



**CITY OF DULUTH
REQUEST FOR PROPOSALS FOR**

**Coastal and Civil Engineering Services
for
Duluth Seawall, Baywalk and Harbor Drive**

RFP NUMBER 21-AA08

ISSUED JANUARY 29, 2021

PROPOSALS DUE FEBRUARY 19, 2021

SUBMIT TO

**CITY OF DULUTH
ATTN: PURCHASING DIVISION
CITY HALL, ROOM 120
411 WEST 1ST STREET
DULUTH, MN 55802**

PART I - GENERAL INFORMATION

I-1. Project Overview. The City of Duluth is looking for an experienced team of professional Coastal Engineers and Civil Engineers to provide comprehensive design services and construction administration for a portion of the harbor seawall, Harbor Drive, and associated Baywalk sections from the southwest corner of Minnesota Slip to the southwest corner of Bayfront Festival Park ending at the Pier B pedestrian bridge. The Harbor Drive road design services extend from Railroad Street around the DECC to the south and up to the intersection of the Railroad Street ramp (see maps in Appendix B).

A Landscape Architectural Team will be selected by the City under a separate RFP process and will provide design services for the project hardscape and softscape elements. The selected Landscape Architectural firm will lead a stakeholder engagement pre-design process and provide a Civil Engineering sub consultant for the pre-design concept phase only.

Landscape Architectural site design, planting design, and detailing, along with Civil Engineering concept pre-design services for stormwater and the road will be secured by the City of Duluth under a separate RFP process. All three selected firms will be required to coordinate and integrate their respective design scopes and construction administration activities to ensure the successful outcome of the project, from concept and pre-design through the completion of the project. The Coastal Engineering firm will serve as the primary coordinating consultant on this project as the seawall infrastructure is the primary driver of any and all changes to the upland hard and soft landscapes.

Additional detail is provided in **Part IV** of this RFP.

I-2. Calendar of Events. The City will make every effort to adhere to the following schedule:

| Activity | Date |
|---|-------------------------|
| Virtual Pre-proposal Conference. The link can be found at https://www.duluthmn.gov/purchasing/bids-request-for-proposals/ | Thur. 2/4/21 at 9:00 am |
| Pre-proposal site visit will be held on this date. | Mon. 2/8/21 at 10:00 am |
| Deadline to submit Questions via email to purchasing@duluthmn.gov | Wed. 2/10/21 |
| Answers to questions will be posted to the City website no later than this date. | Fri. 2/12/21 |
| Proposals must be received in the Purchasing Office by 4:30 PM on this date. | Fri. 2/19/21 |

I-3. Rejection of Proposals. The City reserves the right, in its sole and complete discretion, to reject any and all proposals or cancel the request for proposals, at any time prior to the time a contract is fully executed, when it is in its best interests. The City is not liable for any costs the Bidder incurs in preparation and submission of its proposal, in participating in the RFP process or in anticipation of award of the contract.

I-4. Pre-proposal Conference. The City will hold a pre-proposal conference and separate pre-proposal site visit as specified in the Calendar of Events. Interested Bidders can attend the conference virtually using the link provided. Bidders interested in the site visit should meet at the Minnesota Slip Pedestrian Bridge near 350 Harbor Drive, Duluth, MN.

I-5. Questions & Answers. Any questions regarding this RFP must be submitted by e-mail to the Purchasing Office at purchasing@duluthmn.gov **no later than** the date indicated on the Calendar of Events. Answers to the questions will be posted as an Addendum to the RFP.

I-6. Addenda to the RFP. If the City deems it necessary to revise any part of this RFP before the proposal response date, the City will post an addendum to its website <http://www.duluthmn.gov/purchasing/bids-request-for-proposals/> . Although an e-mail notification will be sent, it is the Bidder's responsibility to periodically check the website for any new information

I-7. Proposals. To be considered, hard copies of proposals must arrive at the City on or before the time and date specified in the RFP Calendar of Events. The City will not accept proposals via email or facsimile transmission. **Due to the closure of City Hall as a result of the pandemic, proposals cannot be dropped off in the Purchasing office. There is a drop box on the 1st Street side of City Hall with an opening that is 11in x 3in. If your proposal is larger than the opening, you must submit it via a delivery or carrier service such as USPS, FedEx or UPS. It is recommended that you have proposals delivered the day before the deadline to ensure they are delivered on time.** The City reserves the right to reject or to deduct evaluation points for late proposals.

Proposals must be signed by an authorized official. If the official signs the Proposal Cover Sheet attached as Appendix A, this requirement will be met. Proposals must remain valid for 60 days or until a contract is fully executed.

Please submit one (1) paper copy of the Technical Submittal and one (1) paper copy of the Cost Submittal. The Cost Submittal should be in a separate sealed envelope. In addition, Bidders shall submit one copy of the entire proposal (Technical and Cost submittals, along with all requested documents) on flash drive in Microsoft Office-compatible or pdf format.

All materials submitted in response to this RFP will become property of the City and will become public record after the evaluation process is completed and an award decision made.

I-8. Small Diverse Business Information. The City encourages participation by minority, women, and veteran-owned businesses as prime contractors, and encourages all prime contractors to make a significant commitment to use minority, women, veteran-owned and other disadvantaged business entities as subcontractors and suppliers. A list of certified Disadvantaged Business Enterprises is maintained by the Minnesota Unified Certification Program at <http://mnucp.metc.state.mn.us/> .

I-9. Term of Contract. The term of the contract will begin once the contract is fully executed and is anticipated to end by November 1, 2022. The selected Bidder shall not start the performance of any work nor shall the City be liable to pay the selected Bidder for any service or work performed or expenses incurred before the contract is executed.

I-10. Award. Due to this project being funded in part by state and federal funds, the initial contract will be awarded only for predesign work, including concept designs and cost estimates. The remaining work is anticipated to be awarded as an amendment(s) to the original agreement upon final approval of the project by the reviewing authorities.

