



**ENVIRONMENTAL
ASSESSMENT
OF THE
CONSTRUCTION
AND OPERATION
OF THE
GREEN
ENGINEERING
AND MATERIALS
FACTORY OF THE
FUTURE**

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**University of
Maine
Orono, Maine**
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EXECUTIVE SUMMARY

This environmental assessment has been conducted to assess any potential environmental impacts from the proposed construction and operation of a Green Engineering and Materials addition to the University of Maine Advanced Structures and Composites Center (ASCC) housing the Factory of the Future. This is the preferred alternative for this assessment; other alternatives are considered, including no action.

The addition is proposed to expand southward from the ASCC in an open grassy field.

Adverse environmental impacts associated with the GEM project include land use, stormwater management, and wetland filling. These impacts are mitigated.

- The GEM project will convert 1.2 acres of vegetated area into impervious (pavement and building).
- The site proposed for the Project has three emergent, old-field wetland areas. The Project's will impact these wetlands filling a total of 26,496 sf for the whole project (20,143 for Phase 1 and 6,353 for Phase 2).
- All runoff from the site will be treated and the excess stormwater treatment BMP capacity will improve the quality of stormwater runoff from the site from existing conditions.
- Construction disturbance can cause erosion and sedimentation, but these impacts will be mitigated through the implementation of BMPs approved by the MeDEP.

Long term benefits from the project include innovative research on large-scale, bio-based hybrid manufacturing, supporting key goals in the State of Maine's 10-Year Economic Development Plan. It will provide active learning spaces for the Maine College of Engineering and Computing where students can interact with and program equipment in a safe and controlled manner and thus develop critical skills to improve Maine's workforce.

Mitigation measures are identified for the projected adverse environmental impacts of the preferred alternative.

LIST OF ACRONYMS

| | |
|---|--|
| EA -- Environmental Assessment | NRPA -- Natural Resources Protection Act |
| U.S.C. -- United States Code | CES -- CES, Consulting Engineering Services, Inc. (firm name) |
| ACOE -- Army Corp of Engineers | NRCS -- Natural Resources Conservation Service |
| GEM -- Green Engineering and Materials | SLOD -- Site Location of Development |
| ASCC -- Advanced Structures and Composites Center | IPaC -- Intra-Governmental Payment and Collection |
| FoF -- Factory of the Future | MHPC -- Maine Historic Preservation Commission |
| ILF -- In-Lieu Fee | BFE -- Base Flood Elevation |
| GUSF -- grassed underdrained soil filters | FFRMS -- Federal Flood Risk Management Standard |
| M.R.S.A. -- Maine Revised Statutes Annotated | CISA -- Climate-informed Science Approach |
| STARS -- Sustainability Tracking, Assessment & Rating System | FVA -- Freeboard Value Approach |
| MeDEP -- Maine Department of Environmental Protection | |
| UMaine -- The University of Maine | |
| CCA -- Collins Center for the Arts | |
| W2 -- Wind and Wave Laboratory Addition | |
| PNR -- Protected Natural Resources | |
| WRC -- Watershed Resource Consultants, LLC (firm name) | |
| SF -- Square (Feet)(Foot)(Footage) | |
| RTE -- Rare, Threatened, and Endangered (Species) | |
| SMRT -- SMRT Architects and Engineers (firm name) | |
| OWL -- Offshore Wind Laboratory | |
| CLT -- cross laminated timber | |
| R&D -- Research and Development | |

1. PURPOSE AND NEED

University of Maine's Advanced Structures & Composites Center (ASCC) proposes a 46,970 SF expansion called the Green Engineering & Materials (GEM) Factory of the Future (FoF).

The Purpose of this project is to provide workforce training and manufacturing equipment demonstration for additive manufacturing using wood-derived biomaterials, with the goal of demonstrating scalability and replicability for use elsewhere in the state. Additive manufacturing is a process to construct objects via a computer-driven manufacturing equipment that deposits material by layers. The process results in significantly less waste than traditional construction processes and can be produced more quickly. The need and broader goal is to stimulate economic recovery and improve diversification in economies that have been hurt by mill closures, job loss, population flight and other demographic and economic challenges.

This state-of-the-art, Industry 4.0 inspired R&D factory will allow for innovative research primarily on large-scale, bio-based hybrid manufacturing, supporting key goals in the State of Maine's 10-Year Economic Development Plan. It will provide active learning spaces for the Maine College of Engineering and Computing where students can interact with and program equipment in a safe and controlled manner and thus develop critical skills to improve Maine's workforce.

2. PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The GEM FoF addition is planned to be located on the campus of the University of Maine in Orono, ME (Penobscot county) south of, and connected to, the existing ASCC building, in an open space between its Offshore Wind Laboratory (OWL) and the Collins Center for the Arts (CCA) parking lot (Campus Plan, see below and attached in Appendix A.). The site/civil design package is attached in Appendix B.



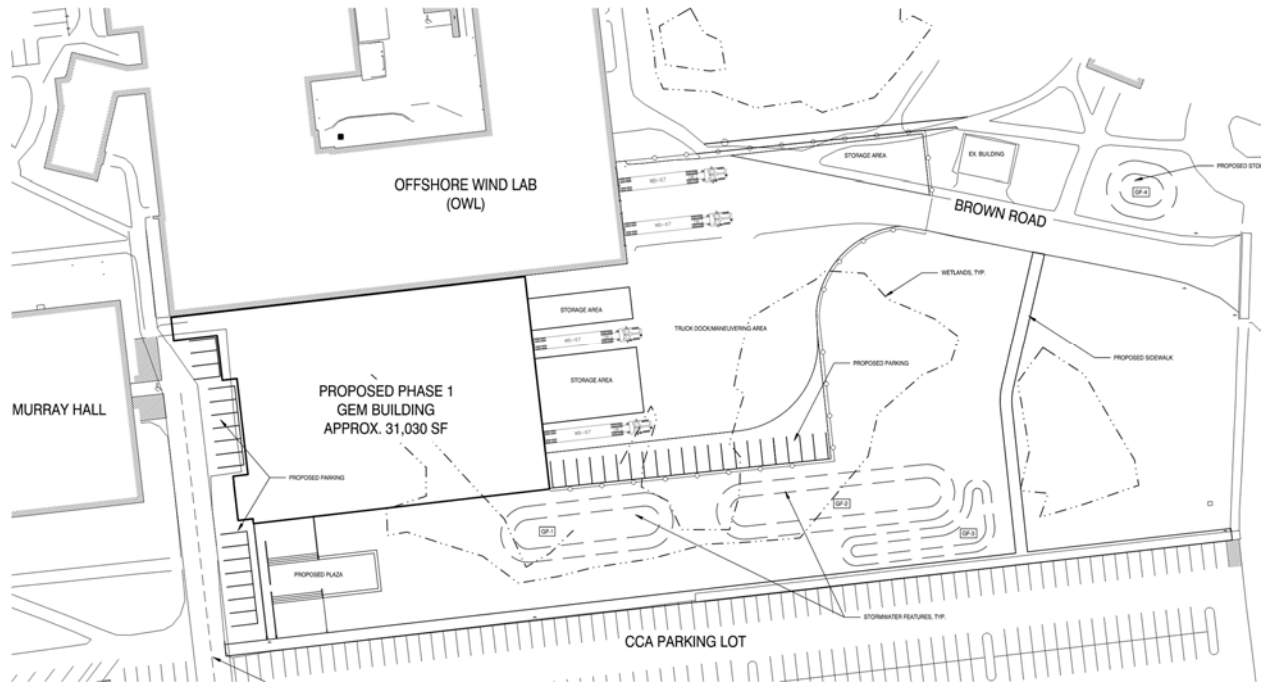
Project Location Plan

The proposed project is a 46,970 SF addition along the southerly wall of the OWL. The GEM FoF is proposed to add 26,000 SF of manufacturing space and a lobby to the south side of the existing ASCC facility. The majority of the facility is the FoF (~26,000 SF), with the remaining support spaces occupying ~20,970 SF. The FoF is divided into two large manufacturing labs, each ~65' x 260', including one lab that can be secured for sensitive projects.

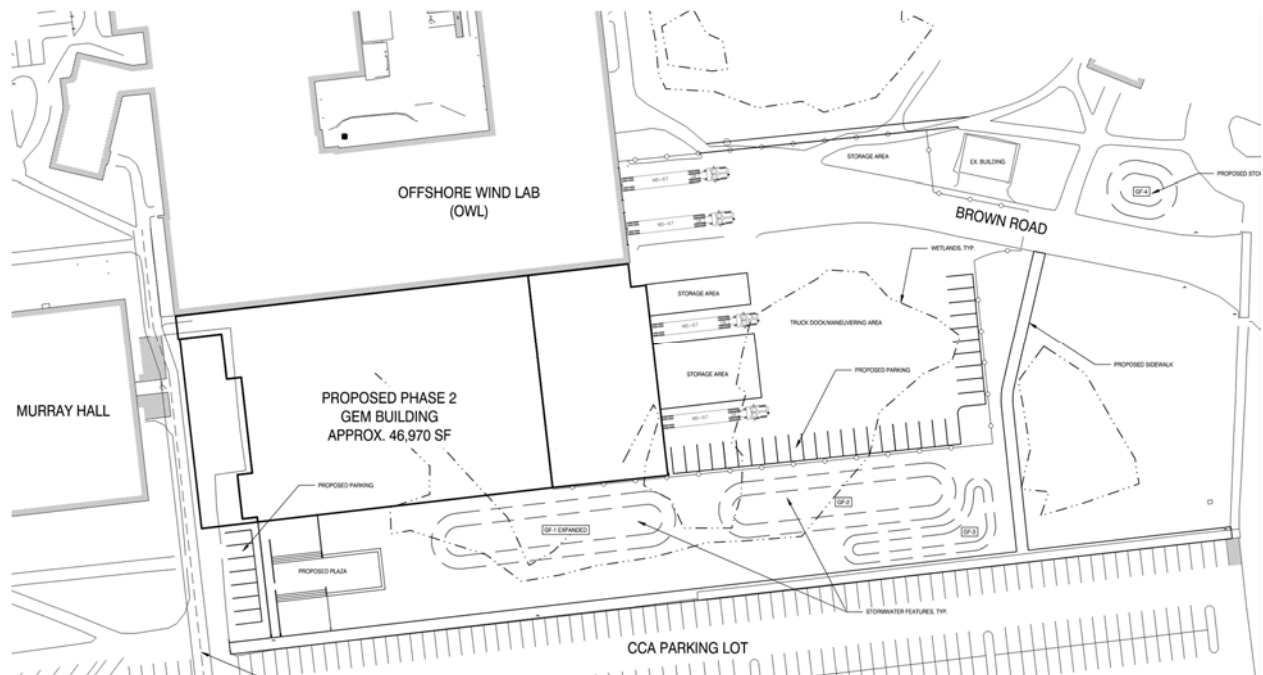
The proposed project also includes new pavement that will provide a vehicle maneuvering area for semi's and other trucks, and storage of the large-scale materials and products of the facility. The project also includes a main entrance plaza area and a sidewalk extension.

The project is being planned in two phases. Three 40' column bays of laboratory space will be built in phase one (two labs each ~65' x 120' for 15,600 SF), additional bays of laboratory space will be added to extend the labs to the east in phase two (add 10,400 SF); support space will be built in phase 1 (~15,050 SF), support

space will be added to the west in phase 2 (add 5,520 SF). The site plans for each phase are illustrated on the figures below and in the civil design set included in Appendix B.



Phase 1 Site Plan



Phase 2 Site Plan

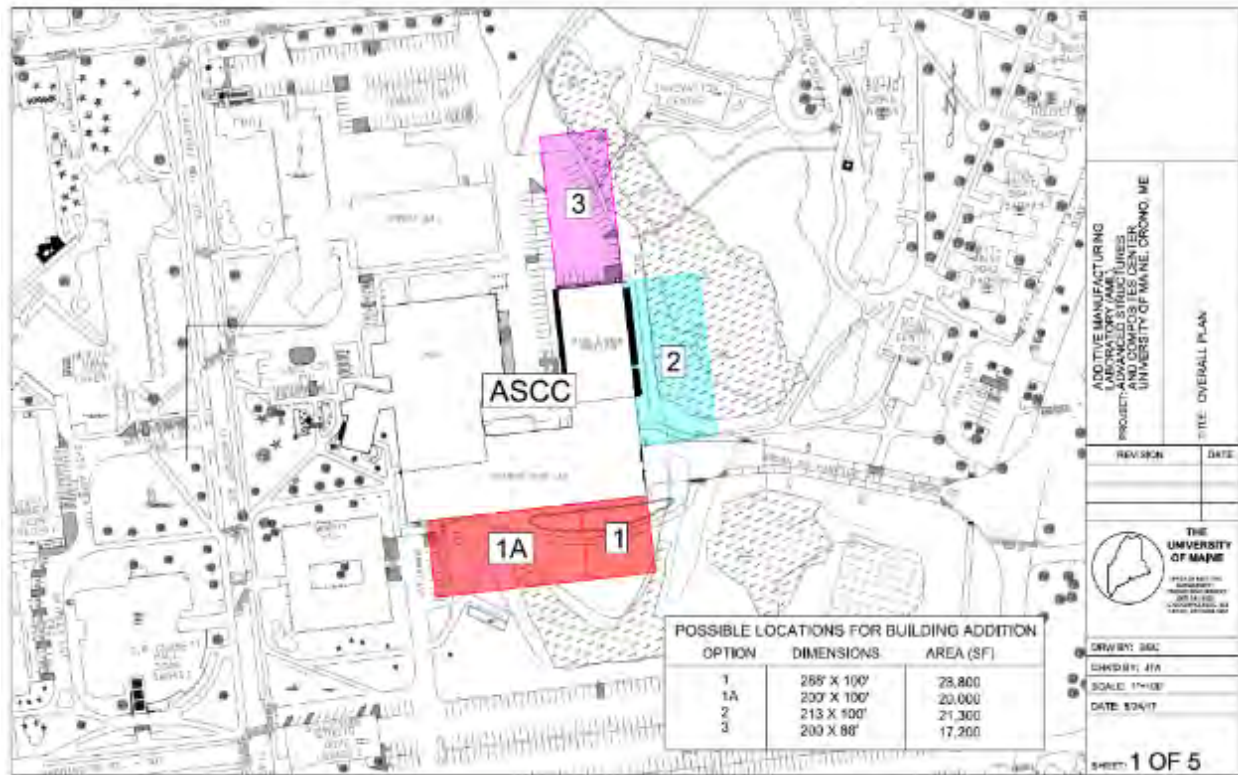
The first phase is planned to begin construction in mid-2024; the second in 2027. Phase 1 is planned to comprise a 31,300 SF building addition and 43,868 SF of associated pavement. Phase 2 is planned to add 15,670 SF of building (built over pavement) and new pavement. The total pavement area after Phase 2 construction would be 48,269 SF, and the total impervious area would be 95,239 SF (1.2 acres). The total developed area for Phase 1 would be 140,531 SF, and after Phase 2, 144,969 SF (3.3 acres).

Because the finish floor elevation of the new building must match the existing building, and there is a grade drop of approximately 5-6' across the building site from north to south, the project will generally be built on fill, and blasting is not anticipated. Stormwater treatment in accordance with Maine MeDEP Rules Chapter 500 for the roofs and paved areas will be provided. Drainage from the new development will be discharged into an existing subsurface stormwater collection system that will also be rebuilt in the project area.

The project will disturb the majority of the 3.4-acre area to the south of the existing Offshore Wind Lab (OWL), north of the CCA parking lot. This area is almost entirely vegetated, though it abuts sidewalks, driveways, a stormwater management feature, and the CCA parking lot. The vegetated area is maintained as meadow, not lawn, and contains 0.75 acres of mapped meadow wetland area. Fill-in of these wetlands as necessary to construct the project has been permitted through the NRPA process, with review and approval from both the MeDEP and Army Corp of Engineers (ACOE). The permit approval is attached in Appendix C.

2.2 Alternatives

The location of this project was evaluated in several configurations. A 2017 feasibility study conducted by the University of Maine evaluated three locations adjacent to the current ASCC facility and concluded the location between the south edge of the existing lab and the CCA Parking Lot was the most viable. The other two options were located on the east side and on the north end of the Wind & Wave Addition (W2), respectively. The preferred option provides for the largest footprint, has the necessary adjacencies for the existing functions in ASCC, minimizes impacts to parking, utilities, and wetlands. A figure from that study illustrates the potential locations that were evaluated.



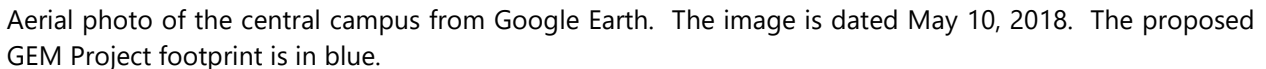
The location on the east side of the W2 (Option 2) would significantly impact Wetland AB-3, a large portion of which is classified as a forested wetland with scrub-shrub inclusions. The option located at the north end of W2 (Option 3) has wetland and parking impacts, would require significant grading, and also has important adjacency challenges for the operations in the ASCC. Because these two Alternatives are less functional for the ASCC and have more impact to the environment, they are not further considered in this assessment. No other alternative sites were acceptable to UMaine.

A "no action" alternative would eliminate any environmental impact; however, it would also impact ASCC by limiting the ability to train workforce and preventing the ability to scale additive manufacturing technology developed over the last decade to meet economic needs in the state. It would also significantly constrain the level of manufacturing capacity which is required to meet project deliverables in Department of Defense, Department of Energy and other federal contracts.

Consequently, only the Preferred Alternative and the No Action Alternative will be considered in this assessment.

This section presents an overview of the existing site conditions at the ASCC GEM Site.

The proposed project is an addition to an existing building / complex that houses the ASCC. It is located in the central area of the UMaine campus, an area of campus that has been largely developed for decades and was once part of the historic University campus.



To the east, there is a largely undeveloped “green corridor” that runs from north to south adjacent to the ASCC facility, which provides both green space and drainage capacity for the campus. On the south side of

the ASCC, where the addition is proposed, there is a meadow / lawn area crossed by a walkway, as well as a stormwater management feature for the ASCC. This meadow area is maintained through periodic field mowing, no more than 3 times per year. This form of maintenance is protective of the wet meadow wetlands within this area.

The project site is located generally at an elevation of approximately 117 ft. It is situated toward the northeast corner of the University of Maine campus, with grades that slope southerly at approximately 3 to 5%. The existing condition of the project site is primarily grassed with paved walkways through the center and along the easterly edge.

There are no other designated areas such as parks or wilderness areas that will be impacted by the proposed project.

3.1.1 Local Land Use-Town of Orono, Maine

The proposed project lies entirely within the Town of Orono's University District. According to the Town Ordinance, the "University District (UNIV) is intended to apply to university land, to allow university-related development, and provide for Town review of University Development which impacts Orono's services, infrastructure or residential areas." The current use of the vicinity is fully in compliance with the zoning as it supports University operations.

Unless a proposed project is within 500 feet of College Avenue or the University District boundary (S), site plan review by the Orono planning board is not required. Because of the state permitting requirements, the wastewater and water departments always review projects to ensure capacity for service. This is discussed further under 3.4 Water Resources.

3.1.2 Coastal Zone

The University of Maine is located primarily in the Town of Orono, which is located within the designated Coastal Zone. The Maine Department of Marine Resources coordinates and provides a point of contact for federal consistency review in Maine, and the standards and criteria of state environmental permitting and licensing laws and regulations serve as the enforceable policies of the Maine Coastal Program. Accordingly, the Maine Department of Environmental Protection and other state agencies in Maine's networked coastal program review and make findings that serve as the basis for the state's consistency decision.

The University of Maine campus is permitted under the Site Location of Development (SLOD) Law (38 M.R.S.A. §§ 481-490) and any development on campus is reviewed by the MeDEP under this law and the permit amended accordingly. Review of the SLOD application constitutes the State's consistency review for federally licensed, permitted, or funded activities in the Coastal Zone, in accordance with the Maine Coastal Program pursuant to Section 307 of the federal Coastal Zone Management Act, 16 U.S.C. §1456.

The application for an Amendment to UMaine's SLOD permit was submitted to the MeDEP on July 13, 2023 and was approved on January 11, 2024. The permit approval is attached in Appendix C.

3.2 Visuals

The location for the proposed building addition is currently a grassy field in the central area of the UMaine Campus. It is surrounded by the existing ASCC complex, a large commuter parking lot to the south, and a

residential dorm complex to the east. Murray Hall, located to the west of the project location is the principal administrative office, and faculty offices and research facilities for the School of Biology and Ecology.

Below is a photo taken by a UMaine staff person showing a view looking west across the proposed site towards Murray Hall. The parking lot is at the left edge of the photo and the ASCC is clearly visible to the right.

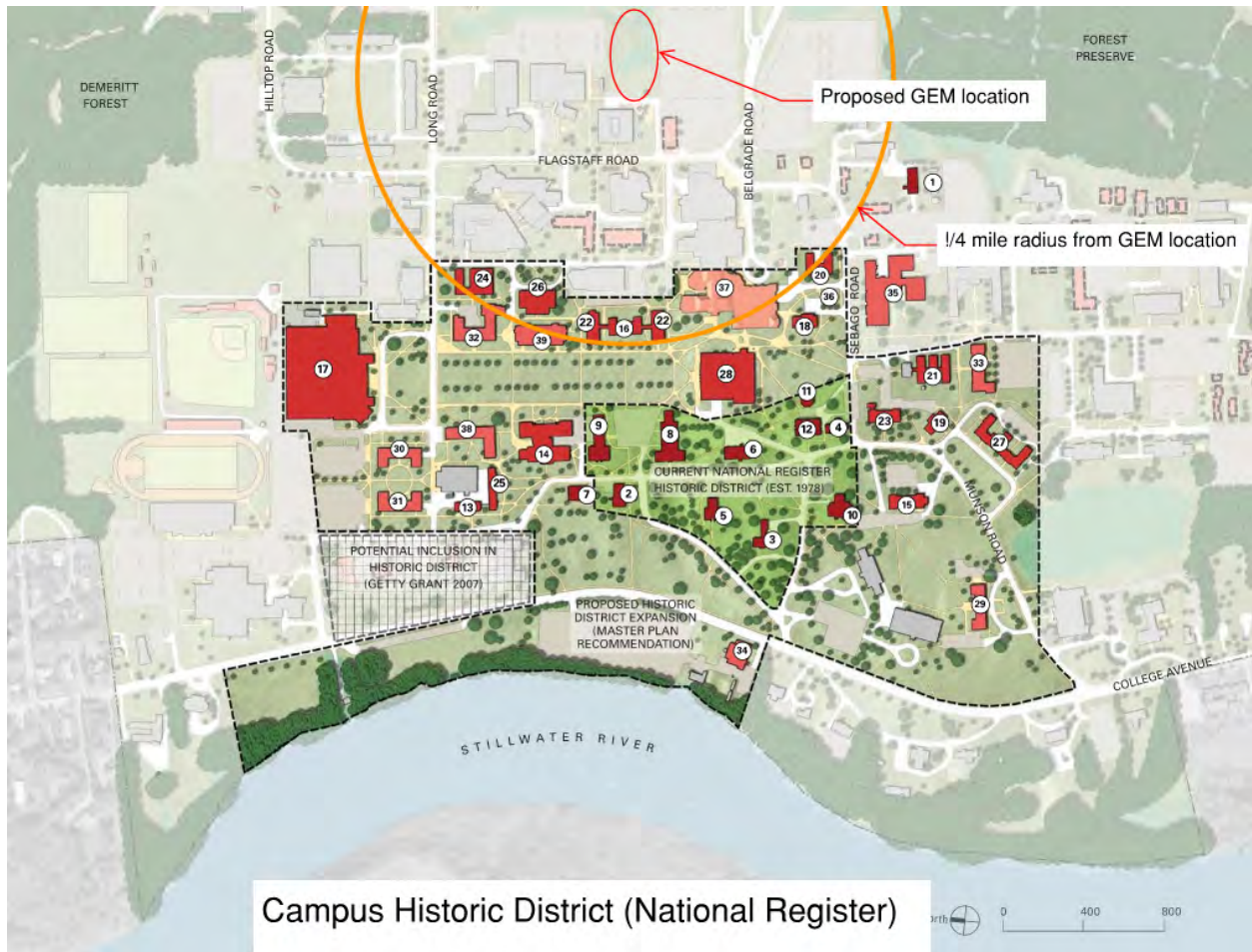


Section 3.1 Land Use above includes a Google Earth image of the central campus where the GEM project is proposed.

DEP Rules Chapter 315: *Assessing and Mitigating Impacts to Existing Scenic and Aesthetic Uses* describes that in the Natural Resources Protection Act (NRPA), 38 M.R.S.A. §§ 480-A through Z, the Legislature has found and declared that Maine's rivers and streams, great ponds, fragile mountain areas, freshwater wetlands, significant wildlife habitat, coastal wetlands, and sand dune systems are resources of state significance and that these resources have great scenic beauty and unique characteristics, and have unsurpassed present and future benefit to the citizens of the State. The Legislature's recognition of the scenic beauty of these protected natural resources through statute distinguishes the visual quality of those resources and its value to the general population.

Therefore, applicants for permits under the NRPA are required to demonstrate that a proposed activity will not unreasonably interfere with existing scenic and aesthetic uses.

The project's proposed wetland impacts are permitted under the NRPA, and therefore must describe the location of the activity and provide an inventory of scenic resources within the viewshed of the proposed activity by completing the MeDEP Visual Evaluation Field Survey Checklist (referenced as Appendix A). The MeDEP Visual Evaluation Field Survey Checklist form for the ASCC GEM is attached in Appendix C. The only resources that are within ¼ mile of the project and from which the project will be visible are the historic structures on the campus; the historic district of campus is located just west of the proposed project (see below). The ¼ mile radius circle from the proposed GEM is indicated.



3.3 Air Quality

The UMaine campus is located in Penobscot County, and Penobscot County is currently in attainment for all ambient air quality standards. The UMaine Campus holds a Title V air emissions license issued by the State of Maine.

The emission sources at the ASCC (including the proposed GEM facility) are exempt from Title V licensing because they meet EPA's exemption for research and development activities.

3.3.1 Greenhouse Gases

UMaine's baseline heating for the campus and surrounding sites in millions of BTUs is 538,431; the baseline electrical usage in kilowatt-hours (kWh) is 42,965,176. The UMaine campus as a whole produces approximately 60,000 metric tons per year of CO₂.

UMaine is a signatory of The Carbon Commitment, which is focused on reducing Greenhouse Gas emissions and achieving carbon neutrality as soon as possible. By signing The Carbon Commitment, UMaine agreed to develop a Climate Action Plan to achieve carbon neutrality. This involves conducting a Greenhouse Gas emissions inventory and implementing steps to reduce greenhouse gas emissions.

UMaine is committed to becoming a national leader in sustainability in higher education. To achieve this goal, the Office of Sustainability works to incorporate sustainability into all aspects of campus living, learning, and operations. To assess our progress toward greater sustainability, UMaine uses the Sustainability Tracking, Assessment & Rating System (STARS), a program of The Association for the Advancement of Sustainability in Higher Education (AASHE). STARS is a comprehensive sustainability rating system for colleges and universities that addresses the environmental, social, and economic dimensions of sustainability.

UMaine completed its first STARS report in April 2019, earning a STARS Silver rating. To achieve the STARS Silver rating, UMaine measured and reported¹ on:

Institutional Characteristics consisting of:

- Institutional Boundary
- Operational Characteristics
- Academics & Demographics

Academics consisting of

- Curriculum including
 - Academic Courses
 - Learning Outcomes
 - Undergraduate Program
 - Graduate Program
 - Immersive Experience

Incentives for Developing Courses

Campus as a Living Laboratory

Research including

Research & Scholarship

Support for Research

Engagement consisting of

Campus Engagement including

Student Educators Program

Student Life

Outreach Materials & Publications

Outreach Campaign

¹ <https://reports.aashe.org/institutions/university-of-maine-me/report/2019-03-01/>

| | |
|----------------------------------|---|
| Staff Professional Development | Construction & Demolition Waste |
| Public Engagement including | Diversion |
| Community Partnerships | Hazardous Waste Management |
| Inter-Campus Collaboration | Water including |
| Community Service | Water Use |
| and Trademark Licensing | Rainwater Management |
| Operations consisting of | Planning & Administration consisting of |
| Air & Climate including | Coordination & Planning including |
| Greenhouse Gas Emissions and | Sustainability Coordination |
| Outdoor Air Quality | Sustainability Planning |
| Buildings including | Participatory Governance |
| Building Design and Construction | Diversity & Affordability including |
| Energy including | Diversity & Equity Coordination |
| Building Energy Consumption | Support for Underrepresented Groups |
| Food & Dining including | Affordability & Access |
| Sustainable Dining | Investment & Finance including |
| Grounds including | Sustainable Investment |
| Landscape Management and | Investment Disclosure |
| Biodiversity | Wellbeing & Work including Employee |
| Purchasing including | Compensation |
| Sustainable Procurement | Wellness Program |
| Cleaning & Janitorial Purchasing | Workplace Health & Safety |
| Office Paper Purchasing | Innovation & Leadership consisting of |
| Transportation including | Innovation including |
| Student Commute Modal Split | SPIRE: The Maine Journal for |
| Employee Commute Modal Split | Conservation and Sustainability |
| and Support for Sustainable | The Climate Change Institute - Climate |
| Transportation | Futures Initiative |
| Waste including | U.S. Community Energy Website |
| Waste Minimization & Diversion | Forest Bioproducts Research Institute |

The University Policy to meet certain standards in new construction is informed by Second Nature Carbon Commitment, Pledge to eliminate greenhouse gas emissions over time, and Regional ClimateAction Planning Process as well as all new campus construction targeted to meet or exceed LEED silver standards.

3.4 Water Resources

The UMaine campus is located in the watersheds of two major rivers, the Stillwater River to the west and the Penobscot River to the southeast. The Stillwater is 0.5 miles west and the Penobscot 1.0 miles southeast from the project site. The confluence of the two is located 1.3 miles directly south of the project site, but the site itself is located in the watershed of the Penobscot. The closest significant aquifer deposits are on the west side of the Stillwater River, over 3,000' to the west of the proposed project location.

3.4.1 Flooding

There are no areas of localized flooding on campus or in the project area. As described in 3.4.2, a functional assessment prepared for the Wetland Alteration permitting identified Floodflow Alteration as the principal function of the on-site wetlands.

A Federal Emergency Management Agency Flood Insurance Rate Map is attached in the appendices, illustrating the special flood zones. As shown on the attached FIRM, the proposed project area is located in an area ZONE X- Area of Minimal Flood Hazard. The closest mapped Special Flood Hazard zones are in the Stillwater River, located 0.5 miles west of the project area. The FIRM shows an AE Base Flood Elevation (BFE) cross-section (line G on the map) at 82.5' elevation directly west of the project site. The elevation of the project site ranges from approximately 112' to 119'. The FIRM also shows the Stillwater Floodway and the 0.2% Annual Chance Flood Hazard area. At its widest point in this vicinity, the 0.2% Chance Zone extends beyond the floodway by 550' to the east. The project site is over 2,700' from this area.

3.4.2 Wetland Delineation Description

Watershed Resource Consultants, LLC (WRC) conducted Protected Natural Resources (PNR) identification and delineation services on, and within appropriate setback distances of, an area of land in the vicinity of the proposed ASCC building addition on the University of Maine campus in Orono, Maine. This report is attached in Appendix E.

Four freshwater wetland areas were delineated on the site. The freshwater wetlands were forested, scrub-shrub, and emergent (old field). Wetlands on the site were determined by WRC to meet MeDEP classification as "Wetlands Not of Special Significance". The four freshwater wetland areas are labeled as Wetlands AB-1, AB-2, AB-3 and AB-4. The details of the delineation by WRC are included in the attached Protected Natural Resources report dated October 24, 2022 (Appendix E).

A Functional Assessment was prepared by WRC and is attached in Appendix E. The principal function of the wetlands in the project area was identified as Floodflow Alteration.

3.4.3 Stormwater Management

Stormwater runoff across the campus discharges to two major river segments, either the Stillwater or the Penobscot. This has allowed the campus to request exemption from the Flooding standard of the stormwater law, so projects are not required to meet any runoff peak flow standard. However, recognizing that the campus has an extensive subsurface stormwater collection system and multiple discharge points, the MeDEP has requested that the University of Maine monitor the capacities of the pipe reaches for each drainage area across campus in each of the two river watersheds.

Every new project on campus is evaluated in terms of its impact on the existing stormwater collection system and its ability to add stormwater quality treatment capacity to the campus. For the General standard (Quality), the MeDEP has accepted a watershed view of treatment, recognizing that because much of the development on campus occurs on already developed areas, it can be difficult to add treatment for every project. Therefore, providing extra treatment when there is space, or adding treatment to existing untreated areas can be just as effective for protecting the water quality of the rivers and meet MeDEP standards.

In 2007, a comprehensive mapping and modeling effort was completed, entitled “University of Maine Campus Hydrologic Analysis” (CES). The purpose was to model the subsurface collection system to understand the drainage areas within each watershed, and to identify any segments that were potentially at or over capacity. Because most of the development on campus occurs on already developed areas, projects on campus that significantly impact imperviousness are now evaluated in relation to their potential to impact portions of the subsurface system that are at risk of exceeding capacity.

Stormwater drawings, including pre- and post-watershed and HydroCAD drawings, are included in Appendix F.

3.4.4 Water Supply

The domestic water source for the Town of Orono, including the University, is the Orono-Veazie Water District. The Orono-Veazie Water District system has adequate capacity to meet the existing water demands of the campus.

The Orono-Veazie Water District water is drawn from four drilled wells located in a well field to the north of 116 Bennoch Road, Orono. The water from all four wells is filtered and then treated with chlorine to protect against bacteriological contaminants, fluoride to promote dental health, and sodium hydroxide to reduce lead solubility from plumbing systems. According to their website, they maintain 2,285 service connections that serve a population of 8,125.

3.4.5 Wastewater

The wastewater flow from the entire UMaine campus is treated by the Town of Orono’s Water Pollution Control Facility. This plant has adequate capacity to handle the existing flows from the campus.

The Orono Water Pollution Control Facility is a secondary activated sludge wastewater treatment plant. The original facility was built in 1970 with a design flow capacity of 1.84 million gallons per day. In 2006 the facility was upgraded to increase capacity, eliminate outdated inefficient processes, provide biological nutrient removal processes, make energy conservation improvements, make physical plant improvements, and to continue work to eliminate combined sewer overflows.

The Facility treats between 375-450 million gallons of wastewater per year, depending on rainfall amount and serves 1,330 users including the University of Maine, the single largest user. Approximately 1,200 cubic yards of sludge are removed per year and shipped to Juniper Ridge in Old Town. Operations at the plant consist of laboratory testing, equipment and building maintenance, process control, and solids handling. The facility is staffed with five State of Maine licensed operators. Additional responsibilities include maintaining 22 miles of sanitary sewer and 4 pumping stations.

3.5 Biological Resources

As described in the WRC PNR report, wetlands AB-1, AB-2, AB-4, and the southern portion of Wetland AB-3 were emergent, old field wetlands with similar characteristics. Reed canarygrass (*Phalaris arundinacea*) was the dominant vegetative species, with other species observed to include meadow foxtail (*Alopecurus pratensis*), fowl blue grass (*Poa palustris*), tall goldenrod (*Solidago gigantea*), wrinkleleaf goldenrod (*Solidago rugosa*), red fescue (*Festuca rubra*), and rough bedstraw (*Galium asprellum*).

The northern and eastern portions of Wetland AB-3 were forested wetlands with scrub-shrub inclusions. Common tree and shrub species observed included quaking aspen (*Populus tremuloides*), red maple (*Acer rubrum*), gray birch (*Betula populifolia*), green ash (*Fraxinus pennsylvanica*), common buckthorn (*Rhamnus cathartica*), and meadowsweet (*Spiraea latifolia*).

3.5.1 Threatened, and Endangered Species,

As part of a campus-wide wetland delineation conducted in 2010, State and Federal Agencies were contacted for information about threatened and endangered species and critical habitats. In 2022, Inland Fish & Wildlife staff and the Maine Natural Areas Program reviewed the GEM project area specifically as part of the preparation of the Protected Natural Resources Report by WRC. There were no habitats or species that meet these criteria identified on the site of the proposed project.

The communications from these agencies described below, as well as the federal Intra-Governmental Payment and Collection (IPaC) review, which is included in Appendix G.

Maine Inland Fish & Wildlife (IF&W) maps the site as within the habitat range of three species of bats that are protected under the Maine Endangered Species Act, and within the habitat range of five species of bats that are listed as species of Special Concern in Maine. As stated in the letter from IF&W, "While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. However, our Agency does not anticipate significant impacts to any of the bat species as a result of this project."

The United States Fish and Wildlife Service database indicates that two federally listed species should be considered as part of an effect analysis for the project: the Endangered northern long-eared bat and the Endangered Atlantic salmon. The database also lists the site as within Critical Habitat for the Atlantic salmon. The database lists the monarch butterfly as a Candidate Species.

Generally, bats are a concern if the site is near a known hibernacula or brooding tree, or if trees will be cut between about April 1 to October 31. No trees are planned to be cut as all of the work will be south of Brown Road, where there are none. Generally, Atlantic salmon are a concern if streams or near-stream areas are to be disturbed. Streams were not observed on, or within 75 feet of, the site.

Generally, monarch butterflies are a concern if there is milkweed (obligate host plant) growing on a site. WRC did not observe milkweed on the site.

The Maine Natural Areas Program response letter dated July 11, 2022 states that "According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Based on the information in our files and the landscape context of this project, there is a low probability that rare or significant botanical features occur at this project location."

The IPaC findings were included in the WRC report, but it has been updated as of January 25, 2024 (attached as Appendix G). The findings are unchanged.

Maine is very attentive to issues of non-native invasive species; there were none observed on the site.

3.6 Soils

Attached is a soils map from the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey. There are two major soil complexes across the project site. These are CuB: Chesuncook-Telos-Urban Land association (0-8% slopes) and PuB: Pushaw-Swanville-Urban land (0-8% slopes). There are no soils in the vicinity designated as Prime Farmland soils.

To meet the design needs of the project, a geotechnical evaluation and a soil documentation report for the stormwater systems areas were prepared. These studies are described below and the reports are attached.

3.6.1 Geotechnical Evaluation

S. W. Cole Engineering, Inc. (S.W.COLE) has completed a geotechnical investigation for a proposed addition to the existing ASCC at the University of Maine in Orono, Maine. Their report is included in Appendix H. The scope of services included completion of sixteen test borings explorations, review of historical test borings from the project vicinity, soils laboratory testing, a geotechnical analysis of the subsurface findings, preparation of a report, attached. Logs of the explorations, including four borings made in September 2003 and eleven made in February 2009 are included in Appendix C of the S.W.COLE report.

S.W.COLE observed the subsurface conditions on November 28th and 29th, 2022 by performing a total of sixteen borings. Borings were performed using hollow-stem auger techniques. The soils were sampled at 2- to 5- foot intervals using a split-spoon sampler and standard penetration test and pocket penetrometer test methods. Soil samples were tested in the lab; three moisture content test and two Atterberg Limits tests are noted in the logs. The results of grain size analysis are included as Appendix D in the S.W.COLE report.

The Exploration Location Plan showing the boring locations is included in Appendix B of the S.W.COLE report.

The test borings encountered a soils profile generally consisting of surficial topsoil or bituminous pavement overlying undocumented fill or native glaciomarine soils underlain by glacial till. Some of the borings terminated on refusal surfaces that were probable bedrock. Test borings B-22-101, B-22-103, B-22-104, B-22-106 and B-22-114 through B-22-116 encountered undocumented fill to depths of about 1 to 5.5 feet which generally consisted of loose to medium dense silt and sand with varying portions of gravel, organics and plastic. Underlying the undocumented fill or topsoil at the remaining borings, the native glaciomarine soils generally consisted of hard to very stiff silty clay that became medium stiff where it was encountered below depths of about 10 feet. Underlying the native glaciomarine soils, the test borings encountered glacial till generally consisting of medium dense to dense gravelly sand and silt with occasional cobbles. Test borings B-22-105 and B-22-106, performed for the proposed access drive, were terminated in glacial till at depths of about 12 feet. The remaining test borings were terminated on refusal surfaces (probable bedrock) at depths ranging from about 7 to 30 feet.

The prior test borings encountered similar subsurface conditions, generally consisting of undocumented fills overlying glaciomarine soils and glacial till mantling.

Free water was observed at the ground surface or relatively shallow depths at test borings B-22-101 and B-22-102 which was likely indicative of perched water conditions. The soils at test borings B-22-102 through B-22-104, B-22-106 and B-22-108 through B-22-116 were observed wet below depths ranging from about

10 to 15 feet. Groundwater likely becomes perched on the glaciomarine soils and glacial till encountered at the explorations. Long term groundwater information is not available.

3.6.2 Stormwater BMP Soils Study

According to SMRT's plans, there are two potential stormwater system locations, one south of the ASCC building, and one as an expansion of an existing attenuation basin south and west of Belgrade Spur Road. According to the Stormwater Rules, subsurface explorations (test pits or borings) must be made within the basin area to identify depths to seasonal high groundwater and bedrock. Explorations should extend to below the proposed basin bottom elevation.

The SMRT plans showed two soil test pit locations within each of the two stormwater system areas. WRC visited the site on November 03, 2022 to document and classify soils at the four test pits, which were pre-staked in the field by the University of Maine. The soil test pits, labeled TP SW-1 through TP SW-4 were dug to approximately 6-7 feet in depth by an excavator and operator provided by University of Maine Facilities Management.

At each test pit, WRC documented soil horizon depths, soil texture, color, consistence, structure, depth of observed fill, depth to seasonal water table, depth to restrictive layer, depth to observed seeping, and depth to bedrock (if observed) to the depth of the test pit. Using the collected soil data, WRC then classified the observed soils to the closest Maine soil series based on data published by the Natural Resources Conservation Service (NRCS). WRC used published NRCS data on the soil series and Maine Department of Environmental Protection (MeDEP) Erosion and Sediment Control Best Management Practices to determine the soil's hydrologic soil group. Soil classification and hydrologic soil group for each test pit are included below in Table 1. The hydrologic soil group presented is based on NRCS published soils data and MeDEP Best Management Practices and does not represent laboratory or in-situ testing results.

| Table 1 – Test Pit Documentation Summary | | | | | |
|---|--------------------------------------|-----------------------------------|-------------------------|---------------------------|-------------------------------------|
| Test Pit | Depth to Seasonal Water Table | Depth to Restrictive Layer | Depth to Bedrock | Soil Series | Hydrologic Soil Group (NRCS) |
| TP SW-1 | 0" | 12" | N/O | Scantic silt loam, buried | D |
| TP SW-2 | 0" | 8" | N/O | Scantic silt loam | D |
| TP SW-3 | 8" | 8" | N/O | Lamoine silt loam | D |
| TP SW-4 | 8" | 8" | N/O | Lamoine silt loam | D |

N/O = Not Observed

3.7 Noise Levels

The University campus is, itself, a protected location under the State of Maine's noise standards described in Chapter 375: No Adverse Environmental Effect Standards of the SLOD Act.

PROTECTED LOCATION: Any location, accessible by foot, on a parcel of land containing a residence or planned residence or approved residential subdivision, house of worship, academic school, college, library, duly licensed

hospital or nursing home near the development site at the time a Site Location of Development application is submitted...”.

There are no particularly noisy functions or operations on campus in general or in the vicinity of the proposed project in particular.

3.8 Historic/Cultural Resources

The University of Maine was founded in 1865. The UMaine website describes the historic district that encompasses the area of the earliest buildings.

In 1978, the National Register of Historic Places designated a University of Maine at Orono Historic District.

The historic district, framed by Munson, Sebec and Schoodic roads, includes 10 architecturally significant structures constructed from 1868 to 1913. The district represents the oldest section of campus of the land grant institution that opened Sept. 21, 1868, on the site of the former Frost and White farms. Frederick Law Olmsted, founder of American landscape architecture, conceived the original campus plan.

From 1868 to 1870, students built the first campus academic building - Fernald Hall, originally called Chemical Hall. Phi Kappa Phi, (Philosophia Krateito Photôn, “Let the love of learning rule humanity”), an honor society promoting academic excellence, was founded in 1897 in Fernald Hall.

The nine other buildings in the district are Alumni Hall, Carnegie Library, Coburn Hall, Holmes Hall, Lord Hall, the President’s House, Stock Judging Pavilion, The Maples, and Winslow Hall.

The following contacts were made:

Tribal Historic Preservation Office
Mi'kmaq Nation
7 Northern Road
Presque Isle, ME 04769
Phone: (207)764-1972 ext. 161
jdennis@micmac-nsn.gov

Response attached

Donald Soctomah, THPO (soctomah@gmail.com)
Passamaquoddy Tribe of Indians
Pleasant Point Reservation
PO Box 343
Perry, ME 04667

No response to date

Donald Soctomah, THPO (soctomah@gmail.com)
Passamaquoddy Tribe of Indians
Indian Township Reservation
PO Box 301
Princeton, ME 04668

No response to date

Isaac St. John, THPO (istjohn@maliseets.com)
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

No response to date

Chris Sockalexis, (Chris.Sockalexis@penobscotnation.org)
Tribal Historic Preservation Officer
Penobscot Nation
12 Wabanaki Way
Indian Island, ME 04468

Response Attached

To date, only the Mi'kmaq and Penobscot Officers have responded; they each stated that there are no concerns for them with this project. They provided guidance in the event that any remains or artifacts should be encountered during construction.

3.9 Socioeconomics

The site is located on the University of Maine campus, a public land-grant research university in Orono, Maine. With an enrollment of approximately 11,500 students, UMaine is the state's largest college or university. Currently, 38% of UMaine's students come from rural and high-poverty counties which also have the highest level of employment levels in the forest products industry¹.

¹ https://formaine.org/wp-content/uploads/2021/07/FORMaine-Workforce-Report-Final_Revised_06.2021.pdf

Orono is located within the Bangor Maine metropolitan area, which includes 3,397.36 square miles of land, 159.72 square miles of water and a population of 153,704. The following is an excerpt of socioeconomic conditions from the 2022 Bangor Economic Development Strategy: “Since the loss of the military base in the 1960s Bangor has both struggled and grown. Like many other cities, for many decades Bangor focused on growth in suburban ‘Big Box Retail / Mall’ development. Recent efforts have begun to shift back into a vibrant downtown community thanks to the initiatives of a few key organizations and businesses. Bangor also stands as a retail, job, educational and governmental service hub. The City has become a more walkable and neighborhood friendly community with the increase of parks and recreation opportunities, with more efforts to increase the standards and quality-of-life. Broadband, transportation, and housing efforts are underway to make for a more livable and connected community. Land space for redevelopment is important for both increase in housing stock and business diversity. A number of local organizations are focused on scaling the entrepreneurial ecosystem. Traditionally, Bangor has been a service hub not just for the community, but for the region – including serving as a critical resource for vulnerable populations. While Bangor provides many services to support these groups, these issues continue to be an area of concern for many.”

Reducing the cost and improving supply of affordable housing units and durable infrastructure, providing workforce training opportunities and catalyzing investment in economically distressed regions are current critical state needs, that are also important globally. The pandemic associated supply chain disruptions negatively impacted housing security, exacerbating disparities in health, education, and economic outcomes dependent on safe, stable housing.

Furthermore, the pandemic accelerated the loss of low-wage jobs that often do not require postsecondary education and resulted in the loss of nearly half of student internships, with many that continued being virtual, greatly limiting opportunities for already disadvantaged Maine students who lack connectivity.

3.10 Health and Safety

3.10.1 Health and Safety Policies

The University utilizes American Institute of Architects contract mechanisms, which outline robust health and safety expectations for design and construction of the facility; in addition to establishing health and safety expectations, this requires contractors to provide and execute their own compliant safety programs.

University of Maine System Safety Management works to encourage and support the safety of employees, including collaboration with Human Resources, Risk Management, and the UMaine researcher’s chain of command. University of Maine System Safety Management remains active on organized committees and receives Proposal Approval Routing System notifications surrounding specialized or unique concerns that operations in the facility may address directly, including the use of radioactive isotopes, equipment containing radioactive materials, or ionizing radiation-producing equipment, the use of Class 3b or 4 lasers, activities which require medical evaluations for potential exposure to Particularly Hazardous Substances, specific Occupational Safety and Health Administration regulated substances, and pesticides, activities where respiratory protection are necessary due to health exposures or lack of engineering controls (chemical fume hoods) in place, activities which have excessive noise in excess of 85 decibels, activities which require special training requirements, and activities which generate hazardous waste.

3.10.2 Climate Change

This area falls within the Northeast Region of the 4th National Climate Assessment, which includes the entire Northeastern United States. The report notes a wide spectrum of geographies and dispersion of potential scenarios. In general, this region is threatened by reduced snow/ice, rising sea levels and rising temperatures. The Northeast is projected to be more than 3.6° F warmer on average than during the preindustrial era by 2035, the largest increase in the contiguous United States. The assessment notes:

“The changing climate of the Northeast threatens the health and well-being of residents through environmental changes that lead to health-related impacts and costs, including additional deaths, emergency room visits and hospitalizations, higher risk of infectious diseases, lower quality of life, and increased costs associated with healthcare utilization. Health impacts of climate change vary across people and communities of the Northeast and depend on social, socioeconomic, demographic, and societal factors; community adaptation efforts; and underlying individual vulnerability”

<https://nca2018.globalchange.gov/chapter/18/>.

4. ENVIRONMENTAL CONSEQUENCES

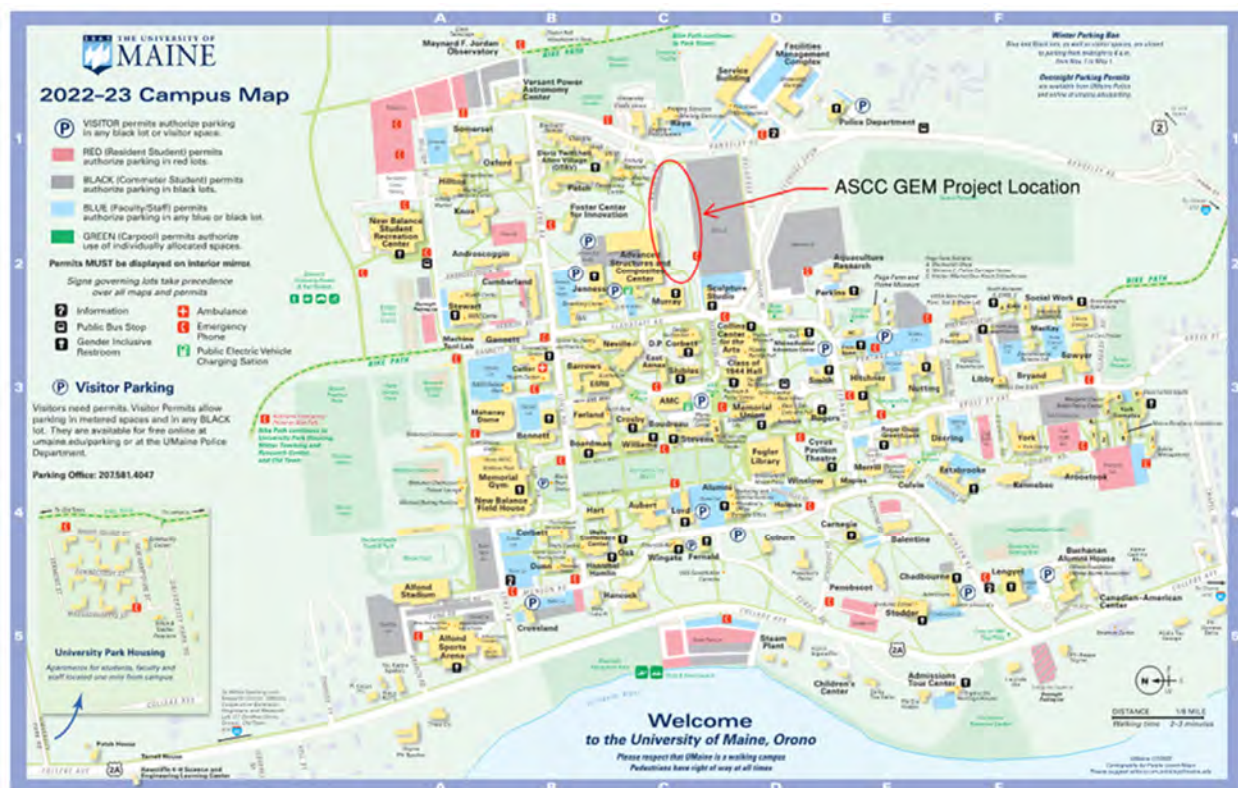
4.1 Land Use Impacts

Preferred Alternative:

The GEM Fof addition is being proposed for construction in two phases. Phase 1 will comprise a 31,300 SF building addition and 43,868 sf of associated pavement. Phase 2 will add 15,670 SF of building (built over pavement) and new pavement. The total pavement area after Phase 2 construction will be 48,269 SF, and the total impervious area will be 95,239 SF. The total developed (impervious plus landscaped) area for Phase 1 will be 140,531, and after Phase 2, 144,969 SF.

Stormwater treatment in accordance with Maine DEP Rules Chapter 500 for the roofs and paved areas will be provided as described below in Section 4.4.3.

The proposed Project Location is illustrated on the figure below (and attached in Appendix A).



A permitting civil package, attached in Appendix B, shows details of the Project design, the Project phases, and the erosion and sedimentation control details.

There are both forested and meadow wetland areas adjacent to and within the footprint of the proposed project.

The most significant changes proposed to the existing topography are the GEM building addition and new paved truck dock. The building addition will be located in an existing grassed area connected to the existing

OWL building. The new paved truck dock will be graded to direct runoff away from the building while matching the existing topography where feasible. Runoff from the new impervious areas will be controlled and directed in a way that maintains existing stormwater runoff conditions as much as possible. The project site in existing condition is primarily covered with field grass with paved walkways through the middle and along the easterly edge. The GEM building addition and paved truck dock will be new impervious areas, with new lawn areas proposed along the south end of the project site. The westerly end of the project site consists of paved parking for Murray Hall and will generally be unchanged by the project. Stormwater features are included in the design to control runoff from new impervious areas. No development is proposed at the southeast corner of the project site to minimize impacts to an existing wetland. All impacts to wetlands within the project site have been permitted.

No-Action Alternative:

There will be no changes to the site under the No-Action Alternative.

4.2 Visual Impacts

As described Section 3.2, the only resource that is within a ¼ mile of the proposed project, and the only resource from which the project might be visible at any time of year is a public site or structure listed on the National Register of Historic Places. These resources are campus buildings that themselves are historic as they are part of the original campus beginning with the campus founding in 1865. They are described in detail in Section 3.8. The proposed project may be visible from one or several of these historic buildings, but it will be consistent in scale and design to the existing ASCC, and so the visibility will not cause a negative impact.

No-Action Alternative:

There would be no visual impact under the No-Action Alternative.

4.3 Air Quality Impacts

The project is not anticipated to have a significant impact on air emissions from the campus. It will be heated using the existing campus steam system. The project will not produce odors. A 500 kW diesel generator to support a fire pump is anticipated in the project, for which an amendment to the University's air license is anticipated to be obtained.

Steam plant projected additional emissions resulting from the added GEM heating load to the University's current steam plant emission levels have been estimated based on the anticipated design demand. The calculations assume that the GEM heating load would be met through increased use of natural gas in Boilers 7 and 8.

A summary table shows that the additional emissions of each pollutant would represent a less than 1% increase to current steam plant emission levels.

| Pollutant | Baseline Steam Plant Emissions Attributable to GEM Heating Load (tons/year) | Additional Steam Plant Emissions Attributable to GEM Heating Load (tons/year) | Steam Plant Total Actual Emissions During CY2022 (tons/year) | Increase in Total Steam Plant Emissions Resulting from GEM (%) |
|-------------------|--|--|---|---|
| NO _x | 34.00 | 0.136 | 34.3 | 0.40% |
| CO | 14.40 | 0.075 | 14.3 | 0.52% |
| PM ₁₀ | 1.18 | 0.002 | 1.4 | 0.17% |
| PM _{2.5} | 0.19 | 0.002 | 1.0 | 0.22% |
| SO ₂ | 10.00 | 0.001 | 12.7 | 0.01% |
| VOC | 1.27 | 0.007 | 1.2 | 0.55% |

No-Action Alternative:

The No-Action Alternative will have no impact on air emissions.

4.3.1 Greenhouse Gases

The University Policy to meet certain standards in new construction is informed by Second Nature Carbon Commitment Pledge to eliminate greenhouse gas emissions over time, and Regional Climate Action Planning Process as well as all new campus construction targeted to meet or exceed LEED silver standards.

The building design anticipates additional annual energy usage of 1,413,500 kWh/yr for electricity and 2,465 MMBtu for district heat. The tables below provide estimates of the Expected Annual Greenhouse Gas (GHG) Emissions from the GEM Facility from electricity consumption and the heating load.

GHG Emissions: Electricity Consumption

| CO2 Emission Factor (lbs/MWh) | GEM Electricity Consumption (kWh/yr) | CO2 Emissions (MT CO2/yr) |
|-------------------------------|---------------------------------------|---------------------------|
| 539.41 | 1,413,500 | 346 |

GHG Emissions: Estimated Heating Load

| GHG | Emission Factors (kg/MMBtu) | Global Warming Potential (100 yr) | GEM District Heat Consumption (MMBtu) | CO2e Emissions (kg/yr) | CO2e Emissions (MT CO2e/yr) |
|---------------|-----------------------------|-----------------------------------|---------------------------------------|------------------------|-----------------------------|
| CH4 | 0.001 | 25 | 2465 | 61.625 | 0.061625 |
| N2O | 0.0001 | 298 | 2465 | 73.457 | 0.073457 |
| CO2 | 53.06 | 1 | 2465 | 130792.9 | 130.7929 |
| TOTAL: | | | | | 130.93 |

GEM will drive massive demand for low-value residuals produced as a byproduct of forest product processing, such as sawmills. A decade ago, these residuals were sent to pulp and paper mills for conversion to product, but with the shutdown of major pulp and paper operations in Maine and elsewhere in the Northeast, there is now a surplus of this material. As a result, the residuals are either landfilled or burned, resulting in the release of embodied carbon. GEM will make use of this material by polymerizing with resin systems, preserving the embodied carbon and creating new materials that can be 3D printed. UMaine has produced a 600-700 ft² affordable housing unit for manufacturing in GEM that could use approximately 16,000 lbs of wood fiber. Meeting just 5% of the nationwide demand for affordable housing units (340,000 units) could utilize 2.72 million tons of wood residuals each year, more than twice the surplus residues produced at all Northeast sawmills.

4.4 Water Resources Impacts

The proposed project will neither utilize surface or groundwater resources near the project, nor impact them. There will be no water withdrawals or discharges to local water resources, and the project is not located on or near a sole source aquifer recharge area. The closest significant aquifer deposits are on the west side of the Stillwater River, over 3,000' to the west of the proposed project location. The water table is generally close to the surface in this region of Maine, but the proposed project will not affect it because there will be no withdrawal or disruption of groundwater flow.

4.4.1 Flood Zones

As described in the 2015 FEMA report Guidelines for Implementing Executive Order 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a

Process for Further Soliciting and Considering Stakeholder Input, the Federal Flood Risk Management Standard (FFRMS) includes specific approaches for determining a vertical flood elevation and corresponding horizontal floodplain that are designed to recognize and incorporate future conditions rather than rely solely on existing data and information.

The FFRMS floodplain can be determined by one of the following approaches:

1. Climate-informed Science Approach (CISA) – The elevation and flood hazard area that result from using a climate-informed science approach that uses the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science. This approach will also include an emphasis on whether the action is a critical action as one of the factors to be considered when conducting the analysis.
2. Freeboard Value Approach (FVA) – The elevation and flood hazard area that result from using the freeboard value, reached by adding an additional 2 feet to the base flood elevation for non-critical actions and from adding an additional 3 feet to the base flood elevation for critical actions.
3. 0.2-percent-annual-chance Flood Approach (0.2PFA) – The area subject to flooding by the 0.2-percent-annual-chance flood.
4. The elevation and flood hazard area that results from using any other method identified in an update to the FFRMS.

As described in Section 3.4.1 of this EA, the 500-year flood boundary (0.2PFA) is along the Stillwater River Floodway is at least 2,700' west of the project site and the elevation in this area on Google Earth is approximately 100'.

Using the Freeboard Value Approach, the elevation and flood hazard area starts with the nearest BFE of 82.5', as shown on the FIRM described in Section 3.4.1. The result is obtained by adding 2 or 3 feet to the BFE, depending on if the project is a critical action. In this case, the FVA is either 85.5 or 86.5, which is 26.5 or 25.5' lower than the lowest area of the project site.

The two methods described show the project to be so far above the FFRMS floodplain, it seems reasonable to state that the project is outside of the FFRMS floodplain and will not be impacted by flooding of the Stillwater River under any likely scenario in the foreseeable future.

The wetlands adjacent to the project and those that will be impacted by it provide Floodflow Alteration, as described in the Functions and Values Assessment attached in Appendix E. The site is designed to ensure water will continue to move through the site, and the stormwater management structures are designed to keep the peak runoff rate the same as it is currently. Therefore, the proposed project will have no impact on flooding or flood zones.

No-Action Alternative:

The No-Action Alternative will also have no impact on flooding or flood zones.

4.4.2 Wetland Impacts

The site proposed for the Project has three existing emergent, old-field wetland areas. The Wetland Impact Plans illustrate the Project's wetland impact area, totaling 26,496 sf for the whole project (20,143 for Phase 1 and 6,353 for Phase 2).

In 2011, the last time there were wetland impacts on campus, the total area of impact permitted under NRPA was 56,580 sf of permanent impact and 65,893 sf of total (permanent + temporary) impact. This included only those impacts that occurred since 1995 because they are subject to Chapter 310 regulations. This is because all wetlands within the project area (UMaine campus) were above-headwater wetlands less than 10 acres in size, and as such were not subject to NRPA jurisdiction until 1996 when the Chapter 310 regulations came into existence.

The Wetland Impact Plans illustrate the Project's wetland impact area, totaling 26,496 sf for the whole project (20,143 for Phase 1 and 6,353 for Phase 2). This will increase the overall historical jurisdictional wetland impact to 90,389 sf, or 2.1 acres.

No-Action Alternative:

Under the No-Action Alternative there would be no impacts to wetlands and no permitting or mitigation would be necessary.

4.4.2.1 Permitting

Applications to permit the impact to wetlands must be obtained from both the Maine DEP and the ACOE prior to construction. These permits were approved January 11, 2024; the approvals are attached in Appendix C.

The State of Maine's Natural Resources Protection Act (NRPA: 38 M.R.S.A. 480-B) became effective on August 4, 1988. The Act focuses on protecting natural resources and recognizes the State significance of these natural resources in terms of their recreational, historical, and environmental value to present and future generations. The Act's intent is to prevent any unreasonable impact to, degradation of or destruction of the resources and to encourage their protection or enhancement.

An application for a NRPA permit is required when an "activity" will be in, on, or over a great pond, coastal wetland, freshwater wetland, significant wildlife habitat, fragile mountain area and river, stream, or brook where the activity includes dredging, bulldozing, removing or displacing sand, soil, vegetation or other materials; draining or dewatering; filling, or any construction, repair, or alteration of a permanent structure. It is also used for activities adjacent to certain protected natural resources (38 M.R.S.A. 480-C(1)).

The ACOE is the most common federal agency involved with projects located in waterways and wetlands. The Corps has jurisdiction over dredging, construction of structures, and other work in navigable waters and placement of fill in all waters of the United States including navigable waters, freshwater wetlands, and coastal wetlands.

For activities that only affect freshwater wetlands and qualify for tiered review, a joint application for both the state and federal permits is available through the MeDEP. These applications are jointly reviewed by the MeDEP and Army Corps providing "one step" permitting for applicants.

4.4.2.2 Mitigation

Mitigating adverse environmental impacts is an integral part of NRPA (38 M.R.S.A. §§ 480-A – 480-JJ), a regulatory program administered by the MeDEP. In general, mitigation is a sequential process of avoiding adverse impacts, minimizing impacts that cannot be practicably avoided, and then compensating for those impacts that cannot be further minimized. Both State and Federal agencies administering resource protection regulations may require appropriate and practicable compensatory mitigation as a condition of their permit approvals and authorizations.

In accordance with regulations and procedures in place with the MeDEP and the ACOE, compensation for any wetland impact from this project approved by the regulators will be made under the In-Lieu Fee (ILF) program.

The ILF program allows applicants to pay a fee rather than complete a permittee-responsible on-site or off-site compensation project. The ILF program specifies resource compensation rates and resource dependent calculation methods for determining the amount of compensation fee necessary to off-set impacts to specific protected natural resources. The ILF compensation program was established to provide applicants with a flexible compensation option over and above traditional permittee-responsible compensation projects. The applicant selected the ILF program for the impact proposed for this project, and this approach has been approved by the regulators. UMaine will pay the ILF amount prior to the beginning of construction as required by the program and documented in the permit approval attached in Appendix C. The total ILF amount is \$113,667.84.

4.4.3 Stormwater Management

The Site Law permit utilizes the standards from the Maine Stormwater Rules for stormwater management requirements for projects permitted under SLOD. The SLOD application must describe pre-development and post-development site conditions and the estimated effects of post-development site runoff on peak discharge rates, flooding and water quality. It must also identify the standards that the project must meet, and which Best Management Practices (BMP's) are proposed to meet the standard.

The stormwater quantity management plan must provide for detention, retention, or infiltration of stormwater from 24-hour storms of 2-year, 10-year and 25-year frequencies such that the peak flow of the stormwater from the developed site does not exceed the peak flow of stormwater from the site prior to construction of the project.

The project must also provide a stormwater quality treatment plan for the site that meets the applicable standards in Chapter 500. To meet these standards, the applicant must demonstrate that a project's stormwater management system includes treatment measures that will provide pollutant removal or treatment and mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms and potential temperature impacts, unless the Department determines that channel protection and/or temperature control are unnecessary due to the nature of the resource.

The discussion below provides the details for how the project will meet these standards.

No-Action Alternative:

Under the No-Action Alternative there would be no change to the stormwater runoff. Because the Preferred Alternative is adding water quality treatment above and beyond what is needed to treat runoff from the new features, under the No-Action Alternative there is less overall treatment capacity on campus.

4.4.3.1 Water Quantity Management

The project will add over two acres of impervious surface to the site, which is currently vegetated. The flooding standard is intended to be met by re-purposing an existing detention basin downstream of the project site. The stormwater pond adjacent to the Belgrade parking lot was previously permitted as an attenuation basin to provide flood control on several impervious areas in the vicinity. The attenuation basin will be modified to increase storage volume and a new outlet control structure will replace an existing outlet culvert. The outlet discharge point for the pond was unchanged by the modifications. These measures are anticipated to mitigate the impacts of approximately 2 acres of new impervious area.

The following methods were used to minimize increased peak flow values with the proposed development.

1. Minimize design of new impervious area to reduce runoff velocity.
2. Improve existing stormwater infrastructure by increasing pipe sizes to accommodate existing and added flows.
3. Enlarge the existing attenuation basin to support runoff from the new impervious areas, providing greater capacity for attenuation for flooding control.
4. Design weir outfalls for each stormwater feature such that runoff is collected and released at a controlled rate (grassed underdrained soil filters and modified existing attenuation basin).

As Table 1 from the report shows (reproduced below), this work will result in substantial reductions in the post development flow rates (cfs – cubic feet per second) at the point of analysis, which is just downstream of the outlet of the pond. The work on the pond will be completed in phase 1.

Table 1: Peak Flows for Pre-Development and Post-Development Conditions at Point of Analysis

| | Storm Event | | | |
|--------------------------|--------------|--------------|--------------|---------------|
| | 2-Year | 10-Year | 25-Year | 100-Year |
| Pre-Development | 41.75 | 96.87 | 133.51 | 196.26 |
| Post-Development | <u>31.74</u> | <u>56.23</u> | <u>97.40</u> | <u>179.53</u> |
| Difference in cfs | (10.01) | (44.64) | (36.11) | (16.68) |
| % Difference | (24%) | (46%) | (27%) | (8%) |

Approval of the SLOD amendment constitutes approval by the MEDEP of the proposed stormwater management plan.

4.4.3.2 Water Quality Treatment

Water quality treatment for this project is being provided for by a combination of on-site grassed underdrained soil filters (GUSFs). As described below, these GUSFs will provide additional treatment credit to the water shed for future projects.

Four GUSFs are proposed to treat runoff from the site. Design details of these GUSFs are shown on Sheet CG-503 in the civil design set included in the appendices. Tables showing the design capacity calculations are included in this section. These calculations show that the proposed GUSFs meet the treatment standards for both phase 1 and phase 2 of the project. The filters will be built in phase 1.

The proposed filters provide excess treatment, and the credit calculations are detailed below.

For phase 1, the GUSFs provide 62,508 sf of available equivalent impervious capacity. If phase 2 were ultimately not constructed, this capacity would be available for other projects.

| Phase 1 | Volume provided | Phase 1 req'd (CF) | Excess capacity (CF) | Equivalent Impervious (SF) (credit) |
|----------------|------------------------|---------------------------|-----------------------------|--|
| GUSF #1 | 5,509 | 2,831 | 2,678 | 32,136 |
| GUSF #2 | 5,325 | 4,197 | 1,128 | 13,536 |
| GUSF #3 | 2,567 | 1,684 | 883 | 10,596 |
| GUSF #4 | 1,327 | 807 | 520 | 6,240 |
| TOTAL | | | | 62,508 |

For phase 1, the GUSFs provide 62,508 sf of available equivalent impervious capacity. When phase 2 is ultimately constructed, the remaining capacity (50,052 sf of impervious equivalent) would be available for other projects.

| Phase 2 | Volume provided | Phase 2 req'd (CF) | Excess capacity (CF) | Equivalent Impervious (SF) (credit) |
|----------------|------------------------|---------------------------|-----------------------------|--|
| GUSF #1 | 5,509 | 4,178 | 1,331 | 15,972 |
| GUSF #2 | 5,325 | 4,199 | 1,126 | 13,512 |
| GUSF #3 | 2,567 | 1,373 | 1,194 | 14,328 |
| GUSF #4 | 1,327 | 8,07 | 520 | 6,240 |
| TOTAL | | | | 50,052 |

Approval of the SLOD amendment constitutes approval by the MEDEP of the proposed stormwater management plan.

4.4.3.3 Stormwater BMP Soils Study

By Maine DEP definition, the underdrained soil filters are filtration features and not intended as infiltration features. The applicable standards for the installation of stormwater GUSFs (grassed underdrained soil filters) require that the bottom of the underdrained soil filter should be a minimum of 18 inches above the seasonal high groundwater table or bedrock unless an impermeable liner (not clay) or other design elements are employed.

The soils investigation for the stormwater GUSFs (described in Section 3.6.2 indicated that the depth to seasonal groundwater table ranges from 0" to 8". The site topography does not allow for the option to raise the soil filters sufficiently to meet the separation standard even though these filters will be built on fill and therefore the separation will be increased, The DEP Best Management Practices allow for the use of

poly liners in situations where the minimum depth to groundwater cannot be met and so, to ensure adequate separation and minimize infiltration, the filters will also be installed with 30 mil liners.

This design was submitted, reviewed, and accepted by the DEP during application review for this project.

4.4.3.4 Erosion and Sedimentation Control

To minimize impacts to soil and water resources in the vicinity, the project will utilize Erosion and Sedimentation Control techniques in accordance with State rules. The Erosion and Sedimentation Control Plan has been reviewed and approved by the MEDEP as part of the SLOD review. Facilities Management on campus has qualified, trained professionals (including licensed Professional Engineers) whose job it is to manage and oversee construction projects of all sizes on behalf of the University. The contact person responsible for maintenance of the erosion and sedimentation control measures is Jonathan Dow:

Jonathan Dow
Project Manager
University Services: Facilities Management and General Services
Capital Planning and Project Management
5765 Service Building 105
Orono, Maine 04469-5765
Tel. (207) 852-7765
jonathan.dow@maine.edu

The overall goal of the Erosion and Sedimentation Control Plan is to restrict the potential for erosion on the sites and sedimentation of areas downhill of the sites. A variety of erosion control techniques will be implemented to achieve this goal.

