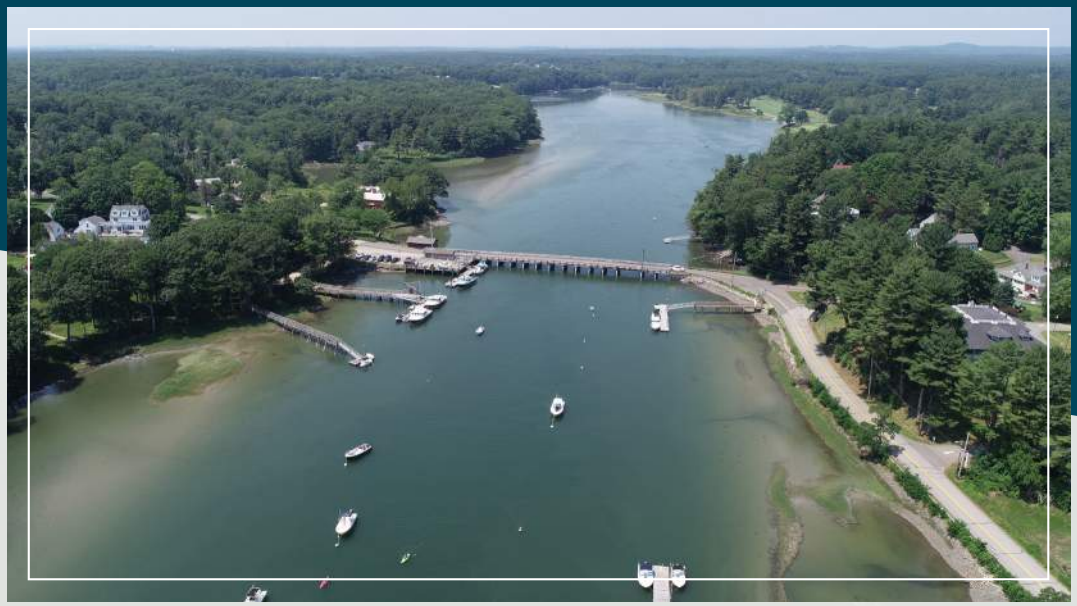
GEI Consultants

RFP Response

Public Paddle Craft Dock at Goodrich Park

Prepared for:
Town of York, Maine
November 15, 2024



Submitted by:
GEI Consultants, Inc.
5 Milk Street, Portland, ME 04101
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November 15, 2024

Mr. Dylan Smith
Planning Director
Town of York
186 York Street
York, ME 03909

Dear Mr. Smith:

RE: Request for Proposals, Public Paddle Craft Dock Project
Town of York, Maine

GEI Consultants, Inc. appreciates the opportunity to present our qualifications for engineering services for the design of a public paddle craft dock at Goodrich Park in the Town of York, ME. This proposal is being submitted in response to the Town's RFP dated September 17, 2024.

In 2020, GEI was retained by the Town of York to undertake a study of uses and capacity of the York Harbor and River. One of the recommendations made by GEI in that study was to develop a paddle craft dock at Goodrich Park as a way to improve public access to the York River, while also reducing landside congestion at some of the existing sites used for paddle craft launching, and reducing waterside congestion in the Harbor by promoting more paddle craft use of upstream portions of the River. The development of this new paddle craft dock may also shift some existing use away from sites such as Strawberry Island, which bring increased use density to the lower areas of the harbor. As part of this work, GEI has already assessed possible locations for docks at Goodrich Park, has visited the site multiple times to document existing conditions, and has a solid understanding of overall River and Harbor uses that may influence the design.

We understand that a stakeholder engagement process will be important to this project, as will a carefully considered context-sensitive design, to ensure that the proposed project reflects community needs, fits with the historical character and aesthetic of the site, is accessible for all, and is permittable within local, state, and federal constraints.

GEI will approach this project with our team of engineers, designers, environmental specialists, and landscape architects to identify and implement a solution that balances the challenges and constraints of this unique project. We will draw on our team's expertise in design of similar facilities for municipalities in Maine, as well as our recent work with the Town of York. We are confident that our approach, as outlined in this proposal, will allow the Town to achieve their goals for the project with great value and efficiency.

We would be happy to discuss our approach and capabilities further. If you have any questions, please feel free to contact Dan Bannon by email (dbannon@geiconsultants.com) or phone (207-347-2372). Thank you for your consideration of our proposal.

We note that no person acting for or employed by the Town of York is directly or indirectly related to the proposer or to any agreement which may be entered into to which the Proposal relates or in any portion of the profits here from.

Sincerely,

GEI CONSULTANTS, INC.

Daniel Bannon, P.E., CFM, BC.PE
Coastal Practice Leader

Travis Pryor, PLA, LEED AP
Senior Project Manager

1 Project Description & Scope of Service

Background

The Town of York is a coastal community with a year-round population of over 12,000. A popular resort community, the summer population increases by 3 to 4 times. The York River, a 13+ mile long river that flows from the Town's western border with Eliot to the Atlantic Ocean at the coast, is a tremendous resource both locally and regionally, resulting in its designation in 2022 as a federally designated Wild and Scenic River. The river supports a range of boating uses including commercial fishing, marinas, charters, and transient mooring in the Harbor, and predominantly recreational boating, fishing, and paddle craft use in upstream areas.

In 2020, GEI completed a study of uses and capacity of the York Harbor and River. While numerous issues were considered in that study, one that rose to be a high priority was improved access for paddle craft use of the river. Goodrich Park was identified as a potential site to develop a new paddle craft facility, which offers multiple advantages, including the large existing Town-owned property with designated upland parking and open space; the location on the river being approximately half way between two existing launch points used by paddle craft users (Scotland Bridge Road Launch upstream, and Strawberry Island downstream); and the location on the upstream portion of the river where use is more heavily weighted toward small recreational boats and paddle craft and away from downstream areas that are more densely used by commercial fishing vessels and larger sail and power boats. Environmental conditions at the site also appear to be suitable for permitting of a public paddle craft facility as proposed, subject to further investigation which will be undertaken as part of this scope of work.

The Town is currently seeking to have a professional engineering consultant develop plans and specifications through 100% final design, for the construction of the proposed paddle craft facility. The design will need to be developed for the following key design considerations:

- Design to be ADA compliant, including the dock itself, access paths and landings, and parking.
- The degree of tidal access and water depth required—i.e., full tide use or partial tide use only
- Optimal selection of location on site in consideration of tidal access needs, environmental conditions, regulatory constraints, and adjacency to existing upland facilities and access
- Capacity for paddle craft use
- Options for dockside or landside storage of paddle craft
- Design aesthetics to fit with the character and historical nature of the site
- Public/stakeholder input on uses and goals for the site

The above represents some but certainly not all considerations for the design. To develop a design that meets the Town's needs, it will be important to work with Town Staff, users, stakeholders, and the public to identify information that will influence the design.

We understand that the preparation and filing of regulatory permit applications is not part of the current scope. However, we acknowledge that a critical aspect to the feasibility of the project will be identifying a design that fits within relevant regulatory constraints. During the current scope, GEI proposes to undertake a regulatory review and hold a pre-application meeting with local, state, and federal agencies to review the project and gather input with the goal of avoiding potential impacts on the design when permitting takes place in the future.

GEI's scope of work is described in the following section.

Scope of Services

1 | General and Project Management

KICKOFF MEETING AND SITE WALK

- Hold a kickoff meeting with Town staff and key project stakeholders to review the project scope and schedule and gather initial input on design goals.
- Following the kickoff meeting, hold a site walk to view and photograph the project site and familiarize the Team with existing conditions at the potential locations for development of the proposed paddle craft dock.
- Prepare and circulate meeting minutes.

MONTHLY STATUS UPDATES

- For the project duration (assumed 4 months), provide the Town with updates on work activities completed and planned, status of schedule, and any support needs.

2 | Background Data Collection and Site Investigations

Review publications, standards, and web-based data for the project site including, but not necessarily limited to:

- Tidal datum information.
- FEMA Flood Mapping.
- Maine Climate Council recommendations for accommodation of sea level rise.
- York River current data.
- Plant and animal habitat mapping.
- Town of York Zoning.
- Existing Site conditions and development constraints.

SITE SURVEY

GEI will retain a professional land survey firm to complete a topographic and bathymetric survey of the proposed project area. The survey will include upland topographic survey data sufficient to generate 1' contour intervals for the project area and access to the site. The survey will also include detailed site information including but not necessarily limited to:

- Top of bank, toe of bank, highest annual tide elevation, MHHW, MLLW, BFE.
- Locations of existing access routes, paths, kayak storage areas, lawns, and other upland site features.
- Location, size, and species of all trees over 3" DBH within the identified limits of clearing (to be confirmed after a preferred design concept has been identified).

A boundary survey is not proposed as part of the current scope. It is assumed that the existing boundary plan for the Goodrich Park property that is recorded in the York County Registry of Deeds will be the basis for parcel boundaries. Boundary information will be tied to existing monuments identified on site by the surveyor.

VESSEL USE INFORMATION

Gather data from Town and past studies and observations and current Town and stakeholder input to establish the type and volume of use to be accommodated at the facility. It is anticipated that use will be limited to paddle craft only. Some considerations for design may include:

- Provision of and quantity of accessible launching floats
- Size of floating docks and amount of dock face available for temporary tie-up
- Paddle craft storage on floats

PUBLIC MEETING NO. 1

A public meeting will be held as part of a regularly scheduled Town committee or Selectboard meeting to introduce the project and notify the public of the planned activities and opportunities to provide input.

GEI will seek input from the Town as to the optimal forum for this public meeting that considers likely attendance by stakeholders.

PUBLIC MEETING NO. 2

A public meeting will be held as part of a regularly scheduled Town committee or selectboard meeting to present the design deliverables for approval by the Town.

3 | Concept Level Design (15% Design)

1. Review design concepts prepared during prior efforts completed in 2020.
2. Develop a Basis of Design Memo that documents design criteria.
3. Prepare up to three alternative concept design plans that consider client input and Basis of Design information.
4. Consider alternatives for floating dock and pier layouts on site.
5. Prepare a concept-level cost estimate.
6. Meet with Town staff and stakeholder group to review the concept design and gather feedback on design refinements and preference.
7. Prepare meeting notes documenting any comments received and proposed approach to addressing comments during preliminary design.
8. It is assumed that at the conclusion of Phase I the Town will confirm the preferred alternative, which will be the basis for further design development.

4 | Preliminary Design (15% - 60% Design)

1. Prepare preliminary design (60%) plans for the proposed project elements including:
    - Pile-supported pier.
    - Floating docks.
    - Gangway(s).

- Mooring and fendering systems.
- Pier abutment.
- Access stairs and paths.
- Upland site erosion control and stormwater features.
- Upland pedestrian features such as benches and gathering areas.
- Upland kayak storage.
- Approximate limits of site clearing/grading impacts.

2. Prepare a list of Technical Specifications.
3. Prepare a preliminary cost estimate.
4. Update the Basis of Design Memo to reflect the 60% level design development.
5. Submit Draft 60% Design Plans, Specification List, Estimate, and Basis of Design Memo for review.
6. Hold a Design Review Meeting to review the preliminary design and gather feedback.
7. Prepare meeting notes documenting any comments received during the meeting and proposed approach to addressing comments during final design.

5 | Regulatory Review

Preparation and filing of permit applications is beyond the current scope of services. In order to identify regulatory constraints to the proposed project and confirm the required permits, GEI proposes to perform the following permitting-related tasks:

- Complete a desktop review of existing resources, habitats, and features as mapped by state and federal agencies to identify existing environmental constraints.
- Hold a virtual pre-application meeting with regulatory agencies to review the project scope and gather feedback on regulatory requirements.
- Summarize the desktop review and pre-application meeting in a memo report.
- Prepare a Draft of NRPA Appendix B: MDEP Coastal Wetland Characterization: Intertidal & Shallow Subtidal FIeld Survey Checklist.

6 | Draft Final Design (60% - 90% Design)

90% DESIGN DEVELOPMENT

- Develop design plans, specifications, and cost estimate to a Draft Final 90% level of design detail.
- Update the Basis of Design Report to reflect the 90% level design development.
- Submit 90% design to Town for review.
- Hold a Design Review Meeting to review the 90% design and gather feedback. Provide a slideshow presentation documenting 90% design development and recommendations.
- Prepare meeting notes documenting any comments received from the Town and proposed approach to addressing comments during 100% design.

Assumptions

1. A scope for geotechnical investigation has not been included in the current project. It is anticipated that the project will include a pile-supported structure that is designed for pedestrian loading only. Data from nearby MaineDOT and Maine Turnpike Authority Bridge projects will be utilized for generalized subsurface conditions. If a site-specific geotechnical investigation is determined to be necessary, a separate proposal will be provided for these services.
2. No specialized environmental characterizations or studies have been included in the current scope of work. It is assumed that habitats and resources will be identified from resource agency mapping databases.
3. GEI has not included services for utilities, MEP, or Fire Protection Design. Any additional utility design services will be by others.
4. The scope of services includes engineering design through 90% Draft Final. We recommend this approach in order to minimize risk of rework due to any revisions or supplemental requirements needing to be incorporated to address comments that arise during regulatory review.
5. Bid Documents, Bidding, and construction phase services are not included in the current scope of work. Services will be provided as part of a future contract. GEI will provide a separate proposal at the completion of this scope of work.

2 Statement of Qualifications

About GEI

GEI Consultants, Inc. is a consulting engineering firm that delivers professional waterfront, geotechnical, and environmental engineering services. Founded in 1970 and headquartered in Massachusetts, our firm was built on a foundation of geotechnical engineering and has evolved into a leader in providing multi-disciplined engineering and technical services to a range of private and public sector clients domestically and abroad. With more than 1,500 staff and 57 offices across North America, GEI is consistently ranked among the top firms in Engineering News Record's (ENR) annual list of Top Design Firms.

At GEI, we help our clients minimize risk and solve complex challenges. As an employee-owned firm, we foster personal relationships with our clients and support our staff in a partnership model, which is underpinned by continuous learning and sharing of knowledge. We retain proven, recognized experts and attract the best young minds to deliver to our clients a refreshing blend of technical expertise, collaborative spirit, and innovation that is rare in our profession.

Local Presence

GEI will manage this project from our Portland, Maine office, where our proposed staff provide waterfront engineering and planning services throughout coastal Maine. We have extensive experience with regulatory permitting for Maine coastal projects.

We are recognized leaders in the Maine coastal community, working recently with the Maine Department of Marine Resources on the State's Living Shoreline Pilot Program, and with the Governor's Office for Policy Innovation & the Future (GOPIF) on multiple community resilience studies. We are active participants in the State of Maine Harbor Masters Association and keep up to date on the recommendations of the Maine Climate Council.

GEI has designed and permitted numerous coastal projects in Maine, and our staff maintains close working relationships with the Maine Department of Environmental Protection (Maine DEP) and U.S. Army Corps of Engineers (USACE). Our local staff in Portland have devoted much of their careers to waterfront projects on the coast of Maine and have decades of experience completing projects along the entire coastline, from Kittery to Eastport. Many of the staff on this project grew up in Maine and have a unique connection to the coast. While we are fortunate to work on projects across the country, we are particularly happy when we work on projects in Maine.

Key Elements of Expertise

Coastal and Waterfront Engineering

Coastal regions are very complex. GEI approaches coastal projects with a multidisciplinary team where science, engineering, and ecology experts collaborate to consider the unique constraints of each project. Our waterfront engineers and scientists provide a comprehensive range of coastal engineering services, including early site assessment, data collection, planning for municipal harbors and waterfront sites, topside and bathymetric survey, above and below water inspections, analysis and design of piers, wharves, dredging, marinas, ferry terminals, bulkheads, and seawalls, regulatory permitting, and construction phase services.

GEI's waterfront engineers specialize exclusively in harbor and waterfront projects. Each staff member has in-depth expertise in the field including design and permitting of waterfront structures. Our in-house engineering staff includes structural, geotechnical, environmental, and water resource engineers, ecologists, regulatory specialists, and engineer-divers. Our experience includes coastal vulnerability and adaptation studies for municipalities, revisions to FEMA Flood Insurance Rate Maps (FIRMs), Geographic Information System (GIS) mapping, harbor studies, and coastal adaptation projects for a changing climate. Our staff is experienced in ecological impacts of climate change in coastal environments and has worked extensively with Maine DEP on permitting projects in coastal and riverine environments.

Universal Design and Accessibility

Waterfront facilities and recreational trails must be designed for compliance with ADA regulations. As illustrated in several of our project examples, our engineers routinely incorporate ADA-compliant access into our projects and can offer innovative approaches to help clients navigate complex constraints and improve the functionality and accessibility of their waterfront assets.

Understanding of Maine Regulatory Climate

We see the regulatory process as having a significant impact on design approach and project schedule. It is critical that regulatory impacts are incorporated into the design, and GEI understands that need. Our staff have permitted numerous projects in coastal Maine and are well versed in federal and state regulatory requirements as well as local requirements.

In the area of development planning, we provide assistance with permit management, environmental and engineering constraint determination, survey and engineering management, stormwater runoff management, and impact evaluation. Our permit management expertise includes Maine Site Location of Development, Maine Natural Resources Protection Act (NRPA), Floodplain Development/Flood Hazard Areas, U.S. Army Corps of Engineers, and Stormwater. As part of permit management, we have prepared and implemented sediment sampling plans to assess environmental impacts prior to utility river crossings in multiple towns in Maine. We have also coordinated dredge spoil testing and analysis as part of dredge spoil disposal permitting.

State-of-the-Art Equipment and Resources

GEI is equipped to perform in-house drone surveys, GPS survey, GIS mapping, CAD, and engineering design using the latest software and technology. These tools allow us to complete our work with detail, accuracy, and efficiency. We have access to a subscription-based aerial photography service that provides up-to-date, high-resolution imagery several times each year. GEI also has certified engineer-divers, survey vessels, and hydrographic survey capabilities.

We have significant experience with recreational access structures in coastal marine environments, including paddle craft docks, piers, boardwalks, and pedestrian bridges. Our expertise in design & permitting of similar projects will allow us to serve the Town efficiently and effectively.

In 2020, GEI completed a study of uses and capacity of the York Harbor and River for the Town of York.

Key Differentiators

GEI specializes in the integration of ecology and coastal engineering, combining an in-depth understanding of physical, chemical, and biological factors and how they intersect and influence each other in both natural and built systems. We combine these factors with social and cultural elements to create project designs that are successful from a functional, ecological, and societal standpoint in both the short and long-term. GEI's team for this endeavor is one of a kind because every team member has in-depth experience in the subject matter. Our staff have worked together on many similar projects of varying scales, complexity, geographies, coastal settings, and riverine estuaries. Even better, we sit together in GEI's Portland office, and when we are not working you might find us enjoying time together sailing, boating, or recreating on the coast of Maine.

Our GEI Team is multidisciplinary, composed of planners, scientists, engineers, geologists, and ecologists, experienced in coastal and riverine vulnerability assessments. GEI has extensive experience in hydrologic and hydraulic analyses of coastal and riverine environments, waterfront adaptation and design, and planning services. We are regular invitees to speak at the State of Maine Harbor Masters Association trainings, we work directly with the Maine Department of Marine Resources on the State's Living Shorelines Pilot Program, and we keep up to date on the recommendations of the Maine Climate Council.

Relevant Project Experience

York Harbor Study

Location: York River, Maine
Client: Town of York

The York River is a mixed-use waterway that hosts many marine uses, including over 300 moorings, 83 docks, 2 federal anchorages, 7 working waterfront sites, 2 commercial marinas, a yacht club, and recreational fishing, paddle craft, and swimming. Rapidly increasing demands for use of the River and development along the shore have increased pressure on limited resources and traditional uses..

Project Facts

Service Dates:
07/2019 - 01/2020

Key Elements

- Drone Survey
- GIS Mapping
- Harbor Inventory
- Boat Demographic Study
- Capacity Assessment
- Public and Stakeholder Input Gathering
- Management Recommendations

The Town of York retained GEI in 2019 to undertake a capacity study of the York River and Harbor. The primary goals were to inventory and assess existing uses on the River and evaluate how those uses compare to capacity in order to identify areas of concern, needed infrastructure improvements, and opportunities for improved management.

GEI staff observed and documented uses and conditions by boat, from shore, and by drone. A Harbor Inventory was prepared that documented marine uses, infrastructure, environmental and historic resources, land use, and regulatory constraints. GIS maps were prepared for presentation of inventory data. River capacity was then evaluated on a range of spatial, facility, ecological, and social factors. Recommendations were developed to address the near- and long- term issues and goals for improved harbor management.

A selection of study recommendations includes: improved mooring field layouts, improving clear navigation channels, expanded dinghy facilities or consideration of a shared dinghy program, creation of new public access to better separate uses, improved paddle craft management, and others. Revisions to the Town's Harbor Ordinance were recommended to improve regulation of dock applications, improve protection for sensitive resources, and provide a more consistent regulatory framework.

Project Facts

Service Dates:
2018 - 2020

Key Elements

- Project Management
- Site Development
- Permitting & Regulatory Support
- Pier Improvements
- Construction Management
- ADA Passenger Access

Client Contact

TOM DANIEL, AICP
Director of Planning and Community Development
City of Salem, MA
978.619.5685
tdaniel@salem.com

Salem Waterfront Improvements

Location: Salem, Massachusetts
Client: City of Salem

GEI conducted field inspections, concept design development, permitting, final design with development of bid documents, bid phase support, and construction management and oversight for a program of improvements at three public waterfront facilities in the City of Salem.

GEI was tasked with development of three sites within Salem Harbor to improve ADA access and increase overall access to the waterfront. The project consisted of developing new waterfront access at Charlotte Forten Park; reconstruction and reconfiguration of the Congress Street Pier; and expansion of access at the National Park site by installing dinghy dockage.

The project consisted of overall project management for the projects, which were all bid as separate projects. The project was performed in-house by GEI personnel.

The major goal for the three sites was to provide access to the water for users of all abilities. Each site included designing a dockage system to meet different waterfront needs. The Charlotte Forten Park Paddle Craft Dock was designed to provide safe and accessible access to Salem Harbor. The Congress Street Pier included development of safe ADA access to the water by creating a new pier with ADA ramps and a dock system to support the new water taxi services. The National Park site included design and development of a dock system, which did not require anchorage of the docks into the harbor bottom, but supported by the adjacent seawall.

These docks were designed to incorporate a number of accessibility features including ADA-compliant gangways, low freeboard floating docks, and float-mounted accessibility hoists to facilitate vessel access for users requiring assistance with embarking and disembarking.

Project Facts

Service Dates:
2003 - Ongoing

Key Elements

- Recreational Waterfront
- Paddle Craft Launching
- Mixed-Use Facility Design
- ADA Compliance
- Permitting

Client Contact

SCOTT LAFLAMME
Town Manager
Town of Yarmouth, ME
207.846.9036
slaflamme@yarmouth.me.us

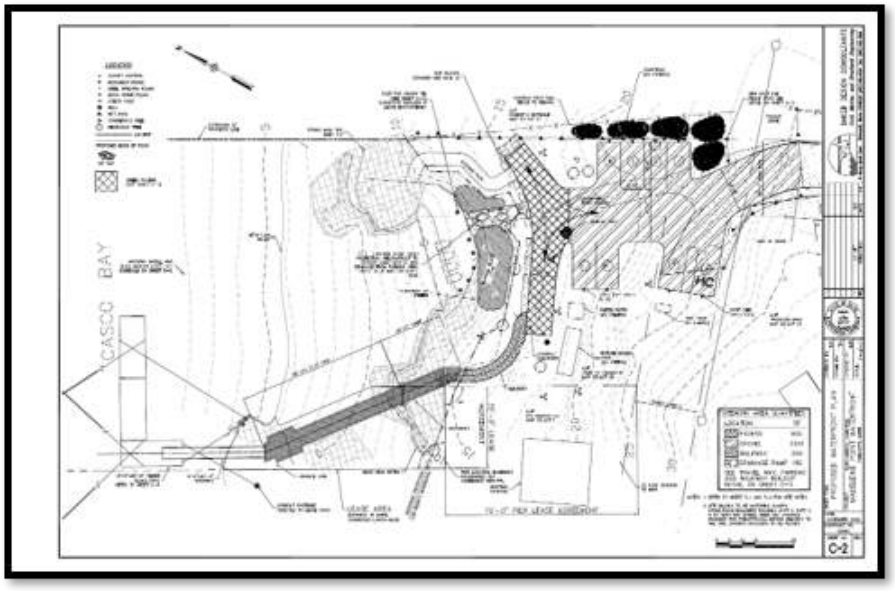
Madeleine Point Waterfront

Location: Yarmouth, Maine
Client: Town of Yarmouth

Working closely with the Town of Yarmouth's Harbor & Waterfront Committee, for over 20 years, GEI staff member Barney Baker has undertaken multiple phases of improvements to the Town-owned Madeleine Point waterfront site.

An initial phase of work included the development of a masterplan for the mixed-use facility. The process included a series of informational meetings to present the plan and to obtain feedback from stakeholders. The site improvements maintained existing beach activity (e.g. swimming and kayaking) and reduced onsite congestion by limiting onsite vehicles and adding offsite parking. A new pier and seasonal floats (on adjacent leased property) provide segregated space for dinghies and improve access to the adjacent mooring field for recreational boaters. The site improvements included onsite racks for dinghy storage, and an embankment ramp and stair to facilitate transfer of dinghies and paddle craft from the top of the coastal embankment down to the beach. Construction of the first phase of improvements was completed in 2010.

In 2021 to 2022, GEI staff worked with the Town to develop a program of improvements to the site to expand the capacity of the waterfront facilities and the upland. Improvements included an expanded dock system with improved mooring, and expanded upland parking on an abutting parcel that was newly acquired by the Town. Final design of these improvements is pending as of Fall 2024.



Project Facts

Service Dates:
2021- 2023

Key Elements

- ADA Accessibility
- New Boat Launch Siting on a Tidal River
- Parking and Circulation
- Context Sensitive Design Considering Surrounding Neighborhoods
- Environmental Regulations
- Budgeting & Implementation Action Planning
- Coordination with Maine Geological Services Water Level Monitoring Research
- Utility Coordination
- Funding Strategies
- Coastal Climate Resiliency

Client Contact

PAM LEDUC
Parks & Recreation
Department Director,
Town of Topsham
207.725.1726
pleduc@topshammaine.com

Topsham Waterfront Access Facilities Feasibility Study

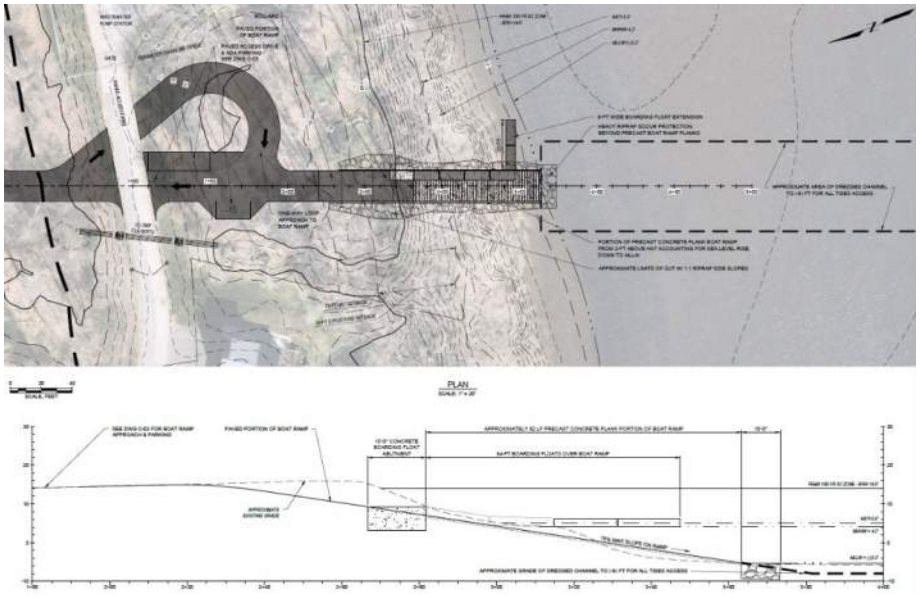
Location: Topsham, Maine
Client: Town of Topsham

GEI was retained by the Town of Topsham to provide consultant services for evaluation of the installation of a new tidal public boat launch on the Town / Sewer District properties between Foreside Road and the Androscoggin River. The evaluation was funded with Federal support from NOAA,as administered by the Maine Department of Marine Resources' Maine Coastal Program.

The evaluation explored the feasibility of constructing a full public boat launching facility, including a ramp, boarding floats, river dredging, upland approach, vehicular and pedestrian access, parking and ancillary supporting site amenities. The Town's Comprehensive Plan has identified public access to the Androscoggin River as a priority, as there is currently no boating access to and from the river in Topsham.

GEI facilitated a public input process with local stakeholders and Town representatives to discuss the project goals and review the preliminary design. The design was supported by on-site observations, coordination with the Topsham Sewer District and the Town of Topsham's Parks and Recreation Department and review of readily available site and environmental data. The design factored coastal riverine environmental risks and resiliency strategies, in consideration of the Maine Climate Council's parameters and recommendations for relative sea level rise projected to 2070. The project also coordinated with the Maine Geological Survey to integrate a new tidal gauge installation at the proposed facility.

Concept plans, implementation costs and a preliminary design basis report were completed under this feasibility study and the Town is now prioritizing an implementation strategy.



Broad Cove Waterfront

Location: Cumberland, Maine
Client: Town of Cumberland

In 2015 the Town of Cumberland acquired a 100+ acre parcel of waterfront property formerly part of the Payson family land, in order to crate a new public recreation facility with access to Casco Bay. The property included significant open space, shore frontage, a sand beach, and significant ecological and historical resources, as well as a 200-foot timber pier.

In 2015 an inspection was completed of the existing pier which resulted in a recommendation that the pier be demolished and reconstructed with a new ADA-compliant structure that would be more resilient to coastal forces and less impactful to environmental resources. The pier replacement was completed in 2018 with funding participation from the MaineDOT Small Harbor Improvement Program. The project included a new timber pier, ADA-compliant gangway, floating docks, float-mounted paddle craft storage racks, and a low-freeboard launching float with access ramp.

In 2022, the Town initiated design of an expansion to increase capacity for dinghies, recreational powerboats, and paddle craft. The work of this project is ongoing and will include an expanded floating dock system and installation of convenience features such as a tide board to warn users when conditions are shallow.