I-11. Payment. All compensation will be based on percentage of project completed and will not exceed the amount identified in the agreement. Weekly progress reports will be provided to the City and will include tracking of estimated percentage of overall project scope completed to date. Due to multiple funding sources, invoices will need to be broken down by sites within the project. Hourly task breakdown by employee is for evaluation purposes and does not imply that payment will be based on hours worked.

I-12. Mandatory Disclosures. By submitting a proposal, each Bidder understands, represents, and acknowledges that:

- A. Their proposal has been developed by the Bidder independently and has been submitted without collusion with and without agreement, understanding, or planned common course of action with any other vendor or suppliers of materials, supplies, equipment, or services described in the Request for Proposals, designed to limit independent bidding or competition, and that the contents of the proposal have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder.
- B. There is no conflict of interest. A conflict of interest exists if a Bidder has any interest that would actually conflict, or has the appearance of conflicting, in any manner or degree with the performance of work on the project. If there are potential conflicts, identify the municipalities, developers, and other public or private entities with whom your company is currently, or have been, employed and which may be affected.
- C. It is not currently under suspension or debarment by the State of Minnesota, any other state or the federal government.

- D. The company is either organized under Minnesota law or has a Certificate of Authority from the Minnesota Secretary of State to do business in Minnesota, in accordance with the requirements in M.S. 303.03.

I-13. Notification of Selection. Bidders whose proposals are not selected will be notified in writing.

PART II - PROPOSAL REQUIREMENTS

1. Cover Letter
2. A restatement of the goals and objectives and the project tasks to demonstrate the Proposer's understanding of the project.
3. An outline of the Proposer's background and experience with similar projects. Experience shown should provide proof of past work experience in successful seawall engineering, engineering competency in large water body coastal/shoreline projects, and any experience with the City of Duluth.
4. Identify the personnel that will be conducting the project and detail their training and work experience, particularly in the projects listed to document competency in seawall and coastal engineering. Identify a professional Coastal Engineer licensed in the State of Minnesota who will oversee the project.

No change in personnel assigned to the project will be permitted without approval of the City.

5. Provide a detailed work plan identifying the tasks to be accomplished and the budget hours to be expended on each task. The work plan shall also identify the deliverables at key milestones in the project as well as any other services expected to be provided by the City.
6. Provide a minimum of three (3) references, including names, addresses and telephone numbers, for whom the Proposer has performed similar services and the reference can address past performance in seawall and coastal engineering design.
7. Provide one copy of the cost proposal in a separate envelope, clearly marked on the outside with "Cost Proposal". The terms of the proposal as stated must be valid for the length of the project.

The Proposer must also include a lump sum, not-to-exceed total project cost including any sub consultant fees, along with the following information:

- A breakdown of the hours by task for each employee.
- Identification of anticipated direct expenses.
- Include miscellaneous charges such as mileage and copies.
- Identification of any assumptions made while developing the cost proposal.

- Identification of any cost information related to additional services or tasks, include this in the cost proposal but identify it as additional costs and do not make it part of the total project cost.
8. The proposal shall be limited to 25 single-sided 8 ½ x 11 pages, excluding the front and back covers, the cover letter and the cost proposal. The separate cost proposal can be an 11" X 17" sheet.
 9. Proposer to provide anticipated project schedule from the start of the design process to completion of construction.

PART III - CRITERIA FOR SELECTION

The proposals will be reviewed by City Staff. The intent of the selection process is to review proposals and make an award based upon qualifications as described therein. A 100-point scale will be used to create the final evaluation recommendations. The factors and weighting on which proposals will be judged are:

| | |
|--|-----|
| Qualifications of the Bidder and Personnel | 40% |
| Prior experience with similar work | 40% |
| Work Plan & Schedule | 5% |
| Cost | 15% |

PART IV – PROJECT DETAIL

This project scope area includes the entire harbor side seawall and shoreline revetment from the end of the Minnesota Slip Seawall Phase I reconstruction zone to the Pier B bridge; The primary intent of this project is to restore and improve the harbor side seawall infrastructure as well as the associated hard and softscapes and Harbor Drive, to the extent possible, as it is directly impacted by the seawall improvements. See Project Detail documents and maps in Appendix B.

The landscape design process and the public engagement concept pre-design process will be led by a Landscape Architect selected by the City under a separate RFP process, but the selected Coastal Engineering firm will need to provide material support to the conceptual design and public/stakeholder engagement process including, but not limited to, pre-design conceptual renderings, consultation with consultants and stakeholders, and project cost estimation. The design of the landscape sections of this project may directly influence design needs for some elements of the seawall reconstruction, Coastal engineering services to a certain extent will be necessary to support the community-supported landscape design. The Coastal Engineering Team will be the primary firm in charge of construction estimation and construction administration, with the Landscape Architect providing technical support and oversight from the concept/pre-design phase through the end of construction on the landscape scope elements.

The Coastal Engineering Team will coordinate with the Landscape Architectural design team throughout the entire design process (including concept/pre-design). Ensuring concepts are constructible as they relate to the seawall and shoreline revetment areas.

The Landscape Architectural design team, selected under a separate RFP process, will coordinate with the DECC and other stakeholders to develop designs that better meet the needs of stakeholder groups while still maintaining access for deliveries, emergency vehicles, commercial uses, and public Baywalk users, etc. The Landscape Architectural design team will also be responsible for final design development of the project soft and hardscapes complimentary to the Seawall infrastructure design and construction; and will function as part of a larger project team to integrate plan sets and coordinate construction administration.

Project Goals;

- A. Coordinate with the DECC and other stakeholders to develop designs that better meet the needs of stakeholder groups while still maintaining access for deliveries, emergency vehicles, commercial uses, and public Baywalk users, etc.
- B. Provide better opportunities for the DECC to utilize space near or in place of Harbor Drive.
- C. Project will examine potential closure or restrictions of Harbor Drive, possible conversion of space for park, trail, or recreation purposes while maintaining Vista Fleet Access, potential cruise ship infrastructure/access, and access for DECC and other stakeholder deliveries, emergency vehicles, etc.
- D. Designer to reimagine vehicular and human usage of space between building and seawall to a landscape that is welcoming, has purpose, and softens the built environment through plantings, shade, natural features, and more interaction with the water.

