANCE & DIRECTIONAL SIGN: BUOY PARK / PUBLIC LANDING / HARBOR TRAIL
SIGN #B2	1'-11" L X 11 1/2" W	MIDDLE PIER	ENTRANCE & DIRECTIONAL SIGN: MIDDLE PIER & HARBOR TRAIL
SIGN #B3	1'-11" L X 11 1/2" W	BUOY PARK	DIRECTIONAL SIGN: TO BOARDWALK / HARBOR PARK / PUBLIC LANDING
SIGN #B4	1'-11" L X 11 1/2" W	BUOY PARK	DIRECTIONAL SIGN: TO G&A CENTRAL PARK / DOWNTOWN
SIGN #B5	1'-11" L X 11 1/2" W	G&A CENTRAL PARK	DIRECTIONAL SIGN: TO BUOY PARK / MIDDLE PIER / HARBOR TRAIL

1. ALL SIGN PANELS SHALL BE MOUNTED ON GRANITE PIERS AT LOCATIONS SHOWN IN THE DRAWINGS.
2. REFERENCE ELEVATIONS AND DETAILS FOR SPECIFICATIONS, FABRICATION AND MOUNTING INFORMATION.
3. PANEL DESIGN AND CONTENTS ARE FOR GUIDANCE; CONTRACTOR SHALL WORK WITH A SIGN GRAPHICS COMPANY TO DEVELOP LAYOUT AND SHOP DRAWINGS FOR APPROVAL BY THE OWNER'S REPRESENTATIVE.

PLANTING SCHEDULE FOR NUMBERED BEDS

QTY.	BOTANICAL NAME	COMMON NAME	SIZE/COND.
LIVING SHORELINE (LOWER BANK) - 2,000 PLUGS			
50%	AMMOPHILA BREVILIGULATA	AMERICAN BEACH GRASS	PLUG
35%	PANICUM VIRGATUM	SWITCHGRASS	PLUG
15%	SOLIDAGO SEMPERVIRENS	SEASIDE GOLDENROD	PLUG
LIVING SHORELINE (UPLAND)			
3	MYRICA PENSYLVANICA	NORTHERN BAYBERRY	#7 POT
2	PRUNUS MARITIMA	BEACH PLUM	#7 POT
11	VACCINIUM CORYBOSUM	HIGHBUSH BLUEBERRY	#5 POT
BED #1			
3	FOTHERGILLA X. 'BLUE SHADOW'	BLUE SHADOW FOTHERGILLA	#5 POT
7	LIATRIS S. 'KOBOLD'	KOBOLD GAYFEATHER	#1 POT
5	SEDUM S. 'CARL'	AUTUMN STONECROP	#1 POT
BED #2			
1	PRUNUS MARITIMA'	BEACH PLUM	#7 POT
5	PINUS S. 'NANA'	DWARF WHITE PINE	#7 POT
8	LIATRIS S. 'KOBOLD'	KOBOLD GAYFEATHER	#1 POT
6	SYMPHOTRICHUM 'PURPLE DOME'	PURPLE DOME ASTER	#1 POT
BED #3			
9	HYDRANGEA A. 'BAR HARBOR'	BAR HARBOR HYDRANGEA	#5 POT
5	LIATRIS S. 'KOBOLD'	KOBOLD GAYFEATHER	#1 POT
BED #4			
5	HYDRANGEA P. 'LITTLE QUICKFIRE'	LITTLE QUICKFIRE HYDRANGEA	#5 POT
5	SYMPHOTRICHUM 'PURPLE DOME'	PURPLE DOME ASTER	#1 POT
BED #5			
3	HYDRANGEA A. 'BAR HARBOR'	BAR HARBOR HYDRANGEA	#5 POT
10	RUDBECKIA H. 'DENVER DAISY'	BLACK-EYED SUSAN	#1 POT
6	SYMPHOTRICHUM 'PURPLE DOME'	PURPLE DOME ASTER	#1 POT
7	VERONICA S. 'PURPLE ILLUSIONS'	PURPLE ILLUSIONS SALVIA	#1 POT
BED #6 (POLLINATOR PLANTS)			
3	HYDRANGEA P. 'LITTLE LIME'	LITTLE LIME HYDRANGEA	#5 POT
6	ALLIUM X. 'MEDUSA'	MEDUSA ORNAMENTAL ONION	#1 POT
7	RUDBECKIA H. 'DENVER DAISY'	BLACK-EYED SUSAN	#1 POT
3	VERONICA S. 'PURPLE ILLUSIONS'	PURPLE ILLUSIONS SALVIA	#1 POT

PLANTING SCHEDULE FOR NUMBERED BEDS, CONT'D.

QTY.	BOTANICAL NAME	COMMON NAME	SIZE/COND.
BED #7 (POLLINATOR PLANTS)			
6	ALLIUM X. 'MEDUSA'	MEDUSA ORNAMENTAL ONION	#1 POT
13	ECHINACEA P. 'MY YELLOW DARLING'	PURPLE CONEFLOWER	#1 POT
3	SYMPHOTRICHUM 'PURPLE DOME'	PURPLE DOME ASTER	#1 POT
7	VERONICA X. 'PINK POTION'	PINK POTION SPEEDWELL	#1 POT
BED #8			
3	FOTHERGILLA X. 'BLUE SHADOW'	BLUE SHADOW FOTHERGILLA	#5 POT
10	ALLIUM X. 'MEDUSA'	MEDUSA ORNAMENTAL ONION	#1 POT
10	ECHINACEA P. 'KIMS KNEE HIGH'	PURPLE CONEFLOWER	#1 POT
10	LEUCANTHEMUM X.S. 'BECKY'	BECKY SHASTA DAISY	#1 POT
8	SYMPHOTRICHUM 'PURPLE DOME'	PURPLE DOME ASTER	#1 POT
10	VERONICA X. 'PINK POTION'	PINK POTION SPEEDWELL	#1 POT
BED #9			
14	AGASTACHE X. 'BLUE FORTUNE'	BLUE FORTUNE HYSSOP	#1 POT
10	ALLIUM X. 'MILLENIUM'	MILLENIUM ORNAMENTAL ONION	#1 POT
5	ECHINACEA P. 'MY YELLOW DARLING'	PURPLE CONEFLOWER	#1 POT
10	NEPETA G. 'EARLY BIRD'	EARLY BIRD CATMINT	#1 POT
10	VERONICA X. 'PURPLE ILLUSIONS'	PURPLE ILLUSIONS SPEEDWELL	#1 POT
10	SEDUM SIEBOLDII	OCTOBER DAPHNE SPIREA	#1 POT
BED #10			
7	LIATRIS S. 'KOBOLD''	KOBOLD SPIKED GAYFEATHER	#1 POT
5	STACHYS M. 'HUMMELO'	HUMMELO LAMBS EARS	#1 POT
5	SYMPHOTRICHUM 'PURPLE DOME'	PURPLE DOME ASTER	#1 POT

RS LEONARD
Landscape Architecture

		REVISIONS	
DRAFTED BY:	RSL	DATE	XX
CHECKED BY:	MJS	DESCR.	XX
PLAN DATE: OCTOBER 5, 2023		DATE	
		DESCR.	

GRAPHIC SCALE
20 0 10 20 40
1 inch = 20 ft.

BUOY PARK LANDSCAPE & MATERIALS PLAN

PRELIM. DESIGN

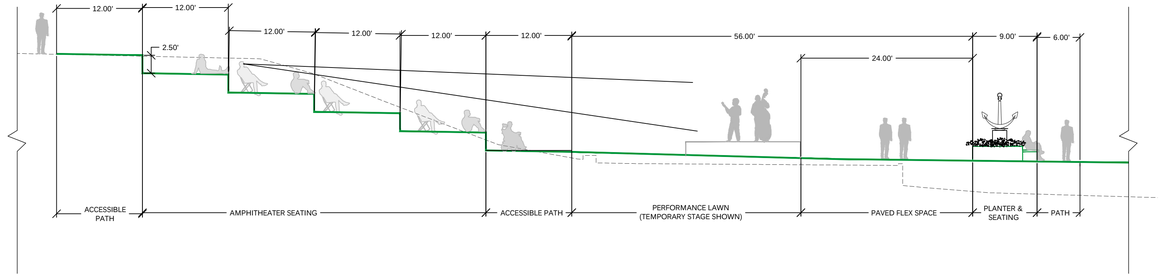
LICENSED LANDSCAPE ARCHITECT
REGINA S. LEONARD
3123
10/05/23
STATE OF MAINE

DOWNTOWN WATERFRONT MARINE INFRASTRUCTURE
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: AS SHOWN | JOB No.: 16-012 | SHEET 2 OF 4

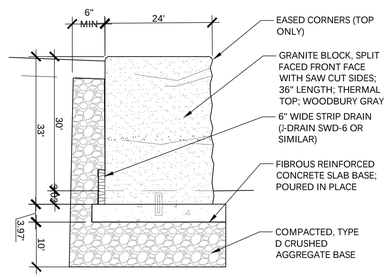
L2

AMPHITHEATER - PLAN DETAIL N.T.S.

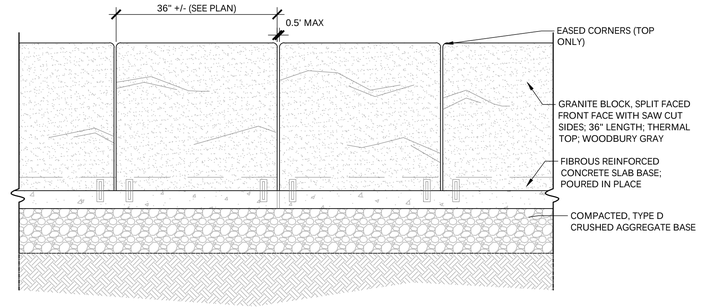


AMPHITHEATER CROSS SECTION
(CENTER, FACING NORTH)

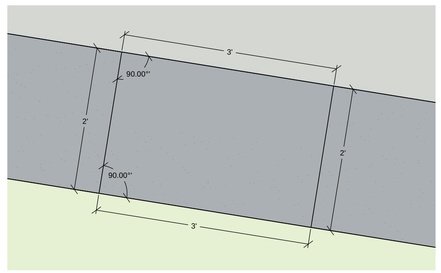
N.T.S.



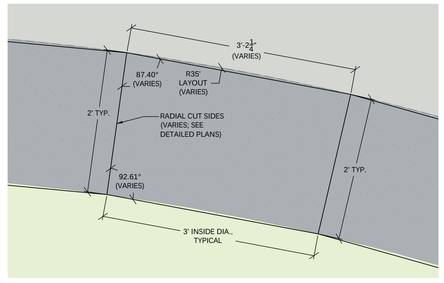
GRANITE SEAT WALL DETAIL N.T.S.



GRANITE SEAT WALL - FRONT ELEVATION N.T.S.



GRANITE SEAT WALL - DIMENSIONS (STRAIGHT LAYOUT SEGMENTS) N.T.S.



GRANITE SEAT WALL - DIMENSIONS (RADIAL LAYOUT SEGMENTS) N.T.S.

RS LEONARD
Landscape Architecture

DRAFTED BY:	RSL
CHECKED BY:	MJS
PLAN DATE:	SEPT. 13, 2023

REVISIONS		
DATE	XX	
DESCR.	XX	
DATE		
DESCR.		

GRAPHIC SCALE
10 0 5 10 20
1 inch = 10 ft.

AMPHITHEATER PLAN
PRELIM. DESIGN

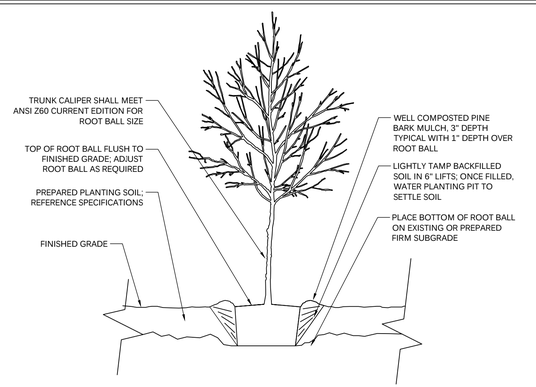
REGINA S. LEONARD 3133 REGISTERED LANDSCAPE ARCHITECT STATE OF MAINE
10/05/23

DOWNTOWN WATERFRONT MARINE INFRASTRUCTURE
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: **AS SHOWN** | JOB No.: **16-012** | SHEET **3** OF **4**

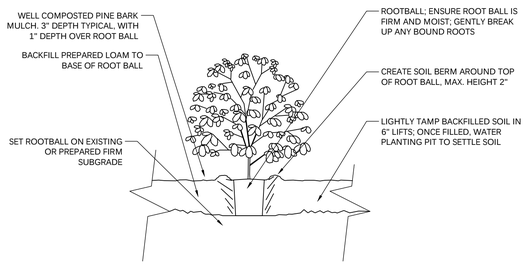
L3

20240 DWG 20240.dwg



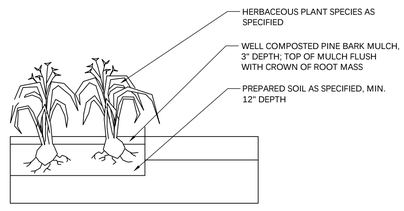
TREE INSTALLATION DETAIL

N.T.S.