Project Facts

Service Dates:
2015 - Ongoing

Key Elements

- ADA Compliant Waterfront Access
- Paddle craft Storage and Launching
- Public Recreation Facility
- Redevelopment of a Historic Site

Client Contact

CHARLES RUMSEY
Chief, Cumberland Police Department
207.829.6391

**Services provided between 2015 and 2021 were performed by Baker Design Consultants (BDC) prior to acquisition by GEI. Current GEI staff Daniel Bannon and Barney Baker were the lead engineers involved in the project through BDC and have continued in those roles in the ongoing work through GEI.*

Project Team

GEI has assembled a team with demonstrated experience on similar projects, including coastal structure design, paddle craft facilities, accessibility, environmental permitting, and impacts of climate change.

- Most of our team members grew up, live, and work in Maine. They have a strong appreciation for the coast and understand the need for balance between the natural and built environment.
- Our team members have a proven track record of municipal waterfront projects in Maine and New England, and we look forward to applying our experience and success from geographic locations both within and outside of Maine.
- We enjoy a range of expertise in coastal and waterfront engineering, landscape architecture, and regulatory permitting.
- We have engineers and landscape architects who are licensed and certified in the State of Maine.

We will manage this project from our Portland, Maine office, where our proposed staff are recognized leaders in providing waterfront engineering services throughout coastal Maine. GEI's Portland office has over 20 staff and is fully supported by GEI's deep bench of staff across the country should the need arise. Our flat corporate structure enables us to share resources seamlessly across geographies to provide the most qualified staff on any project.

GEI maintains relationships with a large number of subconsultant firms to provide specialized support services as required by each project. For this project we anticipate that the following subconsultants may be required:

- Land survey to provide topographic and engineering survey, and if necessary boundary survey, for the project area

GEI will recommend a subconsultant team best suited to the project during scope negotiations.

Project Manager

Daniel Bannon, P.E., CFM, BC.PE
Portland, ME

Senior Technical Advisor

Barney Baker, P.E.
Portland, ME

Key Team Members

Waterfront Engineering Support

Alison Brady, E.I.
John Gareau, E.I.
Portland, ME

Landscape Architecture

Travis Pryor, PLA, LEED AP
Portland, ME

Regulatory Compliance

Lisa Vickers
Portland, ME

Wetland Science

Kristin Connell
Glastonbury, CT

Key Staff Profiles

GEI has assembled a highly skilled and dedicated team with a strong local presence and significant experience providing comprehensive engineering services in support of projects throughout coastal Maine. Below is a summary of our key staff's experience, roles, and responsibilities, followed by their resumes.

Project Manager

Daniel Bannon, P.E., CFM, BC.PE will lead and manage the work of the GEI team. Dan is a senior engineer specializing in projects involving waterfront structures, shore access, flood protection, living shoreline design, recreational and commercial boating facilities, waterfront planning and development, and bridges in coastal settings. He is very familiar with the Federal, State, and Local regulations that govern development in coastal high hazard areas and sensitive environmental habitats, with a primary focus on the Maine coast. He has experience with State and Federal grant programs, often assisting clients with obtaining project funding.

Senior Technical Advisor

Barney Baker, P.E. will serve as the Senior Technical Advisor for this project. In this role, Barney will provide consultancy and senior technical review of all design elements for this effort. Barney has more than 40 years of experience in the analysis, design, and construction of marine infrastructure projects. He will provide strong quality control and advisory oversight to ensure that the GEI team meets or exceeds the Town's expectations..

Landscape Architect

Travis Pryor, PLA, LEED AP will support the team as the landscape architect and resiliency planning lead. Travis utilizes his training in landscape architecture, community planning and environmental engineering towards the development of sustainable, resilient, and context sensitive projects for a wide variety of infrastructure and development projects. He has over 20 years of planning, design, and project management experience in land use planning, waterfront development, community revitalization, parks and recreation, bicycle and pedestrian systems, and infrastructure/utility projects for public, private, and institutional clients throughout the Northeast and beyond.

Regulatory Specialist

Lisa Vickers will provide the team with regulatory support. She has extensive experience in permitting with the USACE, Maine DEP, Maine Submerged Lands Program, Maine Shoreland Zoning, and the Maine Floodplain Management Program. In addition to having worked at the Maine Department of Environmental Protection, Lisa has worked extensively with local, state, and federal agencies to assist clients and design teams in developing projects to meet applicable regulations.

Wetlands Specialist

Kristin Connell will serve as Wetlands Specialist. has over a decade of experience completing and coordinating federal, state and local wetlands permitting across New England. Additionally, Kristin has field and leadership experience in wetland delineation, wildlife habitat assessment, and other field data collection.

Waterfront Engineering Support

John Gareau, E.I. and **Alison Brady, E.I.** will serve as support for waterfront design.

John joined GEI with experience in structural condition assessments, adaptive reuse projects, and structural retrofits. He has experience at all levels of project life cycles, including scope development, condition assessments, project management, design, permitting, and construction administration. He assists GEI with waterfront engineering projects including design of piers and bulkheads, regulatory assistance, and supporting field activities.

Alison is a recent graduate of Northeastern University, where she earned her bachelor's degree in Civil Engineering and completed structural and construction engineering internships. She assists GEI with civil and structural design elements of waterfront engineering projects, and provides support services through the regulatory process.

Resumes

Daniel J. Bannon, P.E., CFM, BC.PE

Project Manager
Portland, ME

Education

M.S., Structural Engineering, University of Maine

B.S., Civil Engineering, University of Maine

Experience in the industry

17 years

Experience with GEI

6 years

Registrations and Licenses

Professional Engineer:
ME No. 13033
FL No. 87648

ASCE Academy of Coastal, Ocean, Port, and Navigation Engineers, Board Certified Port Engineer (BC.PE)

ASPFM Certified Floodplain Manager

MaineDOT Local Project Administrator

Transportation Worker Identification Credential (TWIC)

Daniel Bannon is a Coastal Practice Leader in GEI's Portland, Maine office. He serves as a Project Manager and Senior Engineer specializing in projects involving waterfront structures, shore access, flood protection, recreational and commercial boating facilities, waterfront planning and development, and bridges in coastal settings.

Dan is experienced in all aspects of project development including field inspections, concept planning, life-cycle analysis, project management, design, permitting, and construction administration. He is very familiar with the Federal, State, and Local regulations that govern development in coastal high hazard areas and sensitive environmental habitats, with a primary focus on the Maine coast.

An experienced structural engineer, Dan has expertise in design of concrete, steel, aluminum, timber, and FRP composite structures and foundations in a range of applications.

Dan is also familiar with several of the funding programs available for waterfront planning, design, and construction. He has experience with State and Federal grant programs, often assisting clients with obtaining project funding.

Project Experience

York Harbor/River Study, Town of York, ME. Capacity assessment and usage study of the York Harbor and River. Work included inventory of waterside features including moorings, docks, boat launches, commercial marinas, and working waterfront sites; review of land use and zoning in shoreland areas; review of environmental resources along the River Corridor; GIS mapping of the inventory; study of boat demographics; characterization of River segments by uses and development trends; and field assessment with landside and waterside observations and drone based surveys. Concepts for harbor improvements were developed to increase mooring capacity and improve channel conditions and recommendations were presented for improved waterway management.

Gulf of Maine Research Institute Bulkhead Reconstruction, Portland, ME. Reconstruction of a +/-400' sheet pile bulkhead on Wright's Wharf. New sheet pile will be installed slightly outshore of the existing bulkhead to minimize construction time and upland site impacts. The bulkhead is being designed for improved resilience to flood risks and sea level rise, and for extended lifespan through the use of coatings, sacrificial steel thickness, and passive cathodic protection.

Wells Harbor Dredging, Town of Wells, ME. Design and permitting of maintenance dredging of Town anchorage areas adjacent to the Wells Harbor Federal Navigation Project and beneficial reuse of dredged sand as beach nourishment. Design and permitting of municipal mooring field improvements.

Daniel J. Bannon, P.E., CFM, BC.PE Project Manager

Seawall Reconstruction, Kennebunkport, ME. Rapid design and permitting of reconstruction of a section of concrete seawall that collapsed during the January 10 and 13, 2024 coastal storm events in Maine.

Masterplan for Former Ferry Terminal, Town of Bar Harbor, ME. Development of a Master Site Plan for development of the former Ferry Terminal into a municipal marina to support recreational and commercial uses. Elements of design included: all-tide boat launch, marina layout, upland parking and circulation, pedestrian access, and open spaces. A plan for project phasing was developed that included assessment of timelines, regulatory requirements, and funding opportunities for a variety of facility improvements.

Downeast Institute Waterfront Improvements, Beals, ME. Design of a program of improvements to the DEI waterfront research facility on Great Wass Island. Work included drone survey, site assessment for wind and wave exposure, design of a boat launch, floating dock improvements, and wave attenuation systems consisting of fixed wave screens or concrete attenuator floats.

Simpson's Point Boat Launch & Shore Access, Town of Brunswick, ME. Design of reconstruction and improvements to an existing public boat launch on Middle Bay, and a pedestrian access trail on an adjacent Town-owned parcel to provide public access to shore.

Mariner's Wharf, Town of Long Island, ME. Planning, design, permitting, and construction administration for pier repair and upgrades. Improvements included upgrade and extension of timber wave screens, expansion of the floating dock system, reconfiguration of the Island Rescue Vessel berth, addition of a new 80-foot ADA compliant gangway, and improved upland facility access.

Living Shoreline Pilot Project, Towns of Brunswick and Yarmouth, ME. Project manager for a pilot study that is investigating the use of low-cost living shoreline treatments for shoreline stabilization in Maine. The pilot study involves installations on three sites on Casco Bay, two on Maquoit Bay in Brunswick, and one on Lane's Island in Yarmouth. The pilot treatments use a combination of bagged oyster shell, coir mesh, marine baskets, downed logs, and plantings to stabilize bluff and marsh face erosion at the three sites. Installation was completed in spring 2020, and a three-year monitoring program is planned.

Municipal Harbor Improvements, City of Salem, MA. Prepared final designs and specifications and provided construction administration and oversight for the construction of three separate municipal piers as part of an upgrade to the City of Salem's public waterfront facilities. Piers ranged in size from a pile-supported timber structure that was designed for ADA compliance and increased berth capacity, to a small seasonal facility at a town park for hand-carry access to the South River.

Snow Marine Park Boat Ramp and Masterplan, City of Rockland, ME. Lead a consulting team to prepare a masterplan for 14-acre, city-owned waterfront park. The plan included improvements to the boat launch, expanded parking, recreational trails, and layout of sports fields on the upland property. As a separate task, a replacement design was prepared for the facility boat ramp that provides public access to Rockland Harbor. The ramp is used by vessels up to 50-tons. A replacement ramp was designed that incorporated two 20-ft wide ramp lanes constructed with heavy duty precast concrete planks, a concrete ramp abutment, and center floats.

Ocean Street Footbridge Replacement, Town of Ogunquit, ME. Design, permitting, and construction administration for the replacement of the 310' long timber footbridge that crosses the Ogunquit River to access Footbridge Beach. The replacement bridge improved access, ADA compliance, flood resilience, and provided bumpouts for scenic viewing and fishing. The bridge is located in sensitive coastal habitat that supports nesting by piping plovers and other protected plant and animal species. Permits were obtained from Maine DEP, USCG, and local agencies. The project was completed ahead of schedule and under budget.

Private Residential Piers, Various Locations, ME. Project management, design, permitting, and construction administration for numerous private residential pier projects located throughout the Maine coast. Projects range from seasonal hand-carry docks, to large permanent piers incorporating multiple berths and ferry service access.

Barney J. Baker, P.E.

Senior Technical Advisor

Portland, ME

Education

B.S., (Hon), Civil Engineering, University of Edinburgh, Scotland

Experience in the industry

42 years

Experience with GEI

3 years

Registrations and Licenses

Professional Engineer, ME No. 5737

Professional Engineer, VA No. 0402061146

USCG Captain License -25 ton w/sail (inactive pending seatime)

Professional Affiliations

American Society of Civil Engineers

Friends of Casco Bay

Island Institute

Maine Island Trails

Propeller Club

Portland Waterfront Alliance

Structural Engineering Association of ME

Barney Baker specializes in waterfront facilities, coastal protection, and public access projects. His career has evolved to include expertise in the design and supervision of port facilities, marinas, piers, boat launches, beach access, seawalls, coastal slope stabilization, dune nourishment, bridges, dam rehabilitation, and fish passage structures.

His clients include state and federal agencies, public utilities, municipalities, educational institutions, and private clients. In addition to engineering design and construction phase services, this work often includes concept planning and facilitation for cost-effective design, master plan development to address long-term programming, grant writing to support project funding, and permit preparation to ensure local, state, and federal regulatory compliance. Barney's marine qualifications are enhanced by offshore cruising and racing on his own sailboats that have taken him to ports in Europe, North America, and the Caribbean.

Project Experience

Ocean Street Footbridge Replacement, Ogunquit, ME. Principal Engineer for the replacement of the 310-foot-long timber footbridge that crosses the Ogunquit River to access Footbridge Beach. Served as the project manager, engineer of record, and client manager for the project and oversaw all activities related to design development, permitting, and preparation of construction documents. The replacement bridge improved access, ADA compliance, flood resilience, and provided bumpouts for scenic viewing and fishing. The bridge is located in sensitive coastal habitat that supports nesting by piping plovers and other protected plant and animal species. Permits were obtained from Maine DEP, USCG, and local agencies. The project was completed ahead of schedule and under budget.

Boathouse Pedestrian Bridge, Kennebunkport, ME. Provided structural engineering and permitting services for the construction of a new pedestrian bridge crossing a tidal inlet of the Kennebunk River. The bridge links downtown locations heavily trafficked by pedestrians visiting shops, restaurants, and the waterfront.

River Point Bridge Design/Build, Falmouth, ME. Project Manager for the design/build replacement of a municipal pedestrian bridge over an active rail line. The existing three-span timber bridge was replaced with a 105-foot by 10-foot single span steel truss supported on timber friction piles. The Team balanced numerous complex regulatory, design, and construction requirements to provide a cost-effective, low-maintenance, long-lasting solution.

Fort Popham Waterfront Improvements, Department of Agriculture, Conservation & Forestry, Town of Phippsburg, ME. This historic site has multiple, federal, state agency, and local stakeholders. The project includes an ADA-compliant rehabilitation of the existing pier, site improvements to address pedestrian access, vehicle circulation and parking, dredging to improve water depths, and a flood protection berm that uses spoils material. State and federal grant programs (MeSHIP, LWCF and ARP funds) have been tapped to make the project possible.

Barney J. Baker, P.E. Senior Technical Advisor

is supported by State and Federal grant funding. A phased construction program is implemented to maintain waterfront access for the fishermen during construction.

GOPIF Resiliency Assessment, Towns of Harpswell, West Bath and Phippsburg, ME. The work included a resiliency assessment to address the impact of climate change and sea level rise for one site in each community. A combination of resiliency measures were recommended. The project is sponsored by a grant from the Maine Governor's Office of Policy Innovation and the Future (GOPIF).

Town Landing Resiliency Study, Falmouth, ME. Falmouth Town Landing is a historical waterfront access that currently serve the largest mooring field in Maine. It is increasing overtopped by wave action in storms of increasing frequency and intensity. The project sponsored by the Maine Coastal Program identified resiliency improvements and adaptation strategies for the pier, float system and parking area to address future climate change and sea level rise.

Safe Harbor Great Island Marina Mooring System, Harpswell, ME. Marina mooring system design for a full-service boat yard and marina facility in the upper reaches of Harpswell Sound. In coordination with the float system supplier, the mooring tackle and blocks were accepted for long term maintenance, marina berth efficiency, tidal response, storm surge, wind/wave conditions and future sea level rise.

Mitchell Field Waterfront Development, Town of Harpswell, ME. A multi-phase project that converts an abandoned US Navy Oil Terminal Pier into a municipal waterfront landing. The Navy removed all oil tanks in 2005 and transferred the property to the Town. Initial phases of the work demolished and recycled the deteriorated elements of the port facility. A current project utilizes the original navy causeway to provide a Town landing that includes a boat launch, floats, upland parking, and support amenities.

Town Landing, Yarmouth ME. Planning, design and permitting for a new mooring plan that includes pony docks to increase the number and density of mooring holders in the Royal River Basin within the Federal Navigation project.

Mackworth Island Causeway Rehabilitation, Maine Bureau of General Services/ Baxter School for the Deaf, Falmouth, ME. Planning, design, permitting, and coordination of funding sources for marine causeway repairs necessary to maintain the only roadway link to educational facilities on the island. Identified elements of the project that were eligible for federal FEMA and state MEMA funding and additional improvements necessary to prevent further destabilization of the slope section. Phase I repairs added stone armor to approximately 350 feet of the marine slope and reinforced the flow-through bridge abutments.

Wells Beach Seawall, Lafayette Oceanfront Resort, Wells Beach, ME. Permitting and design for a rehabilitation program to protect resort property. The work included development of a more robust and resilient coastal defense system in a highly regulated environment that included subsurface cut-off wall, remedial action, and adaptive repairs to blend beach access improvements with measures to address structural seawall deterioration and beach scour.

Coastal Protection of Existing Infrastructure, Prouts Neck Association, Scarborough ME. Many projects have been undertaken to protect existing waterfront facilities and residences together with associated access routes. The work has included planning, permitting, and construction supervision for a blend of projects that include dune nourishment, beach grass planting, seawall strengthening and flood control measures in a fragile coastal environment.

University of New England Waterfront Program, Biddeford, ME. Planning for a new pier to support the Marine Science curriculum evolved from feasibility studies in 2008 to a design parameter that included mission, size, location, and configuration. In 2023, permitting and design is underway for a versatile waterfront facility to serve students, faculty, a growing fleet of specialized boats and programs that comprise one of the premier marine science programs in the country

Public Wharf Condition and Resiliency Assessment, Monhegan Island Plantation. A 2019 study sponsored by the Maine Coastal Program identified this critical transportation and safety link to the island community to be vulnerable to current and future flooding associated with climate change. The project investigated the operation and structural integrity of the historic granite pier to support a program of resiliency measures that include raising the structure to reduce overtopping and improving surface resistance to erosion in conjunction with operational improvements to segregate pier use, traffic flow and material handling.

Travis J. Pryor, PLA, LEED AP

Landscape Architect

Portland, ME

Education

B.L.A, Landscape Architecture
Virginia Polytechnic Institute & State University

Experience in the industry

23 years

Experience with GEI

3 years

Registrations and Licenses

Licensed Landscape Architect
ME No. 3290

USGBC LEED Accredited Professional

MaineDOT Local Project Administrator

Training and Certifications

10-Hour OSHA

Exterior Computer Lighting Calculations

MaineDOT Construction Documentation

Professional Affiliations

Maine Association of Planners

Maine Island Trail Association

Travis Pryor is a Senior Project Manager and Professional Landscape Architect in GEI's Portland, Maine office. Travis utilizes his training in landscape architecture, community planning and environmental engineering towards the development of sustainable, resilient and context sensitive project outcomes for of a wide variety of infrastructure and development projects. He is also an accredited professional under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED).

Travis has over 20 years of design and project management experience in land use planning, waterfront development, community revitalization, parks and recreation, bicycle and pedestrian systems, and infrastructure/utility projects for public, private and institutional clients in the northeast and throughout the United States. He has been involved in all phases of project development, from master planning through public participation, design development, permitting, funding assistance and construction.

Project Experience

Downtown Waterfront Master Plan, Town of Bucksport, ME. Project management for planning and design development of coastal resiliency improvements for a public walkway and adjacent public parking, pier, marina and park space at the Downtown Waterfront along the Penobscot River. The master plan includes coordination with MaineDOT's Route 1 Bridge to Verona Island and adjacent Main Street roadway and drainage facilities, as well as coordination with public, private and utility stakeholders with property and / or facilities along the waterfront. The project has financial support from MaineDMR SHPG.

Simpsons Point Boat Launch and Beach Access, Town of Brunswick, ME. Project management for design and permitting of public boat launch and pedestrian beach access improvements. Town assistance with bid and construction administration. The project has financial support from MaineDOT SHIP and MaineDACF BFF. Developed in accordance with MaineDOT LPA requirements.

Mitchell Field Boat Launch, Town of Harpswell, ME. Technical design and in-house-review for design and permitting of public boat launch and adjacent upland vehicular and pedestrian site access improvements. The project has financial support from MaineDOT SHIP. Developed in accordance with MaineDOT LPA requirements.

Pott's Point Town Landing Rehabilitation, Town of Harpswell, ME. Construction administration assistance of public boat launch and adjacent upland vehicular and pedestrian site access improvements. The project has financial support from MaineDOT SHIP. Developed in accordance with MaineDOT LPA requirements.

Tide Mill Landing Improvements, Town of Harpswell, ME. Project management for design, permitting, bid and construction administration of public boat launch, and vehicular and pedestrian site access improvements. The project has financial support from MaineDACF BFF.

Travis J. Pryor, PLA, LEED AP Landscape Architect

Former Ferry Terminal Master Plan, Town of Bar Harbor, ME. Project management for planning and design development of the former MaineDOT ferry terminal property including upland parking, pedestrian and vehicular access, coastal boat launch, pier and floating dock system improvements. The improvements were coordinated with MaineDOT Route 3 roadway and drainage facilities, as well as the active Ferry Service on a portion of the property. The project has financial support from MaineDMR SHPG.

Cape Porpoise Pier Rehabilitation, Town of Kennebunkport, ME. Technical design assistance and in-house-review for design and permitting of public working waterfront facilities and adjacent upland vehicular and pedestrian site access improvements. The project has been bid and is currently under construction. The project has financial support from MaineDOT SHIP as well as US EDA and FEMA. Developed in accordance with MaineDOT LPA requirements.

Pre-Disaster Mitigation Boat Launch, Town of Machias, ME. Technical design assistance and in-house-review for design of a public boat launch in Downtown Machias along the Machias River. The project has financial support from MaineDOT SHIP.

Pre-Disaster Mitigation Seawall / Trail, Ransom Consulting, Machias, ME. Technical design assistance and in-house-review for design of a seawall flood protection and trail system in Downtown Machias. Design includes coordination with MaineDOT's concurrent U.S. Route 1 Machias River Dike improvements project. The project has financial support for FEMA PDM.

Head of Tide Park Upstream Boat Launch, Town of Topsham, ME. Project management for design, permitting, bid and construction administration of public boat launch, and vehicular and pedestrian site access improvements. The project has financial support from MaineDACF BFF.

Topsham Water Access Facilities Feasibility Study, Town of Topsham, ME. Project management for planning and design development of public boat launch, and vehicular and pedestrian site access improvements. Coordination with the Topsham Sewer District's property and facilities. The project has financial support from MaineDACF BFF.

Cistern Bridge, Town of Yarmouth, ME. Project management for design and permitting of pedestrian walkway improvements for a segment of trail along the Royal River within Royal River Park.

Geospatial Vulnerability Assessment of Coastal Hazards, Southern Maine Planning and Development Commission, Ten Municipal Project Regions, Southern ME. Supported GIS-based sea level rise vulnerability assessment for 10 municipalities in Southern Maine.

Hampton Beach New Pier Feasibility Study, Hampton Beach Area Commission, Hampton, NH. Project management for a planning level assessment that studied the feasibility of constructing a new public pier to improve accessible access and recreational opportunities to and over the water.

Hampton Beach Accessibility Feasibility Study, New Hampshire Department of Natural and Cultural Resources; Division of State Parks, Hampton, NH. Project management for a planning level assessment that studied accessibility improvements for all Hampton Beach State Park facilities. Reported findings of existing conditions and recommendations for compliant, proactive and or universally accessible improvements.

Lisa Vickers

Regulatory Specialist

Portland, ME

Lisa Vickers is a senior coastal professional in GEI's Portland, ME office. She has more than 17 years of regulatory experience with a focus area on coastal infrastructure to include waterfront access structures, shoreline stabilization, living shorelines, and sand dune restoration for residential, commercial, and government entities. She has extensive experience in permitting with the U.S. Army Corps of Engineers (USACE), Maine Department of Environmental Protection (DEP), Maine Submerged Lands Program, Maine Shoreland Zoning, and the Maine Floodplain Management Program. In addition to having worked at the Maine Department of Environmental Protection, Lisa has worked extensively with local, state, and federal agencies to assist clients and design teams in developing projects to meet applicable regulations.

Education

M.S., Biological Sciences, University of Southern Maine

B.A., Biological Sciences, Clemson University

Experience in the industry

20 years

Experience with GEI

Less than 1 year

Training and Certifications

Certified Maine Department of Environmental Protection Third-Party Inspector

American Red Cross First Aid/ CPR/AED

Professional Affiliations

Committee Member, Board of Appeals, City of South Portland (2021 – present)

Project Experience

Yarmouth Town Landing Commercial Pier, Town of Yarmouth, ME. Regulatory specialist providing review and support for permit applications to the Maine DEP, USACE, Submerged Lands, and Shoreland Zoning. The project includes the modification of a commercial fishing pier to support local fishermen and aquaculture operations.

Maine Maritime Museum Deering Pier Improvements, American Cruise Lines, Bath, ME. Regulatory specialist providing historical review of existing permits and review and support for permit applications to the Maine DEP and USACE. The project includes the addition of steel monopiles with donut fenders to provide docking for cruise ship vessels.

Sand Dune Damage Repair Assessment, Town of Ogunquit, ME. Regulatory specialist working closely with the Town and conducting early outreach with state and federal regulatory agencies, MEMA/FEMA as a potential funding agency, and local contractors who could potentially source the dune restoration sand material. This initial assessment approach will identify actionable opportunities to move forward with design development, permitting, bidding, and construction of the project.

Bennett's Cove Barge Landing Assessment, Town of Chebeague Island, ME. Regulatory specialist providing review of existing conditions at Bennett's Cove and evaluation of the feasibility of maintaining a barge landing for solid waste removal and transportation of large vehicles located off Bennett's Cove Road. Scope to include identification of regulatory and constructability constraints that exist at the current location and conducting outreach with state and federal regulatory agencies.

Previous Project Experience

Drakes Island Beach Shoreline Stabilization, Wells, ME. Permitting and regulatory agency review coordination for the restoration of a coastal sand dune on Drakes Island Beach. Project design elements include cobble lifts, coir logs, dredge sand, and native plants.

Cliff Island Wharf Replacement, Portland, ME. Project Manager for the replacement of a wharf for an island-based community organization.

Kristin Connell

Wetlands Specialist

Glastonbury, CT

Education

M.A., Biology, Central Connecticut State University

B.S., Animal Science and Biological Science, The University of Vermont

Graduate Certificate, Soil Science, The University of Massachusetts

Experience in the industry

19 years

Experience with GEI

Less than 1 year

Professional Affiliations

Connecticut Association of Wetland Scientists

Kristin Connell is a Senior Project Manager - Natural Resources in GEI's Glastonbury, CT office. She has over a decade of experience completing and coordinating federal, state and local wetlands permitting across New England. Additionally, Kristin has field and leadership experience in wetland delineation, wildlife habitat assessment, and other field data collection.

Project Experience

Watson Road Dam, Hinsdale, MA. Completed wetland delineation, bathymetric survey, and permitting efforts associated with the partial removal of a privately owned dam to address structural deficiencies in response to a Dam Safety Order. Project restored flow and hydrologic and habitat connectivity, benefitting fisheries and other aquatic organisms as well as reducing liability associated with dam failure. Permitting effort included MEPA EENF, Ecological Restoration Notice of Intent, USACE Section 404, and Chapter 253. Hosted virtual site walk for regulatory officials and interested parties.

Natural Resource Assessment, Westerly, RI. Served as wetland delineator, habitat assessor, and peer reviewer at a former mill site proposed for demolition and reuse as a public park.

Private Land, Bennington County, VT. Served as wetland delineator on a portion of a Class I wetland, dam and outlet channel at a historic mill site. Prepared associated permits to support dam repairs.

Confidential Client, Southern CT. Served as the project manager to coordinate engineering and contractor services to meet state and federal permitting needs for several large coastal dredging projects. Certain efforts required coordination of biological assessments, essential fish habitat assessments, and compliance with the migratory bird treaty act.

Congress Street Flood Mitigation Project, Bridgeport, CT. Managed coastal resource permitting and related construction oversight for coastal resiliency and future protection of the power grid for environmental justice populations. Maintained clear communication with regulators, the client, and contractors to continue forward progress and maintain project timelines.

Southbridge Reservoir Dam No. 5, Southbridge, MA. Assisted in the completion of local, state, and federal permit applications. Conducted initial condition assessment and installation of hand driven wells to collect hydrologic data for wetland mitigation design. Oversaw wetland construction activities, completed post-construction wetland mitigation monitoring and reporting.

Hatchet Pond Dam, Southbridge, MA. Conducted wetland delineation and permitting efforts for low levels outlet repair. Permitting included Notice of Intent, USACE Section 404, Chapter 91, and Chapter 253.

Eversource Transmission Upgrades, Statewide, MA. Completed wetland delineations along right of ways and access roadways. Observed installation of temporary roadways and completed erosion and sedimentation inspections. Provided oversight for the installation of a permanent water crossing as well as post-construction wetland monitoring and associated reporting.

John Gareau, E.I.

Waterfront Engineering Support

Portland, ME

Education

B.S., Civil Engineering, Florida Atlantic University

Experience in the industry

3 years

Experience with GEI

2 years

Registrations and Licenses

Engineering Intern, FL No. 1100025296

MaineDOT Local Project Administrator

SSI Open-Water Diver

FAA Part 107 Drone Pilot

Professional Affiliations

American Society of Civil Engineers (ASCE)

John Gareau is a staff professional in GEI's Portland, ME office. He joined GEI with experience in structural condition assessments of buildings and parking decks, adaptive reuse projects, and structural retrofits. John has experience at all levels of project life cycles, including scope development, condition assessments, project management, design, permitting, and construction administration. He is proficient in AutoCAD, Mathcad, RISA 3D, RAM Elements, WoodWorks, and Enercalc. He is also a certified open-water diver and an FAA Part 107 licensed drone pilot.

Project Experience

University of New England Marine Science Pier, Biddeford, ME. Developed structural model for proposed pier on the Saco River. Performed structural analysis of pier considering wave, current, wind, vessel berthing, vehicle, and equipment loads. Designed and detailed structural elements including concrete abutment, concrete filled steel pipe piles, and precast concrete pile caps and deck planks.