Meetings

Provide a summary of the necessary meetings along the entire duration of the project along with anticipated cost of each meeting.

Survey Services

The City of Duluth will provide a full existing-conditions topographic survey in PDF and AutoCAD format to the selected consultant team.

Concept Pre-Design

The Coastal Engineering design team will provide concept level pre-designs and associated cost estimates that support integration of the Seawall infrastructure design and the landscape pre-design concepts developed by the Landscape Architectural team. These concepts will be used in the public engagement process lead by the Landscape Architectural firm selected under separate RFP process.

The Coastal Engineering Team is the primary consultant from design development through the end of the construction project.

1. Review existing conditions, plans, and other pertinent documents.

2. Participate in stakeholder meetings which may include staff from City departments (Planning, DEDA/Economic Development, Parks, Property & Facilities Management, Engineering); the Landscape Architectural design team,; staff from the DECC, Vista Fleet, and the Great Lakes Aquarium ; and cruise ship stakeholders such as Visit Duluth and the Duluth Seaway Port Authority.
3. Based on stakeholder input through Landscape Architectural design process under separate RFP, create multiple design alternatives, review with staff and Landscape Architectural design team, modify design alternatives
4. City staff, with consultant support, to present to Commissions and Public Bodies: Planning, DEDA, Port Authority
5. City staff, with consultant support, will present to Parks Commission with the goal of a positive recommendation to City Council
6. City staff, with consultant support, to present to City Council seeking approval for concept design

Permitting Phase

Consultant to list in the RFP response any necessary permits (local, state, federal) needed for the seawall and shoreline revetment portion of the construction. Any permits above the seawall and shoreline revetment areas will be the responsibility of the Landscape Architectural design team. Preparation and submission of any and all necessary permits shall be included in the scope of services provided. Permitting fees will be paid for by the City of Duluth.

Design and Bidding Phase

The Coastal Engineer will function as the primary consultant on this scope item and will lead the design team through the final design process with full specifications and plans ready for bid. Cost estimates of the project shall be prepared and updated at each step in the design process and coordinated with the Landscape Architectural team selected under separate RFP process. The Landscape Architectural design team will provide fully integrated signed site plans, planting plans and necessary details to implement the council-approved pre-design to the Coastal and Civil Engineering team to be included in the bid set.

Consultant shall support the bid process by attending the pre-bid meeting with contractors, preparing addenda as needed, evaluating the bids in a timely manner, and assisting City staff in making a recommendation for contract award.

Construction Administration and Staking Phase

The Coastal Engineering design team shall provide 100 percent on-site construction administration and will function as the primary design/engineering construction administrator on site during construction. The Coastal Engineering design team will integrate and consult with the Landscape Architectural design team to the extent required.

For purposes of this project, 100 percent construction administration / site observation is defined as a requirement of documented presence by an approved individual whenever

construction crews are on site and work is being performed. It shall include daily pre-job briefs and recording meeting notes to be included in weekly observation reports; and providing weekly progress reports and other reports as needed to support the project. . During construction, potential changes to project scope, quantities, cost or final product will be disclosed, reported and discussed with City staff at the next weekly progress meeting or before. No significant changes will be approved by successful proposer without prior City approval in writing.

The Coastal Engineer will propose a construction administration plan and schedule with identified personnel rates and skill sets and will work with the other design consultants on the project team (i.e. Landscape and Civil) to determine the appropriate amount of construction administrative responsibility to apportion for each of the respective work scopes (i.e. Civil/Road, Landscape, Coastal) to provide a cost for construction survey staking during the duration of the project.

PART IV – APPENDICES

Appendix A

Proposal Cover Sheet – this form must be completed and returned with the proposal.

Appendix B

Exhibit B-1 1-12-18 Engineer's Estimate - Phase 2: Engineer's estimate for the seawall portion of the project, and is subject to change as this project evolves toward design and construction.

Exhibit B-2 2020.07.31_EDA Report (Preliminary)_1: Report submitted to the EDA for funds the city has secured to include infrastructure in this project to accommodate cruise ships along the harbor side seawall infrastructure. This grant add a minimum of \$2.62m to the project budget plus a city match.

Exhibit B-3 201334 – Schematic Plans (1.25.21): Latest renderings of the seawall project to date, and represents approximately 50% of design development for the seawall portion of the project. Upland hard and softscapes are subject to change in the pre-design process.

Exhibit B-4 Lakewalk and Seawall Bonding Narrative: Official submission to the State of MN for general obligation bonds to support this project, which will be funded by a combination of State, City and Federal funds and also includes project areas not represented in this RFP process (i.e. Lakewalk from Endion Station to Brighton Beach, etc.).

Exhibit B-5 S1.0_Overview Plan: Map of the seawall stations included in the project.

Exhibit B-6 Seawall Section Map – 2020 GO Bond: Seawall sections map that was submitted to the State of MN to support the City bond request.

Exhibit B-7 Section F – Bayfront to end of Seawall Ph 1: Map of the entire project area, including areas of revetment and Harbor Drive.

APPENDIX A - PROPOSAL COVER SHEET

CITY OF DULUTH

RFP# 21-AA08

| Bidder Information: | |
|---------------------------------|--|
| Bidder Name | |
| Mailing Address | |
| Contact Person | |
| Contact Person's Phone Number | |
| Contact Person's E-Mail Address | |
| Federal ID Number | |
| Authorized Signature | |
| Title | |

APPENDIX B - EXHIBITS

City of Duluth
Supplementary Provisions – State & Federal Funding
21-AA08 Coastal Engineer for Baywalk-Seawall-Harbor Drive

1. Disbursements

- a. No money under this Contract shall be disbursed by the City to any Contractor unless the Contractor is in compliance with the Federal Agency requirements with regard to accounting and fiscal matters to the extent they are applicable.
- b. Unearned payments under this Contract may be suspended or terminated upon the Contractor's refusal to accept any additional conditions that may be imposed by the Federal Agency at any time; or if the grant, if applicable, to the City under which this Contract is made is suspended or terminated.