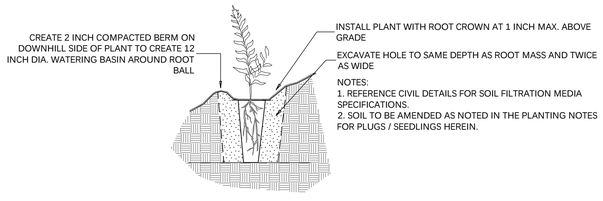
N.T.S.

SHRUB INSTALLATION DETAIL



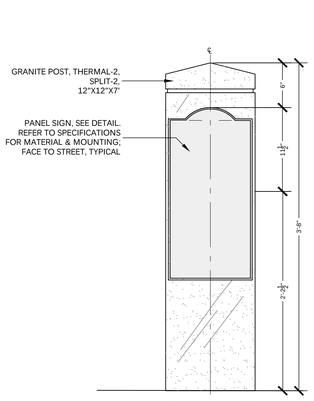
HERBACEOUS PLANT INSTALLATION DETAIL

N.T.S.

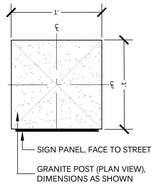


PLUG / SEEDLING INSTALLATION DETAIL

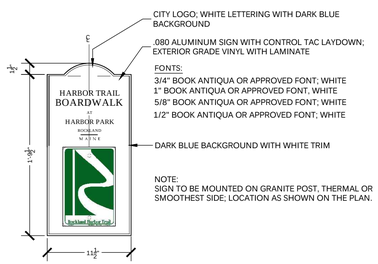
N.T.S.



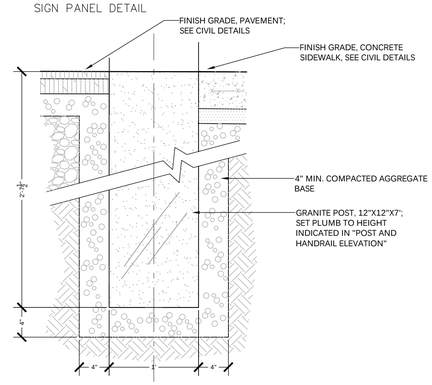
POST & SIGN DETAIL (ABOVE GRADE)



POST CROSS SECTION (TOP VIEW)



SIGN PANEL DETAIL

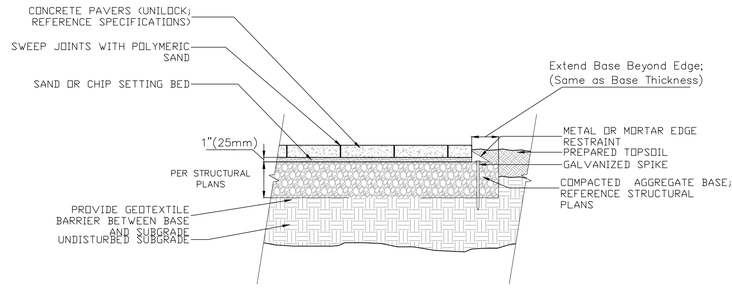


SIGN POST INSTALLATION DETAIL

GRANITE SIGN POST & PANEL DETAILS

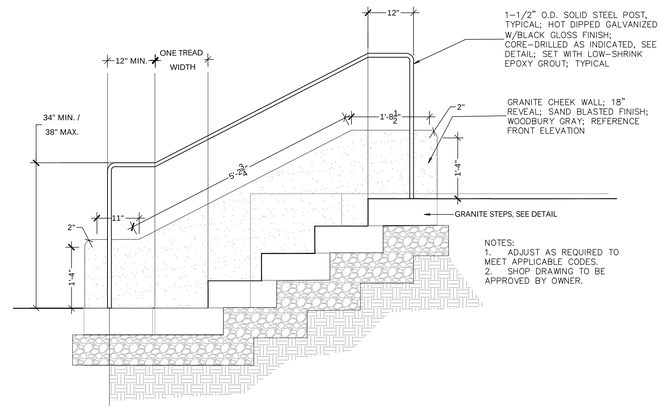
N.T.S.

SIGN PANEL #1 SIGN PANEL #2 SIGN PANEL #3 SIGN PANEL #4 SIGN PANEL #5 SIGN PANEL #6



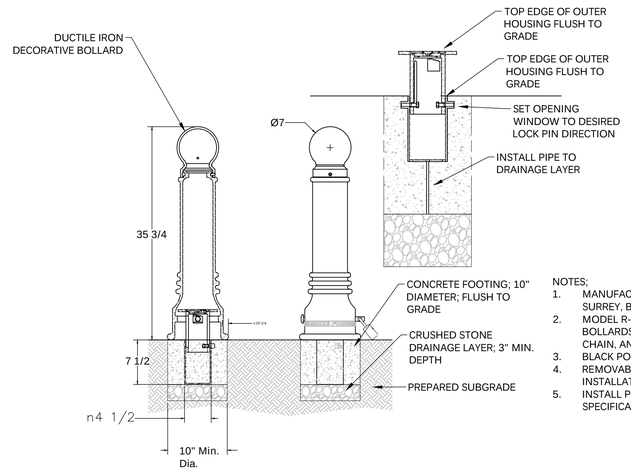
CONCRETE PAVERS ON AGGREGATE BASE DETAIL

N.T.S.



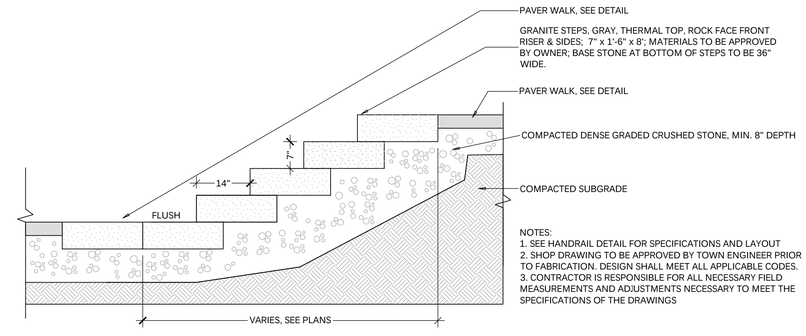
AMPHITHEATER RAILING & CHEEK WALL DETAIL

N.T.S.



REMOVABLE BOLLARD INSTALLATION

N.T.S.



AMPHITHEATER STEPS DETAIL

N.T.S.

RS LEONARD
Landscape Architecture

		REVISIONS	
DRAFTED BY:	RSL	DATE	XX
CHECKED BY:	MJS	DESCR.	XX
PLAN DATE:	SEPT. 13, 2023	DATE	
		DESCR.	

SITE & LANDSCAPE DETAILS
PRELIM. DESIGN

REGINA S. LEONARD 3123 10/05/23 LICENSED LANDSCAPE ARCHITECT STATE OF MAINE

DOWNTOWN WATERFRONT MARINE INFRASTRUCTURE
AT HARBOR AND BUOY PARKS
ROCKLAND, MAINE
KNOX COUNTY

SCALE: **AS SHOWN** | JOB No.: **16-012** | SHEET **4** OF **4**

L4

20046\DWG\20046.DWG

ELECTRICAL LEGEND

GENERAL

- PANEL
- HOT LEG
- HOT LEG WITH NEUTRAL
- HOT LEG WITH GROUND
- SWITCH LEG
- THREE-WAY CIRCUIT
- CIRCUIT HOME RUN

POWER

- NON-FUSED DISCONNECT
- TRANSFORMER
- 120V DUPLEX RECEPTACLE
- RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER
- RECEPTACLE, IN-FLOOR BOX & COVER

WIRING COLOR CODE

CONDUCTOR	COLOR
120/208 (240)	
PHASE A	BLACK
PHASE B	RED
PHASE C (3Φ ONLY)	BLUE
NEUTRAL	WHITE
GROUND	GREEN
277/480	
PHASE A	BROWN
PHASE B	ORANGE
PHASE C (3Φ ONLY)	YELLOW
NEUTRAL	GRAY
GROUND	GREEN

CALL BEFORE YOU DIG

www.call811.com

THE CONTRACTOR SHALL NOTIFY ALL UTILITIES INCLUDING AND NOT LIMITED TO GAS, WATER, ELECTRIC, CABLE, AND TELEPHONE COMPANIES PRIOR TO ANY EXCAVATION. THE CONTRACTOR SHALL NOTIFY ONE-CALL SERVICE (CALL 811) SEVENTY-TWO (72) HOURS AS REQUIRED BY LAW BEFORE ANY EXCAVATION, AT ANY LOCATION.

ELECTRICAL ABBREVIATIONS

A / AB	ABOVE
AF	AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT INTERRUPTER
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AVAILABLE FAULT CURRENT
AMP	AMPERE
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
BFG	BELOW FINISHED GRADE
BOD	BASIS OF DESIGN
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
DETD	DUAL ELEMENT TIME DELAY
DN	DOWN
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
ECB	ENCLOSED CIRCUIT BREAKER
EDP	ELECTRICAL DATUM PLANE
EMG	EMERGENCY
EQUIP	EQUIPMENT
ETB	ELECTRONIC TRIP BREAKER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFM	GROUND FAULT MONITOR
GFPE	GROUND FAULT PROTECTION OF EQUIPMENT
IPC	INTEGRATED POWER CENTER
KVA	KILOVOLT-AMPERE
KW	KILOWATT
LEUD	LOCAL ELECTRICAL AND UTILITY DEPARTMENT
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCS	MOLDED CASE SWITCH
MDP	MAIN DISTRIBUTION PANEL
MFG	MANUFACTURING
MFR	MANUFACTURER
MIN	MINIMUM
MLO	MAIN LUG ONLY
MOCP	MAIN OVERCURRENT PROTECTION
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OCP	OVERCURRENT PROTECTION
OH	OVERHEAD
PH / Φ	PHASE
PNL	PANEL
PPC	PORTABLE POWER CABLE
RECPT	RECEPTACLE
SCH	SCHEDULE
SER	SERVICE ENTRANCE CONDUCTOR
SPD	SURGE PROTECTIVE DEVICE
ST	SHUNT TRIP
TEL	TELEPHONE
TMB	THERMAL MAGNETIC BREAKER
TYP	TYPICAL
U / UC	UNDER / UNDER CABINET
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
US	UNDERSLAB
UW	UNDERWATER
V	VOLT
VA	VOLT-AMPERE
W	WATT
WR	WEATHER-RESISTANT
WRI	WEATHER-RESISTANT, IN-USE