Based upon field inspection of the subject project, it was determined that the potential for erosion is minimal on the project site. Erosion and sedimentation at the site will be primarily from and associated with the construction of the ASCC addition, parking areas and walkways. There are no critical areas observed that require extraordinary measures for erosion control.

Erosion will be managed using silt fencing, bark mulch erosion control berms, an underdrain soil filter and revegetation. Silt fencing or bark mulch berms will be installed prior to any other construction activities and will be maintained in working condition by the contractor until final soil stabilization is achieved. They will be inspected frequently. Once areas reach final grade, they will be revegetated as soon as possible but in no case more than 7 days after grading is completed.

Erosion control measures include the following:

- All disturbed areas are to be loamed, seeded and stabilized with mulch or geotextile fabric.
- Silt fencing or bark mulch berms will be installed downgradient of all grubbing and earth moving activities.
- Temporary grass or legume cover will be installed on dormant stockpiles and construction during the non-growing season.
- Water will be utilized to control dust if necessary. No oils will be used.

- Construction entrances will be installed to minimize materials being carried off site by construction vehicles.

Recognizing that construction during the winter in Maine is difficult and that construction activities may be delayed, special considerations must be made to prevent damage to the site. Winter construction, if necessary, will adhere to the following plan:

- All open areas that are not permanently stabilized will be heavily mulched when work is completed on the site and not anticipated to begin again within one day.
- All open areas will be heavily mulched every night in the case of a stormy forecast within the next 12 hours.

The site-civil design plans included in Appendix B provide erosion control details.

All measures will be implemented in accordance with the *Maine Erosion and Sedimentation Handbook for Construction: Best Management Practices*. All temporary measures will be removed after the areas are permanently stabilized.

The anticipated date of final site stabilization for phase one is the summer of 2025.

4.4.4 Water supply

The proposed project will create only a very minor increase in water demand driven by the few toilet rooms included in the project. Available water supply capacity is sufficient to support the proposed project.

The proposed project will not have a significant impact on the municipal water supply as the increase in flow is trivial compared to the overall campus water demand. Phase 1 of the proposed project is anticipated to add 50 new employees to the campus, thereby generating new water demand of 600 gallons of water per day.

The Phase 2 addition is anticipated to add approximately 20 new staff members to the building. This represents an estimated additional flow of 240 gallons per day for the Phase 2 project. Included in Appendix M is an email communication with the Orono/Veazie Water District confirming their capacity and willingness to provide this water demand for Phase 1 of the proposed project.

No-Action Alternative:

Under the No-Action Alternative there will be no increase in water supply need.

4.4.5 Wastewater

The proposed project will create only a very minor increase in wastewater flow driven by the few toilet rooms included in the project. Available wastewater treatment capacity is sufficient to support the proposed project.

The proposed project will not have a significant impact on the municipal wastewater treatment capacity as the increase in flow is trivial compared to the overall campus water demand. Phase 1 of the proposed project is anticipated to add 50 new employees to the campus, thereby generating new wastewater treatment capacity demand of 600 gallons of water per day.

The Phase 2 addition is anticipated to add approximately 20 new staff members to the building. This represents an estimated additional flow of 240 gallons per day for the Phase 2 project. Included in Appendix M is an email communication with the Superintendent of the Orono Water Pollution Control Facility confirming their capacity and willingness to accept the volume of wastewater from Phase 1 of the proposed project.

No-Action Alternative:

Under the No-Action Alternative there will be no increase in wastewater treatment capacity need.

4.5 Biological Resources Impacts

While the plants growing at the site will be cleared by the construction of the proposed project, they are all common species in the vicinity. As described in the Protected Natural Resources report and the IPaC letter (both attached) there are animal species of concern in the vicinity, but none are anticipated to be present on the site such that they would be impacted by the proposed project. This includes Atlantic Salmon, bats, and Monarch Butterflies.

The proposed project will not introduce or promote growth of any non-native invasive species.

No-Action Alternative:

Under the No-Action Alternative there will be no impact to on-site biological resources.

4.6 Soils Impacts

The final FFE design will require approximately 1,600 cy of fill and this design provides the lowest impact for existing conditions and proposed features. There is no blasting proposed for this project.

Based on the Geotechnical Study Report for this site attached in Appendix I the principal geotechnical considerations include:

- Based on the current and prior borings, the undocumented fills may vary in thickness from about 1 to 10.5 feet across the site. The fills may vary outside of the exploration locations. S.W.COLE's opinion is that the undocumented fills are unsuitable for direct support of the proposed building.
- Options for support of the proposed building include over-excavation and replacement of the undocumented fills, ground improvements, or deep foundations.
- If conventional spread footing foundations bearing on properly prepared subgrades are utilized, the estimated post-construction settlement and deflection estimates could exceed amounts tolerable for the positioning equipment cranes, in which case the report recommends pile-supported foundations.
- Subgrades across the site will consist of moisture sensitive glaciomarine soils. Earthwork and grading activities should occur during drier, non-freezing months of late Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the exposed native soils. Excavation of bearing surfaces should be completed with a smooth-edged bucket to lessen subgrade disturbance.

- Imported Granular Borrow, Structural Fill and Crushed Stone will be required for construction. The undocumented fills and native soils are unsuitable for reuse as fill in the building footprint but may be suitable for reuse in paved and landscape areas as needed.

Additional recommendations are provided in the report. Based on the subsurface findings, the report concludes that, with the implementation of the recommendations, the site is suitable and the proposed construction appears feasible from a geotechnical standpoint.

4.7 Noise Level Impacts

The proposed project operations will all occur inside the building. The operations will be similar in function, activity, and noise generation to existing operations at ASCC and facilities across the campus. Current noise levels at the ASCC are insignificant. Therefore, the proposed Project is a minor noise source and is expected to meet the state noise standards as required for a project covered by a SLOD permit. There are no applicable local noise standards. There are no non-campus Protected Locations in the vicinity of the proposed project.

No-Action Alternative:

Under the No-Action Alternative there will also be no noise level impacts.

4.8 Historic/Cultural Resources Impacts

At our request, the MHPC reviewed the Project site specifically in 2022 as it had been several years since their last file review. The correspondence is attached in the appendices. They confirmed that there are no National Register eligible properties on or adjacent to the Project site, nor is the area considered sensitive for archeological resources.

Though no sensitive resources are anticipated, the response from the Tribal Historic Preservation Officer for the Mi'kmaq Nation requested that, if during the course of excavation/construction activities human remains, artifacts, or any other evidence of Native American presence is discovered, site activities in the vicinity of the discovery immediately cease, pending notification to them. This would allow any artifacts to be documented with appropriate detail. If human remains were discovered, they would be reburied at a distinctive and respectable site with the appropriate respect for the remains.

The proposed project is not expected to impact historic or archeological resources.

No-Action Alternative:

Under the No-Action Alternative there will also be no impacts to historic resources.

4.9 Socioeconomic Impacts

The intent of GEM is to transform affordable housing construction by building additive manufacturing capacity using local forest feedstock that removes dimensional constraints for large structure printing, addressing the underlying cost of construction that is currently limiting supply of new homes. By developing and transferring this process to private sector partners, the technology can meet demand for 20,000+ affordable housing units in the state, improve outcomes for housed Mainers and help businesses recover from pandemic-induced downturns.

GEM will address this by creating new paid training pathways for high-demand career fields for more than 400 students and workers annually. The hands-on learning provided in this modernized facility will ensure students and other users are adequately prepared for full employability in the 21st century economy and can realize the social mobility good-paying jobs support.

These students will be offered paid work opportunities to learn new skills and grow their careers within the GEM FoF. Equitable access to and design of technical training pathways for adult learners will be accomplished by collaborating with partners identified in the Workforce and Communities component projects. Short-term technical training opportunities will open engagement with the education system to groups who formerly viewed higher education out of reach such as New Americans, justice system involved people, people in recovery or underrepresented people.

It is estimated that approximately 424 temporary jobs will be created by the construction of GEM, based on the economic IMPLAN model.

No-Action Alternative:

Under the No-Action Alternative there will also be no positive socioeconomic impacts such as training, development state economic diversity, as detailed in 3.9.

4.9.1 Traffic/Transportation

The proposed project is located internal to the UMaine campus and all the roads in the near vicinity (within approximately 2,000') are owned and maintained by the University's facilities staff. As the operations in the new facility will be similar to those of the existing ASCC facility

The estimated number of construction workers is a maximum of 125, who will generate a maximum of approximately 400 trips per day, including deliveries.

Construction and operation of the new facility is not expected to impact traffic patterns or intensity either on campus or on the surrounding street network beyond the campus.

4.10 Health and Safety Impacts

The proposed project is not anticipated to create any adverse human health impacts.

4.10.1 Climate Change

The GEM facility will be primarily built using mass timber, including cross laminated timber (CLT) and glue-laminated timber (glulam). The original ASCC building is itself a mass timber building, one of four on the UMaine Orono campus. The use of timber significantly reduces the carbon footprint of the building, compared to use of alternative materials such as steel or concrete.

To further reduce the building's carbon footprint, wood fiber insulation is proposed as a substitute for petroleum-based foam insulation. Wood fiber insulation is being produced by a new company, TimberHP, in Madison, ME. Finally, as a showcase of CLT in large buildings, the project will serve as a demonstration project and contribute to increased demand of CLT, with the hopeful outcome being the siting of a CLT facility in Maine, to feed the ever-growing demand for mass timber buildings in the Northeastern U.S. corridor, one of the most populous regions on the planet, which sits beneath the most heavily forested

state in the nation. A CLT plant in Maine will be a boon to Maine's five spruce-pine-fir lumber mills, all located in rural areas that stand to benefit from increased demand for dimension lumber, the primary feedstock for CLT.

In summary, not only will the R&D conducted within the GEM FoF be dedicated to commercialization of green technologies, but the building itself will be a showcase and celebration of how these green materials can be utilized.

No-Action Alternative:

Under the No-Action Alternative there will no positive contributions to counteracting climate change.

4.10.2 Solid and Hazardous waste handling

There are several solid waste streams associated with the GEM project. These include wastes from operations, and construction and demo debris generated during construction.

No-Action Alternative:

Under the No-Action Alternative there will no increase in solid waste generated at the campus.

4.10.2.1 Trash

All trash at the University, including recyclables from that trash, are handled by University Resource Recovery. This group manages the dumpsters for each building and hauls them to the disposal site. Trash from the University now goes to Juniper Ridge Landfill. Recyclables from the campus are taken by University Resource Recovery to Casella Waste in Old Town. The full-time occupants of the GEM will generate approximately 2 lbs./day of trash, for a total increase of 100 lbs. per day., which is a trivial increase in generation from the campus.

4.10.2.2 Operating Waste

In addition to typical trash, research manufacturing process operations at the ASCC produce typical construction debris including concrete, plywood, wood, plastics, metals, etc. These materials are handled by Casella, who provide and haul roll-off containers for disposal/recycling of these materials. The GEM is estimated to increase the generation rate of these wastes from the ASCC by approximately 50 tons per year. Casella will continue to manage this operating waste stream for the ASCC, and attached in Appendix M is a letter from them documenting their willingness and capacity to do so.

4.10.2.3 Construction and Demolition Debris

Construction debris will include packaging and other waste during construction. The project will require significant fills, so there will be no need to manage or dispose of excess soil materials.

Based on a 110-week construction period and hauling one 30-yard roll-off container per week, the estimated quantity of demolition and construction debris to be generated by the project is 3,300 cy, total.

Attached in Appendix M is communication from Casella Waste systems that they have the capacity to supply the roll-off container, haul the waste monthly and dispose of it appropriately. UMaine will ensure that the project specifications require that this material will be hauled by Casella to Juniper Ridge.

4.10.2.4 Hazardous Wastes

The ASCC uses solvents, paints, adhesives/resins, and other materials that are the source of wastes that must be managed and disposed of as hazardous. These wastes, along with hazardous wastes generated elsewhere on campus, are picked up and disposed of by Veolia Environmental Services. The overall program is handled on campus by the Safety Management office. There will be no changes to the hazardous waste management, policies, or procedures for the campus as a result of the GEM.

The ASCC staff estimates that the GEM operations will increase the generation rate of these materials by approximately 40% over current conditions at the ASCC. The annual wastes generated at ASCC and the estimated amounts including GEM include:

| Waste | Current ASCC annual quantity (approx.) | Projected ASCC annual quantity (incl GEM) |
|--|---|--|
| Derakane | 165 gals (1,650 lbs) | 230 gals |
| spray cans | 89 lbs (119 cans) | 125 lbs (167 cans) |
| non-regulated/non RCRA hazardous lab waste | 50 lbs solids and 7 gals liquids (antifreeze, oils) | 70 lbs solids and 10 gals liquids (antifreeze, oils) |
| flammable liquids (butanol, ethanol, isopropanol, acetone, etc.) | 18 gals (126 lbs) | 25 gals (176 lbs) |
| caustics/corrosives (acids, bases) | 1 gals and 4.4 lbs solids | 1.5 gals and 6 lbs solids |
| paints | 5 gals | 7 gals |
| adhesives, sealants, resins | 100 lbs solids and 47 gals liquids | 140 lbs solids and 66 gals liquids |

5. CUMULATIVE IMPACTS

The projects below are those that are currently planned for the next 3-5 years or are soon to be under construction on the University Campus.

- Shawn Walsh Hockey Center and Alford Arena Addition and Renovation Project includes 11,000 SF of additions to the Alford Arena building. The project also includes extensive renovations inside both the Hockey center and the Arena, as well as the reconfiguration of existing parking and access areas.
- Athletic Field Expansion includes the conversion of existing grassed athletic fields into a track and field arena and associated facilities including parking.
- Witter Farm Addition is construction of new barn facilities at the farm to better accommodate horses and dairy cows.
- Demeritt Forest Teaching Facilities project includes the addition of outside and inside classroom spaces at the Forestry Facility within the 1,650+ acre Demeritt Forest.
- The UMaine Energy Center (UMEC) Project is an addition to the Central Steam Plant, which addresses the capital renewal of infrastructure that is at or past its useful life. This project is effectively a supply-side energy master plan, that will ensure UMaine operates reliably, efficiently, and effectively for the next half century.

The identified projects in the vicinity were reviewed to determine the resources that may be subject to a cumulative impact. The review focused on the resources affected by the Project and identified resources that may be affected by both the Project and the other projects in the vicinity. Based on this review, the following resources were evaluated for cumulative impacts.

- Water Resources
- Air Quality and Climate Change
- Socioeconomics and Environmental Justice
- Traffic and Transportation

The Project, when considered together with the identified projects in the vicinity, does not have the potential to result in significant cumulative impacts on other resources due to the geographic location and separation of the projects, the disturbed nature of the project sites, and/or the lack of construction or operational overlap that would result in an incremental impact on a particular resource.

5.1 Cumulative Resource Impacts

5.1.1 Water Resources

None of the identified projects are located in the same watershed as the GEM. They all drain to the west towards the Stillwater River. The only one of these that will have associated wetland impacts is the Athletic Field Expansion project, which is projected to have approximately 16,000 SF of wetland impact. Three

forested/scrub-shrub wetlands were identified around the edges of the existing athletic fields that are the focus of this project. The proposed project will expand the footprint of these facilities, thereby pushing into the identified wetlands. As with the GEM, the wetlands in the project area will be reduced in size but not eliminated, and the impact will be permitted and compensated for through the ILF program (as described above in Section 4.4.2.2).

Because the projects are in a different watershed and because the wetland impacts will be mitigated, cumulative impacts on Water Resources would not be significant.

5.1.2 Air Quality and Climate Change

The only one of the identified projects that will impact air emissions is the UMEC project, which will have a positive impact on air quality by replacing older heating equipment, including that which supplies the ASCC.

5.1.3 Socioeconomics and Environmental Justice

All of these projects have positive impacts on the educational programs of the University, allowing them to better serve the students and citizens of Maine.

5.1.4 Traffic and Transportation

None of these projects are anticipated to have significant impacts on traffic patterns, individually or collectively.

6. CONCLUSIONS

Adverse environmental impacts associated with the GEM project include land use, stormwater management, and wetland filling. These impacts are mitigated.

- The GEM project will convert 1.2 acres of vegetated area into impervious (pavement and building).
- The site proposed for the Project has three emergent, old-field wetland areas. The Project's will impact these wetlands filling a total of 26,496 sf for the whole project (20,143 for Phase 1 and 6,353 for Phase 2).
- All runoff from the site will be treated and the excess stormwater treatment BMP capacity will improve the quality of stormwater runoff from the site from existing conditions.
- Construction disturbance can cause erosion and sedimentation, but these impacts will be mitigated through the implementation of BMPs approved by the MeDEP.

Long term benefits from the project include the innovative research on large-scale, bio-based hybrid manufacturing, supporting key goals in the State of Maine's 10-Year Economic Development Plan. It will provide active learning spaces for the Maine College of Engineering and Computing where students can interact with and program equipment in a safe and controlled manner and thus develop critical skills to improve Maine's workforce.

7. LIST OF PREPARERS

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snicholson@woodardcurran.com

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University Services: Facilities Management and General Services
Capital Planning and Project Management
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jonathan.dow@maine.edu

APPENDIX A: CAMPUS MAP



2022-23 Campus Map

- P** VISITOR permits authorize parking in any black lot or visitor space.
- RED** (Resident Student) permits authorize parking in red lots.
- BLACK** (Commuter Student) permits authorize parking in black lots.
- BLUE** (Faculty/Staff) permits authorize parking in any blue or black lot.
- GREEN** (Carpool) permits authorize use of individually allocated spaces.

Permits **MUST** be displayed on interior mirror.

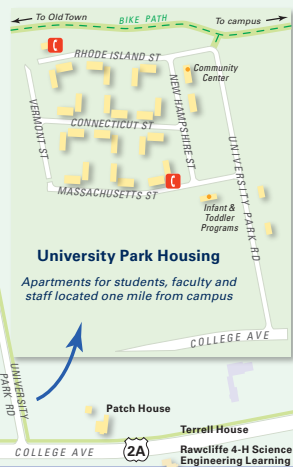
Signs governing lots take precedence over all maps and permits

- ?** Information
- +** Ambulance
- P** Public Bus Stop
- E** Emergency Phone
- G** Gender Inclusive Restroom
- EV** Public Electric Vehicle Charging Station

Visitor Parking

Visitors need permits. Visitor Permits allow parking in metered spaces and in any BLACK lot. They are available for free online at umaine.edu/parking or at the UMaine Police Department.

Parking Office: 207.581.4047



University Park Housing

Apartments for students, faculty and staff located one mile from campus

To Witter Teaching and Research Center, UMaine Cooperative Extension Diagnostic and Research Lab (17 Godfrey Drive, Orono), Old Town, and

Welcome
to the University of Maine, Orono

Please respect that UMaine is a walking campus
Pedestrians have right of way at all times

Winter Parking Ban

Blue and Black lots, as well as visitor spaces, are closed to parking from midnight to 6 a.m. from Nov. 1 to May 1.

Overnight Parking Permits

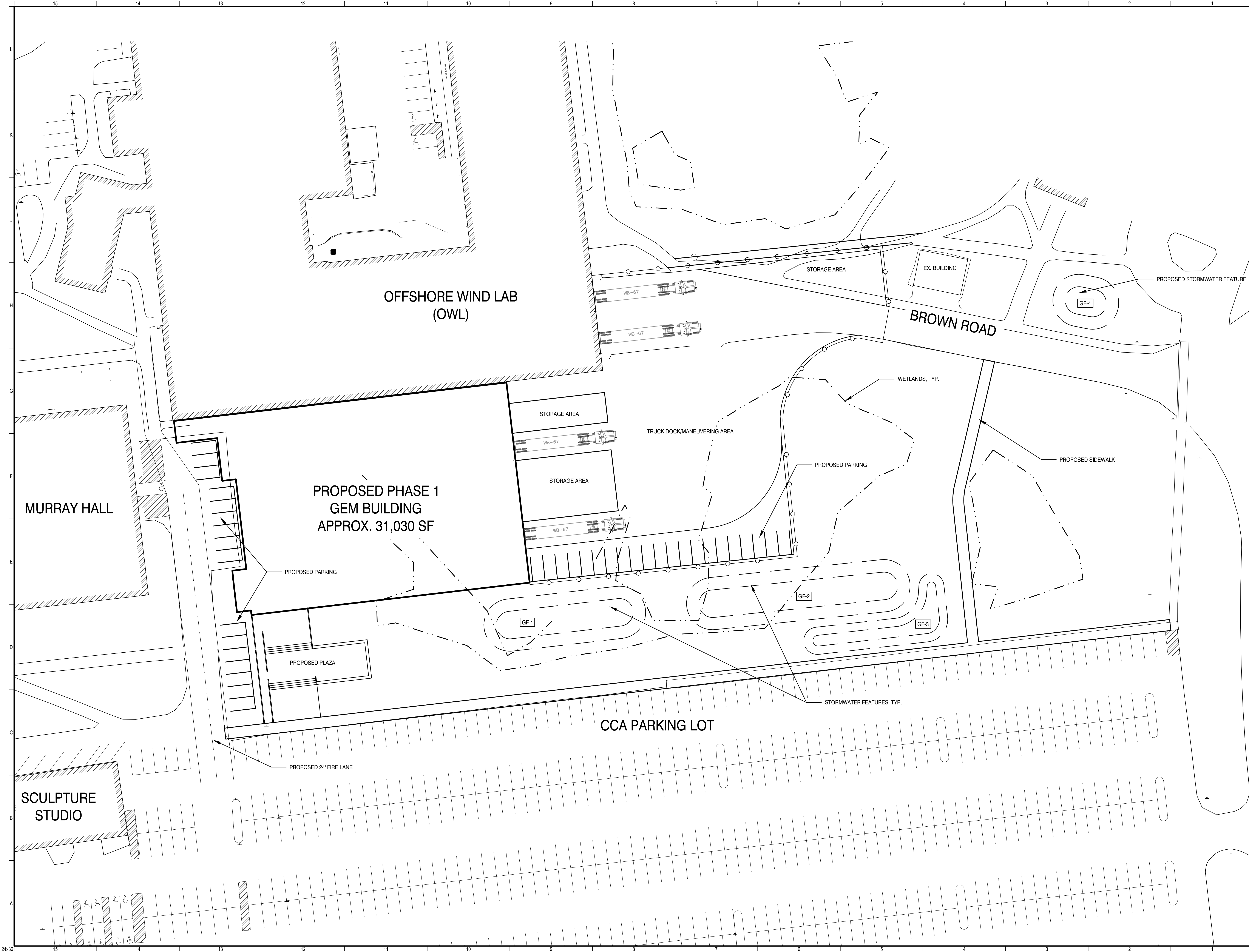
are available from UMaine Police and online at umaine.edu/parking.

ASCC GEM Project Location

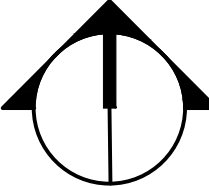
DISTANCE 1/8 MILE
Walking time 2-3 minutes

UMaine ©7/2022
Cartography by Purple Lizard Maps
Please suggest edits to um.printing@umaine.edu

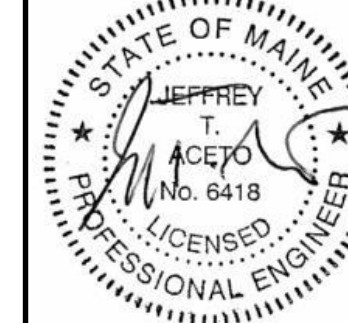
APPENDIX B: CIVIL DESIGN SET




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| 1 | DEP SUBMISSION | 07/12/23 |



TRUE NORTH:



STATE OF MAINE
JEFFREY T. ACEBO
No. 6418
LICENSED PROFESSIONAL ENGINEER

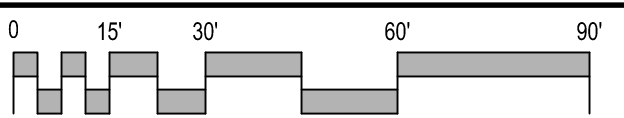


75 Washington Avenue, Suite 3A
Portland, Maine 04101

UNIVERSITY OF MAINE
GREEN ENGINEERING &
MANUFACTURING
FACTORY OF THE FUTURE
PERMITTING INFORMATION

OVERALL SITE PLAN PHASE 1

SHEET TITLE:



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A/E OF RECORD: NAR/JTA

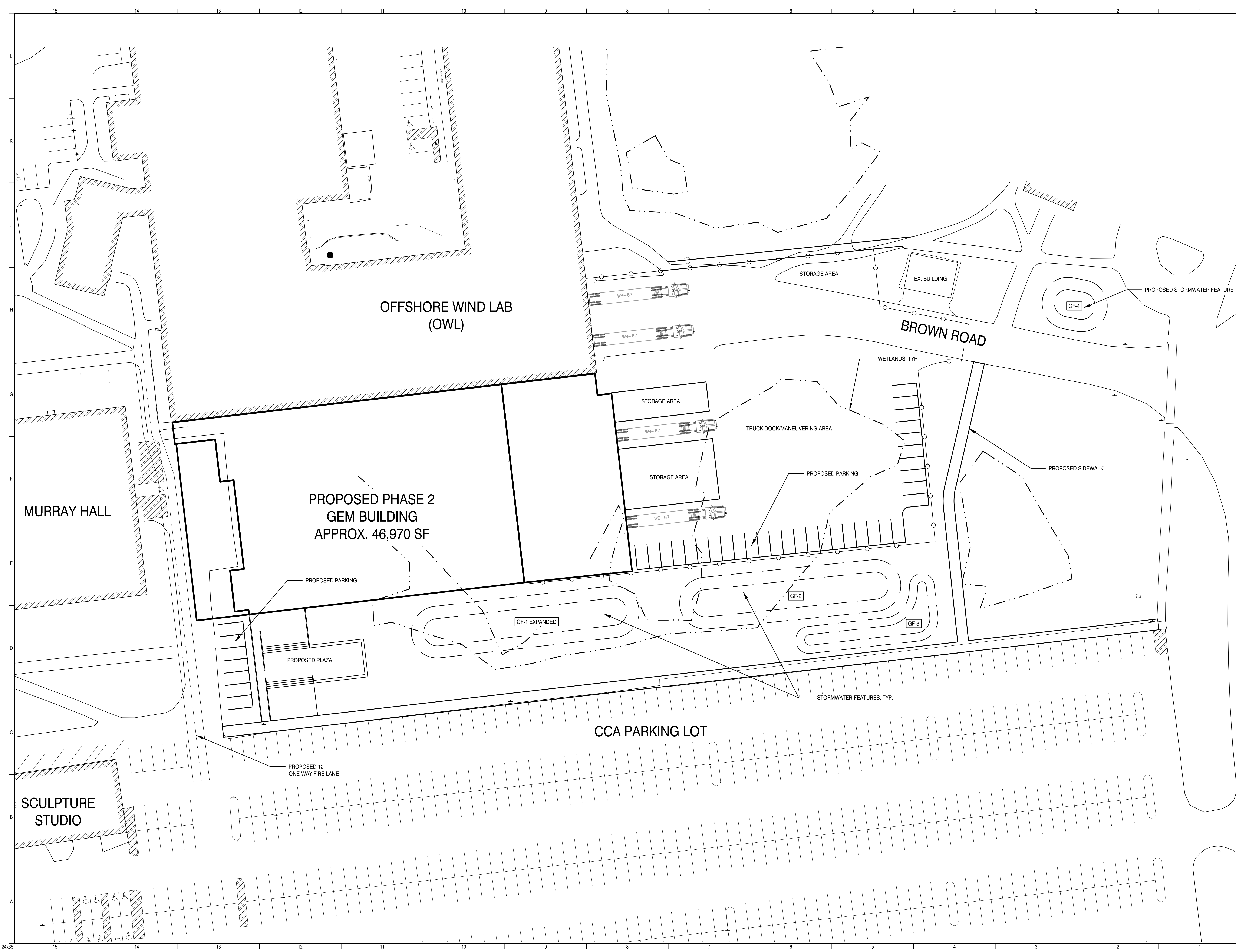
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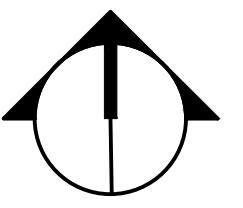
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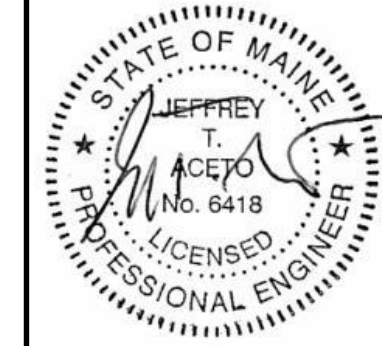
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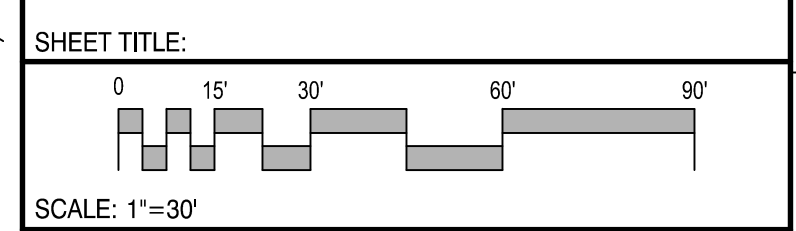
STATE OF MAINE
JEFFREY T. ACEY
No. 6418
LICENSED PROFESSIONAL ENGINEER



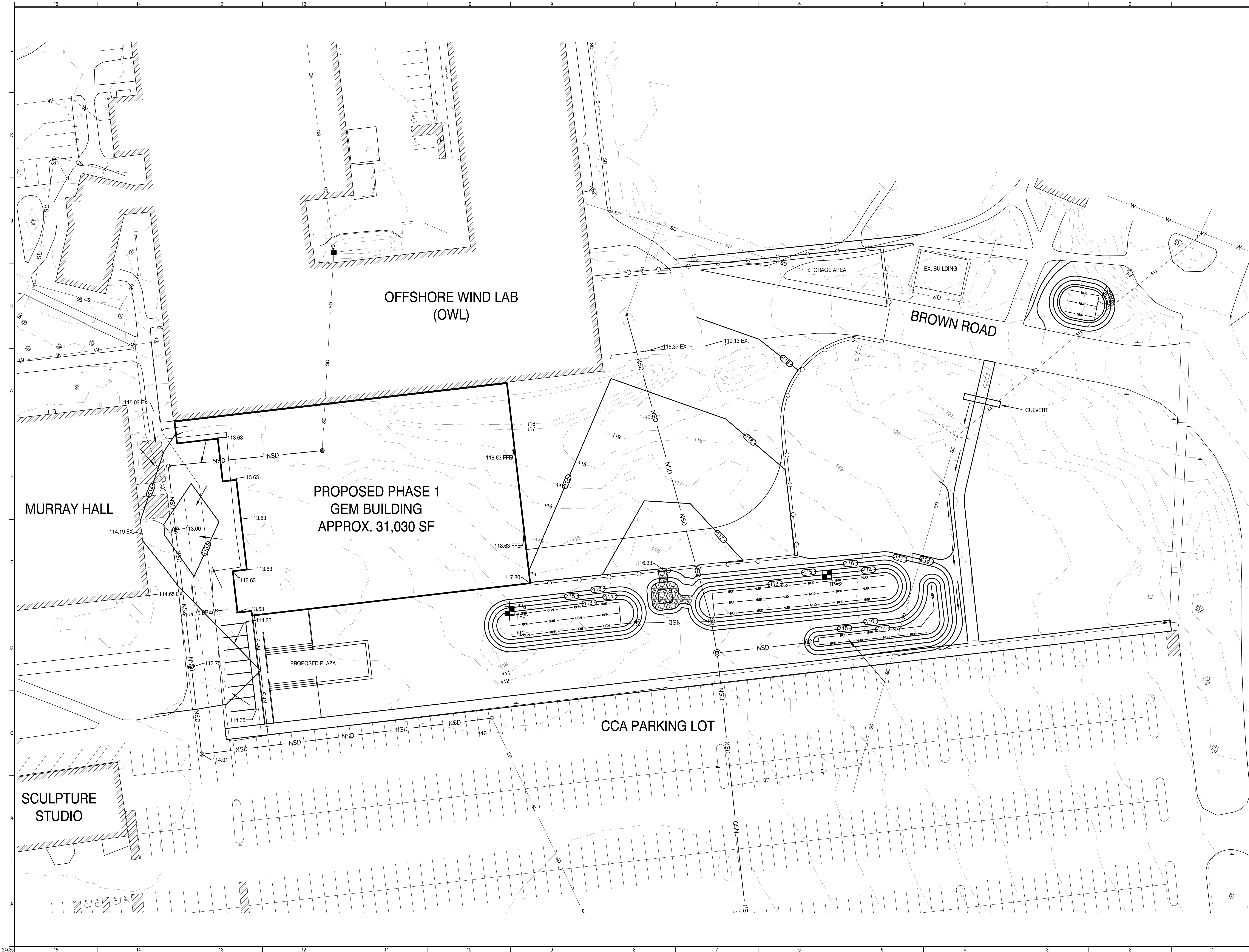
75 Washington Avenue, Suite 3A
Portland, Maine 04101

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PERMITTING INFORMATION

OVERALL SITE PLAN PHASE 2



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| DRAWN BY: | EMS/BSC | |
| SMRT FILE: | CP101-22012 | |
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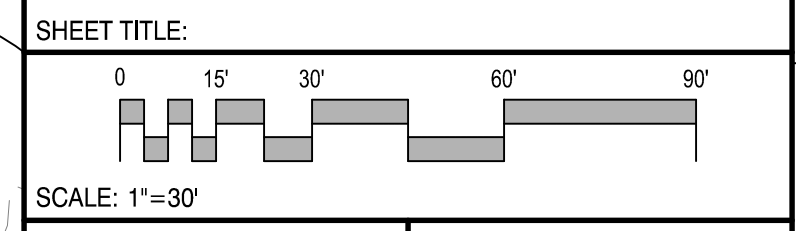
JEFFREY T. ACEVEDO
No. 6418
LICENSED PROFESSIONAL ENGINEER



SMRT
Architecture • Engineering • Planning

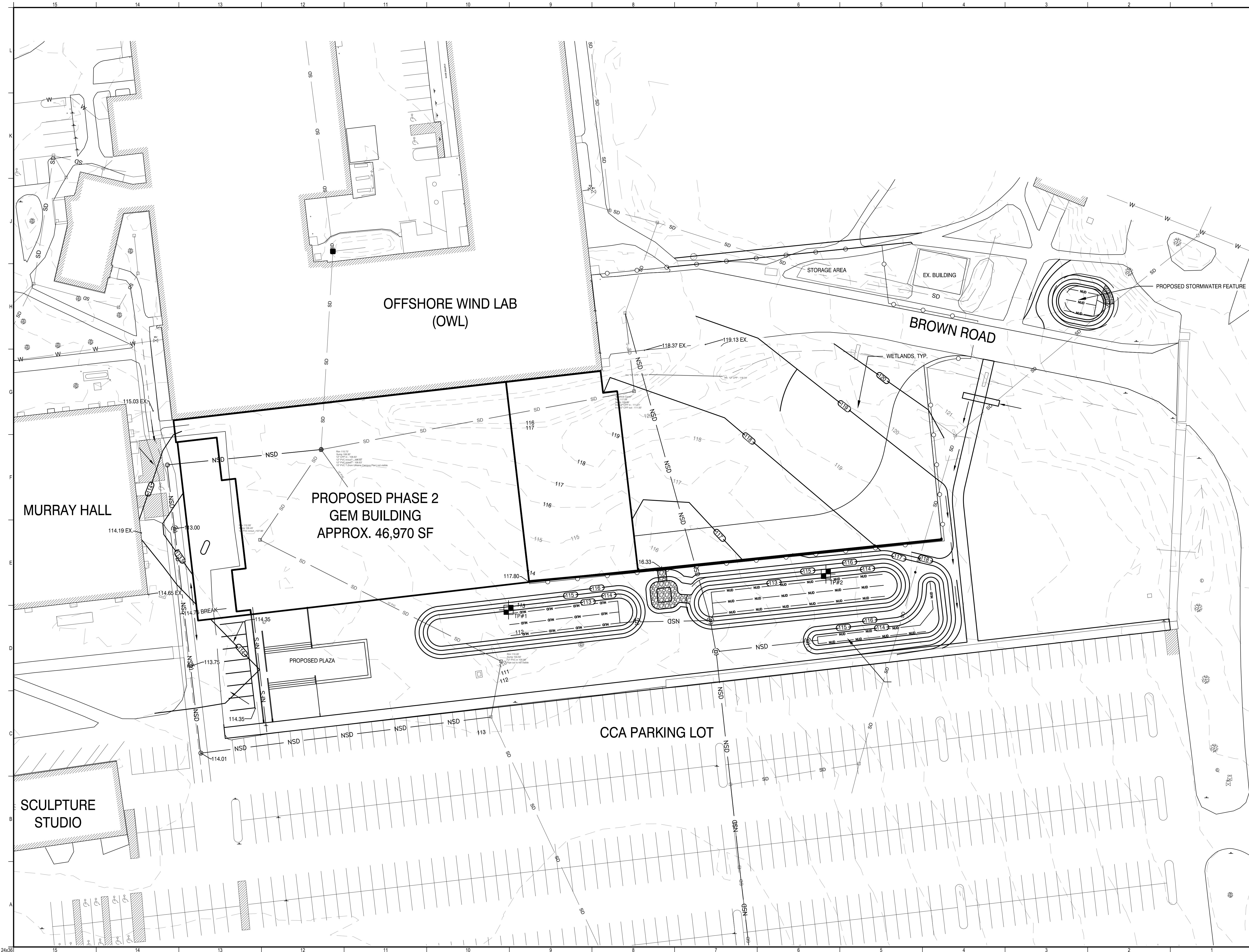
75 Washington Avenue, Suite 3A
Portland, Maine 04101

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GREEN ENGINEERING &
MANUFACTURING
FACTORY OF THE FUTURE
PERMITTING INFORMATION
OVERALL GRADING PLAN PHASE 1

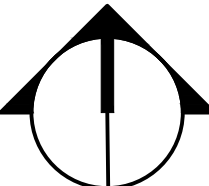


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| A/E OF RECORD: | NAR/JTA | CG111 SHEET No. |
| DRAWN BY: | EMS/BSC | |
| SMRT FILE: | CG111-22012 | |


NOT FOR CONSTRUCTION




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| 1 | DEP SUBMISSION | 07/12/23 |



TRUE NORTH:



STATE OF MAINE
JEFFREY T. ACEVO
No. 6418
LICENSED PROFESSIONAL ENGINEER

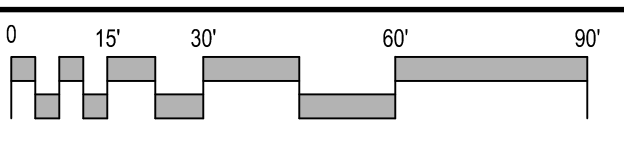


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PERMITTING INFORMATION

OVERALL GRADING PLAN PHASE 2

SHEET TITLE:



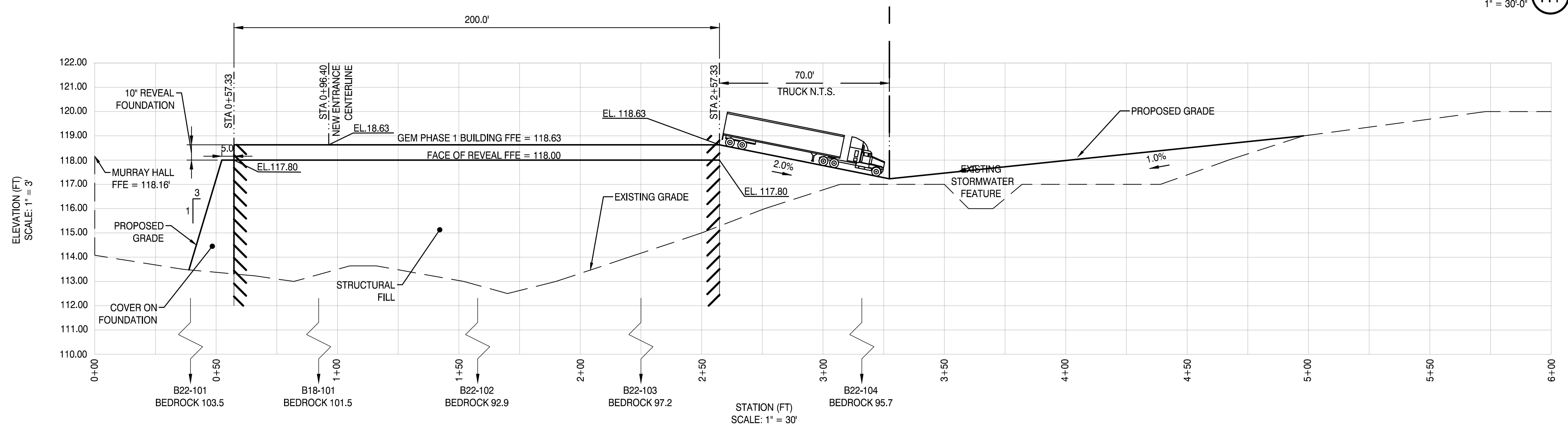
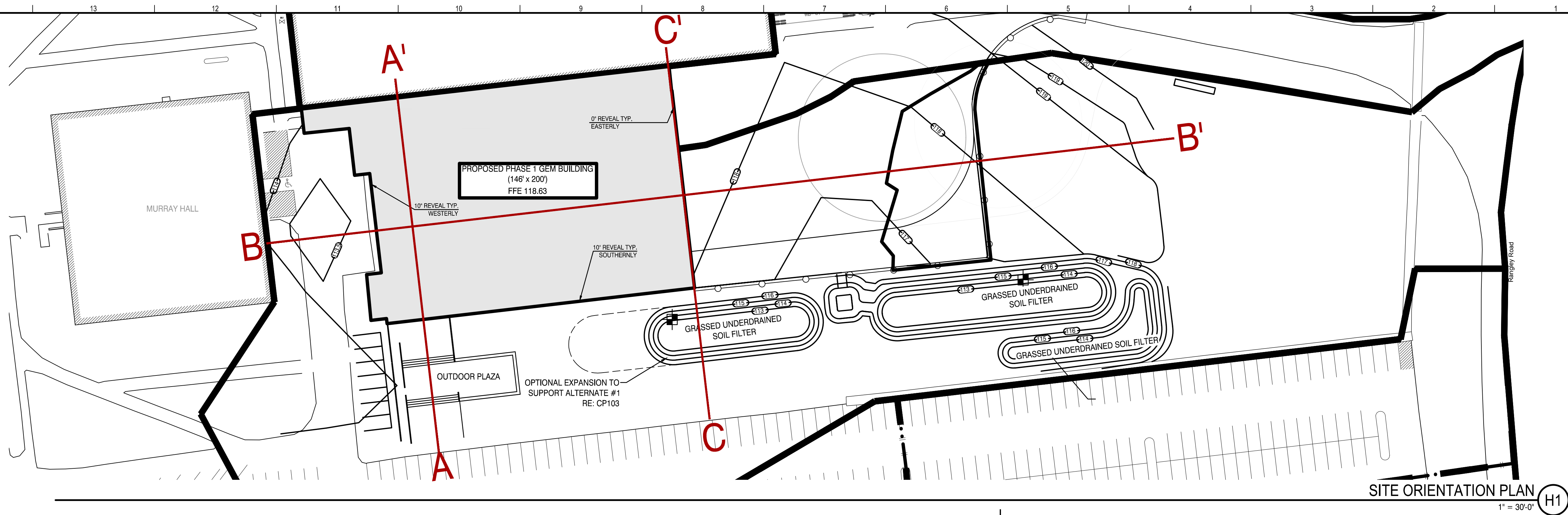
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| A/E OF RECORD: | NAR/JTA |
| DRAWN BY: | EMS/BSC |
| SMRT FILE: | CG111-22012 |

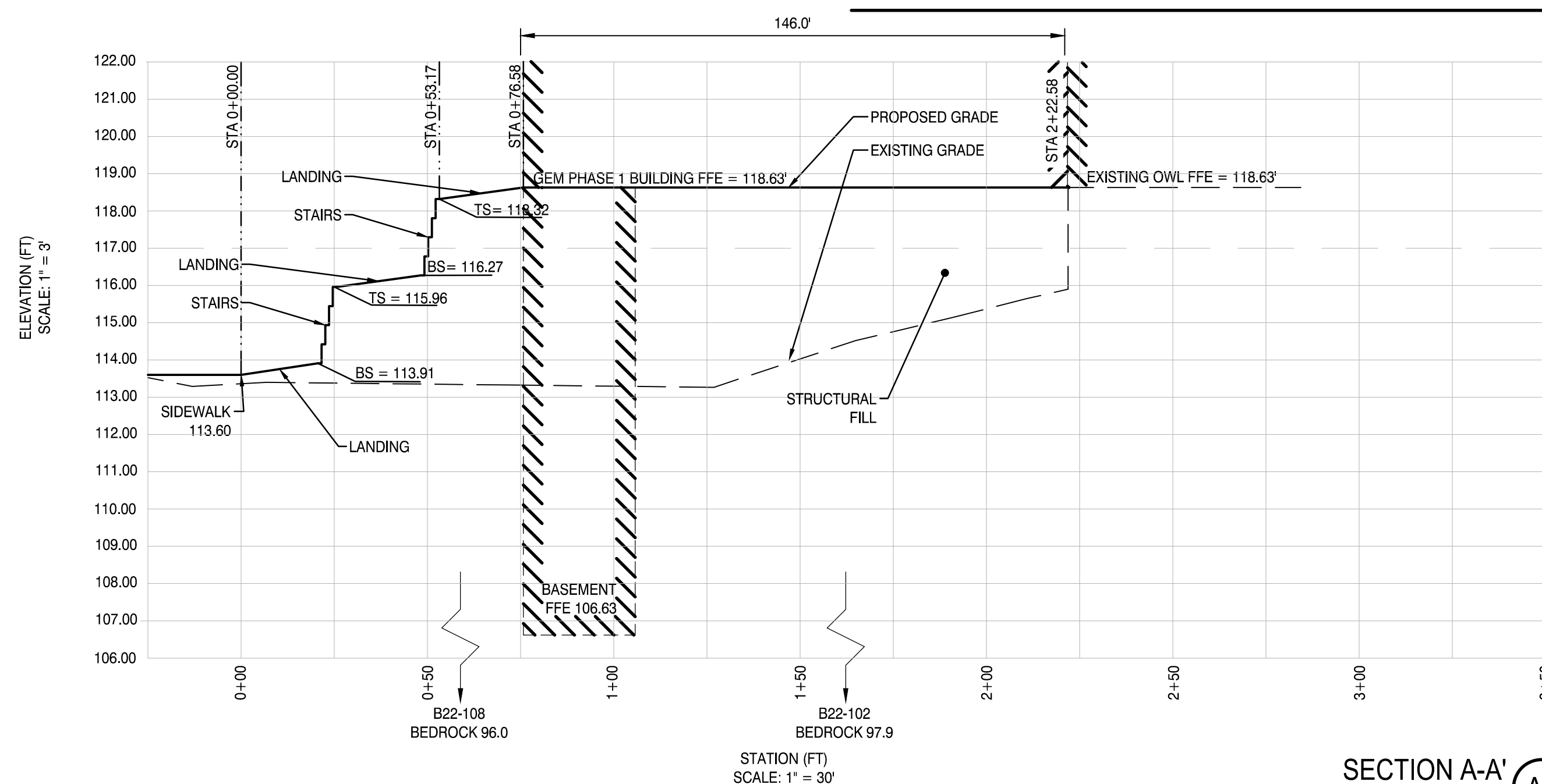
CG211

SHEET No.

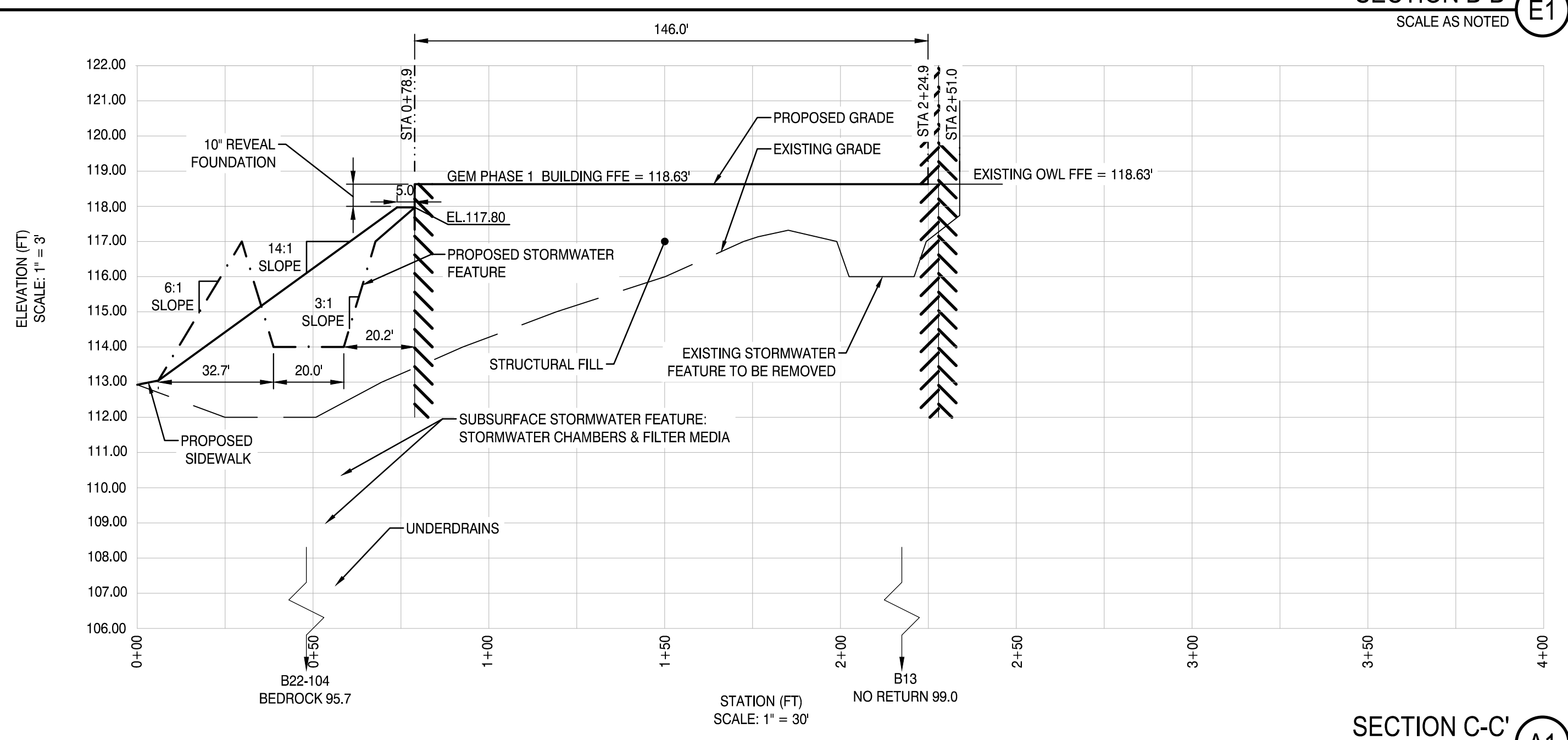
NOT FOR CONSTRUCTION



SECTION B-B'
SCALE AS NOTED



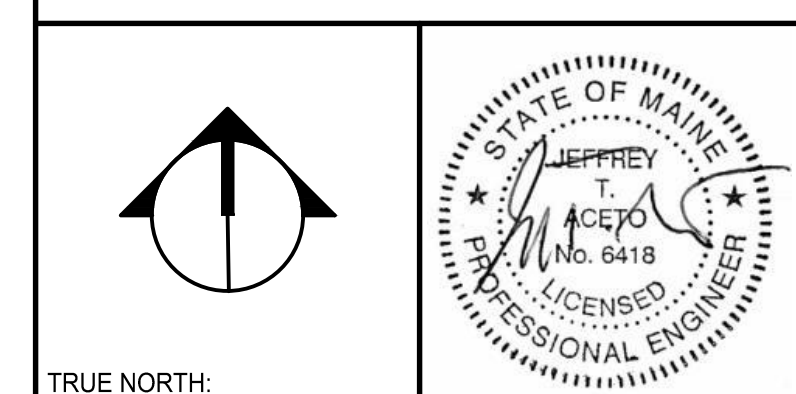
SECTION A-A'
SCALE AS NOTED



SECTION C-C'
SCALE AS NOTED

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| 1 | DEP SUBMISSION | 07/12/23 |

SLODA APPLICATION

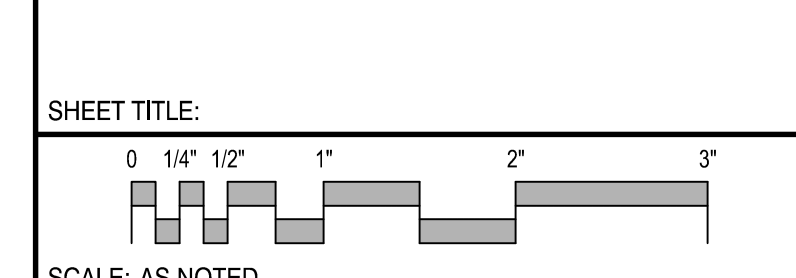


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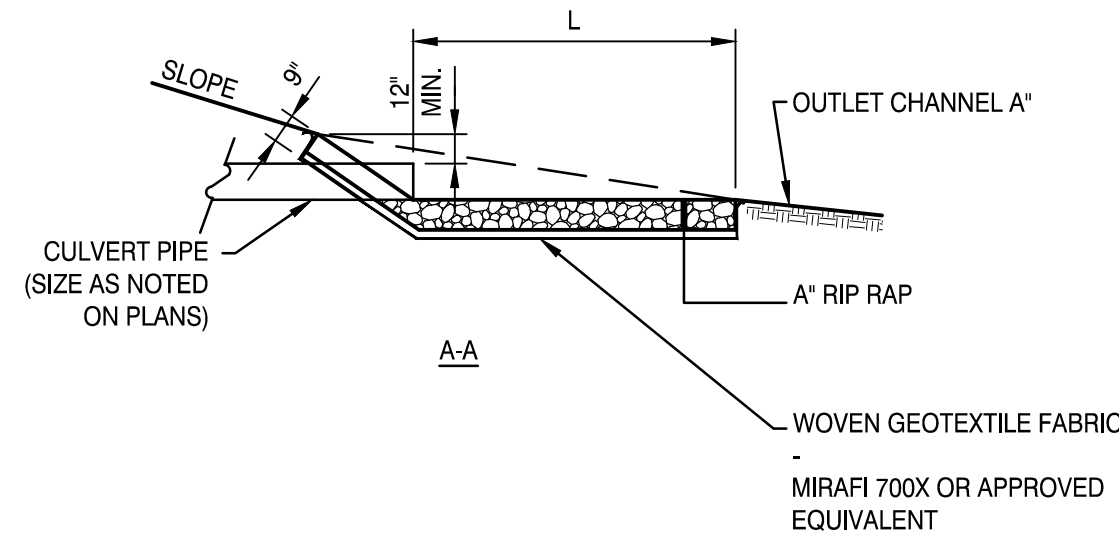
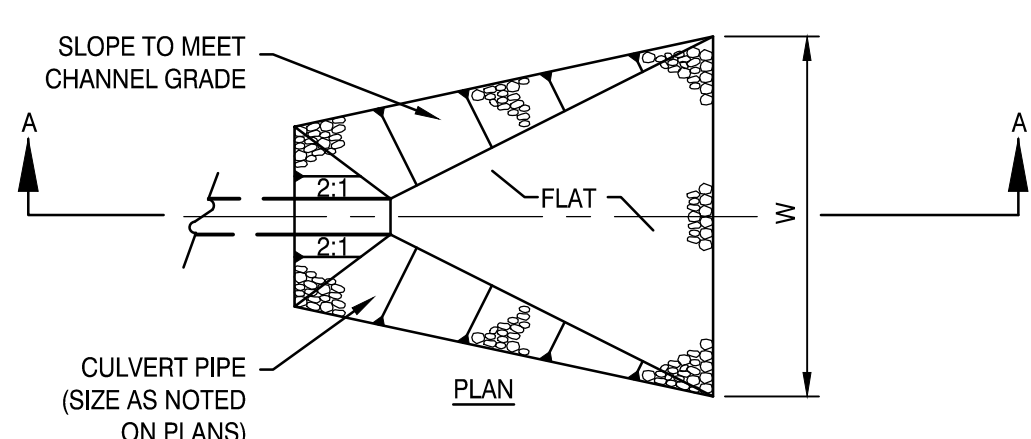
PERMITTING INFORMATION

GRADING & DRAINAGE DETAILS



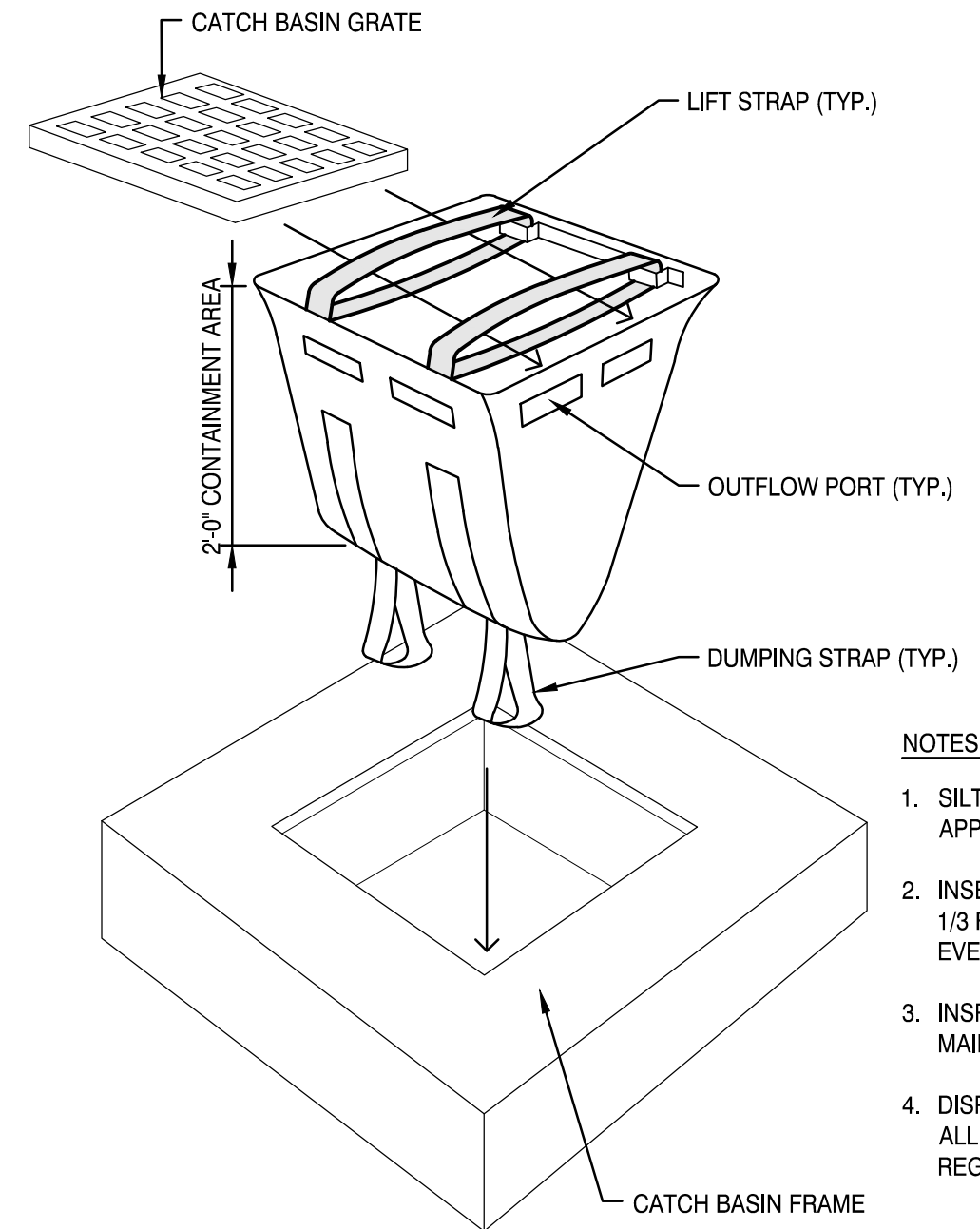
| | | |
|----------------|-------------|-------|
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| DRAWN BY: | EMS/BSC | |
| SMRT FILE: | 22012-CG501 | |

SHEET No. NOT FOR CONSTRUCTION



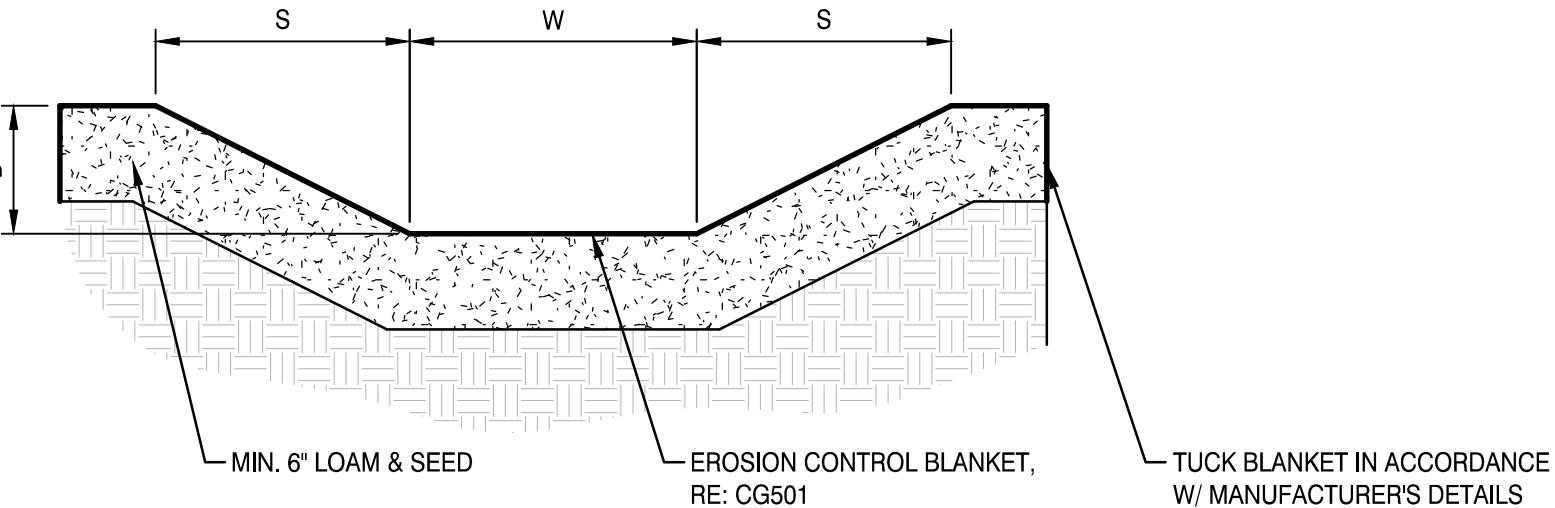
| DIAMETER | L | W | A | D ₅₀ |
|----------|-----|-----|-----|-----------------|
| 12" | 12' | 13' | 14' | 6" |
| 18" | 20' | 22' | 20' | 9" |
| 24" | 30' | 32' | 27' | 12" |
| 30" | 35' | 38' | 32' | 18" |
| 36" | 40' | 43' | 32' | 18" |

RIP-RAP OUTLET PROTECTION (G11)
NOT TO SCALE



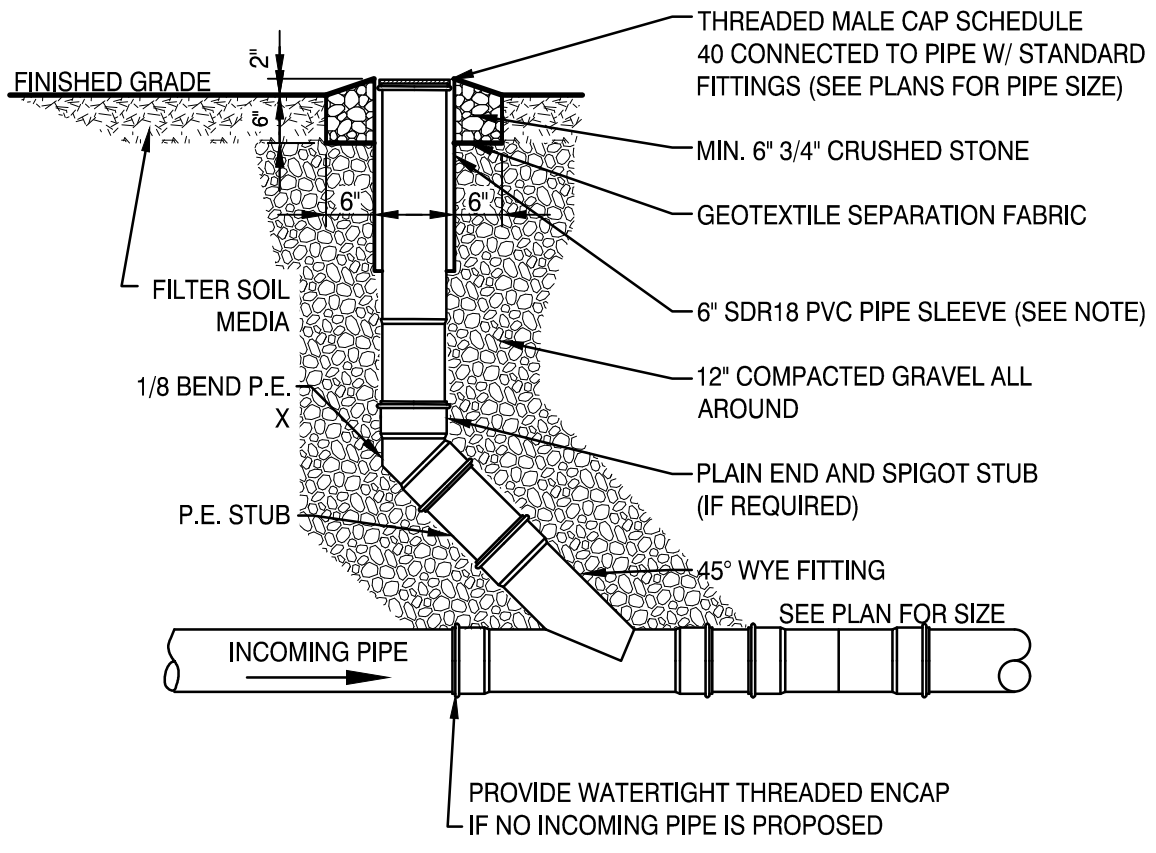
- NOTES:
- SILT SACK TO BE "DANDY SACK" (BY DANDY PRODUCTS) OR APPROVED EQUAL.
 - INSERT TO BE EMPTIED IN AN APPROVED MANNER WHEN IT IS 1/3 FULL OF SEDIMENT AND IMMEDIATELY AFTER EACH STORM EVENT.
 - INSPECT INSERT AFTER ALL RAINFALL EVENTS, REPAIR AND MAINTAIN AS REQUIRED.
 - DISPOSE OF UNIT AND/OR SEDIMENT IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

SILT SACK (C11)
NOT TO SCALE



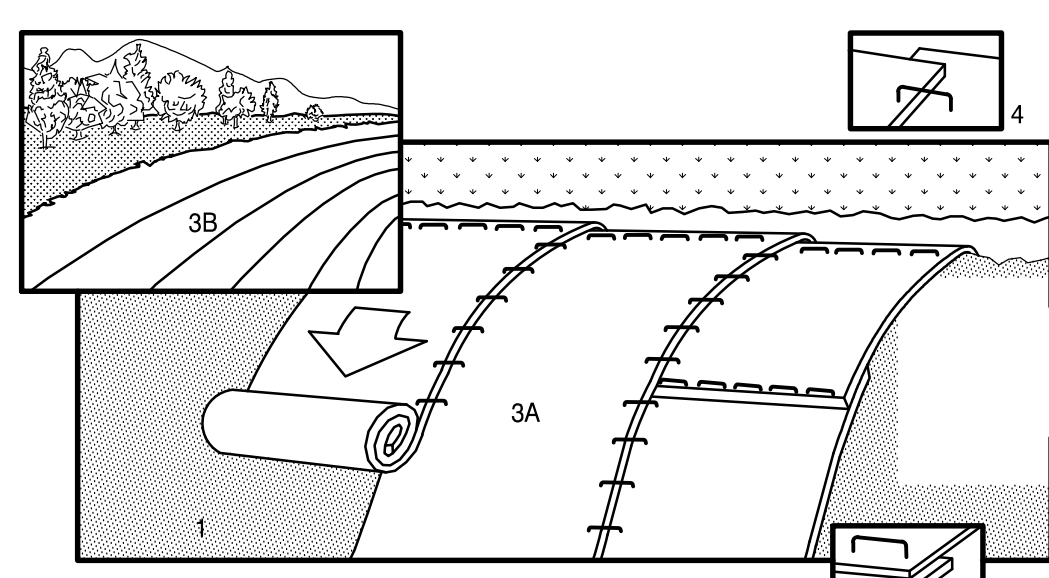
| | W | D | S |
|-----------|-----|------|------|
| SECTION 1 | 0 | 0.5 | 1.0 |
| SECTION 2 | 1.5 | 0.67 | 1.33 |
| SPILL OFF | 0 | 0.5 | 2.0 |

GRASS SWALE (A11)
NOT TO SCALE



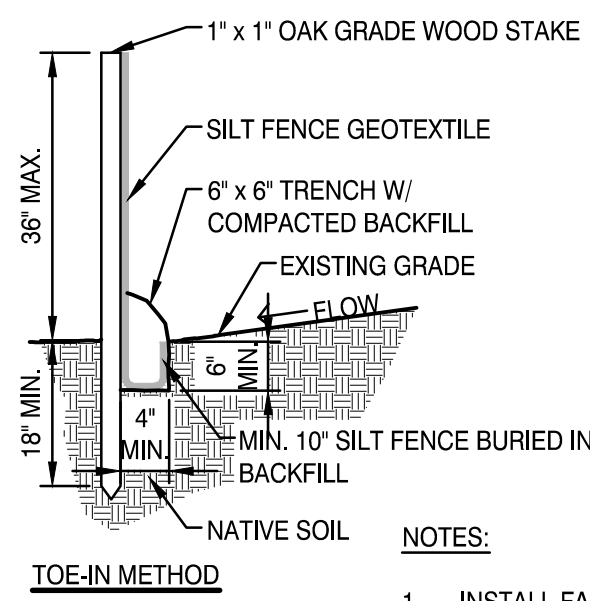
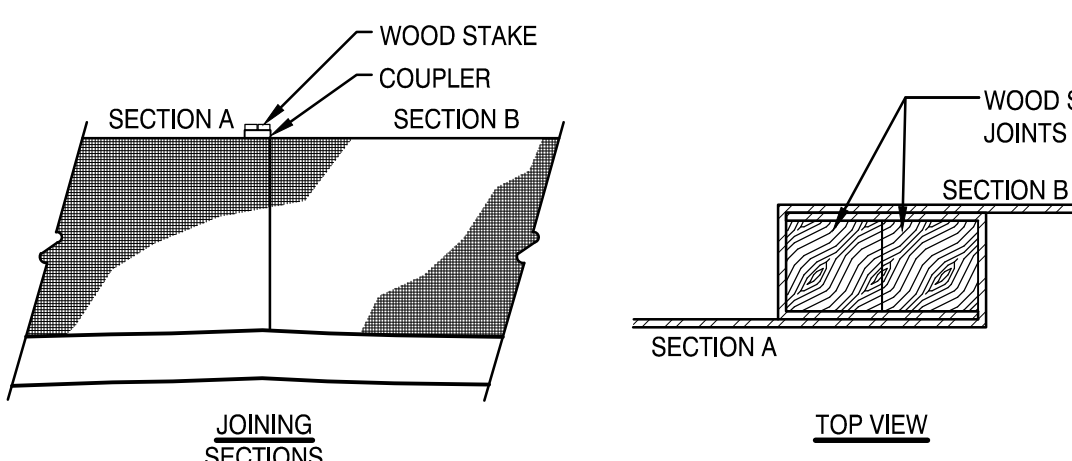
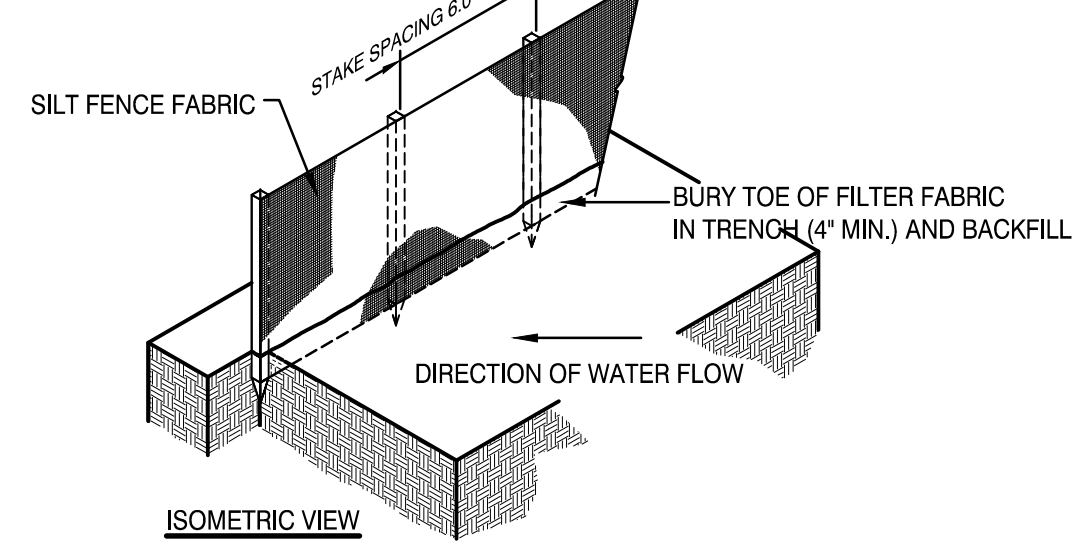
- NOTE:
- WHERE PIPE & RISER ARE 4"Ø USE 6" SLEEVE. WHERE PIPE & RISER ARE 6"Ø USE 8" SLEEVE.