Masterplan for Former Ferry Terminal, Town of Bar Harbor, ME. Assisted in developing a Master Site Plan for development of the former Ferry Terminal into a municipal marina to support recreational and commercial uses. Design elements included an all-tide boat launch, marina layout with concrete wave attenuator floats, upland parking and circulation, pedestrian access, and open waterfront and green spaces. The Master Site Plan provided a conceptual phased approach for development considering regulatory and funding constraints.

Stockton Springs Breakwater Study, Stockton Springs, ME. Assisted with the development of a study on the feasibility for breakwater options to protect the Town of Stockton Springs' public waterfront. Developed conceptual designs and cost estimates for a rubble mound breakwater, timber wave screen, steel sheet pile wave screen, and floating concrete wave attenuators.

Gulf of Maine Research Institute Bulkhead Reconstruction, Portland, ME. Structural design and detailing of an over-sheeted bulkhead structure on Wright's Wharf. The design included a new steel sheet pile bulkhead wall with a concrete cap anchored with new steel tie backs and a new steel sheet pile deadman anchorage system.

Public Wharf Condition and Resiliency Assessment, Monhegan Island, ME. Assisted in the development of a study investigating the condition and vulnerability of the stacked granite public wharf on Monhegan Island. The study included a flood risk assessment considering forecasted sea level rise scenarios and provided conceptual plans for raising the elevation of the wharf with an integrated concrete structure to make the wharf more resilient and reduce its risk of overtopping during severe weather events.

Frye Island Ferry Landing Structural Repairs, Raymond, ME. Repair design for structural repairs to the mainland ferry landing on Sebago Lake. The design included repairs to the vehicle rated, wood-framed ferry landing structure and repairs to the steel hinge plate connecting the ferry landing to the ferry deck.

Mackworth Island January 2024 Storms Assessment, Falmouth, ME. Performed automated and manual drone flights to document erosion along the island's causeway and shoreline from January 2024 coastal storms. Developed photogrammetry model to assess and compare erosion to previous conditions.

Alison Brady, E.I.

Waterfront Engineering Support

Portland, ME

Education

B.S., Civil Engineering, Northeastern University

Experience in the industry

1 year

Experience with GEI

1 year

Registrations and Licenses

Engineering Intern, ME
No. EI8275

Alison Brady is a staff professional in GEI's Portland, ME office. She has worked in both the public and private sector. As a co-op at a municipality in Massachusetts, she gained experience with road reconstruction projects, stream sampling, surveying, public utility management and design, and construction administration. As a co-op at a structural engineering firm in Boston, Alison worked on remodeling projects and new building construction.

Project Experience

Deep Water Access Study, Greater Portland Council of Governments, Freeport, ME. Conducted a feasibility study for sites for the development of a public deep-water access boat launch. Drafted a memo communicating the findings of the study.

Town Landing Commercial Pier Improvements, Town of Yarmouth, ME. Drafted a site characterization and concept design report for improvements to a commercial pier. Produced concept design plans. Designed a pier extension and a hoist connection to an existing concrete crib-supported pier.

Cape Porpoise Pier Rehabilitation, Town of Kennebunkport, ME. Produced meeting minutes to document project progress. Coordinated preconstruction meetings with the contractor, electrical utility representative, and fuel supplier.

Gulf of Maine Research Institute Bulkhead Reconstruction, Portland, ME. Assisted with the design of a stormwater drainage system and drawing set production, conducted site visits, and drafted local, state, and federal permit applications for the replacement of a steel sheet pile bulkhead.

Ponce's Landing, Town of Long Island, ME. Assisted with drawing set and project specification production for a timber pier replacement project.

Ogunquit Coastal Resilience Project, Southern Maine Planning & Development Commission, Ogunquit, ME. Documented existing site conditions. Presented information on sea level rise to the client and community members. Attended a site walk with the client and community members to gather public input.

Hampton Beach Accessibility Feasibility Study, New Hampshire Department of Natural & Cultural Resources, Hampton, NH. Attended site walk with clients and community members, looking at existing accessible amenities. Discussed observations and ideas for improvement with the client and community members. Presented an overview of events and programs put on at Hampton Beach to the client.

Wall Cap Repair & Dune Nourishment, Scarborough, ME. Assisted with the production of drawing sets, created cost and quantity estimate, drafted local permit applications, and met with clients and a scientist from Woods Hole Oceanographic Institute to discuss project scope and best practices for dune grass planting.

North Haven Thorofare Waterfront, Town of North Haven, North Haven, ME. Drafted a report, maps, and tables communicating flood risk and adaptation recommendations.

UNE Living Shoreline, University of New England, Biddeford, ME. Created figures showing concept-level living shoreline options.

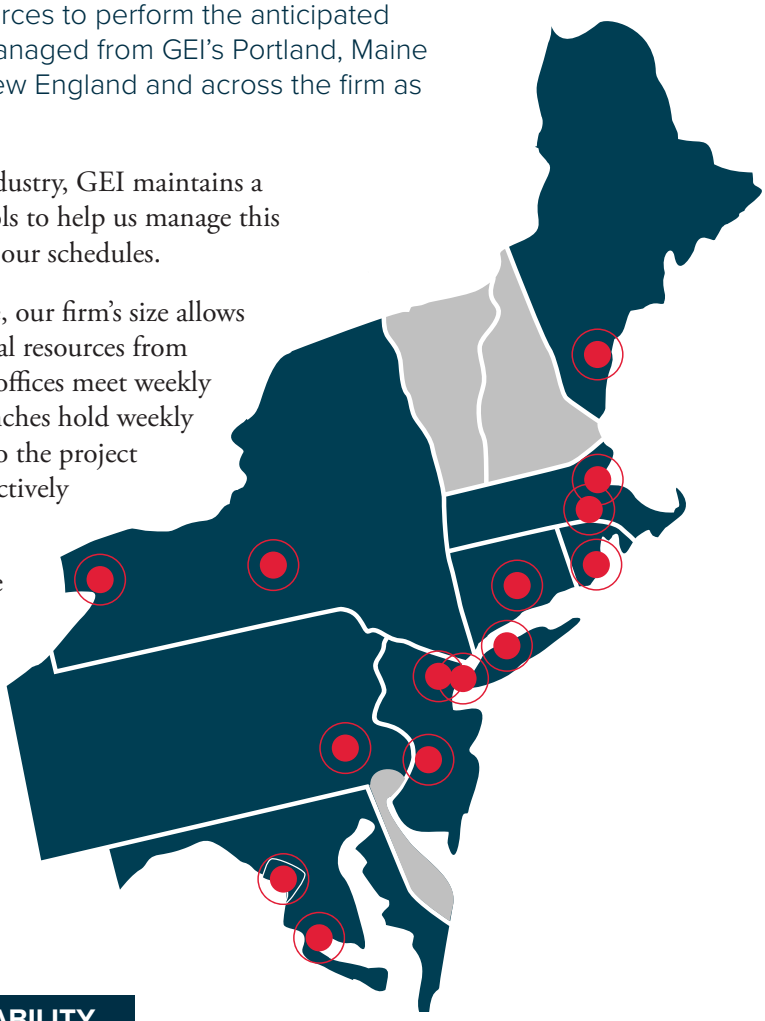
Depth And Breadth Of Capacity

GEI has the expertise and the physical resources to perform the anticipated services. All aspects of this project will be managed from GEI's Portland, Maine office and supported by additional staff in New England and across the firm as needed.

Like many firms in the consulting engineering industry, GEI maintains a significant workload. However, we have many tools to help us manage this workload and allow this project to fit readily into our schedules.

When demands of many projects are high at once, our firm's size allows us to keep projects on track by accessing additional resources from across the company to meet project needs. GEI's offices meet weekly to discuss upcoming projects, and individual branches hold weekly scheduling meetings to enable timely adherence to the project deliverable schedules and allow us to respond effectively and efficiently to any potential scope changes.

At the start of the project, GEI will work with the Town to develop a schedule that identifies goals, work activities, and milestones so that there is a mutual understanding of the project timeline. We will then track progress and update the schedule as needed, and communicate change as it happens.



Capacity of Project Team

NAME	AVAILABILITY
Daniel Bannon, P.E., CFM, BC.PE	10%
Barney Baker, P.E.	10%
Travis Pryor, PLA, LEED AP	15%
Lisa Vickers	15%
Kristin Connell	10%
John Gareau, E.I.	40%
Alison Brady, E.I.	40%

3 Project Task & Schedule Matrix

Project Task & Schedule Matrix

In accordance with the RFP, it is anticipated that the work of this project will be completed in a timeframe of approximately 6 months, with services beginning in March 2025. An outline of the proposed schedule is provided in the Gantt Chart below.

Town of York Paddle Craft Dock Project
Schedule / Sequencing

TASK	MONTHS					
	1	2	3	4	5	6
1. General and Project Management						
2. Background Data Collection and Site Investigations						
3. Concept Level Design (15% Design)						
4. Preliminary Design (15% - 60% Design)						
5. Regulatory Review						
6. Final Design (60% - 90% Design)						

4 Cost Proposal

Project Cost

GEI has developed a technical approach and prepared a budget to implement the tasks outlined in this proposal. We propose to provide the services on a lump sum basis for a fee of $50,000. This budget will not be exceeded without written approval from the Town. The estimated budget is based on assumptions about the scope and availability of information as outlined in this proposal. In the event changes to the scope of work are necessitated by the need for additional investigation, direction from Town, or other factors, we may need to work with the Town to amend the work scope and budget. A breakdown of estimated hours per task is provided in the table below.

We look forward to working with the Town of York to develop a Standard Professional Services Agreement (i.e., contract) to begin the work.

TASK	DESCRIPTION	ESTIMATED LABOR HOURS
1	General and Project Management	32
2	Background Data Collection and Site Investigations	34
3	Concept Level Design (15% Design)	58
4	Preliminary Design (15% - 60% Design)	80
5	Regulatory Review	22
6	Final Design (60% - 90% Design)	70
	Total	**296**

Appendix A Example of Work

*Note: Services provided between 2015 and 2021 were performed by Baker Design Consultants (BDC) prior to acquisition by GEI. Current GEI staff Daniel Bannon and Barney Baker were the lead engineers involved in the project through BDC and have continued in those roles in the ongoing work through GEI.

BROAD COVE PIER REPLACEMENT

BROAD COVE RESERVE, CUMBERLAND, MAINE
BDC PROJECT NO. 15-05
MAINE DOT WIN: 023809.00

USGS LOCATION MAP

INDEX OF SHEETS

TAX MAP #R1

PROPERTY INFORMATION

OWNER: TOWN OF CUMBERLAND, MAINE

ADDRESS: 179 FORESIDE ROAD
CUMBERLAND, MAINE 04021

MAP/LOT: R1-02

ZONING: LOW DENSITY RESIDENTIAL (LDR); SHORELAND OVERLAY

SETBACKS: NO CHANGE

BAKER DESIGN CONSULTANTS
Civil, Marine, and Structural Engineering
7 Spruce Road • Freeport • Maine • 04032 • 207-846-9724 • info@bakerdesignconsultants.com

NO.	DATE	INT.
1	6.5.18	BJB
	BID SET SUBMISSION	

BARNEY J. BAKER No. 5737 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE

DESIGNED BY: DJB
DRAWN BY: JJC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: COVERSHEET

PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE AUG 2015

CONTRACT NO. 15-05

SHEET NO. G-1

REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey general.dwg 6/12/2018

GENERAL NOTES

1. THE CONTRACTOR SHALL BE GOVERNED BY THE CONSTRUCTION SAFETY RULES AS ADOPTED BY THE STATE BOARD OF CONSTRUCTION SAFETY AUGUSTA MAINE
2. THE PROJECT IS SUBJECT TO THE SAFETY AND HEALTH REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AS PROMULGATED BY THE US DEPARTMENT OF LABOR
3. ALL NON PAVED AREAS DISTURBED DURING CONSTRUCTION SHALL BE LOAMED, SEEDED, FERTILIZED AND MULCHED UNLESS OTHERWISE DIRECTED BY THE TOWN OR THEIR REPRESENTATIVE.
4. THE CONTRACTOR SHALL COMPLY WITH FEDERAL, STATE AND LOCAL REGULATORY REQUIREMENTS.
5. TOPSOIL STRIPPED IN AREAS OF CONSTRUCTION THAT IS SUITABLE FOR REUSE AS LOAM SHALL BE STOCKPILED AT A LOCATION TO BE DESIGNATED BY THE TOWN. UNSUITABLE SOIL SHALL BE SEPARATED, REMOVED AND DISPOSED OF AT AN APPROVED DISPOSAL LOCATION OFFSITE

UTILITY NOTES

1. NO DISRUPTION TO THE EXISTING UTILITIES ADJACENT THE PROJECT SITE SHALL BE ALLOWED DURING DEMOLITION OR CONSTRUCTION ACTIVITIES.
2. ANY TEMPORARY ELECTRIC SERVICE, IF REQUIRED DURING THE DURATION OF CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR
3. THE CONTRACTOR SHALL NOT MAKE ANY OPENING OR EXCAVATION WITHIN THE PROJECT AREA UNTIL CONTACT HAS BEEN MADE WITH DIG SAFE AND ALL UTILITIES TO LOCATE ANY EXISTING POWER, TELEPHONE CABLE TV, WATER OR OTHER UNDERGROUND SERVICES
4. THE UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND ARE PROVIDED AS A GUIDE TO THE CONTRACTOR. NO GUARANTEE IS MADE THAT UTILITIES WILL BE ENCOUNTERED WHERE SHOWN OR THAT ALL UTILITIES ARE SHOWN. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS IN THE FIELD AND BE RESPONSIBLE FOR REPAIR OF UTILITIES DISTURBED DURING CONSTRUCTION.

DEMOLITION NOTES

1. DEMOLITION MATERIALS NOT SELECTED FOR RETAINAGE BY THE OWNER TO BE DISPOSED OF AT AN APPROVED FACILITY. ANY TREATED LUMBER SHALL BE DISPOSED OF IN COMPLIANCE WITH MAINE DEP REQUIREMENTS.

CONSTRUCTION SEQUENCE & COORDINATION

1. ALL CONSTRUCTION ACTIVITIES TO BE UNDERTAKEN FROM BARGE NO DISTURBANCE TO UPLAND SITE BEYOND THAT REQUIRED FOR CONSTRUCTION OF NEW PIER ABUTMENT AND APPROACH RAMP SHALL BE ALLOWED.
2. THE CONTRACTOR SHALL WORK WITH THE TOWN TO DESIGNATE A LAYDOWN AREA IN THE UPPER PARKING AREA ONSITE FOR PARKING AND MATERIAL DELIVERY, AND WILL COORDINATE ACCESS BETWEEN THE LAYDOWN AREA AND THE WATERFRONT WITH THE TOWN.

EROSION CONTROL NOTES

1. APPLICATION OF TEMPORARY AND PERMANENT EROSION CONTROL MEASURES FOR THE PROJECT SHALL BE IN ACCORDANCE WITH PROCEDURES AND SPECIFICATIONS OF THE CURRENT MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION; BEST MANAGEMENT PRACTICES.
2. SILTATION FENCE SHALL BE INSTALLED BEFORE ANY EXCAVATION TAKES PLACE
3. INSTALL EROSION CONTROL MESH ON ALL PROPOSED SLOPES 2:1 OR STEEPER, UNLESS SHOWN OR NOTED OTHERWISE.
4. ALL EROSION CONTROL MEASURES SEEDING AND MULCHING SHALL BE INSPECTED WEEKLY, AFTER RAINSTORMS AND DURING RUNOFF EVENTS. ALL MEASURES SHALL BE REPAIRED OR REPLACED WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DAMAGE.
5. SEEDED AND MULCHED AREAS SHALL BE MAINTAINED UNTIL FINAL ACCEPTANCE OF THE WORK
6. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED UPON COMPLETION OF GRADING OPERATIONS AND ESTABLISHMENT OF ACCEPTABLE GROUND COVER.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EROSION CONTROL MEASURES DURING CONSTRUCTION.

SURVEY & DATUM NOTES

1. BASE SURVEY, TOPOGRAPHY, SITE DATUM CONTROL AND PROJECT BENCHMARKS ARE FROM A FIELD SURVEY WITH DOCUMENTING PLAN BY LITTLE RIVER LAND SURVEYING DATED 10/19/15
2. ALL TOPOGRAPHIC INFORMATION PROVIDED IS REFERENCED TO NAVD88 VERTICAL DATUM UNLESS OTHERWISE NOTED.
3. BASE FLOOD/TIDAL INFORMATION TAKEN FROM MEDEP, FEMA, AND NOAA PUBLISHED DATA REFER TO THE TABLE BELOW

PROJECT ELEVATIONS (BY DATUM)

ELEVATION	CHART (ft)	NGVD29 (ft)	NAVD88 (ft)	Notes
FEMA Base Flood	22.3	17.7	17.0	Prelim FEMA Zone VE
FEMA Base Flood	19.5	15.0	14.3	Effective FEMA Zone V2
Highest Annual Tide	11.9	7.4	6.7	2013 MEDEP Predictions
MHHW	9.9	5.4	4.7	BASED ON TIDAL SM 'PORTLAND'
MHW	9.5	5.0	4.2	
NAVD88	5.3		0.0	
NGVD29	4.5	0.0		
MLW	0.3	-4.2	-4.9	
MLLW	0.0	-4.5	-5.3	

REFERENCE DOCUMENTS

1. BOUNDARY SURVEY PLAN OF SPEARS HILL SUBDIVISION, 179 FORESIDE ROAD, CUMBERLAND, MAINE" BY TITCOMB ASSOCIATES, DATED AUGUST 28, 2014 AND REVISED THROUGH DECEMBER 11 2014.
2. COPIES OF REGULATORY PERMITS ARE PROVIDED IN THE PROJECT MANUAL.
3. SUBSURFACE INFORMATION PROVIDED IN THESE PLANS IS BASED ON A SUBSURFACE INVESTIGATION CONSISTING OF 11 PILE PROBES DRIVEN TO REFUSAL. PROBE RESULTS ARE PROVIDED ON SHEET G-2

SCOPE OF WORK SUMMARY

1. DEMOLITION AND DISPOSAL OFFSITE OF EXISTING PIER STRUCTURE INCLUDING REMOVAL OF CRIBS TO 2' BELOW EXISTING GROUND AND DISPOSAL OF CRIB BALLAST MATERIAL.
2. CONSTRUCTION OF NEW TIMBER PIER INCLUDING CONCRETE ABUTMENT, GRANITE CRIB AND PILE SUPPORTED BENTS.
3. INSTALLATION OF SEASONAL GANGWAY, FLOATS, AND RESTRAINT SYSTEM

DESIGN CRITERIA

1. PIER DESIGN LOADS
   - DEAD LOADS - SELF WEIGHT OF COMPONENTS & ATTACHMENTS
   - LIVE LOAD - 100 PSF
   - WAVE HEIGHT - 3 FT
   - DESIGN WIND SPEED - 100 MPH
2. ALL HANDRAIL AND POSTS SHALL BE CONSTRUCTED TO WITHSTAND A 200 LB LOAD APPLIED IN ANY DIRECTION OR 50 LB/FT APPLIED ALONG RAIL LENGTH
3. GANGWAY
   - NOMINAL SIZE 60'-0" X 5'-0"
   - MINIMUM CLEAR DISTANCE BETWEEN HANDRAILS 3'-6"
   - GANGWAY SHALL BE CONSTRUCTED OF MARINE GRADE ALUMINUM
   - HANDRAILS, APRONS AND TRANSITION PLATES SHALL MEET ADA AND OSHA ACCESSIBILITY REQUIREMENTS
   - GANGWAY SHALL BE DESIGNED TO SAFELY SUPPORT
     i. 60 PSF LIVE LOAD WITH SPAN/360 DEFLECTION LIMIT
     ii. 75 PSF LIVE LOAD WITH NO DEFLECTION LIMIT
   - GANGWAY SHALL BE PROVIDED WITH INTEGRAL WATER LINE WITH HOSE B/B CONNECTIONS TOP AND BOTTOM.
   - GANGWAY SHALL BE PROVIDED WITH DETACHABLE CHAIN ACROSS TOP TO DETER ACCESS WHEN RAISED AND STORED ON THE PIER

STRUCTURAL NOTES

STEEL PILES

1. STEEL PIPE PILES SHALL BE 10-3/4 INCH DIAMETER, MINIMUM 3/8 INCH THICK WALL, STEEL PIPE PILES IN ACCORDANCE WITH ASTM A252 GRADE 3
2. ALL PILES SHALL BE SEAMLESS.
3. AN OPEN CUTTING SHOE IS REQUIRED
4. STEEL PIPE PILES SHALL BE TREATED WITH FUSION BONDED EPOXY (COLOR: BROWN) TO A DEPTH OF AT LEAST 13-FT BELOW GRADE. REPAIR ANY COATING DAMAGED IN THE FIELD.
5. THE CONTRACTOR SHALL TAKE STEPS TO PROTECT PILE COATING FROM DAMAGE DURING HANDLING AND DRIVING OPERATIONS.
6. ALL PILES SHALL BE FILLED WITH MDOT CLASS A CONCRETE AFTER INSTALLATION IS COMPLETE.

CAST-IN-PLACE CONCRETE

1. MIX DESIGN
   a. MDOT CLASS A F_c = 4,000 PSI
2. MINIMUM COVER TO REINFORCEMENT = 3"
3. REINFORCING STEEL
   a. ASTM A615 GRADE 60, F_y = 60,000 PSI
4. COAT EXPOSED CONCRETE SURFACES WITH SIKAGARD 670W CLEAR OR EQUIV. PROTECTIVE COATING.

MISCELLANEOUS METALS AND FASTENERS

1. REFER TO FASTENER SCHEDULE
2. ALL METAL ITEMS TO BE A36 STEEL, HOT DIP GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED
3. ALL FASTENERS SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL
4. ALL BOLTS SHALL CONFORM TO ASTM A-307. MINIMUM SIZE SHALL BE ¾" DIA UNLESS OTHERWISE NOTED. ALL BOLTS TO BE HEAVY HEX UNLESS OTHERWISE NOTED
5. ANCHOR BOLTS SHALL CONFORM TO ASTM F-1554 AND SHALL BE GRADE 36.

TIMBER STRUCTURAL MEMBERS

1. REFER TO TIMBER SCHEDULE.
2. ALL EXPOSED EDGES SHALL BE PLANED OR SANDED TO PROVIDE SMOOTH SURFACE FREE OF ROUGH EDGES OR DEFECTS
3. ALL EXPOSED FASTENERS SHALL BE COUNTERSUNK ON WALKING SURFACE AND PEDESTRIAN HANDRAIL.
4. ALL TIMBER JOISTS, BEAMS AND PILE CAPS TO BE CAPPED WITH ICE AND WATER SHIELD BY GRACE CONSTRUCTION PRODUCTS OR APPROVED EQUAL PRIOR TO PLACEMENT OF DECK

GLUE-LAMINATED TIMBER GIRDERS

1. ALL EXPOSED SURFACES OF GLULAM MEMBERS SHALL BE TREATED BY THE MANUFACTURER WITH THOMPSON'S WATERSEAL WATERPROOFING WOOD PROTECTOR OR EQUIVALENT
2. ANY UNTREATED SURFACES EXPOSED BY CUTTING, DRILLING, SANDING, OR NOTCHING OF GLULAM MEMBERS IN THE FIELD SHALL BE TREATED WITH THOMPSON'S WATERSEAL WATERPROOFING WOOD PROTECTOR OR EQUIVALENT.
3. CAMBER FOR ALL GLULAM GIRDERS SHALL BE BASED ON A RADIUS OF 2000-FT

TIMBER SCHEDULE

Timber Size	Location	% Moisture at Treatment	Treatment Type	Treatment pcf	Grading to SPIB	Surface Finishing
Pier						
6.75 x 28.875 24F-V3 SP	Glulam Girders	KD, 16% Prior to Gluing	Penta	0.6 Prior to Gluing	Architectural Grade Unadilla Laminated Products (207) 846-5580	
6.75 x 28.875 24F-V3 SP	End Beam	KD, 16% Prior to Gluing	Penta	0.6 Prior to Gluing	Architectural Grade Unadilla Laminated Products (207) 846-5580	
4 x 10	Cross Beams	25%	CCA	1.0	No. 1	S4S
3 x 8	Deck Nailers	25%	CCA	1.0	No. 1	S4S
10 x 12	Overlook Edge Beam	25%	CCA	1.0	No. 1	S4S
3 x 8	Deck Planking	19%	ACQ	0.6	No. 1	S4S
4 x 4	Diagonal Bracing	25%	CCA	1.0	No. 1	S4S
8 x 8	Gallows Upright	19%	ACQ	0.6	No. 1	S4S
8 x 8	Gallows Beam	19%	ACQ	0.6	No. 1	S4S
6 x 6	Knee Brace	19%	ACQ	0.6	No. 1	S4S
Handrail						
2 x 4	Backer Supports	19%	ACQ	0.6	No. 1	S4S
4 x 4	Posts	19%	ACQ	0.6	No. 1	S4S
5/4 x 6	Top rail	Composite lumber				
5/4 x 6	Midrail, Lowrail	19%	ACQ	0.6	No. 1	S4S

PILE SCHEDULE

Elevations based on NAVD88 Datum

PILE Reference	Material	Type	Cutoff Elev	Mudline Elev	Ledge Elevation	Overburden	End Condition	Pile Tip Elevation*	Calculated Length FT	Min. Pile Order Length
2 A	STEEL PIPE PILE, ASTM A252, GRADE 3, SEAMLESS 10.75" OD, 0.375" THK, CONCRETE FILLED	Support	10.33	2.3	-2.0	4.3	SOCKETED 4-FT	-6.0	16	21
2 B		Support	10.33	2.3	-0.6	2.9	SOCKETED 4-FT	-4.6	15	20
3 A		Support	11.67	1.0	-6.8	7.8	SOCKETED 4-FT	-10.8	23	28
3 B		Support	11.67	1.0	-13.3	14.3	SOCKETED 4-FT	-17.3	29	34
4 A		Support	11.67	-1.3	-30.1	28.8	DRIVEN TO LEDGE	-30.1	42	47
4 B		Support	11.67	-1.3	-28.3	27.0	DRIVEN TO LEDGE	-28.3	40	45
5 A		Support	11.67	-3.7	-27.1	23.5	DRIVEN TO LEDGE	-27.1	39	44
5 B		Support	11.67	-3.7	-33.1	29.4	DRIVEN TO LEDGE	-33.1	45	50
5 C		Support	11.67	-3.7	-39.0	35.4	DRIVEN TO LEDGE	-39.0	51	56
6.1 A		Guide	20.00	-5.7	-36.0	30.3	DRIVEN TO LEDGE	-36.0	56	61
6.1 B		Batter	17.00	-5.7	-36.0	30.3	DRIVEN TO LEDGE	-36.0	53	58
6.1 C		Batter	17.00	-5.7	-36.0	30.3	DRIVEN TO LEDGE	-36.0	53	58
6.2 A		Guide	20.00	-5.7	-36.0	30.3	DRIVEN TO LEDGE	-36.0	56	61
6.2 B		Batter	17.00	-5.7	-36.0	30.3	DRIVEN TO LEDGE	-36.0	53	58
6.2 C		Batter	17.00	-5.7	-36.0	30.3	DRIVEN TO LEDGE	-36.0	53	58
							STEEL PIPE PILE		Total Length	698
									No of Piles	15

FASTENER SCHEDULE

Location	Diameter in	Fastener Type	No./ Connection	Finish	Length in
Pier Superstructure					
Decking to Girder/Deck Nailer	5/16"	GRK-RSS	2	316 Stainless	6"
Deck Nailer to Cross Beam	5/16"	GRK-RSS	2	316 Stainless	6"
Cross Beam to Support Bracket	3/4"	Heavy Hex	2	Hot-Dipped Galvanized	6"
Cross Beam Bracket to Glulam	3/4"	Timber Bolt	4	Hot-Dipped Galvanized	8"
Diagonal Bracing to Glulam	3/4"	Timber Bolt	2	Hot-Dipped Galvanized	12"
Brace Blocking to Glulam	3/4"	Lag Bolt	4	Hot-Dipped Galvanized	8"
Overlook Extension Bracket to Glulam	3/4"	Heavy Hex	6	Hot-Dipped Galvanized	10"
Overlook Extension Bracket to Edge Beam	3/4"	Timber Bolt	4	Hot-Dipped Galvanized	12"
Girder Seat Bracket to Glulam	3/4"	Heavy Hex	4	Hot-Dipped Galvanized	10"
Girder Seat Bracket to Pile Cap	3/4"	ASTM F1554	4	Hot-Dipped Galvanized	14"
End Beam to Gallows Upright	3/4"	Timber Bolt	3	Hot-Dipped Galvanized	16"
End Beam to Connection Bracket	3/4"	Timber Bolt	3	Hot-Dipped Galvanized	8"
Gallows Upright to Glulam and Bracket	3/4"	Timber Bolt	3	Hot-Dipped Galvanized	16"
Gallows Beam to Upright	1"	Drift Pin	1	Hot-Dipped Galvanized	20"
Knee Brace to Beam and Upright	3/4"	Timber Bolt	1	Hot-Dipped Galvanized	12"
Handrails					
Timber Handrail Post to Beam	5/8"	Timber Bolt	2	Hot-Dipped Galvanized	12"
Timber Handrail to Post	#10	GRK-R4	2	316 Stainless	3-1/8"
Top Rail Backer to Post	5/16"	GRK-RSS	2	316 Stainless	6"
Top Rail to Top Rail Backer	#8	GRK-R4	2 Full Rows @.18" o.c.	316 Stainless	2-1/2"

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NO.	DATE	INT.
1	6.5.18	BJB
	BID SET SUBMISSION	