ELECTRICAL NOTES

1. APPLICABLE CODES INCLUDE, BUT ARE NOT RESTRICTED TO, THE LATEST ADOPTED VERSIONS OF THE FOLLOWING CODES AT THE TIME OF THE PLAN DATE:
   - NFPA 70 NATIONAL ELECTRIC CODE
   - INTERNATIONAL BUILDING CODE
   - UL UNDERWRITERS LABORATORY
   - NEMA
2. ELECTRICAL SYSTEM(S) SHALL BE INSTALLED COMPLETE WITH ALL WORK, MATERIALS, AND EQUIPMENT CUSTOMARILY CONSIDERED PART OF SUCH WORK FOR A FULLY OPERATIONAL, COMPLETE, AND CODE COMPLIANT SYSTEM.
3. PLANS ARE DIAGRAMMATIC AND ARE PROVIDED ONLY TO SHOW GENERAL SYSTEM. CONTRACTOR SHALL CONSIDER ACTUAL FIELD CONDITIONS DURING INSTALLATION. ANY GROSS INTERFERENCE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE CONTINUING.
4. ALL ELECTRICAL CONNECTIONS SHALL BE MOUNTED ABOVE ELECTRICAL DATUM PLANE.
5. COORDINATE FINAL LOCATIONS OF ALL SWITCHES AND OUTLETS WITH OWNER. OWNER SHALL RETAIN RIGHT TO MAKE MINOR LOCATION ADJUSTMENTS PRIOR TO EQUIPMENT INSTALLATION WITHOUT ADDITIONAL COST.
6. ALL 3Φ CIRCUITS SHALL HAVE A-B-C PHASE ROTATION. ALL 3Φ ELECTRICAL SWITCHGEAR, SWITCHBOARDS, MCC'S, AND SIMILAR EQUIPMENT SHALL HAVE A-B-C PHASE ROTATION FROM LEFT TO RIGHT. REFER TO THE POWER WIRING COLOR CODE ON THIS SHEET.
7. VERIFY AVAILABLE CIRCUIT CURRENT WITH ELECTRICAL POWER SUPPLIER.
8. PROVIDE COMPLETE AND COMPLIANT EQUIPMENT AND SYSTEM GROUNDING THROUGHOUT ELECTRICAL INSTALLATION. INSTALL BONDING JUMPERS TO OUTLET BOXES IN METALLIC CONDUIT SYSTEMS.
9. UNLESS OTHERWISE NOTED, EACH CONDUIT OR RACEWAY SHALL CONTAIN ONLY A SINGLE CIRCUIT.
10. ALL EXTERIOR EQUIPMENT SHALL BE NEMA 3R RAINTIGHT.
11. WITH ALL LIGHTING AND MOTOR LOADS OPERATING, CONTRACTOR SHALL VERIFY THAT THE PHASE BALANCE IN EACH PANEL IS WITHIN 5%.
12. COMPLETE ELECTRICAL SYSTEMS SHALL BE TESTED FOR COMPLIANCE AND FUNCTION IN ACCORDANCE WITH LOCAL INSPECTIONS AND NATIONAL CODES.
13. CONTRACTOR SHALL INSTALL EXPANSION AND DEFLECTION CONDUIT FITTINGS PER NEC 300.7(B), PLANS, AND SPECIFICATIONS.
14. THE AMPACITY, VOLTAGE, AND PHASE OF ALL DISCONNECTS SHALL BE RATED PER THE SPECIFIED CIRCUIT AND UPSTREAM OVERCURRENT PROTECTION UON. THE ENCLOSURE NEMA RATING SHALL BE COORDINATED AS REQUIRED BY THE ENVIRONMENT.
15. IF DISCREPANCIES EXIST WITHIN THE PLANS AND/OR SPECIFICATIONS, THE MOST STRINGENT SHALL APPLY AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BRING IT TO THE ATTENTION OF THE ENGINEER BEFORE WORK IS STARTED OR MATERIAL/EQUIPMENT IS ORDERED.
16. THE PLANS AND SPECIFICATIONS FOR THIS WORK HAVE BEEN PREPARED WITH THE INTENT TO BE AS ACCURATE AND COMPLETE AS PRACTICAL, BUT ERRORS, OMISSIONS, AND CONFLICTS MAY EXIST. PRIOR TO SUBMITTING A BID FOR CONSTRUCTING THE WORK, THE CONTRACTOR SHALL REVIEW THE PLANS AND SPECIFICATIONS IN DETAIL. ANY QUESTIONS OR COMMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO SUBMITTING A BID. BY SUBMITTING A BID FOR THE WORK, THE CONTRACTOR ACKNOWLEDGES THAT HE HAS REVIEWED THE PLANS AND SPECIFICATIONS, UNDERSTANDS THE DESIGN INTENT, AND DOES NOT HAVE ANY FURTHER QUESTIONS OR COMMENTS.
17. CONTRACTOR SHALL FIELD VERIFY THAT ALL PARALLEL CONDUCTOR RUNS OF SERVICE ENTRANCE OR FEEDER CONDUCTORS FOR EACH CIRCUIT FOLLOW THE SAME PATH AND ARE OF EQUAL LENGTH.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UTILITY FEES AND CHARGES FOR INSTALLATION AND UTILITY UPGRADES FOR PROJECT.
19. CONTRACTOR SHALL COORDINATE AND PAY FOR ALL PERMITS, INSPECTION FEES, UTILITY FEES, AND UTILITY CHARGES FOR THIS PROJECT.
20. CONTRACTOR SHALL WARRANTY ALL SYSTEMS FOR PARTS, EQUIPMENT, MATERIAL, AND LABOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.
21. THE OWNER AND/OR OWNER'S REPRESENTATIVE SHALL INSPECT THE INSTALLATION AT SUBSTANTIAL COMPLETION AND AT ONE YEAR FROM SUBSTANTIAL COMPLETION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORRECTIONS THAT DO NOT CONFORM TO THE CODE AND/OR THE CONTRACT DOCUMENTS.
22. KELLEMS GRIPS SHALL BE INSTALLED SO THE GRIP IS ALIGNED WITH THE CABLE TO AVOID ANY PRESSURE POINTS ANYWHERE ALONG THE LENGTH OF THE GRIP. THIS INCLUDES INSTALLATION PROJECTS WHERE TIDAL ACTION MAY CHANGE THE ANGLE OF THE CABLE IN REFERENCE TO THE GRIP POSITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBSERVING AND MAKING ANY ADJUSTMENTS TO THE GRIP MOUNTING POSITION AND CABLE LENGTHS AS REQUIRED TO MITIGATE PRESSURE POINTS AT LOW AND HIGH TIDES. REFER TO PLANS AND DETAILS WHERE THE GRIPS ARE INDENDED TO BE INSTALLED. ALL KELLEMS GRIPS, SUPPORT CABLE, AND MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
23. LABEL REQUIREMENTS:
    A. ALL ELECTRICAL EQUIPMENT SHALL BE AFFIXED WITH A PERMANENT LABEL STATING THE EQUIPMENT NAME, VOLTAGE AND PHASE CLASS, AMPACITY, AND WHERE THE EQUIPMENT IS FED FROM.
    B. PANEL DIRECTORIES SHALL BE TYPED SHOWING EACH BRANCH BREAKER LOAD AS SHOWN IN THE PANEL SCHEDULES.
    C. EACH SHORE POWER PEDESTAL SHALL BE LABELED WITH THE UPSTREAM CIRCUIT AND PANEL.
24. CONTRACTOR SHALL CARRY CONTINGENCY IN THE AMOUNT OF 10% OF BID.
25. SUBMITTAL REQUIREMENTS: CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL DETAILED PRODUCT INFORMATION ON ALL EQUIPMENT INCORPORATED IN THE PROJECT RELATED TO THE SPECIFIC CONTRACTOR TRADE. SUBMITTAL SHALL BE PROVIDED, AND ENGINEER SHALL REVIEW AND APPROVE, PRIOR TO EQUIPMENT PURCHASE. FOUR COPIES OF SUBMITTALS SHALL BE PROVIDED TO THE ENGINEER. TWO COPIES SHALL BE RETURNED TO THE CONTRACTOR. PRIOR TO SUBMITTAL, CONTRACTOR SHALL REVIEW AND CERTIFY BY SIGNATURE THE SUBMITTED EQUIPMENT MEETS SPECIFICATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DIMENSIONS, FITTINGS, AND CONSTRUCTION FEATURES RELATIVE TO EQUIPMENT. APPROVAL OF SUBMITTAL INFORMATION BY THE ENGINEER ONLY REFERS TO MATERIALS, DESIGN, AND ADHERENCE TO SPECIFICATIONS.

BRANCH CIRCUIT AND FEEDER LEGEND W/ EQUIP. GND.

ALL WIRE SIZED FOR THWN COPPER
ALL CONDUIT SIZED FOR RIGID PVC, SCHEDULE 40; RESIZE FOR DIFFERENT CONDUIT AS REQUIRED
FEEDER LABEL WITH * IN THE PLANS INDICATES NEUTRAL IS NOT REQUIRED

LABEL	CONDUCTORS PER CONDUIT	NUMBER OF RUNS	MINIMUM CONDUIT	CONDUCTOR AMPACITY 75 °C	Φ	VOLTAGE RANGE
A20	(2) #12 & (1) #12 GND.	1	1/2"	20	1	120 OR 277
A30	(2) #10 & (1) #10 GND.	1	3/4"	30	1	120 OR 277
A50	(2) #8 & (1) #10 GND.	1	3/4"	50	1	120 OR 277
B20	(3) #12 & (1) #12 GND.	1	1/2"	20	1	208 - 480
B30	(3) #10 & (1) #10 GND.	1	3/4"	30	1	208 - 480
B50	(3) #8 & (1) #10 GND.	1	3/4"	50	1	208 - 480
B60	(3) #6 & (1) #10 GND.	1	3/4"	65	1	208 - 480
B80	(3) #4 & (1) #8 GND.	1	1"	85	1	208 - 480
B100	(3) #3 & (1) #8 GND.	1	1-1/2"	100	1	208 - 480
B110	(3) #2 & (1) #6 GND.	1	1-1/2"	115	1	208 - 480
B125	(3) #1 & (1) #6 GND.	1	1-1/2"	130	1	208 - 480
B150	(3) #1/0 & (1) #6 GND.	1	2"	150	1	208 - 480
B175	(3) #2/0 & (1) #6 GND.	1	2"	175	1	208 - 480
B200	(3) #3/0 & (1) #6 GND.	1	2"	200	1	208 - 480
B225	(3) #4/0 & (1) #4 GND.	1	2-1/2"	230	1	208 - 480
B250	(3) #250 KCM & (1) #4 GND.	1	2-1/2"	255	1	208 - 480
B275	(3) #300 KCM & (1) #4 GND.	1	2-1/2"	285	1	208 - 480
B300	(3) #350 KCM & (1) #4 GND.	1	3"	310	1	208 - 480
B350	(3) #500 KCM & (1) #3 GND.	1	3"	380	1	208 - 480
B400	(3) #3/0 & (1) #3 GND.	2	2"	400	1	208 - 480
B450	(3) #4/0 & (1) #2 GND.	2	2-1/2"	460	1	208 - 480
B500	(3) #250 KCM & (1) #2 GND.	2	2-1/2"	510	1	208 - 480
B600	(3) #350 KCM & (1) #1 GND.	2	3"	620	1	208 - 480
B800	(3) #300 KCM & (1) #1/0 GND.	3	2-1/2"	855	1	208 - 480
B1000	(3) #250 KCM & (1) #2/0 GND.	4	2-1/2"	1020	1	208 - 480
B1200	(3) #350 KCM & (1) #3/0 GND.	4	3"	1240	1	208 - 480
C20	(4) #12 & (1) #12 GND.	1	1/2"	20	3	208 - 480
C30	(4) #10 & (1) #10 GND.	1	3/4"	30	3	208 - 480
C50	(4) #8 & (1) #10 GND.	1	3/4"	50	3	208 - 480
C60	(4) #6 & (1) #10 GND.	1	1"	65	3	208 - 480
C80	(4) #4 & (1) #8 GND.	1	1-1/2"	85	3	208 - 480
C100	(4) #3 & (1) #8 GND.	1	1-1/2"	100	3	208 - 480
C110	(4) #2 & (1) #6 GND.	1	1-1/2"	115	3	208 - 480
C125	(4) #1 & (1) #6 GND.	1	1-1/2"	130	3	208 - 480
C150	(4) #1/0 & (1) #6 GND.	1	2"	150	3	208 - 480
C175	(4) #2/0 & (1) #6 GND.	1	2"	175	3	208 - 480
C200	(4) #3/0 & (1) #6 GND.	1	2"	200	3	208 - 480
C225	(4) #4/0 & (1) #4 GND.	1	3"	230	3	208 - 480
C250	(4) #250 KCM & (1) #4 GND.	1	3"	255	3	208 - 480
C300	(4) #350 KCM & (1) #4 GND.	1	3"	310	3	208 - 480
C350	(4) #500 KCM & (1) #3 GND.	1	3-1/2"	380	3	208 - 480
C400	(4) #3/0 & (1) #3 GND.	2	2"	400	3	208 - 480
C450	(4) #4/0 & (1) #2 GND.	2	3"	460	3	208 - 480
C500	(4) #250 KCM & (1) #2 GND.	2	3"	510	3	208 - 480
C600	(4) #350 KCM & (1) #1 GND.	2	3"	620	3	208 - 480
C800	(4) #300 KCM & (1) #1/0 GND.	3	3"	855	3	208 - 480
C1000	(4) #250 KCM & (1) #2/0 GND.	4	3"	1020	3	208 - 480
C1200	(4) #350 KCM & (1) #3/0 GND.	4	3"	1240	3	208 - 480
C1400	(4) #500 KCM & (1) #4/0 GND.	4	3-1/2"	1520	3	208 - 480
C1600	(4) #400 KCM & (1) #4/0 GND.	5	3"	1675	3	208 - 480
C2000	(4) #600 KCM & (1) #250 KCM GND.	5	4"	2100	3	208 - 480

SERVICE ENTRANCE CONDUCTOR & CONDUIT LEGEND

ALL WIRE SIZED FOR THWN COPPER
ALL CONDUIT SIZED FOR RIGID PVC, SCHEDULE 40; RESIZE FOR DIFFERENT CONDUIT AS REQUIRED

LABEL	GROUNDING ELECTRODE CONDUCTOR	CONDUCTORS PER CONDUIT	NUMBER OF RUNS	MINIMUM CONDUIT	CONDUCTOR AMPACITY 75 °C	Φ	VOLTAGE RANGE
1S60	#8	(3) #6	1	2"	65	1	208 - 480
1S100	#8	(3) #3	1	3"	100	1	208 - 480
1S150	#6	(3) #1/0	1	3"	150	1	208 - 480
1S200	#4	(3) #3/0	1	3"	200	1	208 - 480
1S225	#2	(3) #4/0	1	3"	230	1	208 - 480
1S400	#1/0	(3) #3/0	2	3"	400	1	208 - 480
1S400	#1/0	(3) #600 KCM	1	4"	420	1	208 - 480
1S600	#3/0	(3) #3/0	3	3"	600	1	208 - 480
1S600	#3/0	(3) #350 KCM	2	3"	620	1	208 - 480
1S800	#3/0	(3) #3/0	4	3"	800	1	208 - 480
1S800	#3/0	(3) #300 KCM	3	3"	855	1	208 - 480
1S1000	#3/0	(3) #250 KCM	4	3"	1020	1	208 - 480
1S1200	#3/0	(3) #350 KCM	4	3"	1240	1	208 - 480
3S200	#4	(4) #3/0	1	3"	200	3	208 - 480
3S225	#2	(4) #4/0	1	3"	230	3	208 - 480
3S400	#1/0	(4) #3/0	2	3"	400	3	208 - 480
3S600	#3/0	(4) #350 KCM	2	3"	620	3	208 - 480
3S800	#3/0	(4) #300 KCM	3	3"	855	3	208 - 480
3S1000	#3/0	(4) #400 KCM	3	3"	1005	3	208 - 480