CLEANOUT (G9)
3/4" = 1'-0"



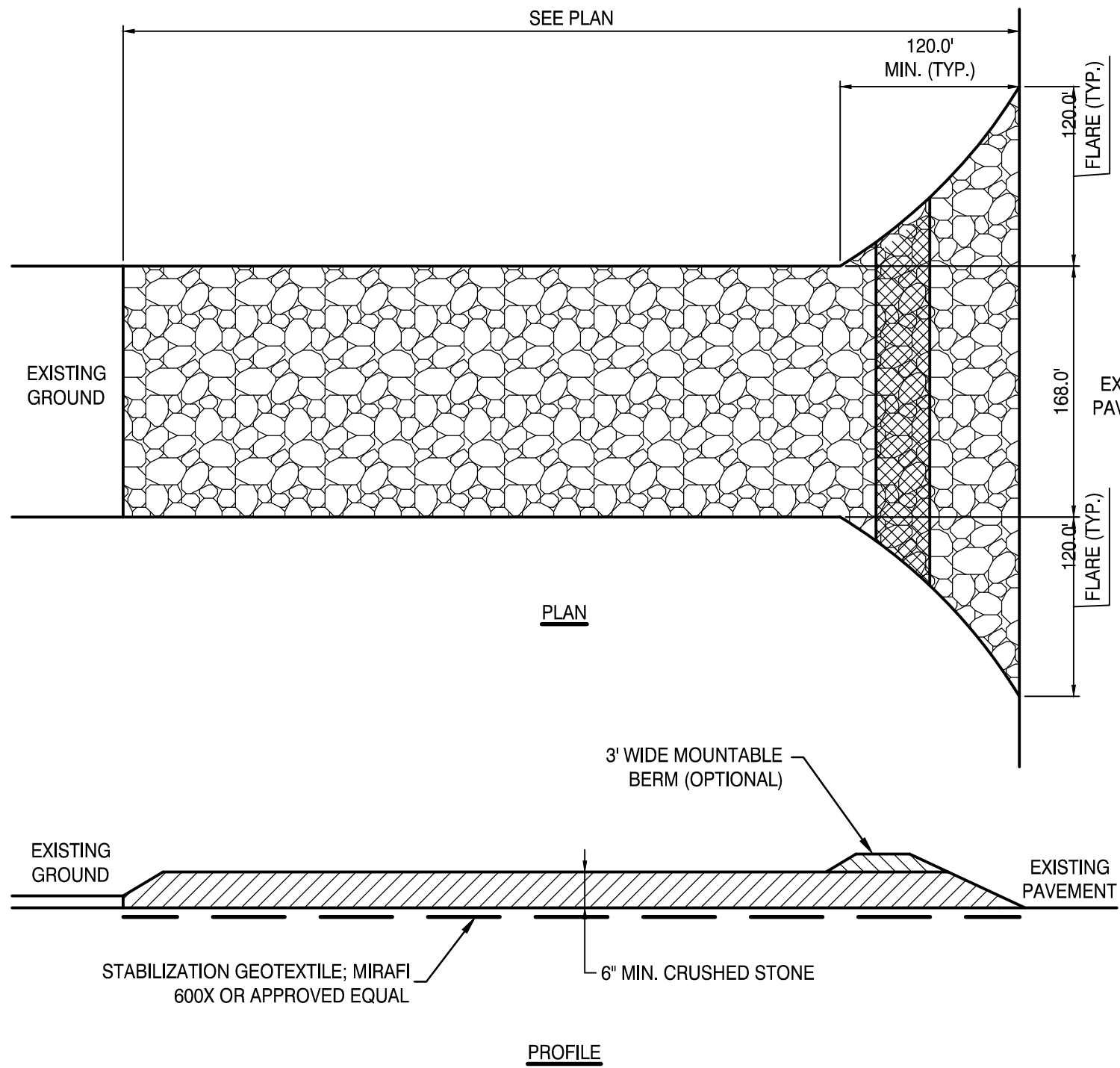
- NOTES:
- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
 - UP-SLOPE ANCHOR: BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE UPSLOPE EDGE IN A 12" DEEP TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
 - ROLL THE BLANKETS IN DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE.
 - THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 4" OVERLAP. REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.
 - WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, OVERLAP SINGLE STYLE A MINIMUM OF 12 INCHES AT THE TOP OF EACH ROW AND 4 INCHES AT THE EDGES OF PARALLEL ROWS. ANCHOR ALONG THE OVERLAP WITH A MAXIMUM SPACING OF 3 FEET OR AS REQUIRED BY THE MANUFACTURER.
 - EROSION CONTROL BLANKET FOR USE ON SLOPES SHALL BE A BIODEGRADABLE DOUBLE NET WOVEN BLANKET WITH JUTE NETTING AND COCONUT FIBRE MATRIX SPECIFICALLY MANUFACTURED FOR THE PURPOSE (NORTH AMERICAN GREEN) BIO-NET S150EN OR APPROVED EQUAL.
 - ONCE PERMANENT STABILIZATION IS ACHIEVED, REMOVE ANY NON-BIODEGRADABLE MESH, IF USED.
 - ALL SLOPES 3H:1V OR GREATER, DRAINAGE WAYS AND AREAS INDICATED SHALL RECEIVE EROSION CONTROL BLANKET.
 - IF MANUFACTURER'S ANCHORING AND INSTALLATION SPECIFICATIONS DIFFER FROM THOSE LISTED ABOVE, THE MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED.

EROSION CONTROL BLANKET (D5)
NOT TO SCALE



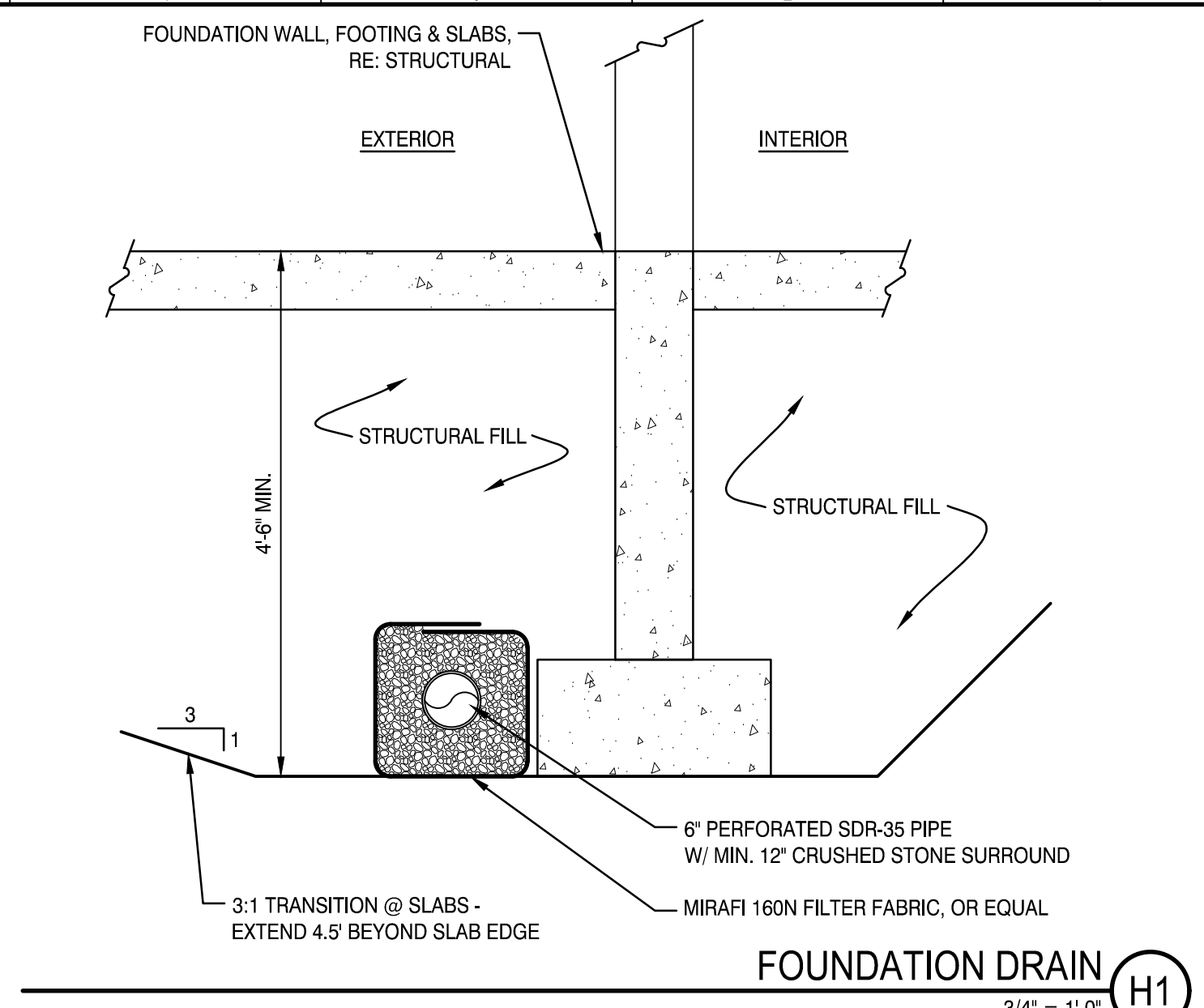
- NOTES:
- INSTALL FABRIC ON UPHILL SIDE OF SUPPORT POSTS.
 - SILT FENCE WILL NOT BE USED IN DRAINAGE WAYS.
 - CONTRACTOR TO REMOVE SILT AS NECESSARY TO MAINTAIN FABRIC EFFECTIVENESS.
 - ACCUMULATED SEDIMENT SHALL NOT EXCEED 9". (FOR MAINE)

SILT FENCE (A5)
NOT TO SCALE

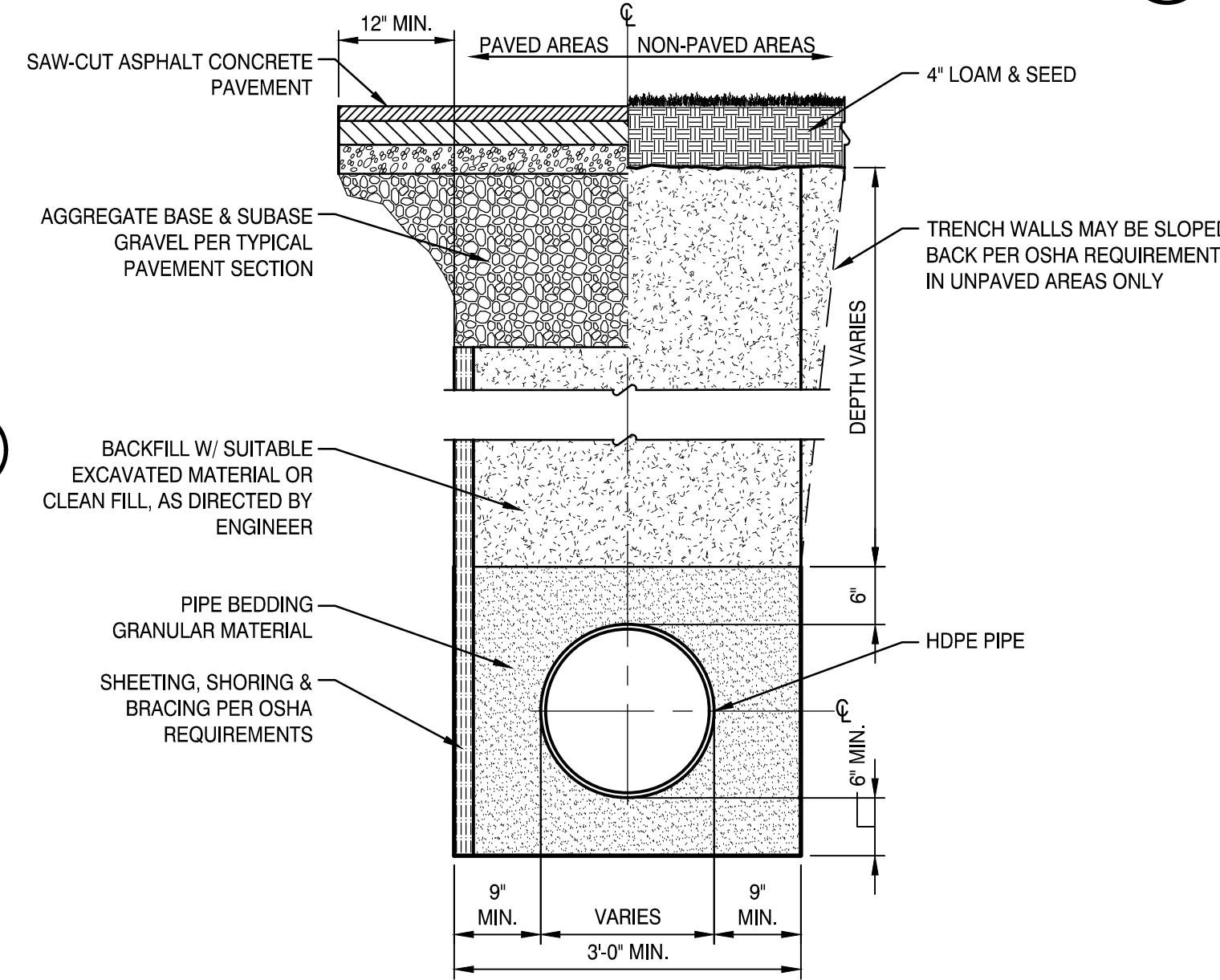


- NOTES:
- THE PURPOSE IS TO REMOVE MUD FROM TIRES OF CONSTRUCTION VEHICLES.
 - WHEN STONE BECOMES CLOGGED AND INEFFECTIVE, TOPDRESS WITH 3" OF NEW STONE OR REPLACE ENTIRE PAD.
 - IF TIRE WASHING IS REQUIRED, WASH WATER SHALL DRAIN INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

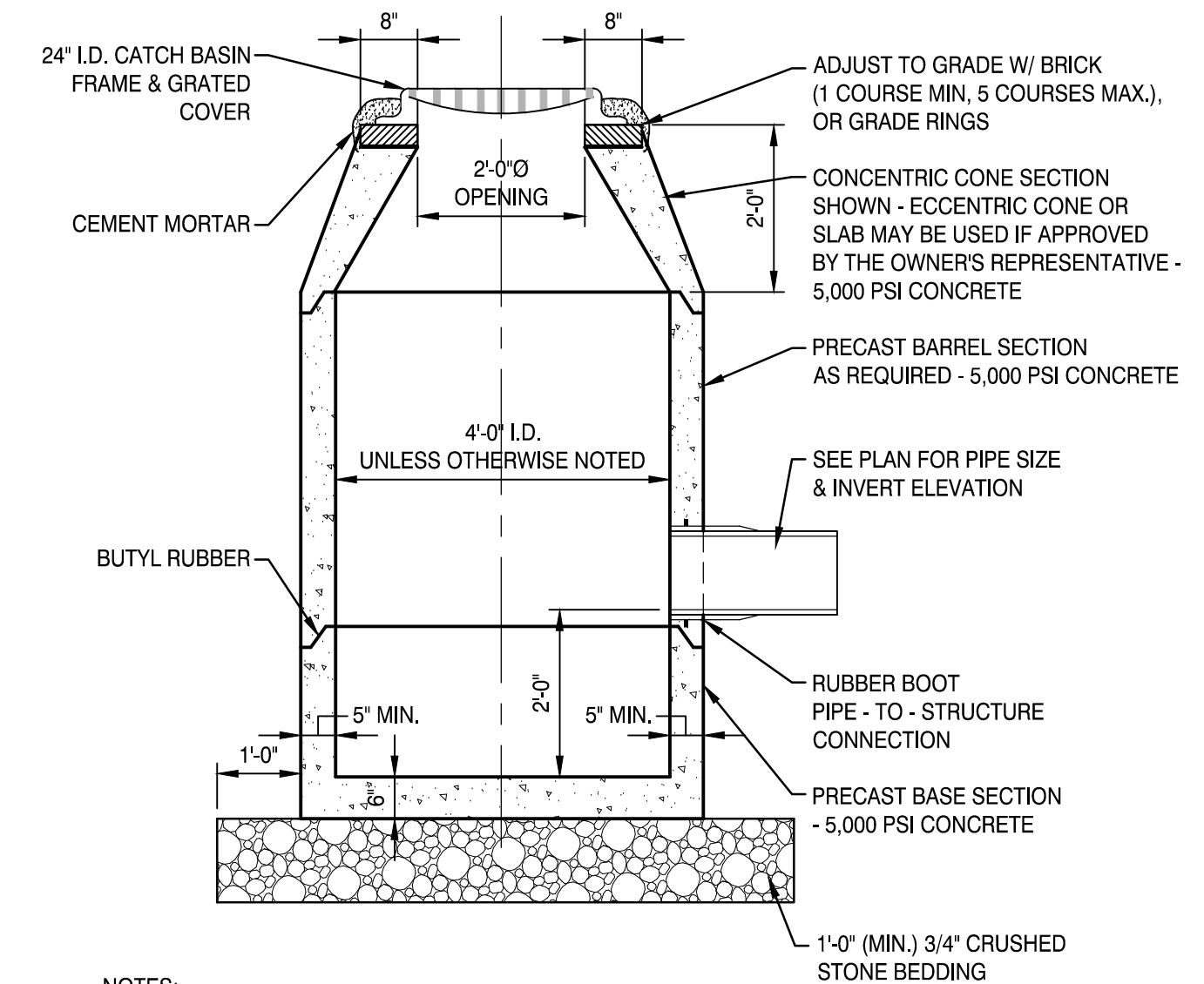
STABILIZED CONSTRUCTION ENTRANCE (G5)
NOT TO SCALE



FOUNDATION DRAIN (H1)
3/4" = 1'-0"

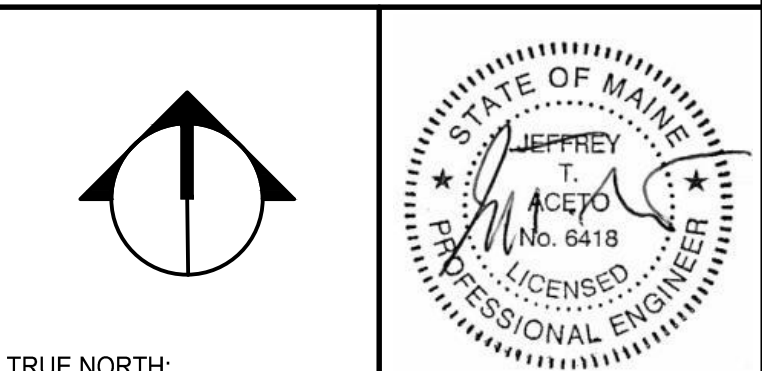


STORM DRAIN TRENCH (E1)
3/4" = 1'-0"



- NOTES:
- STANDARD GRATES SHALL BE NENAH R-3210-L OR APPROVED EQUAL. DITCH GRATES SHALL BE NENAH R-4342 OR APPROVED EQUAL.
 - STEPS SHALL BE PROVIDED FOR CATCH BASINS WITH DEPTHS IN EXCESS OF 8.0'. STEPS SHALL NOT EXCEED 18" O.C., AND BE LOCATED 6" FROM BARREL SECTION JOINTS.

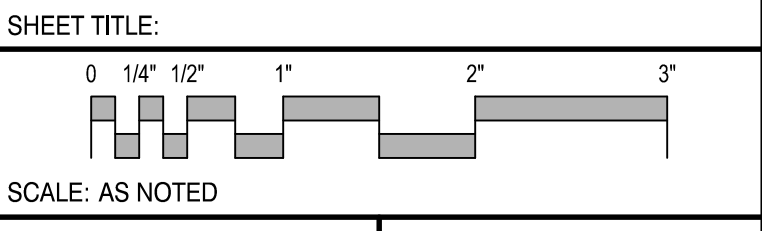
CATCH BASIN (A1)
1/2" = 1'-0"



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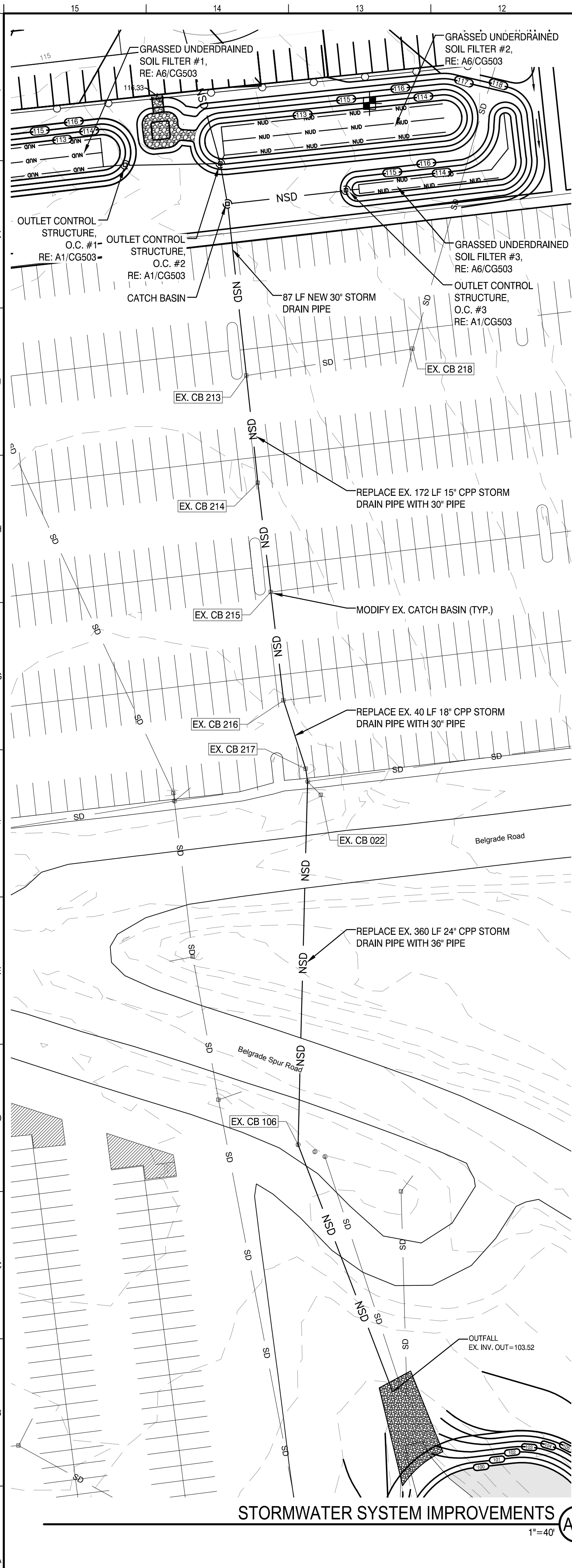
UNIVERSITY OF MAINE
GREEN ENGINEERING &
MANUFACTURING
FACTORY OF THE FUTURE
PERMITTING INFORMATION

GRADING & EROSION CONTROL
DETAILS



SHEET TITLE:
A/E OF RECORD: JTA
DRAWN BY: EMS
SMRT FILE: CG502-22012
SHEET No. CG502

NOT FOR CONSTRUCTION



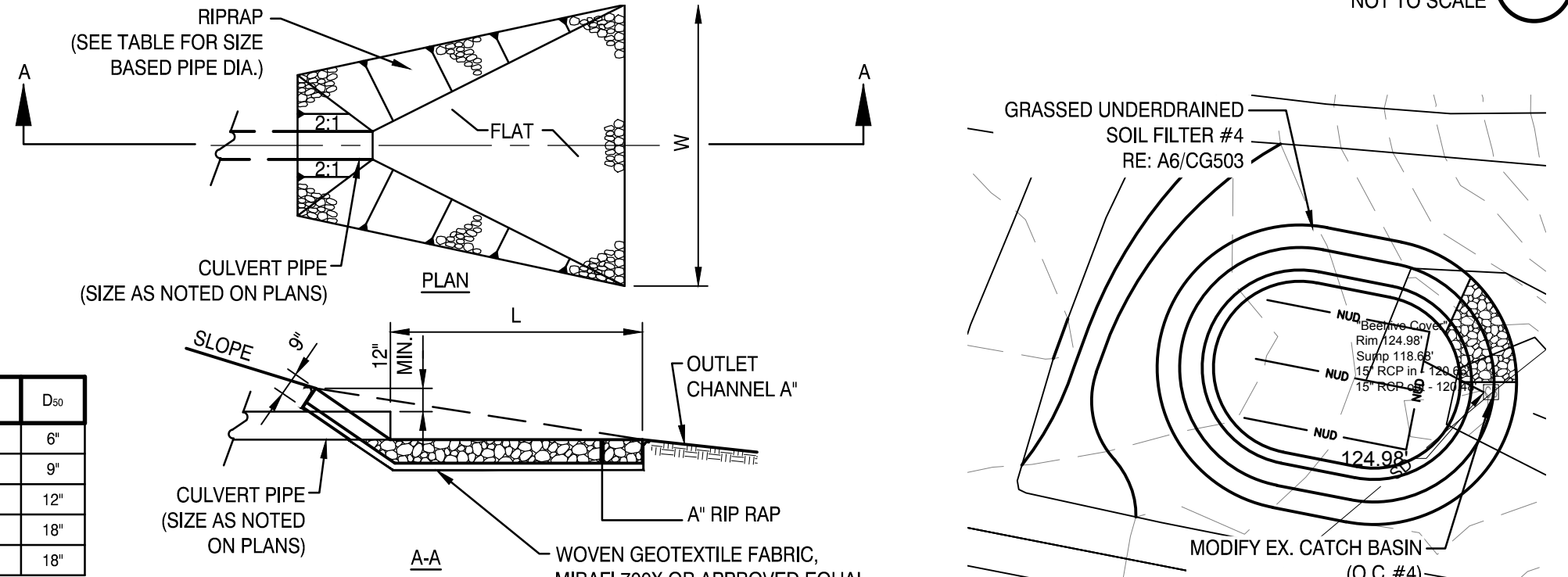
STORMWATER SYSTEM IMPROVEMENTS
1"=40' A11

| | | PHASE I | | | | PHASE II | | | |
|--|--|-----------------------|--------------------|------------------|---------------|-----------------------|--------------------|------------------|---------------|
| STRUCTURE | ELEVATION | MIN. FILTER AREA REQ. | DESIGN FILTER AREA | MIN. VOLUME REQ. | DESIGN VOLUME | MIN. FILTER AREA REQ. | DESIGN FILTER AREA | MIN. VOLUME REQ. | DESIGN VOLUME |
| G.U.S.F. #1 SPILLWAY CB RIM BOTTOM | 117.00 EL. 116.50 EL. 115.50 EL. 114.00 EL. | 1,689 SF | 1,887 SF | 2,831 CF | 3,800 CF | 2,507 SF | 2,800 SF | 4,178 CF | 5,777 CF |
| G.U.S.F. #2 TOP SPILLWAY CB RIM BOTTOM | 117.00 EL. 116.50 EL. 115.50 EL. 114.00 EL. | 2,518 SF | 2,798 SF | 4,197 CF | 5,585 CF | 2,520 SF | 2,799 SF | 4,199 CF | 5,585 CF |
| G.U.S.F. #3 TOP SPILLWAY CB RIM BOTTOM | 116.00 EL. 115.50 EL. 114.50 EL. 113.00 EL. | 1,010 SF | 1,123 SF | 1,684 CF | 2,710 CF | 824 SF | 1,123 SF | 1,373 CF | 2,710 CF |
| G.U.S.F. #4 TOP SPILLWAY CB RIM BOTTOM | 126.00 EL. — 124.98 EL. (EX.) 123.50 EL. | 484 SF | 538 SF | 807 CF | 1,349 CF | 484 SF | 538 SF | 807 CF | 1,349 CF |

FEATURE SIZING SCHEDULE
NOT TO SCALE J5

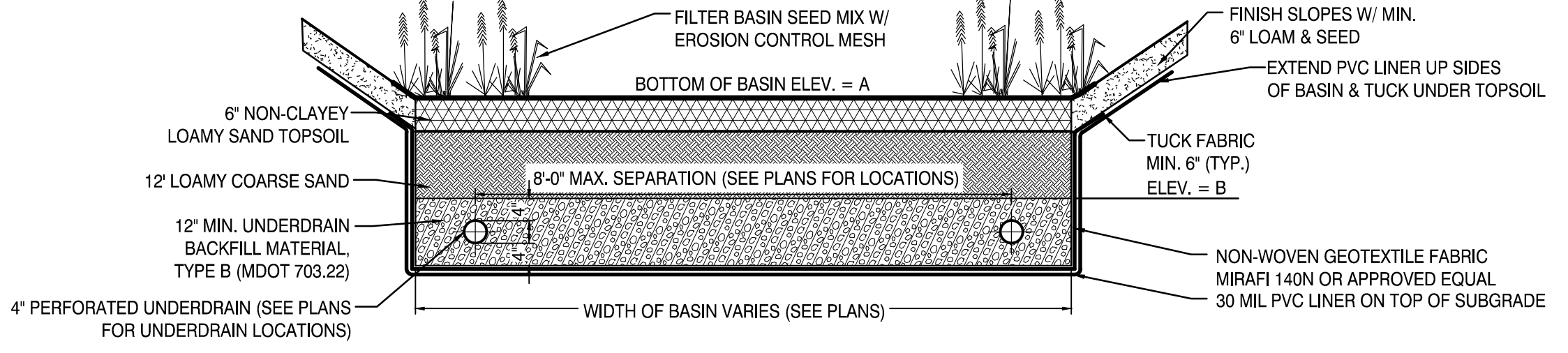
| STRUCTURE | RIM | SIZE | INV. IN | INV. OUT | OVERFLOW WEIR EL. | ORIFICE ELEVATION |
|-----------|------------|------|--|---|-------------------|---|
| O.C. #1 | EL. 115.50 | 4' Ø | NEW 24" DIA. CB (115.50) NEW 4" UD SYSTEM (111.83) | NEW 15" SD (109.50) NEW 4" UD SYSTEM (110.30) | 116.50 | 115.50 - 24" DIA. CB |
| O.C. #2 | EL. 115.50 | 4' Ø | NEW 24" DIA. CB (115.50) NEW 4" UD SYSTEM (111.83) | NEW 15" SD (109.50) NEW 4" UD SYSTEM (110.38) | 116.50 | 115.50 - 24" DIA. CB |
| O.C. #3 | EL. 114.50 | 4' Ø | NEW 24" DIA. CB (114.50) NEW 4" UD SYSTEM (110.83) | NEW 15" SD (111.00) NEW 4" UD SYSTEM (109.76) | 115.50 | 114.50 - 24" DIA. CB |
| O.C. #4 | EX. 124.98 | 4' Ø | EX. 24" CB (VERIFY INVERTS W/ TEST PIT) NEW 4" UD SYSTEM (119.33) | EX. 15" SD (120.48) - VERIFY W/ TEST PIT NEW 4" UD SYSTEM (119.03) | 127.00 | 124.98 - 24" DIA. CB |
| O.C. #5 | EL. 106.00 | 8' Ø | NEW 30" SD (100.00) | NEW 30" SD (99.60) | 104.50 | 103.50 - SHARP-CRESTED WEIR 101.50 - (4) @ 18" DIA. 100.00 - (5) @ 12" DIA. |

OUTLET CONTROL SCHEDULE
NOT TO SCALE G5

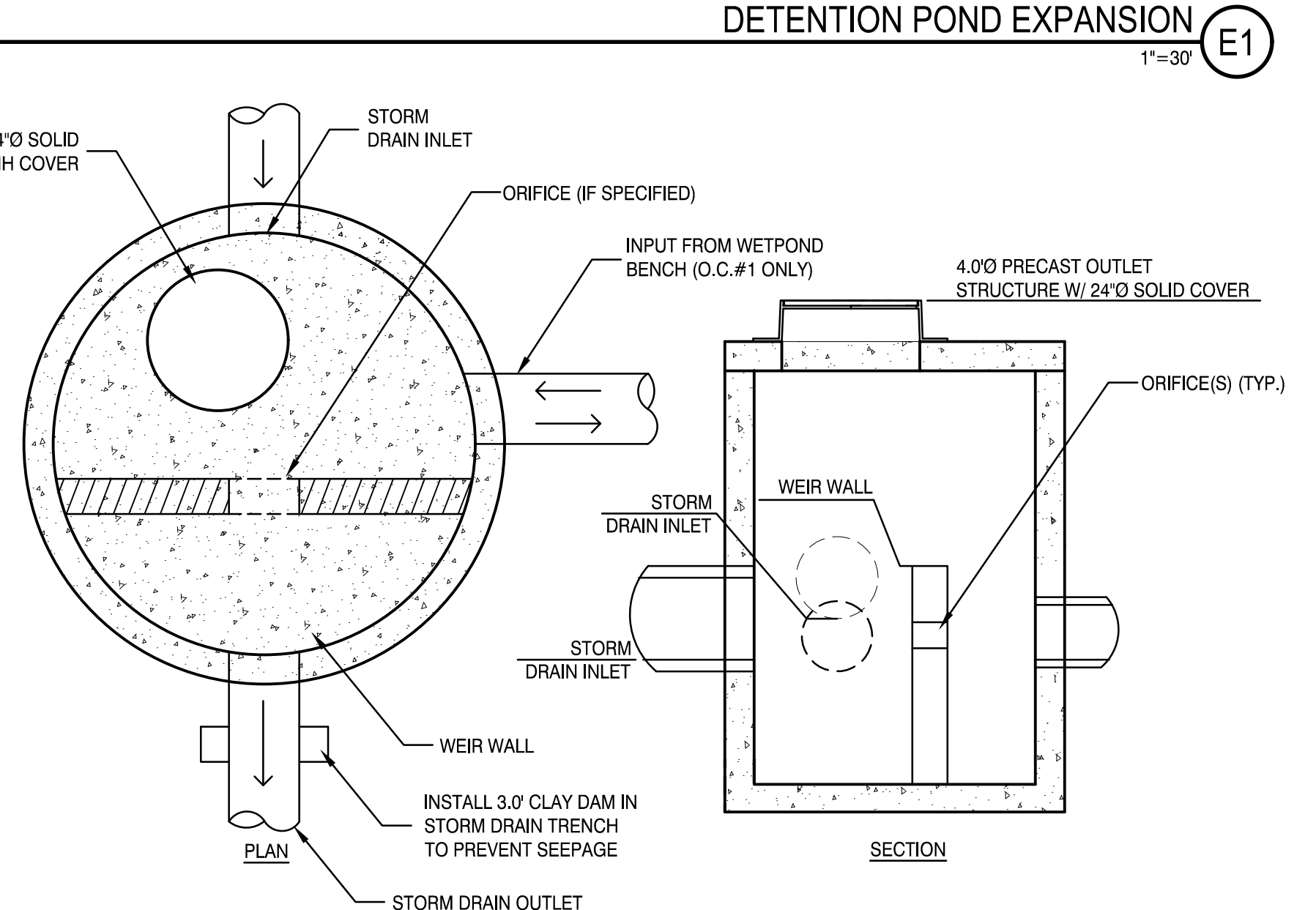


RIP-RAP OUTLET PROTECTION
NOT TO SCALE E7

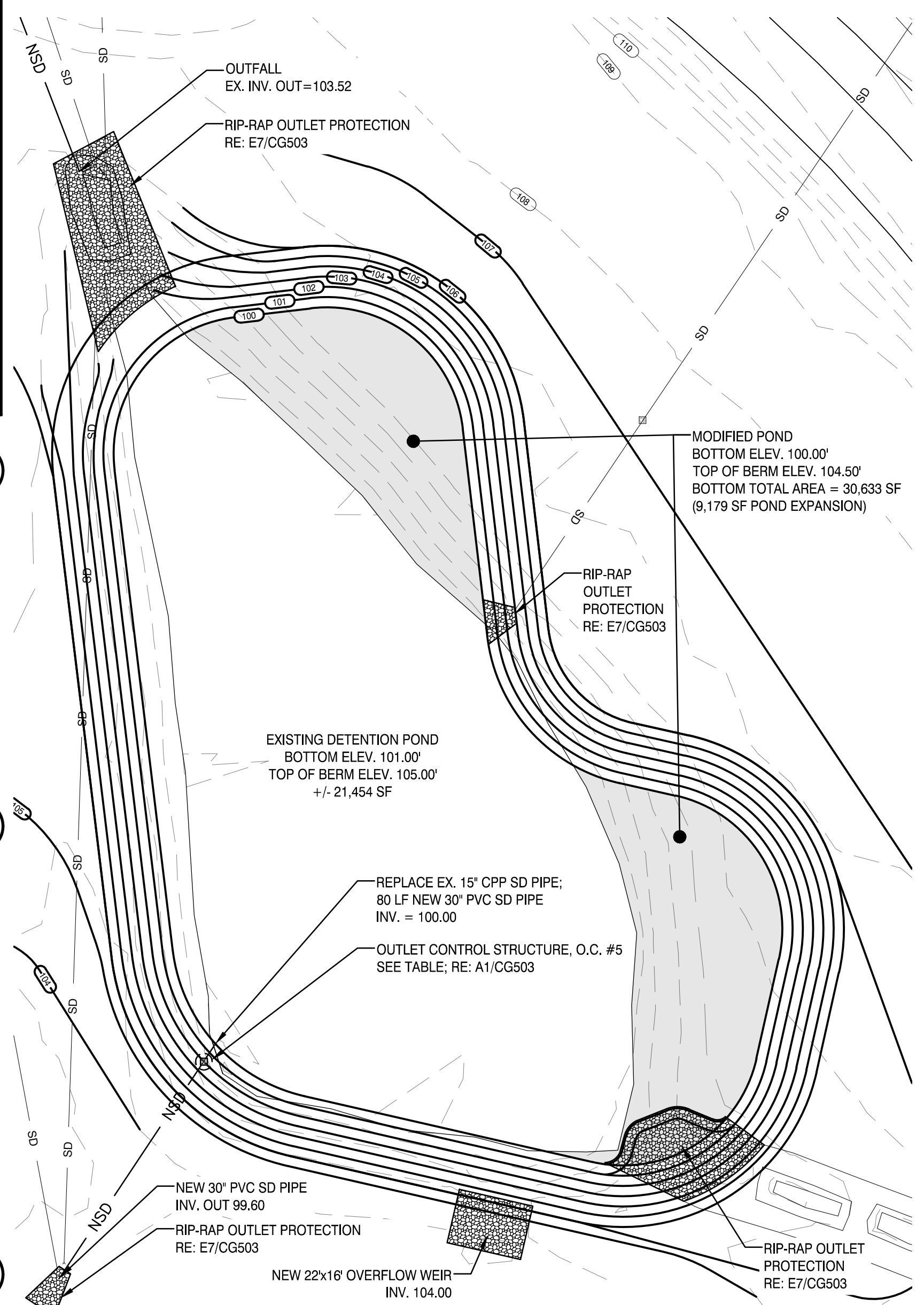
STORMWATER FEATURE #4
1"=20' E5



GRASSED UNDERDRAINED SOIL FILTER
NOT TO SCALE A6

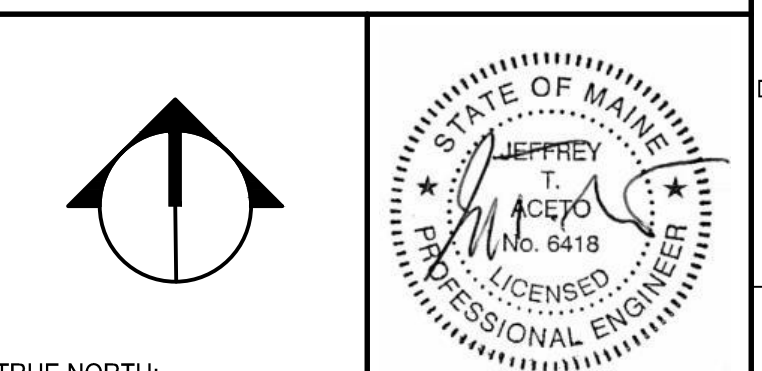


OUTLET CONTROL STRUCTURE
NOT TO SCALE A1



DETENTION POND EXPANSION
1"=30' E1

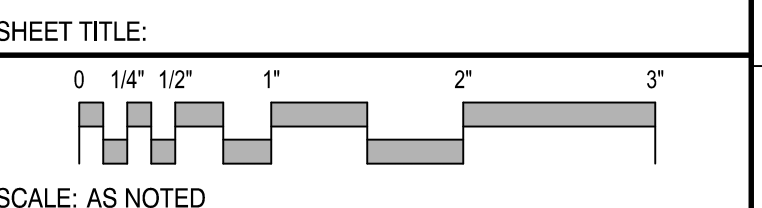
| | | |
|---|----------------|----------|
| 1 | DEP SUBMISSION | 07/12/23 |
|---|----------------|----------|



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STORMWATER DETAILS



A/E OF RECORD: JTA

DRAWN BY: EMS

SMRT FILE: CG503-22012

CG503

SHEET No.

NOT FOR CONSTRUCTION

[illegible]

**APPENDIX C: DEP SLOD AND NRPA PERMIT APPROVALS AND VISUAL
IMPACT FORM (NRPA APPENDIX A)**

APPENDIX A - MDEP VISUAL EVALUATION FIELD SURVEY CHECKLIST

(Natural Resources Protection Act, 38 M.R.S. §§ 480 A - Z)

Name of applicant: University of Maine Phone: c/o Walter Shannon 207-581-2628

Application Type: NRPA Tier 2

Activity Type: (brief activity description) Construction of addition to ASCC including pavement

Activity Location: Town: Orono County: Penobscot

GIS Coordinates, if known: UTM N 4971990 E 526505

Date of Survey: July 5, 2023 Observer: Sarah Nicholson Phone: 207-632-5039

Distance Between the Proposed Visibility Activity and Resource (in Miles)

- | | | 0-1/4 | 1/4-1 | 1+ |
|--|----------|-------------------------------------|-------------------------------------|--|
| 1. Would the activity be visible from: | | | | |
| A. A National Natural Landmark or other outstanding natural feature? | No | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| B. A State or National Wildlife Refuge, Sanctuary, or Preserve or a State Game Refuge? | No | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| C. A state or federal trail? | No | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| D. A public site or structure listed on the National Register of Historic Places? | Yes | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| E. A National or State Park? | | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| F. 1) A municipal park or public open space? | No | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2) A publicly owned land visited, in part, for the use, observation, enjoyment and appreciation of natural or man-made visual qualities? | No | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3) A public resource, such as the Atlantic Ocean, a great pond or a navigable river? | No | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. What is the closest estimated distance to a similar activity? | Adjacent | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. What is the closest distance to a public facility intended for a similar use? | N/A | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Is the visibility of the activity seasonal? (i.e., screened by summer foliage, but visible during other seasons) | | | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
| 5. Are any of the resources checked in question 1 used by the public during the time of year during which the activity will be visible? | N/A | | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

(blue)

A listing of National Natural Landmarks and other outstanding natural features in the State of Maine can be found at: www.nature.nps.gov/nnl/Registry/USA_map/states/Maine/maine.htm . In addition, unique natural areas are listed in the Maine Atlas and Gazetteer published by DeLorme.

Most Maine State and National Wildlife Refuges, Sanctuaries, and Preserves and State Game Refuges are listed in the Maine Atlas and Gazetteer published by DeLorme.

Most State and federal trails are listed in the Maine Atlas and Gazetteer published by DeLorme. In addition, the Maine Department of Conservation maintains a list of state parks with trails that can be searched by county at: www.state.me.us/doc/parks/programs/db_search/index.html

Maine sites and structures listed on the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended, can be searched by town at: www.cr.nps.gov/nr/research/nris.htm

In addition, State historic sites can be found at: www.state.me.us/doc/parks/programs/db_search/index.html A partial listing of historic sites in Maine can be found in the Maine Atlas and Gazetteer published by DeLorme.

A listing of Maine State Parks can be found at: www.state.me.us/doc/parks/programs/db_search/index.html or in the Maine Atlas and Gazetteer published by DeLorme. Acadia National Park on Mount Desert Island is Maine's only National Park.

For guidance on completing this field survey checklist, please contact Licensing staff in the Division of Land Resource Regulation at the following offices:

(Headquarters)
Central Maine Regional Office
17 State House Station
Ray Building, Hospital Street
Augusta, Maine 04333
(207) 287-7688 or
toll free at **1-800-452-1942**

Northern Maine Regional Office
1235 Central Drive
Presque Isle, Maine 04769
(207) 764-0477 or
toll free at **1-888-769-1053**

Eastern Maine Regional Office
106 Hogan Road
Bangor, Maine 04401
(207) 941-4570 or
toll free at **1-888-769-1137**

Southern Maine Regional Office
312 Canco Road
Portland, Maine 04103
(207) 822-6300 or
toll free at **1-888-769-1036**

(blue)



DEPARTMENT ORDER

IN THE MATTER OF

| | |
|-------------------------------|------------------------------------|
| UNIVERSITY OF MAINE |) SITE LOCATION OF DEVELOPMENT ACT |
| Orono, Penobscot County |) NATURAL RESOURCES PROTECTION ACT |
| GREEN ENGINEERING & MATERIALS |) FRESHWATER WETLAND ALTERATION |
| |) WATER QUALITY CERTIFICATION |
| L-19408-22-DF-A (approval) |) AMENDMENT |
| L-19408-TE-DG-N (approval) |) FINDINGS OF FACT AND ORDER |

Pursuant to the provisions of 38 M.R.S. §§ 481–489-E, §§ 480-A–480-JJ, Section 401 of the Clean Water Act (33 U. S. C. § 1341) and Chapters 310, 315, 373, 375 and 500 of the Department’s rules, the Department of Environmental Protection (Department) has considered the application of UNIVERSITY OF MAINE (applicant) with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. History of Project: The University of Maine was founded in 1865. In Department Order #L-19408-22-A-N, dated January 13, 1998, the Department approved all post-1970 expansions of the University of Maine’s Orono campus and the construction of three new structures. Since 1998, a number of modifications and amendments have received Department approval. The project site is located on the University of Maine campus in the Town of Orono.

B. Summary: The applicant proposes to construct a 46,970 square foot expansion to the University of Maine’s Advanced Structures & Composites Center (ASCC) called the Green Engineering & Materials (GEM) Factory of the Future (FoF). The addition will be located on the campus of the University of Maine in Orono south of, and connected to, the existing ASCC building, in an open space between the offshore wind laboratory and the Collins Center for the Arts parking lot. The proposed project also includes a main entrance plaza area, a sidewalk extension and a vehicle maneuvering and storage area.

The applicant proposes to construct the project in two phases. Phase 1 will consist of a 31,300 square foot building addition and 43,868 square feet of associated pavement and phase 2 will consist of an additional 15,670 square foot building addition. The proposed project after Phase 2 will result in the creation of approximately 3.3 acres of new developed area, of which 2.2 acres will be new impervious area. The proposed project is indicated on a set of plans the first of which is titled “Overall Site Plan Phase 1,” prepared by SMRT Architects & Engineers, and dated July 12, 2023.

The applicant is seeking concurrent approval under the Natural Resources Protection Act to permanently fill 26,469 square feet of wet meadow wetlands (20,143 square feet for Phase 1 and 6,353 square feet for Phase 2) in order to construct the addition. Taken

together with previous wetland impact of 53,783 square feet, the cumulative amount of freshwater wetland impact will total 80,252 square feet. Wetland impacts are further discussed in Finding 10.

2. FINANCIAL CAPACITY:

The project is intended to be constructed in phases, as described in Finding 1. The overall project budget is estimated to be \$115,500,000, with a Phase 1 budget of \$80,500,000 and a Phase 2 budget of 35,000,000.

The project will be funded through a variety of sources including the Maine Jobs and Recovery Act, federal grants, defense appropriations and university funds. The applicant submitted documentation confirming that the funds designated for Phase 1 are available. Prior to the start of construction of Phase 2, the applicant must submit financial assurance consistent with Department Rules, Chapter 373(1), to the Bureau of Land Resources (BLR) for review and approval.

The Department finds that the applicant has demonstrated adequate financial capacity to comply with Department standards provided that prior to the start of construction of Phase 2, the applicant submits final financial information for review and approval.

3. TECHNICAL ABILITY:

The applicant provided resume information for key persons involved with the project and a list of projects successfully constructed by the applicant. The applicant also retained the services of Woodard & Curran, a professional engineering firm, to assist in the design and engineering of the project.

The Department finds that the applicant has demonstrated adequate technical ability to comply with Department standards.

4. NOISE:

The proposed project will be similar in function, activity, and noise generation as the other operations at ASCC and facilities across the campus. The proposed project operations will occur inside the building and will continue to be a minor noise source that meets the state noise standards as required by the Department.

5. SOILS:

The applicant submitted a geotechnical report based on the soils found at the project site. This report was prepared by a certified soils scientist and reviewed by staff from the BLR. No blasting is anticipated at this site.

The Department finds that, based on this report and BLR's review, the soils on the project site present no limitations to the proposed project that cannot be overcome through standard engineering practices.

6. STORMWATER MANAGEMENT:

The proposed project includes approximately 3.3 acres of new developed area, of which 2.2 acres is new impervious area. It lies within the watershed of the Stillwater River. The applicant submitted a stormwater management plan based on the Basic, General and Flooding Standards contained in Chapter 500 of the Department's Stormwater Management rules pursuant to 38 M.R.S. § 420-D. The proposed stormwater management system consists of four grassed underdrained soil filters and an expansion to an existing wet pond.

A. Basic Standards:

(1) Erosion and Sedimentation Control: The applicant submitted an Erosion and Sedimentation Control Plan that is based on the performance standards contained in Appendix A of Chapter 500 and the Best Management Practices outlined in the Maine Erosion and Sediment Control BMPs, which were developed by the Department. This plan and plan sheets containing erosion control details were reviewed by BLR.

Erosion control details will be included on the final construction plans and the erosion control narrative will be included in the project specifications to be provided to the construction contractor.

(2) Inspection and Maintenance: The applicant submitted a maintenance plan that addresses both short and long-term maintenance requirements. The maintenance plan is based on the standards contained in Appendix B of Chapter 500. This plan was reviewed by BLR. The applicant will be responsible for the maintenance of the stormwater management system.

(3) Housekeeping: The proposed project will comply with the performance standards outlined in Appendix C of Chapter 500.

Based on BLR's review of the erosion and sedimentation control plan and the maintenance plan, the Department finds that the proposed project meets the Basic Standards contained in Chapter 500(4)(B).

B. General Standards:

The applicant's stormwater management plan includes general treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This mitigation is being achieved by using

Best Management Practices (BMPs) that will control runoff from no less than 95% of the impervious area and no less than 80% of the developed area.

The stormwater management system proposed by the applicant was reviewed by BLR. After a final review, BLR commented that the proposed stormwater management system is designed in accordance with the Chapter 500 General Standards and recommended that the applicant's design engineer or another qualified professional oversees the construction of the stormwater management structures to ensure that they are installed in accordance with the details and notes specified on the approved plans. Within 30 days of completion of the entire system, as-built plans must be submitted to the Department. If the project takes more than one year to complete, at least once per year, the applicant must submit a log of inspection reports detailing the items inspected, photographs taken, and dates of each inspection to the BLR for review.

Based on the stormwater system's design and BLR's review, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the General Standards contained in Chapter 500 (4)(C) provided the applicant meets the inspection and reporting requirements outlined above.

C. Flooding Standard:

The applicant is proposing to utilize a stormwater management system based on estimates of pre- and post-development stormwater runoff flows obtained by using Hydrocad, a stormwater modeling software that utilizes the methodologies outlined in Technical Releases #55 and #20, U.S.D.A., Soil Conservation Service and detains stormwater from 24-hour storms of 2-, 10-, and 25-year frequency. The post-development peak flow from the site will not exceed the pre-development peak flow from the site and the peak flow of the receiving water will not be increased as a result of stormwater runoff from the development site.

BLR commented that the proposed system is designed in accordance with the Flooding Standard contained in Chapter 500(4)(F).

Based on the system's design and BLR's review, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the Flooding Standard contained in Chapter 500(4)(F) for peak flow from the project site, and channel limits and runoff areas.

7. WATER SUPPLY:

When completed, the proposed project is anticipated to use 600 gallons of water per day for Phase 1 and 240 gallons of water per day for Phase 2. Water will be supplied by the Orono/Veazie Water District. The applicant submitted email communication from the District, dated July 6, 2023, indicating that it will be capable of servicing this project.

The Department finds that the applicant has made adequate provision for securing and maintaining a sufficient and healthful water supply.

8. WASTEWATER DISPOSAL:

When completed, the proposed project is anticipated to discharge 600 gallons of wastewater per day for Phase 1 and 240 gallons of wastewater per day for Phase 2 to the Orono Water Pollution Control Facility. The applicant submitted email communication from the Facility dated July 6, 2023, stating that it will accept these flows. This project was reviewed by the Division of Water Quality Management (DWQM) of the BWQ, which commented that the Orono Water Pollution Control Facility has the capacity to treat these flows and is currently operating in compliance with the water quality laws of the State of Maine.

Based on DWQM's comments, the Department finds that the applicant has made adequate provision for wastewater disposal at a facility that has the capacity to ensure satisfactory treatment.

9. SOLID WASTE:

When completed, the proposed project is anticipated to add an additional 100 pounds of general solid waste per day. All general solid wastes from the proposed project will be disposed of at Juniper Ridge Landfill, which is currently in substantial compliance with the Maine Solid Waste Management Rules.

The proposed project will generate approximately 3,300 cubic yards of construction debris and demolition debris and will result in an increase of processing debris, including concrete, plywood, wood, plastics, and metals of approximately 50 tons per year. All construction, demolition and processing debris generated will be disposed of at Juniper Ridge, which is currently in substantial compliance with the Maine Solid Waste Management Rules.

Hazardous wastes such as solvents, paints, adhesives/resins, and other materials will continue to be picked up and disposed of by Veolia Environmental Services. There will be no changes to the hazardous waste management, policies, or procedures for the campus as a result of the proposed project.

Based on the above information, the Department finds that the applicant has made adequate provision for solid waste disposal.

10. WETLAND IMPACTS:

Wetland delineations were conducted by Watershed Resource Consultants, LLC (WRC) in October of 2022 and four freshwater wetland areas were delineated on the proposed project site.

The applicant proposes to permanently fill approximately 26,469 square feet of wet meadow freshwater wetlands (20,143 square feet for Phase 1 and 6,353 square feet for Phase 2) in order to construct the expansion. The proposed alteration is shown on the set of plans the first of which is titled "Phase 1 Wetland Impacts," prepared by SMRT Architects & Engineers, and dated July 12, 2023.

The Wetland and Waterbodies Protection Rules, 06-096 C.M.R. ch. 310 (last amended November 11, 2018), interpret and elaborate on the Natural Resources Protection Act (NRPA) criteria for obtaining a permit. The rules guide the Department in its determination of whether a project's impacts would be unreasonable. A proposed project would generally be found to be unreasonable if it would cause a loss in wetland area, functions and values and there is a practicable alternative to the project that would be less damaging to the environment. Each application for a NRPA permit that involves an alteration of a freshwater wetland must provide an analysis of alternatives in order to demonstrate that a practicable alternative does not exist.

A. Avoidance. An applicant must submit an analysis of whether there is a practicable alternative to the project that would be less damaging to the environment and this analysis is considered by the Department in its assessment of the reasonableness of any impacts. The applicant submitted an alternatives analysis for the proposed project completed by Watershed Resource Consultants, LLC and submitted with the application.

The purpose of the proposed expansion of the ASCC building is to create a research and design factory for bio-based hybrid manufacturing and provide active learning spaces for students to interact with and program equipment in a safe and controlled manner. The proposed project also intends to provide a vehicle maneuvering area, storage area for large-scale materials and products and a main entrance plaza area with sidewalk extension.

The applicant considered other locations however, proximity to the existing ASCC makes the proposed site the only practical and suitable location. The applicant also considered several design configurations including three different locations adjacent to the current ASCC facility. The applicant concluded that the location between the south edge of the existing lab and the CCA Parking Lot was the most viable. The other two options were located on the east side and on the north end of the Wind & Wave Addition (W2), respectively. These alternative configurations created significant impacts to the forested wetland areas, parking issues, required significant grading, and had adjacency challenges for the operations in the ASCC. The preferred option provides for the required footprint size, has the necessary adjacencies for the existing functions in ASCC as well as for the proposed visitor experience plaza access, and minimizes impacts to parking, utilities, and wetlands. Layout options were considered to minimize the amount of wetland impact, but the requirements of the project and the location of the wetland areas made avoidance impossible.

B. Minimal Alteration. The amount of freshwater wetland to be altered must be kept to the minimum amount necessary for meeting the overall purpose of the project. As

noted in the alternative's analysis, the applicant examined multiple site layout designs before selecting the one with the smallest wetland impact.

C. Compensation. In accordance with Chapter 310 §5(C), compensation may be required to achieve the goal of no net loss of wetland functions and values. Due to previous impacts, that resulted in a cumulative total greater than 15,000 square feet of freshwater wetland not of special significance, which is the threshold over which compensation is generally required, this project will require compensation. The applicant submitted an assessment of the functions and values for the impacted wetlands with the application. The assessment identified flood flow alteration as the principal function of the wetlands at the proposed project site. The proposed project site has been historically disturbed including former agricultural uses as well as above and below-ground campus infrastructure. The applicant stated that drainage manholes and an electrical manhole were observed within the wetlands. The entirety of one wetland area will have no alteration and will continue to fulfill the function of flood flow alteration. Wetland impacts will only include wet meadow freshwater wetland areas with no alterations to the forested and scrub-shrub wetland areas.

For the impacts resulting from the project after avoidance and minimization, the applicant proposes to make a contribution into the In-Lieu Fee program of the Maine Natural Resource Conservation Program in the amount of \$113,667.84 (both Phase 1 and 2). Prior to the start of construction, the applicant must submit a payment in the amount of \$113,667.84, payable to "Treasurer, State of Maine," and directed to the attention of the In-Lieu Fee Program Administrator at 17 State House Station, Augusta, Maine 04333.

The Department finds that the applicant has avoided and minimized impacts to the freshwater wetlands to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project provided that prior to project construction, the applicant submits the In-Lieu Fee payment as described above.

11. ALL OTHER:

All other Findings of Fact, Conclusions and Conditions remain as approved in Department Order #L-19408-22-A-N, and subsequent Orders.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 480-A–480-JJ and Section 401 of the Federal Water Pollution Control Act:

- A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses.
- B. The proposed activity will not cause unreasonable erosion of soil or sediment.

- C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.
- D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life provided that prior to construction the applicant makes a contribution to the In-Lieu Fee program as described in Finding 10.
- E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.
- F. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters.
- G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.
- H. The proposed activity is not on or adjacent to a sand dune.
- I. The proposed activity is not on an outstanding river segment as noted in 38 M.R.S. § 480-P.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 481–489-E:

- A. The applicant has provided adequate evidence of financial capacity and technical ability to develop the project in a manner consistent with state environmental standards provided that final financial evidence is submitted to the BLR for review and approval as outlined in Finding 2.
- B. The applicant has made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipality or in neighboring municipalities.
- C. The proposed development will be built on soil types which are suitable to the nature of the undertaking and will not cause unreasonable erosion of soil or sediment nor inhibit the natural transfer of soil.
- D. The proposed development meets the standards for storm water management in 38 M.R.S. § 420-D and the standard for erosion and sedimentation control in 38 M.R.S. § 420-C provided the applicant meets the requirements outlined in Finding 6.
- E. The proposed development will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur.

- F. The applicant has made adequate provision of utilities, including water supplies, sewerage facilities and solid waste disposal required for the development and the development will not have an unreasonable adverse effect on the existing or proposed utilities in the municipality or area served by those services.
- G. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.

THEREFORE, the Department APPROVES the application of UNIVERSITY OF MAINE to expand the ASCC as described in Finding 1, SUBJECT TO THE FOLLOWING CONDITIONS and all applicable standards and regulations:

1. The Standard Conditions of Approval, a copy attached.
2. In addition to any specific erosion control measures described in this or previous orders, the applicant shall take all necessary actions to ensure that its activities or those of its agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.
3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.
4. The applicant shall retain the design engineer or other qualified professional to oversee the construction of the stormwater management structures according to the details and notes specified on the approved plans. Within 30 days of completion of the entire system, as-built plans shall be submitted to the Department. If the project takes more than one year to complete, at least once per year, the applicant shall submit a log of inspection reports detailing the items inspected, photographs taken, and dates of each inspection to the BLR for review.
5. Prior to the start of construction of Phase 2, the applicant must submit financial assurance consistent with Department Rules, Chapter 373(1), to BLR for review and approval.
6. Prior to the start of construction, the applicant shall submit a payment in the amount of \$113,667.84, payable to "Treasurer, State of Maine", to the attention of the In-Lieu Fee Program Administrator at 17 State House Station, Augusta, Maine 04333. A copy of this Order shall be included or referenced with payment submittal.
7. All other Findings of Fact, Conclusions and Conditions remain as approved in Department Order #L-19408-22-A-N, and subsequent Orders.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 11th DAY OF JANUARY, 2024.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY 
For: Melanie Loyzim, Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

SS/L19408DFADGN/ATS#91262/91263

FILED
January 11th, 2024
State of Maine
Board of Environmental Protection

Department of Environmental Protection
SITE LOCATION OF DEVELOPMENT (SITE)
STANDARD CONDITIONS

- A. Approval of Variations from Plans.** The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation. Further subdivision of proposed lots by the applicant or future owners is specifically prohibited without prior approval of the Board, and the applicant shall include deed restrictions to that effect.
- B. Compliance with All Applicable Laws.** The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.
- C. Compliance with All Terms and Conditions of Approval.** The applicant shall submit all reports and information requested by the Board or the Department demonstrating that the applicant has complied or will comply with all preconstruction terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.
- D. Advertising.** Advertising relating to matters included in this application shall refer to this approval only if it notes that the approval has been granted WITH CONDITIONS and indicates where copies of those conditions may be obtained.
- E. Transfer of Development.** Unless otherwise provided in this approval, the applicant shall not sell, lease, assign or otherwise transfer the development or any portion thereof without prior written approval of the Board where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval shall be granted only if the applicant or transferee demonstrates to the Board that the transferee has the technical capacity and financial ability to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant.
- F. Time frame for approvals.** If the construction or operation of the activity is not begun within four years, this approval shall lapse, and the applicant shall reapply to the Board for a new approval. The applicant may not begin construction or operation of the development until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- G. Approval Included in Contract Bids.** A copy of this approval must be included in or attached to all contract bid specifications for the development.
- H. Approval Shown to Contractors.** Work done by a contractor pursuant to this approval shall not begin before the contractor has been shown by the developer a copy of this approval.

(2/81)/Revised December 27, 2011



Natural Resources Protection Act (NRPA) Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

- A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.
- B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.
- C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.
- D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.
- E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.
- G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.
- H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

STORMWATER STANDARD CONDITIONS

STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL

Standard conditions of approval. Unless otherwise specifically stated in the approval, a department approval is subject to the following standard conditions pursuant to Chapter 500 Stormwater Management Law.

- (1) Approval of variations from plans. The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the permittee. Any variation from these plans, proposals, and supporting documents must be reviewed and approved by the department prior to implementation. Any variation undertaken without approval of the department is in violation of 38 M.R.S. §420-D(8) and is subject to penalties under 38 M.R.S. §349.
- (2) Compliance with all terms and conditions of approval. The applicant shall submit all reports and information requested by the department demonstrating that the applicant has complied or will comply with all terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.
- (3) Advertising. Advertising relating to matters included in this application may not refer to this approval unless it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.
- (4) Transfer of project. Unless otherwise provided in this approval, the applicant may not sell, lease, assign, or otherwise transfer the project or any portion thereof without written approval by the department where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval may only be granted if the applicant or transferee demonstrates to the department that the transferee agrees to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant. Approval of a transfer of the permit must be applied for no later than two weeks after any transfer of property subject to the license.
- (5) Time frame for approvals. If the construction or operation of the activity is not begun within four years, this approval shall lapse and the applicant shall reapply to the department for a new approval. The applicant may not begin construction or operation of the project until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- (6) Certification. Contracts must specify that "all work is to comply with the conditions of the Stormwater Permit." Work done by a contractor or subcontractor pursuant to this approval may not begin before the contractor and any subcontractors have been shown a copy of this approval with the conditions by the permittee, and the permittee and each contractor and subcontractor has certified, on a form provided by the department, that the approval and conditions have been received and read, and that the work will be carried out in accordance with the approval and conditions. Completed certification forms must be forwarded to the department.

- (7) Maintenance. The components of the stormwater management system must be adequately maintained to ensure that the system operates as designed, and as approved by the Department. If maintenance responsibility is to be transferred from the permittee to another entity, a transfer request must be filed with the Department which includes the name and contact information for the person or entity responsible for this maintenance. The form must be signed by the responsible person or agent of the responsible entity.
- (8) Recertification requirement. Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify the following to the department.
- (a) All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
 - (b) All aspects of the stormwater control system are operating as approved, have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system, as necessary.
 - (c) The stormwater maintenance plan for the site is being implemented as approved by the Department, and the maintenance log is being maintained.
 - (d) All proprietary systems have been maintained according to the manufacturer's recommendations. Where required by the Department, the permittee shall execute a 5-year maintenance contract with a qualified professional for the coming 5-year interval. The maintenance contract must include provisions for routine inspections, cleaning and general maintenance.
 - (e) The Department may waive some or all of these recertification requirements on a case-by-case basis for permittees subject to the Department's Multi-Sector General Permit ("MSGP") and/or Maine Pollutant Discharge Elimination System ("MEPDES") programs where it is demonstrated that these programs are providing stormwater control that is at least as effective as required pursuant to this Chapter.
- (9) Transfer of property subject to the license. If any portion of the property subject to the license containing areas of flow or areas that are flooded are transferred to a new property owner, restrictive covenants protecting these areas must be included in any deeds or leases, and recorded at the appropriate county registry of deeds. Also, in all transfers of such areas and areas containing parts of the stormwater management system, deed restrictions must be included making the property transfer subject to all applicable terms and conditions of the permit. These terms and conditions must be incorporated by specific and prominent reference to the permit in the deed. All transfers must include in the restrictions the requirement that any subsequent transfer must specifically include the same restrictions unless their removal or modification is approved by the Department. These restrictions must be written to be enforceable by the Department, and must reference the permit number.
- (10) Severability. The invalidity or unenforceability of any provision, or part thereof, of this permit shall not affect the remainder of the provision or any other provisions. This permit shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.



DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: August 2021

Contact: (207) 314-1458

SUMMARY

This document provides information regarding a person's rights and obligations in filing an administrative or judicial appeal of a licensing decision made by the Department of Environmental Protection's (DEP) Commissioner.

Except as provided below, there are two methods available to an aggrieved person seeking to appeal a licensing decision made by the DEP Commissioner: (1) an administrative process before the Board of Environmental Protection (Board); or (2) a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development ([35-A M.R.S. § 3451\(4\)](#)) or a general permit for an offshore wind energy demonstration project ([38 M.R.S. § 480-HH\(1\)](#)) or a general permit for a tidal energy demonstration project ([38 M.R.S. § 636-A](#)) must be taken to the Supreme Judicial Court sitting as the Law Court.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

A person filing an appeal with the Board should review Organization and Powers, [38 M.R.S. §§ 341-D\(4\)](#) and [346](#); the Maine Administrative Procedure Act, 5 M.R.S. § [11001](#); and the DEP's [Rule Concerning the Processing of Applications and Other Administrative Matters \(Chapter 2\)](#), 06-096 C.M.R. ch. 2.

DEADLINE TO SUBMIT AN APPEAL TO THE BOARD

Not more than 30 days following the filing of a license decision by the Commissioner with the Board, an aggrieved person may appeal to the Board for review of the Commissioner's decision. The filing of an appeal with the Board, in care of the Board Clerk, is complete when the Board receives the submission by the close of business on the due date (5:00 p.m. on the 30th calendar day from which the Commissioner's decision was filed with the Board, as determined by the received time stamp on the document or electronic mail). Appeals filed after 5:00 p.m. on the 30th calendar day from which the Commissioner's decision was filed with the Board will be dismissed as untimely, absent a showing of good cause.

HOW TO SUBMIT AN APPEAL TO THE BOARD

An appeal to the Board may be submitted via postal mail or electronic mail and must contain all signatures and required appeal contents. An electronic filing must contain the scanned original signature of the appellant(s). The appeal documents must be sent to the following address.

Chair, Board of Environmental Protection
c/o Board Clerk
17 State House Station
Augusta, ME 04333-0017
ruth.a.burke@maine.gov

The DEP may also request the submittal of the original signed paper appeal documents when the appeal is filed electronically. The risk of material not being received in a timely manner is on the sender, regardless of the method used.

At the time an appeal is filed with the Board, the appellant must send a copy of the appeal to: (1) the Commissioner of the DEP (Maine Department of Environmental Protection, 17 State House Station, Augusta, Maine 04333-0017); (2) the licensee; and if a hearing was held on the application, (3) any intervenors in that hearing proceeding. **Please contact the DEP at 207-287-7688 with questions or for contact information regarding a specific licensing decision.**

REQUIRED APPEAL CONTENTS

A complete appeal must contain the following information at the time the appeal is submitted.