BARNEY J. BAKER No. 5737 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE

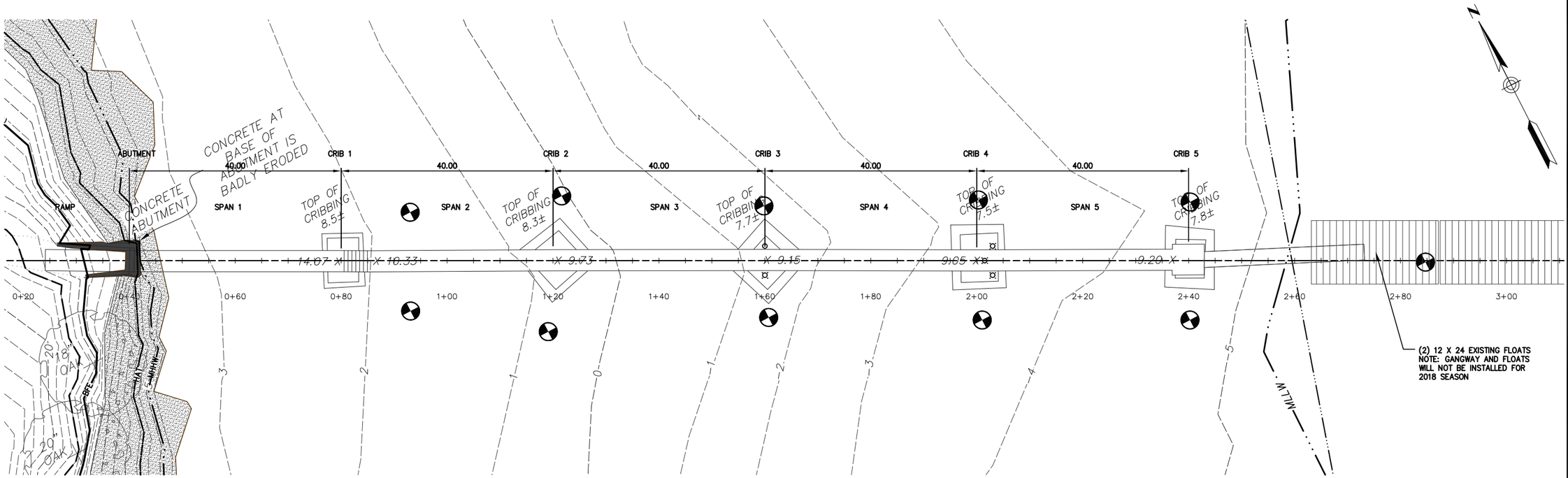
DESIGNED BY: DJB
DRAWN BY: JJC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: NOTES & SCHEDULES

PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

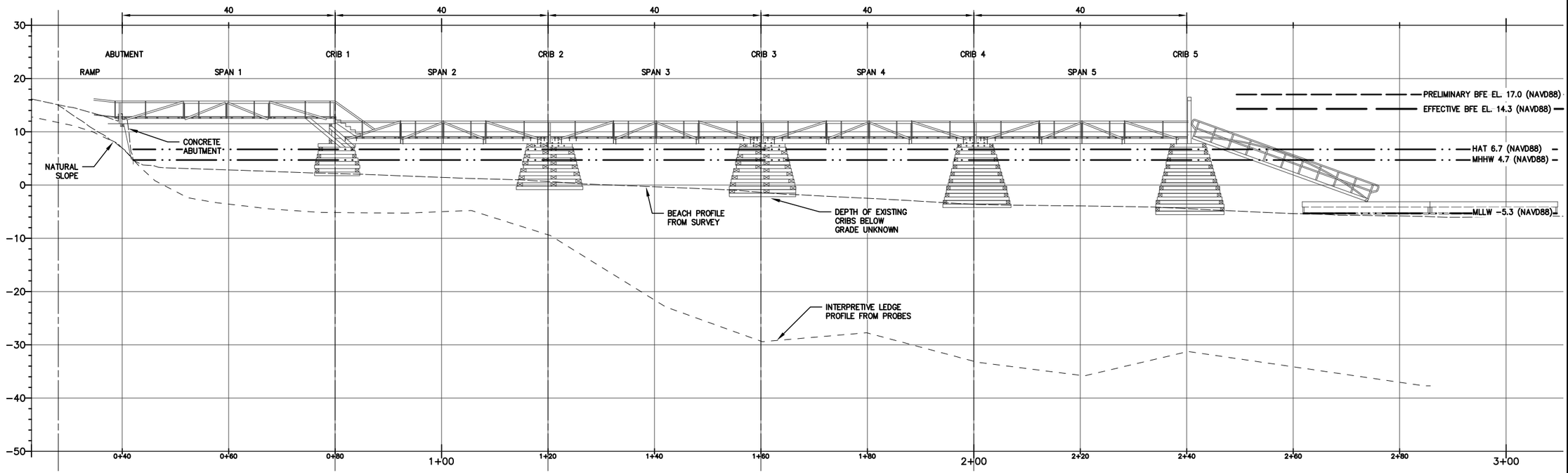
DATE AUG 2015
CONTRACT NO. 15-05
SHEET NO. G-2
REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey general.dwg 6/12/2018



PLAN

0 5 10 15 30



ELEVATION

0 5 10 15 30

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NO.	DATE	INT.
1	6.5.18	BJB
	BID SET SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: DJB
DRAWN BY: JJC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: EXISTING PIER PLAN & ELEVATION

PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE
AUG 2015

CONTRACT NO.
15-05

SHEET NO. C-1

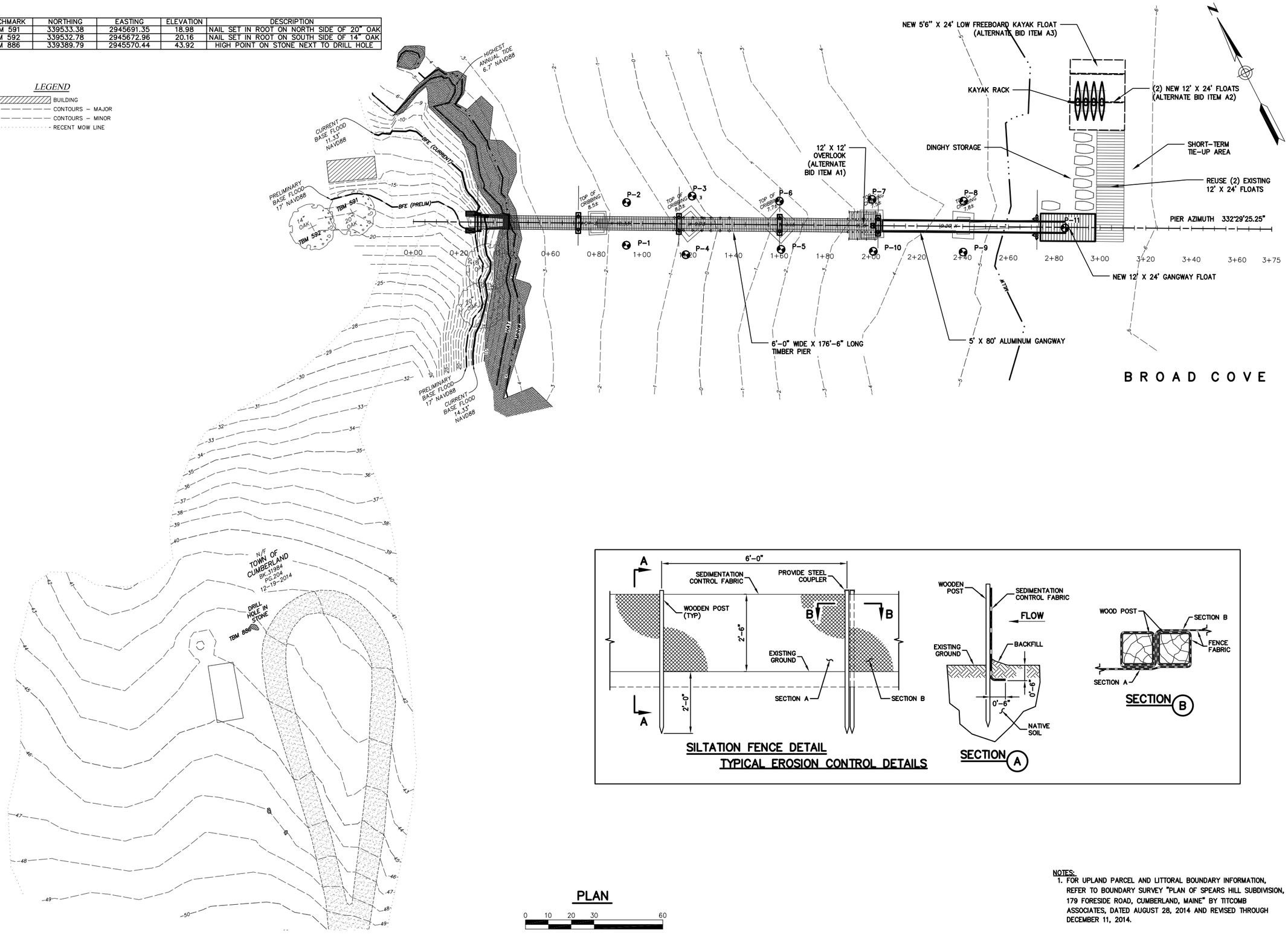
REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey civil3d.dwg 6/12/2018

BENCHMARK	NORTHING	EASTING	ELEVATION	DESCRIPTION
TBM 591	339533.38	2945691.35	18.98	NAIL SET IN ROOT ON NORTH SIDE OF 20" OAK
TBM 592	339532.78	2945672.96	20.16	NAIL SET IN ROOT ON SOUTH SIDE OF 14" OAK
TBM 886	339389.79	2945570.44	43.92	HIGH POINT ON STONE NEXT TO DRILL HOLE

LEGEND

- BUILDING
- CONTOURS – MAJOR
- CONTOURS – MINOR
- RECENT MOW LINE



PLAN

0 10 20 30 60

SILTATION FENCE DETAIL

TYPICAL EROSION CONTROL DETAILS

SECTION (A)

SECTION (B)

NOTES:

1. FOR UPLAND PARCEL AND LITTORAL BOUNDARY INFORMATION, REFER TO BOUNDARY SURVEY "PLAN OF SPEARS HILL SUBDIVISION, 179 FORESIDE ROAD, CUMBERLAND, MAINE" BY TITCOMB ASSOCIATES, DATED AUGUST 28, 2014 AND REVISED THROUGH DECEMBER 11, 2014.

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NO.	DATE	INT.
1	6.5.18	BJB
	BID SET SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DJB	JJC	BJB	AS SHOWN

SHEET TITLE: SITE PLAN

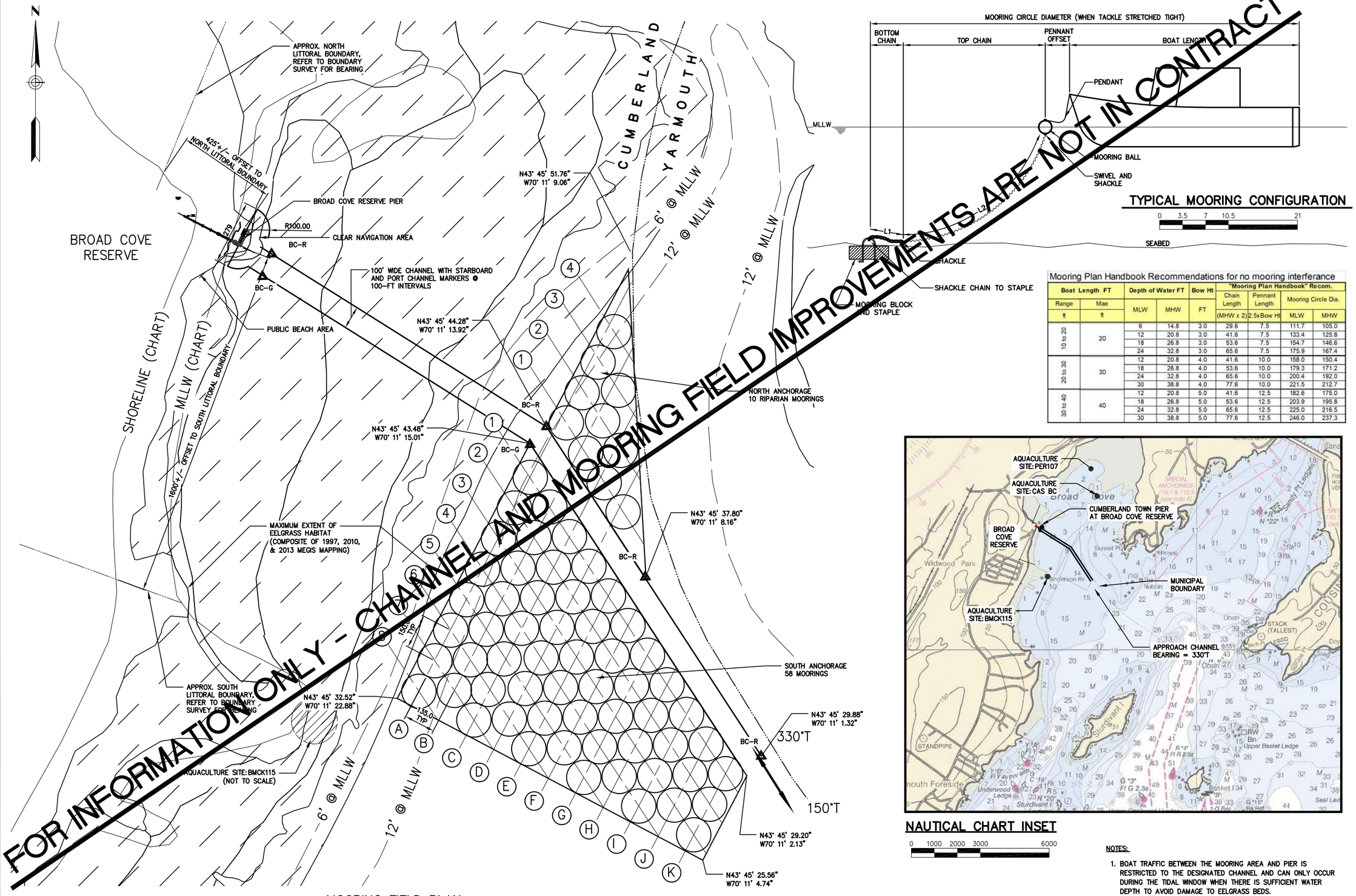
PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE: AUG 2015

CONTRACT NO. 15-05

SHEET NO. C-2 | REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey civil3d.dwg 6/12/2018



MOORING FIELD PLAN

0 100 200 300 600

TYPICAL MOORING CONFIGURATION

0 3.5 7 10.5 21

Mooring Plan Handbook Recommendations for no mooring interference

Boat Length FT		Depth of Water FT		Bow Ht	"Mooring Plan Handbook" Recom.			
Range	Max	MLW	MHW	FT	Chain Length	Pennant Length	Mooring Circle Dia.	
ft	ft				(MHW x 2)	2.5xBow Ht	MLW	MHW
10 to 20	20	6	14.8	3.0	29.6	7.5	111.7	105.0
		12	20.8	3.0	41.6	7.5	133.4	125.8
		18	26.8	3.0	53.6	7.5	154.7	146.6
		24	32.8	3.0	65.6	7.5	175.9	167.4
20 to 30	30	12	20.8	4.0	41.6	10.0	158.0	150.4
		18	26.8	4.0	53.6	10.0	179.3	171.2
		24	32.8	4.0	65.6	10.0	200.4	192.0
		30	38.8	4.0	77.6	10.0	221.5	212.7
30 to 40	40	12	20.8	5.0	41.6	12.5	182.6	175.0
		18	26.8	5.0	53.6	12.5	203.9	195.8
		24	32.8	5.0	65.6	12.5	225.0	216.5
		30	38.8	5.0	77.6	12.5	246.0	237.3

NAUTICAL CHART INSET

0 1000 2000 3000 6000

NOTES:

1. BOAT TRAFFIC BETWEEN THE MOORING AREA AND PIER IS RESTRICTED TO THE DESIGNATED CHANNEL AND CAN ONLY OCCUR DURING THE TIDAL WINDOW WHEN THERE IS SUFFICIENT WATER DEPTH TO AVOID DAMAGE TO EELGRASS BEDS.
2. CHANNEL MARKERS LOCATED IN EELGRASS AREAS MUST USE LOW IMPACT TACKLE COMPRISING A MUSHROOM ANCHOR (OR EQUAL) AND SUSPENDED LINE TO MINIMIZE DISTURBANCE TO THE SEABED.

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NO.		DATE	INT.
1	BID SET SUBMISSION	6.5.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB	DRAWN BY:	JJC	CHECKED BY:	BJB	SCALE:	AS SHOWN

SHEET TITLE: MOORING FIELD PLAN

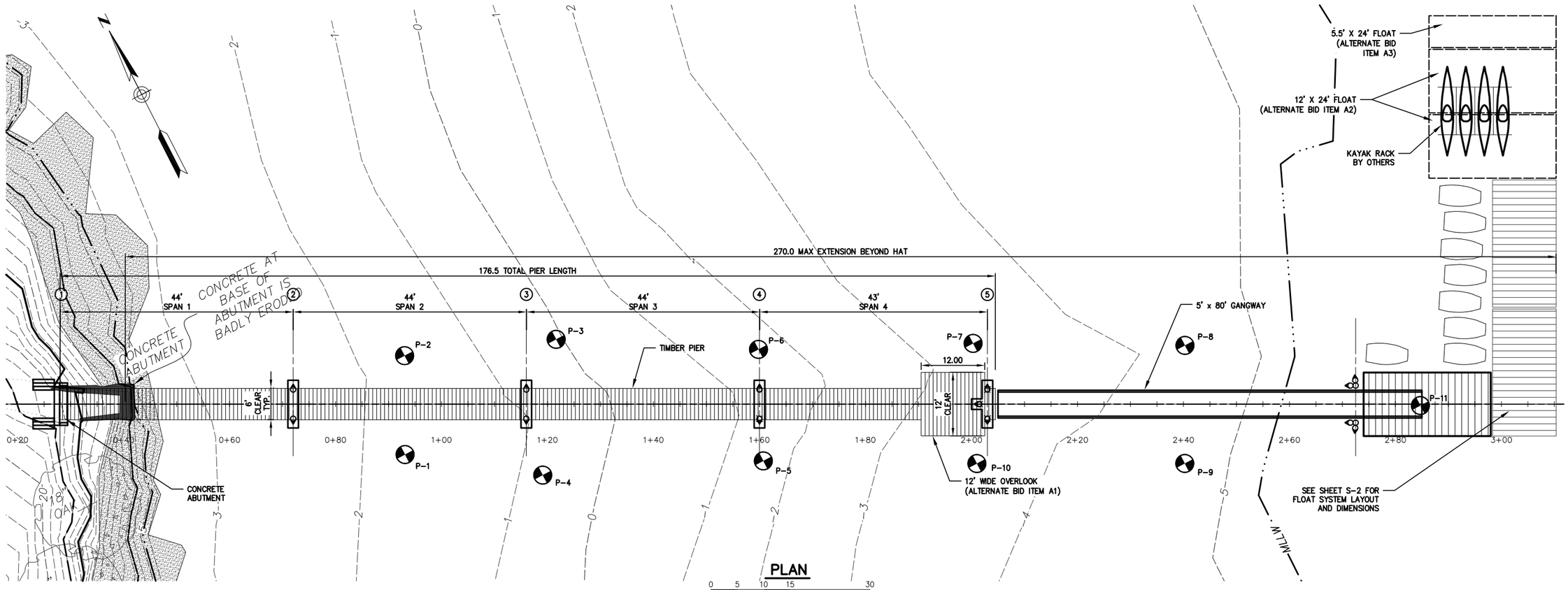
PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

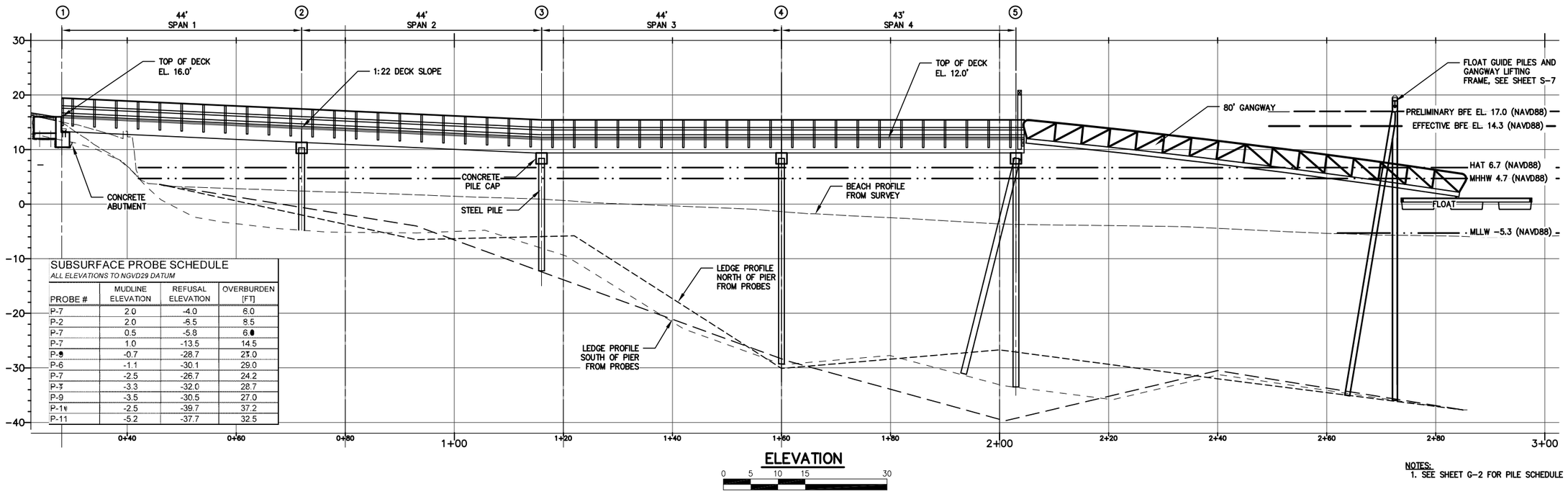
DATE: JAN 2016

CONTRACT NO. 15-05

SHEET NO. C-3 | REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey civil3d.dwg 6/12/2018





SUBSURFACE PROBE SCHEDULE

ALL ELEVATIONS TO NGVD29 DATUM

PROBE #	MUDLINE ELEVATION	REFUSAL ELEVATION	OVERBURDEN [FT]
P-7	2.0	-4.0	6.0
P-2	2.0	-6.5	8.5
P-7	0.5	-5.8	6.3
P-7	1.0	-13.5	14.5
P-3	-0.7	-28.7	27.0
P-6	-1.1	-30.1	29.0
P-7	-2.5	-26.7	24.2
P-4	-3.3	-32.0	28.7
P-9	-3.5	-30.5	27.0
P-10	-2.5	-39.7	37.2
P-11	-5.2	-37.7	32.5

NOTES:
1. SEE SHEET G-2 FOR PILE SCHEDULE

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NO.	DESCRIPTION	DATE	INT.
1	BID SET SUBMISSION	6.5.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: DJB
DRAWN BY: JJC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: PIER PLAN & ELEVATION

PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE: AUG 2015

CONTRACT NO. 15-05

SHEET NO. S-1

REV. 1

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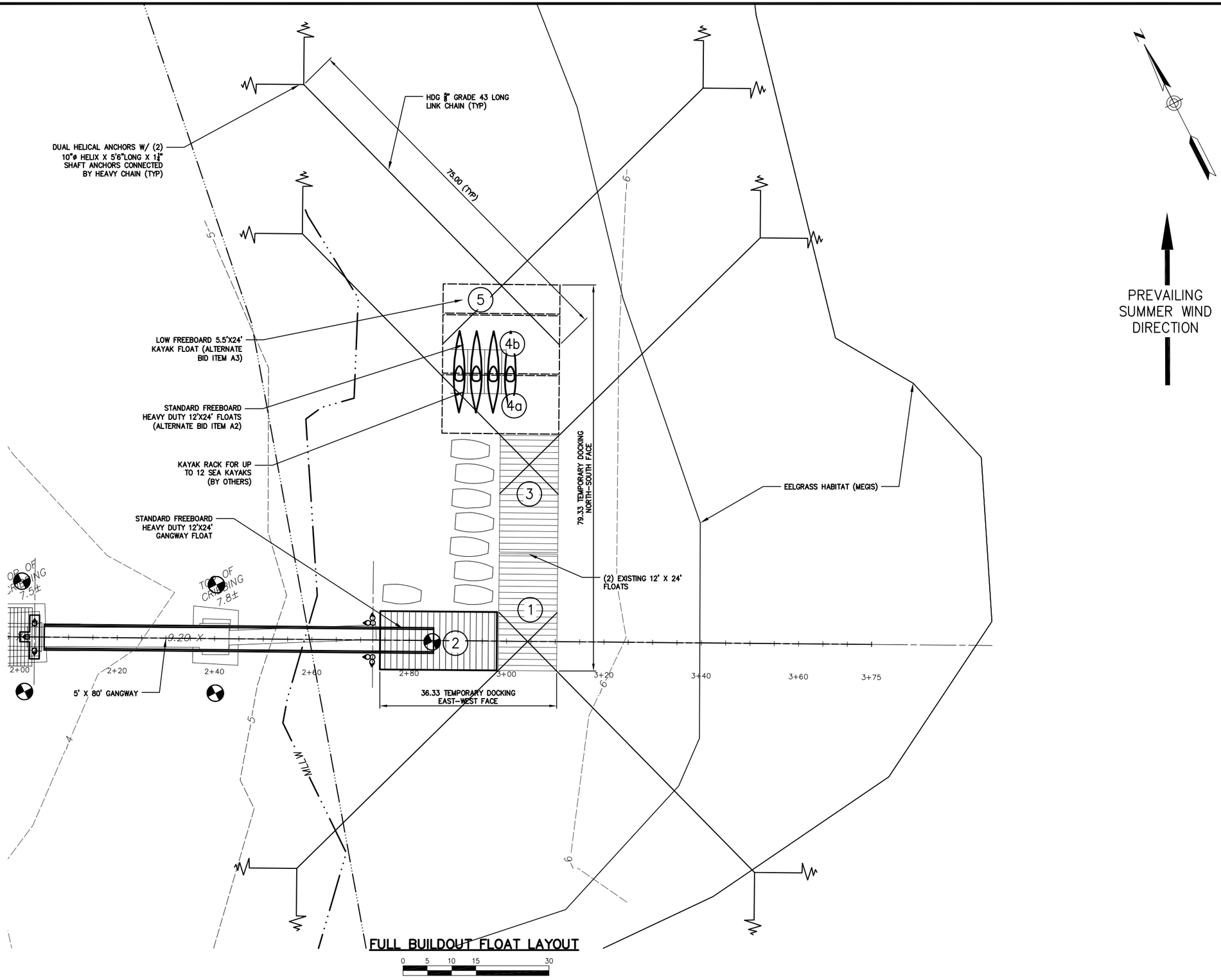

FULL BUILDOUT FLOAT LAYOUT

0 5 10 15 30

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey civil3d.dwg 6/12/2018

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NO.	DATE	INT.
1	6.5.18	BJB

BID SET SUBMISSION

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: DJB
DRAWN BY: JJC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: FLOAT LAYOUT PLAN

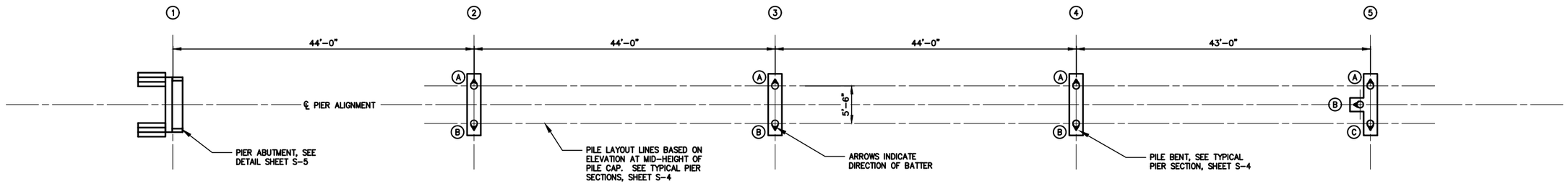
PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE AUG 2015

CONTRACT NO. 15-05

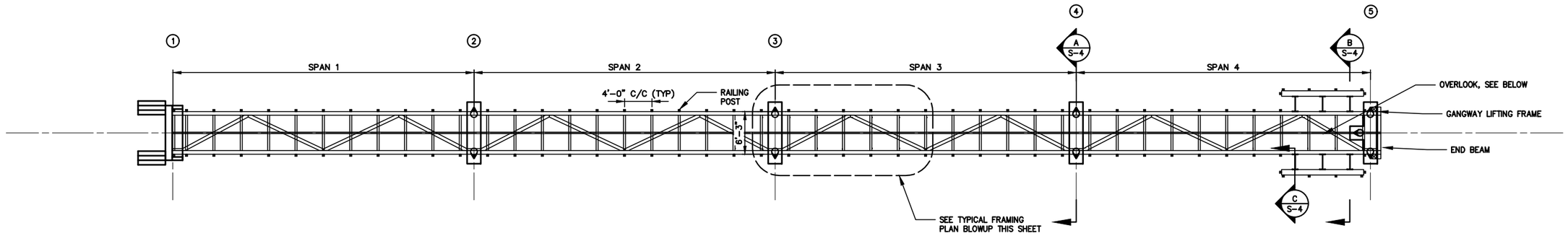
SHEET NO. S-2

REV. 1



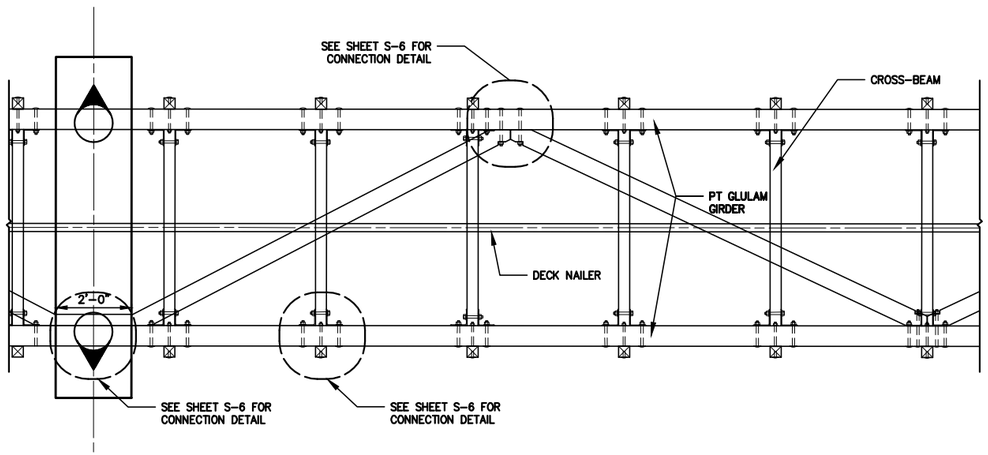
PILE LAYOUT PLAN

0 6 12 18 24 48



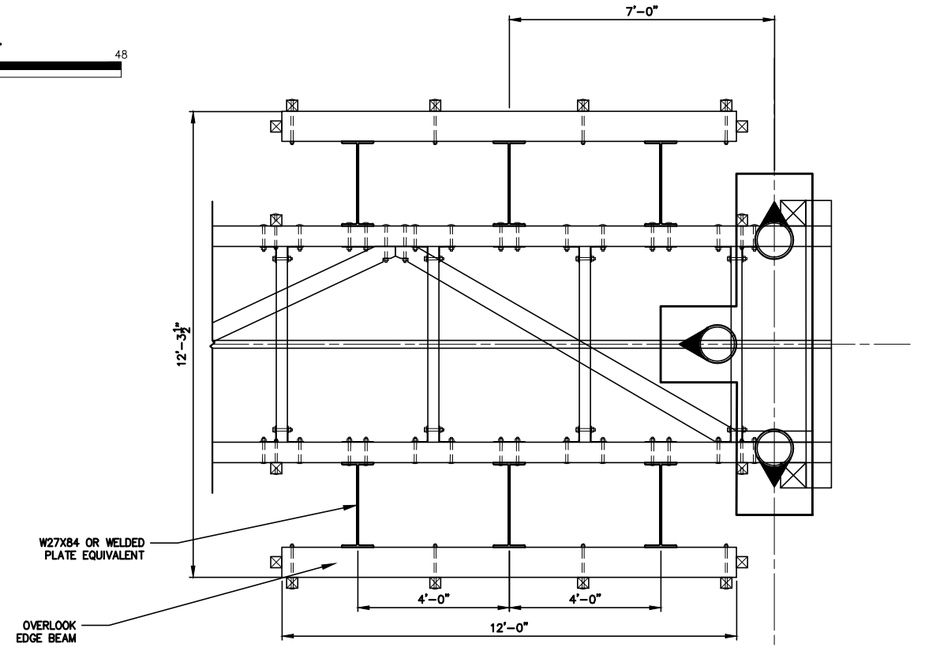
PIER FRAMING PLAN

0 6 12 18 24 48



TYPICAL FRAMING PLAN

0 2 4 6 12



OVERLOOK FRAMING PLAN

0 2 4 6 12

NOTE: CONSTRUCTION OF WIDENED OVERLOOK IS COVERED BY ALTERNATE BID ITEM A1.