POWER PEDESTAL LEGEND

OTHER NOTES:
- (1) kWH METER INCLUDED PER ACTIVE PEDESTAL SIDE UNLESS OTHERWISE NOTED
- ALL SHORE POWER BREAKERS SHALL BE PROTECTED BY A LISTED INDIVIDUAL GFPE DEVICE SET TO TRIP BETWEEN 25mA - 30mA AND 250ms OR FASTER LOCATED IN THE SHORE POWER PEDESTAL
- COORDINATE LIGHT COLOR AND/OR LENS COLOR WITH OWNER AND LOCAL REQUIREMENTS

	LABEL	SIDE 1	SIDE 2	LIGHTING	OTHER UTILITIES	MOUNTING	MODEL #
	PP1	(1) 50A 240V SHORE POWER RECPT (1) 30A 120V SHORE POWER RECPT - 120V GFCI MAINTENANCE OUTLET	(1) 50A 240V SHORE POWER RECPT (1) 30A 120V SHORE POWER RECPT - 120V GFCI MAINTENANCE OUTLET	10W LED W/ INTEGRAL PHOTOCELL	(1) 3/4" HOSE BIBB PER ACTIVE PEDESTAL SIDE	DECK-MOUNTED	HYPOWER POWERPORT
	PP2	(1) 50A 240V RV RECPT (1) 30A 120V RV RECPT - 120V GFCI MAINTENANCE OUTLET	N/A	10W LED W/ INTEGRAL PHOTOCELL	(1) 3/4" HOSE BIBB PER ACTIVE PEDESTAL SIDE	PAD-MOUNTED	HYPOWER POWERPORT
	PP3	(2) 50A 240V SHORE POWER RECPT - 120V GFCI MAINTENANCE OUTLET	(2) 50A 240V SHORE POWER RECPT - 120V GFCI MAINTENANCE OUTLET	10W LED W/ INTEGRAL PHOTOCELL	(1) 3/4" HOSE BIBB PER ACTIVE PEDESTAL SIDE	DECK-MOUNTED	HYPOWER POWERPORT
	PP4	(2) 30A 120V SHORE POWER RECPT (1) 50A 240V SHORE POWER RECPT - 120V GFCI MAINTENANCE OUTLET	(2) 30A 120V SHORE POWER RECPT (1) 50A 240V SHORE POWER RECPT - 120V GFCI MAINTENANCE OUTLET	10W LED W/ INTEGRAL PHOTOCELL	(1) 3/4" HOSE BIBB PER ACTIVE PEDESTAL SIDE	DECK-MOUNTED	HYPOWER POWERPORT
	PP5	(4) 120V GFCI MAINTENANCE OUTLETS	(4) 120V GFCI MAINTENANCE OUTLETS	9W 120V LED W/ INTEGRAL PHOTOCELL	N/A	PAD-MOUNTED	HYPOWER POWERPORT
◯	PP6	N/A	N/A	9W 120V LED W/ INTEGRAL PHOTOCELL			HYPOWER POWERPORT
△	PP7	DURABLE U/V PROTECTED CASE W/ LOCKABLE BREAK-AWAY DOOR W/ HEAVY-DUTY, POWDER-COATED 6061 ALUMINUM STAND, W/ 10lb ABC FIRE EXTINGUISHER	N/A	9W 120V LED W/ INTEGRAL PHOTOCELL			HYPOWER FIRE PEDESTAL

GROUND FAULT MONITOR SCHEDULE

- MANUFACTURER SHALL PROGRAM ALL PARAMETERS PER THE DESIGN AND SHALL SET TIME AND DATE FOR THE PROJECT'S TIME ZONE
- SEE CIRCUIT SCHEDULES FOR TRIP SETTINGS
- CT SENSORS TO BE USED AS REQUIRED TO CONTROL SHUNT TRIP BREAKERS
- SPARE CHANNELS SHALL BE DISABLED
- USE SPECIFIED EQUIPMENT OR APPROVED EQUAL
- SHALL HAVE LOCKABLE DOOR
- SEE GROUND FAULT MONITOR WIRING DETAIL

LABEL	LOCATION	MANUFACTURER	RELAY MODEL	INPUTS / OUTPUTS	ENCLOSURE	NOTES
G1	HARBOR PARK	BENDER	RCM420	1	SS1	LISTED ASSEMBLY
G3	MIDDLE PIER	BENDER	RCMS490	12	SS3	LISTED ASSEMBLY
G2	PUBLIC LANDING	BENDER	RCMS490	12	SS2	LISTED ASSEMBLY

SUB-STATION SCHEDULE

- NEMA 3R, ALUMINUM, WHITE
- USE AMERICAN MIDWEST POWER OR APPROVED EQUAL
- SEE ONE-LINE & SCHEDULES

SS1	
TRANSFORMER	T1
PANEL	H1
PANEL	L1
GFM	G1
SS2	
TRANSFORMER	T2
PANEL	H2
PANEL	L2
GFM	G2
SS3	
TRANSFORMER	T3
MCS	M3
PANEL	L3
GFM	G3

ELECTRICAL MATERIALS SCHEDULE - MARINA

• ALL NONMETALLIC MATERIAL SHALL BE UV-RESISTANT

DESCRIPTION	MATERIAL	STANDARDS	REMARKS
BOXES			
PULL / JUNCTION / OUTLET BOX	GALVANIZED STEEL	UL 731A	• 1 1/2" MINIMUM DEPTH COORDINATE SIZE WITH NEC COORDINATE COVER MATERIAL & COLOR W/ ARCH/OWNER
WIRE / CABLE			
#10 & SMALLER	600-VOLT THWN THWN-2 AS NOTED	UL 83	• SOLID OR STRANDED AS REQUIRED BY EQUIPMENT MANUFACTURER • TINNED SOFT • DRAWN COPPER
#8 & LARGER	600-VOLT THWN THWN-2 AS NOTED	UL 83	• STRANDED • TINNED SOFT • DRAWN COPPER
TYPE "W" / "G" / "G-GC" MARINE CABLE	105°C 2000-VOLT	UL 83	• USE FOR UNDERWATER FEEDER • STRANDED • TINNED SOFT • DRAWN COPPER • EXTRA HARD USE • SUN LIGHT RESISTANT • OIL, GAS, AND CHEMICAL RESISTANT
WET-LISTED MC CABLE	600-VOLT		• PVC JACKET
CONDUIT			
RIGID	GALVANIZED STEEL	HH 9359	• USE ABOVE OR BELOW GROUND
PVC	SCHEDULE 40 / 80 PVC	NEMA TC-2	• USE SCHEDULE 40 IN PROTECTED DOCK STRUCTURE OR UNDERGROUND / UNDERWATER / UNDERDECK • USE SCHEDULE 80 ABOVE THE DECK AND ABOVE GROUND UP TO 6'
EMT	GALVANIZED DUCTILE STEEL	HE 8141	• ELECTRIC METALLIC TUBING - USE IN DRY OF FLOATING BUILDINGS
LFNC	LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT		• LISTED FOR DIRECT BURIAL - INSTALL WHERE NOT SUBJECT TO PHYSICAL DAMAGE AND NOT ABOVE THE DECK
HDPE	HIGH-DENSITY POLYETHYLENE		• INSTALL UNDERGROUND FOR SERVICE AND FEEDER CONDUCTORS WHERE NOT SUBJECT TO PHYSICAL DAMAGE
CONDUIT HANGERS / STRAPS			
UP TO 3/4"	GALVANIZED STEEL		• 4'-0" O/C MAXIMUM
1" TO 1-1/4"			• 6'-0" O/C MAXIMUM
1-1/2" & UP			• 8'-0" O/C MAXIMUM
CABLE SUPPORT			
"KELLEMS" CABLE GRIPS	STAINLESS STEEL		• COORDINATE SIZE AND STYLE FOR PROPER CABLE OR CONDUIT

TRANSFORMER SCHEDULE

- USE SPECIFIED EQUIPMENT OR EQUAL

LABEL	LOCATION	ENCLOSURE	TYPE	DOUBLE LUG	PRIMARY VOLTS	PRIMARY Φ	PRIMARY WINDING	SECONDARY VOLTS	SECONDARY Φ	SECONDARY WINDING
T1	HARBOR PARK	SS1	DRY	N	480	1	1	240	1	CTR TAP
T2	MIDDLE PIER	SS2	DRY	N	480	1	1	240	1	CTR TAP
T3	PUBLIC LANDING	SS3	DRY	N	480	1	1	240	1	CTR TAP

ELECTRICAL UPGRADES FOR CITY OF ROCKLAND DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS ROCKLAND, MAINE

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Revisions indicated w/ △

Revisions: No.	Date	Description

SHEET: E0.1
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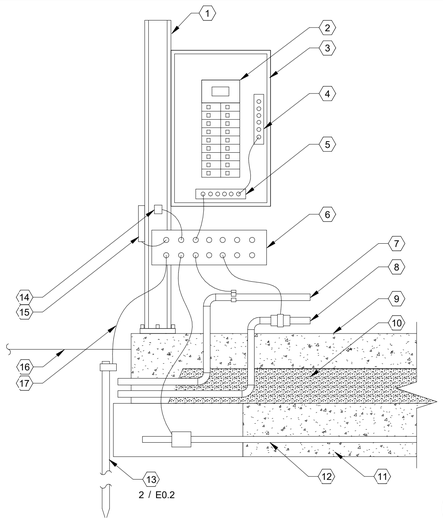
PRELIMINARY SET NOT FOR CONSTRUCTION



ELECTRICAL NOTES

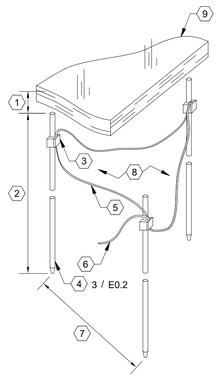
NUMBERED NOTES

1 METAL FRAME OF BUILDING OR MOUNTING STRUCTURE.
2 MAIN DISCONNECT.
3 SERVICE EQUIPMENT.
4 NEUTRAL BAR.
5 GROUNDING BAR.
6 GROUNDING PLATE OR BONDING POINT AS REQUIRED.
7 WATER PIPING ON LOAD SIDE OF METER.
8 GAS PIPING ON LOAD SIDE OF METER.
9 FINISHED FLOOR.
10 FILL GRAVEL.
11 CONCRETE FOOTER.
12 CONCRETE-ENCASED ELECTRODE, 1/2" x 20' FOR NEW CONSTRUCTION.
13 GROUND ROD, SEE REFERENCED DETAIL.
14 BONDING POINT.
15 GROUND BAR FOR LOW VOLTAGE UTILITIES.
16 FINISHED GRADE.
17 GROUNDING ELECTRODE CONDUCTOR.

GENERAL NOTES

A SHALL BE PER NEC ARTICLE 250.
B ALL PROJECTS MAY NOT INCLUDE METAL WATER PIPE, GAS LINE, OR METAL CONSTRUCTION.
C CONFIGURATION OF SERVICE MAY DIFFER, COORDINATE INSTALLATION.

1 GROUNDING DTL
E0.2 — NOT TO SCALE

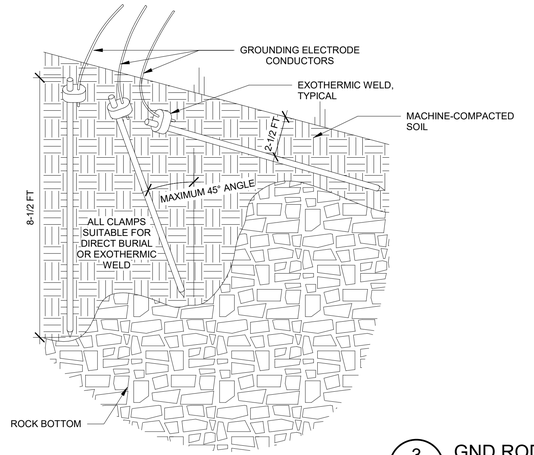


ELECTRICAL NOTES

NUMBERED NOTES

1 INSTALL GROUND ROD BELOW GROUND FREEZING DEPTH. COORDINATE DEPTH WITH AREA OF INSTALLATION.
2 GROUND ROD TO HAVE A MINIMUM OF 8' IN CONTACT WITH UNDISTURBED EARTH.
3 UL LISTED UNDERGROUND EXOTHERMIC WELD OR APPROVED CLAMP, TYP.
4 UL LISTED 5/8" Ø x 10' DRIVEN GROUND ROD, TYP. COORDINATE LOCATION WITH SITE. SEE REFERENCED DETAIL.
5 GROUNDING CONDUCTOR, TYP. SAME SIZE AS GROUNDING ELECTRODE CONDUCTOR.
6 GROUNDING ELECTRODE CONDUCTOR.
7 GROUND RODS TO BE INSTALLED IN A TRIANGULAR PATTERN WITH MIN. 6' APART, TYP.
8 VIRGIN EARTH.
9 FINISHED GRADE.