2. Subcontracting Requirements

- a. The Contractor shall include in any subcontract the clauses set forth in these City of Duluth Supplementary Provisions in their entirety and shall also include a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.
- b. The Contractor shall not subcontract any part of the work covered by this Contract or permit subcontracted work to be further subcontracted without the City's prior written approval of the subcontractors. The City will not approve any subcontractor for work covered by this Contract who is at the time ineligible under the provisions of any applicable regulations issued by a Federal Agency or the Secretary of Labor, United States Department of Labor, to receive an award of such subcontract.

3. Breach of Contract.

The City may, subject to the Force Majeure provisions below and in addition to its other rights under the Contract, declare the Contractor in breach of the Contract by written notice thereof to the Contractor, and terminate the Contract in whole or in part, in accordance with Section 4, Termination, for reasons including but not limited to any of the following:

- a. Failure to begin the Work within the time specified in the Contract;
- b. Failure to perform the Work with sufficient labor, equipment, or material to insure the completion of the specified Work in accordance with the Contract terms;
- c. Unsatisfactory performance of the Work;
- d. Failure or refusal to remove material, or remove and replace any Work rejected as defective or unsatisfactory;
- e. Discontinuance of the Work without approval;
- f. Failure to resume the Work, which has been discontinued, within a reasonable time after notice to do so;
- g. Insolvency or bankruptcy;
- h. Failure to protect, to repair, or to make good any damage or injury to property;
- i. Breach of any provision of the Contract;
- j. Misrepresentations made in the Contractor's bid/proposal; or
- k. Failure to comply with applicable industry standards, customs, and practice.

4. Termination

If the Contractor is in breach of the Contract, the City, by written notice to the Contractor, may terminate the Contractor's right to proceed with the Work. Upon such termination, the City may take over the Work and prosecute the same to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any additional cost incurred by the City in its completion of the Work and they shall also be liable to the City for liquidated damages for any delay in the completion of the Work as provided below. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the Work such materials, tools, equipment, and plant as may be on the site of the Work and necessary therefore.

City shall have the right to terminate this contract immediately without other cause in the event that all or a portion of the funds that the City intends to use to fund its obligations under the contract have their source with the State or Federal government or any agency thereof and said source reduces or eliminates their obligation to provide some or all of the funds previously committed by it to fund City's payment obligations under the Contract. The City

agrees that termination hereunder will not relieve the City of its obligation to pay Contractor for Work satisfactorily performed and reasonable costs incurred prior to the effective date.

Notwithstanding anything herein to the contrary, the City may terminate this Contract at any time upon written notice given by the City (for any reason, including the convenience of the City) to the Contractor at least thirty (30) days prior to the effective date of the termination of this Contract. The City agrees that termination hereunder will not relieve the City of its obligation to pay Contractor for Work satisfactorily performed and reasonable costs incurred prior to the effective date of the termination provided that Contractor has not committed a breach of this Contract. Nothing contained in this section shall prevent either party from pursuing or collecting any damages to which it may be entitled by law.

5. Force Majeure.

The right of the Contractor to proceed shall not be terminated nor shall the Contractor be charged with liquidated damages for any delays in the completion of the Work due to any acts of the Government, including controls or restrictions upon or requisitioning of materials, equipment, tools, or labor by reason of war, National Defense, or any other national emergency; any acts of the City; causes not reasonably foreseeable by the parties to this Contract at the time of the execution of the Contract which are beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God or of the public enemy, acts of another Contractor in their performance of some other contract with the City, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and weather of unusual severity such as hurricanes, tornadoes, cyclones, and other extreme weather conditions; nor to any delay of any Subcontractor occasioned by any of the causes specified above. The Contractor shall promptly notify the City in writing within ten (10) days of the delay. Upon receipt of such notification, the City shall ascertain the facts and the cause of the delay. If, upon the basis of facts and the terms of the Contract, the delay is properly excusable, the City shall extend the time for completing the Work for a period of time commensurate with the period of excusable delay.

6. Contracting with Small and Minority Businesses, Women's Business Enterprises, and Labor Surplus Area Firms.

Per 2 CFR 200.321, prime contractor must take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms (collectively referred to as socioeconomic firms) are used when possible. The affirmative steps must include:

- a. Placing qualified socioeconomic firms on solicitation lists;
- b. Assuring that socioeconomic firms are solicited whenever they are potential sources;
- c. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by socioeconomic firms;
- d. Establishing delivery schedules, where the requirements permit, which encourage participation by socioeconomic firms; and
- e. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

7. Energy Standards.

Contractor shall comply with all mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).

8. Suspension and Debarment.

This contract is a covered transaction for purposes of 49 CFR Part 29. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945. The contractor is required to comply with 49 CFR 29, Subpart C and must include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.

9. Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended).

Contractors must certify that that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

10. Procurement of Recovered Materials.

In the performance of this contract, the Contractor shall comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. This shall include making maximum use of products containing recovered materials as designated by the Environmental Protection Agency (EPA) unless (i) the materials cannot be acquired competitively and within the timeframe required by the contract performance schedule; (ii) the materials designated by the EPA do not meet contract performance requirements; or (iii) the materials cannot be acquired for a reasonable price. Information about this requirement, along with the list of EPA - designated items, is available at the EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

ENGINEERS ESTIMATE

NOTE: All costs are to be considered in-place costs. Include cost for all materials, hardware, shipping, fabrication, labor, equipment, insurance, bonds, permits state and local taxes, overhead and profit to properly install items listed under each system.