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NO.	DATE	INT.
1	6.5.18	BJB
	BID SET SUBMISSION	

STATE OF MAINE — BARNEY J. BAKER No. 5737 — LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB
DRAWN BY:	JJC
CHECKED BY:	BJB
SCALE:	AS SHOWN

SHEET TITLE: PILE LAYOUT & FRAMING PLANS

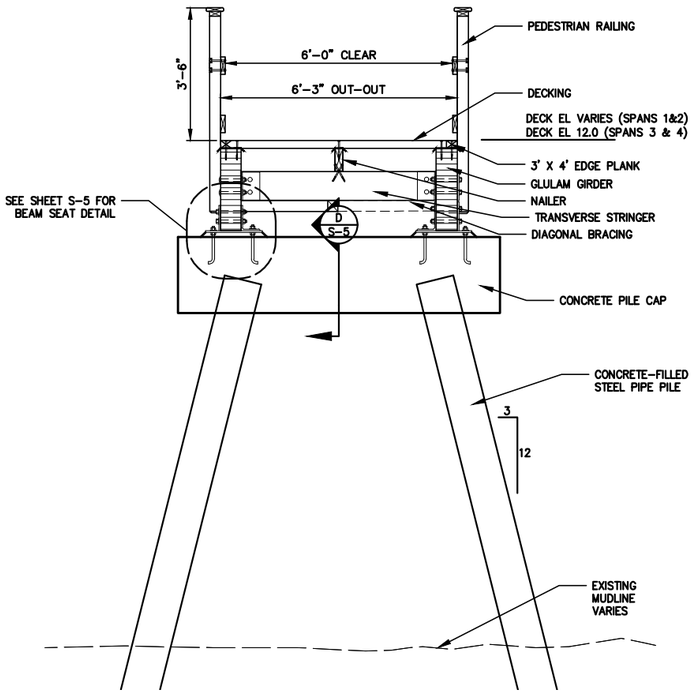
PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE: AUG 2015

CONTRACT NO. 15-05

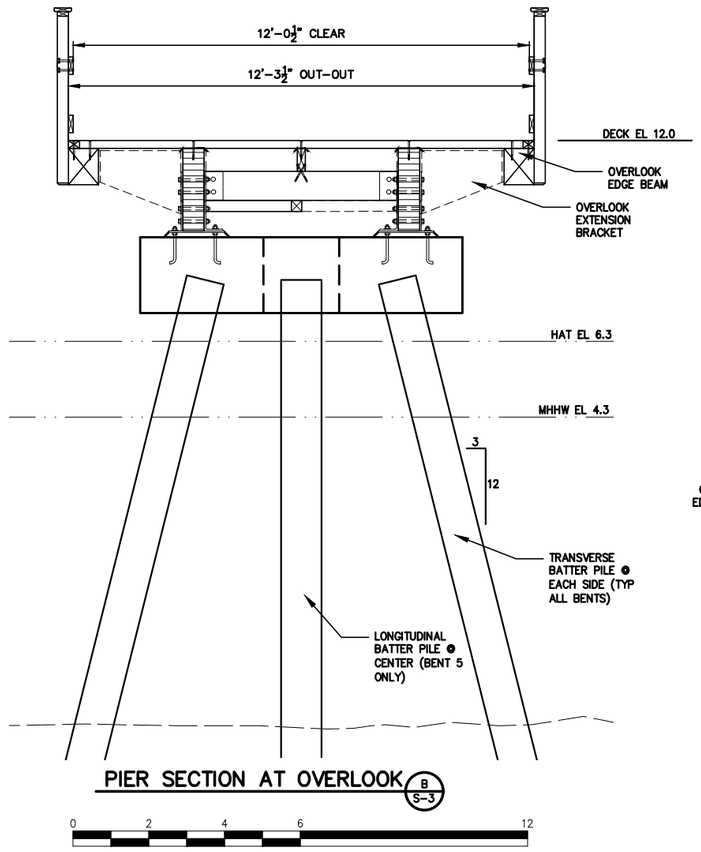
SHEET NO. S-3 | REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey structural.dwg



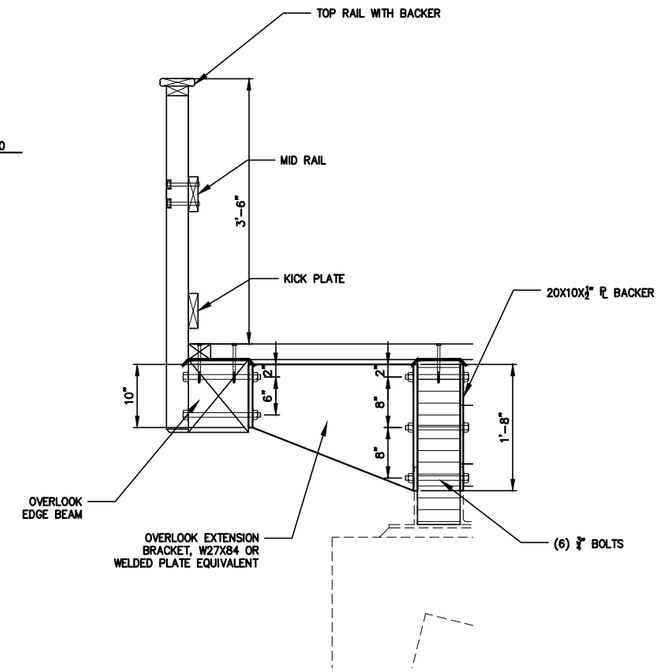
TYPICAL PIER SECTION (A, S-3)

0 2 4 6 12



PIER SECTION AT OVERLOOK (B, S-3)

0 2 4 6 12



OVERLOOK EXTENSION AND RAILING DETAIL (C, S-3)

0 1 2 6

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NO.	DESCRIPTION	DATE	INT.
A	BID SET SUBMISSION	6.5.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB
DRAWN BY:	JJC
CHECKED BY:	BJB
SCALE:	AS SHOWN

SHEET TITLE: PIER SECTIONS AND DETAILS

PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE: AUG 2015

CONTRACT NO.: 15-05

SHEET NO.: S-4

REV.: 1

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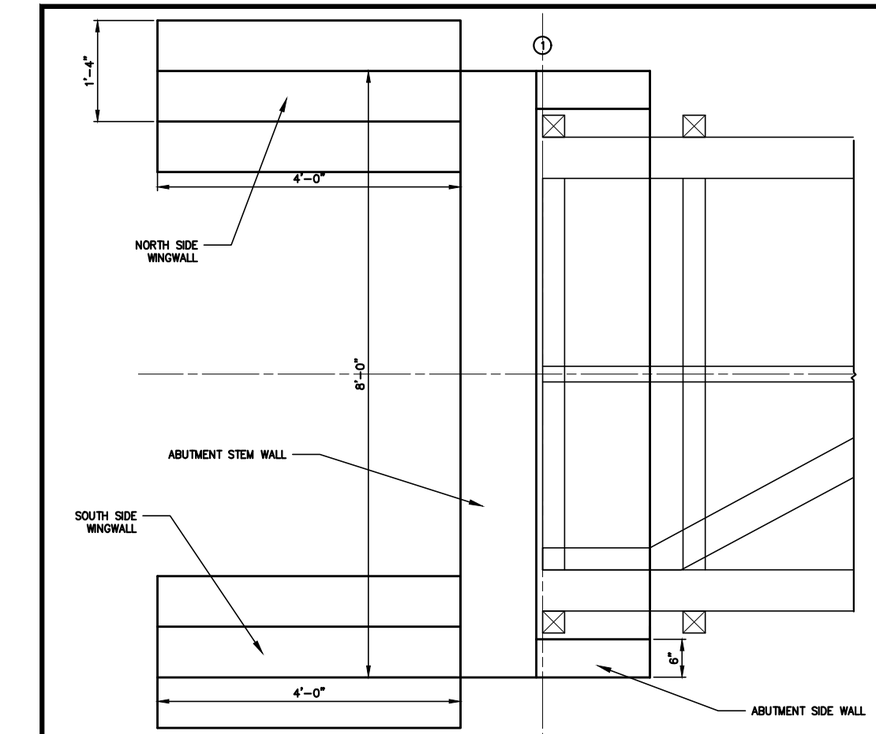
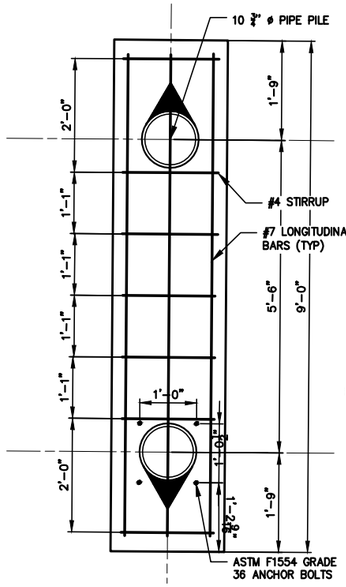
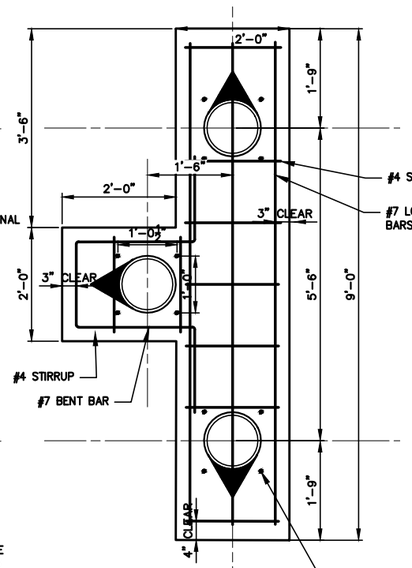


ABUTMENT PLAN

0 1 2 6

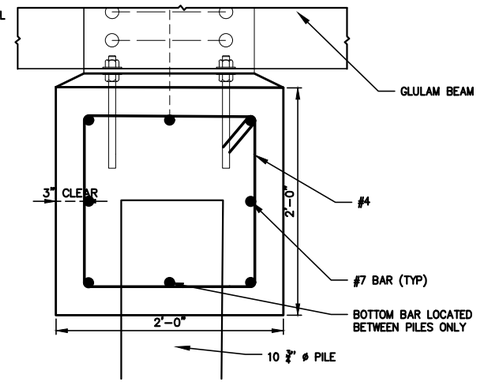


BENT 4 PLAN



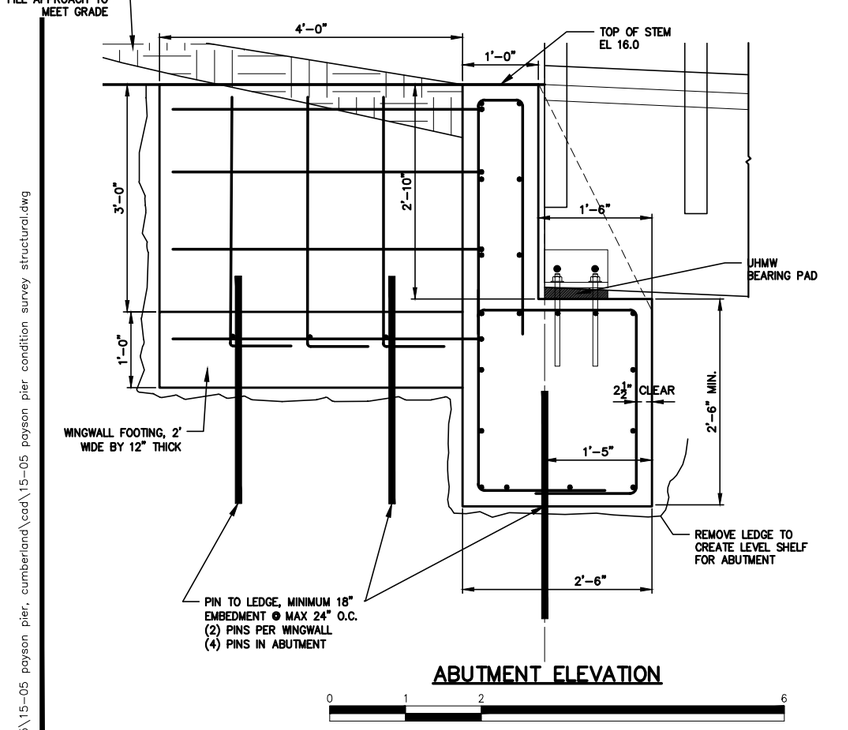
BENT 5 PLAN

0 1 2 3 4 8



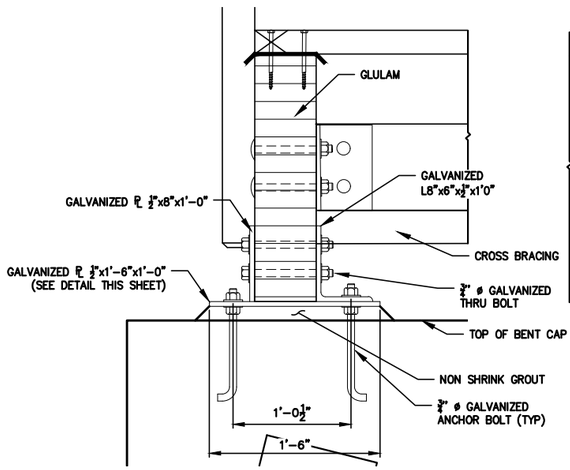
BENT CROSS SECTION D S-4

0 1 2 4

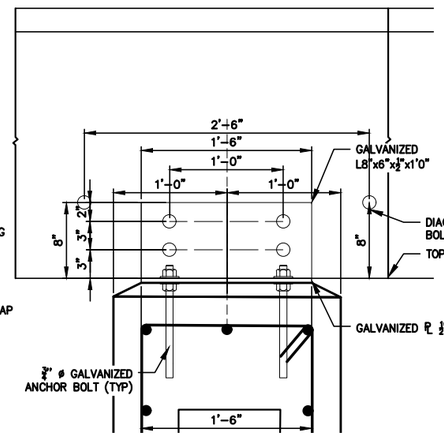


ABUTMENT ELEVATION

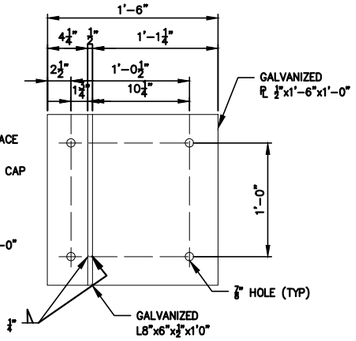
0 1 2 6



BEAM SEAT DETAIL



BEAM SEAT DETAIL



CONNECTION PLATE DETAIL

0 1 2 4

x:\15\15-05 poyson pier, cumberland\cad\15-05 poyson pier condition survey structural.dwg

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NO.	DESCRIPTION	INT.	DATE
1	BID SET SUBMISSION	BJB	6.5.18

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB	DRAWN BY:	JJC	CHECKED BY:	BJB	SCALE:	AS SHOWN

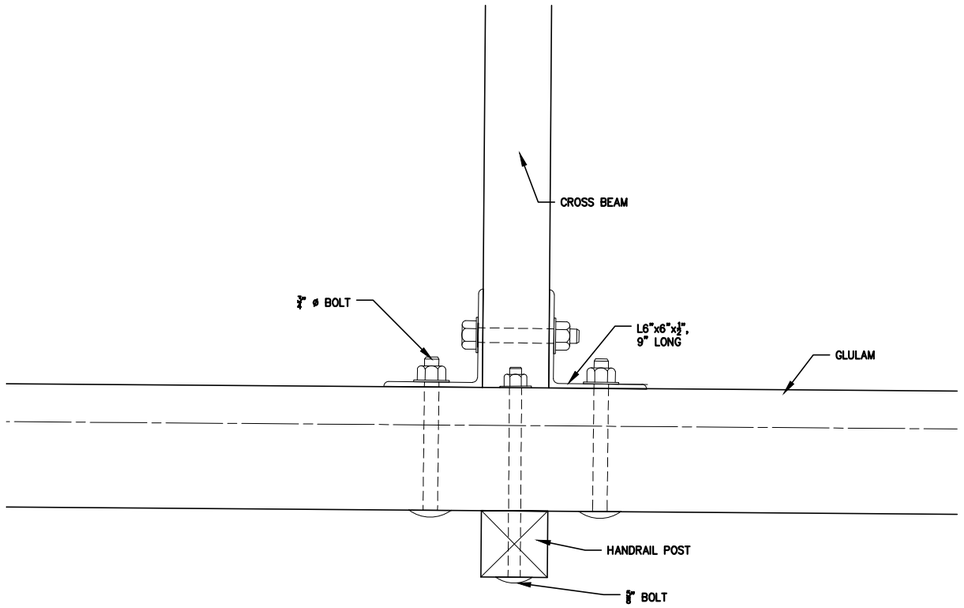
SHEET TITLE: ABUTMENT AND PILE CAP DETAILS

PROJECT: BROAD COVE PIER REPLACEMENT
TOWN OF CUMBERLAND
CUMBERLAND, MAINE

DATE: AUG 2015

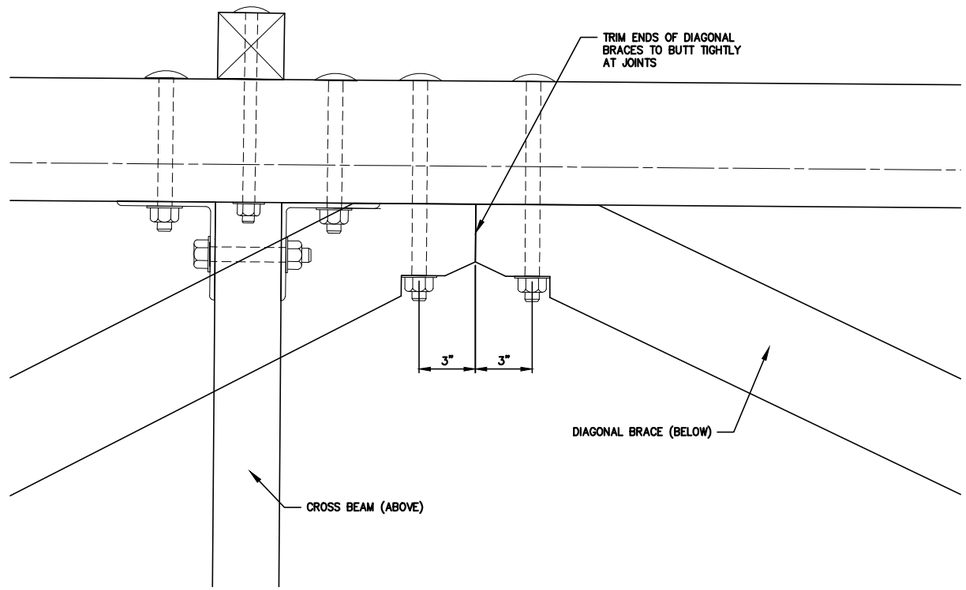
CONTRACT NO. 15-05

SHEET NO. S-5 | REV. 1



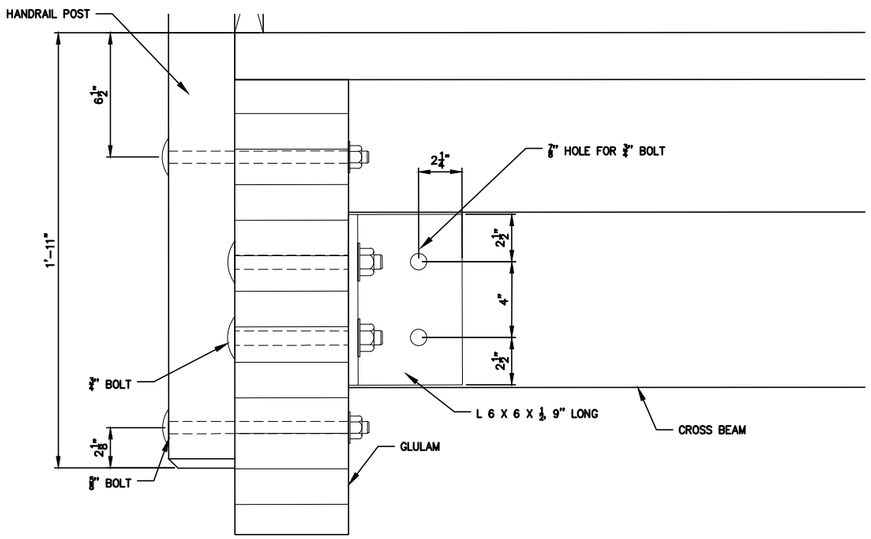
HANDRAIL POST AND CROSSBEAM CONNECTION DETAIL, PLAN VIEW

0 1 2



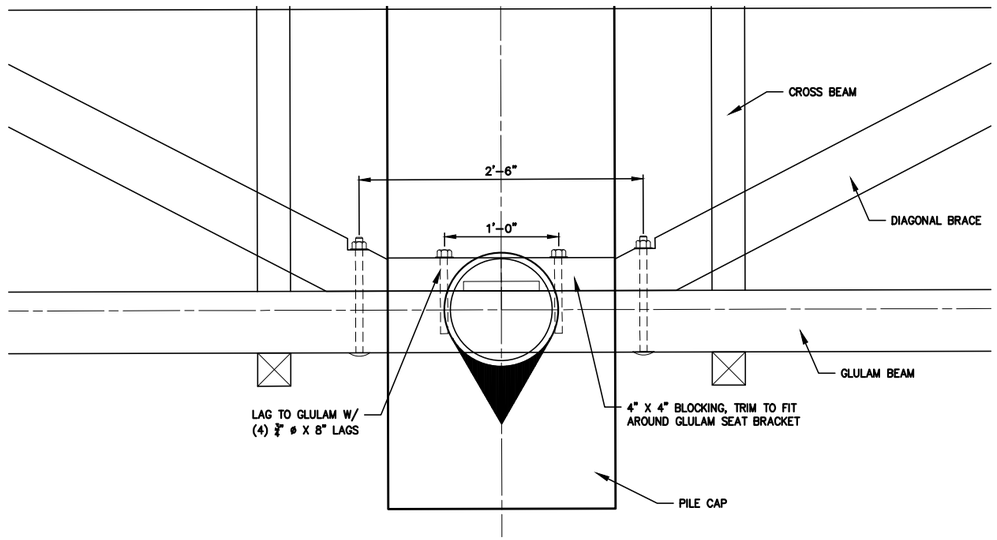
TYPICAL DIAGONAL BRACE CONNECTION DETAIL

0 1 2



HANDRAIL POST AND CROSSBEAM CONNECTION DETAIL, PROFILE VIEW

0 1 2



DIAGONAL BRACE CONNECTION AT SUPPORT

0 1 2 4

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NO.	DESCRIPTION	DATE	INT.
1	BID SET SUBMISSION	6.5.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: DJB
DRAWN BY: JJC
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: STRUCTURAL DETAILS

PROJECT: TOWN OF CUMBERLAND
BROAD COVE PIER REPLACEMENT
CUMBERLAND, MAINE

DATE: APR 2018

CONTRACT NO. 15-05

SHEET NO. S-6 | REV. A

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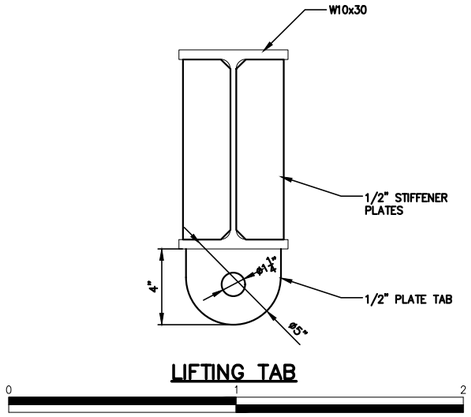
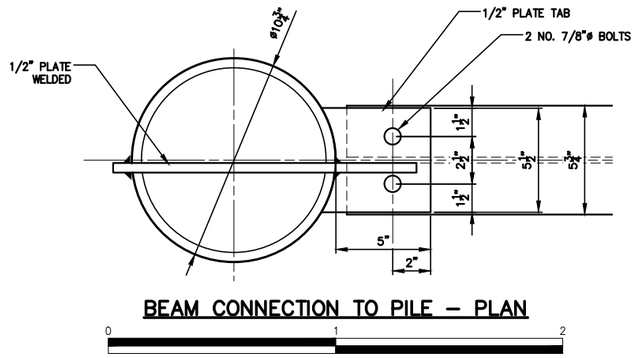


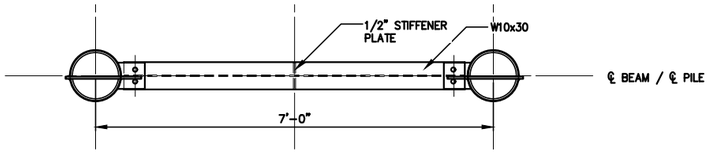
LIFTING TAB

0 1 2

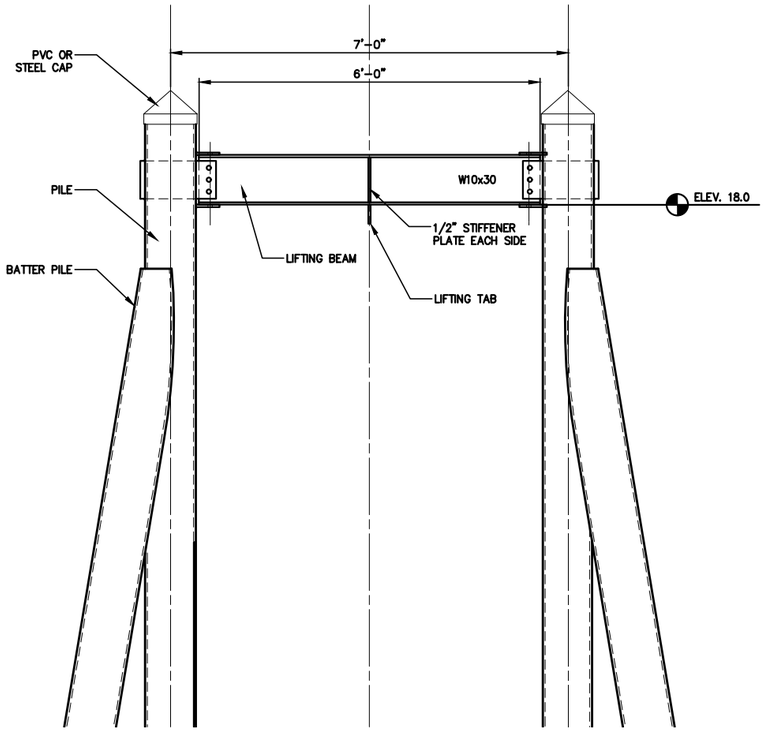


BEAM CONNECTION TO PILE – PLAN

0 1 2

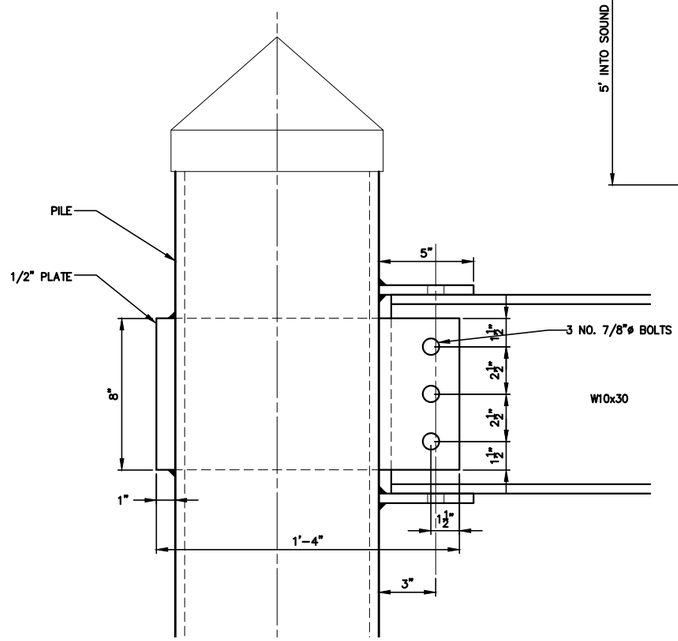


PLAN



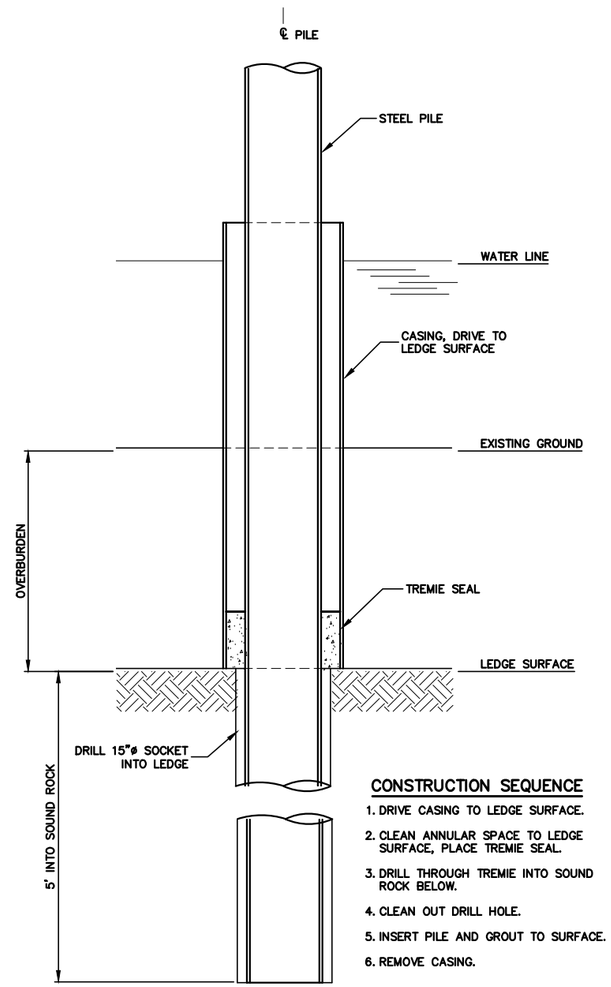
ELEVATION

0 1 2 6



BEAM CONNECTION TO PILE – ELEVATION

0 1 2



CONSTRUCTION SEQUENCE

1. DRIVE CASING TO LEDGE SURFACE.
2. CLEAN ANNULAR SPACE TO LEDGE SURFACE, PLACE TREMIE SEAL.
3. DRILL THROUGH TREMIE INTO SOUND ROCK BELOW.
4. CLEAN OUT DRILL HOLE.
5. INSERT PILE AND GROUT TO SURFACE.
6. REMOVE CASING.