2 GROUND ROD DTL
E0.2 — NOT TO SCALE



3 GND ROD INSTALL. DTL
E0.2 — NOT TO SCALE

ELECTRICAL NOTES

NUMBERED NOTES

1 BONDING CONDUCTOR #3/0 GREEN INSULATION COPPER CABLE, MSHA ACCEPTED, WET LOCATIONS, RESISTANT TO OILS, ACIDS, ALKALINES, AND ABRASION-RESISTANT, OR 12" OF GREEN TAPE AT EACH END. CONDUCTOR STRAND SHALL BE MINIMUM OF 448/24 STRANDS. ALLOW ENOUGH SLACK IN WIRE FOR STRUCTURE MOVEMENT AS PRACTICAL. INSTALLATION LOCATION SHALL BE SUCH THAT NO DAMAGE WILL OCCUR TO CONDUCTOR DURING STRUCTURE MOVEMENT.
2 (2) STAINLESS STEEL HEX BOLTS 5/16 - 18 MIN.
3 HEX STYLE CRIMP OR EQUAL, USING A MINIMUM OF 14 TON CRIMP TOOL.
4 CLEAN STRUCTURE METAL BEHIND CLAMP.

4 BONDING DTL
E0.2 — NOT TO SCALE

SIDE VIEW

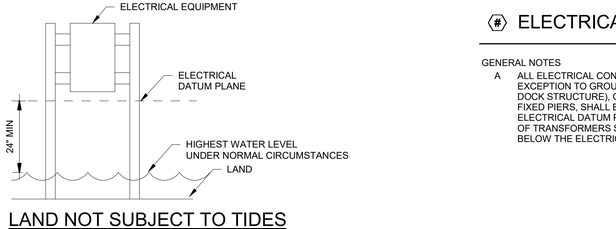
ELEVATION VIEW

5 POST MOUNT DTL
E0.2 — NOT TO SCALE

ELECTRICAL NOTES

NUMBERED NOTES

1 3-1/4" GALVANIZED SQUARE POST.
2 PLASTIC CAP.
3 EQUIPMENT PAD.
4 OPEN BOTTOM.
5 6" OF GRADE #57 GRAVEL.
6 FINISHED GRADE.
7 ELECTRICAL EQUIPMENT PER PLANS.
8 UNISTRUT FOR EQUIPMENT MOUNTING AS REQUIRED. COORDINATE UNISTRUT SPACING WITH EQUIPMENT MOUNTING HOLES.
9 UNISTRUT FOR CONDUIT SUPPORT INSTALLED WITHIN 12" OF EQUIPMENT.
10 POLE BASE SUPPORT.
11 SLAB.
12 EQUIPMENT WIDTH VARIES.
13 STRUCTURE WIDTH SHALL BE 4" WIDER THAN WIDTH OF EQUIPMENT.
14 IF SPACE BETWEEN FIRST UNISTRUT AND SLAB IS GREATER THAN 36", INSTALL SECOND UNISTRUT EQUIDISTANT.



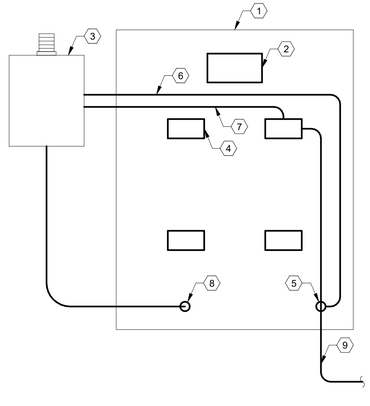
LAND NOT SUBJECT TO TIDES

6 ELECTRICAL DATUM PLANE DTL
E0.2 — NOT TO SCALE

ELECTRICAL NOTES

GENERAL NOTES

A ALL ELECTRICAL CONNECTIONS (WITH EXCEPTION TO GROUND BONDING TO DOCK STRUCTURE), ON FLOATING OR FIXED PIERS, SHALL BE ABOVE THE ELECTRICAL DATUM PLANE. BOTTOMS OF TRANSFORMERS SHALL NOT BE BELOW THE ELECTRICAL DATUM PLANE.

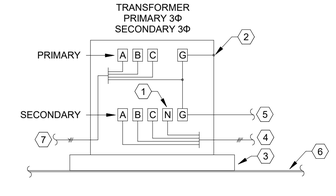


ELECTRICAL NOTES

NUMBERED NOTES

1 ELECTRICAL PANEL.
2 MAIN CIRCUIT BREAKER.
3 GROUND FAULT MONITOR (GFM), COORDINATE WITH MANUFACTURER FOR WIRING AND INSTALLATION REQUIREMENTS. RED BEACON SHALL FLASH UPON ALL CIRCUIT TRIPS DUE TO GROUND FAULT ALARMS.
4 SHUNT TRIP BRANCH BREAKER, TYPICAL. SEE PANEL SCHEDULE FOR SIZE.
5 GFM CURRENT SENSOR, TYPICAL. SIZE PER WIRE AS SHOWN IN PANEL SCHEDULE. HOT AND NEUTRAL CONDUCTORS ROUTED THROUGH CT.
6 CURRENT SENSOR CONTROL WIRE, TYIPCAL.
7 SHUNT TRIP CONTROL WIRE, TYPICAL.
8 TAP BUS ON LOAD SIDE OF THE MAIN BREAKER AND RUN TO GFM. UTILIZE A SUB-FEED LUG BLOCK OR SIMILAR MEANS TO MAKE TAP. TERMINATE CIRCUIT ON MANUFACTURER'S SUPPLIED OVERCURRENT DEVICE. CIRCUIT CONDUCTORS SHALL NOT EXTEND LONGER THAN 10 FEET.
9 BRANCH CIRCUIT TO MARINA PEDESTAL, TYPICAL.

7 GFM WIRING DTL
E0.2 — NOT TO SCALE



ELECTRICAL NOTES

NUMBERED NOTES

1 BOND NEUTRAL TO GROUND AT FIRST OVER CURRENT PROTECTION DEVICE.
2 BOND ENCLOSURE.
3 CONCRETE EQUIPMENT PAD AS REQUIRED.
4 SECONDARY TO PANEL. SEE RISER FOR DETAILS.
5 SUPPLY SIDE BONDING JUMPER BOND TO STRUCTURAL STEEL.
6 FINISHED FLOOR.
7 PRIMARY CONDUCTORS.

8 XFMR WIRING DTL
E0.2 — NOT TO SCALE

ELECTRICAL UPGRADES FOR CITY OF ROCKLAND DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS ROCKLAND, MAINE

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Revisions indicated w/ △

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DATE: 9-7-23
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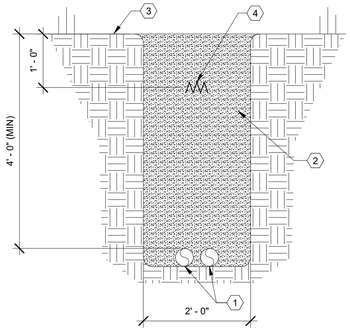
PRELIMINARY SET NOT FOR CONSTRUCTION

ELECTRICAL NOTES

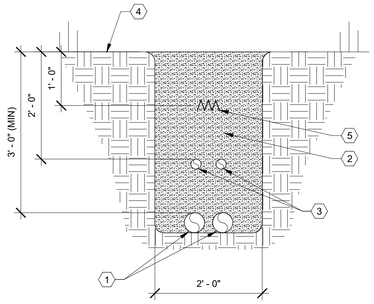
NUMBERED NOTES
1. SCH 40 PVC PRIMARY CONDUITS AS REQUIRED.
2. MACHINE COMPACTED GRAVEL FILL FOR AREAS WHEN CROSSING DRIVEWAYS, ROADS, AND PARKING LOTS. DIRT FILL AND COMPACT ALL OTHER AREAS
3. FINISHED GRADE.
4. WARNING TAPE.



1 E0.3 — 48" DITCH DTL
NOT TO SCALE

ELECTRICAL NOTES

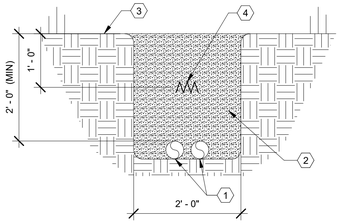
NUMBERED NOTES
1. SCHD 40 PVC SERVICE CONDUITS AS REQUIRED.
2. MACHINE COMPACTED GRAVEL FILL FOR AREAS WHEN CROSSING DRIVEWAYS, ROADS, AND PARKING LOTS. DIRT FILL AND COMPACT ALL OTHER AREAS.
3. COMMUNICATION CONDUITS AS REQUIRED.
4. FINISH GRADE.
5. WARNING TAPE.



2 E0.3 — 36" DITCH DTL
NOT TO SCALE

ELECTRICAL NOTES

NUMBERED NOTES
1. SCH 40 PVC FEEDER AND/OR BRANCH CIRCUIT CONDUITS AS REQUIRED.
2. MACHINE COMPACTED GRAVEL FILL FOR AREAS WHEN CROSSING DRIVEWAYS, ROADS, AND PARKING LOTS. DIRT FILL AND COMPACT ALL OTHER AREAS
3. FINISHED GRADE.
4. WARNING TAPE.



3 E0.3 — 24" DITCH DTL
NOT TO SCALE

ELECTRICAL NOTES

NUMBERED NOTES
1. FIXTURE HEAD, SEE LIGHTING FIXTURE SCHEDULE
2. POLE - REF.
3. ACCESS HAND HOLE, PROVIDE FUSING AT BASE OF POLE.
4. POLE ANCHOR BOLTS, COORDINATE WITH MANUFACTURER.
5. #4 BANDS AT 12" O/C.
6. SONO TUBE FORM, REMOVE AFTER POURING.
7. COMPACTED FILL OR UNDISTURBED SOIL.
8. PVC CONDUITS AS REQUIRED, TYP.
9. (4) #4 REINFORCED.
10. #2 BARE COPPER GROUND WIRE.
11. FINISHED GRADE.
12. 3/4" x 10'-0" COPPER GROUND ROD (DRIVEN).

4 E0.3 — POLE LIGHT DTL
NOT TO SCALE

ELECTRICAL UPGRADES FOR CITY OF ROCKLAND DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS ROCKLAND, MAINE

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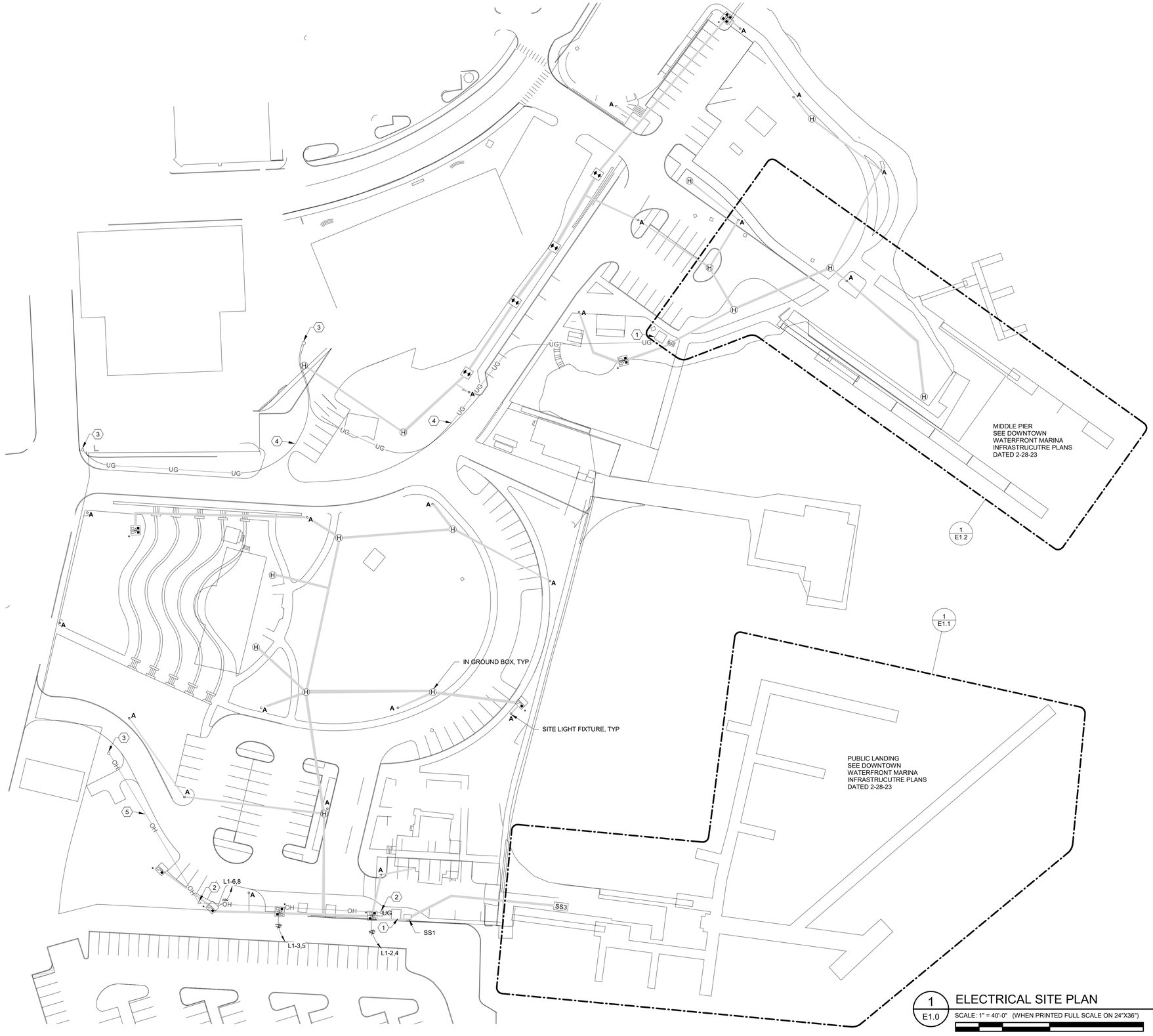
PRELIMINARY SET NOT FOR CONSTRUCTION

ELECTRICAL NOTES

NUMBERED NOTES

1. PROPOSED UTILITY TRANSFORMER LOCATION.
2. NEW PROPOSED UTILITY POLE.
3. EXISTING UTILITY POLE LOCATION.
4. NEW UTILITY PRIMARY. REFER TO 48" DITCH DETAIL.
5. NEW OVERHEAD PRIMARY.