| System | Item | Type | Unit | Qty | Cost per Unit | TOTAL COST |
|---|---|--|----------------------|--------|---------------|------------------------|
| BASE BID - NEW SHEET PILE DOCK WALL - PHASE II | | | | | | |
| 1.1 | Steel Sheet Pile | 805 feet with sheets 45 feet long | SF | 36,225 | \$ 30.00 | \$ 1,086,750.00 |
| 1.2 | Steel Plate Panel Wall Repair | 332 feet x 10 feet tall (includes high-performance coating) | LF | 332 | \$ 1,500.00 | \$ 498,000.00 |
| 1.3 | Transfer Beam over H-Piles | W14x120 | LF | 203 | \$ 240.00 | \$ 48,720.00 |
| 1.4 | Steel H Piles | 25 - HP10x42 @ 30 feet long plus hardware | LF | 750 | \$ 90.00 | \$ 67,500.00 |
| 1.5 | Anchor Rods & Hardware | 1-3/4" DIA x Threaded Rod (75 ksi) | LF | 500 | \$ 40.00 | \$ 20,000.00 |
| 1.6 | Helical Anchors | Complete anchor and attachments to H Pile | EA | 50 | \$ 3,000.00 | \$ 150,000.00 |
| 1.7 | Bent Plate Steel Sheet Pile Cap | A36 3/8" bent plate | LF | 805 | \$ 105.00 | \$ 84,525.00 |
| 1.8 | Steel Guardrails | New Steel Guardrails | LF | 1,051 | \$ 165.00 | \$ 173,415.00 |
| 1.9 | Double Channel Wale | 2 - C12x30 wale | LF | 740 | \$ 155.00 | \$ 114,700.00 |
| 1.10 | Common Excavation | Common Excavation | CY | 1,500 | \$ 30.00 | \$ 45,000.00 |
| 1.11 | Granular Backfill | Select granular backfill (coarse sand) - compacted above waterline | CY | 1,725 | \$ 30.00 | \$ 51,750.00 |
| 1.12 | Removal & Disposal of Misc. Debris | Removal & Disposal of Misc. Debris | CY | 200 | \$ 45.00 | \$ 9,000.00 |
| 1.13 | Concrete Core Drilling | Concrete Core Drilling for Wall Anchorage | LF | 50 | \$ 90.00 | \$ 4,500.00 |
| 1.14 | Wall Anchorage | Wall Anchorage (7/8" Diameter) | LF | 611 | \$ 85.00 | \$ 51,935.00 |
| 1.15 | Dense Graded Base | 6" Layer of Dense Base (class 5) beneath concrete | CY | 300 | \$ 60.00 | \$ 18,000.00 |
| 1.16 | New Bollards & New Foundations | New 65 Ton Bollards | EA | 4 | \$ 30,000.00 | \$ 120,000.00 |
| 1.17 | Single Row Timber (Rub Rail) Fender | 6"x12" Oak No. 2 Timbers Along Lower Platform | LF | 1,137 | \$ 150.00 | \$ 170,550.00 |
| 1.18 | Demolition | Demolition | LS | 1 | \$ 75,000.00 | \$ 75,000.00 |
| 1.19 | Concrete Flatwork | 4" Thick Slabs, sidewalks and ramps | SF | 16,250 | \$ 6.00 | \$ 97,500.00 |
| 1.20 | Concrete Fill | Between exist cap and new sheet pile wall | CY | 321 | \$ 400.00 | \$ 128,400.00 |
| 1.21 | Safety Ladders | A36 Steel - Painted Safety Yellow | EA | 3 | \$ 1,500.00 | \$ 4,500.00 |
| 1.22 | Protective Steel Coating (Applied According to Plans & Specs) | 20 MIL DFT minimum, Engineer Approved Coating | SF | 13,685 | \$ 20.00 | \$ 273,700.00 |
| 1.23 | Curb & Gutter/Bike Path/Sidewalks | Curb & Gutter/Bike Path/Sidewalks | LS | 1 | \$ 100,000.00 | \$ 100,000.00 |
| 1.24 | Flat Surface Improvements | Flat Surface Improvements, Refreshing Lakewalk Elements | LS | 1 | ##### | \$ 1,000,000.00 |
| 1.25 | Electrical Installation | Electrical Installation | LS | 1 | \$ 999,500.00 | \$ 999,500.00 |
| 1.26 | DNR Fish Habitat Restoration | DNR Fish Habitat Restoration | LS | 1 | \$ 150,000.00 | \$ 150,000.00 |
| 1.27 | Mobilization / Demobilization | Lump Sum | LS | 1 | \$ 325,000.00 | \$ 325,000.00 |
| PHASE II PROJECT TOTALS | | | | | | |
| | ITEM | | | | | TOTAL COST |
| | BASE BID | | | | | \$ 5,867,945.00 |
| | PERMITS | | | | | \$ 100,000.00 |
| | PAYMENT / PERFORMANCE BOND | | | | 2% | \$ 117,358.90 |
| | PROJECT ADMINISTRATION | | | | 6% | \$ 352,076.70 |
| | CONTINGENCY | | | | 10% | \$ 586,794.50 |
| | | | PROJECT TOTAL | | | \$ 7,024,175.10 |

CITY OF DULUTH PRELIMINARY ENGINEERING REPORT (PER) EDA ED-900 SECTION B.2



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**CITY OF DULUTH
PRELIMINARY ENGINEERING REPORT (PER)
AMI PROJECT NO. 201187
July 31, 2020**

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Executive Summary

This report provides a summary of the existing conditions and proposed rehabilitation of coastal infrastructure in Duluth, Minnesota. The report will cover, in detail, the proposed site plans, permits required, construction contracts & methods, and estimated costs of construction. The project components described in this preliminary engineering report are consistent with Section B.2 of Form ED-900.

The City of Duluth is located along the shores of Lake Superior and is a popular tourist destination due to the lakeside restaurants, world-class mountain biking, hiking trails, train rides, festivals, community and sporting events. The Lakewalk trail is approximately 15.3 miles of mixed-use trail that runs from Bayfront Park near downtown Duluth to the east end of the city. The trail runs directly through Canal Park, which is a central hub of tourism, and separates several critical infrastructures from Lake Superior. Two sections of the coastal infrastructure along the Lakewalk trail have been determined to be at a high risk of failure which would directly impact the current and potential future economic growth of Duluth as well as inhibit the City of Duluth's recovery from the Covid-19 pandemic if not rehabilitated. These sections of the coastal infrastructure include the existing sheet pile seawall behind the Duluth Entertainment & Convention Center (DECC) and approximately 0.5 mile of stone revetment along Lake Superior.