STEEL PILE SOCKET DETAIL

SCALE: 1"=1'-0"

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NO.	SUBMISSION	DATE	INT.
1	BID SET	6.5.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
DJB	JJC	BJB	AS SHOWN

SHEET TITLE: LIFTING FRAME AND PILE SOCKET

PROJECT: BROAD COVE PIER REPLACEMENT
TOWN OF CUMBERLAND
CUMBERLAND, MAINE

DATE: AUG 2015

CONTRACT NO.: 15-05

SHEET NO.: S-7

REV.: 1

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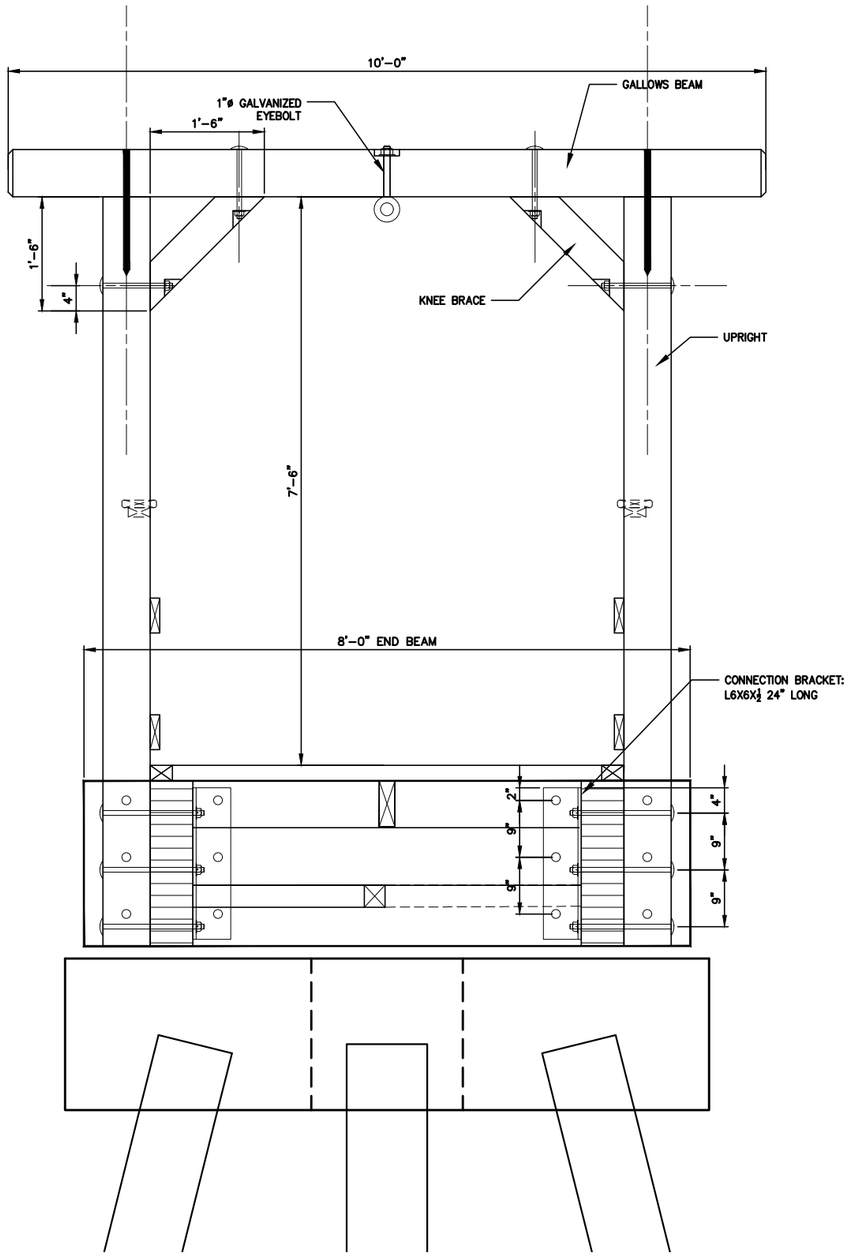
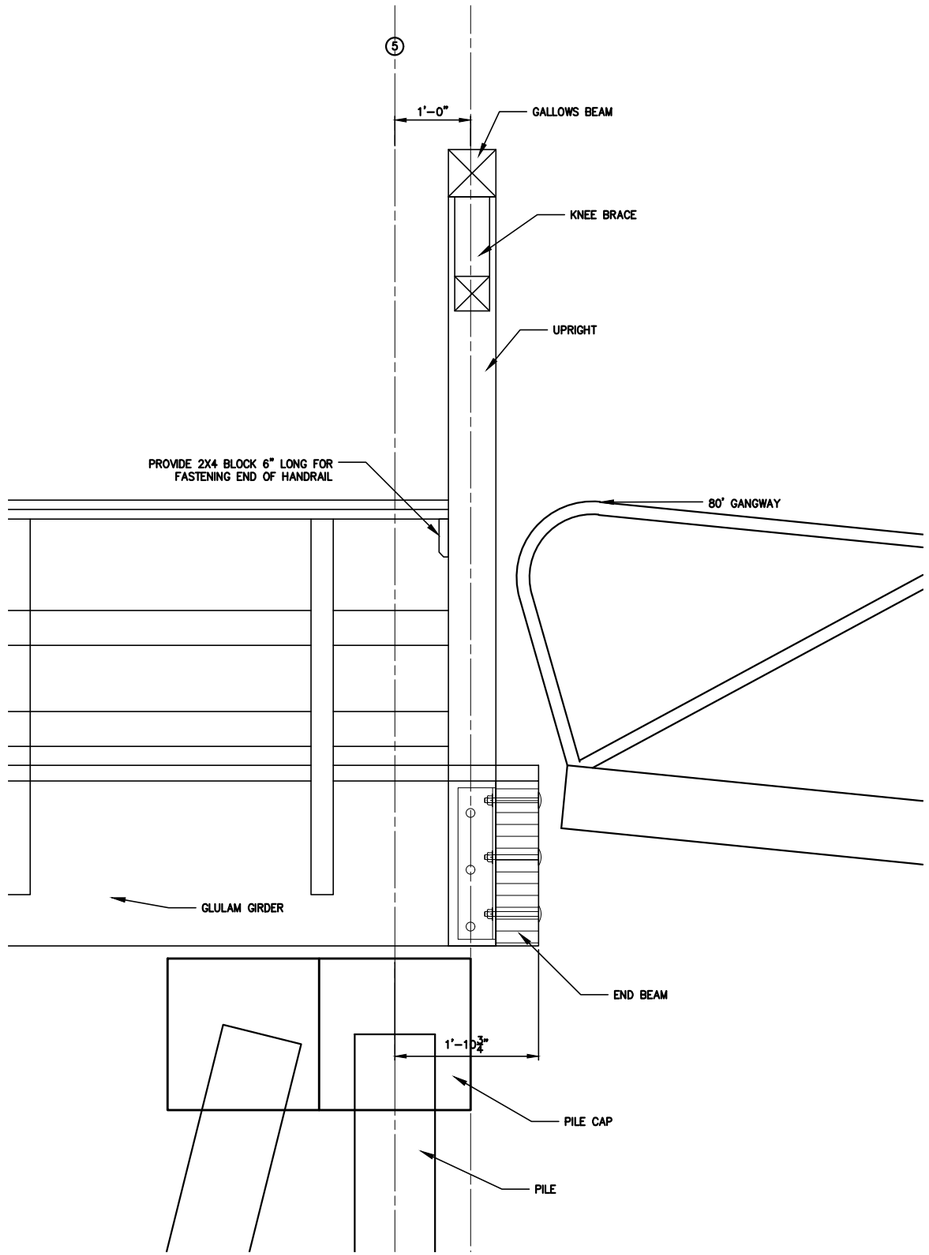


GALLOWS FRAME SECTION

0 1 2 6



GALLOWS FRAME ELEVATION

0 1 2 6

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NO.	DATE	INT.
1	6.5.18	BJB
	BID SET SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB	CHECKED BY:	BJB
DRAWN BY:	JJC	SCALE:	AS SHOWN

SHEET TITLE: GALLOWS & END BEAM DETAILS

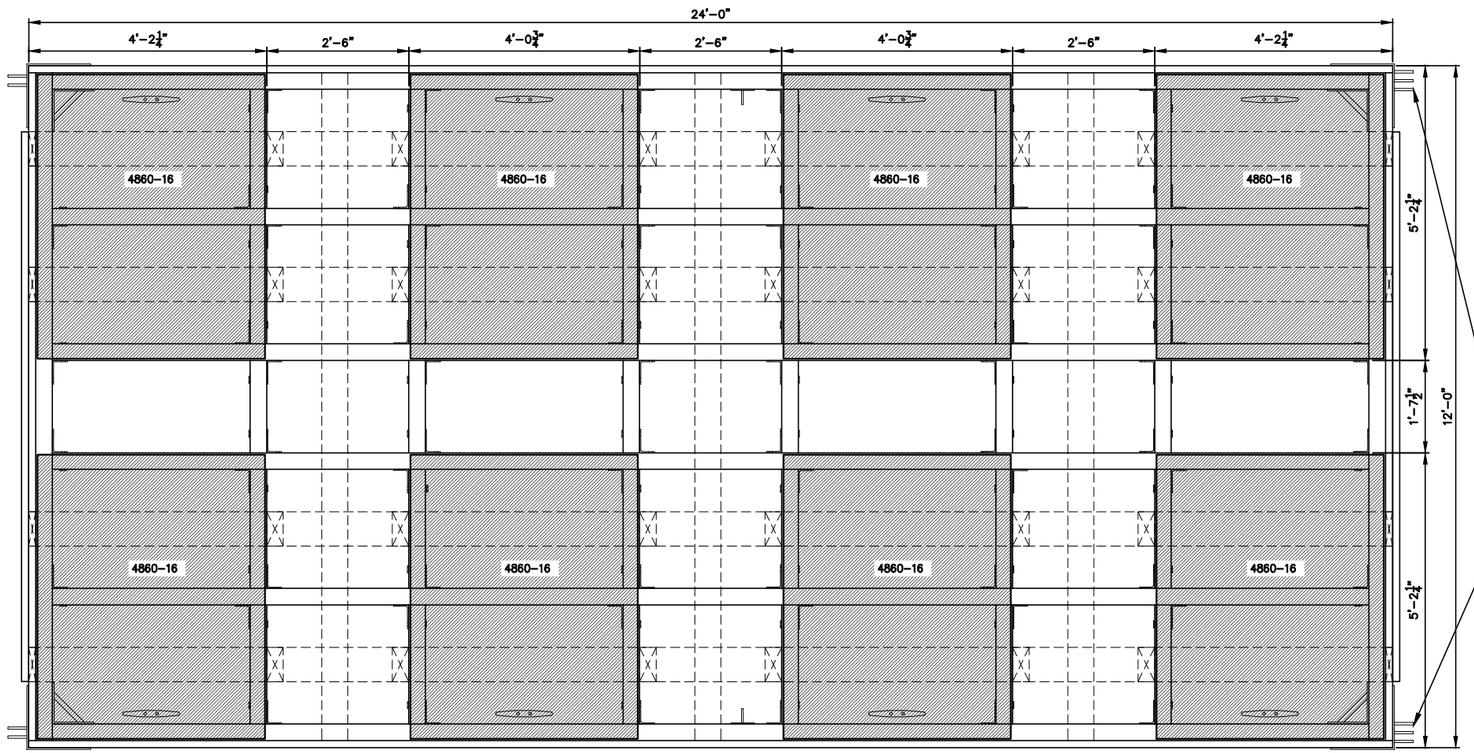
PROJECT: BROAD COVE PIER REPLACEMENT
TOWN OF CUMBERLAND
CUMBERLAND, MAINE

DATE APR. 2018

CONTRACT NO. 15-05

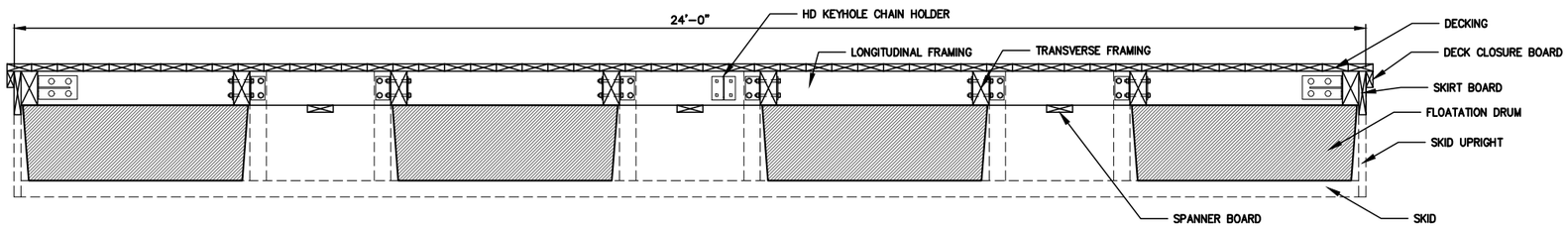
SHEET NO. S-8 | REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey structural.dwg

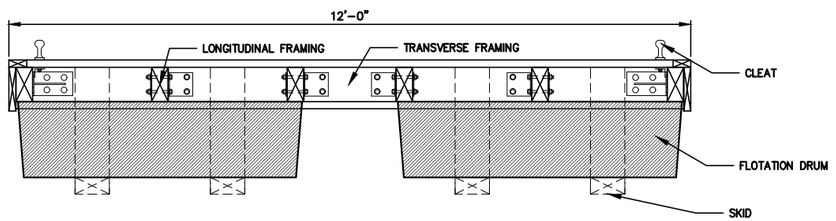


TIMBER SCHEDULE						
Timber Size	Location	% Moisture at Treatment	Treatment		Grading to SPIB	Surface Finishing
			Type	pcf		
FLOATS						
2 X 6	DECKING	19%	ACQ	0.6	No. 1	S4S
4 X 8	LONGITUDINAL FRAMING	25%	CCA	1.0	No. 1	S4S
4 X 8	TRANSVERSE FRAMING	25%	CCA	1.0	No. 1	S4S
2 X 6	SPANNER BOARD	25%	CCA	1.0	No. 1	S4S
4 X 8	SKIDS	25%	CCA	1.0	No. 2	R
4 X 8	SKID UPRIGHT - INTERIOR	25%	CCA	1.0	No. 2	R
2 X 8	SKID UPRIGHT - END	25%	CCA	1.0	No. 2	R
2 X 4	DECK CLOSURE BOARD	19%	ACQ	0.6	No. 1	S4S
2 X 10	SKIRT BOARD	19%	ACQ	0.6	No. 1	S4S

PLAN



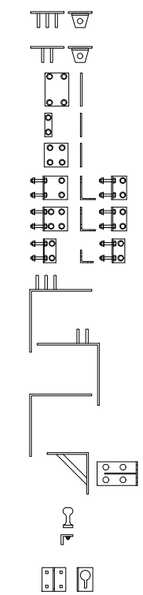
TYPICAL SECTION



TYPICAL SECTION

0 1 2 3 4 8

FLOAT HARDWARE



- 3/8" T-TAB PLATE 3 TAB (FEMALE) (6H494)
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- 3/8" CORNER NO TAB (6H490)
- 1/4" INSIDE CORNER (6H411)
- CLEAT WITH BACKING ANGLE
- HD KEYHOLE CHAIN HOLDER (6H416)

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NO.	DATE	INT.
1	6.5.18	BJB
	BID SET SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB	DRAWN BY:	JJC	CHECKED BY:	BJB	SCALE:	AS SHOWN

SHEET TITLE: TYPICAL 12X24 FLOAT DETAILS

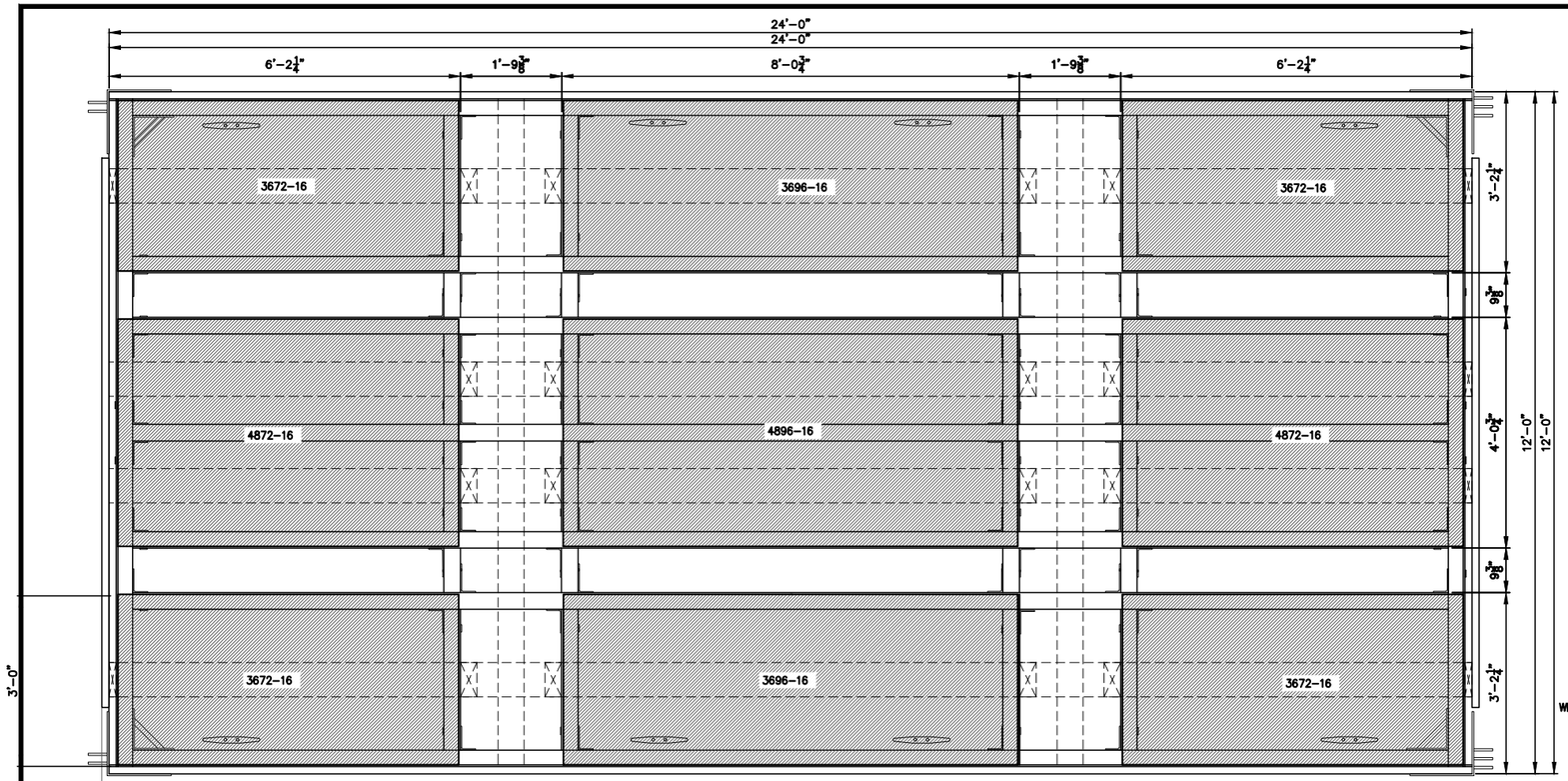
PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE DEC 2015

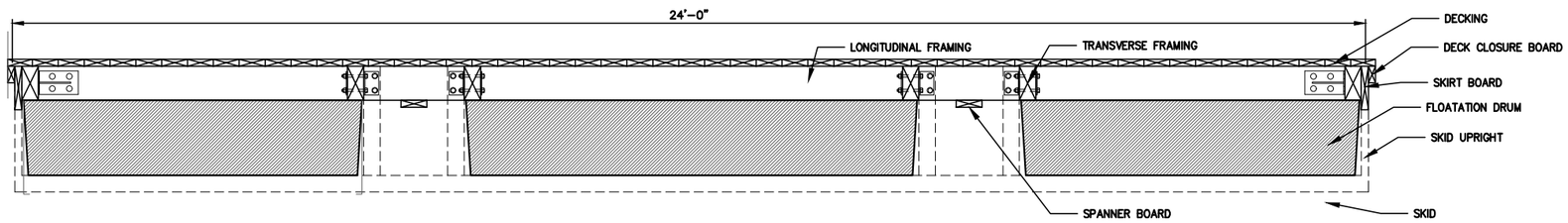
CONTRACT NO. 15-05

SHEET NO. F-1 | REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey structural.dwg



PLAN



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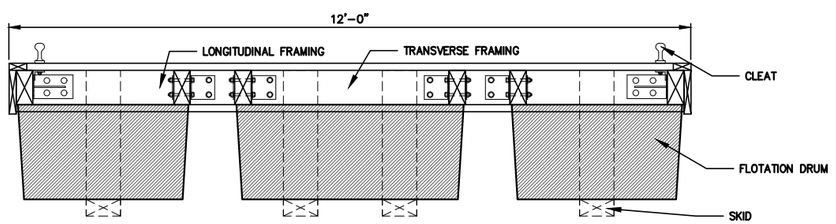
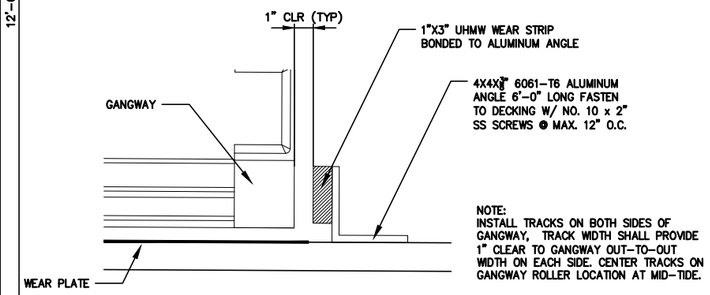


TYPICAL SECTION

0 1 2 3 4 8

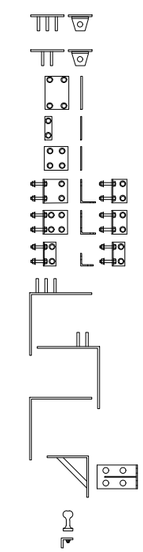
TIMBER SCHEDULE						
Timber Size	Location	% Moisture at Treatment	Treatment		Grading to SPIB	Surface Finishing
			Type	pcf		
FLOATS						
2 X 6	DECKING	19%	ACQ	0.6	No. 1	S4S
4 X 8	LONGITUDINAL FRAMING	25%	CCA	1.0	No. 1	S4S
4 X 8	TRANSVERSE FRAMING	25%	CCA	1.0	No. 1	S4S
2 X 6	SPANNER BOARD	25%	CCA	1.0	No. 1	S4S
4 X 8	SKIDS	25%	CCA	1.0	No. 2	R
4 X 8	SKID UPRIGHT - INTERIOR	25%	CCA	1.0	No. 2	R
2 X 8	SKID UPRIGHT - END	25%	CCA	1.0	No. 2	R
2 X 4	DECK CLOSURE BOARD	19%	ACQ	0.6	No. 1	S4S
2 X 10	SKIRT BOARD	19%	ACQ	0.6	No. 1	S4S



GANGWAY TRACK DETAIL

0 1 2

FLOAT HARDWARE



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SMALL BACKER PLATE (6H401)

BACKER PLATE (6H402)

90° STIFFENER PLATE (6H414)

90° SKID STIFFENER PLATE (6H418)

90° STIFFENER PLATE JR (6H414J)

3/8" CORNER HINGE PLATE 3 TAB (FEMALE) (6H492)

3/8" CORNER HINGE PLATE 2 TAB (MALE) (6H491)

3/8" CORNER NO TAB (6H490)

1/4" INSIDE CORNER (6H411)

CLEAT WITH BACKING ANGLE

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NO.	DESCRIPTION	DATE	INT.
1	BID SET SUBMISSION	6.5.18	BJB

STATE OF MAINE — BARNEY J. BAKER No. 5737 — LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB	DRAWN BY:	JJC	CHECKED BY:	BJB	SCALE:	AS SHOWN

SHEET TITLE: 12X24 GANGWAY FLOAT DETAILS

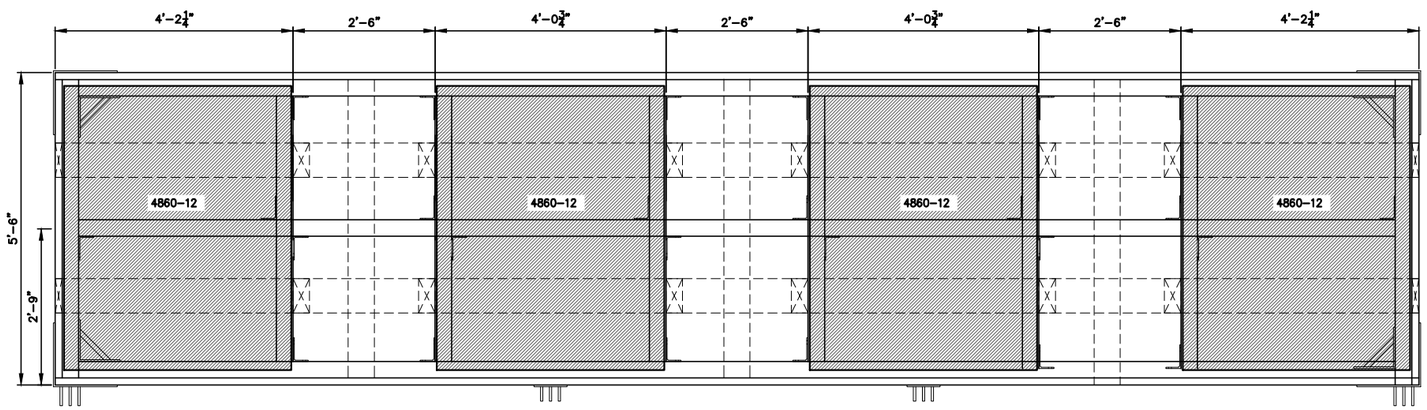
PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE: DEC 2015

CONTRACT NO. 15-05

SHEET NO. F-2 | REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey structural.dwg



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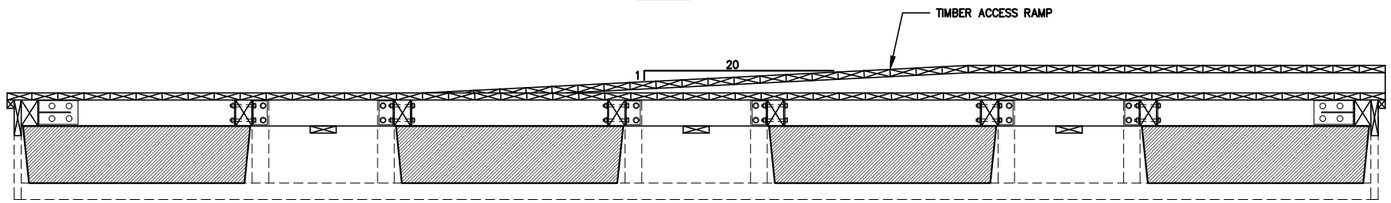

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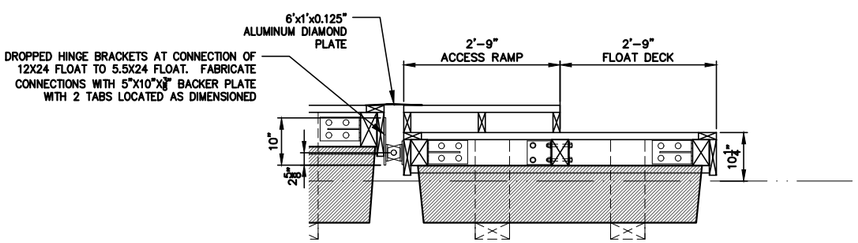