1. *Aggrieved status.* The appeal must explain how the appellant has standing to bring the appeal. This requires an explanation of how the appellant may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions, or conditions objected to or believed to be in error.* The appeal must identify the specific findings of fact, conclusions of law, license conditions, or other aspects of the written license decision or of the license review process that the appellant objects to or believes to be in error.
3. *The basis of the objections or challenge.* For the objections identified in Item #2, the appeal must state why the appellant believes that the license decision is incorrect and should be modified or reversed. If possible, the appeal should cite specific evidence in the record or specific licensing criteria that the appellant believes were not properly considered or fully addressed.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license to changes in specific license conditions.
5. *All the matters to be contested.* The Board will limit its consideration to those matters specifically raised in the written notice of appeal.
6. *Request for hearing.* If the appellant wishes the Board to hold a public hearing on the appeal, a request for hearing must be filed as part of the notice of appeal, and it must include an offer of proof regarding the testimony and other evidence that would be presented at the hearing. The offer of proof must consist of a statement of the substance of the evidence, its relevance to the issues on appeal, and whether any witnesses would testify. The Board will hear the arguments in favor of and in opposition to a hearing on the appeal and the presentations on the merits of an appeal at a regularly scheduled meeting. If the Board decides to hold a public hearing on an appeal, that hearing will then be scheduled for a later date.
7. *New or additional evidence to be offered.* If an appellant wants to provide evidence not previously provided to DEP staff during the DEP's review of the application, the request and the proposed supplemental evidence must be submitted with the appeal. The Board may allow new or additional evidence to be considered in an appeal only under limited circumstances. The proposed supplemental evidence must be relevant and material, and (a) the person seeking to add information to the record must show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process; or (b) the evidence itself must be newly discovered and therefore unable to have been presented earlier in the process. Requirements for supplemental evidence are set forth in [Chapter 2 § 24](#).

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, and is made accessible by the DEP. Upon request, the DEP will make application materials available to review and photocopy during normal working hours. There may be a charge for copies or copying services.

2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing the appeal.* DEP staff will provide this information upon request and answer general questions regarding the appeal process.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed, the license normally remains in effect pending the processing of the appeal. Unless a stay of the decision is requested and granted, a licensee may proceed with a project pending the outcome of an appeal, but the licensee runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will acknowledge receipt of an appeal, and it will provide the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials admitted by the Board as supplementary evidence, any materials admitted in response to the appeal, relevant excerpts from the DEP's administrative record for the application, and the DEP staff's recommendation, in the form of a proposed Board Order, will be provided to Board members. The appellant, the licensee, and parties of record are notified in advance of the date set for the Board's consideration of an appeal or request for a hearing. The appellant and the licensee will have an opportunity to address the Board at the Board meeting. The Board will decide whether to hold a hearing on appeal when one is requested before deciding the merits of the appeal. The Board's decision on appeal may be to affirm all or part, affirm with conditions, order a hearing to be held as expeditiously as possible, reverse all or part of the decision of the Commissioner, or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, the licensee, and parties of record of its decision on appeal.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court (see [38 M.R.S. § 346\(1\)](#); 06-096 C.M.R. ch. 2; [5 M.R.S. § 11001](#); and M.R. Civ. P. 80C). A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S. § 346(4).

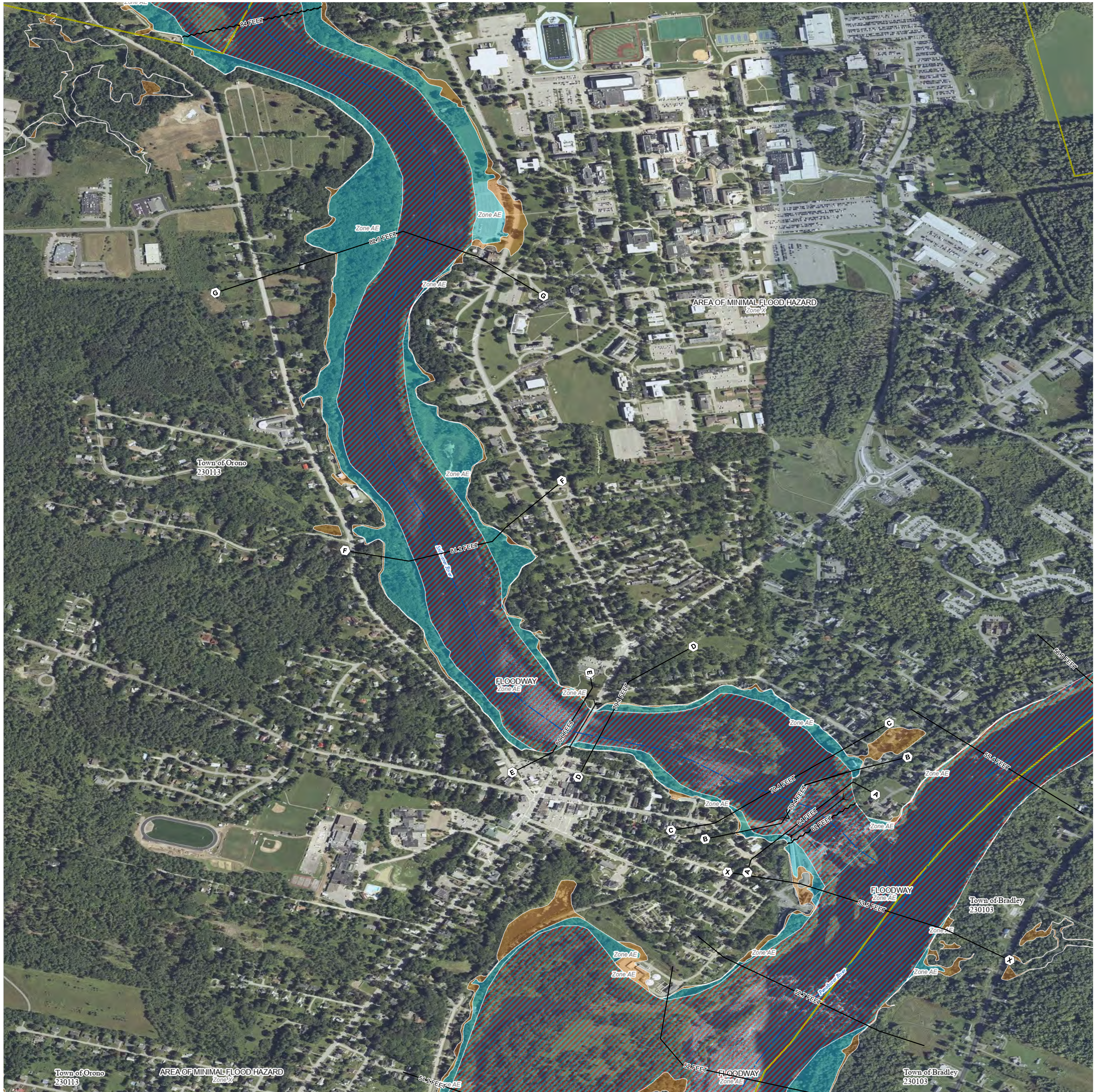
Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board Clerk at 207-287-2811 or the Board Executive Analyst at 207-314-1458 bill.hinkel@maine.gov, or for judicial appeals contact the court clerk's office in which the appeal will be filed.

Note: This information sheet, in conjunction with a review of the statutory and regulatory provisions referred to herein, is provided to help a person to understand their rights and obligations in filing an administrative or judicial appeal. The DEP provides this information sheet for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.

APPENDIX D: FEMA FLOOD INSURANCE RATE MAP



USGS, USDA

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP
FOR DRAFT FIRM PANEL LAYOUT

| | | |
|-----------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE) Zone A, V, A99 |
| | | With BFE or Depth Zone AE, AO, AH, VE, AR |
| OTHER AREAS OF FLOOD HAZARD | | Regulatory Floodway |
| | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | | Area with Reduced Flood Risk due to Levee See Notes Zone X |
| OTHER AREAS | | Area with Flood Risk due to Levee Zone D |
| | | NO SCREEN Area of Minimal Flood Hazard Zone X |
| GENERAL STRUCTURES | | Effective LOMRs |
| | | Area of Undetermined Flood Hazard Zone D |
| OTHER FEATURES | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| | | 20.2 Cross Sections with 1% Annual Chance |
| | | 17.5 Water Surface Elevation |
| | | 8 Coastal Transect |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | |

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

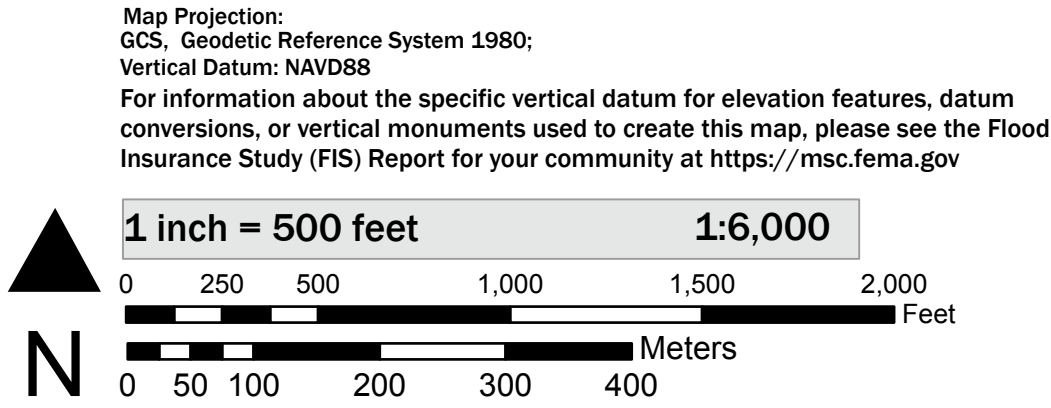
To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **8/17/2023 4:17 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP

PANEL 1943 OF 2356

| | | |
|------------------|--------|-------|
| Panel Contains: | | |
| COMMUNITY | NUMBER | PANEL |
| CITY OF OLD TOWN | 230112 | 1943 |
| TOWN OF BRADLEY | 230103 | 1943 |
| TOWN OF ORONO | 230113 | 1943 |

**APPENDIX E: PROTECTED NATURAL RESOURCES REPORT, WETLAND
FUNCTIONS AND VALUES REPORT, AND WETLAND IMPACT
FIGURES**

Protected Natural Resources Report

Proposed ASCC Building Expansion
University of Maine
Orono, Maine

October 24, 2022



Prepared For:

University of Maine
Facilities Management
Attention: Jonathan Dow, Project Manager
5765 Service Building 111
Orono, Maine 04469-5765

Prepared By:

Watershed Resource Consultants, LLC
P.O. Box 145
Orrington, ME 04474

WRC #22544

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| Appendix D | Agency Letters and Published Mapping |
| Appendix E | Corps Wetland Data Forms |

1.0 INTRODUCTION

This Report presents the findings of protected natural resource services conducted by Watershed Resource Consultants, LLC (WRC) on an approximately 2-acre area of land in the vicinity of the proposed ASCC building addition on the University of Maine campus in Orono, Maine (i.e., the “site”). The purpose of the services was to identify and delineate Maine Department of Environmental Protection (MDEP) and U.S. Army Corps of Engineers (Corps) defined Protected Natural Resources on, and within appropriate setback distances of, the site.

2.0 METHODOLOGY

2.1 Resource Identification and Delineation: WRC conducted Protected Natural Resources identification and delineation at the site on June 23 and October 04, 2022. Protected Natural Resources were identified as defined by the Maine Department of Environmental Protection¹ (MDEP) and U.S. Army Corps of Engineers² (Corps). Wetland delineation was conducted using the 1987 Corps Wetland Delineation Manual³ and Northeast Regional Supplement⁴. Stream identification was conducted using the MDEP Natural Resources Protection Act Statute and the Corps General Permit. Vernal pool/potential vernal pool identification was conducted using MDEP Chapter 335⁵, the 2014 Maine Association of Wetlands Scientists (MAWS) Vernal Pool Survey Protocol, and the Corps General Permit.

Wetlands were delineated within the site. WRC conducted reconnaissance on the site and within 75 feet of the site for streams, and on the site and within 250 feet of the site for potential vernal pools.

Wetland boundaries were flagged with pink flagging. Flagging was numbered according to the Resource ID.

Wetland and waterbody resources were characterized using the Cowardin Classification system⁶.

2.2 Resource Location: Resource delineation flagging was located by Watershed Resource Consultants, LLC with a sub-meter GPS receiver. The GPS data was provided to Plisga & Day Land Surveyors who used the GPS data to assist in their site survey. The Plisga & Day survey and publicly available data through MeGIS were used to make the Protected Natural Resources Plan attached in Appendix B.

¹ State of Maine, Department of Environmental Protection, Natural Resources Protection Act Statute, 38 M.R.S.A. §480-A to 480-HH, DEPLW284-W2010, Revised August 12, 2011.

² United States Department of the Army, General Permit, State of Maine, Effective: October 14, 2020 to October 14, 2025.

³ Environmental Laboratory. 1987. “Corps of Engineers Wetland Delineation Manual”, Technical Report Y-87-1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, Miss.

⁴ U.S. Army Corps of Engineers. 2011. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

⁵ State of Maine, Department of Environmental Protection, Chapter 335 Significant Wildlife Habitat, amended January 7, 2014.

⁶ Cowardin, et al. 1979. United States, Fish and Wildlife Service, “Classification of Wetlands and Deepwater Habitats of the United States”. Biological services program; FWS/OBS-79/31) FWS/OBS-79/31. QH76.U54a 79/31 [QH104] 574.5'0973s [574.5'2632] 79-607795

3.0 PROTECTED NATURAL RESOURCES ASSESSMENT

3.1 Site Overview: The existing ASCC building is located at the end of Brown Road, in the central portion of campus, at the University of Maine in Orono, Maine. The proposed expansion area and associated infrastructure is south and east of the building. The approximately 2-acre area within which WRC conducted services (i.e. the “site”) is located between a large commuter parking lot to the south, an access road to the west, the ASCC building to the northwest, a social trail that leads to a dorm to the north, and a dorm, Brown Road, and paved accessways to the east. A portion of Brown Road and associated parking area and sidewalk, a windmill blade, paved pedestrian walkways, two electrical structures, a small parking area, and a utility building and associated accessways are within the site.

The site has been historically disturbed to include former agricultural uses (old field), as well as above and below-ground campus infrastructure. Drainage manholes and an electrical manhole were observed within the wetlands. The extent of wetlands in the area prior to any disturbance is unknown, but the disturbances may have increased and/or decreased the area of wetlands on the site.

3.2 Topography and Soils: The site is on a westerly sideslope of a local hill. It is in the Stillwater River watershed, which is part of the Penobscot River system.

The USDA NRCS Soil Survey for Penobscot County maps Chesuncook-Telos-Urbanland association, and Peru-Swanville-Urbanland association soils on the site. Chesuncook, Telos, and Peru soils are moderately well and somewhat poorly drained soils formed in glacial till sediments. Swanville soils are poorly drained soils formed in glacio-lacustrine/marine sediments. Urbanland is a map unit used to describe areas developed with buildings, parking lots and roadways. Site slopes range from approximately 0-6%, with steeper slopes at fill extensions.

3.3 Wetlands: Four freshwater wetland areas, labeled as Wetlands AB-1, AB-2, AB-3 and AB-4, were delineated on the site.

Wetlands AB-1, AB-2, AB-4, and the southern portion of Wetland AB-3 were emergent, old field wetlands with similar characteristics. Reed canarygrass (*Phalaris arundinacea*) was the dominant vegetative species, with other species observed to include meadow foxtail (*Alopecurus pratensis*), fowl blue grass (*Poa palustris*), tall goldenrod (*Solidago gigantea*), wrinkleleaf goldenrod (*Solidago rugosa*), red fescue (*Festuca rubra*), and rough bedstraw (*Galium asprellum*). Observed soils in the wetlands met classification as Soil Indicator F3: Depleted Matrix. Hydrology Indicators observed included A2: High Water Table and A3: Saturation, D2: Geomorphic Position, and D4: Microtopographic Relief.

The northern and eastern portions of Wetland AB-3 were forested wetlands with scrub-shrub inclusions. Common tree and shrub species observed included quaking aspen (*Populus tremuloides*), red maple (*Acer rubrum*), gray birch (*Betula populifolia*), green ash (*Fraxinus pennsylvanica*), common buckthorn (*Rhamnus cathartica*), and meadowsweet (*Spiraea latifolia*). Observed soils in the wetlands met classification as Soil Indicator F3: Depleted Matrix. Hydrology Indicators observed included A3: Saturation, B10: Drainage Patterns, and D4: Microtopographic Relief.

Corps Wetland Data Forms, which contain data taken at plots within the wetlands and uplands are included in Appendix E. Color photographs are included in Appendix C.

3.4 Streams: Streams were not observed on, or within 75 feet of the site.

3.5 Vernal Pools: Potential vernal pools were not observed on, or within 250 feet of the site.

3.6 Resource Agency Mapped Resources: Watershed Resource Consultants, LLC (WRC) contacted and/or accessed the databases of natural resource agencies to identify if there are Threatened, Endangered, Significant or Essential species and/or habitats mapped on the site. Agencies contacted included the U.S. Fish and Wildlife Service (US FWS), Maine Department of Inland Fisheries and Wildlife (IF&W), and Maine Natural Areas Program (MNAP). Copies of resource agency responses and database searches are included in Appendix D.

According to the IF&W response letter and map, dated July 27, 2022, IF&W maps the site as within the habitat range of three species of bats that are protected under the Maine Endangered Species Act, and within the habitat range of five species of bats that are listed as species of Special Concern in Maine. According to the letter *“While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. However, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.”*

IF&W recommends that vernal pools be documented, and documentation sent to IF&W for review. No potential vernal pools were observed on or within 250 feet of the site.

The MNAP response letter dated July 11, 2022 states that *“According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Based on the information in our files and the landscape context of this project, there is a low probability that rare or significant botanical features occur at this project location.”* The MNAP database is not a site-specific field survey.

The US FWS database, accessed on October 20, 2022, indicates that two federally listed species should be considered as part of an effect analysis for the project: the Threatened northern long-eared bat and the Endangered Atlantic salmon. The database also lists the site as within Critical Habitat for the Atlantic salmon. The database lists the monarch butterfly as a Candidate Species. If the project will require a federal permit or will use federal funding, the federal action agency will determine if there are concerns regarding the project affecting this mapped habitat. Generally, bats are a concern if the site is near a known hibernacula or brooding tree, or if trees will be cut between about April 1 to October 31. Generally, Atlantic salmon are a concern if streams or near-stream areas are to be disturbed. Generally, monarch butterflies are a concern if there is milkweed (obligate host plant) growing on a site. WRC did not observe milkweed on the site.

WRC also reviewed available published mapping for the site including USGS topographic mapping, U.S. Fish and Wildlife National Wetland Inventory (NWI), U.S. Natural Resources Conservation Service (NRCS)

soil mapping, and FEMA flood maps, as available, to provide an indication of potential areas of protected natural resources on the property and for wetland classification purposes.

3.7 Classification: Based on the Cowardin Classification System, WRC classified Wetlands AB-1, AB-2, AB-4, and the southern portion of Wetland AB-3 as PEM1 (palustrine, emergent, persistent) wetlands. WRC classified the northern and eastern portions of Wetland AB-3 as PFO1 (palustrine, forested, broad-leaved deciduous) wetlands with PSS1 (palustrine, scrub-shrub, broad-leaved deciduous) wetland inclusions.

Wetlands on the site meet MDEP classification as “Wetlands Not of Special Significance” (WNSS).

4.0 GENERAL PERMITTING INFORMATION

Alterations to jurisdictional wetlands require a permit from the MDEP and the Corps, the type of permit dependent on the amount and type of alteration. General permitting information included pertains to resources observed on the site.

In general, wetland alterations of between 1 and 4,300 square feet of “Wetlands Not of Special Significance” require filing of a Corps Self-Verification Form to the Corps. Wetland alterations of between 4,300 and 15,000 square feet of “Wetlands Not of Special Significance” require filing of a MDEP Natural Resources Protection Act (NRPA) Tier 1 Permit Application to the MDEP and the Corps. Wetland alterations of greater than 15,000 square feet of “Wetlands Not of Special Significance”, or of any alteration of “Wetlands of Special Significance” require filing of a MDEP NRPA Tier 2, Tier 3, or Individual Permit Application to the Corps and MDEP, depending on the amount and type of alteration. These higher threshold permits generally require further submissions such as wetland data forms and a functional assessment and generally include a wetland compensation component. Please note that wetland alteration permit thresholds are for cumulative impacts since MDEP and Corps jurisdiction dates.

If wetland alteration occurs for the project, the Corps licensing process includes review for impacts to wetlands, Atlantic salmon habitat, and northern long-eared bat habitat.

If the project will trigger MDEP Site Location of Development Act (SLODA) permitting, other setbacks may apply to resource features; and further botanical and/or wildlife studies may be required.

WRC did not review Town of Orono ordinances regarding alterations to natural resources. WRC recommends that the Town of Orono be contacted during the planning process for the project if natural resources are proposed to be altered.

5.0 SUMMARY AND RECOMMENDATIONS

Watershed Resource Consultants, LLC (WRC) conducted Protected Natural Resources identification and delineation services on, and within appropriate setback distances of, an approximately 2-acre area of land in the vicinity of the proposed ASCC building addition on the University of Maine campus in Orono,

October 24, 2022

Maine. Four freshwater wetland areas were delineated on the site. The freshwater wetlands were forested, scrub-shrub, and emergent (old field).

Wetlands on the site meet MDEP classification as “Wetlands Not of Special Significance” (WNSS).

IF&W maps the site as within the habitat range of three species of bats that are protected under the Maine Endangered Species Act, and within the habitat range of five species of bats that are listed as species of Special Concern in Maine. According to the letter *“While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. However, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.”*

The US FWS database indicates that two federally listed species should be considered as part of an effect analysis for the project: the Threatened northern long-eared bat and the Endangered Atlantic salmon. The database also lists the site as within Critical Habitat for the Atlantic salmon. The database lists the monarch butterfly as a Candidate Species. If the project will require a federal permit or will use federal funding, the federal action agency will determine if there are concerns regarding the project affecting this mapped habitat. Generally, bats are a concern if the site is near a known hibernacula or brooding tree, or if trees will be cut between about April 1 to October 31. Generally, Atlantic salmon are a concern if streams or near-stream areas are to be disturbed. Generally, monarch butterflies are a concern if there is milkweed (obligate host plant) growing on a site. WRC did not observe milkweed on the site.

WRC recommends that alterations to Protected Natural Resources be avoided and minimized to the greatest extent practicable. If alterations to Protected Natural Resources are proposed, we recommend a pre-application meeting with the MDEP and Corps to discuss permitting requirements.

6.0 CLOSING

We appreciate the opportunity to assist the University of Maine during this phase of the project. If you have any questions, please contact us.

Sincerely,



Aleita M. Burman, CSS, CWS, LSE

Principal and Member | Watershed Resource Consultants, LLC
lburman@wrcmaine.com

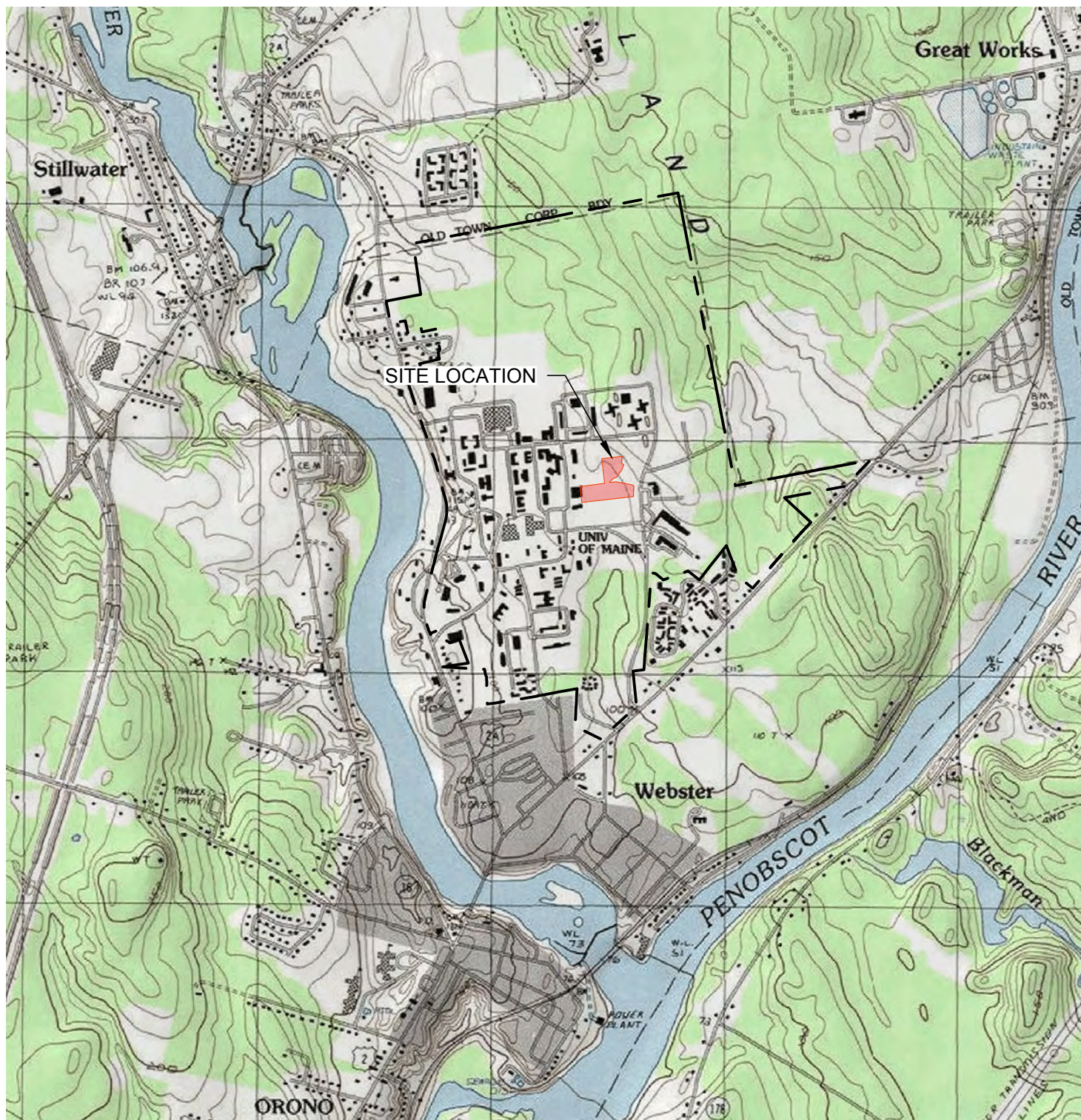
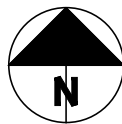
APPENDIX A

Limitations

Appendix A – Limitations

The scope of Watershed Resource Consultants, LLC services has been limited to Protected Natural Resources identification and delineation services on, and within appropriate setback distances of, an approximately 2-acre area of land in the vicinity of the proposed ASCC building addition on the University of Maine campus in Orono, Maine. This Report has been prepared for the exclusive use of the University of Maine. No warranty, expressed or implied, is made. The conclusions made in this report are based on the data obtained from the areas explored at the time of services.

APPENDIX B
Site Location Map
Protected Natural Resources Plan



Do Not Use for Construction
For Regulatory Review Only

Watershed Resource Consultants, LLC.

1366 State Hwy 102 PO Box 145
#6 Bar Harbor, ME 04609 Orrington, ME 025-4050
(207) 944-7288 (207) 825-4050
rstamand@wrcmaine.com lburman@wrcmaine.com

**Site Location Map
Proposed ASCC Building Expansion**

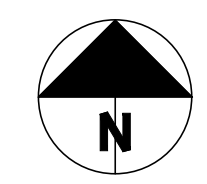
University of Maine
Orono, Maine

Job No.: 22544

Date: 10/21/2022

Scale: 1" = 2,000'

Sheet: B-1



| | | | | |
|-----|----------------------|-------|-------|------|
| — | — | — | — | — |
| — | — | — | — | — |
| No. | Revision Description | Drwn. | Chk'd | Date |

APPENDIX C
Color Photographs



Photo 1: Wetland AB-1: PEM1 (old field). ASCC building to right. Photograph taken June 23, 2022.



Photo 2: Wetland AB-2: PEM1 (old field). ASCC building to right. Photograph taken June 23, 2022.



Photo 3: Wetland AB-3: PEM1 portion (old field). Photograph taken June 23, 2022.



Photo 4: Wetland AB-3: PFO1 portion. Photograph taken June 23, 2022.



Photo 5: Wetland AB-4: PEM1 (old field). ASCC building to right. Photograph taken June 23, 2022.



Photo 6: Data Form (DF) 1 in Wetland AB-1. Photograph taken October 04, 2022.



Photo 7: Data Form (DF) 2 in Upland between Wetland AB-1 and AB-2.
Photograph taken October 04, 2022.



Photo 8: Data Form (DF) 3 in Wetland AB-2. Photograph taken October 04, 2022.



Photo 9: Data Form (DF) 4 in Upland between Wetland AB-2 and AB-4.
Photograph taken October 04, 2022.



Photo 10: Data Form (DF) 5 in Wetland AB-4. Photograph taken October 04, 2022.



Photo 11: Data Form (DF) 6 in Wetland AB-3. Photograph taken October 04, 2022.



Photo 12: Data Form (DF) 7 in Upland east of Wetland AB-3. Photograph taken October 04, 2022.

APPENDIX D
Agency Letters



STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041



July 27, 2022

Lee Burman
Watershed Resource Consultants LLC
PO Box 145, Orrington
ME, ME 04474

RE: Information Request – Institutional Development Project, Orono

Dear Lee:

Per your request received on July 12, 2022, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *Institutional Development* project in Orono.

Our Department has not mapped any Essential Habitats or inland fisheries habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bat Species – Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S. §12801 - §12810. The three *Myotis* species include little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat. While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. However, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Significant Wildlife Habitat

Significant Vernal Pools - At this time MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs subject to protection under the Natural Resources Protection Act (NRPA) within the project area, which include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Agency for review well before the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program, Maine Department of Marine Resources, and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

A handwritten signature in black ink, appearing to read 'Becca Settele', with a stylized, flowing script.

Becca Settele
Wildlife Biologist

526000

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4974000

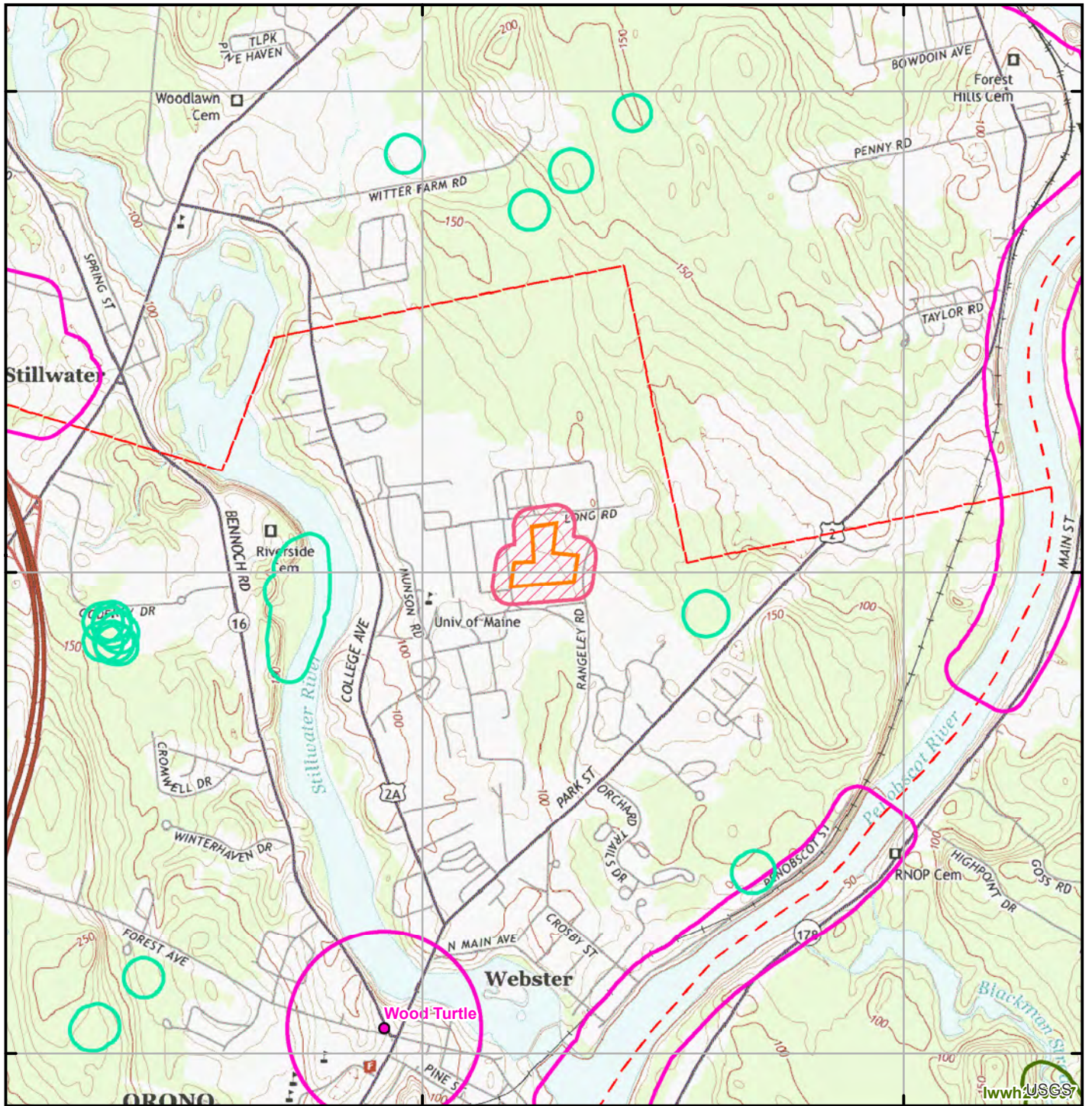
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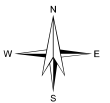
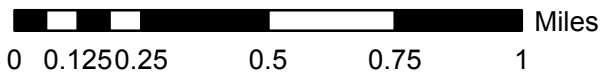
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Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name:

Institutional Development, Orono
(Version 1)Maine Department of
Inland Fisheries and Wildlife

Projection: UTM, NAD83, Zone 19N

Date: 7/12/2022

- ▬ ProjectSearchAreas - All Versions
- ▬ Maine Cliff and Talus Areas

- ▬ Deer Winter Area
- ▬ LUPC p-fw
- ▬ Cooperative DWAs
- ▬ Seabird Nesting Islands
- ▬ Shorebird Areas
- ▬ Inland Waterfowl and Wading Bird
- ▬ 2008 Iwwh - Shoreland Zoning
- ▬ Tidal Waterfowl and Wading Bird
- ▬ Significant Vernal Pools
- ▬ Environmental Review Polygons

- ▬ Roseate Tern
- ▬ Piping Plover and Least Tern
- ▬ Aquatic ETSc - 2.5 mi review
- ▬ Rare Mussels - 5 mi review
- ▬ Maine Heritage Fish Waters
- ▬ Arctic Charr Habitat
- ▬ Redfin Pickerel and Swamp Darter Habitats - buffer100ft
- ▬ Special Concern occupied habitats - 100ft buffer
- ▬ Wild Lake Trout Habitats





STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

July 11, 2022

Aleita Burman
Watershed Resource Consultants
PO Box 145
Orrington, ME 04474

Via email: lburman@wrcmaine.com

Re: Rare and exemplary botanical features in proximity to: #22544, Institutional Development, University of Maine Campus, Orono, Maine

Dear Ms. Burman:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received July 9, 2022 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Orono, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Based on the information in our files and the landscape context of this project, there is a low probability that rare or significant botanical features occur at this project location.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
90 BLOSSOM LANE, DEERING BUILDING



PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

The Maine Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Lisa St. Hilaire

Lisa St. Hilaire | Information Manager | Maine Natural Areas Program
207-287-8044 | lisa.st.hilaire@maine.gov



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588



In Reply Refer To:

October 20, 2022

Project Code: 2023-0006740

Project Name: University of Maine, ASCC Building Expansion Project, Orono, Me

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

(207) 469-7300

Project Summary

Project Code: 2023-0006740
Project Name: University of Maine, ASCC Building Expansion Project, Orono, Me
Project Type: New Constr - Above Ground
Project Description: The project is expansion of the ASCC Building on the University of Maine campus in Orono, Maine. Design has not been completed to date, but will include a building expansion and associated infrastructure including stormwater systems.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.9003125,-68.66430647349233,14z>



Counties: Penobscot County, Maine

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

| NAME | STATUS |
|--|------------|
| Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 | Threatened |

Fishes

| NAME | STATUS |
|--|------------|
| Atlantic Salmon <i>Salmo salar</i> Population: Gulf of Maine DPS There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2097 | Endangered |

Insects

| NAME | STATUS |
|--|-----------|
| Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743 | Candidate |

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

| NAME | STATUS |
|---|--------|
| Atlantic Salmon <i>Salmo salar</i> https://ecos.fws.gov/ecp/species/2097#crithab | Final |

IPaC User Contact Information

Agency: Watershed Resource Consultants, LLC

Name: Aleita Burman

Address: P.O. Box 145

City: Orrington

State: ME

Zip: 04474

Email: blburman@gmail.com

Phone: 2073856056



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588



In Reply Refer To:

October 20, 2022

Project code: 2023-0006740

Project Name: University of Maine, ASCC Building Expansion Project, Orono, Me

Subject: Verification letter for the 'University of Maine, ASCC Building Expansion Project, Orono, Me' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Aleita Burman:

The U.S. Fish and Wildlife Service (Service) received on October 20, 2022 your effects determination for the 'University of Maine, ASCC Building Expansion Project, Orono, Me' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"^[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Atlantic Salmon *Salmo salar* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

University of Maine, ASCC Building Expansion Project, Orono, Me

2. Description

The following description was provided for the project 'University of Maine, ASCC Building Expansion Project, Orono, Me':

The project is expansion of the ASCC Building on the University of Maine campus in Orono, Maine. Design has not been completed to date, but will include a building expansion and associated infrastructure including stormwater systems.

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.9003125,-68.66430647349233,14z>

**Determination Key Result**

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

No

3. Will your activity purposefully **Take** northern long-eared bats?

No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

Automatically answered

No

5. [Semantic] Is the project action area located within 0.25 miles of a known northern long-eared bat hibernaculum?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

Automatically answered

No

6. [Semantic] Is the project action area located within 150 feet of a known occupied northern long-eared bat maternity roost tree?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

Automatically answered

No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

2

2. If known, estimated acres of forest conversion from April 1 to October 31

2

3. If known, estimated acres of forest conversion from June 1 to July 31

2

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

IPaC User Contact Information

Agency: Watershed Resource Consultants, LLC
Name: Aleita Burman
Address: P.O. Box 145
City: Orrington
State: ME
Zip: 04474
Email: blburman@gmail.com
Phone: 2073856056

Lead Agency Contact Information

Lead Agency: Army Corps of Engineers
Name: Shawn Mahaney
Email: shawn.b.mahaney@usace.army.mil



U.S. Fish and Wildlife Service

National Wetlands Inventory

Wetlands



October 20, 2022

Wetlands

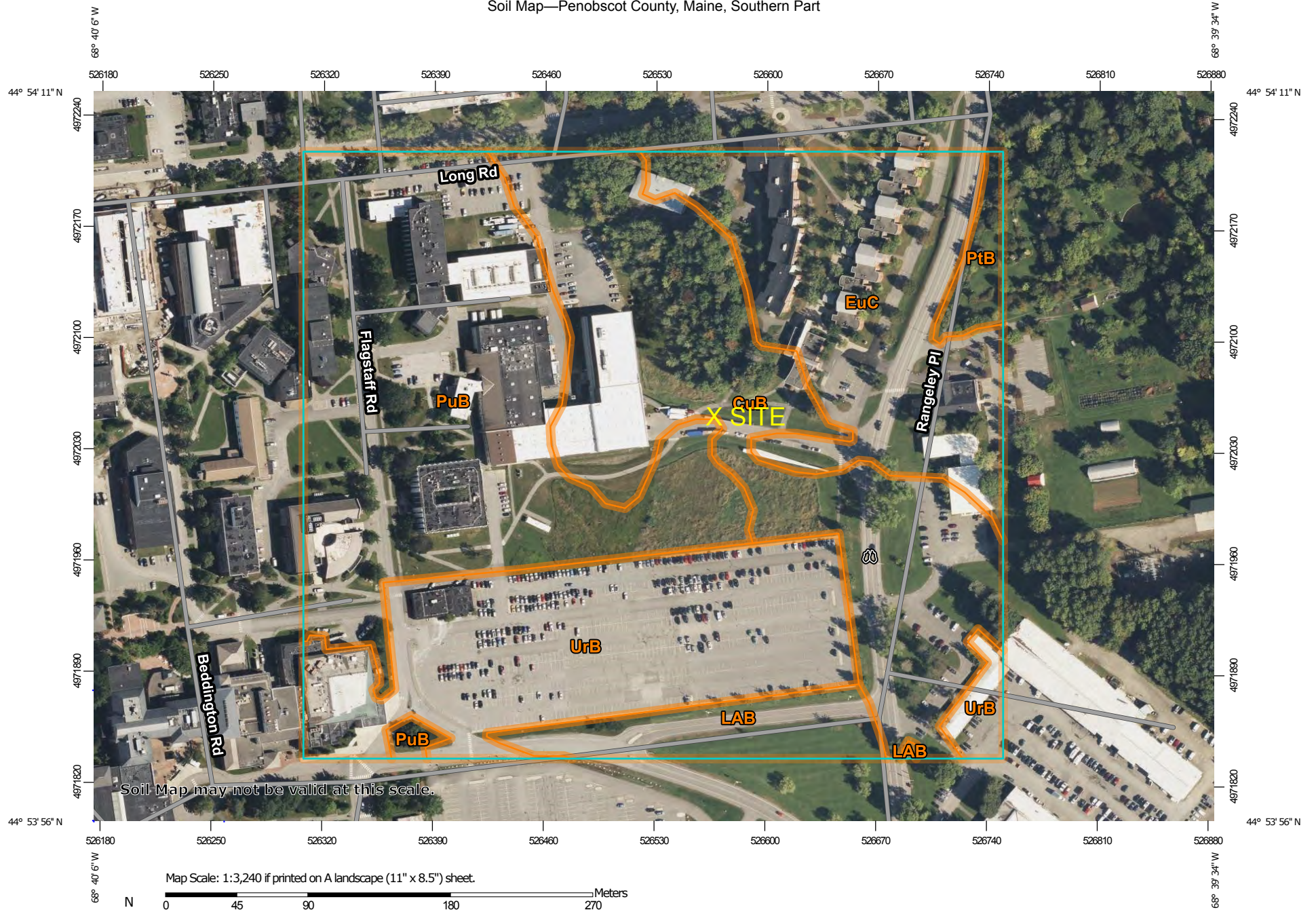
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Soil Map—Penobscot County, Maine, Southern Part




Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

10/20/2022
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Penobscot County, Maine, Southern Part

Survey Area Data: Version 8, Aug 30, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 11, 2021—Oct 29, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------------|----------------|
| CuB | Chesuncook-Telos-Urban land association, 0 to 8 percent slopes | 10.5 | 25.0% |
| EuC | Elliottsville-Urban land-Chesuncook association, 0 to 15 percent slopes | 7.6 | 18.0% |
| LAB | Lamoine-Scantic complex, 0 to 8 percent slopes | 1.9 | 4.6% |
| PtB | Peru-Tunbridge association, 3 to 8 percent slopes, very stony | 0.7 | 1.7% |
| PuB | Pushaw-Swanville-Urban land association, 0 to 8 percent slopes | 12.7 | 30.2% |
| UrB | Urban land-Anthroportic Udorthents complex, 0 to 8 percent slopes | 8.6 | 20.5% |
| Totals for Area of Interest | | 41.9 | 100.0% |

Maine Flood Hazard Map



10/20/2022, 11:09:09 AM

Flood_Zones_Q3



AE



X500

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Esri Community Maps Contributors, Province of New Brunswick, ©
OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies,
Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, Maine
Floodplain Program, FEMA, Maxar

Maine Floodplain Program

2017

APPENDIX E
Corps Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: University of Maine, ASCC Building Expansion City/County: Orono/Penobscot Sampling Date: 10/04/22
 Applicant/Owner: University of Maine State: ME Sampling Point: DF 1 WET
 Investigator(s): Aleita Burman Section, Township, Range: _____
 Landform (hillside, terrace, etc.): shallow hillside Local relief (concave, convex, none): concave Slope %: 0-5%
 Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 44.900735 Long: -68.664144 Datum: WGS 84
 Soil Map Unit Name: PuB: Pushaw-Swanville-Urban Land Association, 0-8 percent slopes NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland AB-1</u> |
| Remarks: (Explain alternative procedures here or in a separate report.) Wetland is within the developed area of the University of Maine campus, between a large parking lot and the ASCC Building, and associated roads and paved walkways. Vegetation, soils and hydrology are disturbed, with apparent grading, fill, and breaks in natural hydrology at least along the edges of the wetland. Wetland contains a drainage structure. | |

HYDROLOGY

| | |
|---|---|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) <u>X</u> High Water Table (A2) _____ Aquatic Fauna (B13) <u>X</u> Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8) | <u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <u>X</u> Geomorphic Position (D2) <u>X</u> Shallow Aquitard (D3) <u>X</u> Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>12</u> Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <u>X</u> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: | |

Sampling Point: DF 1 WET

| Tree Stratum | | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------|----------------------------|------------------|-------------------|------------------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| | | =Total Cover | | |
| Sapling/Shrub Stratum | | | | |
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| | | =Total Cover | | |
| Herb Stratum | | | | |
| 1. | <i>Phalaris arudinacea</i> | 100 | Yes | FACW |
| 2. | <i>Agrostis perennans</i> | 5 | No | FACU |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. | | | | |
| | | 105 | =Total Cover | |
| Woody Vine Stratum | | | | |
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| | | =Total Cover | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

| Total % Cover of: | | Multiply by: | |
|--------------------------|---------|--------------|---------|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 100 | x 2 = | 200 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 5 | x 4 = | 20 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 105 (A) | | 220 (B) |
| Prevalence Index = B/A = | | 2.10 | |

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DF 1 WET

[illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: University of Maine, ASCC Building Expansion City/County: Orono/Penobscot Sampling Date: 10/04/22
Applicant/Owner: University of Maine State: ME Sampling Point: DF 2 UPL
Investigator(s): Aleita Burman Section, Township, Range: _____
Landform (hillside, terrace, etc.): Shallow Hillside Local relief (concave, convex, none): gentle slope Slope (%): 2-5
Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 44.900801 Long: -68.663945 Datum: WGS 84
Soil Map Unit Name: PuB: Pushaw-Swanville-Urbanland Association, 0 to 8 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation X, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|---|
| Hydrophytic Vegetation Present? Yes _____ No <u>x</u> | Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____ |
| Hydric Soil Present? Yes _____ No <u>X</u> | |
| Wetland Hydrology Present? Yes _____ No <u>X</u> | |
| Remarks: (Explain alternative procedures here or in a separate report.) Upland is within the developed area of the University of Maine campus, between a large parking lot and the ASCC Building, and associated roads and paved walkways. Vegetation, soils and hydrology are disturbed, with apparent grading, fill, and breaks in natural hydrology in some areas. | |

HYDROLOGY

| | | |
|--|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | <u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe) | Wetland Hydrology Present? Yes _____ No <u>X</u> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION – Use scientific names of plants.

 Sampling Point: DF 2 UPL

| Tree Stratum (Plot size: <u>30Ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | |
|--|--------------------|---------------------|------------------|---|-------------------|--------------|----------------------|----------------|------------------------|-----------------|-----------------------|-----------------|-------------------------|------------------|----------------------|----------------|---------------------------|--------------------|--------------------------------------|--|
| 1. <u><i>Pinus strobus</i></u> | <u>5</u> | <u>Yes</u> | <u>FACU</u> | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B) | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | <u>5</u> | <u>=Total Cover</u> | | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>20</u></td> <td>x 3 = <u>60</u></td> </tr> <tr> <td>FACU species <u>100</u></td> <td>x 4 = <u>400</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>140</u></td> <td>(A) <u>500</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>3.57</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>20</u> | x 2 = <u>40</u> | FAC species <u>20</u> | x 3 = <u>60</u> | FACU species <u>100</u> | x 4 = <u>400</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>140</u> | (A) <u>500</u> (B) | Prevalence Index = B/A = <u>3.57</u> | |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | | | |
| OBL species <u>0</u> | x 1 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| FACW species <u>20</u> | x 2 = <u>40</u> | | | | | | | | | | | | | | | | | | | |
| FAC species <u>20</u> | x 3 = <u>60</u> | | | | | | | | | | | | | | | | | | | |
| FACU species <u>100</u> | x 4 = <u>400</u> | | | | | | | | | | | | | | | | | | | |
| UPL species <u>0</u> | x 5 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| Column Totals: <u>140</u> | (A) <u>500</u> (B) | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>3.57</u> | | | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15Ft</u>) | | | | Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) | | | | | | | | | | | | | | | | |
| 1. <u><i>Pinus strobus</i></u> | <u>5</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | <u>5</u> | <u>=Total Cover</u> | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5Ft</u>) | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | |
| 1. <u><i>Lupinus polyphyllus</i></u> | <u>30</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 2. <u><i>Solidago rugosa</i></u> | <u>20</u> | <u>No</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 3. <u><i>Phalaris arundinacea</i></u> | <u>20</u> | <u>No</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 4. <u><i>Galium mollugo</i></u> | <u>25</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 5. <u><i>Solidago canadensis</i></u> | <u>5</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 6. <u><i>Elymus repens</i></u> | <u>5</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 7. <u><i>Agrostis perennans</i></u> | <u>25</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 8. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 9. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 10. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 11. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 12. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | <u>130</u> | <u>=Total Cover</u> | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Present? Yes <u> </u> No <u> </u> x | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | _____ | <u>=Total Cover</u> | | | | | | | | | | | | | | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DF 2 UPL

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) | | | | | | | | |
|---|---------------|-----|----------------|----|-------------------|------------------|--------------|--------------|
| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-4 | 2.5Y 4/3 | 100 | | | | | Loamy/Clayey | Ap, granular |
| 4-10 | 2.5Y 4/3 | 100 | | | | | Loamy/Clayey | B, blocky |
| 10-18 | 2.5y 4/3 | 80 | 10YR 3/6 | 20 | C | M | Loamy/Clayey | BC, firm |
| | | | | | | | | |
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¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | | | Indicators for Problematic Hydric Soils ³ : | | |
|--|--|--|--|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, | <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B) | | | |
| <input type="checkbox"/> Histic Epipedon (A2) | MLRA 149B) | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) | | | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) | | | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> High Chroma Sands (S11) (LRR K, L) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L) | | | |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L) | | | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) | | | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) | | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B) | | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Red Parent Material (F21) | | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Redox Depressions (F8) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Marl (F10) (LRR K, L) | <input type="checkbox"/> Other (Explain in Remarks) | | | |
| <input type="checkbox"/> Dark Surface (S7) | | | | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| Restrictive Layer (if observed): | | | |
|----------------------------------|--|----------------------|----------|
| Type: Firm Layer | | | |
| Depth (inches): 10 | | Hydric Soil Present? | Yes No X |

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: University of Maine, ASCC Building Expansion City/County: Orono/Penobscot Sampling Date: 10/04/22
 Applicant/Owner: University of Maine State: ME Sampling Point: DF 3 WET
 Investigator(s): Aleita Burman Section, Township, Range: _____
 Landform (hillside, terrace, etc.): shallow hillside Local relief (concave, convex, none): concave Slope %: 0-5%
 Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 44.900874 Long: -68.663583 Datum: WGS 84
 Soil Map Unit Name: PuB: Pushaw-Swanville-Urbanland Complex NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|-----------------------|---|
| Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland AB-2</u> |
| Hydric Soil Present? | Yes <u>X</u> No _____ | |
| Wetland Hydrology Present? | Yes <u>X</u> No _____ | |
| Remarks: (Explain alternative procedures here or in a separate report.) Wetland is within the developed area of the University of Maine campus, between a large parking lot and the ASCC Building, and associated roads and paved walkways. Vegetation, soils and hydrology are disturbed, with apparent grading, fill, and breaks in natural hydrology at least along the edges of the wetland. | | |

HYDROLOGY

| | | |
|---|--|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8) | | <u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <u>X</u> Geomorphic Position (D2) ? Shallow Aquitard (D3) <u>X</u> Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>10</u> (includes capillary fringe) | | Wetland Hydrology Present? Yes <u>X</u> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION – Use scientific names of plants.

 Sampling Point: DF 3 WET

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | |
|--|------------------|-------------------|------------------|--|-------------------|--------------|----------------------|----------------|------------------------|------------------|----------------------|-----------------|------------------------|------------------|----------------------|----------------|-------------------------------|----------------|--------------------------------------|--|
| 1. _____ | _____ | _____ | _____ | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>85</u></td> <td>x 2 = <u>170</u></td> </tr> <tr> <td>FAC species <u>7</u></td> <td>x 3 = <u>21</u></td> </tr> <tr> <td>FACU species <u>25</u></td> <td>x 4 = <u>100</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>117</u> (A)</td> <td><u>291</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.49</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>85</u> | x 2 = <u>170</u> | FAC species <u>7</u> | x 3 = <u>21</u> | FACU species <u>25</u> | x 4 = <u>100</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>117</u> (A) | <u>291</u> (B) | Prevalence Index = B/A = <u>2.49</u> | |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | | | |
| OBL species <u>0</u> | x 1 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| FACW species <u>85</u> | x 2 = <u>170</u> | | | | | | | | | | | | | | | | | | | |
| FAC species <u>7</u> | x 3 = <u>21</u> | | | | | | | | | | | | | | | | | | | |
| FACU species <u>25</u> | x 4 = <u>100</u> | | | | | | | | | | | | | | | | | | | |
| UPL species <u>0</u> | x 5 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| Column Totals: <u>117</u> (A) | <u>291</u> (B) | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>2.49</u> | | | | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5'</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Phalaris arundinacea</u> | <u>85</u> | <u>Yes</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 2. <u>Solidago rugosa</u> | <u>7</u> | <u>No</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 3. <u>Festuca rubra</u> | <u>20</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 4. <u>Poa pratensis</u> | <u>5</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 8. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 9. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 10. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 11. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 12. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| <u>117</u> =Total Cover | | | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> | | | | | | | | | | | | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DF 3 WET

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) | | | | | | | | |
|---|---------------|----|----------------|----|-------------------|------------------|--------------|--------------------------------|
| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-5 | 2.5Y 4/3 | | | | | | Loamy/Clayey | Ap, friable |
| 5-10 | 2.5Y 4/2 | 80 | 5Y 5/1 | 10 | D | M | Loamy/Clayey | Bg, firm |
| | | | 10YR 3/6 | 10 | C | M | | Prominent redox concentrations |
| 10-15 | 2.5Y 4/2 | 60 | 5Y 5/1 | 20 | D | M | Loamy/Clayey | BCg, very firm |
| | | | 10YR 3/6 | 20 | C | M | | Prominent redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
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¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7)

☐

Polyvalue Below Surface (S8) (**LRR R,
MLRA 149B**)
☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
☐ High Chroma Sands (S11) (**LRR K, L**)
☐ Loamy Mucky Mineral (F1) (**LRR K, L**)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils³:
☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
☐ ? Coast Prairie Redox (A16) (**LRR K, L, R**)
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
☐ Polyvalue Below Surface (S8) (**LRR K, L**)
☐ Thin Dark Surface (S9) (**LRR K, L**)
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (F22)
☐ Other (Explain in Remarks)

Restrictive Layer (if observed):
Type: Firm Layer
Depth (inches): 5

Hydric Soil Present? Yes X No

Remarks:
This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nracs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: University of Maine, ASCC Building Expansion City/County: Orono/Penobscot Sampling Date: 10/04/22
Applicant/Owner: University of Maine State: ME Sampling Point: DF 4 UPL
Investigator(s): Aleita Burman Section, Township, Range: _____
Landform (hillside, terrace, etc.): Shallow Hillside Local relief (concave, convex, none): gentle slope Slope (%): 1-3
Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 44.900873 Long: -68.663211 Datum: WGS 84
Soil Map Unit Name: PuB: Pushaw-Swanville-Urbanland Association, 0 to 8 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|--|-----------|-------------|---|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>x</u> | Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____ |
| Hydric Soil Present? | Yes _____ | No <u>x</u> | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | |
| Remarks: (Explain alternative procedures here or in a separate report.) Upland is within the developed area of the University of Maine campus, between a large parking lot and the ASCC Building, and associated roads and paved walkways. Vegetation, soils and hydrology are disturbed, with apparent grading, fill, and breaks in natural hydrology in some areas. DF 4 UPL is within/near a buried utility. | | | |

HYDROLOGY

| | | |
|--|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | <u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe) | Wetland Hydrology Present? Yes _____ No <u>X</u> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION – Use scientific names of plants.

 Sampling Point: DF 4 UPL

| <u>Tree Stratum</u> (Plot size: <u>30Ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | |
|---|---------------------|----------------------|---------------------|---|-------------------|--------------|----------------------|----------------|------------------------|------------------|----------------------|----------------|------------------------|------------------|----------------------|----------------|---------------------------|--------------------|--------------------------------------|--|
| 1. _____ | _____ | _____ | _____ | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B) | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>60</u></td> <td>x 4 = <u>240</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>110</u></td> <td>(A) <u>340</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.09</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>50</u> | x 2 = <u>100</u> | FAC species <u>0</u> | x 3 = <u>0</u> | FACU species <u>60</u> | x 4 = <u>240</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>110</u> | (A) <u>340</u> (B) | Prevalence Index = B/A = <u>3.09</u> | |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | | | |
| OBL species <u>0</u> | x 1 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| FACW species <u>50</u> | x 2 = <u>100</u> | | | | | | | | | | | | | | | | | | | |
| FAC species <u>0</u> | x 3 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| FACU species <u>60</u> | x 4 = <u>240</u> | | | | | | | | | | | | | | | | | | | |
| UPL species <u>0</u> | x 5 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| Column Totals: <u>110</u> | (A) <u>340</u> (B) | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>3.09</u> | | | | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15Ft</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| <u>Herb Stratum</u> (Plot size: <u>5Ft</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Phalaris arundinacea</u> | <u>50</u> | <u>Yes</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 2. <u>Cirsium arvense</u> | <u>50</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 3. <u>Lupinus polyphyllus</u> | <u>10</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 8. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 9. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 10. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 11. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 12. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| <u>110</u> =Total Cover | | | | | | | | | | | | | | | | | | | | |
| <u>Woody Vine Stratum</u> (Plot size: _____) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| Hydrophytic Vegetation Present? Yes <u> </u> No <u> </u> x | | | | | | | | | | | | | | | | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DF 4 UPL

[illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: University of Maine, ASCC Building Expansion City/County: Orono/Penobscot Sampling Date: 10/04/22
 Applicant/Owner: University of Maine State: ME Sampling Point: DF 5 WET
 Investigator(s): Aleita Burman Section, Township, Range: _____
 Landform (hillside, terrace, etc.): shallow hillside Local relief (concave, convex, none): concave Slope %: 0-5%
 Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 44.900834 Long: -68.662886 Datum: WGS 84
 Soil Map Unit Name: CuB: Chesuncook-Telos-Urbanland Association NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|-----------------------|---|
| Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland AB-4</u> |
| Hydric Soil Present? | Yes <u>X</u> No _____ | |
| Wetland Hydrology Present? | Yes <u>X</u> No _____ | |
| Remarks: (Explain alternative procedures here or in a separate report.) Wetland is within the developed area of the University of Maine campus, between a large parking lot and the ASCC Building, and associated roads and paved walkways. Vegetation, soils and hydrology are disturbed, with apparent grading, fill, and breaks in natural hydrology at least along the edges of the wetland. Drainage structure in/near wetland. | | |

HYDROLOGY

| | | |
|---|--|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8) | | <u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <u>X</u> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>10</u> (includes capillary fringe) | | Wetland Hydrology Present? Yes <u>X</u> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION – Use scientific names of plants.

 Sampling Point: DF 5 WET

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | |
|--|------------------|-------------------|------------------|---|-------------------|--------------|----------------------|----------------|-------------------------|------------------|----------------------|----------------|------------------------|-----------------|----------------------|----------------|-------------------------------|----------------|--------------------------------------|--|
| 1. _____ | _____ | _____ | _____ | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B) | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>100</u></td> <td>x 2 = <u>200</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>10</u></td> <td>x 4 = <u>40</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>110</u> (A)</td> <td><u>240</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.18</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>100</u> | x 2 = <u>200</u> | FAC species <u>0</u> | x 3 = <u>0</u> | FACU species <u>10</u> | x 4 = <u>40</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>110</u> (A) | <u>240</u> (B) | Prevalence Index = B/A = <u>2.18</u> | |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | | | |
| OBL species <u>0</u> | x 1 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| FACW species <u>100</u> | x 2 = <u>200</u> | | | | | | | | | | | | | | | | | | | |
| FAC species <u>0</u> | x 3 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| FACU species <u>10</u> | x 4 = <u>40</u> | | | | | | | | | | | | | | | | | | | |
| UPL species <u>0</u> | x 5 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| Column Totals: <u>110</u> (A) | <u>240</u> (B) | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>2.18</u> | | | | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5'</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Phalaris arundinacea</u> | <u>100</u> | <u>Yes</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 2. <u>Agrostis perennans</u> | <u>10</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. <u>pratensi</u> | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 8. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 9. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 10. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 11. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 12. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| <u>110</u> =Total Cover | | | | Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | | | | | | | | | | | | | | | | | |
| =Total Cover | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ | | | | | | | | | | | | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point DF 5 WET

[illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: University of Maine, ASCC Building Expansion City/County: Orono/Penobscot Sampling Date: 10/04/22
Applicant/Owner: University of Maine State: ME Sampling Point: DF 6 WET
Investigator(s): Aleita Burman Section, Township, Range: _____
Landform (hillside, terrace, etc.): Shallow Hillside Local relief (concave, convex, none): Sloped Slope (%): 1-6
Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 44.901759 Long: -68.663563 Datum: WGS 84
Soil Map Unit Name: CuB: Chesuncook-Telos-Urbanland Association, 0-8 percent slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|-----------------------|---|
| Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>Wetland AB-3</u> |
| Hydric Soil Present? | Yes <u>X</u> No _____ | |
| Wetland Hydrology Present? | Yes <u>X</u> No _____ | |
| Remarks: (Explain alternative procedures here or in a separate report.) Forested wetland is on relatively undisturbed wooded hillside, transitioning down to disturbed (old field) wetland at base of slope. These soils appear and vegetation is somewhat disturbed either from farming or historic campus alterations. Wetland is surrounded by development. | | |

HYDROLOGY

| | | |
|--|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u> </u> Surface Water (A1) <u> </u> Water-Stained Leaves (B9) <u> </u> High Water Table (A2) <u> </u> Aquatic Fauna (B13) <u> X </u> Saturation (A3) <u> </u> Marl Deposits (B15) <u> </u> Water Marks (B1) <u> </u> Hydrogen Sulfide Odor (C1) <u> </u> Sediment Deposits (B2) <u> </u> Oxidized Rhizospheres on Living Roots (C3) <u> </u> Drift Deposits (B3) <u> </u> Presence of Reduced Iron (C4) <u> </u> Algal Mat or Crust (B4) <u> </u> Recent Iron Reduction in Tilled Soils (C6) <u> </u> Iron Deposits (B5) <u> </u> Thin Muck Surface (C7) <u> </u> Inundation Visible on Aerial Imagery (B7) <u> </u> Other (Explain in Remarks) <u> </u> Sparsely Vegetated Concave Surface (B8) | | <u>Secondary Indicators (minimum of two required)</u> <u> </u> Surface Soil Cracks (B6) <u> X </u> Drainage Patterns (B10) <u> </u> Moss Trim Lines (B16) <u> </u> Dry-Season Water Table (C2) <u> </u> Crayfish Burrows (C8) <u> </u> Saturation Visible on Aerial Imagery (C9) <u> </u> Stunted or Stressed Plants (D1) <u> X </u> Geomorphic Position (D2) <u> </u> Shallow Aquitard (D3) <u> X </u> Microtopographic Relief (D4) <u> </u> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>10</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <u>X</u> No _____ | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION – Use scientific names of plants.

 Sampling Point: DF 6 WET

| Tree Stratum (Plot size: <u>10M</u>) | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | |
|--|------------------|---------------------|------------------|--|-------------------|--------------|----------------------|----------------|------------------------|-----------------|------------------------|------------------|------------------------|------------------|----------------------|----------------|-------------------------------|----------------|--------------------------------------|--|
| 1. <u>Fraxinus pennsylvanica</u> | <u>7</u> | <u>No</u> | <u>FACW</u> | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80.0%</u> (A/B) | | | | | | | | | | | | | | | | |
| 2. <u>Acer rubrum</u> | <u>50</u> | <u>Yes</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 3. <u>Betula populifolia</u> | <u>7</u> | <u>No</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | <u>64</u> | <u>=Total Cover</u> | | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species <u>5</u></td> <td>x 1 = <u>5</u></td> </tr> <tr> <td>FACW species <u>13</u></td> <td>x 2 = <u>26</u></td> </tr> <tr> <td>FAC species <u>232</u></td> <td>x 3 = <u>696</u></td> </tr> <tr> <td>FACU species <u>65</u></td> <td>x 4 = <u>260</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>315</u> (A)</td> <td><u>987</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>3.13</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>5</u> | x 1 = <u>5</u> | FACW species <u>13</u> | x 2 = <u>26</u> | FAC species <u>232</u> | x 3 = <u>696</u> | FACU species <u>65</u> | x 4 = <u>260</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>315</u> (A) | <u>987</u> (B) | Prevalence Index = B/A = <u>3.13</u> | |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | | | |
| OBL species <u>5</u> | x 1 = <u>5</u> | | | | | | | | | | | | | | | | | | | |
| FACW species <u>13</u> | x 2 = <u>26</u> | | | | | | | | | | | | | | | | | | | |
| FAC species <u>232</u> | x 3 = <u>696</u> | | | | | | | | | | | | | | | | | | | |
| FACU species <u>65</u> | x 4 = <u>260</u> | | | | | | | | | | | | | | | | | | | |
| UPL species <u>0</u> | x 5 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| Column Totals: <u>315</u> (A) | <u>987</u> (B) | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>3.13</u> | | | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>5M</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Rhamnus cathartica</u> | <u>80</u> | <u>Yes</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 2. <u>Acer rubrum</u> | <u>25</u> | <u>Yes</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 3. <u>Betula populifolia</u> | <u>10</u> | <u>No</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | <u>115</u> | <u>=Total Cover</u> | | Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>1M</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Rhamnus cathartica</u> | <u>40</u> | <u>Yes</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 2. <u>Solidago canadensis</u> | <u>25</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 3. <u>Poa nemoralis</u> | <u>35</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 4. <u>Osmunda claytoniana</u> | <u>15</u> | <u>No</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 5. <u>Symphyotrichum lateriflorum</u> | <u>5</u> | <u>No</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 6. <u>Juncus canadensis</u> | <u>5</u> | <u>No</u> | <u>OBL</u> | | | | | | | | | | | | | | | | | |
| 7. <u>Oxalis montana</u> | <u>5</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 8. <u>Phalaris arundinacea</u> | <u>5</u> | <u>No</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 9. <u>Spiraea latifolia</u> | <u>1</u> | <u>No</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 10. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 11. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 12. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | <u>136</u> | <u>=Total Cover</u> | | Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | _____ | <u>=Total Cover</u> | | | | | | | | | | | | | | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DF 6 WET

[illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: University of Maine, ASCC Building Expansion City/County: Orono/Penobscot Sampling Date: 10/04/22
 Applicant/Owner: University of Maine State: ME Sampling Point: DF 7 UPL
 Investigator(s): Aleita Burman Section, Township, Range: _____
 Landform (hillside, terrace, etc.): Shallow Hillside Local relief (concave, convex, none): Sloped Slope (%): 5
 Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 44.901952 Long: -68.663319 Datum: WGS 84
 Soil Map Unit Name: CuB: Chesuncook-Telos-Urbanland association, 0 to 8 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | |
|---|-----------------------|---|
| Hydrophytic Vegetation Present? | Yes _____ No <u>X</u> | Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____ |
| Hydric Soil Present? | Yes _____ No <u>X</u> | |
| Wetland Hydrology Present? | Yes _____ No <u>X</u> | |
| Remarks: (Explain alternative procedures here or in a separate report.) Upland is within the developed area of the University of Maine campus, between a dorm and the ASCC building. The wooded area appears relatively undisturbed. | | |

HYDROLOGY

| | | |
|---|--|---|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8) | | <u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe) | | Wetland Hydrology Present? Yes _____ No <u>X</u> |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | |
| Remarks: | | |

VEGETATION – Use scientific names of plants.

 Sampling Point: DF 7 UPL

| Tree Stratum (Plot size: <u>30Ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | | | | | | | | | | | | | | | | | |
|---|--------------------|-------------------------|------------------|--|-------------------|--------------|----------------------|----------------|------------------------|------------------|-----------------------|-----------------|-------------------------|------------------|----------------------|----------------|---------------------------|--------------------|--------------------------------------|--|
| 1. <u>Pinus strobus</u> | <u>50</u> | <u>Yes</u> | <u>FACU</u> | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20.0%</u> (A/B) | | | | | | | | | | | | | | | | |
| 2. <u>Quercus rubra</u> | <u>50</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 3. <u>Acer rubrum</u> | <u>10</u> | <u>No</u> | <u>FAC</u> | | | | | | | | | | | | | | | | | |
| 4. <u>Pinus resinosa</u> | <u>10</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 5. <u>Fraxinus pennsylvanica</u> | <u>10</u> | <u>No</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | | <u>130</u> =Total Cover | | Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>10</u></td> <td>x 3 = <u>30</u></td> </tr> <tr> <td>FACU species <u>185</u></td> <td>x 4 = <u>740</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>245</u></td> <td>(A) <u>870</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>3.55</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>50</u> | x 2 = <u>100</u> | FAC species <u>10</u> | x 3 = <u>30</u> | FACU species <u>185</u> | x 4 = <u>740</u> | UPL species <u>0</u> | x 5 = <u>0</u> | Column Totals: <u>245</u> | (A) <u>870</u> (B) | Prevalence Index = B/A = <u>3.55</u> | |
| Total % Cover of: | Multiply by: | | | | | | | | | | | | | | | | | | | |
| OBL species <u>0</u> | x 1 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| FACW species <u>50</u> | x 2 = <u>100</u> | | | | | | | | | | | | | | | | | | | |
| FAC species <u>10</u> | x 3 = <u>30</u> | | | | | | | | | | | | | | | | | | | |
| FACU species <u>185</u> | x 4 = <u>740</u> | | | | | | | | | | | | | | | | | | | |
| UPL species <u>0</u> | x 5 = <u>0</u> | | | | | | | | | | | | | | | | | | | |
| Column Totals: <u>245</u> | (A) <u>870</u> (B) | | | | | | | | | | | | | | | | | | | |
| Prevalence Index = B/A = <u>3.55</u> | | | | | | | | | | | | | | | | | | | | |
| | | <u>110</u> =Total Cover | | | | | | | | | | | | | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15Ft</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Fraxinus pennsylvanica</u> | <u>40</u> | <u>Yes</u> | <u>FACW</u> | | | | | | | | | | | | | | | | | |
| 2. <u>Quercus rubra</u> | <u>50</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 3. <u>Picea rubens</u> | <u>20</u> | <u>No</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | | <u>110</u> =Total Cover | | Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | | | | | | | | | | | |
| | | <u>5</u> =Total Cover | | | | | | | | | | | | | | | | | | |
| Herb Stratum (Plot size: <u>5Ft</u>) | | | | | | | | | | | | | | | | | | | | |
| 1. <u>Berberis thunbergii</u> | <u>5</u> | <u>Yes</u> | <u>FACU</u> | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 5. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 6. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 7. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 8. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 9. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 10. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 11. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 12. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | | <u>5</u> =Total Cover | | Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. | | | | | | | | | | | | | | | | |
| | | <u>5</u> =Total Cover | | | | | | | | | | | | | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | | | | | | | | | | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 2. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 3. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| 4. _____ | _____ | _____ | _____ | | | | | | | | | | | | | | | | | |
| | | _____ =Total Cover | | | | | | | | | | | | | | | | | | |
| Hydrophytic Vegetation Present? Yes _____ No <u>X</u> | | | | | | | | | | | | | | | | | | | | |

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DF 7 UPL

[illegible]

WATERSHED RESOURCE CONSULTANTS, LLC

NATURAL RESOURCE AND SOIL SCIENCE CONSULTING

WRC #22544
October 24, 2022

University of Maine
Facilities Management
Attention: Jonathan Dow, Project Manager
5765 Service Building 111
Orono, Maine 04469-5765

Subject: Wetland Functional Assessment Report
ASCC Building Expansion Project
University of Maine
Orono, Maine

Dear Jonathan,

This Report presents the findings of wetland functional assessment services conducted by Watershed Resource Consultants, LLC (WRC) on delineated wetlands within approximately 2-acres of land in the vicinity of the proposed ASCC building addition on the University of Maine campus in Orono, Maine. The purpose of the services was to assess and provide a report of wetland functions and values identified within the proposed expansion area.