The coastal infrastructure along Lake Superior is at a high risk of failure at five locations due to high levels of shoreline erosion documented over the last couple of years. Due to the rise in water levels around the Great Lakes and the increased frequency of major storms, many areas are experiencing high levels of erosion. The shoreline erosion in this region of the Lakewalk trail potentially poses safety hazards for pedestrians, economic impacts to business owners, and environmental concerns. In addition to the Lakewalk trail, there are several different critical infrastructures located within 60 feet of the trail. These infrastructures include an active railroad line, public utilities and a major roadway through Duluth, Interstate 35. If these areas are not improved in the near future, these areas of critical infrastructure are at a high risk of failure which will severely impact the economy of the City of Duluth.

The existing seawall behind the DECC is rapidly deteriorating and has been identified as an area of potential economic impact if failures occur. The DECC seawall provides berthing for visiting government and commercial vessels such as research ships, Coast Guard cutters, tugs, luxury yachts, Tall Ships and visiting cruise ships up to 400 feet in length. The seawall also protects Harbor Dr. which has an average annual daily traffic volume of approximately 8,500 vehicles (according to MNDOT 2016 Publication Traffic Volumes) and is part of the route for Grandma's Marathon, which brings in thousands of runners and tourists every year to the City of Duluth. Multiple sections of the seawall have suffered severe deterioration and corrosion and as a result multiple sinkholes have developed along the backside of the sheet pile. If the structure is not rehabilitated in the near future, the seawall will continue to deteriorate causing larger sink holes and loss of functionality. The loss of material behind the dock structure and resulting sinkholes cause safety concerns for the public walking or driving behind the seawall. The loss of functionality of the seawall can ultimately prevent vessels from utilizing the coastal infrastructure which will negatively impact the value of the seawall to the City of Duluth and its economy.

The proposed rehabilitation plan for the Lake Superior Section of the coastal infrastructure is to install a series of colored concrete wave return walls along the worst areas of the shoreline. Using drone aerial imagery and topographic survey data, AMI determined a preliminary design and layout for these wave return walls. The proposed wave return walls will have a design life of approximately 50 years and will integrate the natural aesthetics of the shoreline while also allowing for public access down to the gravel beaches. Large stones scattered along the gravel beaches will be salvaged and placed behind the new walls as fill material. Additional stone will be added behind the walls in a future phase to increase the durability of the system. These wave return walls will serve as erosion protection for the lakeside businesses and adjacent critical infrastructure. EDA funding would cover the construction costs of the concrete wave return walls for all five critical areas covering 925 lineal feet of shoreline.

The proposed rehabilitation plan for the DECC Seawall is to install a new epoxy coated steel sheet pile (SSP) in front of the existing seawall with a new tieback system for support. AMI has determined a preliminary design and layout for the new seawall utilizing drone aerial imagery, bathymetric and topographic survey data. The proposed structure will have a design life of approximately 50 years. The new structure will also have the capacity to accommodate the current and future vessel traffic which will include large cruise ships. EDA funding would cover the construction costs of the 1,166 lineal feet of steel sheet pile seawall.

It is expected that the design and permitting for the Lake Superior Section of the seawall will take 40 working days (8 weeks) and that the construction will take 140 working days (28 weeks) to complete. The expected time for design and permitting for the DECC Seawall Rehabilitation will take 90 working days (18 weeks) and that the construction will take 150 working days (30 weeks) to complete.

There will be one master contract for the rehabilitation of the Lake Superior section of the seawall and a separate master contract for the rehabilitation of the DECC Seawall. Both construction contracts will be secured by a sealed public bid process. The requested EDA grant funds is \$4,375,000 which include a 20% match by the City of Duluth to assist with the rehabilitation of the deteriorated coastal infrastructures along the Lakewalk trail.

Section 1.0 – Existing Conditions

Duluth is located on the south western tip of Lake Superior as shown in Figure 1. The two sections of the coastal infrastructures along the Lakewalk trail are located within approximately 3 miles from each other. Throughout the year, Duluth holds festivals and events which gather thousands of people that stay in hotels in Canal Park and along the lakeshore, spend time walking along the Lakewalk and take part in events at the DECC. The existing site conditions of these two sections of coastal infrastructure along the Lakewalk can be seen in the attached plan sheets in Appendix A and Figure 2.



Figure 1. Duluth, MN



Figure 2. Vicinity Map

1.1 Lake Superior Seawall

The Lakewalk is greenspace that is 15.3 miles long and runs from Bayfront Park near downtown Duluth to the east end of the city. The Lakewalk greenspace provides a buffer for several critical infrastructures located within 60 ft of the lake. These infrastructures include an active railroad line, public utilities (stormwater, sewer, and power) and interstate Highway 35. This area has been experiencing severe erosion over the past three years due to the rise in water levels combined with an increase in 50 to 100-year storm events. Due to a lake effect climate, Duluth experiences extreme high northeastern winds which make their way from Canada over Lake Superior. Continuous high winds over the large smooth terrain of Lake Superior can generate large waves reaching heights of 28 feet in deep water. As these waves move into shore, they generate immense power as they break and crash into the coastal infrastructures along the shoreline (Figure 3). The current coastal infrastructure along this section consists of rock revetments, bedrock out croppings, concrete retaining walls, gravel beaches and vegetated sandy clay hill sides. Using a drone and topographic data, AMI has identified five main areas along this section that need immediate attention and protection from additional erosion. A plan view for each location can be seen in Appendix A.



Figure 3. Canal Park during Storm Event

1.1.1 Local & National Businesses

One of the five main areas is located along a stretch of gravel/bedrock beach and armor stone revetment near several restaurants and local shops as shown in Figure 4. All of these restaurants and businesses are built on the edge of a 15 ft cobble stone retaining wall. This is a commonly populated area, as people visit the local stores, restaurants and ice cream shops then come down

to the beach to relax and enjoy the scenery. The BNSF Railway owns a stretch of rail which runs parallel to the Lakewalk. During the winter, BNSF stores rail cars and locomotives along this stretch of tracks when not in service. The rail line is managed by the St. Louis & Lake Counties Regional Rail Authority. During the spring, summer & fall, the Northshore Scenic Railroad utilizes this line to make daily trip up the Northshore. The current armor stone revetment is not sufficient to protect the shoreline from any additional erosion. Any future storm could cause additional erosion resulting in undermining of the railroad tracks and the cobble retaining wall which would negatively affect the adjacent businesses.