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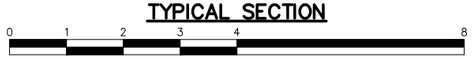
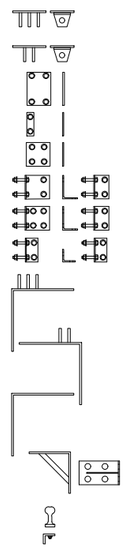


FLOAT HARDWARE



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NO.	DESCRIPTION	DATE	INT.
1	BID SET SUBMISSION	6.5.18	BJB

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DJB	DRAWN BY:	JJC	CHECKED BY:	BJB	SCALE:	AS SHOWN

SHEET TITLE: 5.5X24 FLOAT DETAILS

PROJECT: BROAD COVE PIER REPLACEMENT
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE: FEB 2016

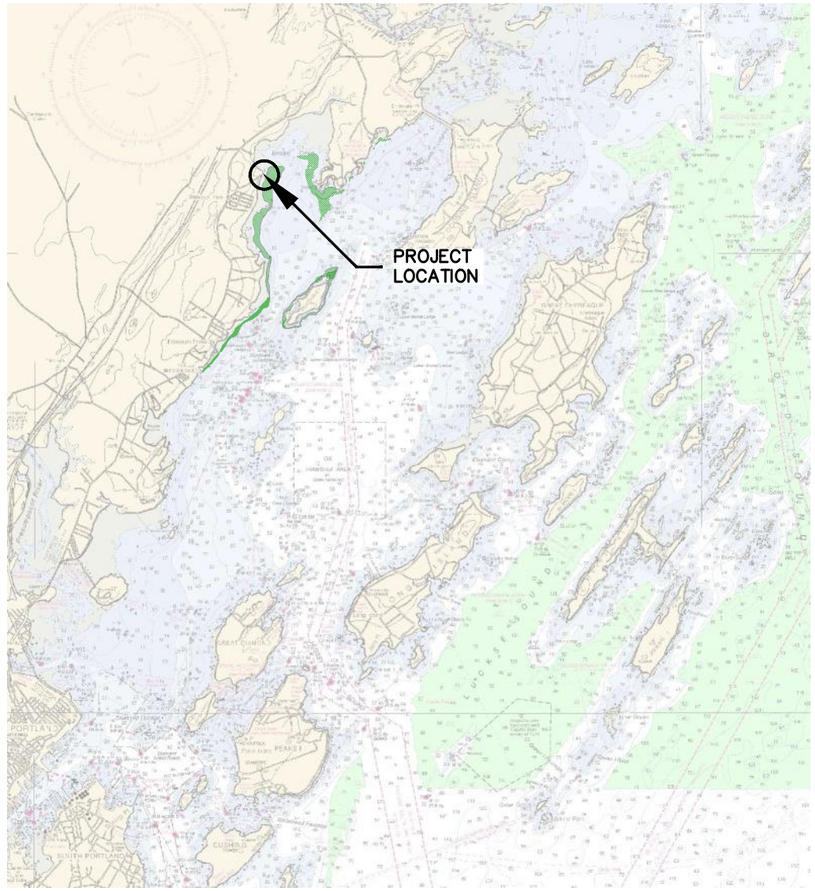
CONTRACT NO. 15-05

SHEET NO. F-3 | REV. 1

x:\15\15-05 payson pier, cumberland\cad\15-05 payson pier condition survey structural.dwg

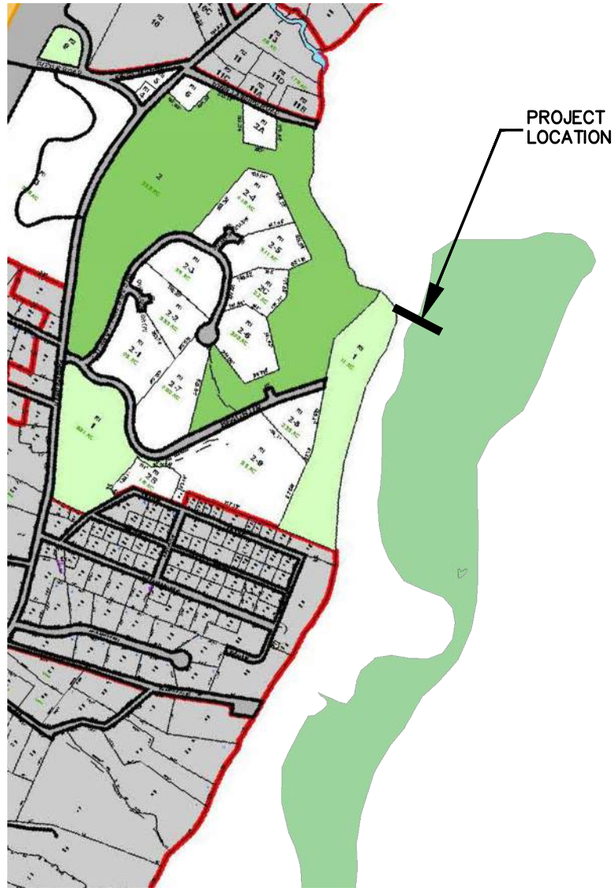
BROAD COVE PIER MASTER PLAN

BROAD COVE RESERVE, CUMBERLAND MAINE
PROJECT NO. 2209962



USGS LOCATION MAP

INDEX OF SHEETS



TAX MAP #R01

N

PROPERTY INFORMATION

OWNER:	TOWN OF CUMBERLAND, MAINE
ADDRESS:	179 FORESIDE ROAD CUMBERLAND, MAINE 04021
MAP/LOT:	R1-02
ZONING:	LOW DENSITY RESIDENTIAL (LDR); SHORELAND OVERLAY
SETBACKS:	NO CHANGE

GEI Consultants
5 MILK STREET • PORTLAND, ME 04101 • (207)797-8901

NO.	DATE	INT.
B	2022 EELGRASS	BJB
A	PERMIT SET	BJB
	SUBMISSION	

"STATE OF MAINE" BARNEY J. BAKER No. 5737 LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
BJB	JLD	BJB	AS SHOWN

SHEET TITLE: COVER SHEET

PROJECT: BROAD COVER RESERVE
BROAD COVER MASTER PLAN
Cumberland, Maine

DATE: JAN 2020

CONTRACT NO.: 2209962

SHEET NO.: G-1

REV.: A

GENERAL NOTES

1. THE CONTRACTOR SHALL BE GOVERNED BY THE CONSTRUCTION SAFETY RULES AS ADOPTED BY THE STATE BOARD OF CONSTRUCTION SAFETY, AUGUSTA, MAINE.
2. THE PROJECT IS SUBJECT TO THE SAFETY AND HEALTH REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) AS PROMULGATED BY THE US DEPARTMENT OF LABOR.
3. ALL NON-PAVED AREAS DISTURBED DURING CONSTRUCTION SHALL BE LOAMED, SEEDED, FERTILIZED AND MULCHED UNLESS OTHERWISE DIRECTED BY THE TOWN OR THEIR REPRESENTATIVE.
4. THE CONTRACTOR SHALL COMPLY WITH FEDERAL, STATE AND LOCAL REGULATORY REQUIREMENTS.
5. TOPSOIL STRIPPED IN AREAS OF CONSTRUCTION THAT IS SUITABLE FOR REUSE AS LOAM SHALL BE STOCKPILED AT A LOCATION TO BE DESIGNATED BY THE TOWN. UNSUITABLE SOIL SHALL BE SEPARATED, REMOVED AND DISPOSED OF AT AN APPROVED DISPOSAL LOCATION OFFSITE.

CONSTRUCTION SEQUENCE & COORDINATION

1. ALL CONSTRUCTION ACTIVITIES TO BE UNDERTAKEN FROM BARGE NO DISTURBANCE TO UPLAND SITE BEYOND THAT REQUIRED FOR CONSTRUCTION OF NEW PIER ABUTMENT AND APPROACH RAMP SHALL BE ALLOWED.
2. THE CONTRACTOR SHALL WORK WITH THE TOWN TO DESIGNATE A LAYDOWN AREA IN THE UPPER PARKING AREA ONSITE FOR PARKING AND MATERIAL DELIVERY; AND WILL COORDINATE ACCESS BETWEEN THE LAYDOWN AREA AND THE WATERFRONT WITH THE TOWN.

EROSION CONTROL NOTES

1. APPLICATION OF TEMPORARY AND PERMANENT EROSION CONTROL MEASURES FOR THE PROJECT SHALL BE IN ACCORDANCE WITH PROCEDURES AND SPECIFICATIONS OF THE CURRENT MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION; BEST MANAGEMENT PRACTICES.
2. SILTATION FENCE SHALL BE INSTALLED BEFORE ANY EXCAVATION TAKES PLACE.
3. INSTALL EROSION CONTROL MESH ON ALL PROPOSED SLOPES 2:1 OR STEEPER, UNLESS SHOWN OR NOTED OTHERWISE.
4. ALL EROSION CONTROL MEASURES, SEEDING AND MULCHING SHALL BE INSPECTED WEEKLY, AFTER RAINSTORMS AND DURING RUNOFF EVENTS. ALL MEASURES SHALL BE REPAIRED OR REPLACED WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DAMAGE.
5. SEEDED AND MULCHED AREAS SHALL BE MAINTAINED UNTIL FINAL ACCEPTANCE OF THE WORK
6. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED UPON COMPLETION OF GRADING OPERATIONS AND ESTABLISHMENT OF ACCEPTABLE GROUND COVER.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EROSION CONTROL MEASURES DURING CONSTRUCTION.

SURVEY & DATUM NOTES

1. BASE SURVEY, TOPGRAPHY, SITE DATUM CONTROL, AND PROJECT BENCHMARKS ARE FROM A FIELD SURVEY WITH DOCUMENTING PLAN BY LITTLE RIVER LAND SURVEYING DATED 10/19/15.
2. ALL TOPOGRAPHIC INFORMATION PROVIDED IS REFERENCED TO NAVD88 VERTICAL DATUM UNLESS OTHERWISE NOTED.
3. BASE FLOOD/TIDAL INFORMATION TAKEN FROM MEDEP, FEMA, AND NOAA PUBLISHED DATA, REFER TO THE TABLE BELOW.

PROJECT ELEVATIONS (BY DATUM)

ELEVATION	CHART (ft)	NGVD29 (ft)	**NAVD88 (ft)**	Notes
FEMA Base Flood	22.3	17.7	**17.0**	Prelim FEMA Zone VE
FEMA Base Flood	19.5	15.0	**14.3**	Effective FEMA Zone V2
Highest Annual Tide	11.9	7.4	**6.7**	2013 MEDEP Predictions
MHHW	9.9	5.4	**4.7**	BASED ON TIDAL BM "PORTLAND"
MHW	9.5	5.0	**4.2**	
NAVD88	5.3		**0.0**	
NGVD29	4.5	0.0		
MLW	0.3	-4.2	**-4.9**	
MLLW	0.0	-4.5	**-5.3**	

REFERENCE DOCUMENTS

1. BOUNDARY SURVEY "PLAN OF SPEARS HILL SUBDIVISION, 179 FORESIDE ROAD, CUMBERLAND, MAINE" BY TITCOMB ASSOCIATES, DATED AUGUST 28, 2014 AND REVISED THROUGH DECEMBER 11, 2014.
2. COPIES OF REGULATORY PERMITS ARE PROVIDED IN THE PROJECT MANUAL.

SCOPE OF MASTER PLAN

1. REMOVE EXISTING GROUND TACKLE. INSPECT FOR CONDITION AND SUITABILITY FOR REUSE.
2. MODIFY FLOAT CONNECTIONS ON EXISTING FLOATS [NO. 1, NO. 2] TO MATCH PROPOSED LAYOUT.
3. FABRICATE FLOATS [NO. 6, 7, 8, 9a, 9b, 10].
4. INSTALL PROPOSED FLOAT SYSTEM WITH ADDITIONAL MOORRING HARDWARE PER SCHEDULE.
5. ADD TITAL GAUGE AT END OF EXISTING PIER PER DETAIL ON SH. C-2.

STRUCTURAL NOTES

FLOAT SYSTEM

1. REFER TO DRAWINGS F-1, F-2.
2. PROVIDE ONE 90-DEGREE STIFFENER (6H414 PLATE OR EQUAL) AT EACH TIMBER CONNECTION WHERE NO CORNER BRACKET OCCURS UNLESS OTHERWISE NOTED.
3. FLOAT FENDERING HAS NOT BEEN SPECIFIED ON THE FLOATS WITH THE UNDERSTANDING THAT THEY MAY BE ADDED BY CHANGE ORDER ONCE THE BASE BID AND ALTERNATE BID FLOAT CONFIGURATION IS FINALIZED.

MOORING TACKLE

1. REFER TO SHEET C-1 FLOAT LAYOUT PLAN FOR NUMBER AND LOCATION OF MOORINGS AND THE MOORING TACKLE SCHEDULE PROVIDED BELOW FOR TACKLE REQUIREMENTS.

MOORING TACKLE SCHEDULE

MOORING LOCATION	HELIX ANCHOR CONFIGURATION			FLOAT CONNECTION	SHACKLE SIZE [IN]	BOTTOM CHAIN			TOP CHAIN		
	Anchors per Mooring	Anchor Configuration Disc/Disc/Shaft/Length	Pullout Resistance per Anchor			Length (FT)	SIZE [IN]	SPECIFICATION (Working Load Limit)	LENGTH [FT]	SIZE [IN]	SPECIFICATION (Working Load Limit)
See C-1 & C-2	2	10"/12"/1-1/2"/10-FT	8000 lbs. (See Note iii)	6H416 Keyhole Anchor Plate	1	5	1	GRADE 43 HDG (30,000 lbs.)	75	5/8	GRADE 43 HDG (13,000 lbs.)

Notes:

i. Install anchors at locations shown and adjust chain lengths to achieve desired float layout.

ii. The contractor shall include in their bid all hardware (chains, shackles, bolts, etc.) needed for complete installation of the anchor system.

iii. Pullout resistance to be verified by field load test or based on measured installation torque correlated with manufactures test data. Anchors that do not meet this criteria at the direction of the Engineer.

TIMBER SCHEDULE

Timber Size	Location	% Moisture at Treatment	Treatment		Grading to SPIB	Surface Finishing
			Type	pcf		
SEE FLOATS SH. F-1 & F-2						
2 X 6	DECKING	19%	ACQ	0.6	No. 1	S4S
4 X 8	LONGITUDINAL FRAMING	25%	CCA	1.0	No. 1	S4S
4 X 8	TRANSVERSE FRAMING	25%	CCA	1.0	No. 1	S4S
2 X 6	SPANNER BOARD	25%	CCA	1.0	No. 1	S4S
4 X 8	SKIDS	25%	CCA	1.0	No. 2	R
4 X 8	SKID UPRIGHT - INTERIOR	25%	CCA	1.0	No. 2	R
2 X 8	SKID UPRIGHT - END	25%	CCA	1.0	No. 2	R
2 X 4	DECK CLOSURE BOARD	19%	ACQ	0.6	No. 1	S4S
2 X 10	SKIRT BOARD	19%	ACQ	0.6	No. 1	S4S

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NO.	DATE	BY
B	11/1/23	BJB
A	1:20:20	BJB
	2022 EELGRASS PERMIT SET SUBMISSION	INT.

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

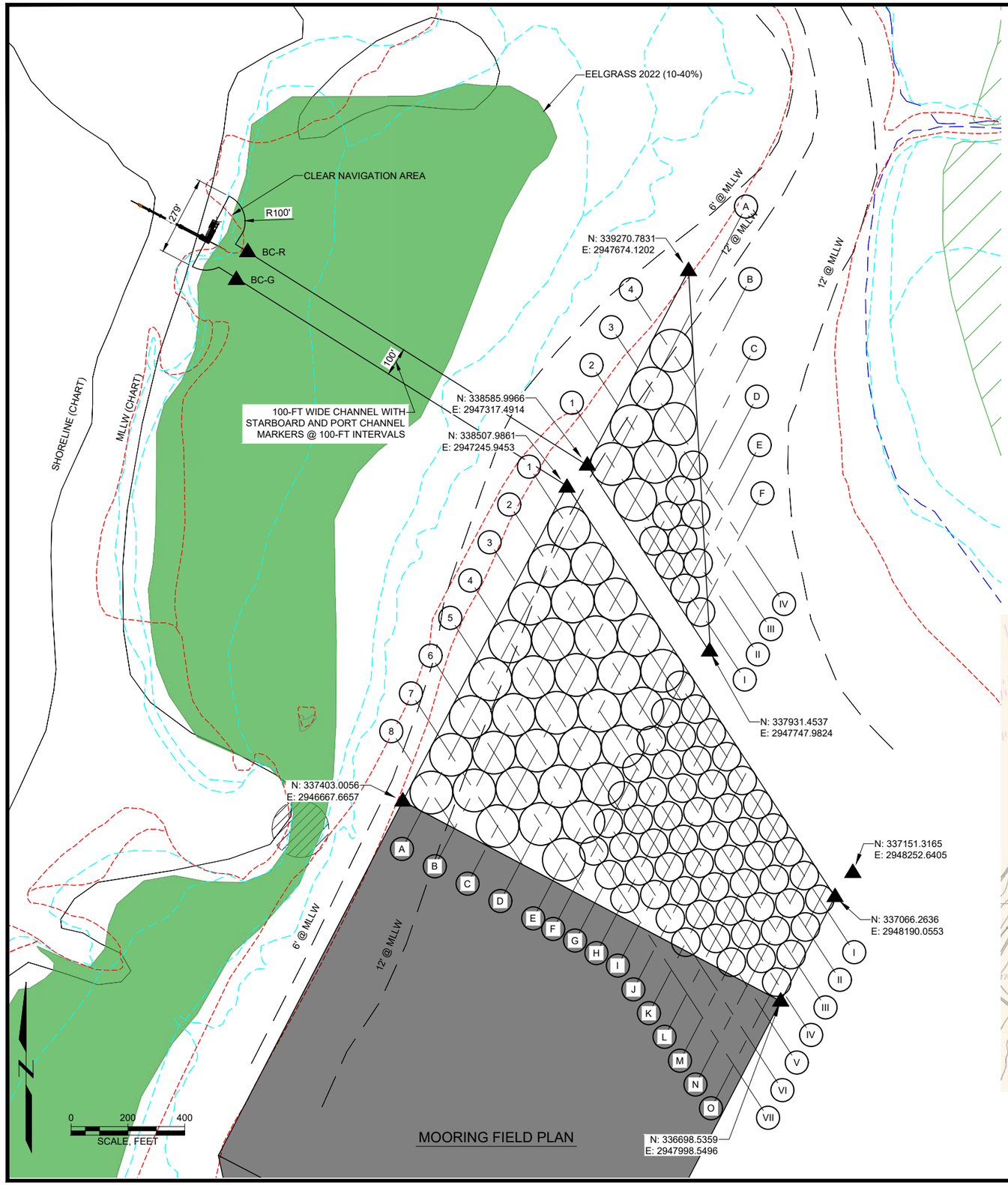
SHEET TITLE: NOTES & SCHEDULES

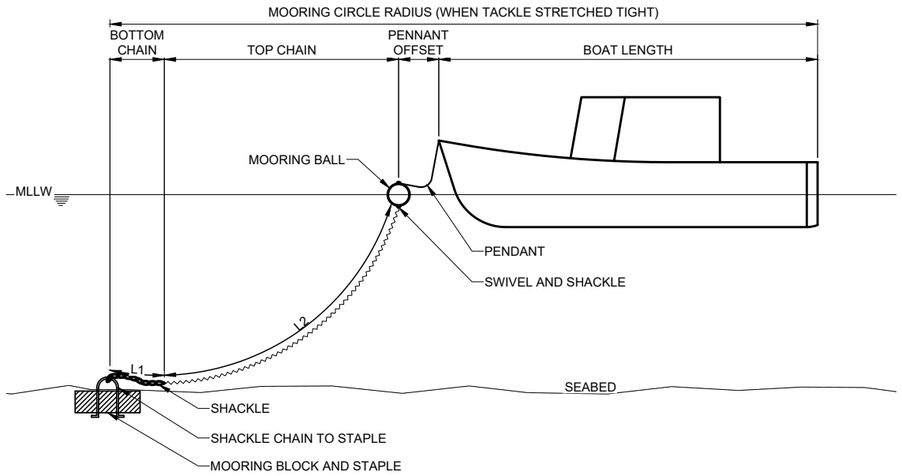
PROJECT: BROAD COVE RESERVE
BROAD COVE MASTER PLAN
Cumberland, Maine

DATE
JAN 2020

CONTRACT NO.
2209962

SHEET NO. G-2 | REV. A





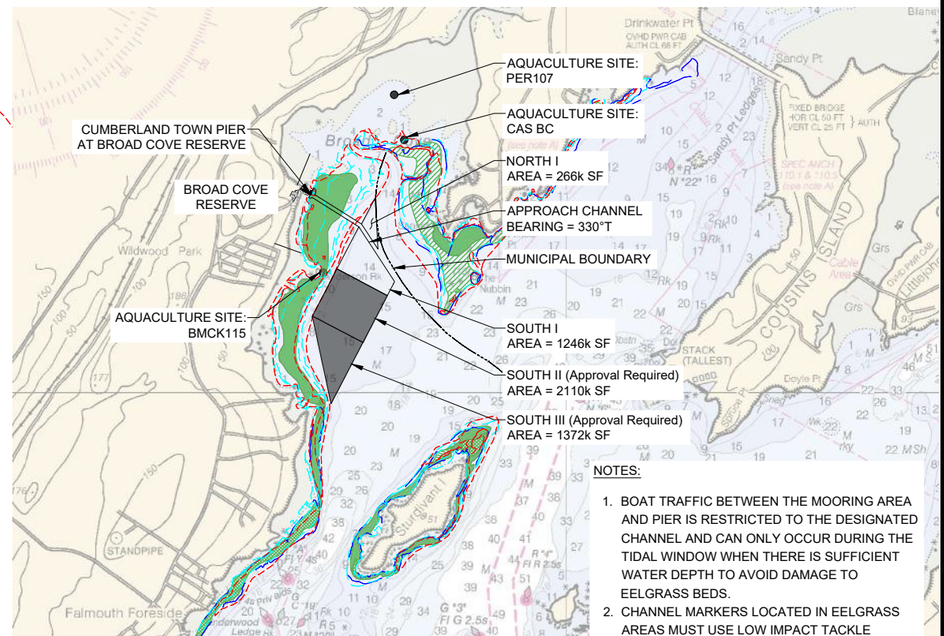
TYPICAL MOORING CONFIGURATION

NOT TO SCALE

2022 EELGRASS LIMITS 0-10% COVERAGE
2022 EELGRASS LIMITS 10-40% COVERAGE
2022 EELGRASS LIMITS 40-70% COVERAGE
2022 EELGRASS LIMITS 70-100% COVERAGE
2018 EELGRASS LIMITS
2013 EELGRASS LIMITS
1997 EELGRASS LIMITS

Mooring Plan Handbook Recommendations for no mooring interference

Boat Length FT		Depth of Water FT		Bow Ht	"Mooring Plan Handbook" Recom.			
					Chain Length	Pennant Length	Mooring Circle Dia.	
Range ft	Max ft	MLW	MHW	FT	(MHW x 2)+2.5xBow Ht		MLW	MHW
10 to 20	20	6	14.8	3.0	29.6	7.5	111.7	105.0
		12	20.8	3.0	41.6	7.5	133.4	125.8
		18	26.8	3.0	53.6	7.5	154.7	146.6
		24	32.8	3.0	65.6	7.5	175.9	167.4
20 to 30	30	12	20.8	4.0	41.6	10.0	158.0	150.4
		18	26.8	4.0	53.6	10.0	179.3	171.2
		24	32.8	4.0	65.6	10.0	200.4	192.0
		30	38.8	4.0	77.6	10.0	221.5	212.7
30 to 40	40	12	20.8	5.0	41.6	12.5	182.6	175.0
		18	26.8	5.0	53.6	12.5	203.9	195.8
		24	32.8	5.0	65.6	12.5	225.0	216.5
		30	38.8	5.0	77.6	12.5	246.0	237.3



NAUTICAL CHART INSET

0 2000 4000
SCALE, FEET

NOTES:

1. BOAT TRAFFIC BETWEEN THE MOORING AREA AND PIER IS RESTRICTED TO THE DESIGNATED CHANNEL AND CAN ONLY OCCUR DURING THE TIDAL WINDOW WHEN THERE IS SUFFICIENT WATER DEPTH TO AVOID DAMAGE TO EELGRASS BEDS.
2. CHANNEL MARKERS LOCATED IN EELGRASS AREAS MUST USE LOW IMPACT TACKLE COMPRISING A MUSHROOM ANCHOR (OR EQUAL) AND SUSPENDED LINE TO MINIMIZE DISTURBANCE TO THE SEABED.

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STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	BJB	CHECKED BY:	BJB
DRAWN BY:	JLD	SCALE:	AS SHOWN

SHEET TITLE: MOORING PLAN

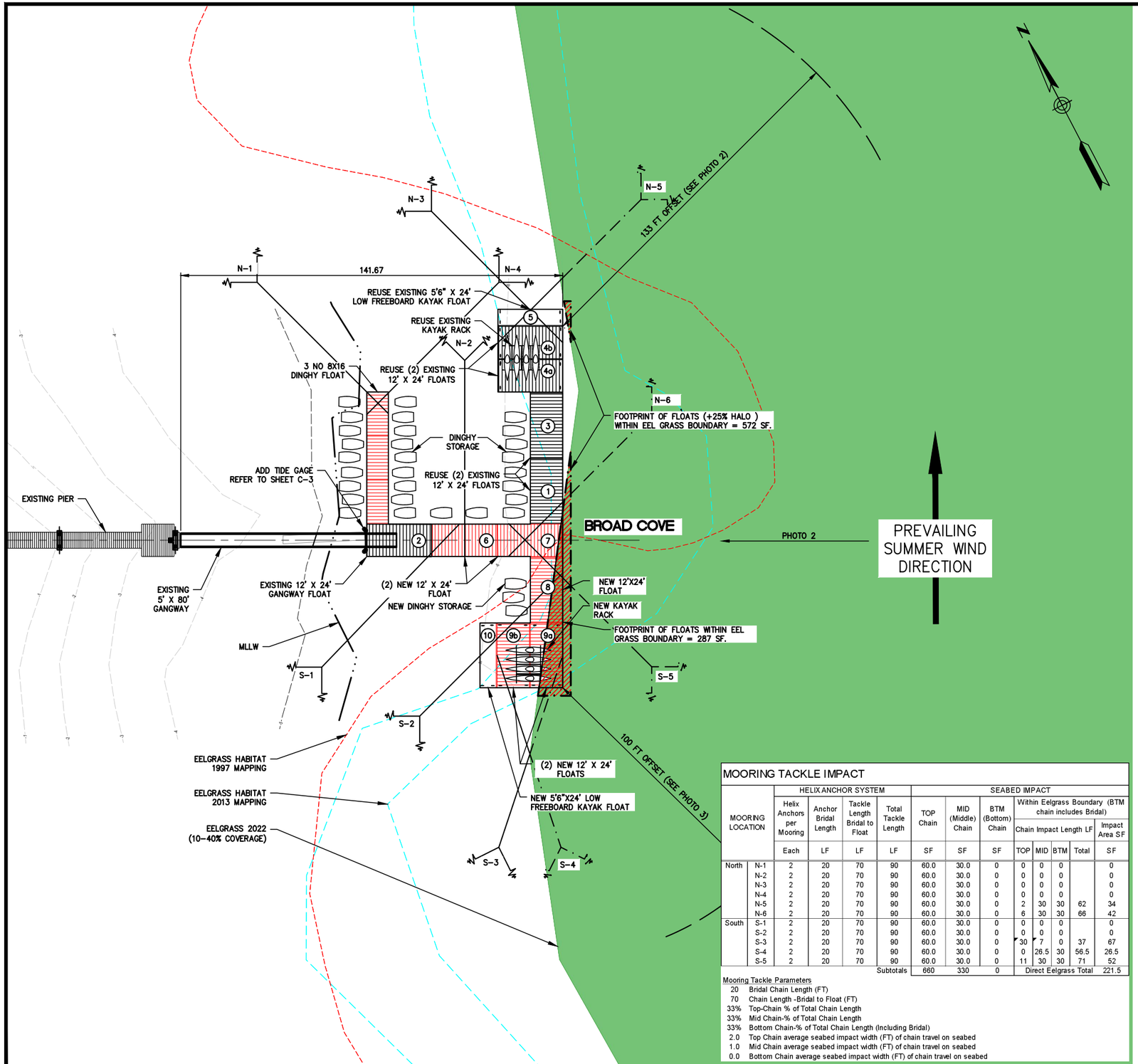
PROJECT: BROAD COVE MASTER PLAN
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE JAN 2020

CONTRACT NO. 2202962

SHEET NO. G-3 | REV. A

b:\working\cumberland, me town of\2202962 broad cove waterfront\00_cad\design\sheets\220962_general.dwg 12/5/2023



PROPOSED SITE PLAN

MOORING TACKLE IMPACT

MOORING LOCATION		HELIX ANCHOR SYSTEM: Helix Anchors per Mooring	Anchor Bridal Length	Tackle Length Bridal to Float	Total Tackle Length	SEABED IMPACT: TOP Chain	MID (Middle) Chain	BTM (Bottom) Chain	Within Eelgrass Boundary (BTM chain includes Bridal): Chain Impact Length LF TOP	MID	BTM	Total	Impact Area SF
		Each	LF	LF	LF	SF	SF	SF					SF
North	N-1	2	20	70	90	60.0	30.0	0	0	0	0		0
	N-2	2	20	70	90	60.0	30.0	0	0	0	0		0
	N-3	2	20	70	90	60.0	30.0	0	0	0	0		0
	N-4	2	20	70	90	60.0	30.0	0	0	0	0		0
	N-5	2	20	70	90	60.0	30.0	0	2	30	30	62	34
	N-6	2	20	70	90	60.0	30.0	0	6	30	30	66	42
South	S-1	2	20	70	90	60.0	30.0	0	0	0	0		0
	S-2	2	20	70	90	60.0	30.0	0	0	0	0		0
	S-3	2	20	70	90	60.0	30.0	0	30	7	0	37	67
	S-4	2	20	70	90	60.0	30.0	0	0	26.5	30	56.5	26.5
	S-5	2	20	70	90	60.0	30.0	0	11	30	30	71	52
					Subtotals	660	330	0	Direct Eelgrass Total				221.5