1 E1.0 ELECTRICAL SITE PLAN

SCALE: 1" = 40'-0" (WHEN PRINTED FULL SCALE ON 24"X36")

0' 20' 40' 80' 160'

ELECTRICAL UPGRADES FOR CITY OF ROCKLAND DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS ROCKLAND, MAINE

MAFFETT LAFOLETTIS
ENGINEERING, LLC
3 JEFFERSON AVE, STE 101
CAMDEN, ME 04843
TEL: (931) 526-5143
www.maffett-lafolletis.com

Revisions:

No.	Date	Description
		Revisions indicated w/ △

SHEET: E1.0

TITLE: ELECTRICAL SITE PLAN

JOB NO: 23008

DATE: 9-7-23

DWN BY: JLC

PRELIMINARY SET NOT FOR CONSTRUCTION

BRANCH PANEL: H1

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: SS1

TYPE: SQUARE - D I-LINE SER
VOLTS: 277/480 Wye
PHASES: 3
WIRES: 4

A.I.C. RATING: COORDINATE
MAINS TYPE: MCB
MAINS RATING: 600 A
MCB RATING: 600 A

TRIP AMPS	POLES	FEED	NOTES	CIRCUIT DESCRIPTION	CKT	A		B		C		CKT	CIRCUIT DESCRIPTION	NOTES	FEED	POLES	TRIP AMPS
300 A	2	B300		T1	1	36.7	66.7					2					
					3			36.6	66.7			4	DC FAST CHARGER		C300	3	300 A
300 A	2	1G300	3	M3	5					85.8	66.7	6					
					7	85.4						8					
					9							10					
					11							12					
					13							14					
					15							16					
					17							18					
					19							20					
					21							22					
					23							24					
					25							26					
					27							28					
					29							30					
					31							32					
					33							34					
					35							36					
					37							38					
					39							40					
					41							42					
				TOTAL LOAD:		188.7 kVA		103.2 kVA		152.4 kVA							

LOAD CLASSIFICATION	CONNECTED (kVA)	DEMAND FACTOR	EST. DEMAND (kVA)	PANEL TOTALS	
Receptacle	0.4 kVA	100.00%	0.4 kVA		
Continuous	200.2 kVA	125.00%	250.3 kVA	**TOTAL CONN. LOAD (kVA):**	444.2 kVA
Non-Continuous	72.0 kVA	100.00%	72.0 kVA	**TOTAL EST. DEMAND (kVA):**	447.2 kVA
Metered Shore Power	168.0 kVA	72.00%	121.0 kVA	**TOTAL CONN.:**	534 A
Maint. Recpt.	3.6 kVA	100.00%	3.6 kVA	**TOTAL EST. DEMAND:**	538 A

BREAKER NOTES (REFERENCED IN NOTES COLUMN):
1. GFCI
2. COMBINATION AFCI
3. SHUNT TRIP - REFER TO GFM WIRING DETAIL
4. 30mA GFPE
5. TAP BLOCK

CIRCUIT NOTES (REFERENCED IN NOTES COLUMN):
A. CONTINUOUS METAL RACEWAY

CIRCUIT SCHEDULE

CKT #	DESCRIPTION	VD %	GFPE TRIP (mA)	GFPE TIME (ms)
1,3	T1	0.03%	N/A	N/A
2,4,6	DC FAST CHARGER	0.43%	90-100	400
5,7	M3	0.90%	90-100	400

BRANCH PANEL: L1

LOCATION:
SUPPLY FROM: T1
MOUNTING: SURFACE
ENCLOSURE: SS1

TYPE: SQUARE - D I-LINE
VOLTS: 120/240 Single
PHASES: 1
WIRES: 3

A.I.C. RATING: COORDINATE
MAINS TYPE: MCB
MAINS RATING: 600 A
MCB RATING: 600 A

TRIP AMPS	POLES	FEED	NOTES	CIRCUIT DESCRIPTION	CKT	A		B		CKT	CIRCUIT DESCRIPTION	NOTES	FEED	POLES	TRIP AMPS
20 A	1	A20		G1	1	0.1	12.2			2					
100 A	2	B100		EVENT PEDESTAL	3			12.2	12.2	4	EVENT PEDESTAL		B100	2	100 A
					5	12.2	12.2			6					
					7				12.2	8	EVENT PEDESTAL	1	B100	2	100 A
					9					10					
					11					12					
					13					14					
					15					16					
					17					18					
					19					20					
					21					22					
					23					24					
					25					26					
					27					28					
					29					30					
					31					32					
					33					34					
					35					36					
					37					38					
					39					40					
					41					42					
				TOTAL LOAD:		36.7 kVA		36.6 kVA							

LOAD CLASSIFICATION	CONNECTED (kVA)	DEMAND FACTOR	EST. DEMAND (kVA)	PANEL TOTALS	
Continuous	0.0 kVA	125.00%	0.0 kVA		
Non-Continuous	72.0 kVA	100.00%	72.0 kVA	**TOTAL CONN. LOAD (kVA):**	73.1 kVA
Maint. Recpt.	1.1 kVA	100.00%	1.1 kVA	**TOTAL EST. DEMAND (kVA):**	73.1 kVA
				TOTAL CONN.:	305 A
				TOTAL EST. DEMAND:	305 A

BREAKER NOTES (REFERENCED IN NOTES COLUMN):
1. GFCI
2. COMBINATION AFCI
3. SHUNT TRIP - REFER TO GFM WIRING DETAIL
4. 30mA GFPE
5. TAP BLOCK

CIRCUIT NOTES (REFERENCED IN NOTES COLUMN):
A. CONTINUOUS METAL RACEWAY

CIRCUIT SCHEDULE

CKT #	DESCRIPTION	FEED	VD %	GFPE TRIP (mA)	GFPE TIME (ms)
2,4	EVENT PEDESTAL	B100	1.61%	90-100	400
3,5	EVENT PEDESTAL	B100	3.36%	90-100	400
6,8	EVENT PEDESTAL	B100	3.16%		

ELECTRICAL UPGRADES FOR CITY OF ROCKLAND DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS ROCKLAND, MAINE

MAFFETT LOFTIS ENGINEERING, LLC
15 JEFFERSON AVE, STE 101
COOKEVILLE, TN 38501
TEL: (931) 526-5143
www.maffett-loftis.com

Revisions indicated w/ △

Revisions: No.	Date	Description

SHEET: E2.1

TITLE: PANEL SCHEDULES

JOB NO: 23008 DATE: 9-7-23

DWN BY: JLC

PRELIMINARY SET NOT FOR CONSTRUCTION

BRANCH PANEL: H2

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: SS2

TYPE: SQUARE-D I-LINE SER
VOLTS: 277/480 Wye
PHASES: 3
WIRES: 4

A.I.C. RATING: COORDINATE
MAINS TYPE: MCB
MAINS RATING: 600 A
MCB RATING: 600 A

TRIP AMPS	POLES	FEED	NOTES	CIRCUIT DESCRIPTION	CKT	A		B		C		CKT	CIRCUIT DESCRIPTION	NOTES	FEED	POLES	TRIP AMPS
					1	66.7	73.0					2					
300 A	3	3G300		DC FAST CHARGER	3			66.7	72.9			4	T2		C300	2	300 A
					5					66.7		6					
					7							8					
					9							10					
					11							12					
					13							14					
					15							16					
					17							18					
					19							20					
					21							22					
					23							24					
					25							26					
					27							28					
					29							30					
					31							32					
					33							34					
					35							36					
					37							38					
					39							40					
					41							42					
				TOTAL LOAD:		139.7 kVA		139.6 kVA		66.7 kVA							

LOAD CLASSIFICATION	CONNECTED (kVA)	DEMAND FACTOR	EST. DEMAND (kVA)	PANEL TOTALS	
Continuous	200.0 kVA	125.00%	250.1 kVA		
Non-Continuous	0.0 kVA	0.00%	0.0 kVA	**TOTAL CONN. LOAD (kVA):**	345.8 kVA
Metered Shore Power	144.0 kVA	72.00%	103.7 kVA	**TOTAL EST. DEMAND (kVA):**	355.5 kVA
Maint. Recpt.	1.8 kVA	100.00%	1.8 kVA	**TOTAL CONN.:**	416 A
				TOTAL EST. DEMAND:	428 A

BREAKER NOTES (REFERENCED IN NOTES COLUMN):
1. GFCI
2. COMBINATION AFCI
3. SHUNT TRIP - REFER TO GFM WIRING DETAIL
4. 30mA GFPE
5. TAP BLOCK

CIRCUIT NOTES (REFERENCED IN NOTES COLUMN):
A. CONTINUOUS METAL RACEWAY

BRANCH PANEL: L2

LOCATION:
SUPPLY FROM: T2
MOUNTING: SURFACE
ENCLOSURE: SS2

TYPE: SQUARE - D I-LINE
VOLTS: 120/240 Single
PHASES: 1
WIRES: 3

A.I.C. RATING: COORDINATE
MAINS TYPE: MCB
MAINS RATING: 600 A
MCB RATING: 600 A

TRIP AMPS	POLES	FEED	NOTES	CIRCUIT DESCRIPTION	CKT	A		B		CKT	CIRCUIT DESCRIPTION	NOTES	FEED	POLES	TRIP AMPS
					1	24.4	24.2			2					
200 A	2	1G250	3	METERED SHORE POWER	3			24.4	24.2	4	METERED SHORE POWER	3	1G250	2	200 A
					5	12.2	12.2			6					
100 A	2	1G125	3	METERED SHORE POWER	7			12.2	12.2	8	METERED SHORE POWER	3	1G100	2	100 A
20 A	1	A20		G2	9	0.1				10					
					11					12					
					13					14					
					15					16					
					17					18					
					19					20					
					21					22					
					23					24					
					25					26					
					27					28					
					29					30					
					31					32					
					33					34					
					35					36					
					37					38					
					39					40					
					41					42					
				TOTAL LOAD:		73.0 kVA		72.9 kVA							

LOAD CLASSIFICATION	CONNECTED (kVA)	DEMAND FACTOR	EST. DEMAND (kVA)	PANEL TOTALS	
Continuous	0.0 kVA	125.00%	0.1 kVA		
Non-Continuous	0.0 kVA	0.00%	0.0 kVA	**TOTAL CONN. LOAD (kVA):**	145.8 kVA
Metered Shore Power	144.0 kVA	72.00%	103.7 kVA	**TOTAL EST. DEMAND (kVA):**	105.5 kVA
Maint. Recpt.	1.8 kVA	100.00%	1.8 kVA	**TOTAL CONN.:**	608 A
				TOTAL EST. DEMAND:	440 A

BREAKER NOTES (REFERENCED IN NOTES COLUMN):
1. GFCI
2. COMBINATION AFCI
3. SHUNT TRIP - REFER TO GFM WIRING DETAIL
4. 30mA GFPE
5. TAP BLOCK

CIRCUIT NOTES (REFERENCED IN NOTES COLUMN):
A. CONTINUOUS METAL RACEWAY

CIRCUIT SCHEDULE

CKT #	DESCRIPTION	FEED	VD %	GFPE TRIP (mA)	GFPE TIME (ms)
1,3	METERED SHORE POWER	1G250	3.60%	90-100	400
2,4	METERED SHORE POWER	1G250	3.45%	90-100	400
5,7	METERED SHORE POWER	1G125	3.79%	90-100	400
6,8	METERED SHORE POWER	1G100	3.43%	90-100	400

ELECTRICAL UPGRADES FOR CITY OF ROCKLAND DOWNTOWN WATERFRONT UPLAND IMPROVEMENTS
ROCKLAND, MAINE

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COOKEVILLE, TN 38501
TEL: (931) 526-5143
www.maffett-loftis.com