This report is subject to the Limitations in Appendix A. Appendix B contains Corps Wetland Function-Value Evaluation Forms and Vegetation-Wildlife List.

SITE LOCATION AND DESCRIPTION

The existing ASCC building is located at the end of Brown Road, in the central portion of campus, at the University of Maine in Orono, Maine. The proposed expansion area and associated infrastructure is south and east of the building. The approximately 2-acre area within which WRC conducted services (i.e. the "site") is located between a large commuter parking lot to the south, an access road to the west, the ASCC building to the northwest, a social trail that leads to a dorm to the north, and a dorm, Brown Road, and paved accessways to the east. A portion of Brown Road and associated parking area and sidewalk, a windmill blade, paved pedestrian walkways, two electrical structures, a small parking area, and a utility building and associated accessways are within the site.

The site is on a westerly sideslope of a local hill. It is in the Stillwater River watershed, which is part of the Penobscot River system. Site slopes range from approximately 0-6%, with steeper slopes at fill extensions.

BAR HARBOR OFFICE
1366 STATE HIGHWAY 102, #6
BAR HARBOR, ME 04609
(207) 944-7288

ORRINGTON OFFICE
P.O. BOX 145
ORRINGTON, ME 04474
(207) 385-6056

The Hydrologic Unit Code (HUC 8) for the site is 01020005 or New England Region, Penobscot River Basin, Lower Penobscot Unit.

HYDROGEOMORPHIC CLASSIFICATION

WRC classified the wetlands within the site based on the U.S. Army Corps of Engineers Hydrogeomorphic Classification for Wetlands¹.

The site wetlands are on a shallow sideslope of a local hill and have no apparent inlet or outlet (Geomorphic Setting). Precipitation is the primary water source for the wetlands (Water Source). Water flow (Hydrodynamics) in the wetlands is Vertical Fluctuation with drawdowns of the water table interspersed between rain events that saturate the sediments.

WETLAND FUNCTIONAL ASSESSMENT

Methodology

This wetland functional assessment was conducted generally following the U.S. Army Corps of Engineers Highway Methodology². WRC visited the site on June 23 and October 04, 2022, to conduct delineation of field-observable Protected Natural Resources, to collect data for Corps Wetland Data Forms, and to collect data for this wetland functional assessment. The functional assessment was based on site visits, review of published mapping, review of resource agency mapping, and review of aerial photography.

Existing Conditions

Four freshwater wetland areas were delineated on the site³. Most of the wetlands are “old field” wetlands dominated by herbaceous species (PEM1), with a portion to the east of the existing ASCC building being both emergent and forested/scrub-shrub (PFO1/PSS1). The wetlands meet MDEP classification as “Wetlands Not of Special Significance”.

The site has been historically disturbed to include former agricultural uses (old field), as well as above and below-ground campus infrastructure. Drainage manholes and an electrical manhole were observed within the wetlands.

Proposed Impacts

The project is an expansion of the existing ASCC Building, to the east and/or south, with additional infrastructure such as parking and stormwater systems. Wetland impacts, if any, are unknown as of the writing of this Report.

¹ Brinson, Mark. A Hydrogeomorphic Classification for Wetlands. U.S. Army Corps of Engineers, Waterways Experiment Station. Wetlands Research Program Technical Report WRP-DE-4. August 1993 – Final Report.

² U.S. Army Corps of Engineers, New England District. The Highway Methodology Workbook Supplement, Wetland Functions and Values A Descriptive Approach. September 1999. NAEPP-360-1-30a.

³ A Protected Natural Resources Report dated October 24, 2022, submitted under separate cover, describes the resources identified.

Functional Assessment

Principal Functions/Values

Floodflow Alteration was identified as the principal function of the wetlands delineated on the site. The wetlands are located on a shallow slope, but some of the wetland areas are within local topographic depressions (apparently) caused by adjacent development. The hydric soils in the wetlands retain hydrology during snowmelt and precipitation events, for slow release into adjacent upland soils, and adjacent wetlands where applicable. Because the site lies in the upper portion of the watershed and is within a highly developed area of a college campus, this function is important on the watershed scale. The stormwater catch basins located within and/or near some of the wetlands reduce the efficacy of this function.

Secondary Functions/Values

Groundwater Recharge/Discharge as shallow soil water interchange is likely occurring along the wetland edges during snowmelt and precipitation events. Considering that this is shallow soil water interchange and not groundwater interchange, and not on a large scale because of the stormwater catch basins, this is considered a secondary function.

The proximity of the wetlands to roads and parking lots, and thick vegetation, would indicate potential for **Sediment/Toxicant Retention**, however, the campus stormwater system and paved surface maintenance (such as sweeping) is assumed to reduce the potential of sediments and toxicants entering the wetlands. Excess sediments were not observed in the wetlands where located adjacent to developed areas.

The emergent wetlands are dominated by nearly monotypic stands of reed canarygrass, which is an invasive species, but provides limited forage source. The forested and scrub-shrub wetlands contain seed and nut producing vegetation. Primary production is attenuated in the wetlands. Considering the limited wildlife function due to proximity to developed areas, and limited suitability of reed canarygrass as forage, **Production Export** is assessed as a secondary function of the wetlands.

Wildlife Habitat is a secondary function of the wetlands on the site. The wetlands are located within a highly developed area of campus, adjacent to a large parking lot, roads, buildings, and paved walkways. These features are associated with reduced wildlife access to the wetlands, as well as higher noise levels, unpleasant odors, and higher activity and motion. The emergent wetlands are dominated by nearly monotypic stands of reed canarygrass, which likely provides limited habitat for rodents, insects and other invertebrates. Grasshoppers were heard, and bumblebees seen, in the emergent wetlands. The forested and scrub-shrub wetlands likely provide limited habitat for small mammals that can live in proximity to human activity such as squirrels, porcupine and skunk; as well as habitat for rodents, reptiles, amphibians, invertebrates, and passerine birds. A gray squirrel and passerine birds were observed in the forested wetlands.

The wetlands are on a college campus, so have potential for **Educational/Scientific Value**, however, do not have unusual or exemplary features that would give them high suitability for this value. The wetlands are disturbed. This is assessed as a secondary value as the wetlands may incidentally be used for educational and/or scientific purposes due to proximity to a University, not because of specific features that have high educational/scientific value.

According to US FWS, the site is within mapped Critical Habitat of the Endangered Atlantic salmon, and so has **Endangered Species Habitat** value. However, many of the wetland areas are isolated, and none of the wetland areas have associated streams within at least 75 feet of the site.

FINDINGS AND RECOMMENDATIONS

WRC conducted a wetland functional assessment on delineated wetlands within approximately 2-acres of land in the vicinity of the proposed ASCC building addition on the University of Maine campus in Orono, Maine.

The principal function identified in the wetlands on the site is Floodflow Alteration. Secondary functions and values identified include Groundwater Recharge/Discharge, Sediment/Toxicant Retention, Production Export, Wildlife Habitat, Educational/Scientific Value, and Endangered Species Habitat.

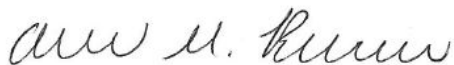
The principal function, Floodflow Alteration, would be directly impacted by direct wetland impacts if any occur for the proposed project.

WRC recommends that alterations to Protected Natural Resources be avoided and minimized to the greatest extent practicable to maintain existing wetland functions and values.

CLOSING

We appreciate the opportunity to assist the University of Maine during this phase of the project. If you have any questions, please contact us.

Sincerely,



Aleita M. Burman, CSS, CWS, LSE

Principal and Member | Watershed Resource Consultants, LLC
lburman@wrcmaine.com

APPENDIX A

Limitations

Appendix A – Limitations

The scope of Watershed Resource Consultants, LLC services has been limited to Wetland Functional Assessment services on delineated wetlands within approximately 2-acres of land in the vicinity of the proposed ASCC building addition on the University of Maine campus in Orono, Maine. This Report has been prepared for the exclusive use of the University of Maine. No warranty, expressed or implied, is made. The conclusions made in this report are based on the data obtained from the areas explored at the time of services.

APPENDIX B

Wetland Function/Value Evaluation Forms
Vegetation/Wildlife List

Wetland Function-Value Evaluation Form

Total area of wetland ~1acre Human made? Unk Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use Parking lot, paved walkways, institutional bldgs Distance to nearest roadway or other development Adjacent

Dominant wetland systems present PEM1 (Old Field) Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? Upper

How many tributaries contribute to the wetland? None Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland AB-1, AB-2, AB-4

Latitude 44.900921 Longitude -68.663628

Prepared by AMBurman Date 6/23 & 10/4/22













Wetland Impact:

Type Unknown Area Unknown

Evaluation based on:

Office X Field X

Corps manual wetland delineation completed? Y X N

| Function/Value | Suitability Y / N | Rationale (Reference #)* | Principal Function(s)/Value(s) | Comments |
|---|----------------------|-----------------------------|-----------------------------------|--|
|  Groundwater Recharge/Discharge | N | 6 | N | Shallow soil water interchange during spring and storm events. |
|  Floodflow Alteration | Y | 2,3,4,5,6,8,9,11,18 | Y | Level and concave surfaces and adjacent impervious areas indicate suitability and function for FF Alt. This fx is diminished by catch basins located in and near wl. |
|  Fish and Shellfish Habitat | N | | N | No streams associated with wetlands. |
|  Sediment/Toxicant Retention | N | 1,2,4,7 | N | Wetlands are near impervious surfaces with potential sedimentation and vehicle toxicants. Campus stormwater system captures and takes elsewhere. No evidence of sedimentation in wetlands. |
|  Nutrient Removal | N | 3,7,8,9 | N | No excess nutrients identified upslope of wetlands. |
|  Production Export | N | 1,7,12 | N | Grasses suitable as forage for deer. Seed producing grasses and flowers for pollen. Not high functioning for PE due to proximity to populated areas, noise. No streams. |
|  Sediment/Shoreline Stabilization | N | 3 | N | No waterbodies or waterways associated with wetlands. |
|  Wildlife Habitat | N | 8,10,13 | N | Grasshoppers, crickets and katydids in grass. No other wildlife sign observed. Wetlands adjacent to high use areas, noise, smells, sounds, etc. Little wildlife fx. |
|  Recreation | N | 10,12 | N | No recreational value identified in wetlands. |
|  Educational/Scientific Value | N | 8,9,10 | N | Wetlands are on a college campus, but are disturbed and are not unique for wetland study, although could be used depending on study. |
|  Uniqueness/Heritage | N | 1,8,9,24 | N | No uniqueness/heritage value identified in wetlands. |
|  Visual Quality/Aesthetics | N | 9,12 | N | No visual quality/aesthetics value identified in wetlands. |
| ES Endangered Species Habitat | N | 2 | N | Wetlands are within area broadly mapped by US FWS as Critical Habitat for the Endangered Atlantic salmon. Wetlands are isolated and not associated with waterbodies or waterways. |
| Other | | | | |

Notes:

* Refer to backup list of numbered considerations.

Wetland Function-Value Evaluation Form

Total area of wetland <1acre Human made? Unk Is wetland part of a wildlife corridor? No or a "habitat island"? No

Adjacent land use Parking lot, paved walkways, institutional bldgs Distance to nearest roadway or other development Adjacent

Dominant wetland systems present PFO/PSS/PEM Contiguous undeveloped buffer zone present No

Is the wetland a separate hydraulic system? Yes If not, where does the wetland lie in the drainage basin? Upper

How many tributaries contribute to the wetland? None Wildlife & vegetation diversity/abundance (see attached list)

Wetland I.D. Wetland AB-3

Latitude 44.900921 Longitude -68.663628

Prepared by AMBurmar Date 6/23 & 10/4/22













Wetland Impact:

Type Unknown Area Unknown

Evaluation based on:

Office X Field X

Corps manual wetland delineation completed? Y X N

| Function/Value | Suitability Y / N | Rationale (Reference #)* | Principal Function(s)/Value(s) | Comments |
|---|----------------------|-----------------------------|-----------------------------------|---|
|  Groundwater Recharge/Discharge | N | 6 | N | Shallow soil water interchange during spring and storm events. |
|  Floodflow Alteration | Y | 2,3,4,5,6,8,9,11,18 | Y | Level surfaces and adjacent impervious areas indicate suitability and function for FF Alt. This fx is diminished by catch basins located in and near wl. Slopes not suitable. |
|  Fish and Shellfish Habitat | N | | N | No streams associated with wetlands. |
|  Sediment/Toxicant Retention | N | 1,2,4,7 | N | Wetlands are near impervious surfaces with potential sedimentation and vehicle toxicants. Campus stormwater system captures and takes elsewhere. No evidence of sedimentation in wetlands. |
|  Nutrient Removal | N | 3,7,8,9 | N | No excess nutrients identified upslope of wetlands. |
|  Production Export | N | 1,7,12 | N | Grasses suitable as forage for deer. Nuts and seeds for squirrels and birds. Seed producing grasses and flowers for pollen. Not high functioning for PE due to proximity to populated areas, noise. No streams. |
|  Sediment/Shoreline Stabilization | N | 3 | N | No waterbodies or waterways associated with wetlands. |
|  Wildlife Habitat | N | 8,13,15,17 | N | Grasshoppers in grass. Squirrels, passerine birds in forest. Wetlands adjacent to high use areas, noise, smells, sounds, etc. Little wildlife function. |
|  Recreation | N | 10,12 | N | No recreational value identified in wetlands. |
|  Educational/Scientific Value | N | 8,9,10 | N | Wetlands are on a college campus, but are disturbed and are not unique for wetland study, although could be used depending on study. |
|  Uniqueness/Heritage | N | 1,4,8,9,10,12,24 | N | No uniqueness/heritage value identified in wetlands. |
|  Visual Quality/Aesthetics | N | 9 | N | No visual quality/aesthetics value identified in wetlands. |
| ES Endangered Species Habitat | N | 2 | N | Wetlands are within area broadly mapped by US FWS as Critical Habitat for the Endangered Atlantic salmon. Wetlands are isolated and not associated with waterbodies or waterways. |
| Other | | | | |

Notes:

* Refer to backup list of numbered considerations.

Project/Site:

Proposed ASCC Building Expansion
University of Maine
Orono, Maine

Consultant:

Watershed Resource Consultants, LLC

Project #:

22544

FW Date:

June 23 and October 04, 2022

D = Dominant; C = Common; O = Observed

Wetland PEM1 (Old Field)Vegetation List: AB-1, AB-2, AB-4, S portion of AB-3

| <u>Species (common)</u> | <u>Species (latin)</u> | <u>Dominance</u> | <u>Indicator Status</u> |
|--------------------------------|------------------------------------|-------------------------|--------------------------------|
| upland bent | <i>Agrostis perennans</i> | O | FACU |
| meadow foxtail | <i>Alopecurus pratensis</i> | O | FAC |
| yellow rocket | <i>Barbarea vulgaris</i> | O | FAC |
| northern cluster sedge | <i>Carex arcta</i> | O | OBL |
| nodding sedge | <i>Carex gynandra</i> | O | OBL |
| pointed broom sedge | <i>Carex scoparia</i> | O | FACW |
| common fox sedge | <i>Carex vulpinoidea</i> | O | OBL |
| Canada thistle | <i>Cirsium arvense</i> | O | FACU |
| red fescue | <i>Festuca rubra</i> | O | FACU |
| rough bedstraw | <i>Galium asprellum</i> | C | OBL |
| white bedstraw | <i>Galium mollugo</i> | O | FACU |
| Canada rush | <i>Juncus canadensis</i> | O | OBL |
| ox-eye daisy | <i>Leucanthemum vulgare</i> | O | UPL |
| lupine | <i>Lupinus polyphyllus</i> | O | FACU |
| reed canarygrass | <i>Phalaris arundinacea</i> | D | FACW |
| fowl blue grass | <i>Poa palustris</i> | C | FACW |
| Canada goldenrod | <i>Solidago canadensis</i> | O | FACU |
| late goldenrod | <i>Solidago gigantea</i> | C | FACW |
| wrinkle leaf goldenrod | <i>Solidago rugosa</i> | C | FAC |
| calico american aster | <i>Symphyotrichum lateriflorum</i> | O | FAC |
| broad leaved cattail | <i>Typha latifolia</i> | D | OBL |
| cow vetch | <i>Vicia cracca</i> | O | UPL |

Project/Site:

Proposed ASCC Building Expansion
University of Maine
Orono, Maine

Consultant:

Watershed Resource Consultants, LLC

Project #:

22544

FW Date:

June 23 and October 04, 2022

Wetland PFO1 with PSS1 inclusions Vegetation List: N and E portion of AB-3

| <u>Species (common)</u> | <u>Species (latin)</u> | <u>Dominance</u> | <u>Indicator Status</u> |
|--------------------------------|-----------------------------------|-------------------------|--------------------------------|
| red maple | <i>Acer rubrum</i> | D | FAC |
| speckled alder | <i>Alnus incana</i> | C | FACW |
| Japanese barberry | <i>Berberis thunbergii</i> | O | FACU |
| gray birch | <i>Betula populifolia</i> | C | FAC |
| Canada bluejoint | <i>Calamagrostis canadensis</i> | O | OBL |
| three-seeded sedge | <i>Carex trisperma</i> | O | OBL |
| field horsetail | <i>Equisetum arvense</i> | C | FAC |
| green ash | <i>Fraxinus pennsylvanica</i> | D | FACW |
| rough bedstraw | <i>Galium asprellum</i> | O | OBL |
| fowl manna grass | <i>Glyceria striata</i> | O | OBL |
| fowl manna grass | <i>Glyceria striata</i> | O | OBL |
| jewelweed | <i>Impatiens capensis</i> | O | FACW |
| Canada rush | <i>Juncus canadensis</i> | O | OBL |
| cinnamon fern | <i>Osmunda cinnamomea</i> | O | FACW |
| Interrupted fern | <i>Osmunda claytoniana</i> | O | FAC |
| royal fern | <i>Osmunda spectabilis</i> | O | OBL |
| wood sorrel | <i>Oxalis montana</i> | O | FACU |
| reed canarygrass | <i>Phalaris arundinacea</i> | D | FACW |
| Norway spruce | <i>Picea abies</i> | O | UPL |
| white pine | <i>Pinus strobus</i> | O | FACU |
| forest blue grass | <i>Poa nemoralis</i> | O | FACU |
| quaking aspen | <i>Populus tremuloides</i> | C | FACU |
| red oak | <i>Quercus rubra</i> | O | FACU |
| common buckthorn | <i>Rhamnus cathartica</i> | D | FAC |
| multiflora rose | <i>Rosa multiflora</i> | O | FACU |
| gray willow | <i>Salix bebbiana</i> | O | FACW |
| meadow willow | <i>Salix petiolaris</i> | C | FACW |
| late goldenrod | <i>Solidago gigantia</i> | O | FACW |
| Canada goldenrod | <i>Solidago canadensis</i> | O | FACU |
| wrinkle leaved goldenrod | <i>Solidago rugosa</i> | O | FAC |
| meadowsweet | <i>Spiraea latifolia</i> | C | FACW |
| calico american aster | <i>Symphotrichum lateriflorum</i> | O | FAC |

Project/Site:

Proposed ASCC Building Expansion
University of Maine
Orono, Maine

Consultant:

Watershed Resource Consultants, LLC

Project #:

22544

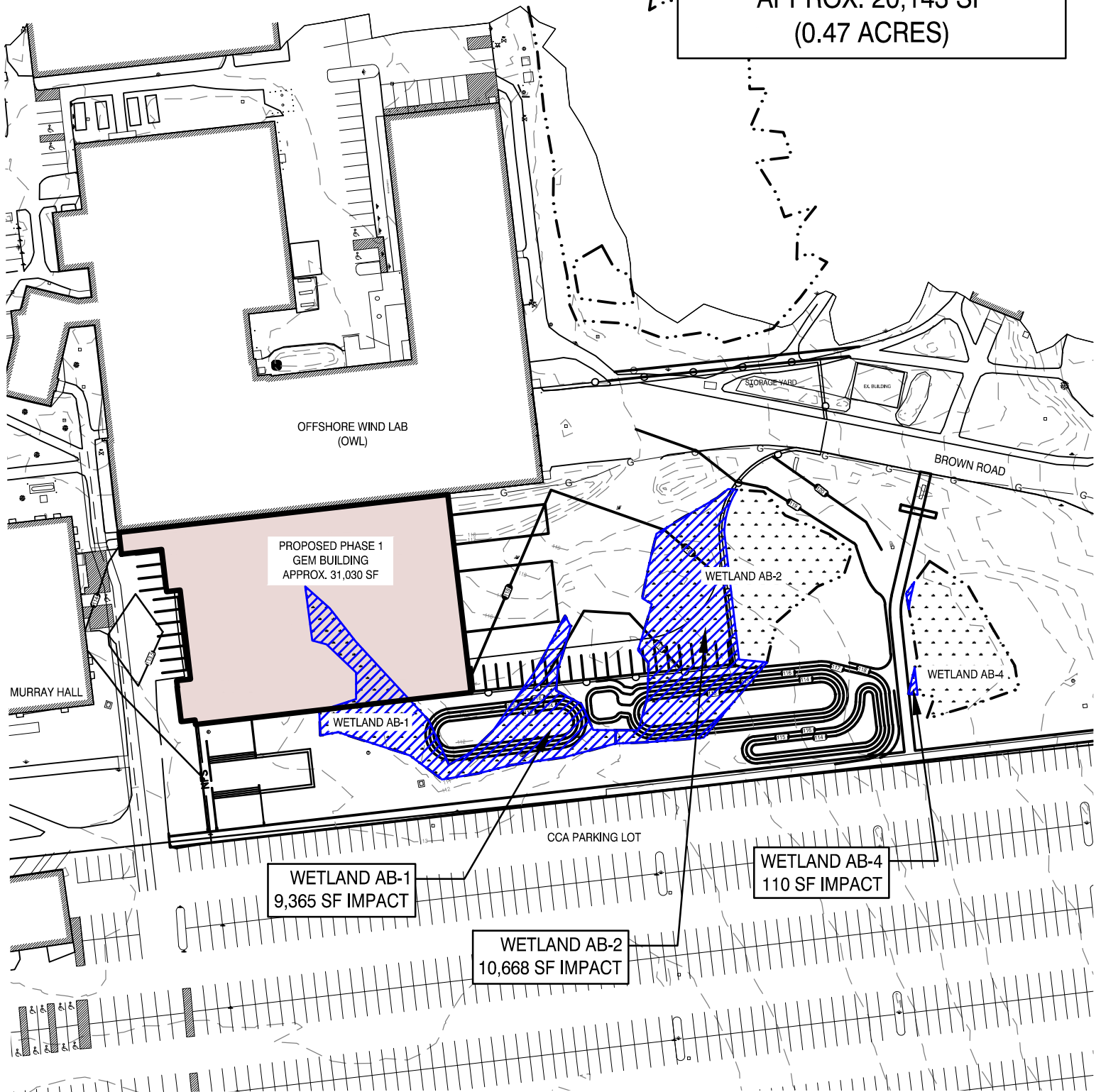
FW Date:

June 23 and October 04, 2022

Wildlife List (observations in/near/above wetlands)

| <u>Species (common)</u> | <u>Species (latin)</u> | <u>Sign</u> |
|--------------------------------|-------------------------------|--------------------|
| black capped chickadee | <i>Poecile atricapillus</i> | heard |
| bumble bee | <i>Bombus sp.</i> | seen |
| American crow | <i>Corvus brachyrhynchos</i> | heard, seen |
| gray squirrel | <i>Sciurus carolinensis</i> | seen |
| red breasted nuthatch | <i>Sitta canadensis</i> | heard, seen |
| grasshopper | <i>Order Orthoptera</i> | heard |

TOTAL PHASE 1
WETLAND IMPACT
APPROX. 20,143 SF
(0.47 ACRES)



Phase 1 Wetland Impacts

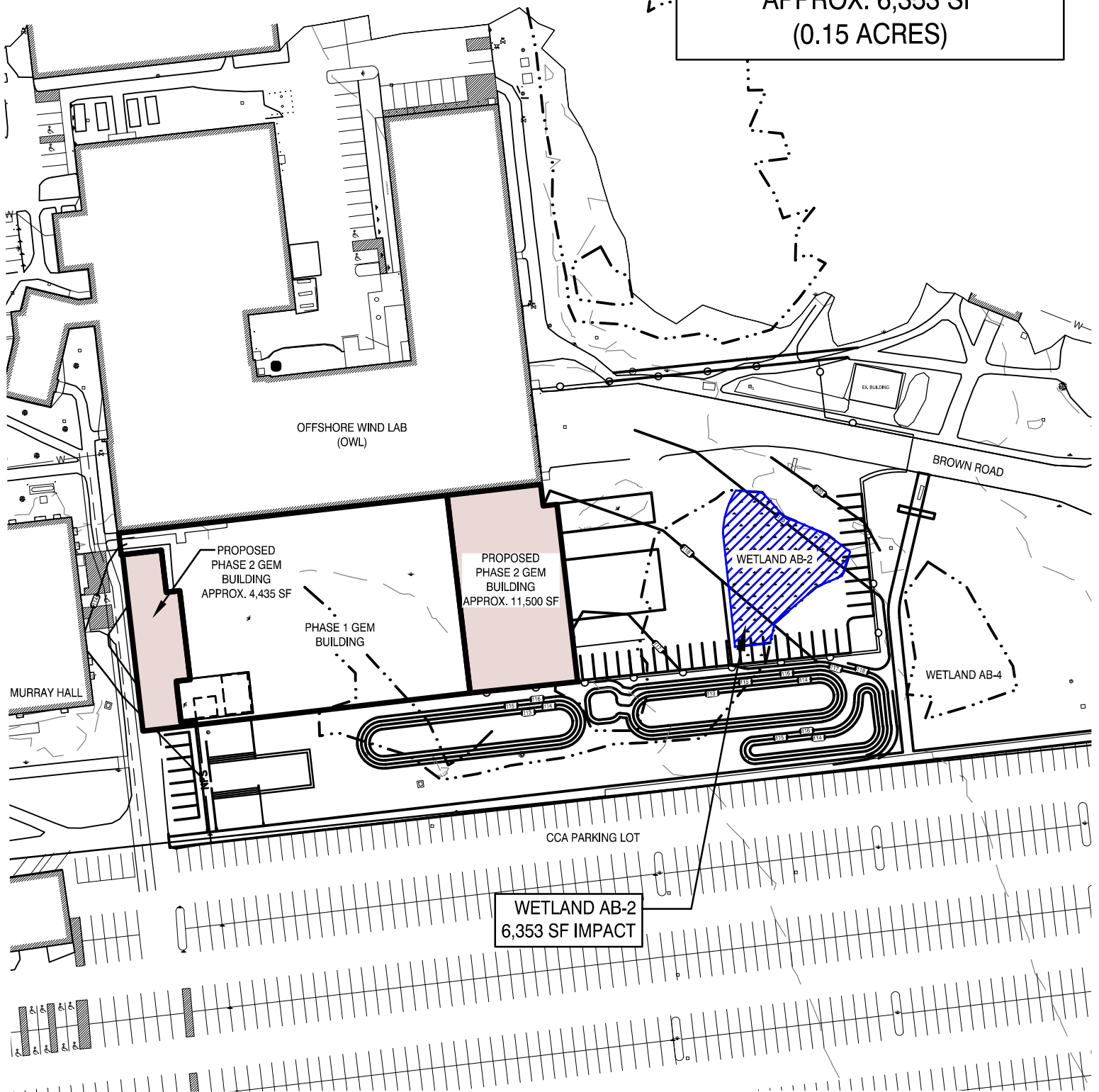
University of Maine - GEM Addition
168 College Ave., Town of Orono, Penobscot County, ME 04469
Penobscot River Watershed
(44.897732° N, -68.668708° W)
Prepared 12 July, 2023

SMRT PROJECT NO. 22012 SCALE: 1"=100'
0 50' 100' 200'



SMRT

TOTAL PHASE 2
WETLAND IMPACT
APPROX. 6,353 SF
(0.15 ACRES)

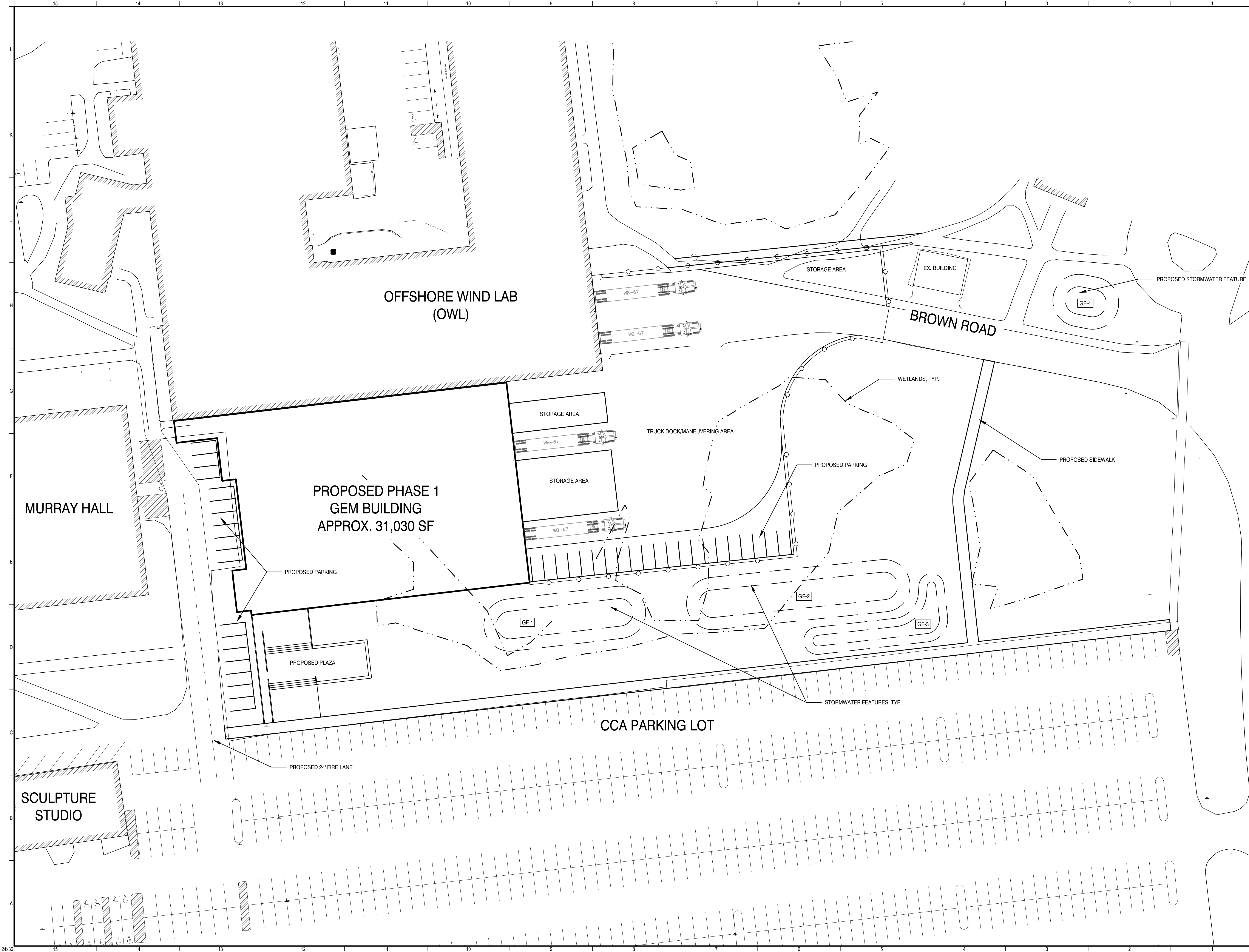


Phase 2 Wetland Impacts

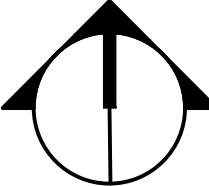
University of Maine - GEM Addition
168 College Ave., Town of Orono, Penobscot County, ME 04469
Penobscot River Watershed
(44.897732° N, -68.668708° W)
Prepared 12 July, 2023




**APPENDIX F: STORMWATER DRAWINGS, INCLUDING PRE- AND POST-
WATERSHED AND HYDROCAD DRAWINGS**




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| 1 | DEP SUBMISSION | 07/12/23 |



TRUE NORTH:



STATE OF MAINE
JEFFREY T. ACEVEDO
No. 6418
LICENSED PROFESSIONAL ENGINEER

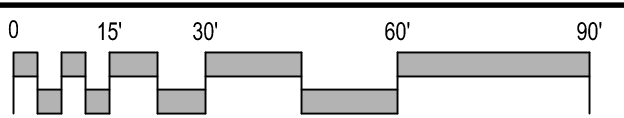


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PERMITTING INFORMATION

OVERALL SITE PLAN PHASE 1

SHEET TITLE:



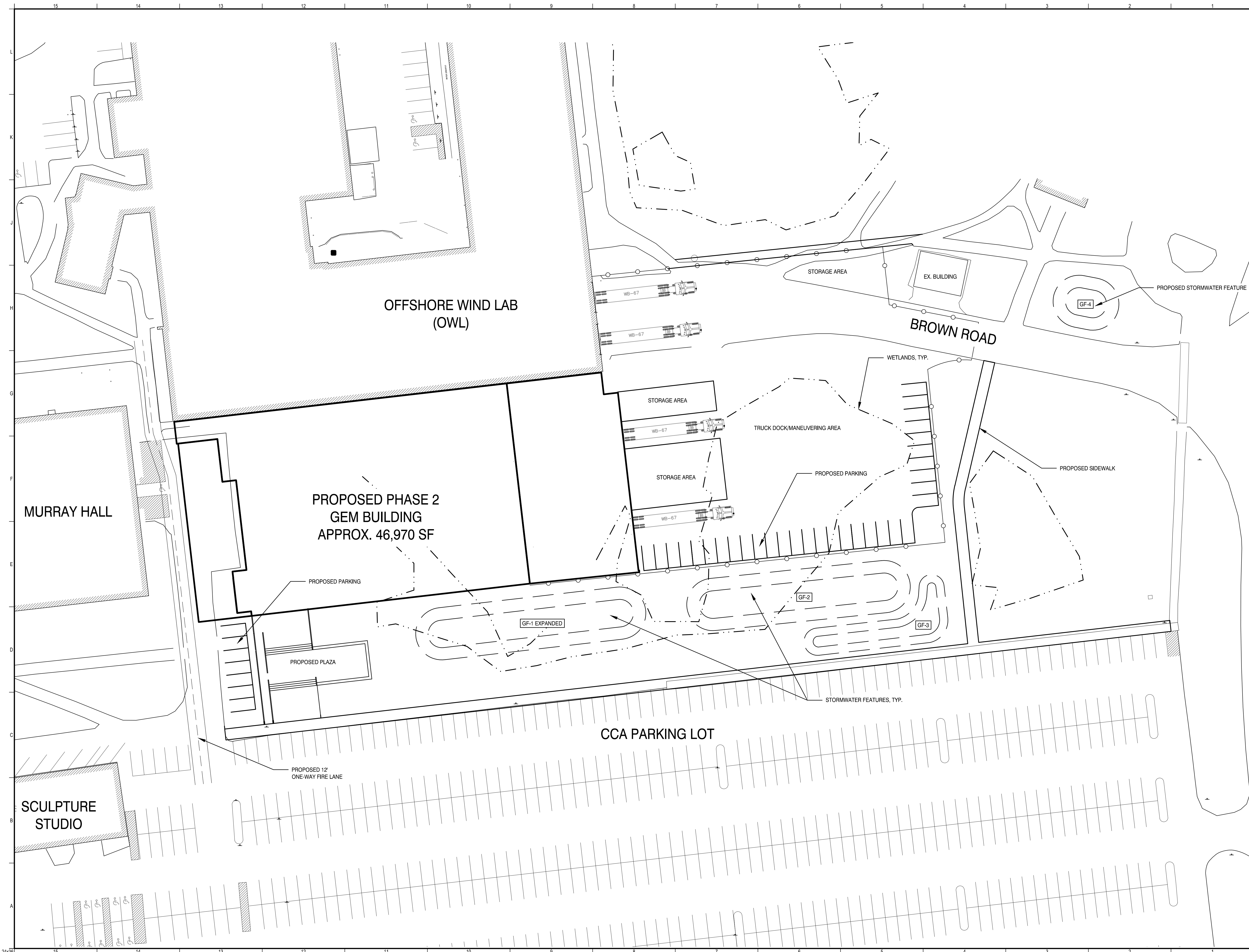
SCALE: 1"=30'

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| A/E OF RECORD: | NAR/JTA |
| DRAWN BY: | EMS/BSC |
| SMRT FILE: | CP101-22012 |

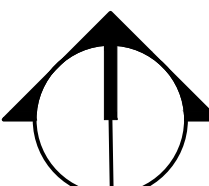
CP100

SHEET No.

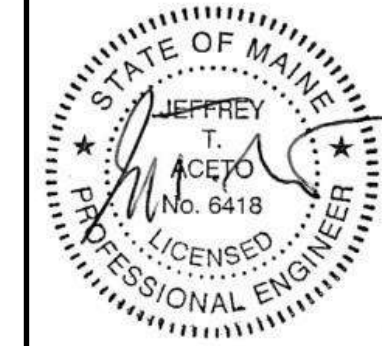
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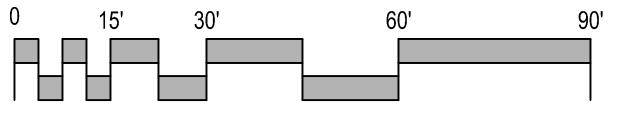


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OVERALL SITE PLAN PHASE 2

SHEET TITLE:



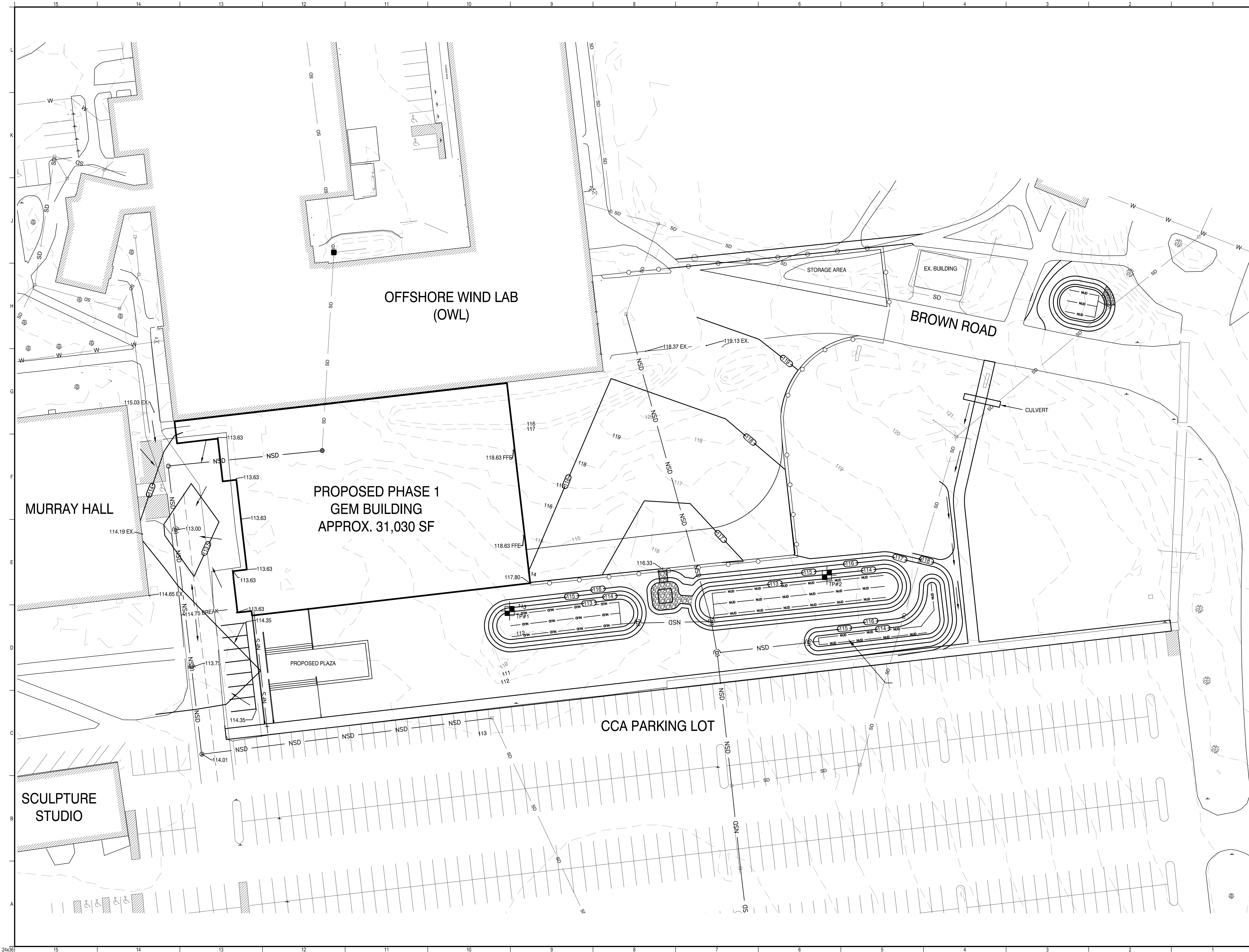
SCALE: 1"=30'

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| DRAWN BY: | EMS/BSC |
| SMRT FILE: | CP101-22012 |

SHEET No.

CP200

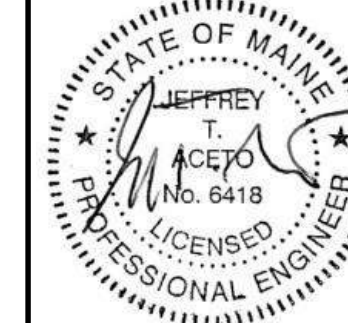
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| 1 | DEP SUBMISSION | 07/12/23 |



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No. 6418
LICENSED PROFESSIONAL ENGINEER

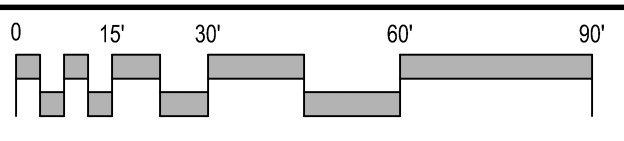


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PERMITTING INFORMATION
OVERALL GRADING PLAN PHASE 1

SHEET TITLE:

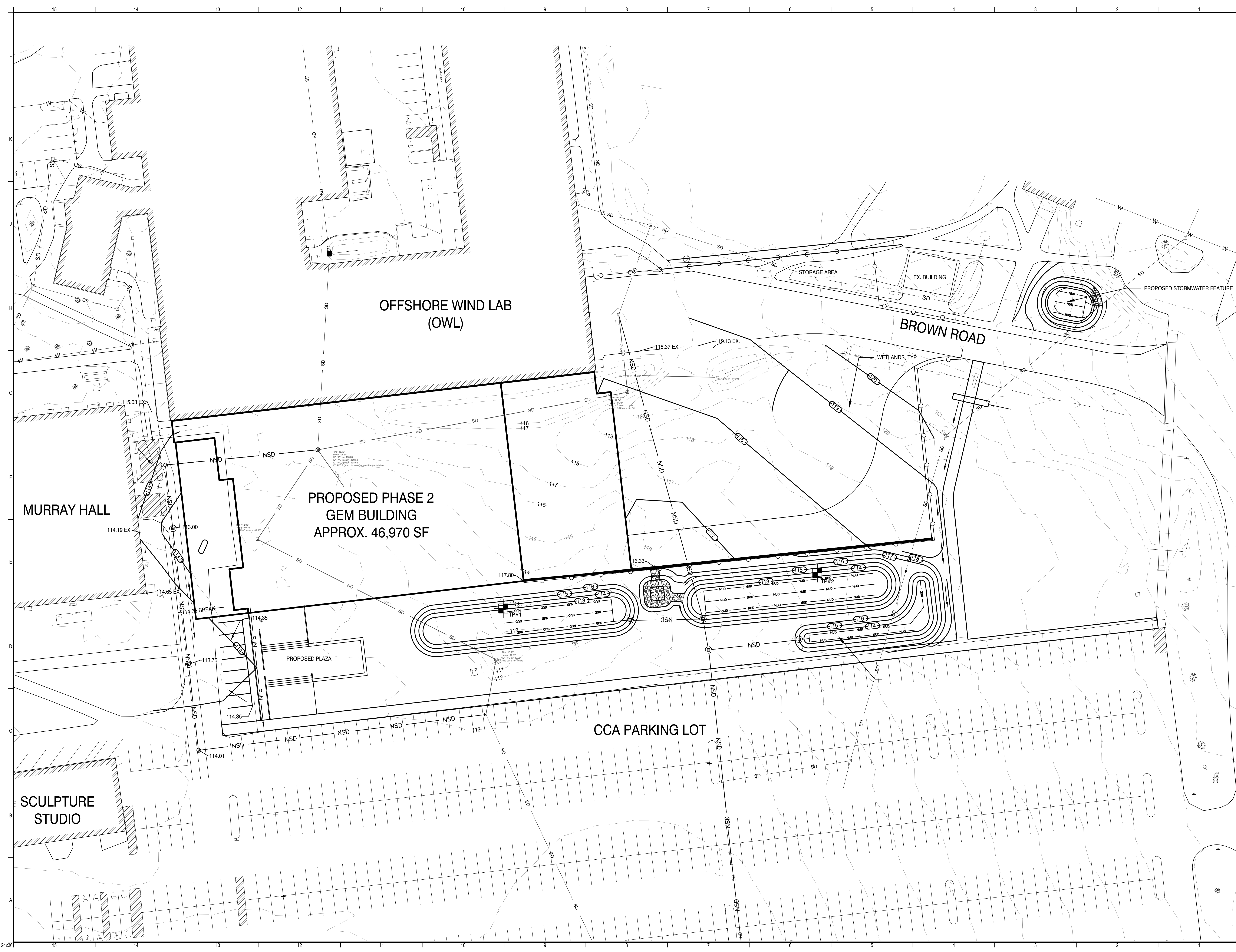


0 15' 30' 60' 90'

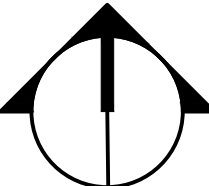
SCALE: 1"=30'

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| DRAWN BY: | EMS/BSC | |
| SMRT FILE: | CG111-22012 | |


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JEFFREY T. ACEY
No. 6418
LICENSED PROFESSIONAL ENGINEER




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OVERALL GRADING PLAN PHASE 2

SHEET TITLE:



SCALE: 1"=30'

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| A/E OF RECORD: | NAR/JTA |
| DRAWN BY: | EMS/BSC |
| SMRT FILE: | CG111-22012 |

CG211

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LEGEND

WATERSHED BOUNDARY

TIME OF CONCENTRATION

REACH

SUBCATCHMENT

REACH

STORMWATER POND

SOIL TYPE LEGEND

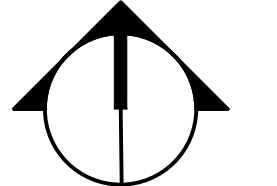
HSG CD

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HSG IMPERVIOUS, NOT RATED


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| 1 | DEP SUBMISSION | 07/12/23 |



TRUE NORTH:



STATE OF MAINE
JEFFREY T. ACEY
No. 6418
LICENSED PROFESSIONAL ENGINEER

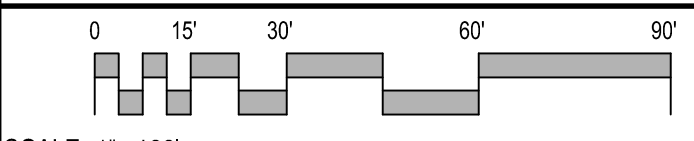


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PERMITTING INFORMATION

PRE-DEVELOPMENT WATERSHED
PLAN

SHEET TITLE:



SCALE: 1"=100'

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| A/E OF RECORD: | JTA |
| DRAWN BY: | EMS |
| SMRT FILE: | C120-22012 |

C-120

SHEET No.

NOT FOR CONSTRUCTION



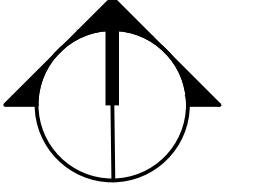
LEGEND

WATERSHED BOUNDARY
TIME OF CONCENTRATION
REACH
SUBCATCHMENT
REACH
STORMWATER POND


SOIL TYPE LEGEND

HSG CD
HSG D
HSG C
HSG IMPERIOUS, NOT RATED


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| 1 | DEP SUBMISSION | 07/12/23 |



TRUE NORTH:



STATE OF MAINE
JEFFREY T. ACEVEDO
No. 6418
LICENSED PROFESSIONAL ENGINEER

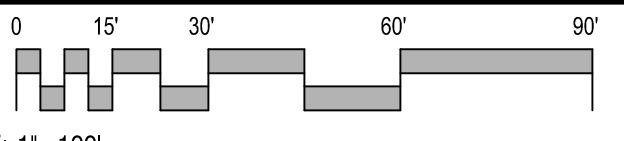


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PERMITTING INFORMATION

POST DEVELOPMENT WATERSHED
PLAN

SHEET TITLE:



SCALE: 1"=100'

A/E OF RECORD: JTA

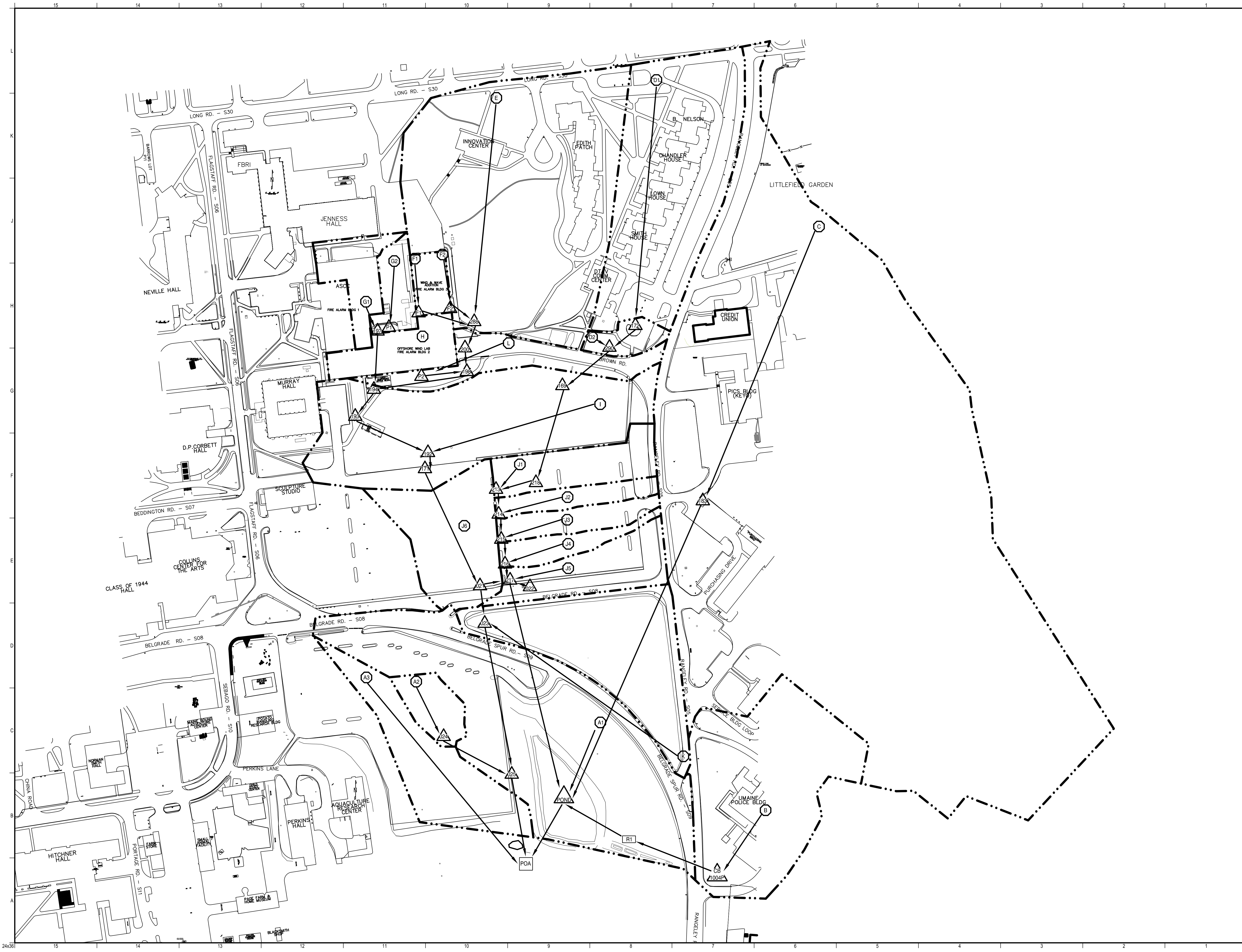
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SMRT FILE:

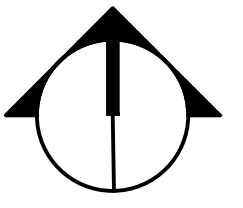
C121

SHEET No.


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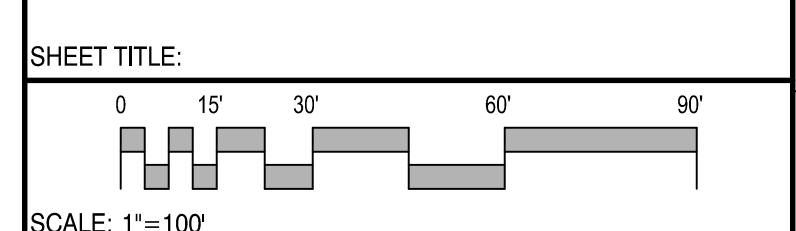


TRUE NORTH:



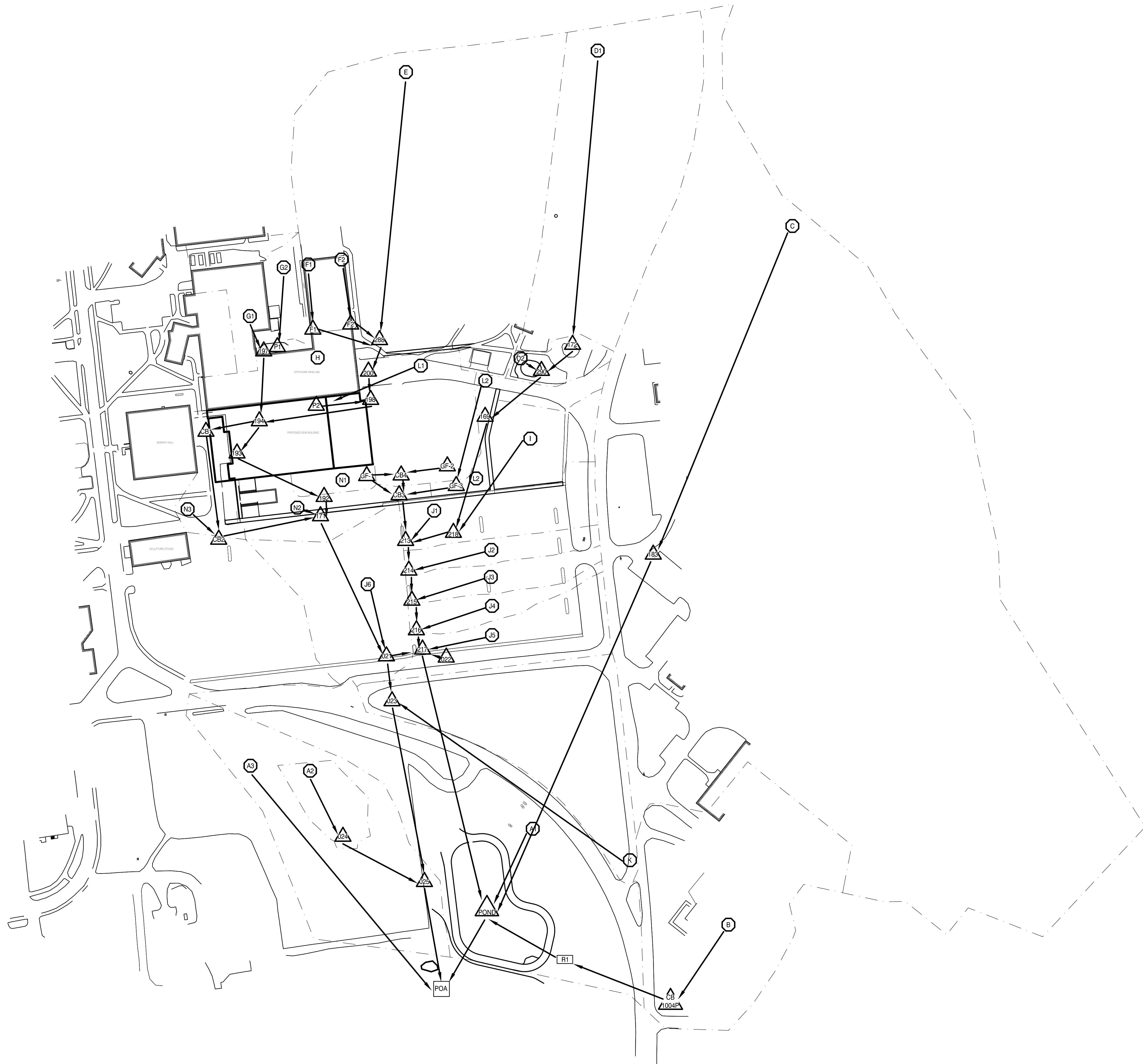
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FACTORY OF THE FUTURE
PERMITTING INFORMATION
PRE-DEVELOPMENT HYDROCAD
PLAN

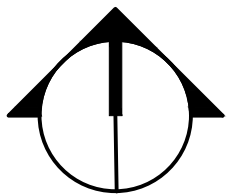


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| DRAWN BY: | EMS | |
| SMRT FILE: | C120-22012 | |

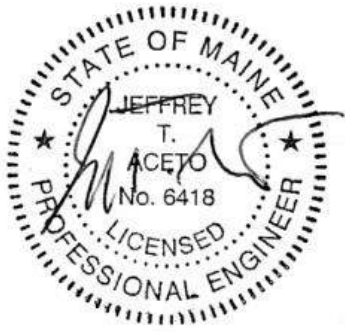
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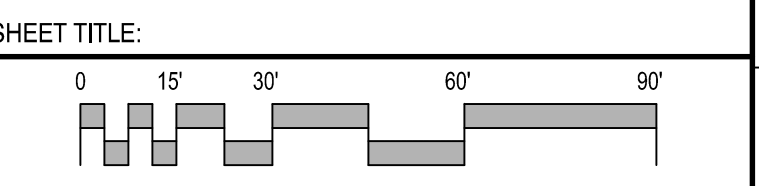




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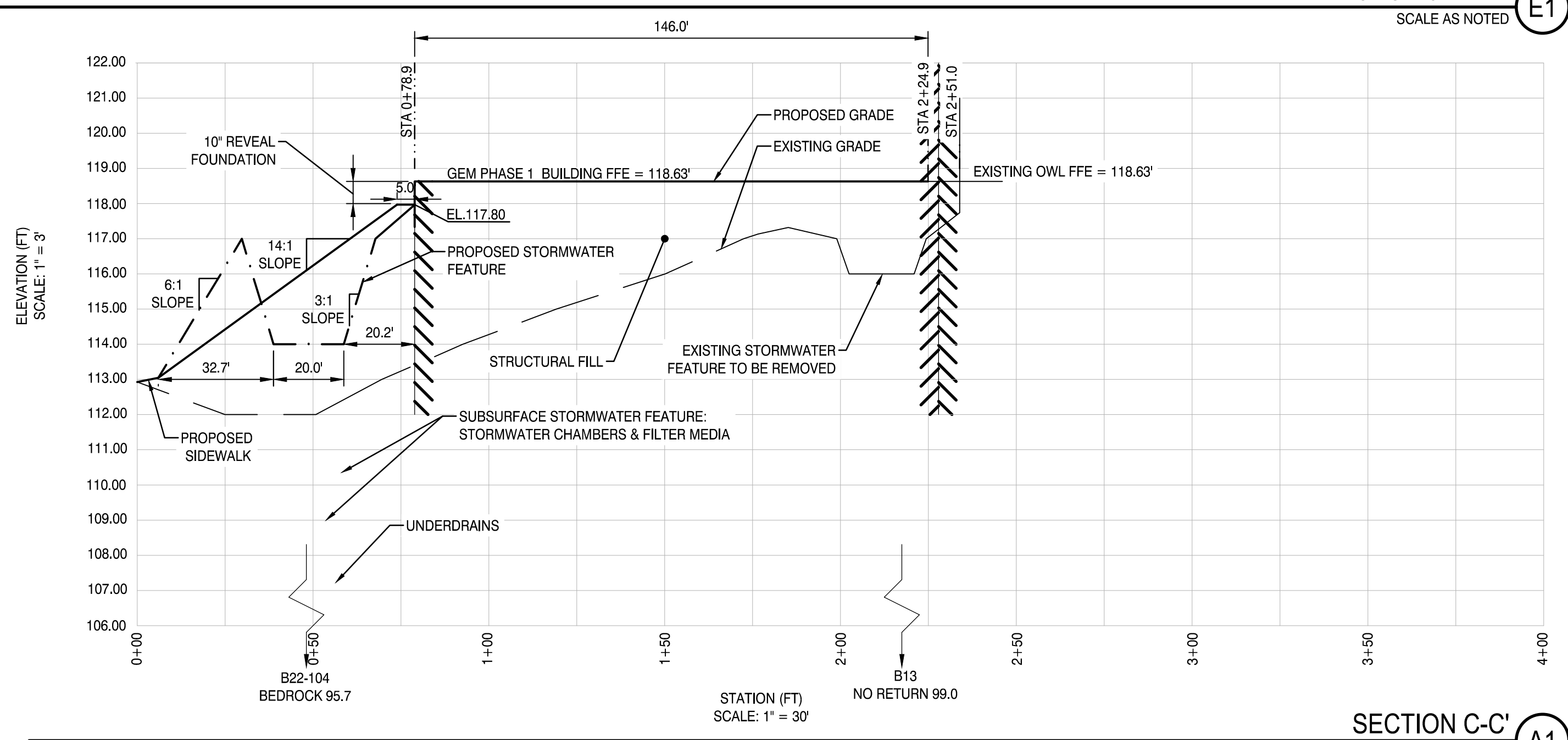
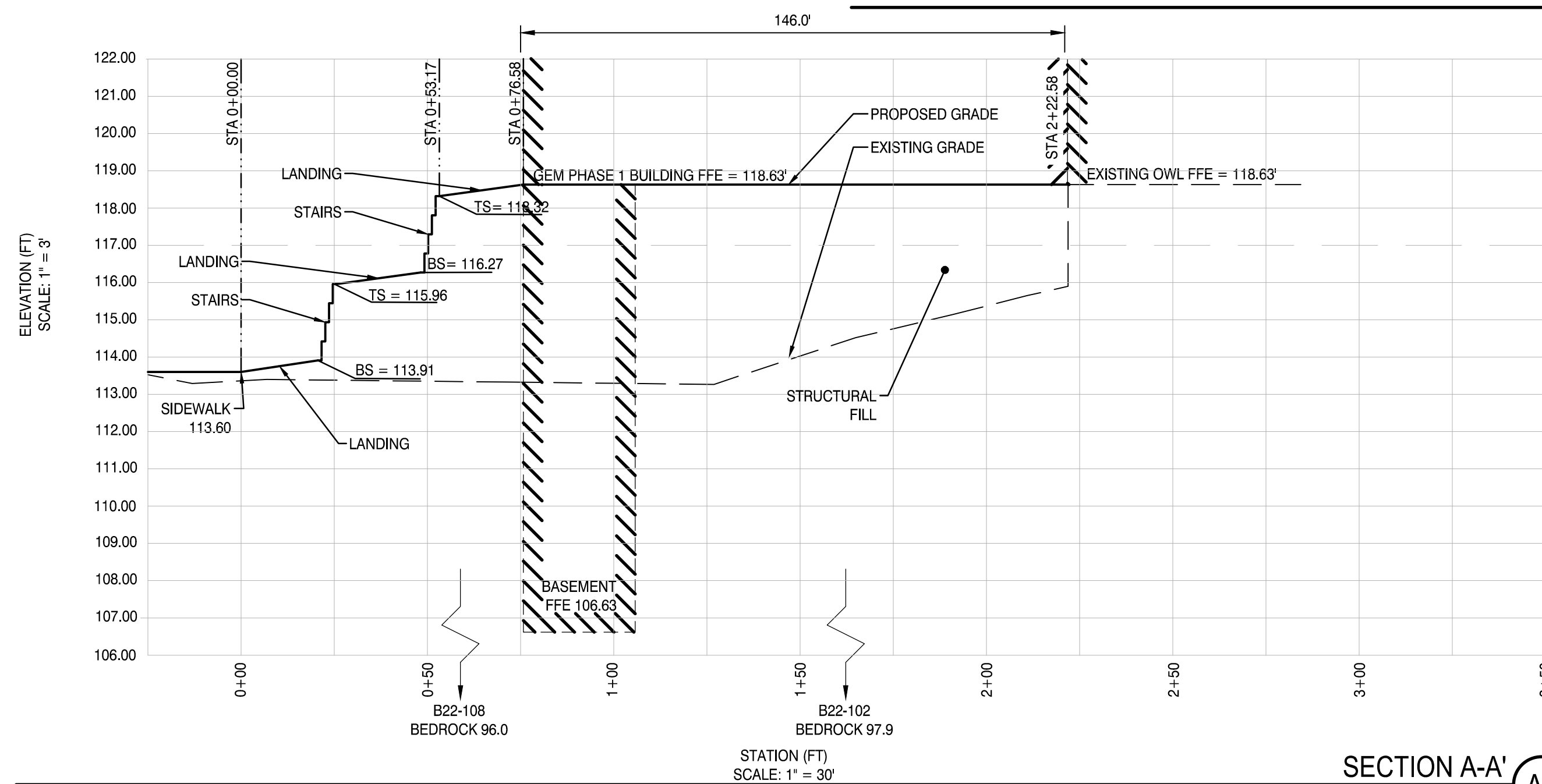
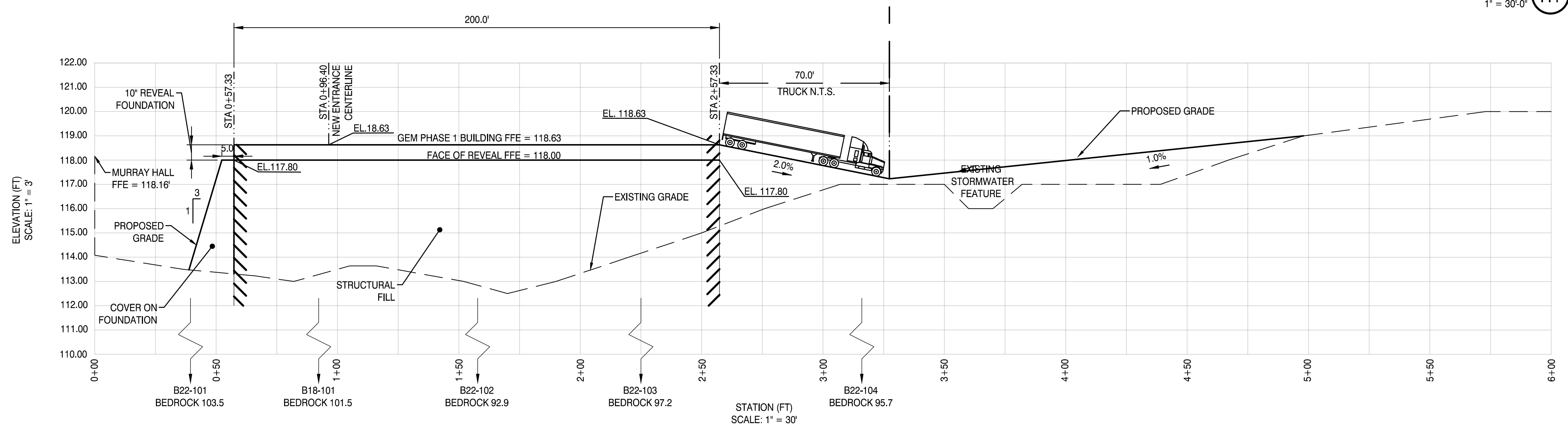
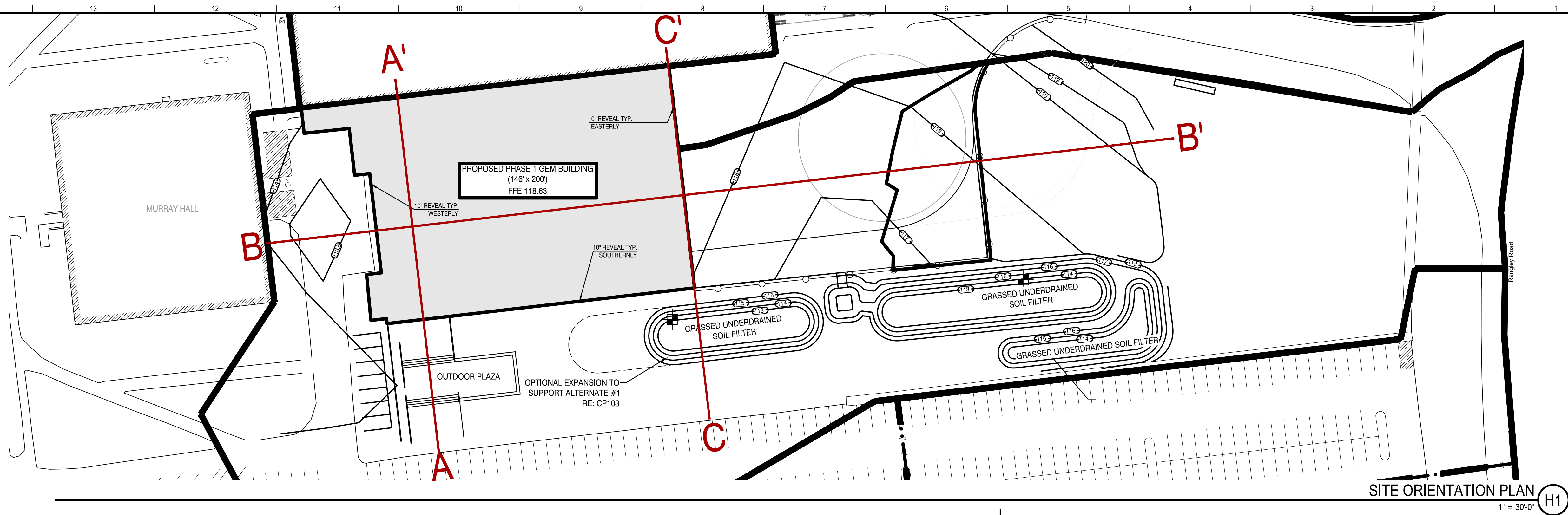
UNIVERSITY OF MAINE
GREEN ENGINEERING &
MANUFACTURING
FACTORY OF THE FUTURE
PERMITTING INFORMATION