Figure 4. Lakewalk

1.1.2 Sewer Force Main

The Western Lake Superior Sanitary District (WLSSD), located in Duluth, has a 24" sanitary force main that travels under the Lakewalk and the BNSF Railroad. The force main provides sanitary services for thousands of clients in Duluth and 430 clients of the Duluth North Shore Sanitary District. The protection of this sewer force main is critical as this structure could become exposed and fail due to shoreline erosion from severe storms. Figure 5. shows the approximate location of the force main and its close proximity to Lake Superior. If the erosion of the shoreline continues, the force main may fail resulting in potentially thousands of gallons of untreated sewage leaking into Lake Superior affecting the fishing industries, drinking water, wildlife habitat and the largest freshwater lake in North America.



Figure 5. WLSSD Force Main Location (Green Line)

1.1.3 Interstate 35

Interstate 35 (I-35) is adjacent to the BNSF Railroad and runs parallel to the Lakewalk. I-35 is a main transportation route for daily commuters, tourists, and the main route for traveling up the North Shore for the delivery of goods and supplies (Figure 6). I-35 experiences 30,000 cars per day with increased truck traffic, carrying critical cargo, forecasted. There are several overpasses over I-35 that pedestrians utilize to access Lake Superior and the Lakewalk. The shoreline is a main connection point for all parts of Duluth allowing for transportation by vehicle, train, bike and by foot all within 60 ft of one another. It is crucial to maintain this 0.5 mile stretch by restoring and protecting the five main areas that are experiencing the highest concentration of erosion.

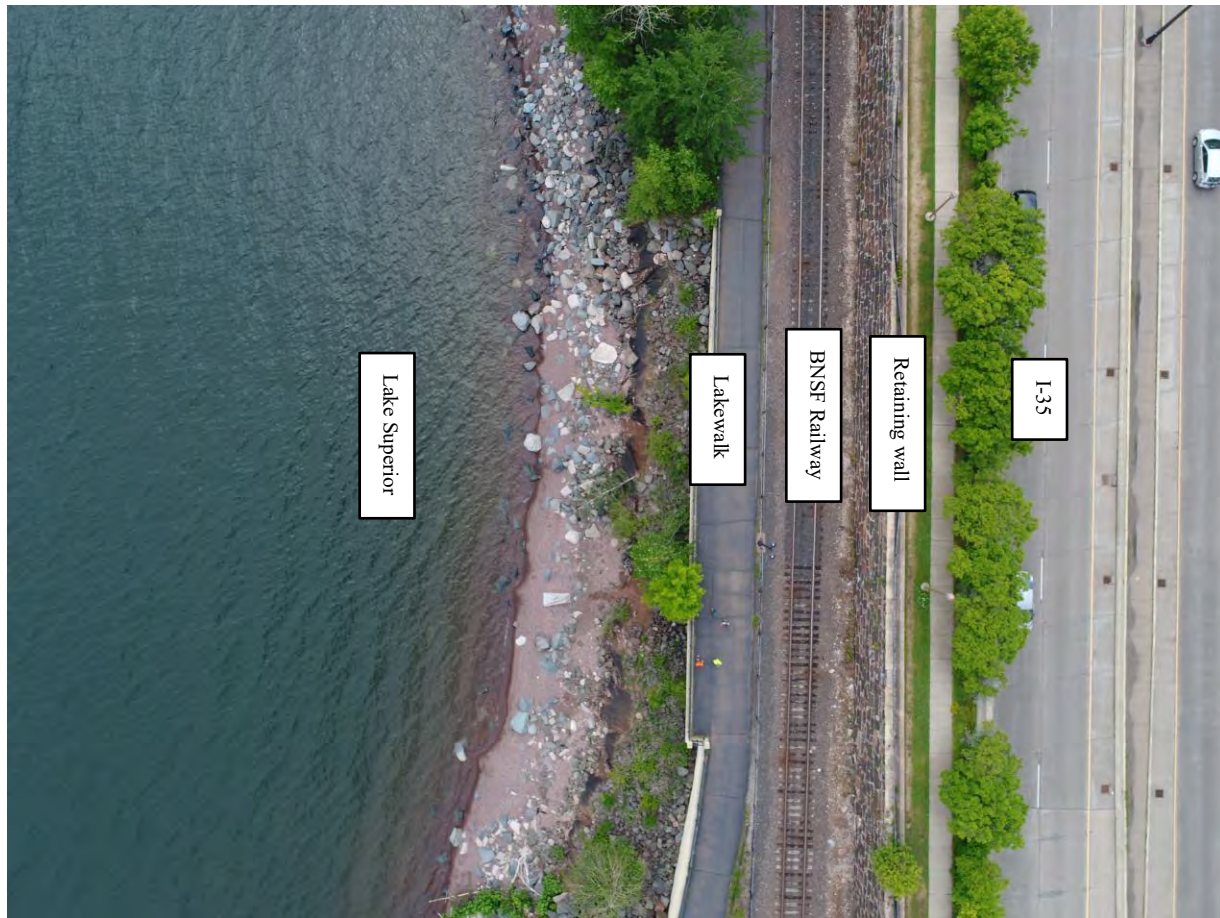


Figure 6. Interstate 35

1.1.4 Lakewalk Seawall Existing Conditions Summary

The current Lake Superior section of the seawall is not adequate to protect the Lakewalk, BNSF Railroad, force main, businesses and I-35 from future damage. The rise in water level and increase in severe storm events has eroded away the shoreline and left five locations in need of immediate attention. The City of Duluth is dependent on the income that comes from tourists visiting the Lakewalk, promoting job growth and economic growth. If these areas are protected and restored, it will increase the public safety, ensure continued operation of the transportation and logistics infrastructure, lower the regular maintenance costs of the Lakewalk, stimulate growth, and create economic resiliency to the entire City.