Revisions indicated w/ △

Revisions: No.	Date	Description

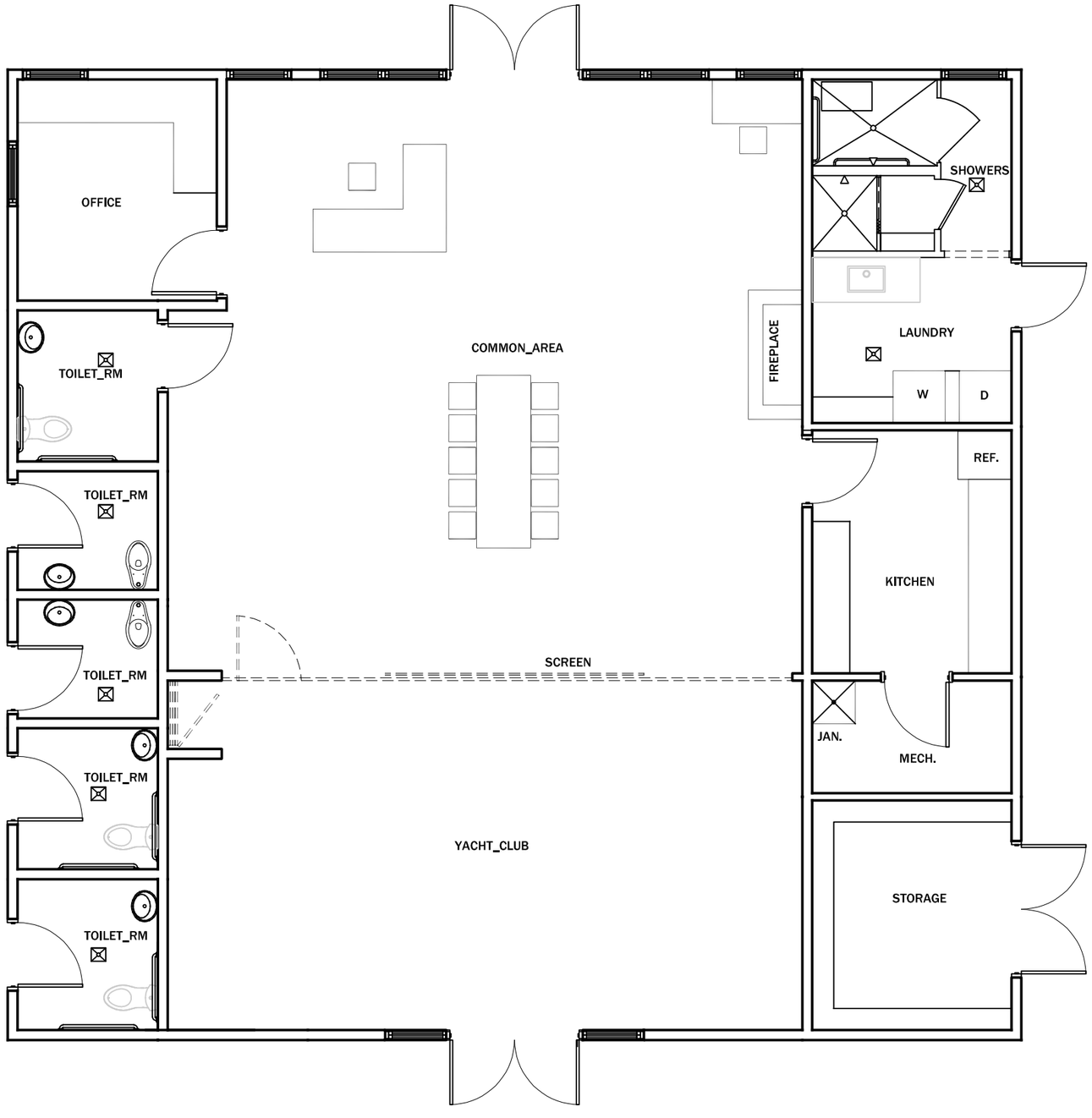
SHEET: E2.2

TITLE: PANEL AND EQUIPMENT SCHEDULES

JOB NO: 23008 DATE: 9-7-23

DWN BY: JLC

PRELIMINARY SET NOT FOR CONSTRUCTION



ROCKLAND HARBOR MASTERS BUILDING SCHEMATIC FLOOR PLAN

Single story 45' X 47' 2,115 S.F.

A1

1

WEST ELEVATION

SCALE: 1/4" = 1'-0"

4

SOUTH ELEVATION

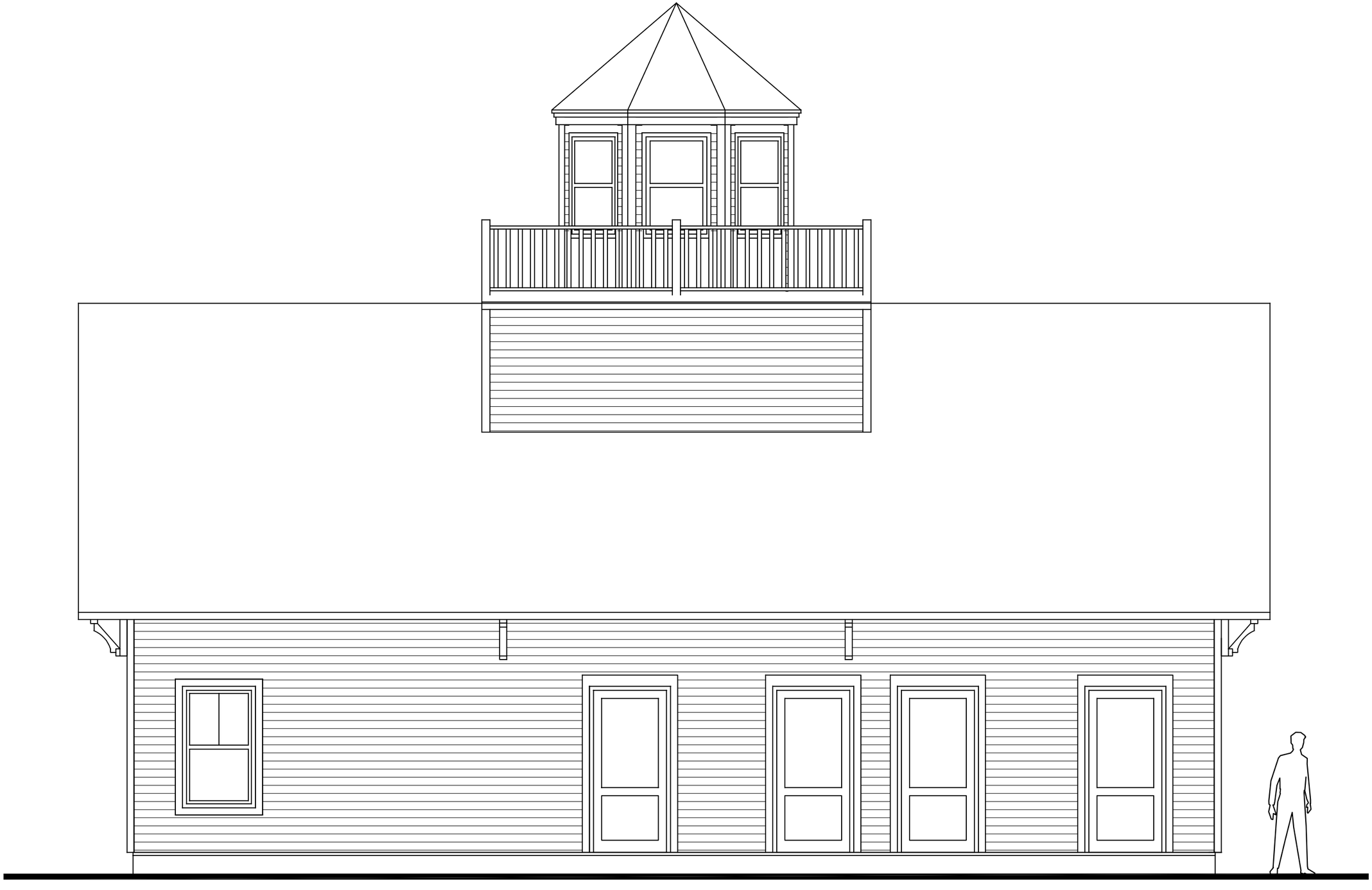
SCALE: 1/4" = 1'-0"

3

EAST ELEVATION

SCALE: 1/4" = 1'-0"

A4



2

NORTH ELEVATION

SCALE: 1/4" = 1'-0"

ATTACHMENT B

Preliminary Cost Estimates

Harbor Park Upland, Rockland, Maine
Preliminary Opinion of Cost

October 2023

Component Description	Work Item Description	Quantity	Unit	Unit Cost	Item Cost	Total Cost
GENERAL REQUIREMENTS						
	Mobilization & Facilities (5%)	1	ls	$ 272,300.00	$ 272,300.00	
	Traffic Control (assume 4 weeks necessary)	20	day	$ 1,200.00	$ 24,000.00	
	Layout & Control	1	ls	$ 3,000.00	$ 3,000.00	
	Erosion & Sedimentation Control	1	ls	$ 5,000.00	$ 5,000.00	$ 304,300.00
DEMOLITION & REMOVALS						
	Sawcut pavement	660	lf	$ 3.00	$ 1,980.00	
	Pavement removal & disposal (3" depth)	7,590	sy	$ 4.00	$ 30,360.00	
	Pavement mill & disposal (1.5" depth)	0	sy	$ 5.00	$ -	
	Concrete Slabs Removal & Disposal	540	sy	$ 5.00	$ 2,700.00	
	Granite Curb removal & salvage	290	lf	$ 10.00	$ 2,900.00	
	Granite Blocks removal & salvage	205	ea	$ 25.00	$ 5,125.00	
	Excavation (majority of material to be reused on site)	930	cy	$ 12.00	$ 11,160.00	
	Remove existing catch basins/manholes	6	ea	$ 1,200.00	$ 7,200.00	
	Remove existing water hose bibs & cap line	4	ea	$ 400.00	$ 1,600.00	
	Remove existing utility poles	18	ea	$ 200.00	$ 3,600.00	
	Remove existing electric panels/pedestals	6	ea	$ 300.00	$ 1,800.00	
	Demo Harbormaster Building (2,200sf, 2 story)	1	ls	$ 15,000.00	$ 15,000.00	
	Remove & relocate sheds on site (80 sf)	2	ea	$ 250.00	$ 500.00	
	Remove & relocate playset on site	1	ls	$ 1,200.00	$ 1,200.00	
	Picnic Tables & Benches removal & store on site	8	ea	$ 200.00	$ 1,600.00	
	Remove fencing	445	lf	$ 5.00	$ 2,225.00	
	Remove Trees & Stumps	10	ea	$ 500.00	$ 5,000.00	
	Remove & relocate existing signs	14	ea	$ 100.00	$ 1,400.00	$ 95,350.00
SITEWORK & PAVING						
	Bituminous Pavement (4" full depth areas)	1292	ton	$ 250.00	$ 323,000.00	
	Bituminous Pavement (1.5" overlay areas)	0	ton	$ 250.00	$ -	
	Subbase Gravel (15" deep full new pave area)	2440	cy	$ 40.00	$ 97,600.00	
	Base Gravel (6" deep full new pave area)	976	cy	$ 50.00	$ 48,800.00	
	Base Gravel (12" deep under pavers)	610	cy	$ 55.00	$ 33,550.00	
	Base Gravel (12" deep under concrete, gravel areas)	90	cy	$ 55.00	$ 4,950.00	
	Crushed Stone (12" deep ret wall, drainage trench)	40	cy	$ 50.00	$ 2,000.00	
	Common Borrow Fill	19040	cy	$ 20.00	$ 380,800.00	
	Structural Fill, under building	320	cy	$ 35.00	$ 11,200.00	
	Storm Drain, 36" HDPE	390	lf	$ 160.00	$ 62,400.00	
	Storm Drain, 24" HDPE	230	lf	$ 140.00	$ 32,200.00	

Harbor Park Upland, Rockland, Maine
Preliminary Opinion of Cost

October 2023

Component Description	Work Item Description	Quantity	Unit	Unit Cost	Item Cost	Total Cost
	Storm Drain, 18" HDPE	300	lf	$ 120.00	$ 36,000.00	
	Storm Drain, 15" HDPE	80	lf	$ 110.00	$ 8,800.00	
	Storm Drain, 12" HDPE	540	lf	$ 90.00	$ 48,600.00	
	Storm Drain, 8" PVC	0	lf	$ 80.00	$ -	
	Storm Drain, 6" PVC	0	lf	$ 70.00	$ -	
	Storm Drain & Perf Underdrain, 4" PVC	0	lf	$ 50.00	$ -	
	Catch basin, 6' dia	4	ea	$ 7,000.00	$ 28,000.00	
	Catch basin, 4' dia	7	ea	$ 5,000.00	$ 35,000.00	
	Catch basin, Type F	12	ea	$ 3,500.00	$ 42,000.00	
	Catch basin, Type F (for sewer)	5	ea	$ 4,000.00	$ 20,000.00	
	Inline Drains	0	ea	$ 1,000.00	$ -	
	Stormwater Treatment basin, CDS5653-10, 10' dia	1	ea	$ 95,000.00	$ 95,000.00	
	Stormwater Treatment basin, Cascade CS-6, 6' dia	2	ea	$ 26,000.00	$ 52,000.00	
	Stormwater Treatment basin, Cascade CS-4, 4' dia	1	ea	$ 15,000.00	$ 15,000.00	
	Water line, 8"	10	lf	$ 210.00	$ 2,100.00	
	Water line, 1"	770	lf	$ 100.00	$ 77,000.00	
	Sewer line, 6"	480	lf	$ 170.00	$ 81,600.00	
	Sewer Manhole, 4' dia	1	ea	$ 5,500.00	$ 5,500.00	
	Sewer grease Trap	1	ea	$ 12,000.00	$ 12,000.00	
	Core & Patch Existing Manhole	1	ea	$ 1,500.00	$ 1,500.00	
	Reset Sewer Manhole rims to grade	12	ea	$ 1,000.00	$ 12,000.00	
	Adjust Water Valve elevations	6	ea	$ 300.00	$ 1,800.00	
	Fire hydrant	1	ea	$ 7,000.00	$ 7,000.00	
	Striping	1	ls	$ 4,000.00	$ 4,000.00	$ 1,581,400.00
CURBING						
	Type 1 granite curbing	1870	lf	$ 75.00	$ 140,250.00	
	Concrete bedding for curbing	1870	lf	$ 15.00	$ 28,050.00	
	Detectable warning device	0	ea		$ -	$ 168,300.00