POST-DEVELOPMENT HYDROCAD
PLAN



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| A/E OF RECORD: | JTA | C123 |
| DRAWN BY: | EMS | |
| SMRT FILE: | | |

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| 1 | DEP SUBMISSION | 07/12/23 |

SLODA APPLICATION

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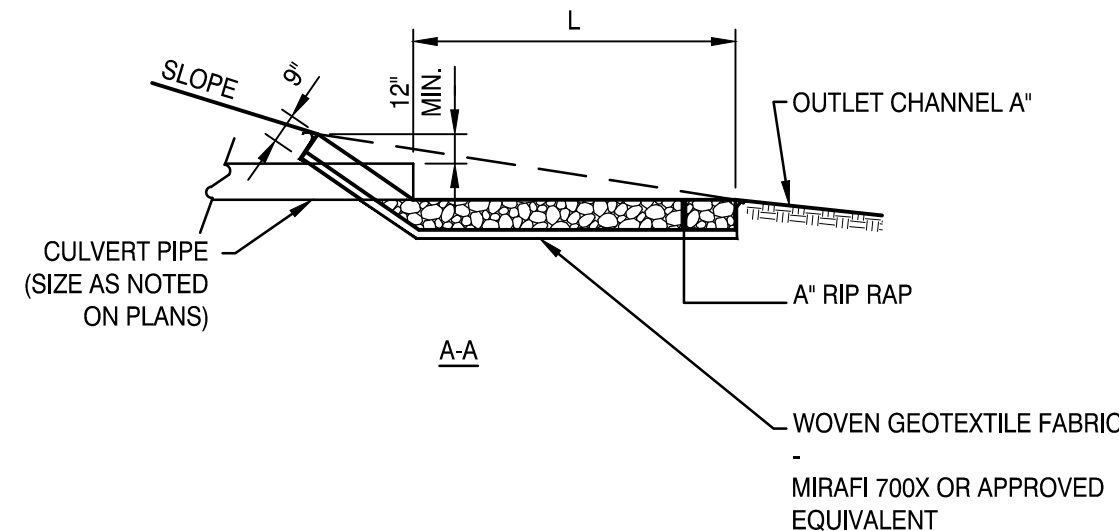
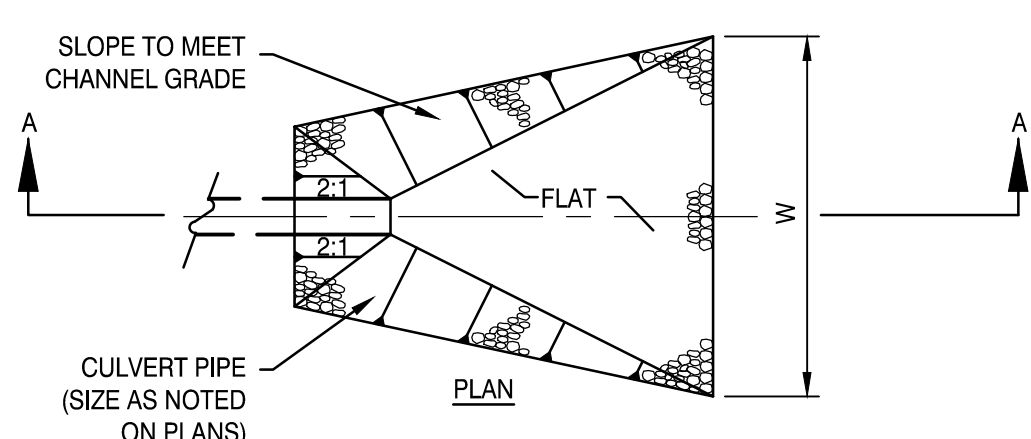
UNIVERSITY OF MAINE GREEN ENGINEERING FACTORY OF THE FUTURE

PERMITTING INFORMATION GRADING & DRAINAGE DETAILS

SHEET TITLE:
0 1/4" 1/2" 1" 2" 3"
SCALE: AS NOTED

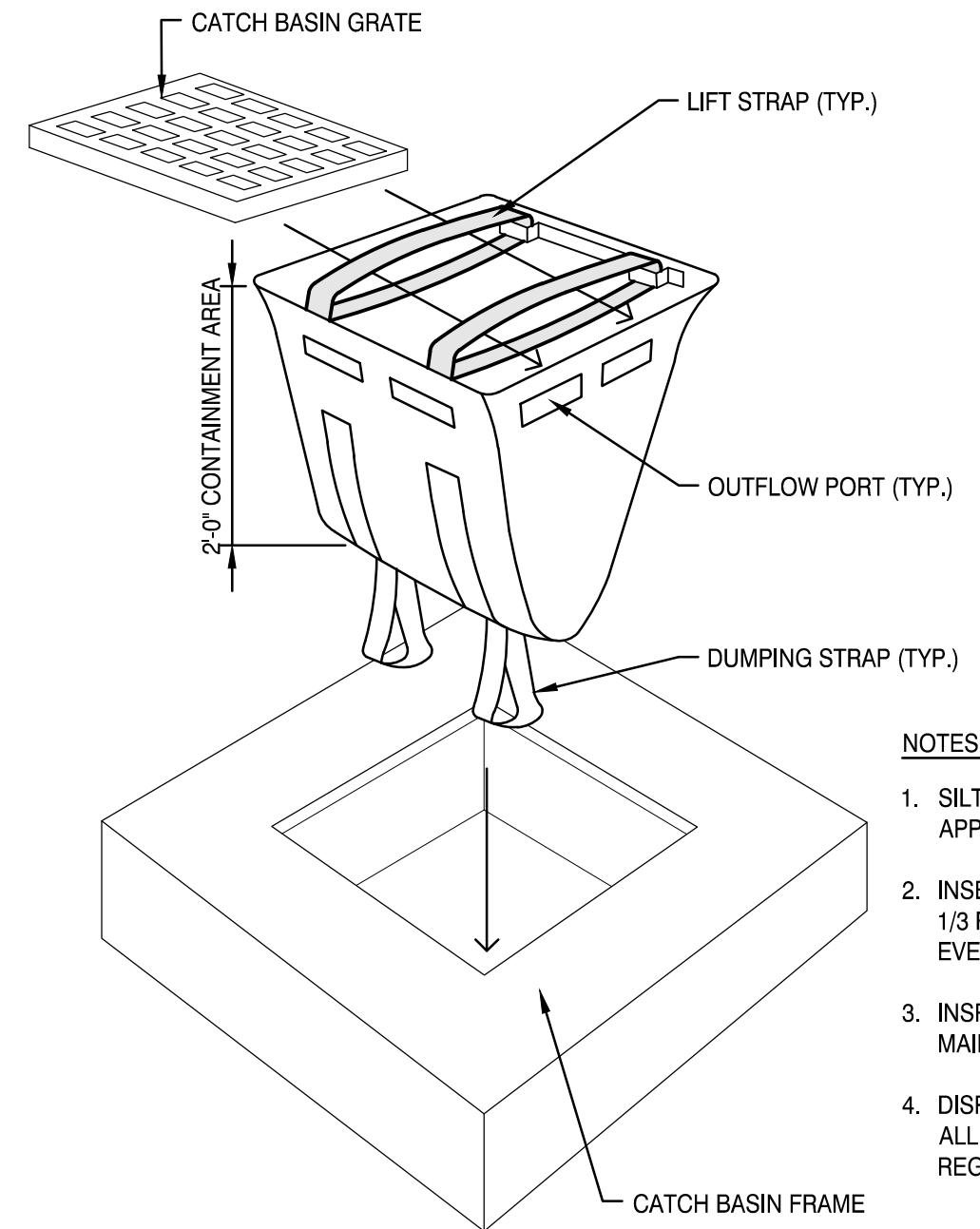
A/E OF RECORD: JTA
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SMRT FILE: 22012-CG501

CG501
SHEET No.
NOT FOR CONSTRUCTION



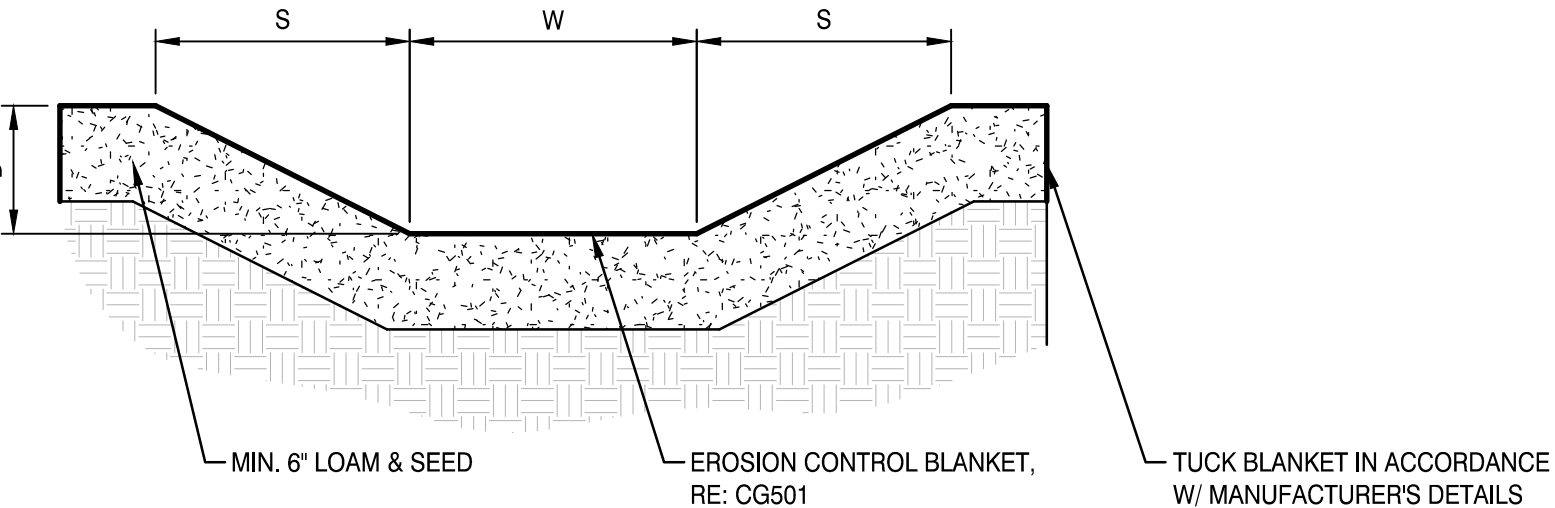
| DIAMETER | L | W | A | D ₅₀ |
|----------|-----|-----|-----|-----------------|
| 12" | 12' | 13' | 14' | 6" |
| 18" | 20' | 22' | 20' | 9" |
| 24" | 30' | 32' | 27' | 12" |
| 30" | 35' | 38' | 32' | 18" |
| 36" | 40' | 43' | 32' | 18" |

RIP-RAP OUTLET PROTECTION (G11)
NOT TO SCALE



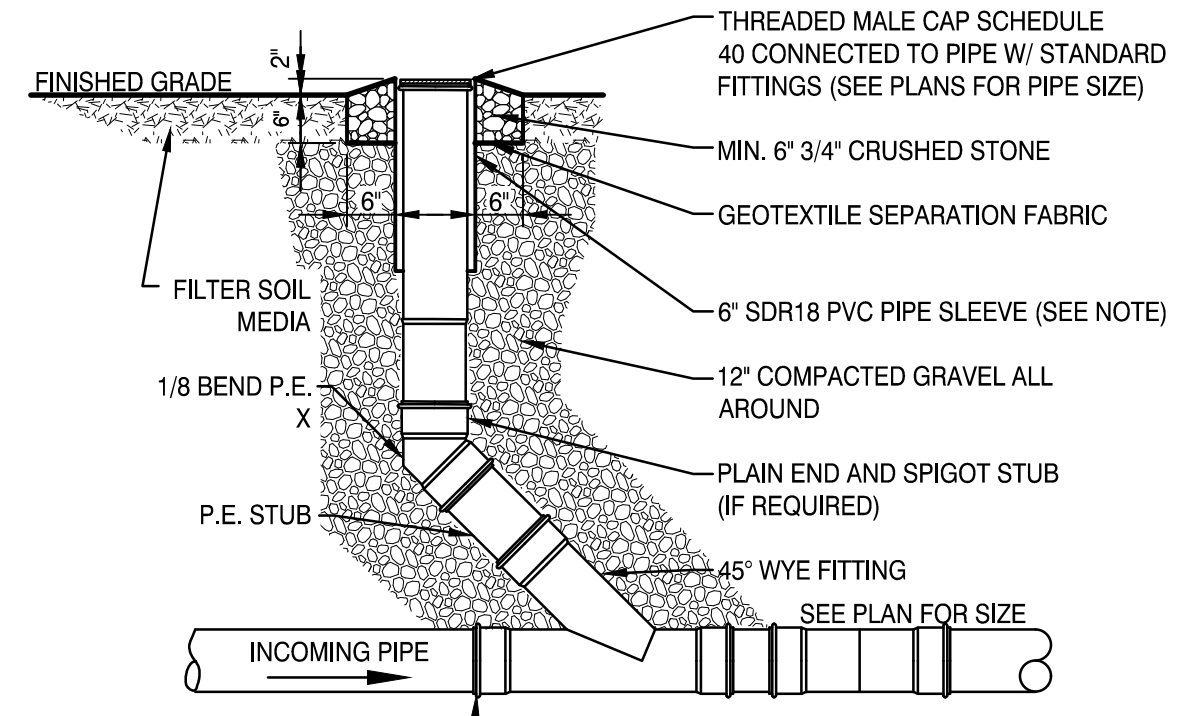
- NOTES:**
1. SILT SACK TO BE "DANDY SACK" (BY DANDY PRODUCTS) OR APPROVED EQUAL.
 2. INSERT TO BE EMPTIED IN AN APPROVED MANNER WHEN IT IS 1/3 FULL OF SEDIMENT AND IMMEDIATELY AFTER EACH STORM EVENT.
 3. INSPECT INSERT AFTER ALL RAINFALL EVENTS, REPAIR AND MAINTAIN AS REQUIRED.
 4. DISPOSE OF UNIT AND/OR SEDIMENT IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

SILT SACK (C11)
NOT TO SCALE



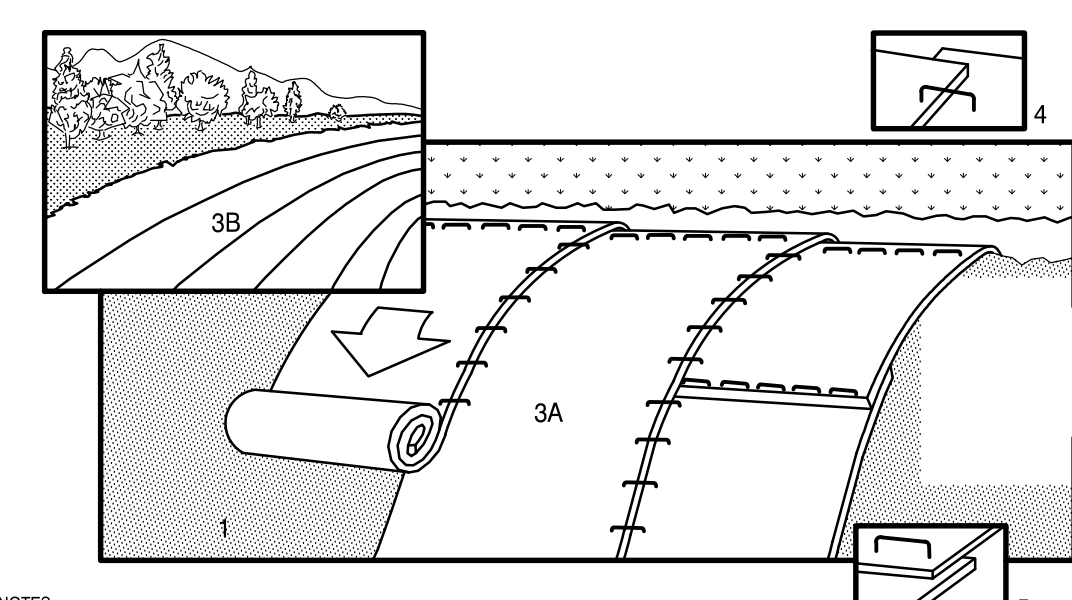
| | W | D | S |
|-----------|------|-------|-------|
| SECTION 1 | 0 | 0.5' | 1.0' |
| SECTION 2 | 1.5' | 0.67' | 1.33' |
| SPILL OFF | 0 | 0.5' | 2.0' |

GRASS SWALE (A11)
NOT TO SCALE



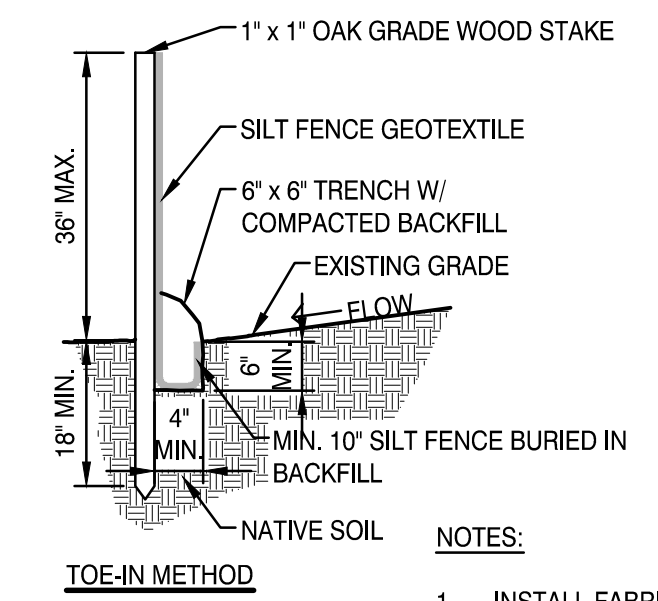
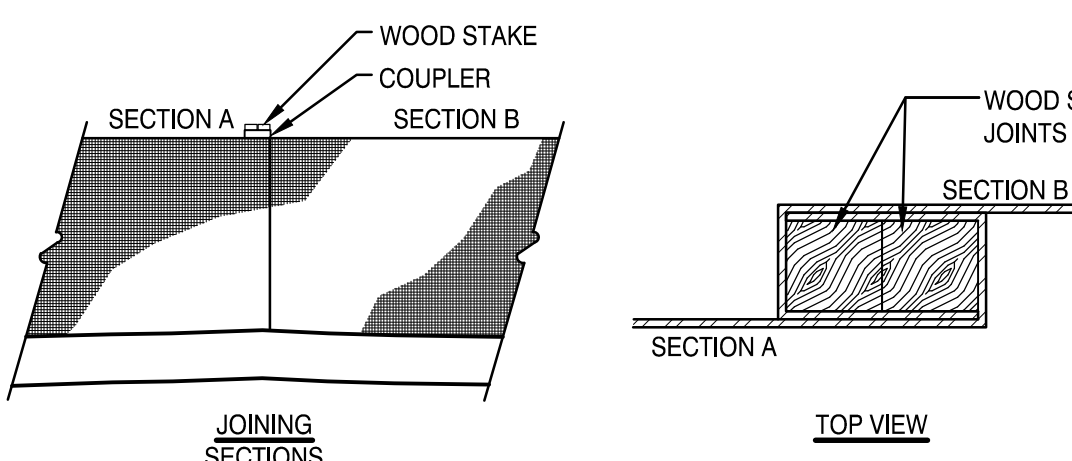
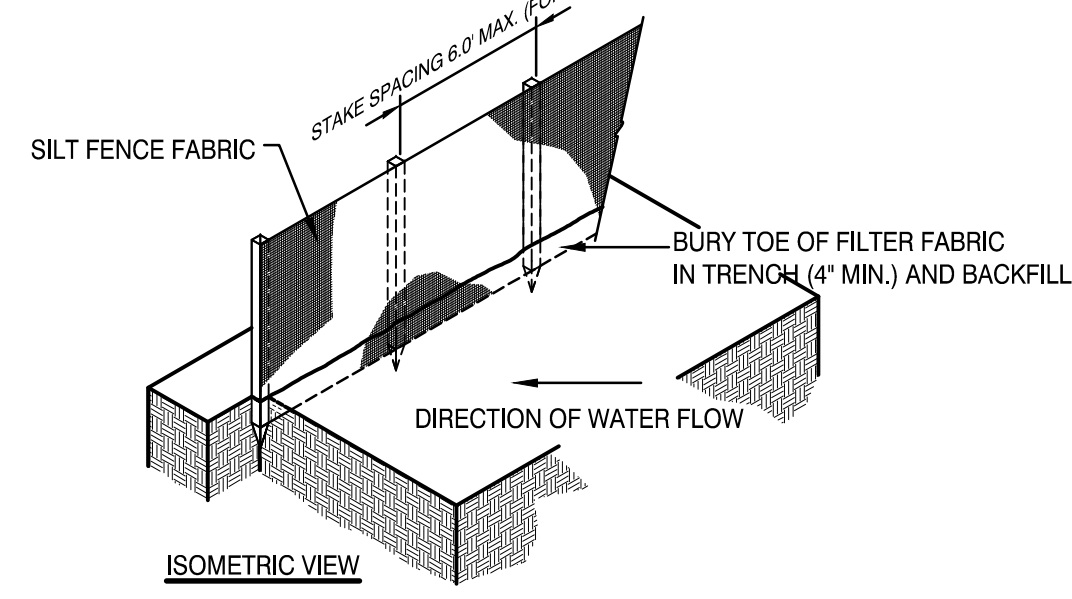
NOTE:
WHERE PIPE & RISER ARE 4"Ø USE 6" SLEEVE. WHERE PIPE & RISER ARE 6"Ø USE 8" SLEEVE.

CLEANOUT (G9)
3/4" = 1'-0"



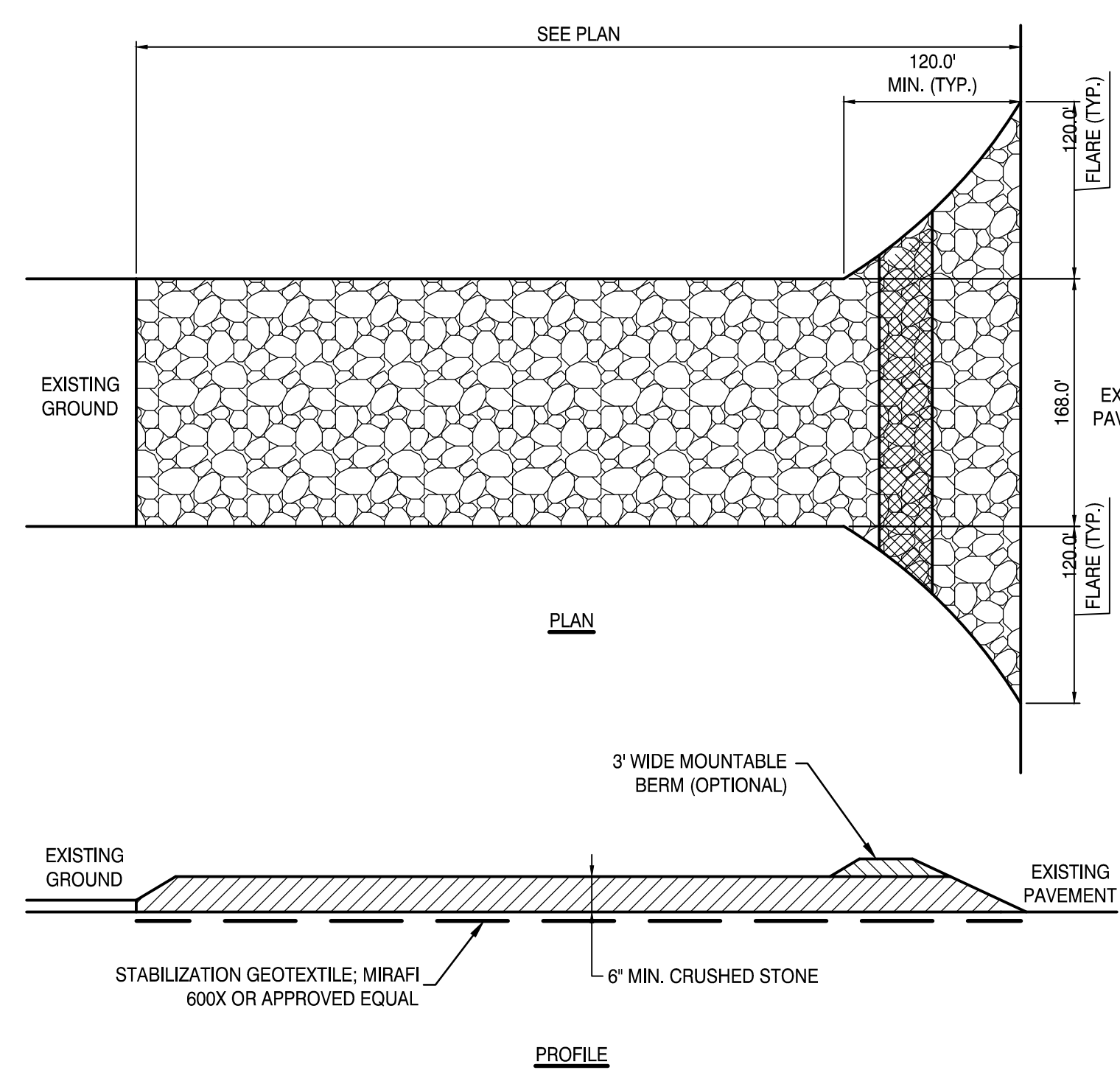
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
 2. UPSLOPE ANCHOR: BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE UPSLOPE EDGE IN A 12" DEEP TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
 3. ROLL THE BLANKETS IN DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE.
 4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 4" OVERLAP. REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.
 5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, OVERLAP SINGLE STYLE A MINIMUM OF 12 INCHES AT THE TOP OF EACH ROW AND 4 INCHES AT THE EDGES OF PARALLEL ROWS. ANCHOR ALONG THE OVERLAP WITH A MAXIMUM SPACING OF 3 FEET OR AS REQUIRED BY THE MANUFACTURER.
 6. EROSION CONTROL BLANKET FOR USE ON SLOPES SHALL BE A BIODEGRADABLE DOUBLE NET WOVEN BLANKET WITH JUTE NETTING AND COCONUT FIBRE MATTES SPECIFICALLY MANUFACTURED FOR THE PURPOSE (NORTH AMERICAN GREEN) BIO-NET S150EN OR APPROVED EQUAL.
 7. ONCE PERMANENT STABILIZATION IS ACHIEVED, REMOVE ANY NON-BIODEGRADABLE MESH, IF USED.
 8. ALL SLOPES 3H:1V OR GREATER, DRAINAGEWAYS AND AREAS INDICATED SHALL RECEIVE EROSION CONTROL BLANKET.
 9. IF MANUFACTURER'S ANCHORING AND INSTALLATION SPECIFICATIONS DIFFER FROM THOSE LISTED ABOVE, THE MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED.

EROSION CONTROL BLANKET (D5)
NOT TO SCALE



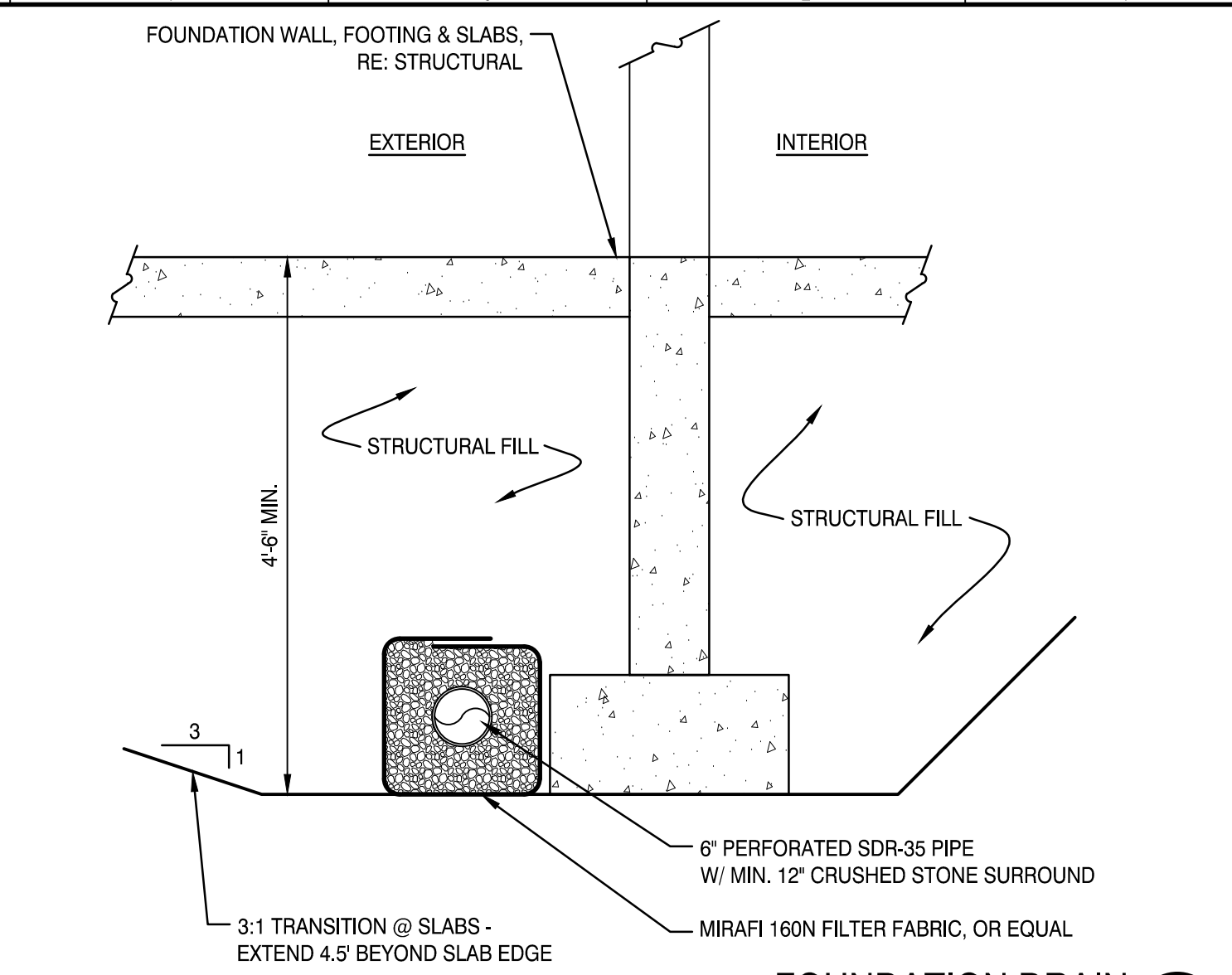
- NOTES:**
1. INSTALL FABRIC ON UPHILL SIDE OF SUPPORT POSTS.
 2. SILT FENCE WILL NOT BE USED IN DRAINAGEWAYS.
 3. CONTRACTOR TO REMOVE SILT AS NECESSARY TO MAINTAIN FABRIC EFFECTIVENESS.
 4. ACCUMULATED SEDIMENT SHALL NOT EXCEED 9". (FOR MAINE)

SILT FENCE (A5)
NOT TO SCALE

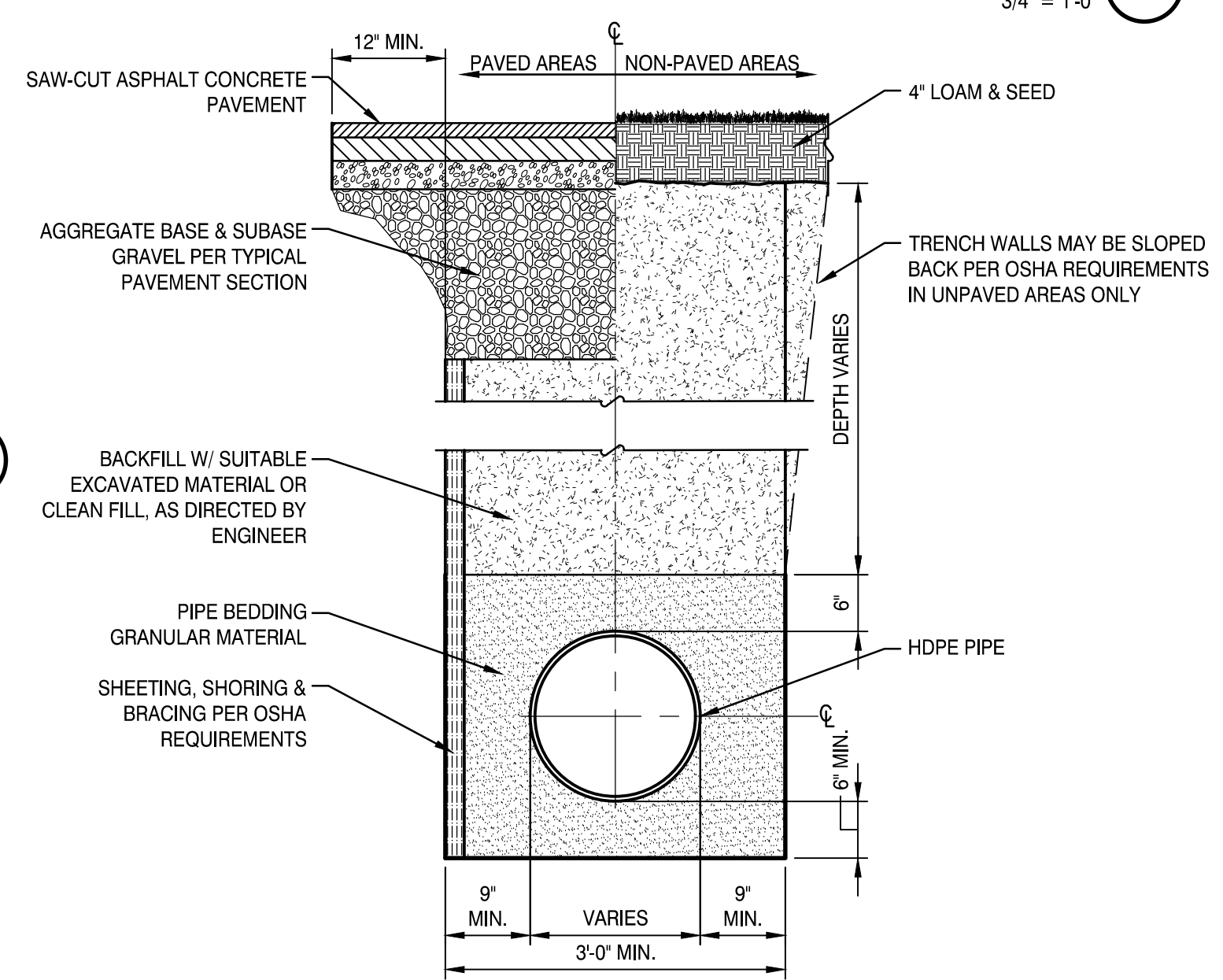


- NOTES:**
1. THE PURPOSE IS TO REMOVE MUD FROM TIRES OF CONSTRUCTION VEHICLES.
 2. WHEN STONE BECOMES CLOGGED AND INEFFECTIVE, TOPDRESS WITH 3" OF NEW STONE OR REPLACE ENTIRE PAD.
 3. IF TIRE WASHING IS REQUIRED, WASH WATER SHALL DRAIN INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

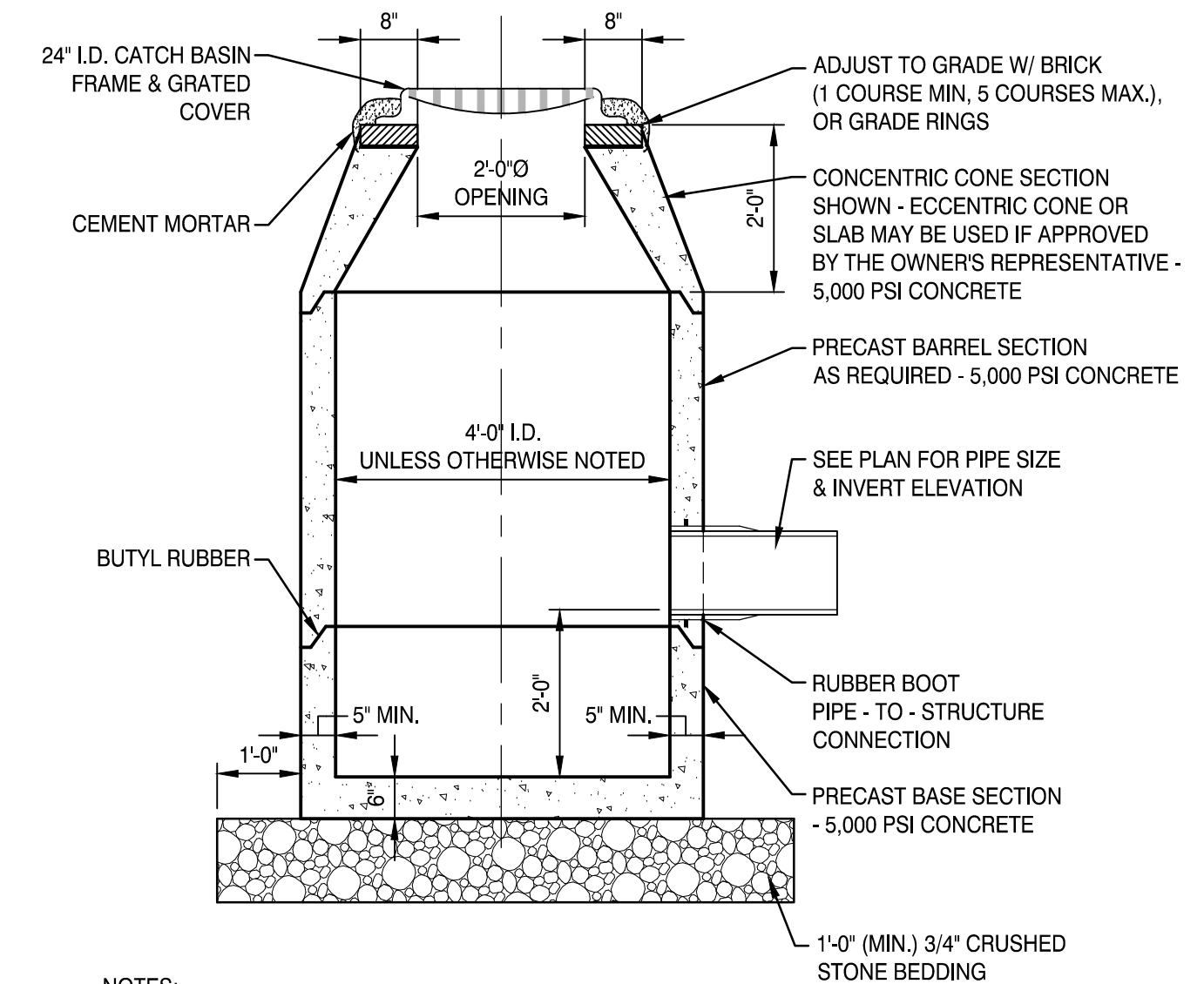
STABILIZED CONSTRUCTION ENTRANCE (G5)
NOT TO SCALE



FOUNDATION DRAIN (H1)
3/4" = 1'-0"

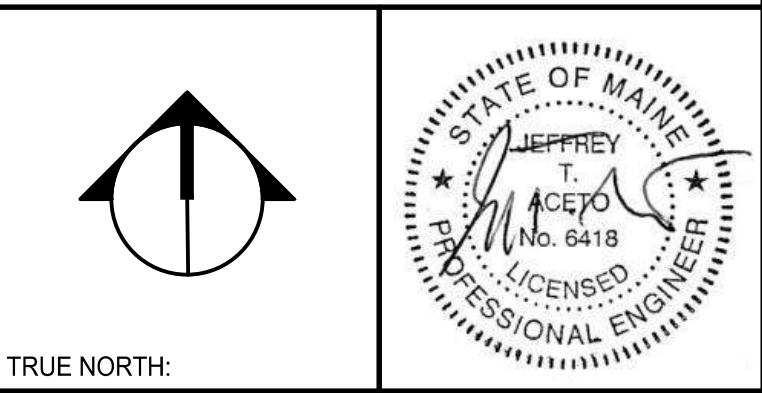


STORM DRAIN TRENCH (E1)
3/4" = 1'-0"



- NOTES:**
1. STANDARD GRATES SHALL BE NENAH R-3210-L OR APPROVED EQUAL. DITCH GRATES SHALL BE NENAH R-4342 OR APPROVED EQUAL.
 2. STEPS SHALL BE PROVIDED FOR CATCH BASINS WITH DEPTHS IN EXCESS OF 8.0'. STEPS SHALL NOT EXCEED 18" O.C., AND BE LOCATED 6" FROM BARREL SECTION JOINTS.

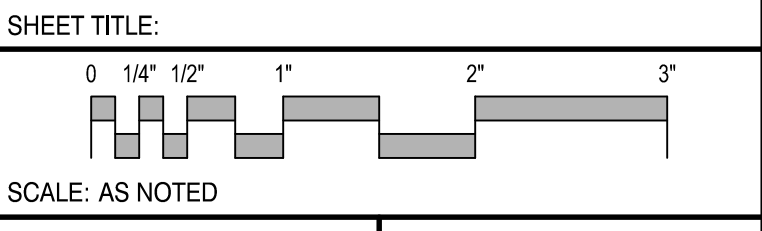
CATCH BASIN (A1)
1/2" = 1'-0"



SMRT
Architecture • Engineering • Planning
75 Washington Avenue, Suite 3A
Portland, Maine 04101

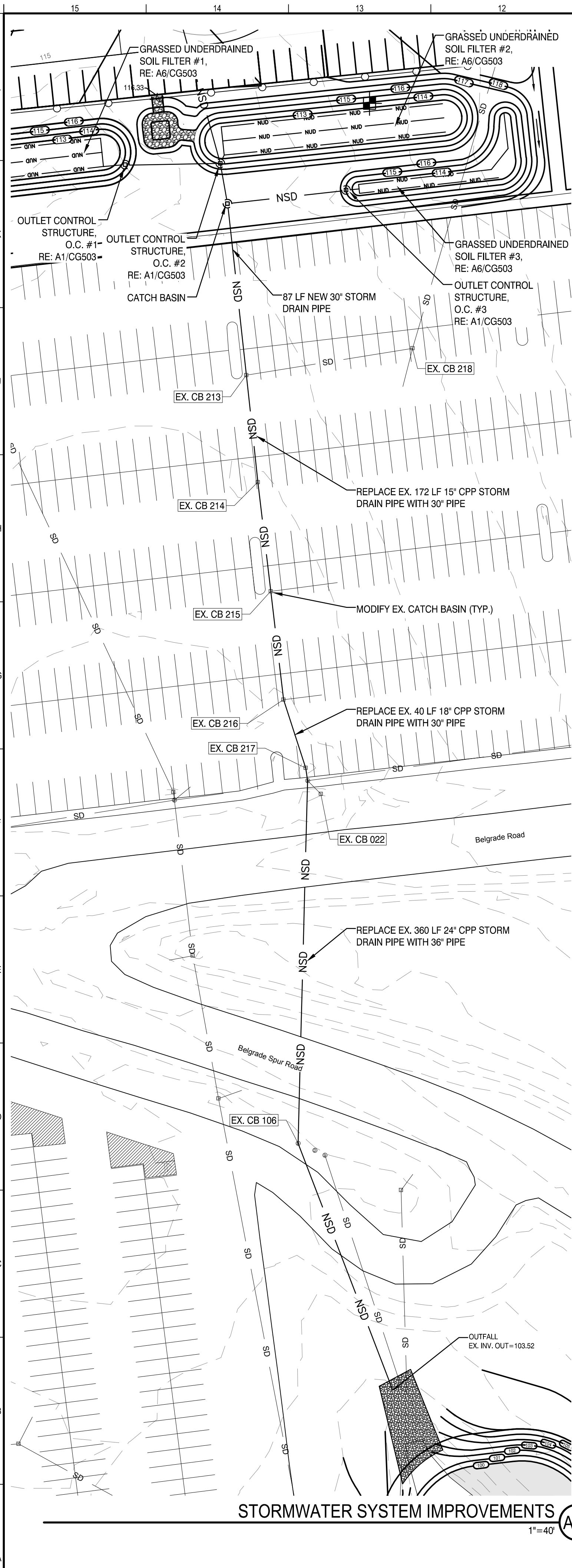
UNIVERSITY OF MAINE
GREEN ENGINEERING &
MANUFACTURING
FACTORY OF THE FUTURE
PERMITTING INFORMATION

**GRADING & EROSION CONTROL
DETAILS**



| | |
|----------------|-------------|
| A/E OF RECORD: | JTA |
| DRAWN BY: | EMS |
| SMRT FILE: | CG502-22012 |
| SHEET No. | CG502 |

NOT FOR CONSTRUCTION

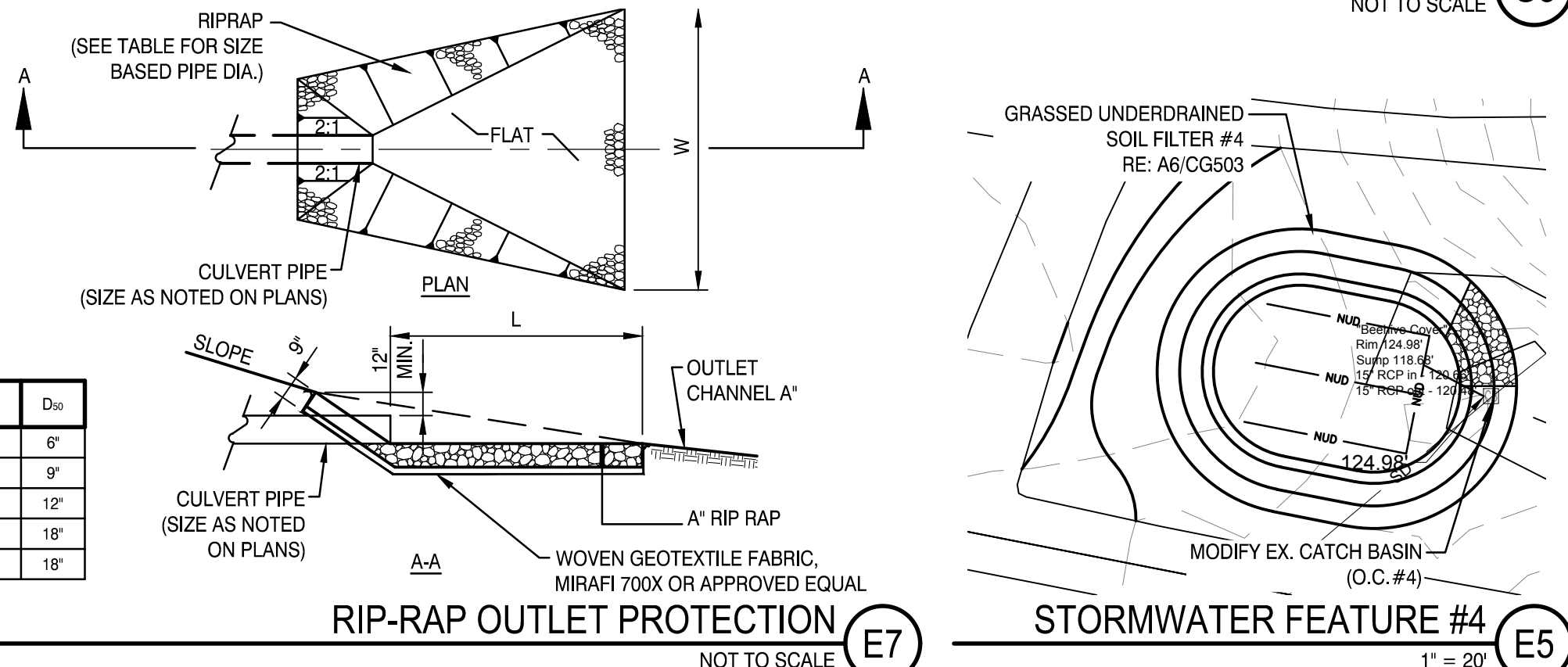


| | | PHASE I | | | | PHASE II | | | |
|--|--|-----------------------|--------------------|------------------|---------------|-----------------------|--------------------|------------------|---------------|
| STRUCTURE | ELEVATION | MIN. FILTER AREA REQ. | DESIGN FILTER AREA | MIN. VOLUME REQ. | DESIGN VOLUME | MIN. FILTER AREA REQ. | DESIGN FILTER AREA | MIN. VOLUME REQ. | DESIGN VOLUME |
| G.U.S.F. #1 TOP SPILLWAY CB RIM BOTTOM | 117.00 EL. 116.50 EL. 115.50 EL. 114.00 EL. | 1,689 SF | 1,887 SF | 2,831 CF | 3,800 CF | 2,507 SF | 2,800 SF | 4,178 CF | 5,777 CF |
| G.U.S.F. #2 TOP SPILLWAY CB RIM BOTTOM | 117.00 EL. 116.50 EL. 115.50 EL. 114.00 EL. | 2,518 SF | 2,798 SF | 4,197 CF | 5,585 CF | 2,520 SF | 2,799 SF | 4,199 CF | 5,585 CF |
| G.U.S.F. #3 TOP SPILLWAY CB RIM BOTTOM | 116.00 EL. 115.50 EL. 114.50 EL. 113.00 EL. | 1,010 SF | 1,123 SF | 1,684 CF | 2,710 CF | 824 SF | 1,123 SF | 1,373 CF | 2,710 CF |
| G.U.S.F. #4 TOP SPILLWAY CB RIM BOTTOM | 126.00 EL. — 124.98 EL. (EX.) 123.50 EL. | 484 SF | 538 SF | 807 CF | 1,349 CF | 484 SF | 538 SF | 807 CF | 1,349 CF |

FEATURE SIZING SCHEDULE J5
NOT TO SCALE

| STRUCTURE | RIM | SIZE | INV. IN | INV. OUT | OVERFLOW WEIR EL. | ORIFICE ELEVATION |
|-----------|------------|--------|--|---|-------------------|---|
| O.C. #1 | EL. 115.50 | 4'0" Ø | NEW 24" DIA. CB (115.50) NEW 4" UD SYSTEM (111.83) | NEW 15" SD (109.50) NEW 4" UD SYSTEM (110.30) | 116.50 | 115.50 - 24" DIA. CB |
| O.C. #2 | EL. 115.50 | 4'0" Ø | NEW 24" DIA. CB (115.50) NEW 4" UD SYSTEM (111.83) | NEW 15" SD (109.50) NEW 4" UD SYSTEM (110.38) | 116.50 | 115.50 - 24" DIA. CB |
| O.C. #3 | EL. 114.50 | 4'0" Ø | NEW 24" DIA. CB (114.50) NEW 4" UD SYSTEM (110.83) | NEW 15" SD (111.00) NEW 4" UD SYSTEM (109.76) | 115.50 | 114.50 - 24" DIA. CB |
| O.C. #4 | EX. 124.98 | 4'0" Ø | EX. 24" CB (VERIFY INVERTS W/ TEST PIT) NEW 4" UD SYSTEM (119.33) | EX. 15" SD (120.48) - VERIFY W/ TEST PIT NEW 4" UD SYSTEM (119.03) | 127.00 | 124.98 - 24" DIA. CB |
| O.C. #5 | EL. 106.00 | 8'0" Ø | NEW 30" SD (100.00) | NEW 30" SD (99.60) | 104.50 | 103.50 - SHARP-CRESTED WEIR 101.50 - (4) @ 18" DIA. 100.00 - (5) @ 12" DIA. |

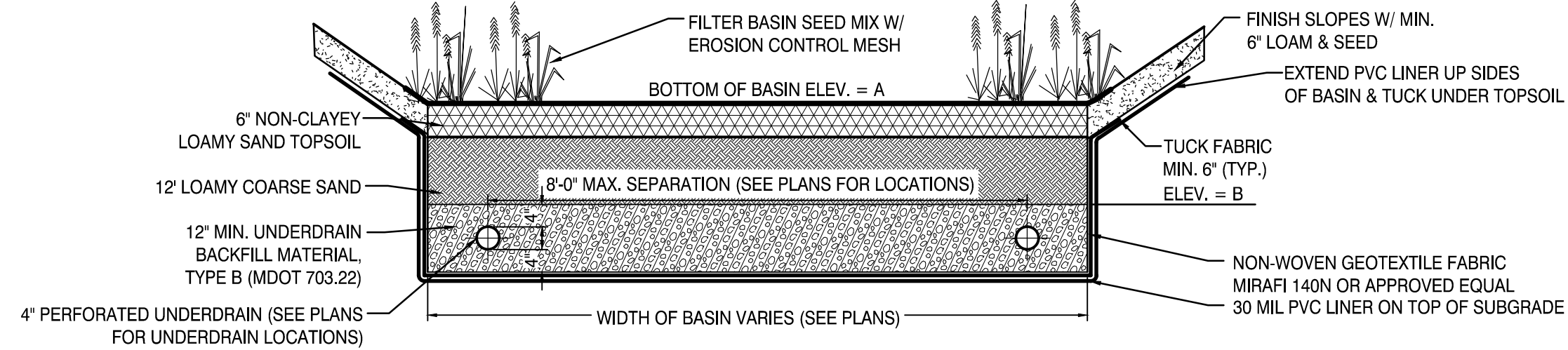
OUTLET CONTROL SCHEDULE G5
NOT TO SCALE



| DIAMETER | L | W | A | D50 |
|----------|-----|-----|-----|-----|
| 12" | 12' | 13' | 14' | 6" |
| 18" | 20' | 22' | 20' | 9" |
| 24" | 30' | 32' | 27' | 12" |
| 30" | 35' | 38' | 32' | 18" |
| 36" | 40' | 43' | 32' | 18" |

RIP-RAP OUTLET PROTECTION E7
NOT TO SCALE

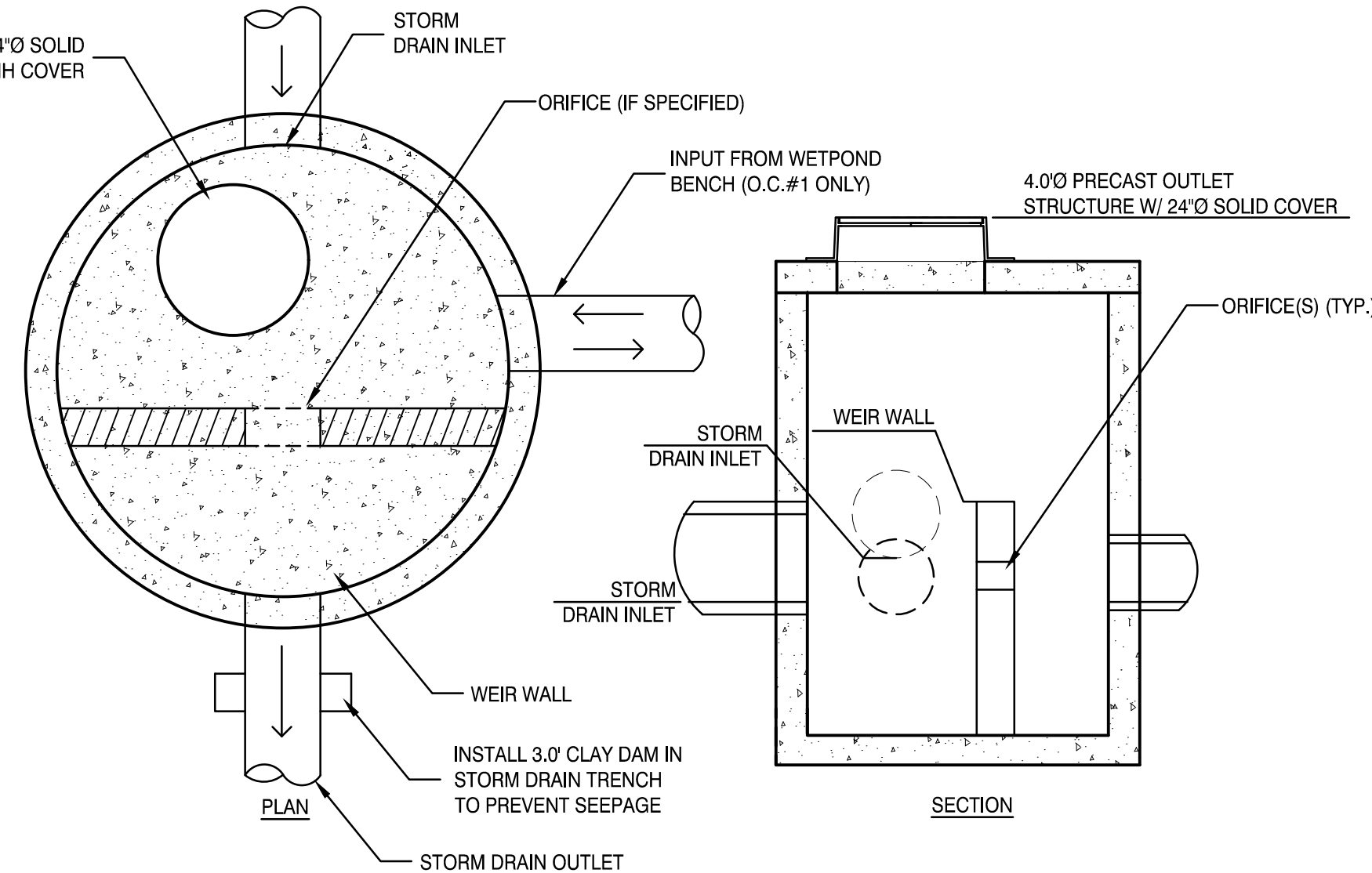
STORMWATER FEATURE #4 E5
1" = 20'



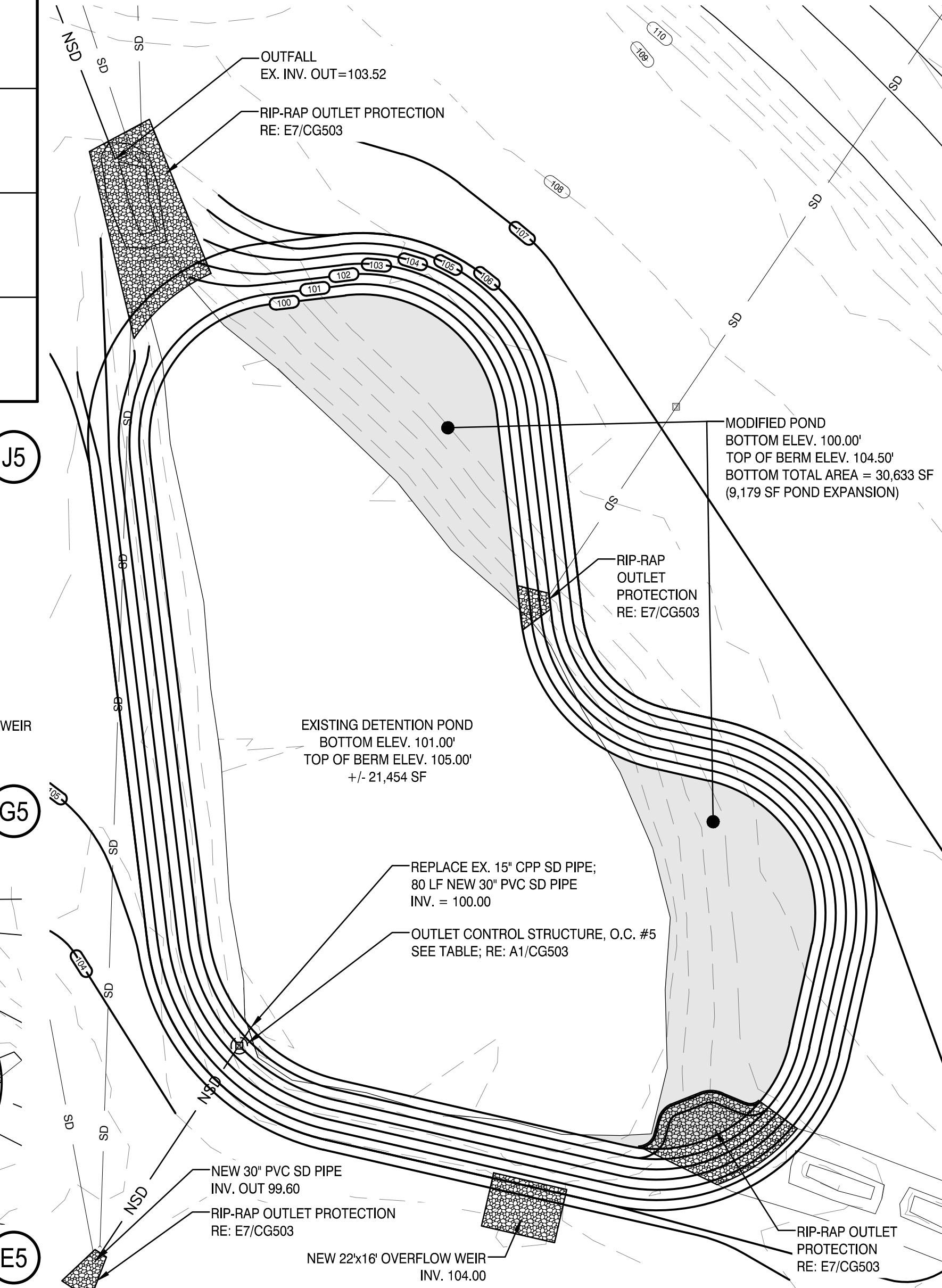
SOIL FILTER NOTES:

- FILTER SOIL MATERIAL FOR UNDERDRAINED SOIL FILTERS AREAS SHALL COMPRISE A TOPSOIL LAYER AND A LAYER OF LOAMY COARSE SAND AS FOLLOWS:
 - TOPSOIL LAYER SHALL BE SIX INCHES DEEP AND SHALL COMPRISE USDA LOAMY SAND TOPSOIL WITH 5-8% HUMIFIED ORGANIC MATTER AND MINIMAL CLAY CONTENT (<5%). ORGANIC MATTER MAY BE ADDED TO PROVIDE SUFFICIENT NUTRIENT CONTENT TO SUPPORT PLANTINGS PROVIDED THAT THE TEXTURE REMAINS AS SPECIFIED.
 - THE LOAMY COARSE SAND LAYER SHALL BE 12 INCHES DEEP. THE PREFERRED MATERIAL SHALL HAVE A CLAY CONTENT <2% BUT HAVE BETWEEN 8% AND 15% PASSING THE #200 SIEVE.
 - THE MIXED FILTER SOIL MATERIAL FOR USE IN SOIL FILTERS SHALL HAVE A SATURATED HYDRAULIC CONDUCTIVITY OF 2.4-4.0 IN/HR.
 - FILTER SOIL MATERIAL SHALL BE PLACED IN 6-INCH LIFTS USING LGP EQUIPMENT OR BY HAND. LGP EQUIPMENT SHALL EXERT A GROUND PRESSURE OF LESS THAN 5 PSI. AS STATED IN THE EQUIPMENT SPECIFICATION FROM THE MANUFACTURER. MATERIAL SHALL BE GRADED TO PROVIDE AN EVEN SURFACE, SEEDED AND COVERED WITH EROSION CONTROL BLANKET.
 - UNDERDRAIN GRAVEL SHALL BE GRANULAR MATERIAL FOR UNDERDRAIN TYPE B, IN ACCORDANCE WITH MDOT SPECIFICATION 703.22.
 - SOIL FILTER MEDIA SHALL NOT BE INSTALLED UNTIL ALL UPSTREAM CONTRIBUTING AREAS HAVE BEEN STABILIZED.

GRASSED UNDERDRAINED SOIL FILTER A6
NOT TO SCALE

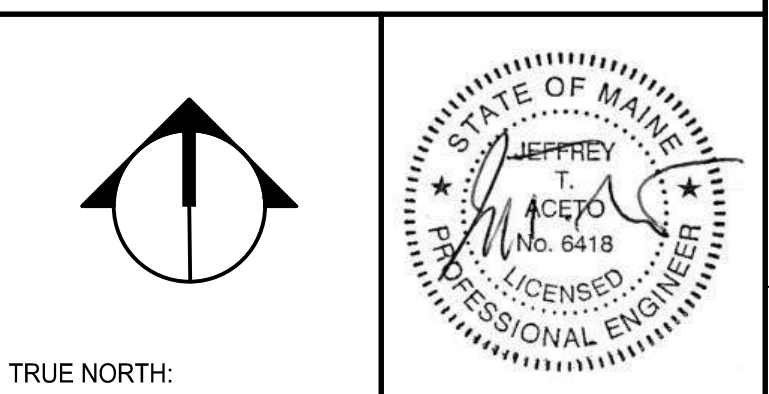


OUTLET CONTROL STRUCTURE A1
NOT TO SCALE



DETENTION POND EXPANSION E1
1"=30'

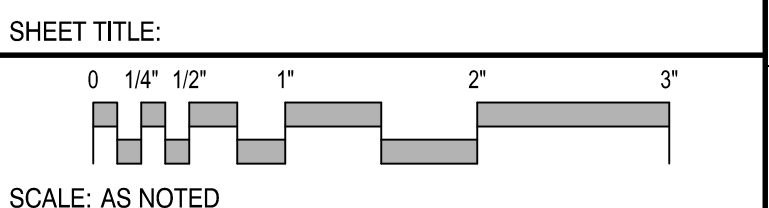
| | | |
|---|----------------|----------|
| 1 | DEP SUBMISSION | 07/12/23 |
|---|----------------|----------|



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Portland, Maine 04101

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PERMITTING INFORMATION

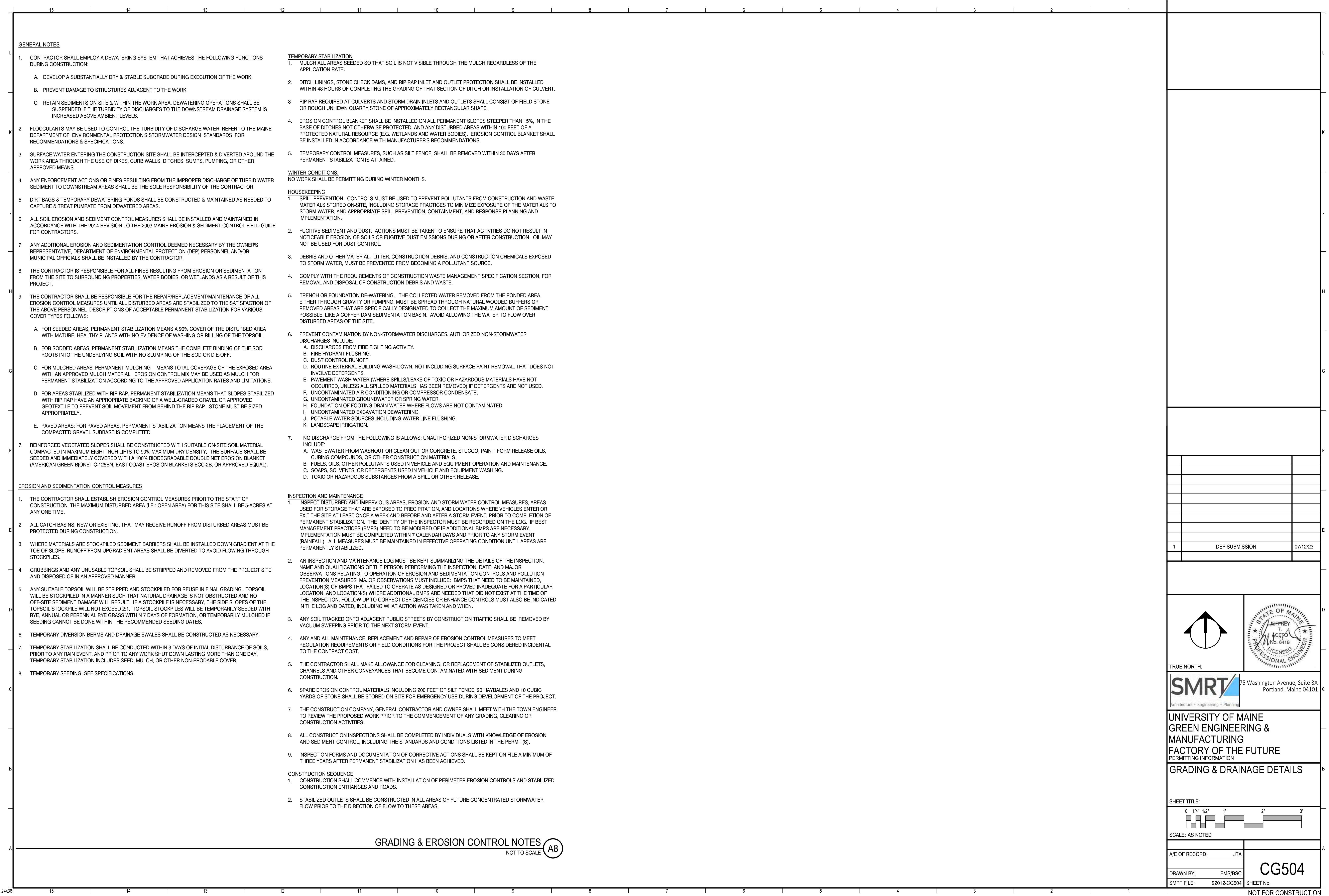
STORMWATER DETAILS



A/E OF RECORD: JTA
DRAWN BY: EMS
SMRT FILE: CG503-22012
SHEET No.

CG503

NOT FOR CONSTRUCTION



APPENDIX G: IPAC REPORT (UPDATED JANUARY 25, 2024)



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588



In Reply Refer To:

January 25, 2024

Project Code: 2023-0006740

Project Name: University of Maine, ASCC Building Expansion Project, Orono, Me

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: <https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see [Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service \(fws.gov\)](#).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

(207) 469-7300

PROJECT SUMMARY

Project Code: 2023-0006740
Project Name: University of Maine, ASCC Building Expansion Project, Orono, Me
Project Type: New Constr - Above Ground
Project Description: The project is expansion of the ASCC Building on the University of Maine campus in Orono, Maine. Design has not been completed to date, but will include a building expansion and associated infrastructure including stormwater systems.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.90031255,-68.66430648657715,14z>



Counties: Penobscot County, Maine

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

| NAME | STATUS |
|--|------------|
| Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045 | Endangered |

FISHES

| NAME | STATUS |
|--|------------|
| Atlantic Salmon <i>Salmo salar</i> Population: Gulf of Maine DPS There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2097 | Endangered |

INSECTS

| NAME | STATUS |
|--|-----------|
| Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743 | Candidate |

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

| NAME | STATUS |
|---|--------|
| Atlantic Salmon <i>Salmo salar</i> https://ecos.fws.gov/ecp/species/2097#crithab | Final |

IPAC USER CONTACT INFORMATION

Agency: Watershed Resource Consultants, LLC

Name: Aleita Burman

Address: P.O. Box 145

City: Orrington

State: ME

Zip: 04474

Email: blburman@gmail.com

Phone: 2073856056

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers

Name: Shawn Mahaney

Email: shawn.b.mahaney@usace.army.mil



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Ecological Services Field Office

P. O. Box A

East Orland, ME 04431

Phone: (207) 469-7300 Fax: (207) 902-1588



In Reply Refer To:

January 25, 2024

Project code: 2023-0006740

Project Name: University of Maine, ASCC Building Expansion Project, Orono, Me

Federal Nexus: yes

Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Technical assistance for 'University of Maine, ASCC Building Expansion Project, Orono, Me'

Dear Aleita Burman:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on January 25, 2024, for 'University of Maine, ASCC Building Expansion Project, Orono, Me' (here forward, Project). This project has been assigned Project Code 2023-0006740 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project. **Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter.**

Determination for the Northern Long-Eared Bat

Based on your IPaC submission and the standing analysis for the Dkey, your project has reached the determination of "May Affect" the northern long-eared bat.

Next Steps

Your action may qualify for the Interim Consultation Framework for the northern long-eared bat. To determine if it qualifies, review the Interim Consultation Framework posted here <https://www.fws.gov/library/collections/interim-consultation-framework-northern-long-eared-bat>. If you

determine it meets the requirements of the Interim Consultation Framework, follow the procedures outlined there to complete section 7 consultation.