Mooring Tackle Parameters

20	Bridal Chain Length (FT)
70	Chain Length -Bridal to Float (FT)
33%	Top-Chain % of Total Chain Length
33%	Mid Chain-% of Total Chain Length
33%	Bottom Chain-% of Total Chain Length (Including Bridal)
2.0	Top Chain average seabed impact width (FT) of chain travel on seabed
1.0	Mid Chain average seabed impact width (FT) of chain travel on seabed
0.0	Bottom Chain average seabed impact width (FT) of chain travel on seabed

NOTES:
1. FIELD MEASUREMENTS TAKEN AT LOW TIDE ON AUGUST 12, 2022 (-1.2 FT @ 5.53 AM)
2. DRONE SURVEY COMPLETED AT LOW TIDE ON AUGUST 13, 2022 (-1.3 FT @ 6:35AM)

PHOTO 1: 133' NE FROM DOCK

PHOTO 2: LOOKING AT EXISTING DOCK

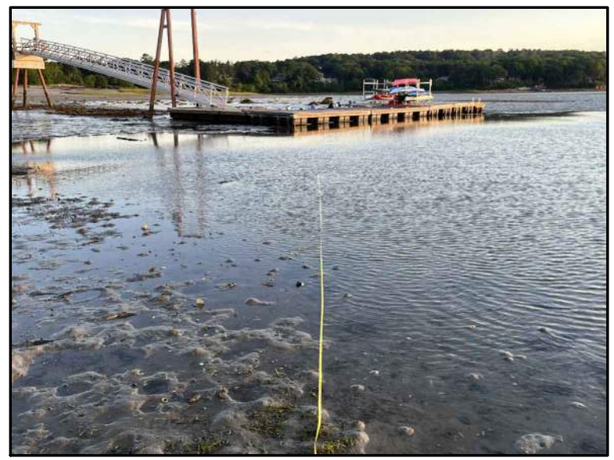


PHOTO 3: 100' SE FROM DOCK

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NO.	DATE	INT.
E	4.26.2024	BJB
D	4/25/24	BJB
C	11/1/23	BJB
B	8/12/22	BJB
A	1/20/20	BJB

MOORING TACKLE IMPACTS
EEL GRASS/FLOAT HALO +25%
2022 EELGRASS
FIELD SURVEY
PERMIT SET
SUBMISSION

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: EELGRASS OFFSETS

PROJECT: BROAD COVE MASTER PLAN
BROAD COVE RESERVE
Cumberland, Maine

DATE JAN 2020
CONTRACT NO. 220962
SHEET NO. C-1
REV. E

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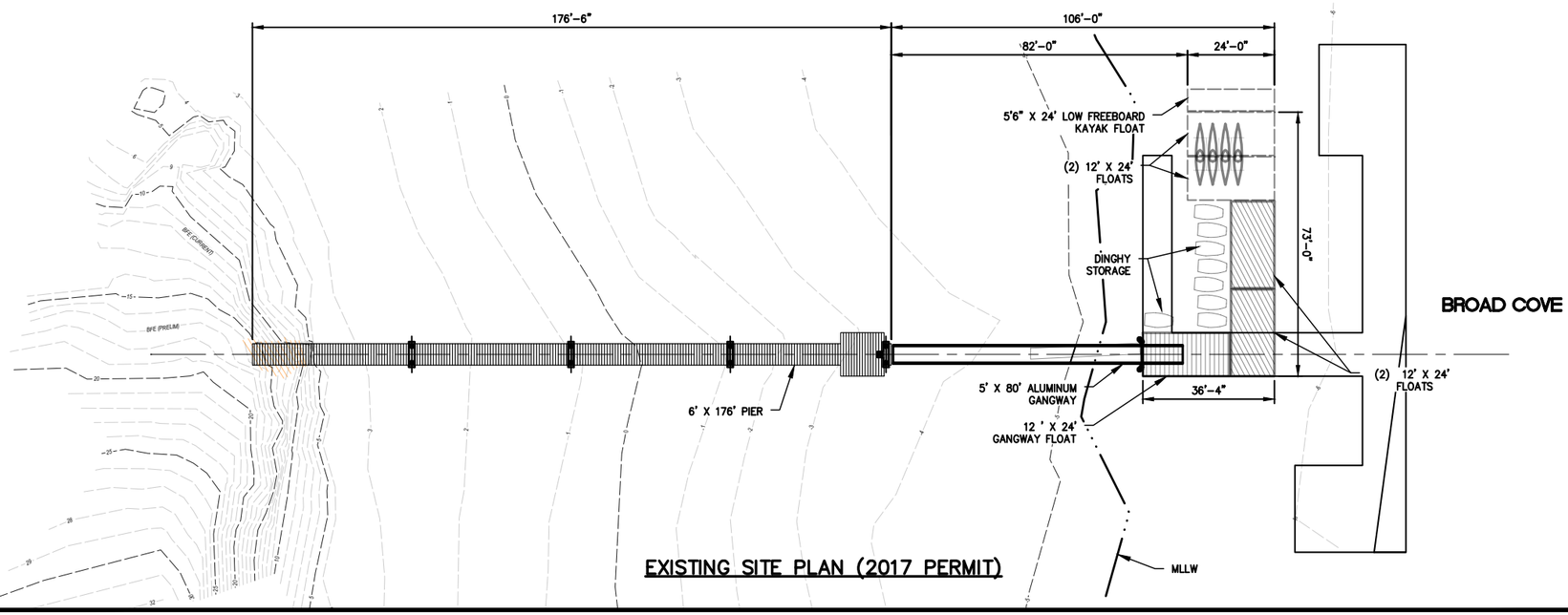
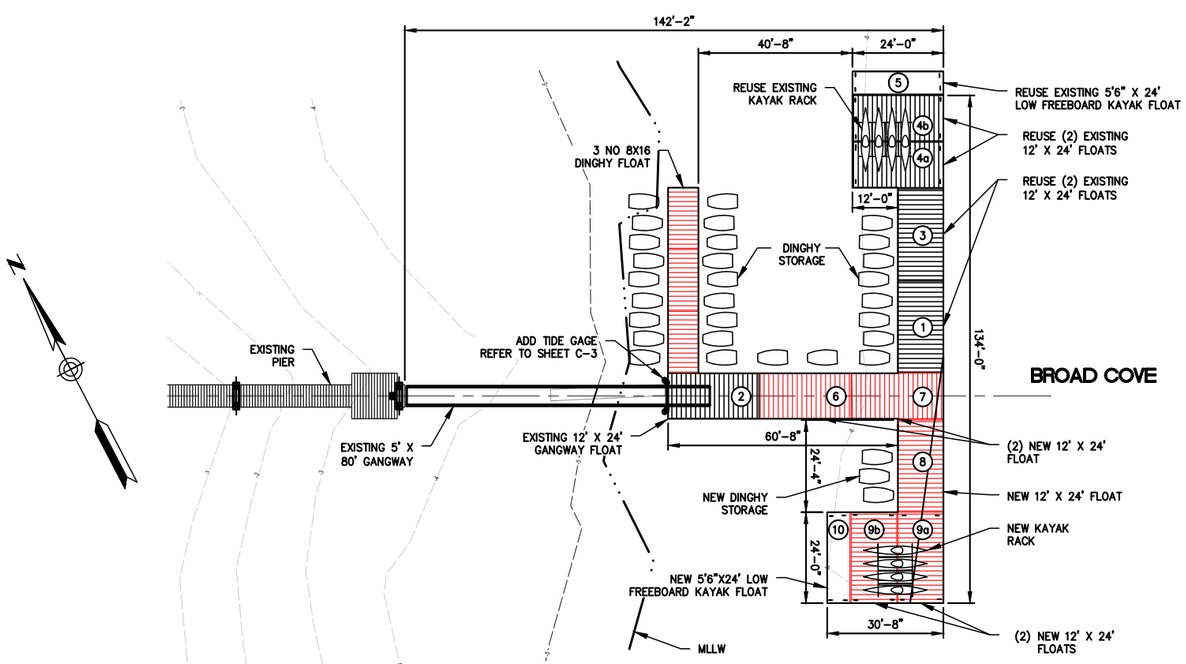


EXISTING SITE PLAN (2017 PERMIT)

FLOAT SCHEDULE							
Size	Area	Existing Floats	Total Area: Existing	Proposed Floats	Total Area: Proposed	Total Floats	Total Area
12 x 24 Gangway Float	288	1	288	0	0	1	288
12 x 24 Float	288	4	1152	5	1440	9	2592
5.5 x 24 Float	132	1	132	1	132	2	264
8 x 16 Float	128	0	0	3	384	3	384
Total:		6	1572	9	1956	15	3528



PROPOSED SITE PLAN

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NO.	DATE	INT.
B	11/1/23	BJB
A	1:20:20	BJB
	PERMIT SET SUBMISSION	
	2022 EELGRASS	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: SITE PLAN

PROJECT: BROAD COVE MASTER PLAN
BROAD COVE RESERVE
Cumberland, Maine

DATE JAN 2020
CONTRACT NO. 220962
SHEET NO. C-2
REV. A

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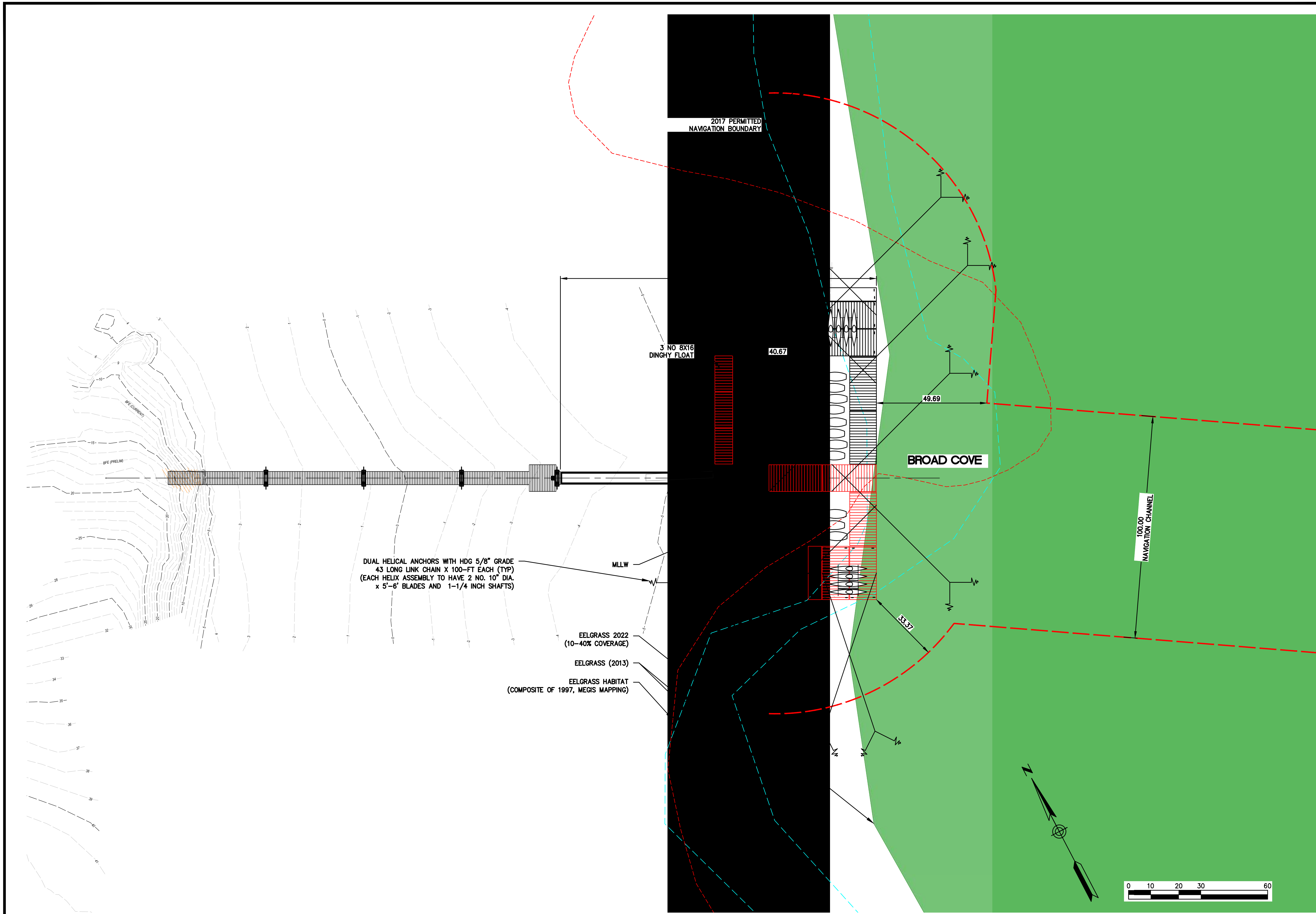

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NO.	SUBMISSION	DATE	INT.
C	HELIX ANCHOR NOTE	03.06.2024	BJB
B	2022 EELGRASS	11/1/23	BJB
A	PERMIT SET	1.20.20	BJB

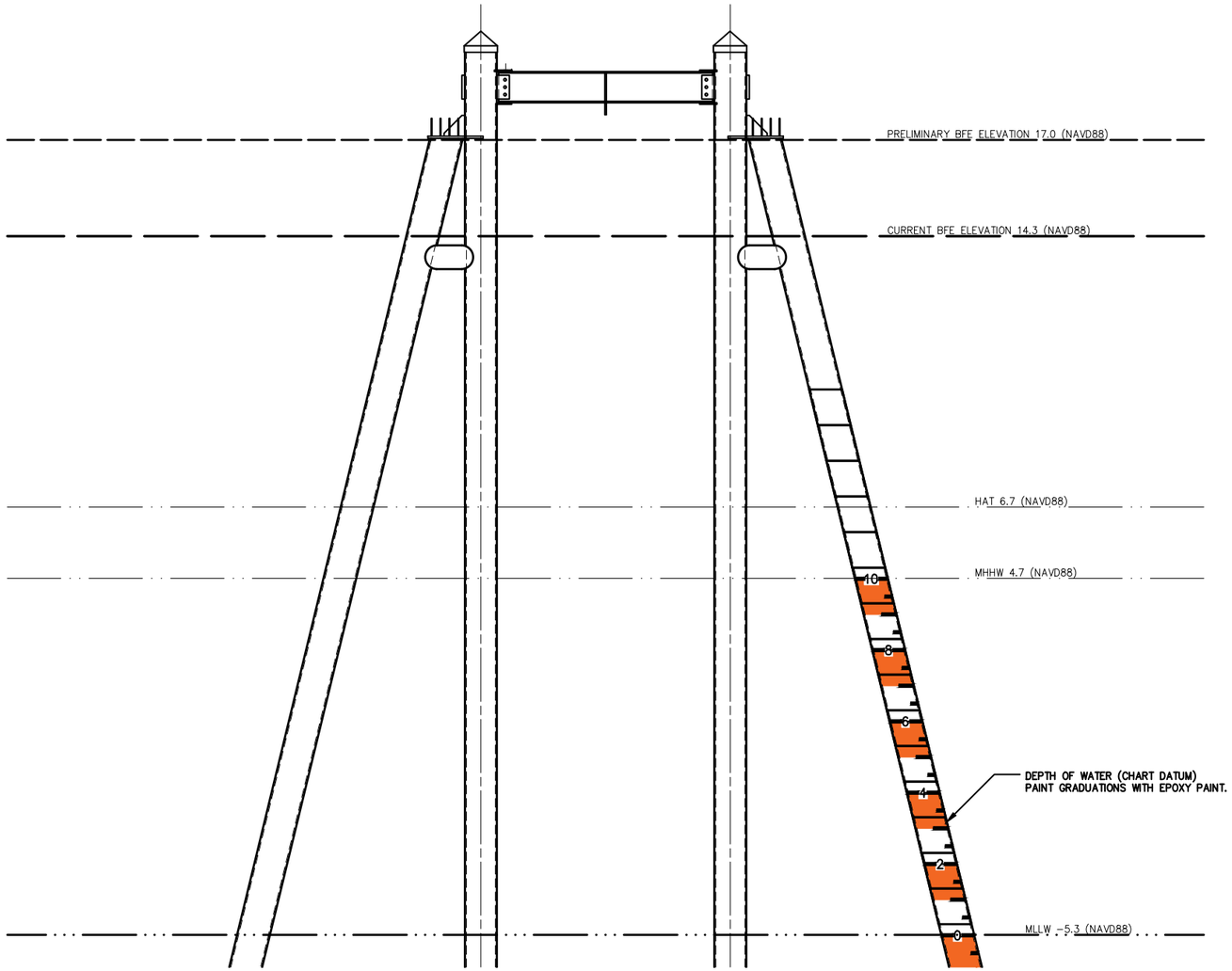
STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: EELGRASS IMPACT PLAN

PROJECT: BROAD COVE RESERVE
BROAD COVE MASTER PLAN
Cumberland, Maine

DATE JAN 2020
CONTRACT NO. 220962
SHEET NO. C-3
REV. C



TIDAL GAUGE

0 2 4 6 12

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NO.	DATE	INT.
B	11/1/23	BJB
A	11/5/19	BJB
	2022 EELGRASS PROGRESS PLAN SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: BJB
DRAWN BY: JLD
CHECKED BY: BJB
SCALE: AS SHOWN

SHEET TITLE: TIDAL GAUGE

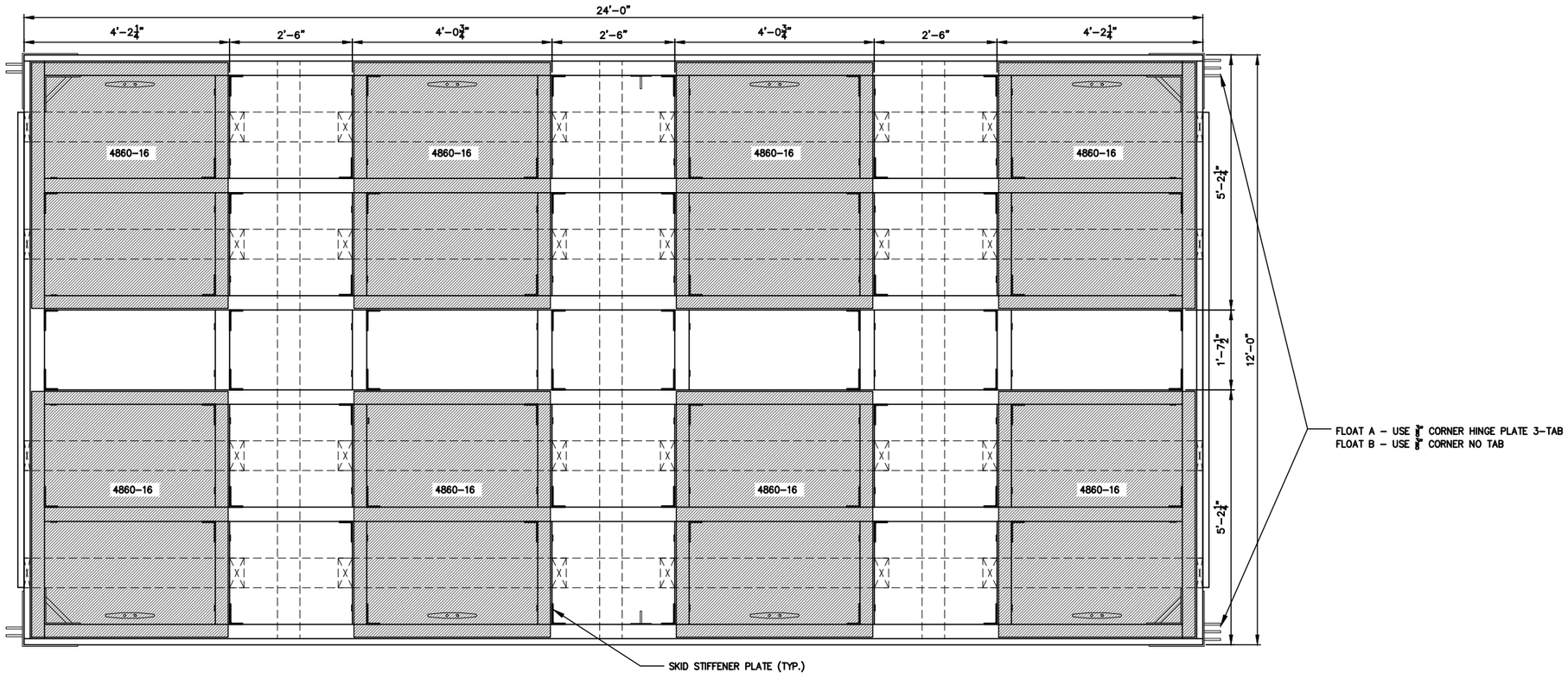
PROJECT: BROAD COVE MASTER PLAN
BROAD COVE RESERVE
Cumberland, Maine

DATE
DEC 2019

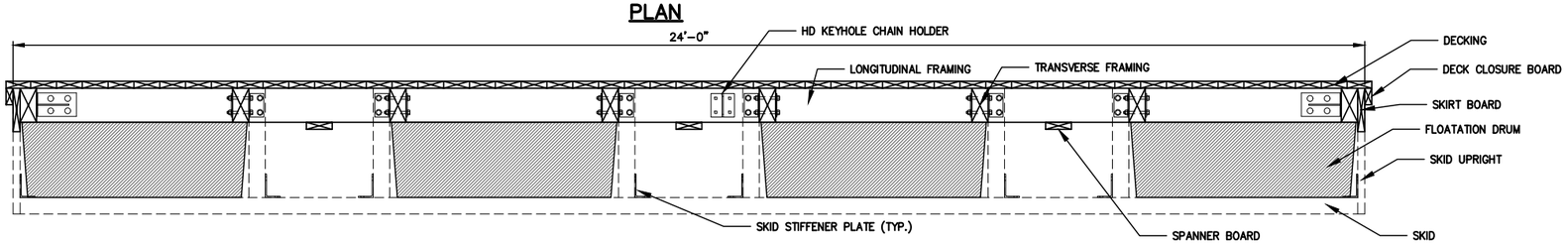
CONTRACT NO.
220962

SHEET NO. C-4

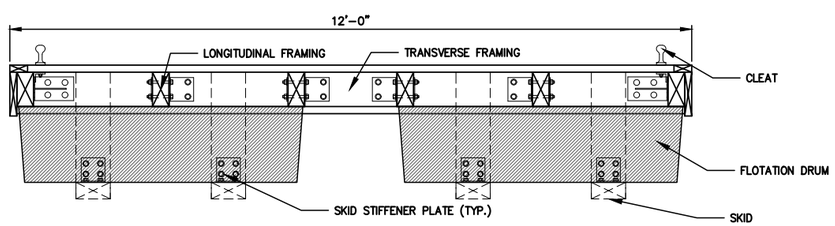
REV. A



PLAN

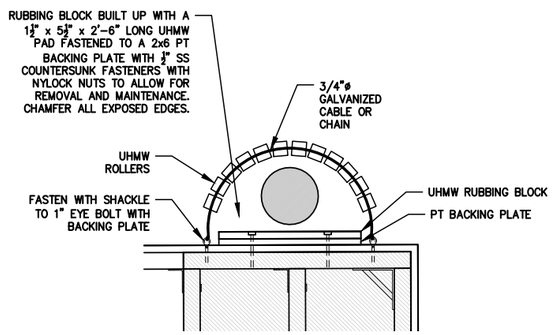


TYPICAL SECTION



TYPICAL SECTION

0 1 2 3 4 8



PILE GUIDE DETAIL

0 1 2 3 4 8

FLOAT HARDWARE

- 3/8" T-TAB PLATE 3 TAB (FEMALE) (6H494)
- 3/8" T-TAB PLATE 2 TAB (MALE) (6H493)
- 3/8" BACKER PLATE (6H496)
- SMALL BACKER PLATE (6H401)
- BACKER PLATE (6H402)
- 90° STIFFENER PLATE (6H414)
- 90° SKID STIFFENER PLATE (6H418)
- 90° STIFFENER PLATE JR (6H414J)
- 3/8" CORNER HINGE PLATE 3 TAB (FEMALE) (6H492)
- 3/8" CORNER HINGE PLATE 2 TAB (MALE) (6H491)
- 3/8" CORNER NO TAB (6H490)
- 1/4" INSIDE CORNER (6H411)
- CLEAT WITH BACKING ANGLE
- HD KEYHOLE CHAIN HOLDER (DH-CR)

NOTES:

1.) REFER TO TIMBER SCHEDULE ON SHEET G-2

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NO.	DATE	INT.
B	11/1/23	BJB
A	1:20:20	BJB
	2022 EELGRASS PERMIT SET SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	BJB	CHECKED BY:	BJB
DRAWN BY:	JLD	SCALE:	AS SHOWN

SHEET TITLE: TYPICAL 12X24 FLOAT DETAILS

PROJECT: BROAD COVE RESERVE
BROAD COVE MASTER
CUMBERLAND, MAINE

DATE JAN 2020

CONTRACT NO. 220962

SHEET NO. F-1 | REV. A

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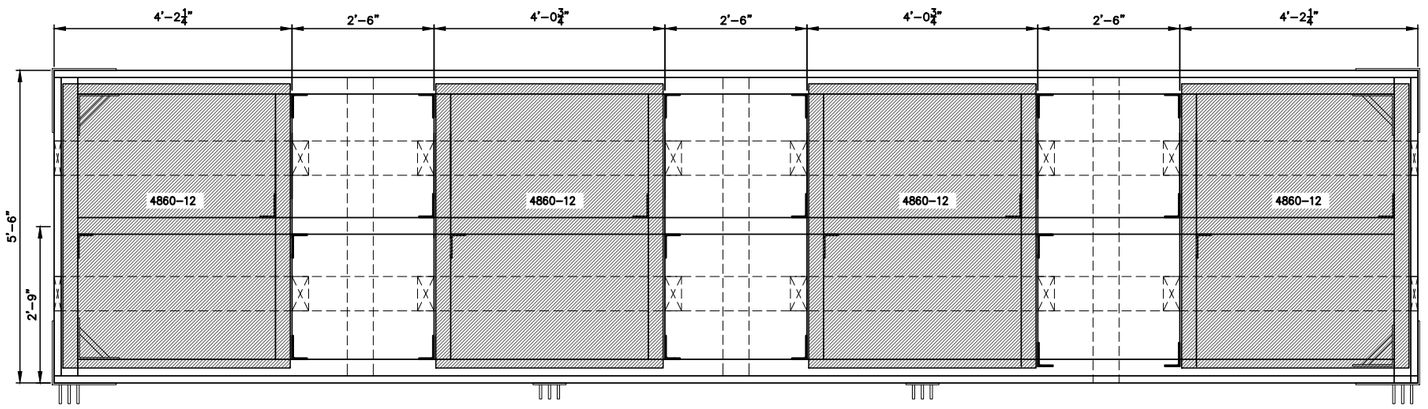
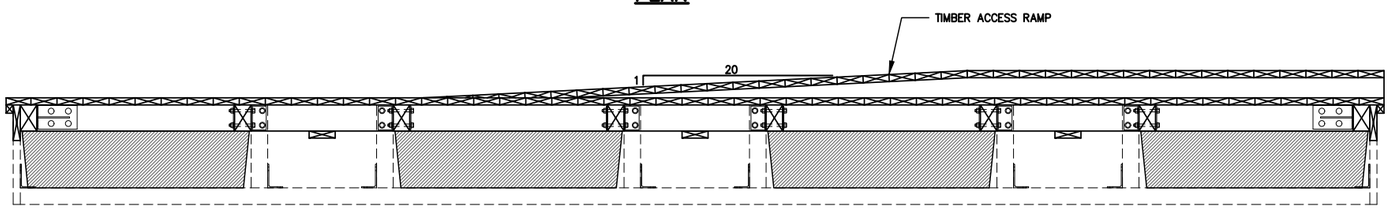
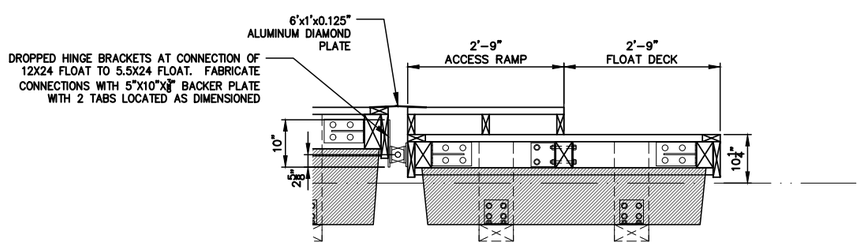


PLAN



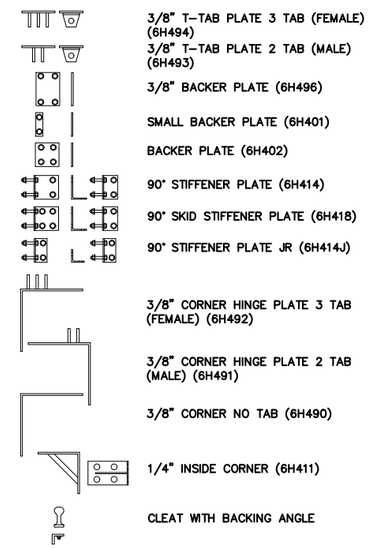
TYPICAL SECTION



TYPICAL SECTION

0 1 2 3 4 8

FLOAT HARDWARE



3/8" T–TAB PLATE 3 TAB (FEMALE) (6H494)

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3/8" CORNER NO TAB (6H490)

1/4" INSIDE CORNER (6H411)

CLEAT WITH BACKING ANGLE

NOTES:

1.) REFER TO TIMBER SCHEDULE ON SHEET G–2

GEI Consultants
5 MILK STREET • PORTLAND, ME 04101 • (207)797-8901

NO.	DATE	INT.
B	11/1/23	BJB
A	1:20:20	BJB
	2022 EELGRASS PERMIT SET SUBMISSION	

STATE OF MAINE
BARNEY J. BAKER
No. 5737
LICENSED PROFESSIONAL ENGINEER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SCALE:
BJB	JLD	BJB	AS SHOWN

SHEET TITLE: 5.5X24 FLOAT DETAILS

PROJECT: BROAD COVE MASTER PLAN
BROAD COVE RESERVE
CUMBERLAND, MAINE

DATE JAN 2020

CONTRACT NO. 220962

SHEET NO. F-2 | REV. A

5 Milk Street, Portland, ME 04101 | 207.797.8901

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