Harbor Park Upland, Rockland, Maine
Preliminary Opinion of Cost

October 2023

Component Description	Work Item Description	Quantity	Unit	Unit Cost	Item Cost	Total Cost
ELELCTRICAL UTILITIES						
	Utility Trenching Backfill & Bedding	1665	lf	$ 60.00	$ 99,900.00	
	Conduit, Wires, Boxes, and Fittings	1	ls	$ 45,000.00	$ 45,000.00	
	Uupland Service Equipment (Panel)	1	ea	$ 48,000.00	$ 48,000.00	
	Power Pedestals	6	ea	$ 2,000.00	$ 12,000.00	
	Electrical Labor	440	hr	$ 65.00	$ 28,600.00	
	Luminaires & Poles, 12ft poles	13	ea	$ 4,000.00	$ 52,000.00	
	Luminaire & Pole installation	13	ea	$ 2,000.00	$ 26,000.00	
	18" Pre-cast concrete bases	13	ea	$ 800.00	$ 10,400.00	$ 321,900.00
HARBOR MASTER BUILDING						
	Construct new building	2115	sf	$ 500.00	$ 1,057,500.00	$ 1,057,500.00
LANDSCAPE IMPROVEMENTS						
	Pavers - Amphitheater plaza	146	sy	$200.00	$29,200.00	
	Pavers - Amphitheater landings	109	sy	$ 200.00	$ 21,800.00	
	Concrete pavers sidewalk	1960	sy	$ 200.00	$ 392,000.00	
	Amphitheater plaza / landing pavers	255	sy	$ 200.00	$ 51,000.00	
	Amphitheater block seating, cheek walls, steps	1	ls	$935,000.00	$935,000.00	
	Amphitheater excavation / installation	1	ls	$385,000.00	$385,000.00	
	Amphitheater hand railings	50	lf	$200.00	$10,000.00	
	Amphitheater lighting	1	ls	$30,000.00	$30,000.00	
	Site signage: Granite posts with panels (3 incl. WF)	2	ea	$4,000.00	$8,000.00	
	Directional sign panels, street & handicap signs	10	ea	$ 500.00	$ 5,000.00	
	Relocation / setting of anchor / buoys	1	ls	$ 5,000.00	$ 5,000.00	
	Kiosk (included in WF Plan)	0	ls	$7,500.00	$0.00	
	Furnishings - Memorial Garden (Amphitheater)	1	ls	$30,000.00	$30,000.00	
	Bicycle Racks (Main Street)	2	ea	$800.00	$1,600.00	
	Drinking ftn w/ bottle fill, dog bowl; hose connect	1	ea	$12,000.00	$12,000.00	
	Decorative bollards (Main Street)	7	ea	$1,500.00	$10,500.00	
	Planting bed soils	79	cy	$75.00	$5,925.00	
	Trees	24	ea	$700.00	$16,800.00	
	Shrubs	79	ea	$75.00	$5,925.00	
	Herbaceous	124	ea	$25.00	$3,100.00	
	Living shoreline plantings / beds	1	ls	$ 25,000.00	$ 25,000.00	
	Loam, seed & mulch lawn areas	68	msf	$ 750.00	$ 51,000.00	
	Loam, seed & mulch conservation cover areas	7	msf	$ 850.00	$ 5,950.00	$ 2,039,800.00
MISC ITEMS						

Harbor Park Upland, Rockland, Maine
Preliminary Opinion of Cost

October 2023

Component Description	Work Item Description	Quantity	Unit	Unit Cost	Item Cost	Total Cost
	Retaining wall guard rail	230	lf	$ 160.00	$ 36,800.00	
	Retaining wall, concrete	107	cy	$ 600.00	$ 64,200.00	
	Retaining wall, concrete veneer	460	sf	$ 115.00	$ 52,900.00	
	Retaining wall, concrete granite cap	230	lf	$ 60.00	$ 13,800.00	
	Retaining wall, granite	70	lf	$ 185.00	$ 12,950.00	$ 180,650.00
SUBTOTAL CONSTRUCTION COSTS						$ 5,749,200.00
DESIGN & ENGINEERING, BIDDING (5%)						$ 287,460.00
CONSRUCTION ADMIN & OBSERVATION (5%)						$ 287,460.00
CONTINGENCY (10%)						$ 574,920.00
TOTAL						**$ 6,899,040.00**

Buoy Park Upland, Rockland, Maine
Preliminary Opinion of Cost

October 2023

Component Description	Work Item Description	Quantity	Unit	Unit Cost	Item Cost	Total Cost
GENERAL REQUIREMENTS						
	Mobilization & Facilities (5%)	1	ls	$ 82,800.00	$ 82,800.00	
	Traffic Control (assume 1 weeks necessary)	5	day	$ 1,200.00	$ 6,000.00	
	Layout & Control	1	ls	$ 2,000.00	$ 2,000.00	
	Erosion & Sedimentation Control	1	ls	$ 2,000.00	$ 2,000.00	$ 92,800.00
DEMOLITION & REMOVALS						
	Sawcut pavement	400	lf	$ 3.00	$ 1,200.00	
	Pavement removal & disposal (3" depth)	3,420	sy	$ 4.00	$ 13,680.00	
	Pavement mill & disposal (1.5" depth)	0	sy	$ 5.00	$ -	
	Concrete Slabs Removal & Disposal	0	sy	$ 5.00	$ -	
	Granite Curb removal & salvage	62	lf	$ 10.00	$ 620.00	
	Granite Blocks removal & salvage	20	ea	$ 25.00	$ 500.00	
	Excavation (majority of material to be reused on site)	180	cy	$ 12.00	$ 2,160.00	
	Remove existing catch basins/manholes	0	ea	$ 1,200.00	$ -	
	Remove existing water hose bibs & cap line	3	ea	$ 400.00	$ 1,200.00	
	Remove existing utility poles	5	ea	$ 200.00	$ 1,000.00	
	Remove existing electric panels/pedestals	5	ea	$ 300.00	$ 1,500.00	
	Picnic Tables & Benches removal & store on site	10	ea	$ 200.00	$ 2,000.00	
	Remove Trees & Stumps	2	ea	$ 500.00	$ 1,000.00	
	Remove & relocate existing street signs	5	ea	$ 100.00	$ 500.00	$ 25,360.00
SITEWORK & PAVING						
	Bituminous Pavement (4" full depth areas)	635	ton	$ 250.00	$ 158,750.00	
	Bituminous Pavement (1.5" overlay areas)	0	ton	$ 250.00	$ -	
	Subbase Gravel (15" deep full new pave area)	1200	cy	$ 40.00	$ 48,000.00	
	Base Gravel (6" deep full new pave area)	480	cy	$ 50.00	$ 24,000.00	
	Base Gravel (12" deep under pavers)	380	cy	$ 55.00	$ 20,900.00	
	Base Gravel (12" deep under concrete, gravel areas)	60	cy	$ 55.00	$ 3,300.00	
	Crushed Stone (12" deep ret wall, drainage trench)	100	cy	$ 50.00	$ 5,000.00	
	Common Borrow Fill	1680	cy	$ 20.00	$ 33,600.00	
	Storm Drain, 24" HDPE	270	lf	$ 140.00	$ 37,800.00	
	Storm Drain, 8" PVC	30	lf	$ 80.00	$ 2,400.00	
	Storm Drain, 6" PVC	150	lf	$ 70.00	$ 10,500.00	
	Storm Drain & Perf Underdrain, 4" PVC	270	lf	$ 50.00	$ 13,500.00	
	Catch basin, 5' dia	1	ea	$ 6,000.00	$ 6,000.00	
	Catch basin, 4' dia	2	ea	$ 5,000.00	$ 10,000.00	
	Catch basin, Type F (for sewer & water)	2	ea	$ 4,000.00	$ 8,000.00	
	Inline Drains	4	ea	$ 1,000.00	$ 4,000.00	

Buoy Park Upland, Rockland, Maine
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Component Description	Work Item Description	Quantity	Unit	Unit Cost	Item Cost	Total Cost
	Stormwater Treatment basin, Cascade CS-6, 6' dia	1	ea	$ 26,000.00	$ 26,000.00	
	Water line, 8"	295	lf	$ 210.00	$ 61,950.00	
	Water line, 1"	417	lf	$ 100.00	$ 41,700.00	
	Sewer line	315	lf	$ 170.00	$ 53,550.00	
	Sewer Manhole, 4' dia	1	ea	$ 5,500.00	$ 5,500.00	
	Core & Patch Existing Manhole	1	ea	$ 1,500.00	$ 1,500.00	
	Reset Sewer Manhole rims to grade	5	ea	$ 1,000.00	$ 5,000.00	
	Adjust Water Valve elevations	1	ea	$ 300.00	$ 300.00	
	Fire hydrant	1	ea	$ 7,000.00	$ 7,000.00	
	Geotextile fabric under riprap	30	sy	$ 4.00	$ 120.00	
	Riprap Outfall Protection	15	cy	$ 60.00	$ 900.00	
	Striping	1	ls	$ 4,000.00	$ 4,000.00	$ 593,270.00
CURBING						
	Type 1 granite curbing	1250	lf	$ 75.00	$ 93,750.00	
	Concrete bedding for curbing	1250	lf	$ 15.00	$ 18,750.00	
	Detectable warning device	0	ea		$ -	$ 112,500.00
ELELCTRICAL UTILITIES						
	Utility Trenching Backfill & Bedding	1693	lf	$ 60.00	$ 101,580.00	
	Conduit, Wires, Boxes, and Fittings	1	ls	$ 29,500.00	$ 29,500.00	
	Uupland Service Equipment (Panel)	1	ea	$ 27,000.00	$ 27,000.00	
	Power Pedestals	6	ea	$ 1,800.00	$ 10,800.00	
	Electrical Labor	400	hr	$ 65.00	$ 26,000.00	
	Luminaires & Poles, 12ft poles	9	ea	$ 4,000.00	$ 36,000.00	
	Luminaire & Pole installation	9	ea	$ 2,000.00	$ 18,000.00	
	18" Pre-cast concrete bases	9	ea	$ 800.00	$ 7,200.00	$ 256,080.00
LANDSCAPE & HARDSCAPE						
	Concrete pavers sidewalk & Harbor Walk	1238	sy	$ 200.00	$ 247,600.00	
	Concrete access path	155	sy	$200.00	$31,000.00	
	Access path hand railings	220	lf	$160.00	$35,200.00	
	Access path lighting	1	ls	$30,000.00	$30,000.00	
	Site signage: Granite posts with panels (2 incl. WF)	2	ea	$4,000.00	$8,000.00	
	Directional sign panels, street & handicap signs	6	ea	$ 500.00	$ 3,000.00	
	Relocation / setting of anchor / buoys	1	ls	$ 10,000.00	$ 10,000.00	
	Furnishings - Boardwalk	1	ls	$45,000.00	$45,000.00	
	Furnishings - Access path	1	ls	$6,000.00	$6,000.00	
	Bicycle Racks (Park Drive / Buoy Park)	4	ea	$800.00	$3,200.00	

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Component Description	Work Item Description	Quantity	Unit	Unit Cost	Item Cost	Total Cost
	Drinking ftn w/ bottle fill, dog bowl; hose connect	1	ea	$12,000.00	$12,000.00	
	Decorative bollards (Boardwalk)	3	ea	$1,500.00	$4,500.00	
	Planting bed soils	118	cy	$75.00	$8,850.00	
	Trees	6	ea	$700.00	$4,200.00	
	Shrubs	94	ea	$75.00	$7,050.00	
	Herbaceous	225	ea	$25.00	$5,625.00	
	Loam, seed & mulch lawn areas	22	msf	$ 750.00	$ 16,500.00	
	Loam, seed & mulch conservation cover areas	0.3	msf	$ 850.00	$ 255.00	$ 477,980.00
MISC ITEMS						
	Retaining wall guard rail	215	lf	$ 160.00	$ 34,400.00	
	Retaining wall, concrete	100	cy	$ 600.00	$ 60,000.00	
	Retaining wall, concrete veneer	430	sf	$ 115.00	$ 49,450.00	
	Retaining wall, concrete granite cap	215	lf	$ 60.00	$ 12,900.00	
	Retaining wall, granite	175	lf	$ 185.00	$ 32,375.00	$ 189,125.00
SUBTOTAL CONSTRUCTION COSTS						$ 1,747,115.00
DESIGN & ENGINEERING, BIDDING (5%)						$ 87,360.00
CONSRUCTION ADMIN & OBSERVATION (5%)						$ 87,360.00
CONTINGENCY (10%)						$ 174,720.00
TOTAL						**$ 2,096,555.00**