If your project does **not** meet the requirements of the Interim Consultation Framework, please contact the Maine Ecological Services Field Office for further coordination on this project. Further consultation or coordination with the Service is necessary for those species or designated critical habitats with a determination of “May Affect”.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Atlantic Salmon *Salmo salar* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate

Critical Habitats:

- Atlantic Salmon *Salmo salar* Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the species listed above.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

University of Maine, ASCC Building Expansion Project, Orono, Me

2. Description

The following description was provided for the project 'University of Maine, ASCC Building Expansion Project, Orono, Me':

The project is expansion of the ASCC Building on the University of Maine campus in Orono, Maine. Design has not been completed to date, but will include a building expansion and associated infrastructure including stormwater systems.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.90031255,-68.66430648657715,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

3. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Yes

4. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

5. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

No

6. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

7. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

8. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the [effects of any activities](#) that would not occur but for the proposed action.

If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer “No” below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project’s action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a “no effect” determination for the northern long-eared bat.

Note: Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer “No” and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of [Effects of the Action](#) can be found here: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

9. [Semantic] Is the action area located within 0.5 miles of a known northern long-eared bat hibernaculum?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

10. Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating northern long-eared bats?

No

11. Does the action area contain or occur within 0.5 miles of (1) talus or (2) anthropogenic or naturally formed rock crevices in rocky outcrops, rock faces or cliffs?

No

12. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?

(If unsure, answer "Yes.")

Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats (i.e., live trees and/or snags ≥ 3 inches (12.7 centimeter) dbh), answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

Yes

13. Will the action cause effects to a bridge?

No

14. Will the action result in effects to a culvert or tunnel?

No

15. Does the action include the intentional exclusion of northern long-eared bats from a building or structure?

Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local U.S. Fish and Wildlife Services Ecological Services Field Office to help assess whether northern long-eared bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures

No

16. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats**?

No

17. Will the action directly or indirectly cause construction of one or more new roads that are open to the public?

Note: The answer may be yes when a publicly accessible road either (1) is constructed as part of the proposed action or (2) would not occur but for the proposed action (i.e., the road construction is facilitated by the proposed action but is not an explicit component of the project).

No

18. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic on one or more existing roads?

Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

No

19. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

20. Will the proposed action involve the creation of a new water-borne contaminant source (e.g., leachate pond pits containing chemicals that are not NSF/ANSI 60 compliant)?

No

21. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

No

22. Will the action include drilling or blasting?

No

23. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

No

24. Will the proposed action involve the use of herbicides or pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

No

25. Will the action include or cause activities that are reasonably certain to cause chronic nighttime noise in suitable summer habitat for the northern long-eared bat? Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time.

Note: Additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

26. Does the action include, or is it reasonably certain to cause, the use of artificial lighting within 1000 feet of suitable northern long-eared bat roosting habitat?

Note: Additional information defining suitable roosting habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

Yes

27. Will the action use only downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting) when installing new or replacing existing permanent lights? Or for those transportation agencies using the Backlight, Uplight, Glare (BUG) system developed by the Illuminating Engineering Society, will all three ratings (backlight, uplight, and glare) be as close to zero as is possible, with a priority of "uplight" of 0?

No

28. Will the proposed action result in the cutting or other means of knocking down, bringing down, or trimming of any trees suitable for northern long-eared bat roosting?

Note: Suitable northern long-eared bat roost trees are live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities.

No

PROJECT QUESTIONNAIRE

Will all project activities be completed by April 1, 2024?

No

IPAC USER CONTACT INFORMATION

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LEAD AGENCY CONTACT INFORMATION

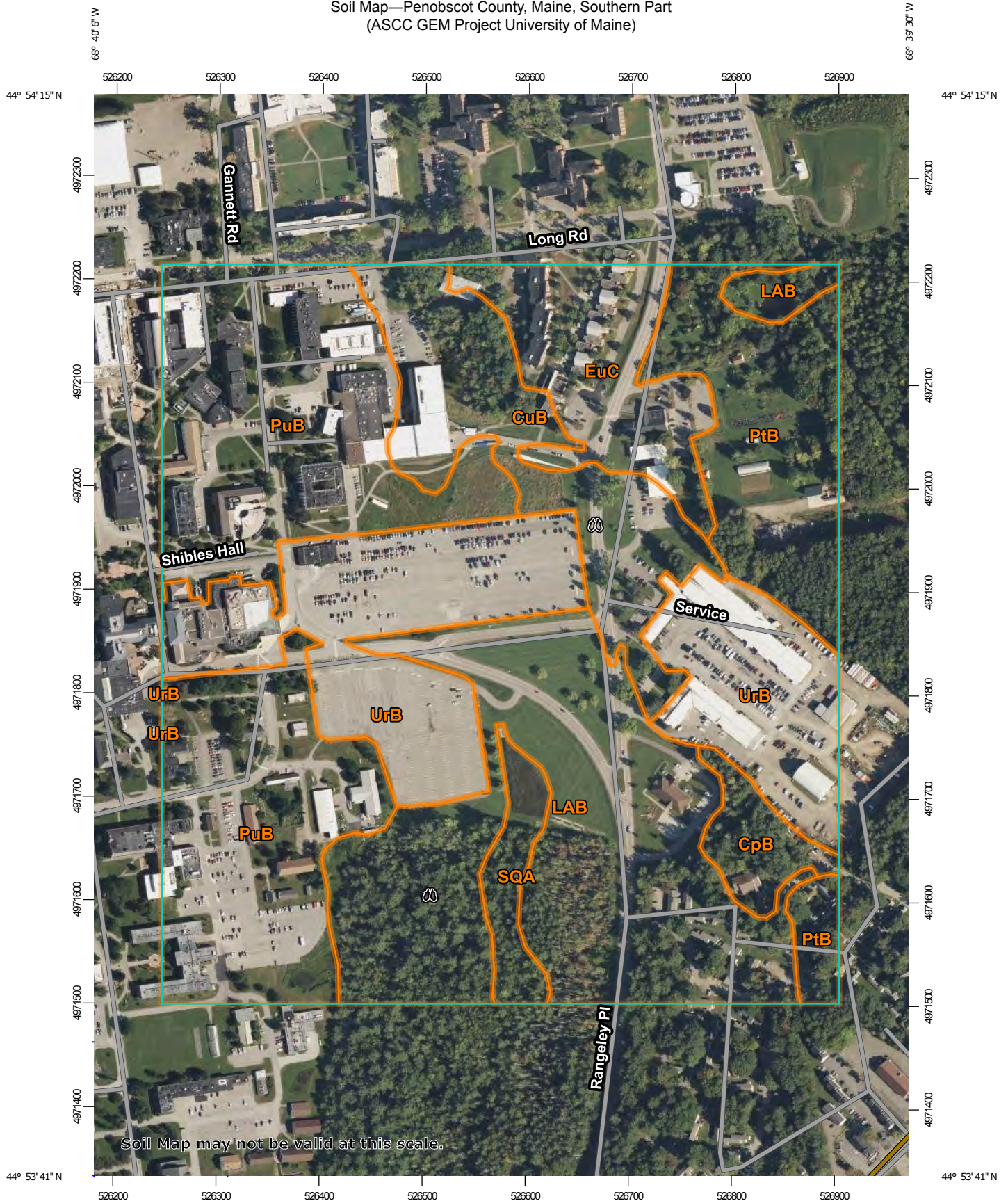
Lead Agency: Army Corps of Engineers

Name: Shawn Mahaney

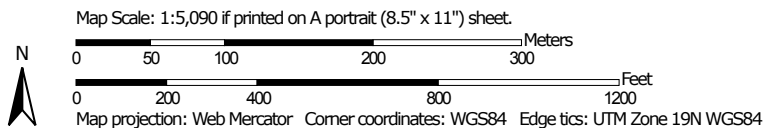
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APPENDIX H: USDA SOILS MAP

Soil Map—Penobscot County, Maine, Southern Part
(ASCC GEM Project University of Maine)



Soil Map may not be valid at this scale.



Natural Resources
Conservation Service


Web Soil Survey
National Cooperative Soil Survey

8/16/2023
Page 1 of 3

Soil Map—Penobscot County, Maine, Southern Part
(ASCC GEM Project University of Maine)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Penobscot County, Maine, Southern Part
Survey Area Data: Version 8, Aug 30, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 11, 2021—Oct 29, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------------|----------------|
| CpB | Colonel-Peru complex, 3 to 8 percent slopes, very stony | 2.5 | 2.1% |
| CuB | Chesuncook-Telos-Urban land association, 0 to 8 percent slopes | 11.3 | 9.7% |
| EuC | Elliottsville-Urban land-Chesuncook association, 0 to 15 percent slopes | 8.3 | 7.1% |
| LAB | Lamoine-Scantic complex, 0 to 8 percent slopes | 26.6 | 22.8% |
| PtB | Peru-Tunbridge association, 3 to 8 percent slopes, very stony | 12.0 | 10.3% |
| PuB | Pushaw-Swanville-Urban land association, 0 to 8 percent slopes | 31.5 | 27.1% |
| SQA | Swanville-Wonsqueak Association, 0 to 3 percent slopes | 2.5 | 2.1% |
| UrB | Urban land-Anthroportic Udorthents complex, 0 to 8 percent slopes | 21.9 | 18.8% |
| Totals for Area of Interest | | 116.5 | 100.0% |

APPENDIX I: GEOTECHNICAL STUDY REPORT



REPORT

22-0937 S

May 24, 2023

Explorations and Geotechnical Engineering Services

Proposed GEM Factory of the Future
University of Maine
Orono, Maine

Prepared For:

The University of Maine System
Office of Facilities Management
Attention: Walter Shannon
5765 Service Building
Orono, ME 04469-5765

Prepared By:

S. W. Cole Engineering, Inc.
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DRAFT

23-0937 S

May 24, 2023

The University of Maine System
Office of Facilities Management
Attention: Walter Shannon
5765 Service Building
Orono, ME 04469-5765

Subject: Explorations and Geotechnical Engineering Services
Proposed GEM Factory of the Future
University of Maine
Orono, Maine

Dear Walter:

In accordance with our Proposal – Rev 2, dated October 7, 2022, we have performed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

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

1.2 Site and Proposed Construction

Based on our conversations and the information provided, we understand the GEM Factory of the Future is proposed as an addition to the existing Advanced Structures and Composites Center (ASCC) at the University of Maine (UMaine) in Orono, Maine.

The site is located on the southern side of the ASCC building located on Flagstaff Road, within open grassed surfaced areas. Based on the survey plan received from UMaine on December 1, 2022, we understand the site generally slopes downward from northeast to southwest from about elevation 125 to 112 feet (project datum).

Based on the plans provided by SMRT and the Conceptual Design Report, dated November 13, 2020, we understand development plans call for the construction of a building addition with associated pavement access drive and stormwater management areas. We understand the building is proposed over two phases and will be located on the southern side of the existing building, occupying a footprint of about 46,400 square feet, including both phases. We understand the building will be a Cross-Laminated Timber (CLT) framed structure with on-grade floor slabs. We understand the western 80 feet of the building will include three stories for classroom areas. We understand the remainder of the building will be a factory area with high-bay ceilings approaching 50 feet in height. We understand the factory area will include two interior building cranes on rail systems with U-shaped column supports for the positioning system. We understand the U-shaped columns will have settlement/deflection tolerances of 0.25 mm during operation of the facility.

We understand the building is proposed at a Finish Floor Elevation (FFE) of 118.6 feet. The site within the building footprint generally slopes downward from northeast to southwest from about elevation 118 to 112 feet requiring tapered grade raise fills approaching 7 feet to achieve the proposed FFE. Based on the information provided by Thornton Tomasetti (project structural engineer), we understand column loads within the classroom areas of the building are estimated to range from 120 to 440 kips. We understand the column loads within the factory area of the building are estimated to range from 120 to 305 kips. We understand the U-shaped column loads to support the positioning system are estimated to range from 100 to 200 kips, which includes live loads of 90 to 175 kips. Additionally, we understand the live loads for the on-grade slab for the classroom area and the factory area are 100 and 250 psf, respectively.

Proposed and existing site features are shown on the "Exploration Location Plan" attached in Appendix B.

2.0 EXPLORATION AND TESTING

2.1 Explorations

2.1.1 Current Explorations

Sixteen test borings (B-22-101 through B-22-116) were made at the site on November 28 and 29, 2022 by S. W. Cole Explorations, LLC. The exploration locations were selected by SMRT and established in the field by S. W. Cole Engineering, Inc. (S.W.COLE) using a mapping grade GPS unit. The approximate exploration locations are shown on the “Exploration Location Plan” attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C. The elevations shown on the logs were estimated based on topographic information shown on the “Exploration Location Plan.”

2.1.2 Prior Explorations

S.W.COLE performed a subsurface investigation for the AEWC high bay lab expansion and provided a geotechnical report, dated September 30, 2003. Four test borings (B-03-16 through B-03-19) were made in the project vicinity by Maine Test Boring, Inc. (MTB) under the direction of S.W.COLE in August 2003.

S.W.COLE performed subsurface explorations for a subsequent AEWC lab expansion and provided a geotechnical report, dated March 26, 2009. Eleven test borings (B-1 through B-5, B-9 through B-11, B-13, B-14 and B-18) were made in the project vicinity by MTB under the direction of S.W.COLE in February 2009.

The approximate locations of these prior explorations are shown on the “Exploration Location Plan” attached in Appendix B. Logs of these prior explorations are attached in Appendix C.

2.2 Testing

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

Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. The results of three moisture content tests and two Atterberg Limits tests are noted on the logs. The results of one grain size analysis are attached in Appendix D.

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

3.1.1 Current Explorations

The test borings encountered a soils profile generally consisting of surficial topsoil or bituminous pavement overlying undocumented fill or native glaciomarine soils. Test borings B-22-101, B-22-103, B-22-104, B-22-106 and B-22-114 through B-22-116 encountered undocumented fill to depths of about 1 to 5.5 feet which generally consisted of loose to medium dense silt and sand with varying portions of gravel, organics and plastic. Underlying the undocumented fill or topsoil at the remaining borings, the native glaciomarine soils generally consisted of hard to very stiff silty clay which became medium stiff where encountered below depths of about 10 feet. Underlying the native glaciomarine soils, the test borings encountered glacial till generally consisting of medium dense to dense gravelly sand and silt with occasional cobbles. Test borings B-22-105 and B-22-106, performed for the proposed access drive, were terminated in glacial till at depths of about 12 feet. The remaining test borings were terminated on refusal surfaces (probable bedrock) at depths ranging from about 7 to 30 feet.

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

3.1.2 Prior Explorations

S.W.COLE completed geotechnical investigations for previous projects as identified in Section 2.1.2. The prior test borings encountered similar subsurface conditions, generally consisting of undocumented fills overlying glaciomarine soils and glacial till mantling probable bedrock. The undocumented fills from the February 2009 test borings were observed to depths up to 10.5 feet, however we anticipate portions of the fills were removed during the construction phase of the AEWB lab expansion. The bedrock was cored in boring B-9 from depths of 19.6 to 24.8 feet utilizing NQ2 rock coring techniques. The bedrock was classified as gray Pelite / Metasiltstone, of the Vassalboro Formation.

The obtained bedrock core had a Rock Quality Designation (RQD) of 75 percent, corresponding to a rock quality of good. Logs of the prior explorations are attached in Appendix C.

3.2 Groundwater

Free water was observed at the ground surface or relatively shallow depths at test borings B-22-101 and B-22-102 which was likely indicative of perched water conditions. The soils at test borings B-22-102 through B-22-104, B-22-106 and B-22-108 through B-22-116 were observed wet below depths ranging from about 10 to 15 feet. Groundwater likely becomes perched on the glaciomarine soils and glacial till encountered at the explorations. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

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

- Based on the current and prior borings, the undocumented fills may vary in thickness from about 1 to 10.5 feet across the site. The fills may vary outside of the exploration locations. It is our opinion that the undocumented fills are unsuitable for direct support of the proposed building.
- Options for support of the proposed building include over-excavation and replacement of the undocumented fills (provided anticipated settlement described herein are acceptable), ground improvements, or deep foundations.
- If conventional spread footing foundations bearing on properly prepared subgrades are utilized, we estimate post-construction settlement may approach 1½ inches total and 1 inch differential over 40 feet. Following post-construction settlements, we estimate elastic deflections of the columns supporting the position equipment will be on the order of 1/8 inch during operation of the interior cranes. If these settlement and deflection estimates exceed tolerable amounts for the positioning equipment cranes, we recommend pile-supported foundations.

- Subgrades across the site will consist of moisture sensitive glaciomarine soils. Earthwork and grading activities should occur during drier, non-freezing months of late Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the exposed native soils. Excavation of bearing surfaces should be completed with a smooth-edged bucket to lessen subgrade disturbance.
- Imported Granular Borrow, Structural Fill and Crushed Stone will be required for construction. The undocumented fills and native soils are unsuitable for reuse as fill in the building footprint but may be suitable for reuse in paved and landscape areas as needed.

4.2 Settlement and Liquefaction Evaluations

4.2.1 Settlement

We have estimated post-construction settlement of the site soils considering:

- The subsurface findings at the test borings;
- The use of conventional spread footing foundations following removal of undocumented fills and replacement with imported compacted Granular Borrow or Structural Fill;
- The results of laboratory consolidation testing performed on a sample of the medium stiff silty clay obtained from the adjacent site;
- The existing grades shown on the “Exploration Location Plan” and a proposed building FFE of 118.6 feet;
- Anticipated foundation loadings provided by Thornton Tomasetti.

Based on our analysis using RocScience Settle3D software, we estimate post-construction settlement may approach 1½ inches total and 1 inch differential over 40 feet: an illustration of the estimated settlement is attached in Appendix E.

Additionally, we have evaluated elastic deflections of the U-shaped columns for the position system during the operation of the interior cranes. Our evaluation included the use of conventional spread footing foundations bearing on properly prepared subgrades and the provided column loads of 100 to 200 kips, including live loads of 90 to 175 kips.

Based on our evaluation, we estimate elastic deflections on the order of 1/8 inch during operation of the interior cranes.

4.2.2 Liquefaction

Liquefaction is typically observed in saturated deposits of loose sands and non-plastic silts subjected to ground shaking most commonly from earthquakes. Considering the subsurface conditions encountered, it is our opinion if undocumented fills are removed and replaced beneath foundations, the risk of seismically induced liquefaction occurring at the site is low. Further, it is our opinion that the risk of seismically induced settlement occurring at the site is low.

4.3 Site and Subgrade Preparation

We recommend site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. We recommend as much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance.

Building and Structure Footprints: As discussed, undocumented fills exist within the proposed building footprint. We offer the following recommendations for building pad preparation for each of the foundation support options presented herein:

Over-Excavate and Replace: Over-excavations would consist of removing existing undocumented fills from beneath the entire building footprint and backfilling with imported compacted Granular Borrow or Structural Fill. The extent of removal should extend 1 foot laterally outward from outside edge of perimeter footings for every 1 foot of excavation depth (1H:1V bearing splay).

Ground Improvement: The proposed building foundations and on-grade slabs could derive support from ground improved with Stone Columns or Rigid Inclusions extending into the medium dense to dense glacial till. Ground improvement elements would be used below the proposed building footprint to provide support of conventional spread footing foundations and on-grade floor slabs. We anticipate a 3 to 6 inches thick bearing layer of compacted Crushed Stone would be constructed below footings. We anticipate a 2-foot-thick layer of compacted Structural Fill would be installed below on-grade floor slabs to help distribute floor slab loads to the improved ground.

Deep Foundations: The proposed building could be supported by deep foundations including driven steel piles, drilled micropiles or drilled shafts. We recommend that all deep foundation options be founded on or within bedrock. We anticipate structural slabs would be required in areas of proposed on-grade slabs if undocumented fills remain.

We recommend excavations be performed with a smooth-edged bucket to lessen disturbance of subgrade soils. Spread footings founded on native soils should bear on at least 3 inches of compacted Crushed Stone. We recommend interior footings and slab areas be underlain by at least 12-inches of compacted Structural Fill.

Paved Areas: Undocumented fills with deleterious materials including organics and plastic, were encountered below proposed pavement areas. We recommend undocumented fills encountered beneath proposed paved areas be removed to a depth of at least 1 foot below pavement gravels. Where fills remain, we recommend the subgrade be densified by proof-rolling with at least 3 passes of a 10-ton vibratory roller compactor. Areas that become soft or continue to yield after proof-rolling should be removed and replaced with compacted Granular Borrow.

4.4 Excavation and Dewatering

Excavation work will generally encounter bituminous pavement, topsoil, undocumented fills, glaciomarine soils and glacial till. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should occur during drier Spring, Summer and Fall seasons. Rubber tired construction equipment should not operate directly on the native soils. Final cuts to subgrade should be performed with a smooth-edged bucket to help minimize soil disturbance.

Controlling the water levels to at least 1 foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA trenching regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and pavement. If over-excavations are performed adjacent to the existing structures, underpinning may be required to prevent undermining of the structures. The design and planning of excavations, excavation support systems, and dewatering is the responsibility of the contractor.

4.5 Foundations

4.5.1 Spread Footings

Provided the estimated settlements and elastic deflections are acceptable, on-grade floor slabs and spread footing foundations appear feasible for the proposed building following removal of undocumented fills from the beneath the entire building footprint, and backfilling with imported compacted Granular Borrow or Structural Fill. Spread footings should bear on at least 3 inches of compacted Crushed Stone overlying undisturbed native non-organic soils or compacted Granular Borrow or Structural Fill overlying undisturbed native non-organic soils. For spread footings bearing on properly prepared subgrades, we recommend the following geotechnical parameters for foundation design consideration:

| Geotechnical Parameters for Spread Footings and Foundation Walls | |
|---|---------------------|
| Design Frost Depth | 5 feet |
| Net Allowable Soil Bearing Pressure | 2.5 ksf |
| Base Friction Factor | 0.35 |
| Total Unit Weight of Backfill | 125 pcf |
| At-Rest Lateral Earth Pressure Coefficient | 0.5 |
| At-Rest Equivalent Fluid Earth Pressure | 62.5 |
| Internal Friction Angle of Backfill | 30° |
| Seismic Soil Site Class | C (IBC 2015) |
| Total Settlement | 1 1/2-inches |
| Differential Settlement | 1-inch over 40 feet |

4.5.2 Ground Improvement

Alternatively, the undocumented fills and native soils can be improved with Stone Columns or Rigid Inclusions to support conventional on-grade floor slabs and spread footing foundations. The ground improvement elements will need to extend through undocumented fills and glaciomarine soils and into the glacial till strata. Stone Columns and Rigid Inclusions are designed and installed by a specialty design-build contractor. For this option, we offer the following geotechnical parameters for design consideration:

| Geotechnical Parameters for Spread Footings on Improved Ground | |
|---|------------------|
| Net Allowable Soil Bearing Pressure | 4 ksf |
| Base Friction Factor | 0.35 |
| Total Post-Construction Settlement | 1/2 inch or less |
| Differential Post-Construction Settlement | 1/2 inch or less |

We anticipate footings will be underlain by at least 3 inches of compacted Crushed Stone overlying improved ground and floor slabs will be underlain by at least 2 feet of compacted Structural Fill overlying improved ground. We recommend the specialty design-build contractor provide final foundation and slab subgrade preparation recommendations for their selected ground improvement option.

Ground Improvement Submittal & Load Testing: We recommend the contract documents require an engineered submittal to improve ground conditions to meet or exceed the required foundation support. The ground improvement submittal must include Quality Control and load testing procedures. The ground improvement submittal must be prepared and sealed by a Professional Engineer licensed in the State of Maine and endorsed by the Installer.

4.5.3 Deep Foundations

If the settlement and deflection estimates presented herein exceed tolerable amounts for the positioning equipment cranes and building, we recommend foundations be supported on deep foundations transferring loads to bedrock. We anticipate structural slabs will be required in areas of proposed on-grade slabs if undocumented fills remain.

All grade/tie beams and foundations exposed to freezing temperatures should extend to at least frost penetration depth for frost protection. The foundation subgrade soils will likely consist of undocumented fills or glaciomarine soils, which are susceptible to strength loss when wet. Therefore, we recommend the grade beams and pier caps be directly underlain by at least 3-inches of Crushed Stone to help provide a stable working surface for formwork.

As discussed, we offer the following comments for driven piles and drilled micropiles; recommendations for drilled shafts have been excluded due to their anticipated highest cost .

4.5.3.1 Driven Steel Piles

Driven steel H-piles end-bearing on bedrock could be used to provide support of foundations and floor slabs where post-construction settlement and elastic deflections exceed tolerable amounts. As discussed, pile driving will induce vibrations and noise during construction that may adversely impact nearby equipment and buildings, which

must be considered in evaluation of this alternative. We offer the following pile sizes and allowable axial compressive capacities for consideration:

| <u>Pile Type</u> | <u>Section</u> | <u>Allowable Axial Compressive Capacity (kips)</u> |
|---|-----------------------|---|
| Steel H-Pile, with cast steel driving tip ASTM A572 Grade 50 | HP 12x53 | 106 |
| | HP 10x42 | 78 |
| | HP 8x36 | 74 |
| NOTES: 1) H-Pile capacity based on working stress not exceeding 1/3 the steel yield stress for piles driven to practical refusal on bedrock with cast driving tips. 2) Capacity based on 1/8-inch reduction in steel cross sectional area due to corrosion. | | |

Post-construction settlement of foundations on piles driven to practical refusal on bedrock should be limited to elastic shortening of the piles. We anticipate pile lengths will likely range from about 15 to 40 feet. We recommend pile caps for columns be supported by at least two piles if laterally tied together by grade beams or tie beams and three piles if laterally isolated. Piles should be spaced a minimum center-to-center distance of at least 3 pile diameters, but no less than 30 inches. S.W.COLE can assist with lateral pile capacities, as deemed necessary by the structural engineer.

Pile Load Test: The pile-driving contractor should submit information on the pile driving equipment and proposed 'set' or stop driving criteria to S.W.COLE prior to the start of pile driving activities. For piles with a capacity over 40 tons (80 kips), we recommend the contractor coordinate a test pile program including monitoring of at least two piles with a Pile Driving Analyzer (PDA) to determine pile and driving equipment compatibility as well as to define the "set" criteria and allowable pile capacity. The test pile program should include PDA monitoring of the test piles during re-strikes in order to assess pile capacity. The pile driving contractor should submit a WEAP analysis and information relative to pile driving equipment prior to beginning driving. The PDA results should be sealed by a Professional Engineer licensed in the State of Maine.

4.5.3.2 Micropiles

Micropiles with permanent steel casing and socketed into bedrock could be used to provide support of foundations and grade beams. As discussed, drilled micro-piles can overcome vibration and noise impacts generally associated with the driven H-pile

alternative. Additionally, drilled micropiles offer resistance to uplift loads, where needed.

We recommend micropiles be installed with permanent steel casing through the overburden soils in order to maintain sidewall stability and then socketed into bedrock. We offer the following for micropile consideration:

| Geotechnical Parameters for Micropile Design | | |
|---|-------------------------------------|--|
| Material Type | Average Ultimate Bond Stress | Average Ultimate End Bearing Strength |
| Bedrock Socket | 120 psi | 20 ksf |

| Estimated Micropile Capacities | | | | |
|---|---------------------------------|----------------------------------|--|---|
| Casing Size & Wall Thickness | Overburden Length (feet) | Rock Socket Length (feet) | Allowable Axial Capacity (kips) | Allowable Uplift Capacity (kips) |
| 5.5" x 0.5" (Casing $F_y=80$ ksi) | 20 – 30 | 10 | 90 | 80 |
| 7.625" x 0.5" (Casing $F_y=80$ ksi) | 20 – 30 | 10 | 115 | 105 |

Notes: Micropile allowable capacities assume a factor of safety of 3.

Deeper rock sockets may be required depending on the load requirements, rock socket diameter and to resist uplift loads. Center-to-center spacing between individual micropiles should be at least 30 inches or 3 diameters, whichever is greater.

Micropile Submittal & Load Testing: We recommend the contract documents require an engineered submittal for micropiles to meet or exceed the required foundation performance. The micropile submittal must include Quality Control and load testing procedures. We recommend micropile load testing be completed prior to installing production micropiles. The micropile submittal must be prepared and sealed by a Professional Engineer licensed in the State of Maine and endorsed by the Installer.

4.5.4 Seismic Considerations

Based on the subsurface findings and recommendations provided herein, in accordance with IBC 2015, we interpret the site to correspond to Seismic Soil Site Class D.

4.6 Foundation Drainage

We recommend an underdrain system be installed on the outside edge of perimeter footings. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drain pipe bedded in Crushed Stone and wrapped in non-woven geotextile fabric such as Mirafi 180N or equivalent. The underdrain pipe must have a positive gravity outlet protected from freezing, clogging and backflow. Surface grades should be sloped away from the building for positive surface water drainage. General underdrain details are illustrated on the “Foundation Detail Sketch” attached in Appendix B.

4.7 Slab-On-Grade

Provided over-excavation methods or ground improvement elements are utilized, on-grade floor slabs in heated areas may be designed using a subgrade reaction modulus of 120 pci (pounds per cubic inch) provided the slab is underlain by at least 12 inches (over-excavation) or 24 inches (ground improvements) of compacted Structural Fill placed over properly prepared subgrades. If deep foundations are used, we anticipate structural slabs will be utilized. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function.

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

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

4.8 Entrance Slabs, Sidewalks and Exterior Slabs

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

4.9 Backfill and Compaction

The undocumented fills and native soils are unsuitable for reuse as fill in the building footprint but may be suitable for reuse in landscape or paved areas, as needed. We recommend the following fill and backfill materials:

Common Borrow: Fill to raise grades in paved and landscape areas should be non-organic compactable earth meeting the requirements of 2020 MaineDOT Standard Specification 703.18 Common Borrow. Where used beneath paved areas, Common Borrow fills shall be capped with a 12-inch layer of Granular Borrow prior to installing Pavement Subbase materials.

Granular Borrow: Granular Borrow may be used to raise grades in building areas and for over-excavations, as well as site fill. Granular Borrow should consist of sand, silty sand or sand and gravel meeting the requirements of 2020 Maine Department of Transportation (MaineDOT) Standard Specification 703.19 “Granular Borrow.”

Structural Fill: Backfill for foundations and over-excavations, and slab base material should be clean, non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below:

| Structural Fill | |
|------------------------|--------------------------------|
| Sieve Size | Percent Finer by Weight |
| 4 inch | 100 |
| 3 inch | 90 to 100 |
| 1/4 inch | 25 to 90 |
| #40 | 0 to 30 |
| #200 | 0 to 6 |

Crushed Stone: Crushed Stone, used below foundations or for ground improvements, should meet the requirements of 2020 MaineDOT Standard Specification 703.13 Crushed Stone 3/4-Inch.

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

4.10 Paved Areas

We anticipate paved areas will be subjected primarily to passenger vehicle and light delivery truck traffic. We anticipate loading dock areas may be subjected to heavy vehicle loadings requiring heavy duty pavement areas. Considering the site soils, and proposed usage, we offer the following pavement sections for consideration. Materials are based on 2020 MaineDOT Standard Specifications.

| Bituminous Pavement Sections | | |
|---|----------------------|-------------------|
| Layer | Thickness | |
| | Standard Duty | Heavy Duty |
| MaineDOT 703.09 Hot Mix Asphalt 9.5mm | 1 1/4 inches | 1 1/4 inches |
| MaineDOT 703.09 Hot Mix Asphalt 19.0mm | 2 1/4 inches | 2 3/4 inches |
| MaineDOT 703.06 Base Aggregate, Type A | 6 inches | 6 inches |
| MaineDOT 703.06 Subbase Aggregate, Type D | 12 inches | 15 inches |

The base and subbase materials should be compacted to at least 95 percent of their maximum dry density as determined by ASTM D-1557. Hot mix asphalt pavement should be compacted to 92 to 97 percent of its theoretical maximum density as

determined by ASTM D-2041. A tack coat should be used between successive lifts of bituminous pavement.

It should be understood that frost penetration can be on the order of 5 feet in this area. In the absence of full depth excavation of frost susceptible soils below paved areas and subsequent replacement with non-frost susceptible compacted fill or adequate drainage of roadway base and subbase gravel, frost penetration into the subgrade will occur and some heaving and distress of pavement must be anticipated.

4.11 Weather Considerations

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

4.12 Design Review and Construction Testing

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

A construction material testing, and quality assurance program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe earthwork activities and the preparation of foundation bearing surfaces, including over-excavations or the installation of ground improvements elements or deep foundations, as well as to provide testing and IBC Special Inspection services for soils, concrete, steel, spray-applied fireproofing and asphalt construction materials.

5.0 CLOSURE

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

Sincerely,

S. W. Cole Engineering, Inc.

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

NDS:tjb

DRAFT

Appendix A

Limitations

This report has been prepared for the exclusive use of The University of Maine System Office of Facilities Management for specific application to the proposed GEM Factory of the Future at the University of Maine in Orono, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

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

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

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

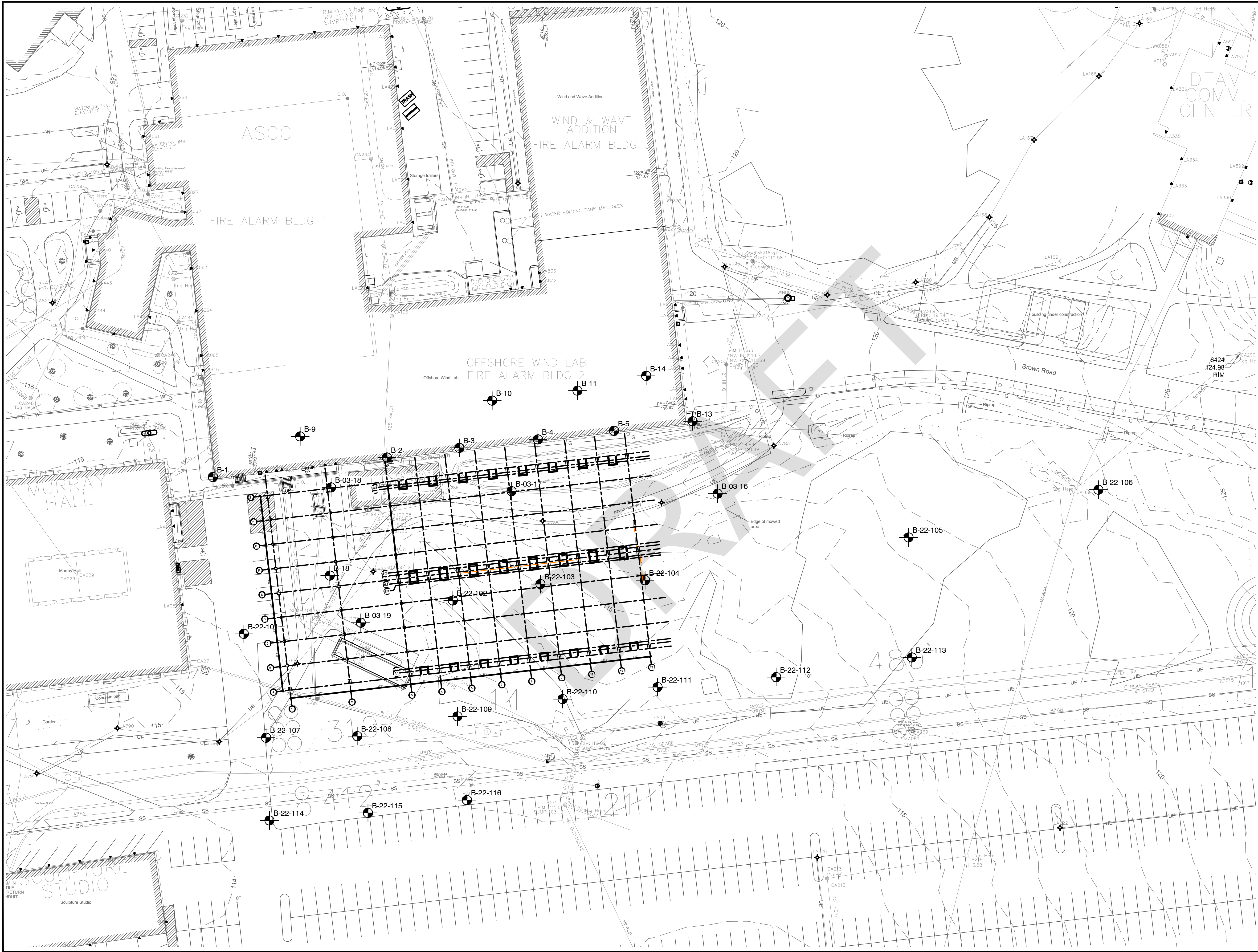
S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses,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

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

APPENDIX B

Figures

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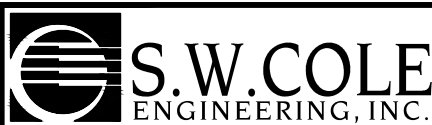
LEGEND:

 APPROXIMATE BORING LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A SCALE PLAN OF THE SITE PROVIDED BY UMAINE.
2. PROPOSED COLUMN FOOTPRINT OVERLAY PROVIDED BY THORNTON TOMASETTI, RECEIVED VIA E-MAIL 5/15/2023
3. BORINGS B-22-101 THROUGH B-22-116 WERE LOCATED IN THE FIELD BY S. W. COLE ENGINEERING, INC. (S.W.COLE) USING A MAPPING GRADE GPS RECEIVER.
4. BORINGS B-03-16 THROUGH B-03-19 WERE PERFORMED UNDER THE DIRECTION OF S.W.COLE IN AUGUST 2003
5. BORINGS B-1 THROUGH B-5, B-9 THROUGH B-11, B-13, B-14, AND B-18 WERE PERFORMED UNDER THE DIRECTION OF S.W.COLE IN FEBRUARY 2009.
6. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
7. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

0 30 60 Feet



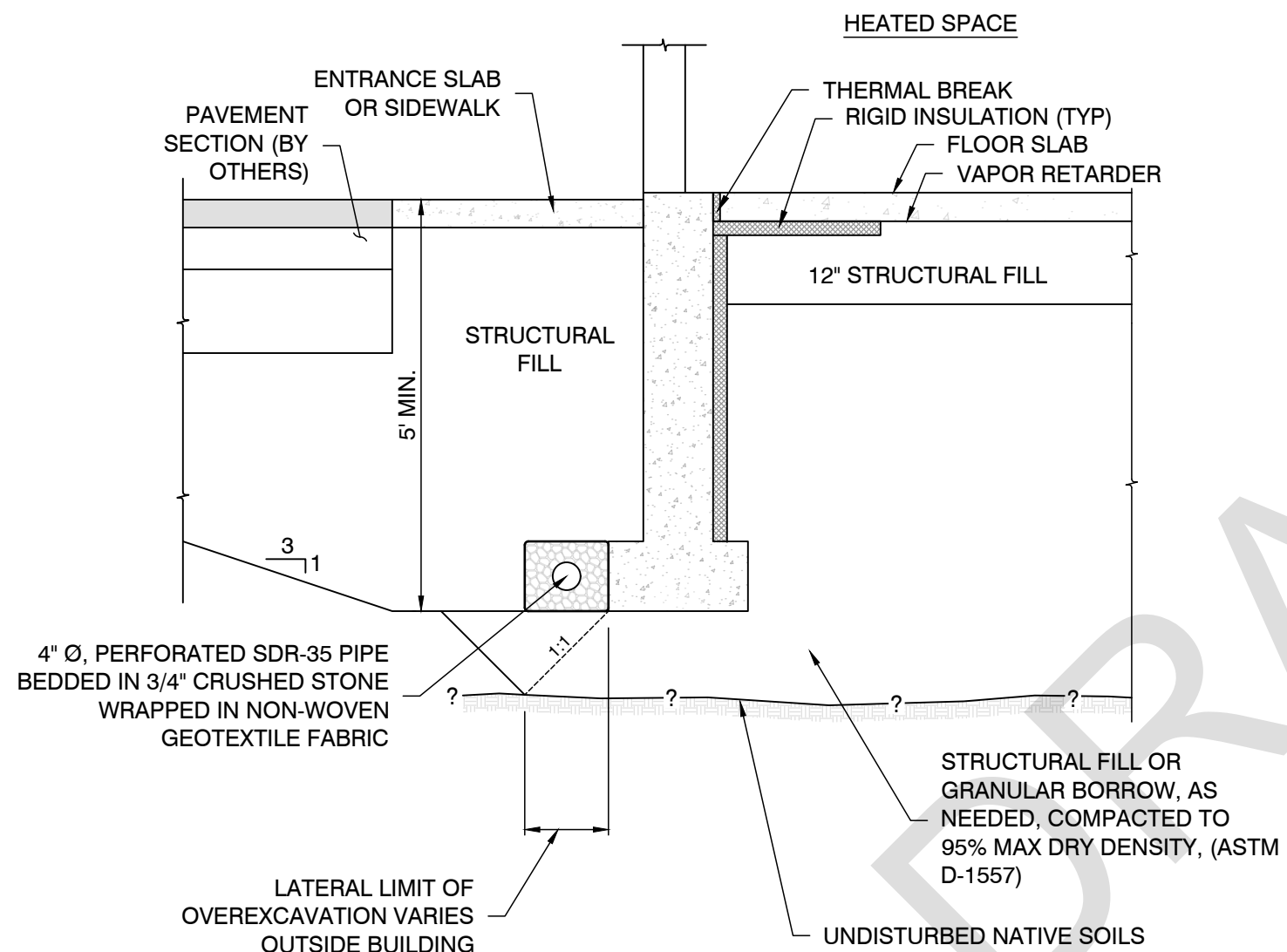
THE UNIVERSITY OF MAINE SYSTEM - OFFICE OF FACILITIES MANAGEMENT

EXPLORATION LOCATION PLAN

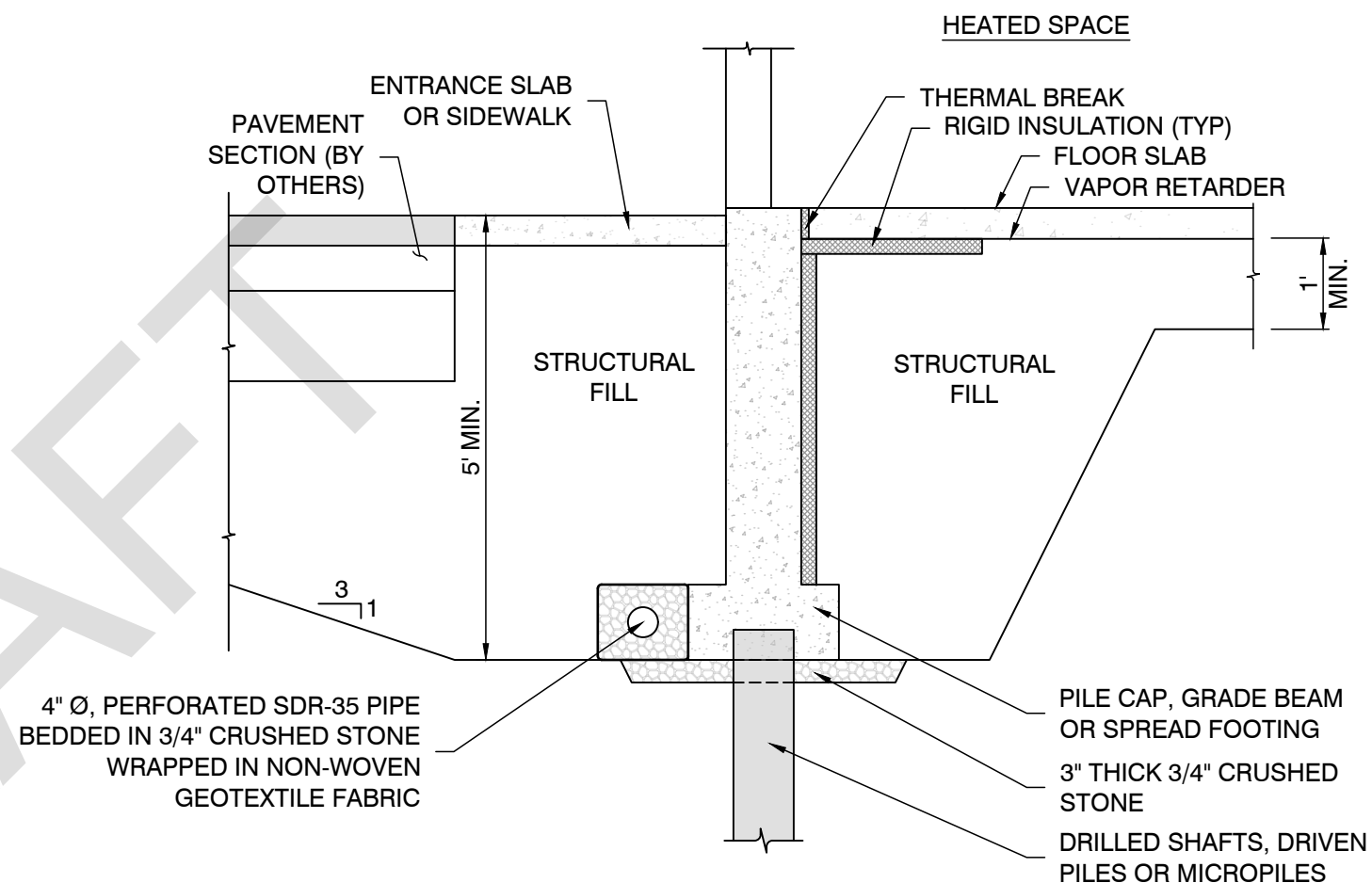
PROPOSED GEM FACTORY OF THE FUTURE
THE UNIVERSITY OF MAINE
ORONO, MAINE

Job No.: 22-0937
Date: 05/22/2023

Scale: 1" = 30'
Sheet: 1



FOUNDATIONS BEARING ON COMPACTED FILL



DEEP FOUNDATIONS

NOTE:

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



S.W. COLE
ENGINEERING, INC.

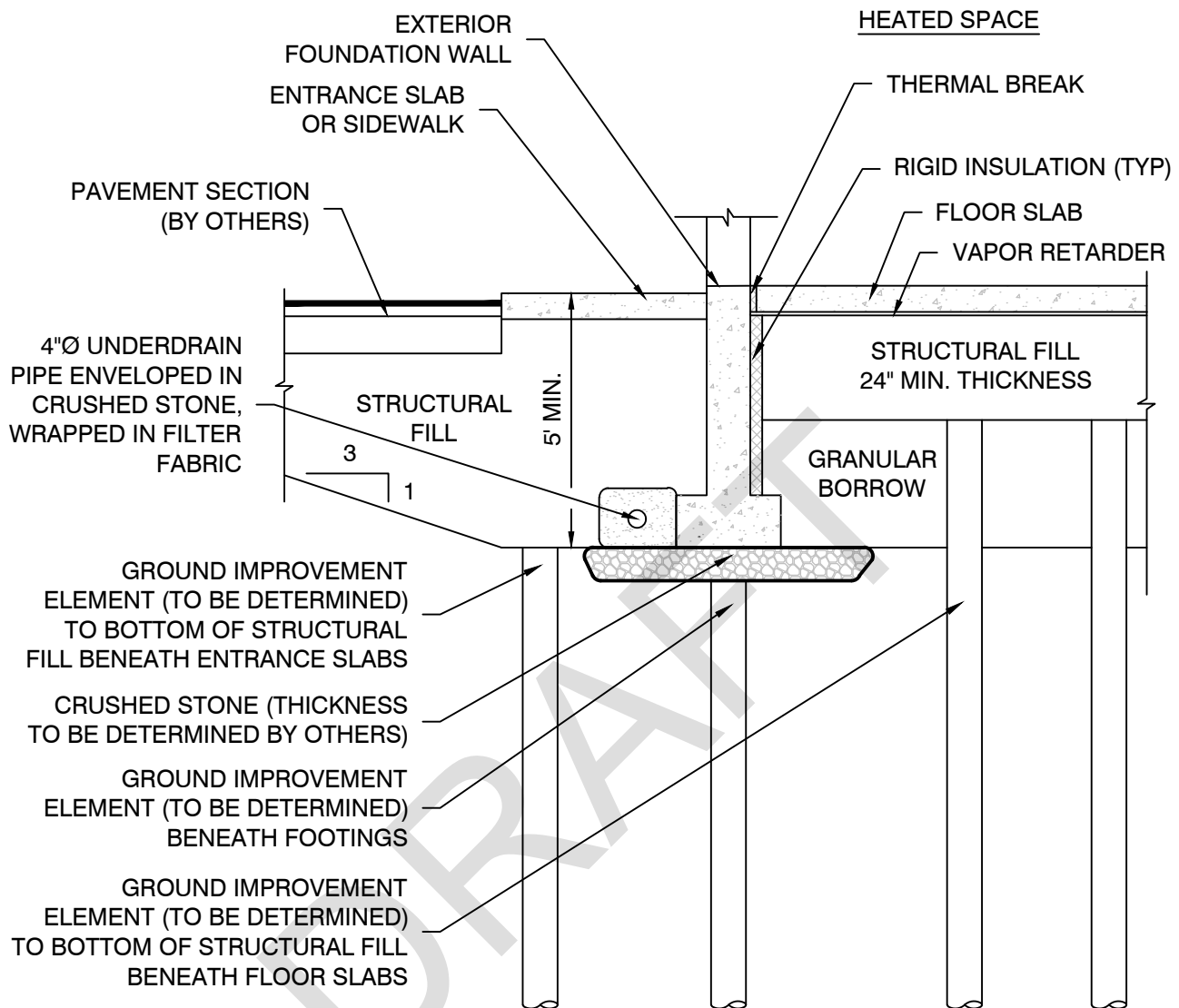
THE UNIVERSITY OF MAINE SYSTEM - OFFICE OF FACILITIES MANAGEMENT

FOUNDATION DETAIL SKETCH

PROPOSED GEM FACTORY OF THE FUTURE
THE UNIVERSITY OF MAINE
ORONO, MAINE

Job No.: 22-0937
Date : 05/24/2023

Scale: Not to Scale
Sheet: 2



GROUND IMPROVEMENT OPTION

NOTE:

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



S.W. COLE
ENGINEERING, INC.

THE UNIVERSITY OF MAINE SYSTEM - OFFICE OF FACILITIES MANAGEMENT

FOUNDATION DETAIL SKETCH

PROPOSED GEM FACTORY OF THE FUTURE
THE UNIVERSITY OF MAINE
ORONO, MAINE

Job No.: 22-0937

Date : 05/22/2023

Scale: Not to Scale

Sheet: 3

APPENDIX C

Exploration Logs and Key

DRAFT

BORING LOG

BORING NO.: B-22-102

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/29/2022

DATE FINISH: 11/29/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 111.5' +/- **TOTAL DEPTH (FT):** 13.6 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon






HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A

HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30

WATER LEVEL DEPTHS (ft): Perched water at ground surface, soils wet below 15 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | Graphic Log | | Sample Description & Classification | H ₂ O Depth | Remarks | |
|---------------|---------------|-------------------------|--------------------|---|---------------|-----------------------|----------------------------|--|-----|---|---------------------------|---------|---------------------------------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | | | | | | Field / Lab Test Data |
| 110 | 5 | | 1D |  | 0-2 | 24/18 | 1-1-2-3 |  | 0.7 | Topsoil | | | |
| | | | 2D |  | 2-4 | 24/24 | 4-5-5-5 | | | q _p =9+ ksf | | | Hard to stiff, brown silty CLAY |
| | | | 3D |  | 5-7 | 24/24 | 2-2-3-3 | | | q _p =3-4 ksf | | | |
| | | | 4D |  | 10-12 | 24/12 | 16-14-14-12 | | | | | | |
| 105 | | | | | | | | | | | | | |
| 100 | 10 | | | | | | | | 7.7 | Medium dense, brown silty gravelly SAND with occasional cobbles (Glacial Till) | | | |

Refusal at 13.6 feet
(Probable Bedrock)

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

BORING NO.: B-22-102



BORING LOG

BORING NO.: **B-22-104**
SHEET: 1 of 1
PROJECT NO. 22-0937
DATE START: 11/28/2022
DATE FINISH: 11/28/2022

CLIENT: The University of Maine System - Office of Facilities Management
PROJECT: Proposed GEM Factory of the Future
LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan ELEVATION (FT): 116' +/- TOTAL DEPTH (FT): 20.6 LOGGED BY: Nate Strout
DRILLING CO.: S. W. Cole Explorations, LLC DRILLER: Kevin Hanscom DRILLING METHOD: Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 AUGER ID/OD: 2 1/4 in / 5 5/8 in SAMPLER: Standard Split-Spoon
HAMMER TYPE: Automatic HAMMER WEIGHT (lbs): 140 CASING ID/OD: N/A / N/A CORE BARREL: N/A
HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30
WATER LEVEL DEPTHS (ft): Soils wet below 15 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks |
|---------------|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|-------------|--|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | | | | |
| 115 | | | 1D | × | 0-2 | 24/14 | 1-2-4-4 | 0.3 | Topsoil | | |
| | | | 2D | × | 2-4 | 24/15 | 2-2-3-2 | | Loose, brown SILT and SAND, some gravel, trace fine organics and plastic (Fill) | | |
| 110 | 5 | | 3D | × | 5-7 | 24/24 | 2-4-5-6 | 5.5 | Hard to stiff, brown silty CLAY | | |
| 105 | 10 | | 4D | × | 10-12 | 24/24 | 2-3-3-3 | | ... becoming medium stiff and olive | | |
| 100 | 15 | | 5D | × | 15-17 | 24/15 | 13-14- 15-21 | | Medium dense to dense, brown gravelly SAND and SILT with occasional cobbles (Glacial Till) | | |
| 20 | 20 | | 6D | × | 20-20.6 | 7/6 | 24- 50/1" | 20.3 | Probable weathered Bedrock | | |
| | | | | | | | | | Refusal at 20.6 feet (Probable Bedrock) | | |

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

BORING NO.: **B-22-104**

BORING LOG

BORING NO.: B-22-105

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/29/2022

DATE FINISH: 11/29/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 118.5' +/- **TOTAL DEPTH (FT):** 12.0 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon

| | | | |
|-------------------------------|---------------------------------|-------------------------------|-------------------------|
| HAMMER TYPE: Automatic | HAMMER WEIGHT (lbs): 140 | CASING ID/OD: N/A /N/A | CORE BARREL: N/A |
|-------------------------------|---------------------------------|-------------------------------|-------------------------|

HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30

WATER LEVEL DEPTHS (ft): No free water observed

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks |
|---------------|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|--------------------------|-------------|--|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | Field / Lab Test Data | | | | |
| 115 | 5 | | 1D | X | 0-2 | 24/18 | 1-1-1-3 | q _p =9+ ksf | 0.6 | Topsoil Hard to very stiff, brown silty CLAY | | |
| | | | 2D | X | 2-4 | 24/224 | 5-7-8-9 | | | | | |
| | | | 3D | X | 5-7 | 24/24 | 4-5-5-6 | | | | | |
| | 110 | | 10 | 4D | X | 10-12 | 24/16 | 12-14- 15-32 | 7.5 | Dense, brown gravelly SAND and with occasional cobbles (Glacial Till) | | |

Bottom of Exploration at 12.0 feet

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

BORING NO.: B-22-105



BORING LOG

BORING NO.: **B-22-107**
SHEET: 1 of 1
PROJECT NO. 22-0937
DATE START: 11/28/2022
DATE FINISH: 11/28/2022

CLIENT: The University of Maine System - Office of Facilities Management
PROJECT: Proposed GEM Factory of the Future
LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan ELEVATION (FT): 114' +/- TOTAL DEPTH (FT): 7.0 LOGGED BY: Nate Strout
DRILLING CO.: S. W. Cole Explorations, LLC DRILLER: Kevin Hanscom DRILLING METHOD: Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 AUGER ID/OD: 2 1/4 in / 5 5/8 in SAMPLER: Standard Split-Spoon
HAMMER TYPE: Automatic HAMMER WEIGHT (lbs): 140 CASING ID/OD: N/A / N/A CORE BARREL: N/A
HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30
WATER LEVEL DEPTHS (ft): No free water observed
GENERAL NOTES: Offset 5 feet south, auger refusal at 6.7 feet

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks | |
|---------------|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|--------------------------|--|---|---------|--------------------------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | | | | | Field / Lab Test Data |
| 110 | 5 | | 1D | | 0-2 | 24/14 | 1-1-2-3 | q _p =8-9+ ksf | 0.4 | Topsoil Hard, brown silty CLAY | | |
| | | 2D | 2-4 | | 24/20 | 5-7-8-9 | | | | | | |
| | | 3D | 5-6.7 | | 20/19 | 4-5-13-50/2" | | | | | | |
| | | | | | | | | 6.2 6.7 | Medium dense, brown gravelly SAND and SILT with occasional cobbles (Glacial Till) Probable Bedrock | | | |
| | | | | | | | | | | Refusal at 7.0 feet (Probable Bedrock) | | |

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

BORING NO.: **B-22-107**

BORING LOG

BORING NO.: B-22-109

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/28/2022

DATE FINISH: 11/28/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 112.5' +/- **TOTAL DEPTH (FT):** 17.8 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A

HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30

WATER LEVEL DEPTHS (ft): Soils wet below 15 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks |
|--|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|--------------------------|-------------|---|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | Field / Lab Test Data | | | | |
| 110 < | | | | | | | | | | | | |

Refusal at 17.8 feet
(Probable Bedrock)

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

BORING NO.: B-22-109

BORING LOG

BORING NO.: B-22-111

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/29/2022

DATE FINISH: 11/29/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 112' +/- **TOTAL DEPTH (FT):** 21.1 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A

HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30

WATER LEVEL DEPTHS (ft): Soils wet below 15 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | Graphic Log | | Sample Description & Classification | H ₂ O Depth | Remarks |
|--|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|-------------|--|---|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | | | | | |
| 110 < | | | | | | | | | | | | |

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

BORING NO.: B-22-111

BORING LOG

BORING NO.: B-22-112

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/29/2022

DATE FINISH: 11/29/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 114.5' +/- **TOTAL DEPTH (FT):** 24.5 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A

HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30

WATER LEVEL DEPTHS (ft): Soils wet below 11.5 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks |
|--|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|--------------------------|-------------|---|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | Field / Lab Test Data | | | | |
| 110 < | | | | | | | | | | | | |

Refusal at 24.5 feet
(Probable Bedrock)

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

BORING NO.: B-22-112

3BORING / WELL 10-12-2022 22-0937.GPJ SWCE TEMPLATE.GDT 5/20/23

BORING LOG

BORING NO.: B-22-113

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/29/2022

DATE FINISH: 11/29/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 117' +/- **TOTAL DEPTH (FT):** 25.1 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A

HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30

WATER LEVEL DEPTHS (ft): Soils wet below 15 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks |
|---|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|--------------------------|-------------|---|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | Field / Lab Test Data | | | | |
| 115 | | | | | | | | | | | | |

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

BORING NO.: B-22-113



BORING LOG

BORING NO.: **B-22-114**
SHEET: 1 of 1
PROJECT NO. 22-0937
DATE START: 11/28/2022
DATE FINISH: 11/28/2022

CLIENT: The University of Maine System - Office of Facilities Management
PROJECT: Proposed GEM Factory of the Future
LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan ELEVATION (FT): 114' +/- TOTAL DEPTH (FT): 23.5 LOGGED BY: Nate Strout
DRILLING CO.: S. W. Cole Explorations, LLC DRILLER: Kevin Hanscom DRILLING METHOD: Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 AUGER ID/OD: 2 1/4 in / 5 5/8 in SAMPLER: Standard Split-Spoon
HAMMER TYPE: Automatic HAMMER WEIGHT (lbs): 140 CASING ID/OD: N/A / N/A CORE BARREL: N/A
HAMMER CORRECTION FACTOR: 0.918 HAMMER DROP (inch): 30
WATER LEVEL DEPTHS (ft): Soils wet below 15 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks |
|--|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|-------------|---|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | | | | |
| 110 < | | | | | | | | | | | |

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

BORING NO.: **B-22-114**

BORING LOG

BORING NO.: B-22-115

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/28/2022

DATE FINISH: 11/28/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 113.5' +/- **TOTAL DEPTH (FT):** 21.2 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A/N/A **CORE BARREL:** N/A

HAMMER CORRECTION FACTOR: 0.918 **HAMMER DROP (inch):** 30

WATER LEVEL DEPTHS (ft): Soils wet below 11.5 feet +/-

GENERAL NOTES:

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

| Elev. (ft) | Depth (ft) | Casing Pen. (bpf) | SAMPLE INFORMATION | | | | | | Graphic Log | Sample Description & Classification | H ₂ O Depth | Remarks |
|--|---------------|-------------------------|--------------------|------|---------------|-----------------------|----------------------------|--------------------------|-------------|---|---------------------------|---------|
| | | | Sample No. | Type | Depth (ft) | Pen./ Rec. (in) | Blow Count or RQD | Field / Lab Test Data | | | | |
| 110 < | | | | | | | | | | | | |

Refusal at 21.2 feet
(Probable Bedrock)

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

BORING NO.: B-22-115

BORING LOG

BORING NO.: B-22-116

SHEET: 1 of 1

PROJECT NO. 22-0937

DATE START: 11/28/2022

DATE FINISH: 11/28/2022

CLIENT: The University of Maine System - Office of Facilities Management

PROJECT: Proposed GEM Factory of the Future

LOCATION: University of Maine, Orono, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 113' +/- **TOTAL DEPTH (FT):** 29.8 **LOGGED BY:** Nate Strout

DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Hollow Stem Auger

RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon

HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A/N/A **CORE BARREL:** N/A

HAMMER CORRECTION FACTOR: 0.918 **HAMMER DROP (inch):** 30

WATER LEVEL DEPTHS (ft): Soils wet below 15 feet +/-

GENERAL NOTES:

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

[illegible]

Refusal at 29.8 feet
(Probable Bedrock)

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

BORING NO.: B-22-116

BORING / WELL 10-12-2022 22-0937.GPJ SWCE TEMPLATE.GDT 5/20/23



BORING LOG

BORING NO.: **B-1**
SHEET: 1 OF 1
PROJECT NO.: 09-0026 S
DATE START: 2/4/2009
DATE FINISH: 2/4/2009
ELEVATION: 114.5' +/-
SWC REP.: SLA

PROJECT / CLIENT: PROPOSED AEW LAB EXPANSION / UNIVERSITY OF MAINE
LOCATION: ORONO, MAINE
DRILLING CO.: MAINE TEST BORINGS, INC. DRILLER: BRAD ENOS

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. HAMMER FALL
SAMPLER: SS 1 3/8" 140 lbs 30"
CORE BARREL:

WATER LEVEL INFORMATION
SAMPLES SATURATED BELOW 10'

| CASING BLOWS PER FOOT | SAMPLE | | | | SAMPLER BLOWS PER 6" | | | | DEPTH | STRATA & TEST DATA |
|--------------------------------|--------|------|------|----------------|----------------------|------|-------|-------|-------|--|
| | NO. | PEN. | REC. | DEPTH @ BOT | 0-6 | 6-12 | 12-18 | 18-24 | | |
| | | | | | | | | | 0.3' | PAVEMENT |
| | | | | | | | | | 2.0' | BROWN SILTY SANDY GRAVEL (PAVEMENT BASE) |
| | 1D | 24" | | 4.0' | 8 | 5 | 4 | 6 | 5.0' | MOTTLED BROWN CLAYEY SILT, TRACE SAND qp = 5.5 - 7.0 ksf ~ VERY STIFF ~ |
| | 2D | 24" | | 7.0' | 13 | 28 | 26 | 25 | | BROWN GRAVELLY SAND AND SILT (GLACIAL TILL) ~ MEDIUM DENSE ~ |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | 3D | 24" | | 12.0' | 11 | 13 | 11 | 16 | | BROWN GRAVELLY SAND AND SILT (GLACIAL TILL) ~ MEDIUM DENSE ~ |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | 4D | 24" | | 17.0' | 5 | 7 | 11 | 18 | | BROWN GRAVELLY SAND AND SILT (GLACIAL TILL) ~ MEDIUM DENSE ~ |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | 5D | 1" | | 20.1' | 50/0.1' | | | | 19.8' | WEATHERED BEDROCK |
| | | | | | | | | | 20.1' | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | SPOON REFUSAL AT 20.1' |
| | | | | | | | | | | |
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SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

| |
|---|
| |
| X |
| X |

 DRILLER - VISUALLY
SOIL TECH. - VISUALLY
LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2

BORING NO.: **B-1**



BORING LOG

BORING NO.: **B-2**
SHEET: 1 OF 1
PROJECT NO.: 09-0026 S
DATE START: 2/4/2009
DATE FINISH: 2/4/2009
ELEVATION: 115' +/-
SWC REP.: SLA

PROJECT / CLIENT: PROPOSED AEW LAB EXPANSION / UNIVERSITY OF MAINE
LOCATION: ORONO, MAINE
DRILLING CO.: MAINE TEST BORINGS, INC. DRILLER: BRAD ENOS

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. HAMMER FALL
SAMPLER: SS 1 3/8" 140 lbs 30"
CORE BARREL:

WATER LEVEL INFORMATION
SAMPLES SATURATED BELOW 10'

| CASING BLOWS PER FOOT | SAMPLE | | | | SAMPLER BLOWS PER 6" | | | | DEPTH | STRATA & TEST DATA |
|--------------------------------|--------|------|------|----------------|----------------------|------|---------|-------|-------|--|
| | NO. | PEN. | REC. | DEPTH @ BOT | 0-6 | 6-12 | 12-18 | 18-24 | | |
| | | | | | | | | | 0.4' | TOPSOIL |
| | | | | | | | | | 1.0' | BROWN SILTY SAND |
| | 1D | 24" | | 4.0' | 3 | 4 | 4 | 5 | | BROWN CLAYEY SILT, SOME SAND, TRACE GRAVEL AND ORGANICS (FILL) ~ MEDIUM DENSE ~ |
| | 2D* | 24" | | 7.0' | 5 | 7 | 5 | 6 | 8.5' | |
| | | | | | | | | | | BROWN GRAVELLY SAND AND SILT (GLACIAL TILL) ~ DENSE ~ |
| | 3D | 16" | | 11.3' | 12 | 24 | 50/0.3' | | 11.3' | |
| | | | | | | | | | | APPARENT BEDROCK |
| | 4D | 0" | | 15.0' | 50/0.0' | | | | 15.0' | |
| | | | | | | | | | | SPOON REFUSAL AT 15.0' |
| | | | | | | | | | | |
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SAMPLES:
D = SPLIT SPOON
C = 2" SHELBY TUBE
S = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

X

DRILLER - VISUALLY
SOIL TECH. - VISUALLY
LABORATORY TEST

REMARKS: 2D* - DROVE PLUG

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-2**



| | |
|--------------|------------|
| BORING NO.: | B-3 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 09-0026 S |
| DATE START: | 2/5/2009 |
| DATE FINISH: | 2/5/2009 |
| ELEVATION: | 119' +/- |
| SWC REP.: | SLA |

| | |
|--------------|----------|
| DATE START: | 2/5/2009 |
| DATE FINISH: | 2/5/2009 |
| ELEVATION: | 119' +/- |
| SWC REP.: | SLA |

WATER LEVEL INFORMATION
SAMPLES SATURATED BELOW 20'

| | | | | | |
|----|----|---------|----|-------|--------------|
| | | | | 1.5' | BROWN |
| 21 | 28 | 23 | 18 | 5.0' | GRAY - BROWN |
| 8 | 8 | 8 | 7 | | |
| | | | | 10.5' | |
| 3 | 33 | 50/0.2' | | 12.5' | |
| | | | | | |
| | | | | 16.0' | BROWN |
| 3 | 3 | 11 | 18 | | |
| | | | | | |
| 5 | 7 | 11 | 8 | 22.0' | |
| | | | | | |
| | | | | | |
| | | | | | |

BORING NO.: B-3



DRILLER: BRAD ENOS

CORE BARREL:

SAMPLES SATURATED BELOW 20'

| CASING BLOWS PER FOOT | SAMPLE | | | | SAMPLER BLOWS PER 6" | | | | DEPTH | STRATA & TEST DATA | |
|---|--------|------|------|-------------|--|------|-------|-------|---|--|--|
| | NO. | PEN. | REC. | DEPTH @ BOT | 0-6 | 6-12 | 12-18 | 18-24 | | | |
| | | | | | | | | | 0.3' | PAVEMENT | |
| | | | | | | | | | 1.3' | BROWN SILTY SANDY GRAVEL (PAVEMENT BASE) | |
| | 1D | 24" | | 4.0' | 36 | 31 | 42 | 18 | 10.5' | GRAY-BROWN GRAVELLY SILTY SAND (FILL) | |
| | | | | | | | | | | ~ MEDIUM DENSE TO DENSE ~ | |
| | 2D | 24" | | 7.0' | 5 | 6 | 7 | 8 | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | 3D | 24" | | 12.0' | 2 | 6 | 7 | 8 | 14.0' | MOTTLED GRAY SILTY CLAY, SOME SAND ~ HARD ~ qp = 7.5 - 9.0 ksf | |
| | | | | | | | | | | | |
| | 4D | 24" | | 17.0' | 2 | 3 | 4 | 4 | 17.5' | BROWN SILTY CLAY ~ VERY STIFF ~ qp = 3.5 - 5.0 ksf | |
| | | | | | | | | | | | |
| | 5D | 24" | | 22.0' | 6 | 7 | 6 | 8 | 22.0' | BROWN GRAVELLY SILT AND SAND (GLACIAL TILL) ~ MEDIUM DENSE ~ | |
| | | | | | | | | | | BOTTOM OF EXPLORATION AT 22.0' | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| SAMPLES: D = SPLIT SPOON C = 2" SHELBY TUBE S = 3" SHELBY TUBE U = 3.5" SHELBY TUBE | | | | | SOIL CLASSIFIED BY: <div> <input type="checkbox"/> DRILLER - VISUALLY <input checked="" type="checkbox"/> SOIL TECH. - VISUALLY <input type="checkbox"/> LABORATORY TEST </div> | | | | REMARKS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. | | |
| | | | | | | | | | BORING NO.: B-4 | | |



BORING LOG

PROJECT / CLIENT: PROPOSED AEWC LAB EXPANSION / UNIVERSITY OF MAINE
 LOCATION: ORONO, MAINE
 DRILLING CO.: MAINE TEST BORINGS, INC. DRILLER: BRAD ENOS

BORING NO.: B-5
 SHEET: 1 OF 1
 PROJECT NO.: 09-0026 S
 DATE START: 2/5/2009
 DATE FINISH: 2/5/2009
 ELEVATION: 120.5' +/-
 SWC REP.: SLA

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. HAMMER FALL
 SAMPLER: SS 1 3/8" 140 lbs 30"
 CORE BARREL:

WATER LEVEL INFORMATION
 SAMPLES SATURATED BELOW 15'

| CASING BLOWS PER FOOT | SAMPLE | | | | SAMPLER BLOWS PER 6" | | | | DEPTH | STRATA & TEST DATA |
|-----------------------|--------|------|------|-------------|----------------------|------|-------|-------|-------|--|
| | NO. | PEN. | REC. | DEPTH @ BOT | 0-6 | 6-12 | 12-18 | 18-24 | | |
| | | | | | | | | | 0.3' | PAVEMENT |
| | | | | | | | | | 1.0' | BROWN SILTY SANDY GRAVEL (PAVEMENT BASE) |
| | 1D | 24" | | 4.0' | 39 | 30 | 23 | 16 | | GRAY-BROWN GRAVELLY SILTY SAND (FILL) |
| | | | | | | | | | | ~ MEDIUM DENSE TO DENSE ~ |
| | 2D | 24" | | 7.0' | 6 | 12 | 11 | 9 | 8.0' | |
| | | | | | | | | | | MOTTLED BROWN SILTY CLAY |
| | 3D | 24" | | 12.0' | 4 | 4 | 6 | 7 | | w = 26.2% ~ VERY STIFF ~ qp = 3.5 - 5.5 ksf |
| | | | | | | | | | 14.0' | |
| | 4D | 24" | | 17.0' | 1 | 1 | 2 | 20 | 16.6' | BROWN SILTY CLAY WITH SILTY SAND LAYERS qp = 0.5 ksf |
| | | | | | | | | | | ~ SOFT ~ |
| | 5D | 24" | | 22.0' | 6 | 5 | 6 | 6 | 22.0' | BROWN GRAVELLY SILT AND SAND (GLACIAL TILL) |
| | | | | | | | | | | ~ MEDIUM DENSE ~ |
| | | | | | | | | | | BOTTOM OF EXPLORATION AT 22.0' |

SAMPLES:
 D = SPLIT SPOON
 C = 2" SHELBY TUBE
 S = 3" SHELBY TUBE
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
☒ DRILLER - VISUALLY
☐ SOIL TECH. - VISUALLY
☐ LABORATORY TEST

REMARKS:
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

6

BORING NO.: B-5



| | |
|--------------|------------|
| BORING NO.: | B-9 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 09-0026 S |
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 117' +/- |
| SWC REP.: | SLA |

| | |
|--------------|----------|
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 117' +/- |

SWC REP.: _____ SLA _____
WATER LEVEL INFORMATION
SAMPLES SATURATED BELOW 10'

| | | | | | |
|----|----|----|----|-------|-------------------------------|
| 4 | 6 | 7 | 7 | 7.5' | MOTTLED ~ VERY S |
| 4 | 6 | 6 | 6 | | |
| | | | | | |
| 9 | 15 | 12 | 22 | 19.6' | BROWN GRAVELLY SI ~ MED |
| 40 | 9 | 12 | 12 | | |
| | | | | | |
| | | | | 24.8' | B (GRAY PELIT RQD = 75% |
| | | | | | |
| | | | | | |
| | | | | | BOTTOM OF |

| | | |
|---|--|-----|
| REMARKS: | | 10 |
| STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. | | |
| BORING NO.: | | B-9 |



BORING LOG

BORING NO.: **B-10**
 SHEET: 1 OF 1
 PROJECT NO.: 09-0026 S
 DATE START: 2/5/2009
 DATE FINISH: 2/5/2009
 ELEVATION: 119.5' +/-
 SWC REP.: SLA

PROJECT / CLIENT: PROPOSED AEW LAB EXPANSION / UNIVERSITY OF MAINE
 LOCATION: ORONO, MAINE
 DRILLING CO.: MAINE TEST BORINGS, INC. DRILLER: BRAD ENOS

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. HAMMER FALL
 SAMPLER: SS 1 3/8" 140 lbs 30"
 CORE BARREL:

WATER LEVEL INFORMATION
 SAMPLES SATURATED BELOW 20'

| CASING BLOWS PER FOOT | SAMPLE | | | | SAMPLER BLOWS PER 6" | | | | DEPTH | STRATA & TEST DATA |
|-----------------------|--------|------|------|-------------|----------------------|------|-------|-------|-------|---|
| | NO. | PEN. | REC. | DEPTH @ BOT | 0-6 | 6-12 | 12-18 | 18-24 | | |
| | | | | | | | | | 0.3' | PAVEMENT |
| | | | | | | | | | 1.5' | BROWN SILTY SANDY GRAVEL (PAVEMENT BASE) |
| | 1D | 24" | | 4.0' | 28 | 24 | 20 | 14 | | GRAY-BROWN GRAVELLY SILTY SAND (FILL) ~ MEDIUM DENSE ~ |
| | 2D | 24" | | 7.0' | 5 | 6 | 6 | 5 | 7.5' | |
| | | | | | | | | | | GRAY-BROWN SILTY CLAY qp = 4.0 - 5.5 ksf ~ VERY STIFF BECOMING MEDIUM WITH DEPTH ~ qp = 1.5 - 2.5 ksf w = 28.3% |
| | 3D | 24" | | 12.0' | 3 | 4 | 7 | 6 | | |
| | 4D | 24" | | 17.0' | 2 | 3 | 3 | 4 | 17.8' | |
| | | | | | | | | | | BROWN GRAVELLY SILT AND SAND (GLACIAL TILL) ~ MEDIUM DENSE ~ |
| | 5D | 24" | | 22.0' | 20 | 14 | 12 | 14 | | |
| | 6D | 24" | | 27.0' | 1* | 6 | 6 | 7 | | |
| | | | | | | | | | 29.0' | WEATHERED BEDROCK |
| | | | | | | | | | 29.3' | |
| | | | | | | | | | | AUGER REUFSAL AT 29.3' |

SAMPLES:
 D = SPLIT SPOON
 C = 2" SHELBY TUBE
 S = 3" SHELBY TUBE
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
☒ DRILLER - VISUALLY
☒ SOIL TECH. - VISUALLY
☐ LABORATORY TEST

REMARKS: 1* FOR LESS THAN 6" OF PENETRATION

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



| | |
|--------------|-------------|
| BORING NO.: | B-11 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 09-0026 S |
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 121' +/- |
| SWC REP.: | SLA |

| | |
|--------------|----------|
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 121' +/- |
| SWC REP.: | SLA |

WATER LEVEL INFORMATION
SAMPLES SATURATED BELOW 15'

| | | |
|---|---|---|
| SAMPLES: D = SPLIT SPOON C = 2" SHELBY TUBE S = 3" SHELBY TUBE U = 3.5" SHELBY TUBE | SOIL CLASSIFIED BY: <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; width: 40px; height: 40px; margin-right: 10px; display: flex; align-items: center; justify-content: center; flex-direction: column;"> <div style="width: 100%; height: 100%; background-color: white;"></div> <div style="width: 100%; height: 100%; background-color: white;"></div> <div style="width: 100%; height: 100%; background-color: white;"></div> </div> <div> DRILLER - VISUALLY SOIL TECH. - VISUALLY LABORATORY TEST </div> </div> | REMARKS: SAMPLE 3D* - DROVE PLUG <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. </div> <div style="width: 35%; text-align: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> 12 </div> </div> </div> |
| | | BORING NO.: B-11 |



| | |
|--------------|-------------|
| BORING NO.: | B-13 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 09-0026 S |
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 121' +/- |
| SWC REP.: | SLA |

| | |
|--------------|----------|
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 121' +/- |

SWC REP.: _____ SLA _____
WATER LEVEL INFORMATION
SAMPLES SATURATED BELOW 15'

| |
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| |
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REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



| | |
|--------------|-------------|
| BORING NO.: | B-14 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 09-0026 S |
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 121.5' +/- |
| SWC REP.: | SLA |

| | |
|--------------|------------|
| DATE START: | 2/6/2009 |
| DATE FINISH: | 2/6/2009 |
| ELEVATION: | 121.5' +/- |
| SWC REP.: | SLA |

WATER LEVEL INFORMATION
SAMPLES SATURATED BELOW 15'

| | | | | | |
|----|----|----|----|-------|-----------------|
| 30 | 45 | 35 | 30 | 4.8' | GRAY-BROWN CLAY |
| | | | | 8.5' | |
| 6 | 6 | 7 | 5 | | |
| | | | | 14.5' | BROWN CLAY |
| 4 | 6 | 9 | 9 | | |
| | | | | | |
| 12 | 22 | 51 | 41 | | |
| | | | | | |
| 5 | 11 | 10 | 5 | 25.5' | |
| | | | | 25.8' | |

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



| | |
|--------------|-------------------------------|
| BORING NO.: | B-03-15 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 03-0732 S |
| DATE START: | 8/26/2003 |
| DATE FINISH: | 8/26/2003 |
| ELEVATION: | 117.3' +/- (PROJECT DATUM) |
| SWC REP.: | |

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 10'+/-

| CASING BLOWS PER FOOT | SAMPLE | | | | SAMPLER BLOWS PER 6" | | | | DEPTH | STRATA & TEST DATA |
|-----------------------------|--------|------|------|----------------|---|------|-------|-------|---|---|
| | NO. | PEN. | REC. | DEPTH @ BOT | 0-6 | 6-12 | 12-18 | 18-24 | | |
| | | | | | | | | | 0.4' | BROWN SILTY TOPSOIL WITH ROOTS AND ORGANICS |
| | | | | | | | | | 5.0' | BROWN CLAYEY SILT WITH TRACE OF SAND, GRAVEL AND ORGANICS (FILL) ~ MEDIUM DENSE ~ |
| | 1D | 24" | | 4.0' | 5 | 8 | 8 | 10 | | |
| | | | | | | | | | | |
| | 2D | 24" | | 7.0' | 6 | 12 | 13 | 16 | 11.8' | ~ HARD BECOMING . . . qp = 8.0 - 8.5 ksf BROWN AND GRAY SILTY CLAY WITH SOME MOTTLING . . . VERY STIFF TO STIFF WITH DEPTH ~ qp = 3.5 - 4.5 ksf |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | 3D | 24" | | 12.0' | 8 | 6 | 5 | 13 | 14.0' | BROWN GRAVELLY SAND AND SILT (TILL) ~ DENSE ~ |
| | 4D | 24" | | 14.0' | 12 | 52 | 68 | 73 | | |
| | | | | | | | | | | |
| | | | | | | | | | BOTTOM OF BORING AT 14.0' | |
| | | | | | | | | | | |
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| | | | | | | | | | | |
| SAMPLES: | | | | | SOIL CLASSIFIED BY: | | | | REMARKS: | |
| D = SPLIT SPOON | | | | | <div><div></div></div> DRILLER - VISUALLY | | | | STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. | |
| C = 3" SHELBY TUBE | | | | | <div><div>X</div></div> SOIL TECH. - VISUALLY | | | | | |
| U = 3.5" SHELBY TUBE | | | | | <div><div>X</div></div> LABORATORY TEST | | | | | |
| | | | | | | | | | BORING NO.: B-03-15 | |

18



| | |
|--------------|-------------------------------|
| BORING NO.: | B-03-16 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 03-0732 S |
| DATE START: | 8/28/2003 |
| DATE FINISH: | 8/28/2003 |
| ELEVATION: | 117.8' +/- (PROJECT DATUM) |
| SWC REP.: | |

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 10'+/-

[illegible]

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



| | |
|--------------|-------------------------------|
| BORING NO.: | B-03-17 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 03-0732 S |
| DATE START: | 8/28/2003 |
| DATE FINISH: | 8/28/2003 |
| ELEVATION: | 117.4' +/- (PROJECT DATUM) |
| SWC REP.: | |

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 10'+/-

[illegible]

| | | |
|---|--|--|
| REMARKS: | | <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">20</div> |
| STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. | | |
| BORING NO.: | | B-03-17 |



| | |
|--------------|-------------------------------|
| BORING NO.: | B-03-18 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 03-0732 S |
| DATE START: | 8/28/2003 |
| DATE FINISH: | 8/28/2003 |
| ELEVATION: | 113.5' +/- (PROJECT DATUM) |
| SWC REP.: | |

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 5'+/-

[illegible]



| | |
|--------------|-------------------------------|
| BORING NO.: | B-03-19 |
| SHEET: | 1 OF 1 |
| PROJECT NO.: | 03-0732 S |
| DATE START: | 8/28/2003 |
| DATE FINISH: | 8/28/2003 |
| ELEVATION: | 113.2' +/- (PROJECT DATUM) |
| SWC REP.: | |

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED BELOW 5'+/-

[illegible]

KEY TO THE NOTES & SYMBOLS

Test Boring and Test Pit Explorations

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

Key to Symbols Used:

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

Description of Proportions:

| | |
|--------|------------------|
| Trace: | 0 to 5% |
| Some: | 5 to 12% |
| "Y" | 12 to 35% |
| And | 35+% |
| With | Undifferentiated |

Description of Stratified Soils

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

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

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

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

APPENDIX D

Laboratory Test Results

DRAFT



Report of Atterberg Limits

ASTM D4318-10 - Method A

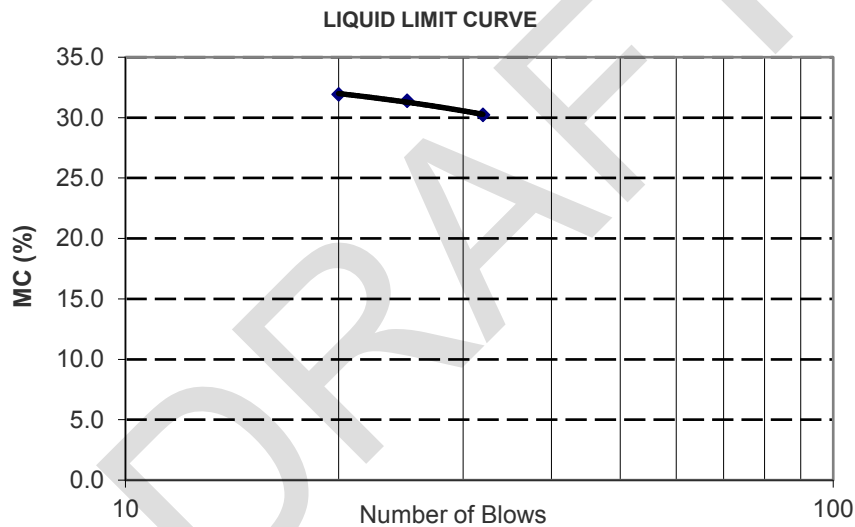
Project Name: ASCC GEM Addition
Project Location: Orono, ME
Client: University of Maine System
Material Description: B-22 103
Material Source: 4D, 10'-12'

Project Number: 22-0937
Lab ID: 29154B
Date Received: 05/18/23
Date Completed: 05/19/23
Tested By: AA

Liquid Limit 31

Plastic Limit 19

Plasticity Index 12



Material Retained On the No. 40 Sieve: 1%

As-received Moisture Content: 29%

Comments:

Reviewed By: TH

Report of Atterberg Limits

ASTM D4318-10 - Method A

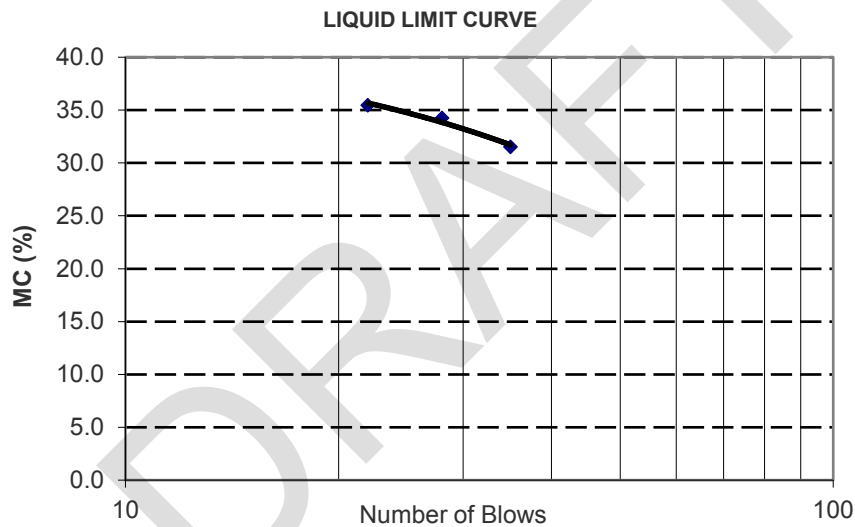
Project Name: ASCC GEM Addition
Project Location: Orono, ME
Client: University of Maine System
Material Description: B-22 104
Material Source: 4D, 10'-12'

Project Number: 22-0937
Lab ID: 29155B
Date Received: 05/18/23
Date Completed: 05/19/23
Tested By: AA

Liquid Limit 35

Plastic Limit 21

Plasticity Index 14



Material Retained On the No. 40 Sieve: 1%

As-received Moisture Content: 26%

Comments:

Reviewed By: TH



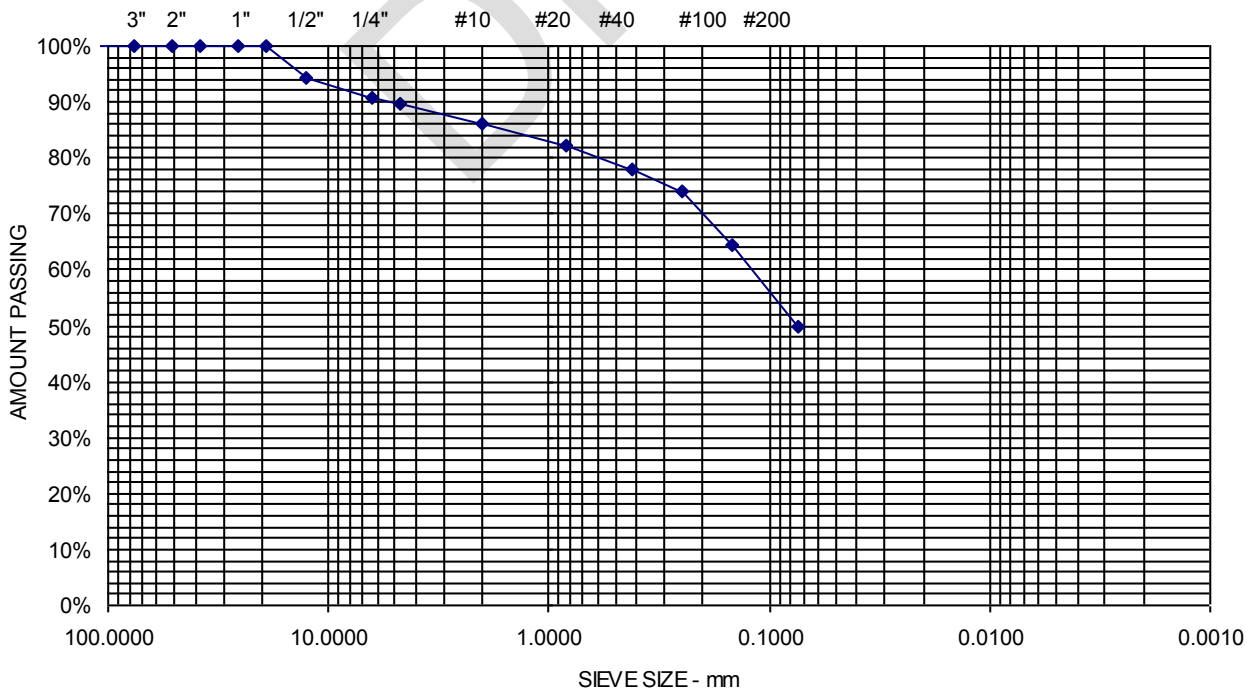
Report of Gradation

ASTM C-117 & C-136

Project Name ORONO ME - PROPOSED ASCC GEM ADDITION - EXPLORATIONS
AND GEOTECHNICAL ENGINEERING SERVICES
Client UNIVERSITY OF MAINE SYSTEM
Exploration **B-22 106**
Material Source **3D, 5'-7'**

Project Number 22-0937
Lab ID 29156B
Date Received 5/18/2023
Date Completed 5/19/2023
Tested By SHARON CUEVAS-STANTON

| <u>STANDARD</u> <u>DESIGNATION (mm/μm)</u> | <u>SIEVE SIZE</u> | <u>AMOUNT PASSING (%)</u> | |
|---|-------------------|---------------------------|--------------|
| 150 | 6" | 100 | |
| 125 | 5" | 100 | |
| 100 | 4" | 100 | |
| 75 | 3" | 100 | |
| 50 | 2" | 100 | |
| 38.1 | 1-1/2" | 100 | |
| 25.0 | 1" | 100 | |
| 19.0 | 3/4" | 100 | |
| 12.5 | 1/2" | 94 | |
| 6.3 | 1/4" | 91 | |
| 4.75 | No. 4 | 90 | 10.2% Gravel |
| 2.00 | No. 10 | 86 | |
| 850 | No. 20 | 82 | |
| 425 | No. 40 | 78 | 39.9% Sand |
| 250 | No. 60 | 74 | |
| 150 | No. 100 | 64 | |
| 75 | No. 200 | 49.9 | 49.9% Fines |

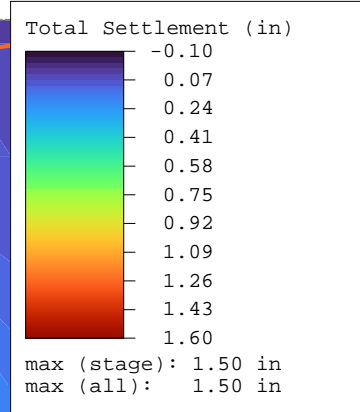
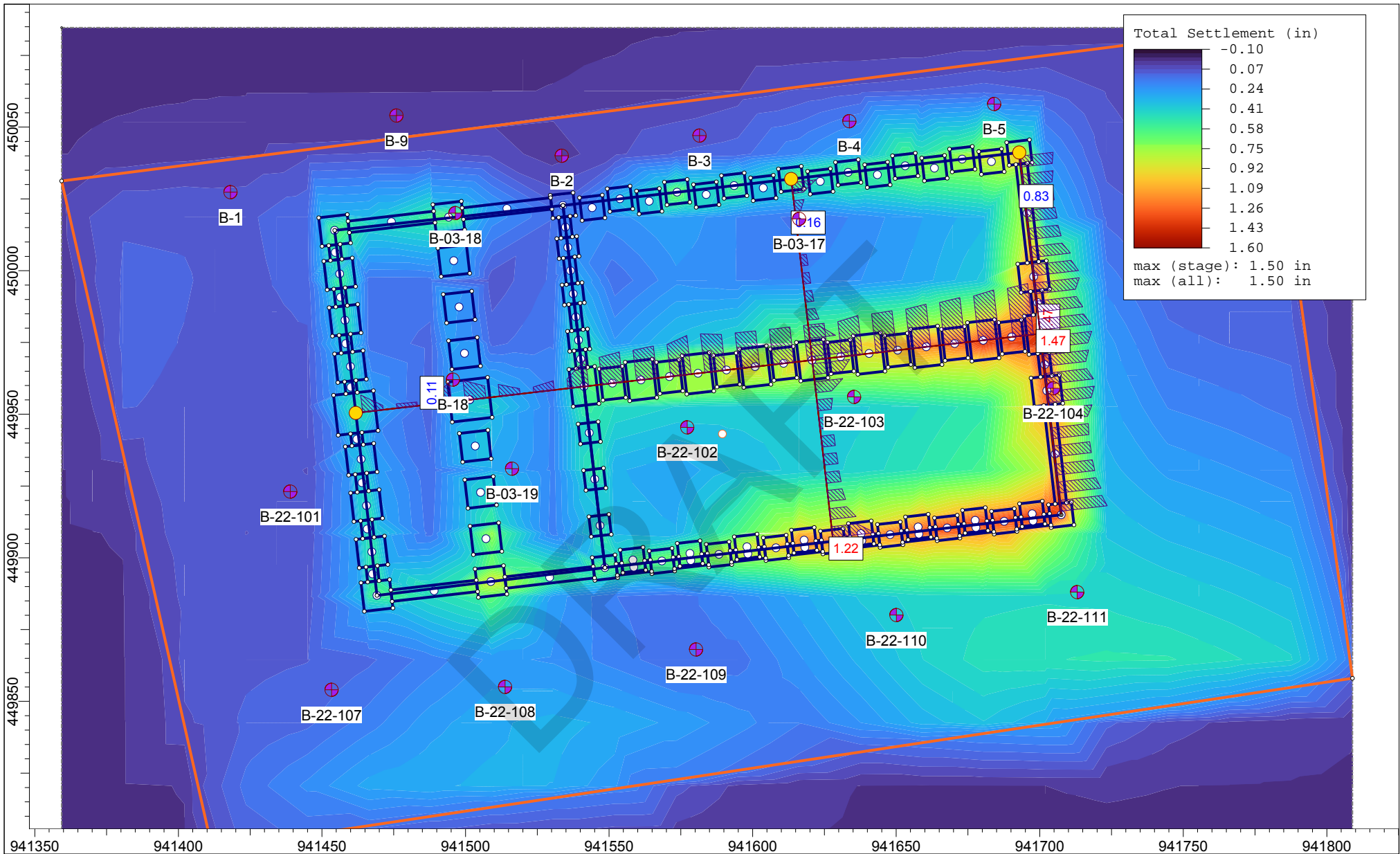



Comments:

APPENDIX E

Computations

DRAFT



| | | | | | |
|--|----------------------|--|-----------------------|------------------------------------|------------------------------|
|  | Project | | | Proposed GEM Factory of the Future | |
| | Analysis Description | | | Post Construction Settlement | |
| | Drawn By | | NDS:tjb | Company | S. W. Cole Engineering, Inc. |
| | Date | | 5/16/2023, 8:06:10 AM | File Name | 22-0937 Model.s3z |

APPENDIX J: STORMWATER BMP SOILS REPORT

WATERSHED RESOURCE CONSULTANTS, LLC

NATURAL RESOURCE AND SOIL SCIENCE CONSULTING

22544

November 07, 2022

University of Maine
Facilities Management
Attention: Jonathan Dow, Project Manager
5765 Service Building 111
Orono, Maine 04469-5765

Subject: Soil Documentation in Stormwater System Areas Report
Proposed ASCC Building Expansion
University of Maine
Orono, Maine

Dear Jonathan,

Watershed Resource Consultants, LLC (WRC) is pleased to present this Soil Documentation in Stormwater System Areas Report for the proposed ASCC building expansion on the University of Maine campus in Orono, Maine. The purpose of the services was to document and classify soils in proposed stormwater system areas in support of SMRT Architects and Engineers (SMRT's) stormwater system design. The proposed project, including proposed stormwater system areas, was shown on the SMRT's GEM: Stormwater Treatment Option 1 and Option 2 plans provided by SMRT on October 21, 2022.

Appendix A of this Report contains Test Pit Logs and copies of the SMRT Plans.

Exploration and Methodology

According to SMRT's plans, there are two potential stormwater system locations, one south of the ASCC building, and one as an expansion of an existing attenuation basin south and west of Belgrade Spur Road. The SMRT plans showed two soil test pit locations within each of the two stormwater system areas. Watershed Resource Consultants, LLC (WRC) visited the site on November 03, 2022 to document and classify soils at the four test pits, which were pre-staked in the field by the University of Maine. The soil test pits, labeled TP SW-1 through TP SW-4 were dug to approximately 6-7 feet in depth by an excavator and operator provided by University of Maine Facilities Management.

BAR HARBOR OFFICE
1366 STATE HIGHWAY 102, #6
BAR HARBOR, ME 04609
(207) 944-7288

ORRINGTON OFFICE
P.O. BOX 145
ORRINGTON, ME 04474
(207) 385-6056

TP SW-1 had approximately 30 inches of silt loam and gravelly loamy very fine sand fill over native soil. TP SW-2 was located in an apparent old field area, with no significant alteration noted. TP's SW-3 and 4 were located in a mowed lawn area, with no significant alteration noted.

At each test pit, WRC documented soil horizon depths, soil texture, color, consistence, structure, depth of observed fill, depth to seasonal water table, depth to restrictive layer, depth to observed seeping, and depth to bedrock (if observed) to the depth of the test pit. Using the collected soil data, WRC then classified the observed soils to the closest Maine soil series based on data published by the Natural Resources Conservation Service (NRCS). WRC used published NRCS data on the soil series and Maine Department of Environmental Protection (MDEP) E&SC BMP's¹ to determine the soil's hydrologic soil group. Soil classification and hydrologic soil group for each test pit are included below in Table 1. The hydrologic soil group presented is based on NRCS published soils data and DEP BMP's and does not represent laboratory or in-situ testing results.

Findings

| <u>Table 1 – Test Pit Documentation Summary</u> | | | | | |
|--|--------------------------------------|-----------------------------------|-------------------------|---------------------------|-------------------------------------|
| Test Pit | Depth to Seasonal Water Table | Depth to Restrictive Layer | Depth to Bedrock | Soil Series | Hydrologic Soil Group (NRCS) |
| TP SW-1 | 0" | 12" | N/O | Scantic silt loam, buried | D |
| TP SW-2 | 0" | 8" | N/O | Scantic silt loam | D |
| TP SW-3 | 8" | 8" | N/O | Lamoine silt loam | D |
| TP SW-4 | 8" | 8" | N/O | Lamoine silt loam | D |

N/O = Not Observed

Lamoine and Scantic soils are somewhat poorly and poorly drained (respectively) soils formed in glaciolacustrine and glaciomarine sediments. The Scantic, buried soil was under approximately 30 inches of fill.

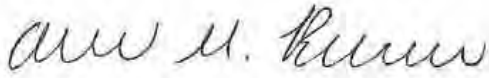
¹ Maine Department of Environmental Protection. MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) Manual for Designers and Engineers, October 2016.

Closing

WRC appreciates the opportunity to assist you during this phase of your project. If you have any questions, please contact us.

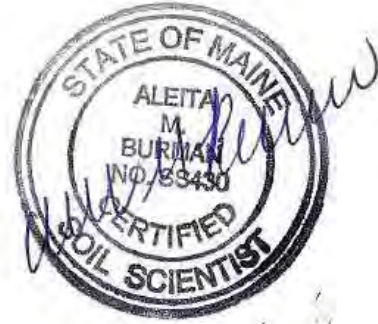
Sincerely,

Watershed Resource Consultants, LLC



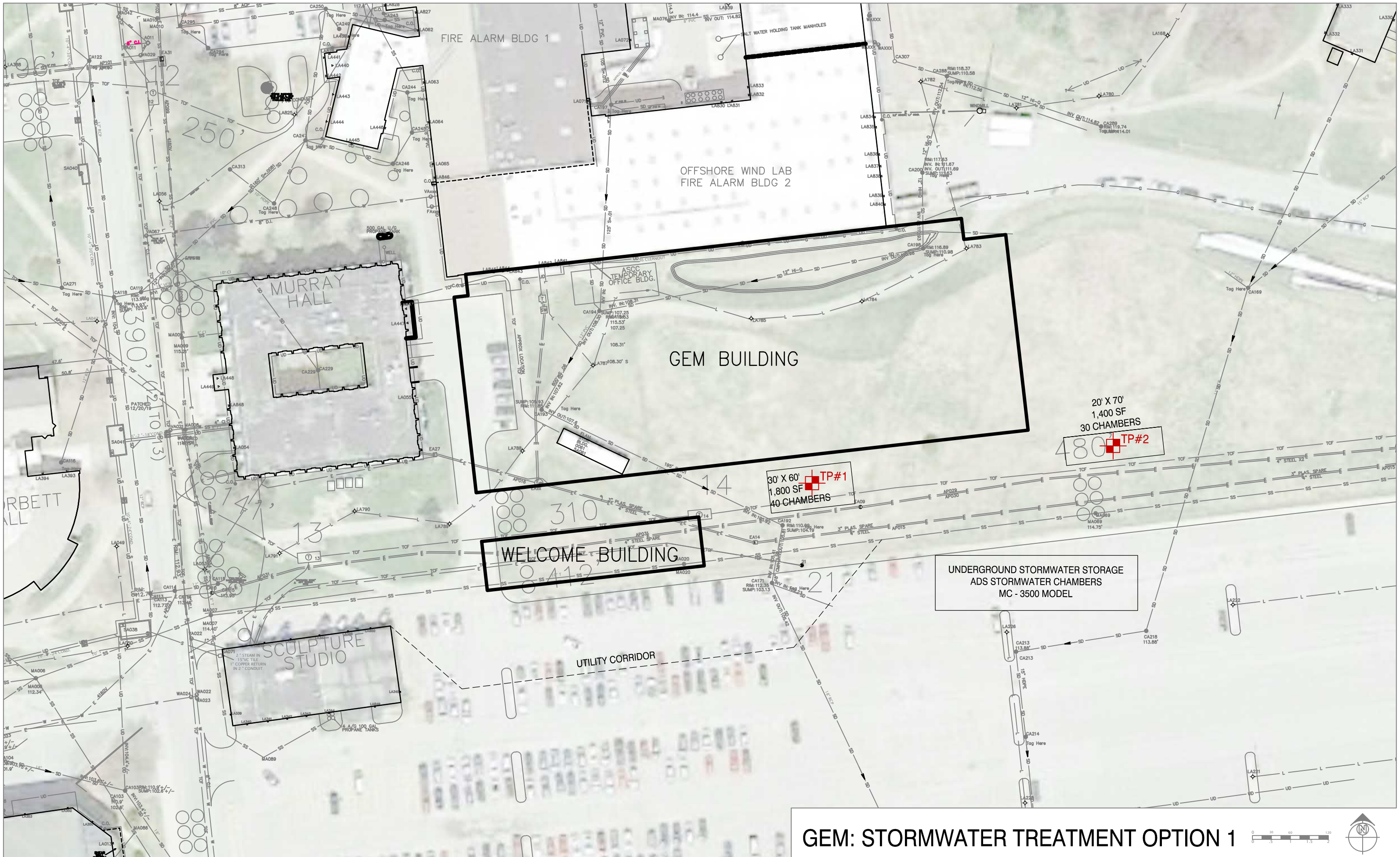
Aleita M. Burman, Licensed Soil Scientist #SS430

Principal and Member | *Watershed Resource Consultants, LLC*

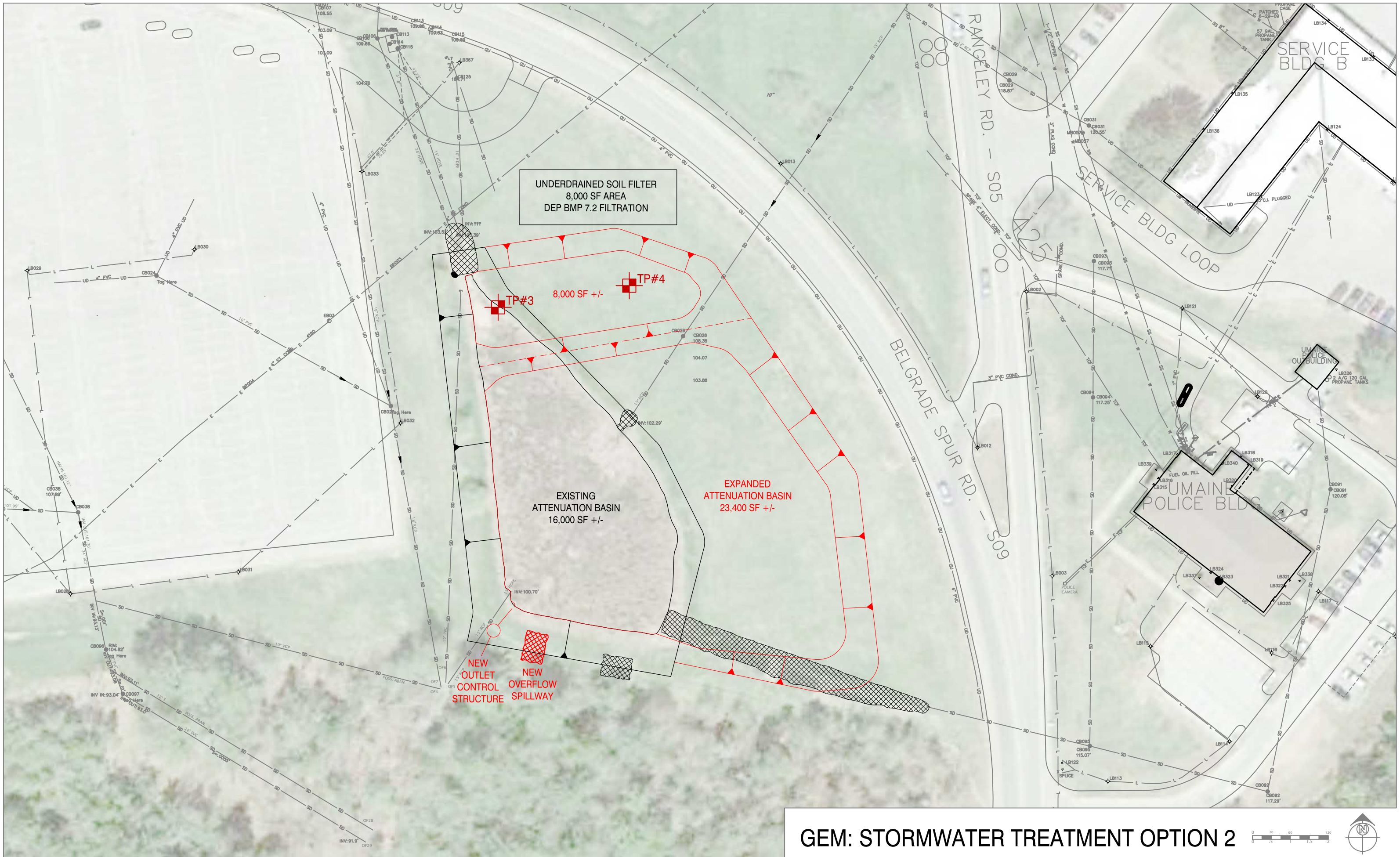


Cc: Jeffrey T. Aceto, P.E., SMRT Architects and Engineers

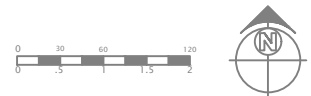
APPENDIX A
SMRT's Plans
Test Pit Logs



GEM: STORMWATER TREATMENT OPTION 1



GEM: STORMWATER TREATMENT OPTION 2



SOIL PROFILE / CLASSIFICATION INFORMATION**SOIL SCIENTIST DESCRIPTION
OF SOIL CONDITIONS AT PROJECT SITES**Project Name:
PROPOSED ASCC EXPANSIONApplicant Name:
UNIVERSITY OF MAINEProject Location (municipality):
ORONOExploration Symbol # TP-SW1 ☒ Test Pit ☐ Boring ☐ Probe
0 " Organic horizon thickness Ground surface elev. _____
84 " Depth: ☒ of exploration, or ☐ to refusal

| Horizon | Color | Texture | Structure | Consistence | Redox |
|-----------------|-----------|--|-----------|-------------------|------------------------------|
| 0-12 FILL 1 | 2.5 Y 4/2 | SILT LOAM | BLOCKY | FRIABLE | CM 2.5 Y 5/1 CM 10 YR 3/6 |
| 12-32 FILL 2 | 2.5 Y 4/2 | GRAVELLY LOAMY VERY FINE SAND (asphalt chunks found) | | FIRM | |
| 32-45 Apb | 10 YR 2/1 | MUCKY SILT LOAM (10% cobbles) | | FIRM (COMPACT) | NONE |
| 45-52 BCgb | 2.5 Y 4/2 | SILT LOAM | | FIRM | CM 5 Y 5/2 FM 10 YR 3/6 |
| 52-84 Cbg | 5 Y 4/2 | SILTY CLAY LOAM | MASSIVE | VERY FIRM | MM 5 Y 4/1 MM 10 YR 3/6 |

Depth below mineral soil horizon (inches)

Soil Series/Phase Name:

Scantic silt loam, buried

Limiting Factor

☒ Groundwater
☐ Restrictive Layer
☐ Bedrock0 "
Depth

Drainage Class

☐ ED ☐ SED ☐ WD ☐ MWD
☐ SPD ☒ PD ☐ VPD

Slope

2
Percent

Hydric Soil

☐ No
☒ Yes

Hydrologic

D
Soil GroupExploration Symbol # TP-SW2 ☒ Test Pit ☐ Boring ☐ Probe
0 " Organic horizon thickness Ground surface elev. _____
78 " Depth: ☒ of exploration, or ☐ to refusal

| Horizon | Color | Texture | Structure | Consistence | Redox |
|--------------|------------------------|--------------------|-----------|-------------|----------------------------------|
| 0-8 Ap | 2.5 Y 4/2 | SILT LOAM | BLOCKY | FRIABLE | NONE OBSERVED |
| 8-21 Bg | 2.5 Y 4/2 | | | FIRM | CM 10 YR 3/6 CM 5 Y 5/1 |
| 21-35 BCb | 5 Y 4/1 & 10 YR 3/6 | | | | dual color heavily mottled |
| 35-64 C1 | 2.5 Y 4/2 | | | | MM 10 YR 3/6 MM 5 Y 4/2 |
| 64-78 C2 | | SILTY CLAY LOAM | | VERY FIRM | |

Depth below mineral soil horizon (inches)

LIMIT OF EXPLORATION AT 78"

Soil Series/Phase Name:

Scantic silt loam

Limiting Factor

☒ Groundwater
☐ Restrictive Layer
☐ Bedrock0 "
Depth

Drainage Class

☐ ED ☐ SED ☐ WD ☐ MWD
☐ SPD ☒ PD ☐ VPD

Slope

2
Percent

Hydric Soil

☐ No
☒ Yes

Hydrologic

D
Soil Group**SOIL SCIENTIST INFORMATION AND SIGNATURE***Aleita M. Burman*
Signature

Aleita M. Burman

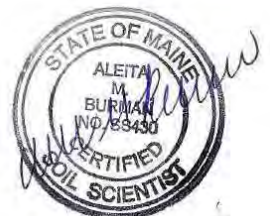
Name Printed

11/03/22

Date

SS430

SS License No.



SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION
OF SOIL CONDITIONS AT PROJECT SITESProject Name:
PROPOSED ASCC EXPANSIONApplicant Name:
UNIVERSITY OF MAINEProject Location (municipality):
ORONOExploration Symbol # TPSW-3 ☒ Test Pit ☐ Boring ☐ Probe
0 " Organic horizon thickness Ground surface elev. _____
84 " Depth: ☒ of exploration, or ☐ to refusal

| Horizon | Color | Texture | Structure | Consistence | Redox |
|--------------|-----------|--------------------|----------------|-------------|----------------------------|
| 0-8 Ap | 10 YR 3/2 | SILT LOAM | WEAK BLOCKY | FRIABLE | NONE |
| 8-16 B | 2.5 Y 4/3 | | BLOCKY | FIRM | CF 10 YR 3/4 CF 5 Y 5/1 |
| 16-24 BCg | 2.5 Y 4/2 | | | | MM 2.5 Y 4/4 MM 5 Y 5/2 |
| 24-62 Cg1 | 5 Y 4/2 | SILTY CLAY LOAM | MASSIVE | VERY FIRM | MM 10 YR 3/6 MM 5 Y 5/1 |
| 62-84 C2g | 5 Y 4/2 | | | | MF 10 YR 3/6 |

Depth below mineral soil horizon (inches)

LIMIT OF EXPLORATION AT 84"

Exploration Symbol # TPSW-4 ☒ Test Pit ☐ Boring ☐ Probe
0 " Organic horizon thickness Ground surface elev. _____
84 " Depth: ☒ of exploration, or ☐ to refusal

| Horizon | Color | Texture | Structure | Consistence | Redox |
|--------------|-----------|--------------------|----------------|-------------|----------------------------|
| 0-8 Ap | 10 YR 3/2 | SILT LOAM | WEAK BLOCKY | FRIABLE | NONE |
| 8-16 B | 2.5 Y 4/3 | | BLOCKY | FIRM | CF 10 YR 3/4 CF 5 Y 5/1 |
| 16-30 BCg | 2.5 Y 4/2 | | | | MM 2.5 Y 4/4 MM 5 Y 5/2 |
| 30-62 Cg | 5 Y 4/2 | SILTY CLAY LOAM | MASSIVE | VERY FIRM | MM 10 YR 3/6 MM 5 Y 5/1 |
| 62-84 C2g | 5 Y 4/2 | | | | MF 10 YR 3/6 |

Depth below mineral soil horizon (inches)

LIMIT OF EXPLORATION AT 84"

Soil
Details

Soil Series/Phase Name:

Lamoine silt loam

Limiting Factor

☒ Groundwater
☒ Restrictive Layer
☐ Bedrock

Drainage Class

☐ ED ☐ SED ☐ WD ☐ MWD
☒ SPD ☐ PD ☐ VPD

Slope

12
Percent

Hydric Soil

☒ No
☐ Yes

Hydrologic

D
Soil GroupSoil
Details

Soil Series/Phase Name:

Lamoine silt loam

Limiting Factor

☒ Groundwater
☒ Restrictive Layer
☐ Bedrock

Drainage Class

☐ ED ☐ SED ☐ WD ☐ MWD
☒ SPD ☐ PD ☐ VPD

Slope

1
Percent

Hydric Soil

☒ No
☐ Yes

Hydrologic

D
Soil Group

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature
Aleita M. Burman

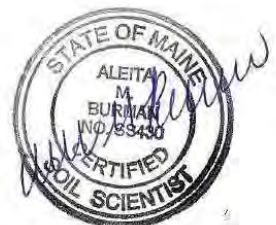
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11/03/22

Date

SS430

SS License No.



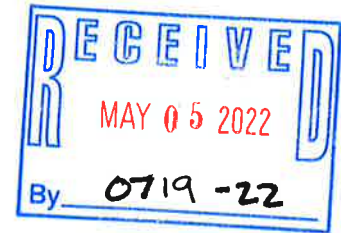
**APPENDIX K: MAINE HISTORIC PRESERVATION COMMISSION
COMMUNICATIONS**

Via Electronic Mail

May 5, 2022



Kirk F. Mohney
Director and State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04333-0065



Re: Economic Development Administration (EDA) Grant applications
for The University of Maine, Orono, Maine

Dear Mr. Mohney:

The University of Maine (UMaine) has applied for grants for two projects on their Orono Campus that are in proximity to one another. The EDA has requested UMaine ask SHPO for an updated review letter for this area of campus; the last review was in 2011. Both additions will be connected to existing buildings and built over existing pavement and vegetated areas. They will expand the existing research facilities for these two important research centers at UMaine.

The first project is an addition to Jenness Hall that houses the Process Development Center, a research facility that provides technical services and resources for clients in traditional pulp and paper and in emerging process technologies and materials science. The second project is another addition to the Advanced Structures and Composites Center (ASCC) which is a center for research, education, and economic development encompassing material sciences, manufacturing, and the engineering of composites and structures.

Could you please review the site for any known or suspected resources of historic significance so we can provide this information to the EDA in support of their NEPA process? Please feel free to contact me at (207) 632-5039 or snicholson@woodardcurran.com if you have any questions or need additional information. Thank you for your assistance.

Sincerely,

WOODARD & CURRAN, INC.

Sarah Nicholson, P.E.
Technical Manager

SSN/

Enclosure(s) Campus Map, Site Sketches

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act. Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106 consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

Kirk F. Mohney,
State Historic Preservation Officer
Maine Historic Preservation Commission

5/16/22
Date

PN: 0230171

APPENDIX L: TRIBAL HISTORIC PRESERVATION COMMUNICATIONS



THPO Communications

Tribal Historic Preservation Office
Mi'kmaq Nation
7 Northern Road
Presque Isle, ME 04769
Phone: (207)764-1972 ext. 161
jdennis@micmac-nsn.gov

Response attached

Donald Soctomah, THPO (soctomah@gmail.com)
Passamaquoddy Tribe of Indians
Pleasant Point Reservation
PO Box 343
Perry, ME 04667

No response to date

Donald Soctomah, THPO (soctomah@gmail.com)
Passamaquoddy Tribe of Indians
Indian Township Reservation
PO Box 301
Princeton, ME 04668

No response to date

Isaac St. John, THPO (istjohn@maliseets.com)
Houlton Band of Maliseet Indians
88 Bell Road
Littleton, ME 04730

No response to date

Chris Sockalexis, (Chris.Sockalexis@penobscotnation.org)
Tribal Historic Preservation Officer
Penobscot Nation
12 Wabanaki Way
Indian Island, ME 04468

No response to date

Sarah Nicholson

From: John Dennis <jdennis@micmac-nsn.gov>
Sent: Friday, June 16, 2023 12:01 PM
To: Sarah Nicholson
Cc: Nichole Francis
Subject: RE: UMaine Project review
Attachments: Tribal Historic Preservation Office letter.docx

From: "Sarah Nicholson" <snicholson@woodardcurran.com>
Sent: 6/13/23 3:33 PM
To: "kreis@micmac-nsn.gov" <kreis@micmac-nsn.gov>
Subject: UMaine Project review

Dear Ms. Reis,

We would appreciate your taking a look at the attached and letting us know if you have any concerns about the project. Of course, if you have any questions or want additional information, please do not hesitate to ask. I can be reached at (207) 632-5039 or snicholson@woodardcurran.com. Thank you very much for your attention and assistance.

Sarah Nicholson, P.E.

Technical Manager

Woodard & Curran

80 Exchange Street

Suite 400

Bangor Maine 04401

snicholson@woodardcurran.com

207-632-5039 (cell)

Tribal Historic Preservation Office

Mi'kmaq Nation

7 Northern Road

Presque Isle, ME 04769

Phone: (207)764-1972 ext. 161

jdennis@micmac-nsn.gov

June 16, 2023



Mi'kmaq
Nation

Based on the project description, we do not have knowledge of any specific sites or cultural features that exist at the proposed project location(s). However, this geographic area does constitute traditional areas that were historically utilized by members of the Mi'kmaq Nation and the other Wabanaki Tribes.

Re: University of Maine at Orono

Wetlands Alteration Permit

Orono, Maine

Therefore, we respectfully request that if during the course of excavation/construction activities, human remains, artifacts, or any other evidence of Native American presence is discovered, that site activities in the vicinity of the discovery immediately cease, pending notification to us. In addition, if this project results in wetland disturbances requiring mitigation, we are requesting that you utilize the black ash (*Fraginus nigra*) as the principal wetland species for wetland restoration activities. The black ash tree has special significance in the culture of the northeastern Tribes and is used extensively for weaving baskets and other Native American crafts. The black ash tree also provides valuable food and habitat for migratory waterfowl and other wildlife. Unfortunately, however, this species has been selected against by foresters and landowners who favor other tree species. As a result of this, and other environmental factors, the black ash tree is in serious decline in Maine. The Mi'kmaq Nation has completed several black ash wetland restoration projects and have a dependable source for highly-quality seedlings, and the experience and expertise to assist you with black ash wetland restoration projects.

On the subject of human remains, artifacts, or any other evidence of Native American presence is discovered. The human remains will be reburied with the appropriate respect for the remains that is required at a distinctive and respectable site. The artifacts and other evidence of Native American discovery will be documented with appropriate detail. The items will be analyzed for the precise period of the items' distinctive period and will be documented by the Tribal Historic Preservation Officer for the Mi'kmaq Nation.

If you have any questions or comments, please feel free to contact me.

Sincerely,

John Dennis,

Interim Tribal Historic Preservation Officer

Via Electronic Mail

June 13, 2023



Kendyl Reis, THPO (kreis@micmac-nsn.gov)
Mi'kmaq Nation
7 Northern Road
Presque Isle, ME 04769

Re: Wetlands Alteration Permit for The University of Maine, Orono, Maine

Dear Ms. Reis:

This letter concerns an application by the University of Maine to the U.S. Army Corps of Engineers for a permit to construct an approximately 50,000 sf addition to the Advanced Structures and Composites Center (ASCC) at the University of Maine (UMaine) that will impact wetlands. The ASCC is a center for research, education, and economic development encompassing material sciences, manufacturing, and the engineering of composites and structures. The proposed addition will house the Green Engineering & Materials Factory of the Future (GEM FoF), which will be a state-of-the-art, Industry 4.0 inspired R&D factory that will allow for innovative research primarily on large-scale, bio-based hybrid manufacturing, supporting key goals in the State of Maine's 10-Year Economic Development Plan. It will provide active learning spaces for the Maine College of Engineering and Computing (MCEC) where students can interact with and program equipment in a safe and controlled manner and thus develop critical skills to improve Maine's workforce.

The proposed location, shown on the attached sketch, will impact approximately 0.6 acres of meadow wetland. Per Section 106 of the Historic Preservation Act, and as a condition of our pending Corps application we are requesting a determination of effect for this project. Please feel free to contact me and the Corps with any questions or comments at 207-632-5039 or via email at snicholson@woodardcurran.com. The Corps fax number is 207-623-8206 and e-mail: shawn.b.mahaney@usace.army.mil. I am grateful for your assistance.

Sincerely,

WOODARD & CURRAN, INC.

A handwritten signature in blue ink, appearing to read 'Sarah Nicholson', with a stylized flourish extending to the right.

Sarah Nicholson, P.E.
Technical Manager

SSN/

Enclosure(s) Campus Map, Site Sketches

PN: 0230171



2022-23 Campus Map

- P** VISITOR permits authorize parking in any black lot or visitor space.
- RED** (Resident Student) permits authorize parking in red lots.
- BLACK** (Commuter Student) permits authorize parking in black lots.
- BLUE** (Faculty/Staff) permits authorize parking in any blue or black lot.
- GREEN** (Carpool) permits authorize use of individually allocated spaces.

Permits **MUST** be displayed on interior mirror.

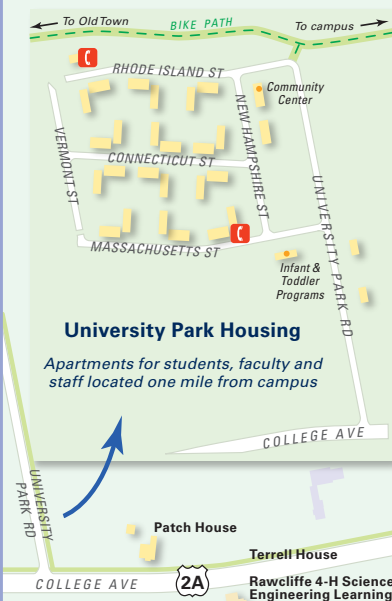
Signs governing lots take precedence over all maps and permits

- ?** Information
- +** Ambulance
- P** Public Bus Stop
- +** Emergency Phone
- ♂** Gender Inclusive Restroom
- EV** Public Electric Vehicle Charging Station

Visitor Parking

Visitors need permits. Visitor Permits allow parking in metered spaces and in any BLACK lot. They are available for free online at umaine.edu/parking or at the UMaine Police Department.

Parking Office: 207.581.4047



University Park Housing

Apartments for students, faculty and staff located one mile from campus

To Witter Teaching and Research Center, UMaine Cooperative Extension Diagnostic and Research Lab (17 Godfrey Drive, Orono), Old Town, and College Ave

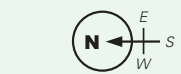
Welcome
to the University of Maine, Orono

Please respect that UMaine is a walking campus
Pedestrians have right of way at all times

Winter Parking Ban
Blue and Black lots, as well as visitor spaces, are closed to parking from midnight to 6 a.m. from Nov. 1 to May 1.

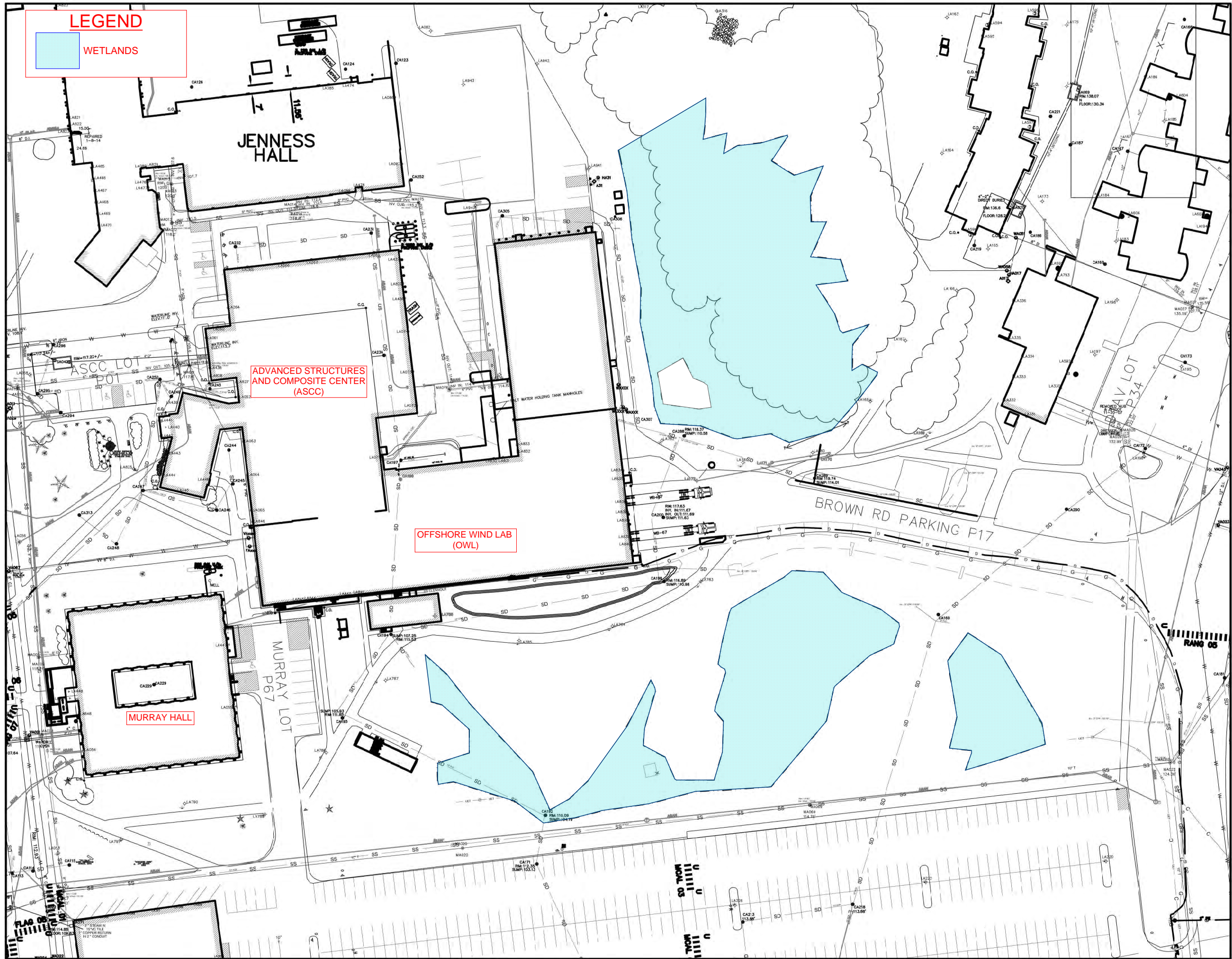
Overnight Parking Permits
are available from UMaine Police and online at umaine.edu/parking.

ASCC GEM Project Location



DISTANCE 1/8 MILE
Walking time 2-3 minutes

UMaine ©7/2022
Cartography by Purple Lizard Maps
Please suggest edits to um.printing@umaine.edu



IT IS A VIOLATION OF THE LAWS OF THE STATE OF NEW YORK FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ARCHITECT/ENGINEER, TO ALTER THIS DRAWING. IF THIS DRAWING IS ALTERED, THE ALTERING ARCHITECT/ENGINEER SHALL AFFIX HIS SEAL WITH THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, DATE AND DESCRIPTION OF THE ALTERATION.

| REV | DESCRIPTION | DATE |
|-----|-------------|------|
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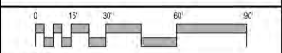
CURRENT ISSUE STATUS:



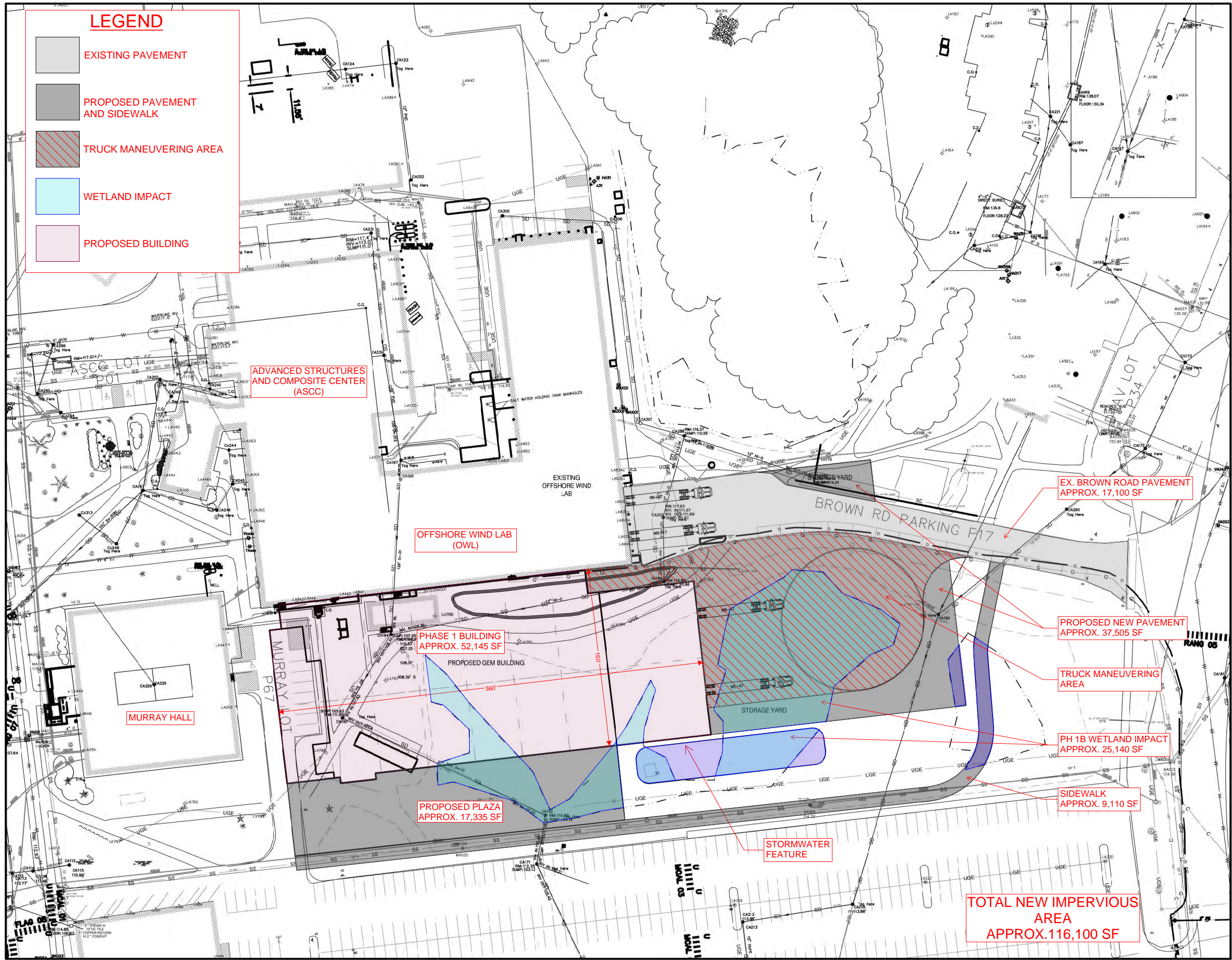
SMRT Architects and Engineers
75 Washington Avenue, Suite 3A
Portland, Maine 04101
1.877.700.7678
www.smrtinc.com

UNIVERSITY OF MAINE
GEM RESEARCH FACTORY
OF THE FUTURE

ORONO, MAINE
EXISTING CONDITIONS



PROJECT MANAGER: NAR PROJECT NO: 22012
JOB CAPTAIN: XXX



IT IS A VIOLATION OF THE LAWS OF THE STATE OF NEW YORK FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ARCHITECT/ENGINEER, TO ALTER THIS DRAWING. IF THIS DRAWING IS ALTERED, THE ALTERING ARCHITECT/ENGINEER SHALL AFFIX HIS SEAL WITH THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, DATE AND DESCRIPTION OF THE ALTERATION.

| REV | DESCRIPTION | DATE |
|-----|-------------|------|
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| | | |
| | | |
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CURRENT ISSUE STATUS:



PROJECT FIRM: SMRT Architects and Engineers
75 Washington Avenue, Suite 3A
Portland, Maine 04101
1.877.700.7678
www.smrtinc.com

UNIVERSITY OF MAINE
GEM RESEARCH FACTORY
OF THE FUTURE

ORONO, MAINE

PHASE 2



SCALE: 1"=30'
PROJECT MANAGER: NAR PROJECT NO: 22012
JOB CAPTAIN: XXX

NOT FOR CONSTRUCTION



PENOBSCOT NATION
CULTURAL & HISTORIC PRESERVATION
12 WABANAKI WAY, INDIAN ISLAND, ME 04468

CHRIS SOCKALEXIS – TRIBAL HISTORIC PRESERVATION OFFICER

E-MAIL: chris.sockalexis@penobscotnation.org

| | |
|-----------------|---|
| NAME | Sarah Nicholson |
| ADDRESS | Woodard & Curran 80 Exchange Street, Suite 400 Bangor Maine 04401 |
| OWNER'S NAME | University of Maine |
| TELEPHONE | 207- 632-5039 |
| EMAIL | snicholson@woodardcurran.com |
| PROJECT NAME | Advanced Structures and Composites Center Expansion |
| PROJECT SITE | Orono, ME |
| DATE OF REQUEST | June 13, 2023 |
| DATE REVIEWED | January 3, 2024 |

Thank you for the opportunity to comment on the above referenced project. This project appears to have no impact on a structure or site of historic, architectural or archaeological significance to the Penobscot Nation as defined by the National Historic Preservation Act of 1966, as amended.

If there is an inadvertent discovery of Native American cultural materials during the course of the project, please contact my office at (207) 817-7471. Thank you for consulting with the Penobscot Nation Tribal Historic Preservation Office with this project.

A handwritten signature in black ink, appearing to read "Chris Sockalexis".

Chris Sockalexis, THPO
Penobscot Nation

**APPENDIX M: UTILITY SUPPLY CAPACITY COMMUNICATIONS (WATER,
WASTEWATER, SOLID WASTE)**

Sarah Nicholson

From: Boyd Smith <bsmith@ovwd.org>
Sent: Thursday, July 6, 2023 3:37 PM
To: Sarah Nicholson
Subject: Re: UMaine project ASCC GEM expansion

Hi Sarah, I don't see any issue with supplying the 600 gpm a day. Let me know if you need anything else, Boyd

On Wed, Jul 5, 2023 at 11:46 AM Sarah Nicholson <snicholson@woodardcurran.com> wrote:

Hello, Boyd,

The University of Maine will be submitting a SLOD application to DEP in the next week or two. The project is a two phase 46,450 SF expansion to the Advanced Structures & Composites Center (ASCC) called the Green Engineering & Materials (GEM) Factory of the Future (FoF). They anticipate 50 new employees at the facility for phase 1, and an increase in water demand of approximately 600 gallons per day. There are no other new water requirements associated with this project.

The phase 2 expansion planned for design in 2026 and construction a year later, will be included in the application. We are requesting conditional approval from the DEP for that phase but we will need to provide them with details such as water usage when design gets underway in a couple of years in order to get final approval for that phase.

For the SLOD application, could you confirm that this additional demand of 600 gpd can be met by the Orono-Veazie Water District? Please let me know if you have any questions.

Thank you, as ever!

-Sarah

Sarah Nicholson, P.E.

Technical Manager

Woodard & Curran

80 Exchange Street

Suite 400

Bangor Maine 04401

snicholson@woodardcurran.com

207-632-5039 (cell)

207-558-4236 (direct)

--

Boyd Smith

Superintendent

Orono Veazie Water district

207-866-4449

Sarah Nicholson

From: Chris Prue <cprue@orono.org>
Sent: Thursday, July 6, 2023 4:47 PM
To: Sarah Nicholson
Subject: Re: UMaine project ASCC GEM expansion permitting

Thank You Sarah,
The Orono WPCF does in fact at this time have the capacity to convey and treat an additional 600 gpd of sanitary wastewater to be discharged from UMaine campus into the Orono sewer collection system. Said flows to be originating from a proposed expansion to the Advanced Structures and Composites Center (ASCC)

Kind Regards
Chris

On Thu, Jul 6, 2023 at 4:27 PM Sarah Nicholson <snicholson@woodardcurran.com> wrote:

Chris,

Yes, strictly sanitary!

From: Chris Prue <cprue@orono.org>
Sent: Thursday, July 6, 2023 4:25 PM
To: Sarah Nicholson <snicholson@woodardcurran.com>
Subject: Re: UMaine project ASCC GEM expansion permitting

Hi Sarah,

To confirm this is strictly domestic sanitary wastewater, there will be no other sources such as tanks that will have to be periodically drain and cleaned or similar activities?

Thank You

Chris

On Wed, Jul 5, 2023 at 11:50 AM Sarah Nicholson <snicholson@woodardcurran.com> wrote:

Chris,

The University of Maine will be submitting a SLOD application to DEP in the next week or two. The project is a two phase 46,450 SF expansion to the Advanced Structures & Composites Center (ASCC) called the Green Engineering & Materials (GEM) Factory of the Future (FoF). They anticipate 50 new employees at the facility for phase 1, and an increase in wastewater flow of approximately 600 gallons per day. There are no other new water requirements associated with this project.

The phase 2 expansion planned for design in 2026 and construction a year later, will be included in the application. We are requesting conditional approval from the DEP for that phase but we will need to provide them with details such as water usage when design gets underway in a couple of years in order to get final approval for that phase.

For the SLOD application, could you confirm that the Orono WPCF has the capacity this meet this additional demand of 600 gpd? An email response is absolutely fine, but please feel free to call with any questions.

Thank you!

-Sarah

Sarah Nicholson, P.E.

Technical Manager

Woodard & Curran

80 Exchange Street

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Bangor Maine 04401

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207-632-5039 (cell)

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Chris Prue

Superintendent

Orono Water Pollution Control Facility

Town of Orono Maine

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cprue@orono.org

Please note that email sent from or coming to this address may be considered a public document and be subject to the State of Maine Freedom of Access Law.

--
Chris Prue
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CONSTRUCTION SOLID WASTE GENERATION

UNIVERSITY OF MAINE GEM / ASCC

June 28, 2023



Walter,

To date, arrangements have not been made, nor have any contracts been written for any waste haulers, material recyclers, demolition contractors or any entity who will be responsible for the generation, handling, and/or disposing of any solid waste.

Consigli will require that all solid waste generated by the GEM Project will be transported to (a) licensed facility(ies). Additionally, the Project will require a detailed Waste Management Plan (WMP) which includes:

- Waste reduction progress reports.
- Waste reduction calculations.
- Records of any donations.
- Records of any sales.
- Recycling and processing facility records.
- Landfill and incinerator disposal records
- Qualification data for the waste management coordinator.

Solid waste generation will occur during the construction of the new 45,000 s.f. Building. Below are some approximate volumetric predictions for waste generated.

GENERAL NEW CONSTRUCTION

During the general construction of the GEM / ASCC Building, it is anticipated that we will maintain three 30 cubic yard dumpsters on the project for 110 weeks. Haul intervals will vary throughout the project, but we expect to haul one dumpster per week. During this period, it is anticipated that the solid waste generated will primarily consist of:

- Ferrous metals – steel stud offcuts, sheet metal trimmings, piping, conduit.
- Non-ferrous metals – aluminum metal panels cuts.
- Wood pallets.
- Gypsum drywall – offcuts and scraps.
- Brick and concrete masonry unit trimmings.
- Cardboard and plastic packaging.

CONSTRUCTION SOLID WASTE GENERATION

UNIVERSITY OF MAINE GEM / ASCC

June 28, 2023



For recycling purposes, the dumpsters will be assigned and limited to particular materials as dictated by the phase of construction (i.e. gypsum wallboard installation, steel stud installation, etc). It is anticipated that most of the materials will be recycled with only a small amount of general trash remaining.

(1) 30-yard dumpsters per week X 110 weeks = approx. **3,300 cubic yards**

Should you have any questions regarding the above, please contact me to discuss.

Eric Bottaro
Consigli Construction, Co.
ebottaro@consigli.com



June 30, 2023

Consigli Construction
15 Franklin St
Portland ME 04101
Attn: Eric Bottaro

Re: Capabilities Statement – GEM Factory of the Future Project, Orono, ME

Dear Mr. Bottaro,

This letter is to confirm that Casella Waste Services located in Hermon, ME has the capabilities to pick up, truck, and dispose of all volumes of Construction and Demolition Debris generated by the proposed construction at the above referenced GEM Factory of the Future Project located in the Orono, ME. Casella can also handle all volumes of operational Construction and Demolition Waste generated by this facility once it is completed. These materials can be disposed of at the Juniper Ridge Secured Landfill Facility located in West Old Town, ME.

Casella Waste Services can transport all anticipated volumes of non-hazardous MSW (Municipal Solid Waste) to the Penobscot Energy Recovery Corporation facility located in Orrington, ME. We are also prepared to handle all amounts of Wood products that may be generated from this development at Re-Energy located in Lewiston, ME, as well as Carboard Recycling at Casella Recycling, located in Old Town, ME.

This letter is not a quote for services. Rather it is a statement of capabilities. The sole purpose of this letter is to communicate the willingness and capabilities that Casella Waste Services has towards providing these services as requested.

Please feel free to contact me with any future requests. I can be reached at (207) 310-0509.

Sincerely,

Adam Graham

Adam Graham
Accounts Manager
Casella Waste Services



**Woodard
& Curran**

woodardcurran.com