1.2 DECC Seawall

The existing seawall near the DECC and the Great Lakes Aquarium (GLA) is approximately 2,400 lineal feet (LF) long. The seawall begins in Minnesota Slip, northeast of the DECC, and continues around the southeast side of the property, terminating near the GLA. Approximately 1,200 LF of the DECC Seawall was rehabilitated in 2018. Prior to the rehabilitation in 2018, the material behind the seawall was tested for contaminants. Some contaminations were documented along Minnesota Slip (MN Slip), but the contaminated material was addressed during the initial

phase of the Seawall Rehabilitation in 2018. No contaminations were documented along the remaining section of the seawall to be rehabilitated behind the DECC. The location of the rehabilitated section of the seawall can be seen in Figure 7. A site plan of the DECC seawall and existing features can be seen in Appendix B.



Figure 7. DECC Seawall

The 1,200 LF of seawall that has not been rehabilitated is located behind the DECC and extends to the GLA. The existing construction of the seawall includes a combination of corroded steel sheet pile (SSP) and deteriorated timber seawalls. The existing steel structures are over 55 years old while the timber structures are over 130 years old. The Duluth-Superior harbor has an accelerated fresh-water corrosion problem due to Microbiological Induced Corrosion (MIC). Research is being performed on the existence of these microbes that oxidize iron and cause corrosion at a similar rate to those found in saltwater ports. The documented MIC has drastically reduced the service life of the SSP seawall, with several areas of the steel almost perforated. The timber sections of the seawall are heavily deteriorated and rotten. Several voids near the waterline have been documented and as a result, sinkholes along the backside of the wall have been documented. An example of the sinkholes behind the dock wall can be seen in Figure 8.



Figure 8. Sinkholes forming behind the DECC

1.2.1 Harbor Drive

Harbor Dr. is a two-lane concrete road that runs parallel with the seawall and is approximately 35 feet back from the edge of the dock (EOD). Due to the rise in water elevation in Lake Superior, waves are overtopping the seawall during large storm events and washing out material beneath the adjacent sidewalks and Harbor Drive. Ground penetrating radar (GPR) was utilized along the surface of the road in 2018 to document the existing subsurface condition of the road. GPR is capable of detecting voids or cavities below the roadway with removing or damaging sections of the concrete. The GPR Scans indicated that there are multiple voids beneath the road and areas of deteriorated within the concrete. The results of the GPR scan can be seen in Figure 9. The red areas are indications of possible voids beneath the roadway.

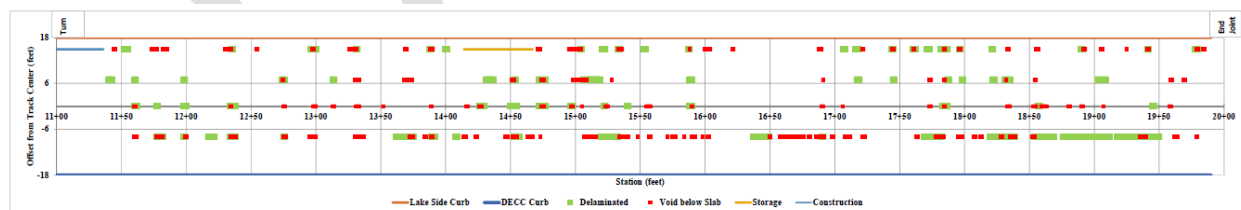


Figure 9. GPR Scans Along Harbor Drive

1.2.2 Aquarium

The GLA hosts tens of thousands of visitors every month and is a major contributor to the tourism for the City of Duluth. The GLA provides the region educational information on wildlife located in the Great Lakes, and hosts private and public events every year. During large storm events, waves overtop the seawall and flood Harbor Drive. As a result of the flooded roadway,

the lower levels of the GLA also flood. The GLA and City of Duluth have to place sandbags outside of the facility to prevent water from infiltrating into the aquarium. An example of the flooding can be seen in Figure 10.



Figure 10. Flooding of Harbor Dr. Outside Great Lakes Aquarium (CBS3 Duluth).

1.2.3 Vista Fleet & Cruise Ships

Vista Fleet is a locally owned and operated company that provides daily cruises around the Duluth Superior Harbor and Lake Superior. Vista Fleet utilizes the seawall along the Lakewalk for mooring, staging and loading/unloading of passenger. The majority of Vista Fleet's business comes from walking traffic along the Lakewalk. The rehabilitation or lack of rehabilitation of the seawall will directly impact the amount of walking traffic along this section of the trail which will as a result impact the business of the Vista Fleet.

The DECC seawall occasionally accommodates cruise ships, such as the M/V Yorktown (now the Americana) and the MS C. Columbus (currently the MS Hamburg), which can be seen in Figure 11. These vessels draft less than 17 ft which can be accommodated. However, the existing mooring along this section of the dock wall is undersized and not properly positioned for the cruise ships. Other cruise ship companies with larger vessels have expressed interest in utilizing the seawall. However, these larger vessels, such as the Viking Octantis, will required a deeper draft depth and higher capacity mooring. The seawall does not have the adequate capacity to accommodate the deeper draft vessels. Dredging operations would also be required for these larger cruise ships to provide adequate draft depth. The dredged material would be tested for contaminations prior to dredging operations to determine proper handling and disposal techniques. The current mudline along the seawall varies from 577 ft to 591 ft below the low-water datum of the Duluth – Superior Harbor. The dredging operations would occur during a future phase. The depth of the water would need to increase to approximately 24 ft for the larger cruise ships. The rehabilitated seawall would be designed to support the current and future anticipated vessel traffic such as government, Environmental Protection Agency (EPA), Coast

Guard and the Great Lakes Maritime Academy.



Figure 11. MS C. Columbus Moored to DECC Seawall (2011)

1.2.4 DECC Seawall Existing Conditions Summary

The seawall is severely deteriorated and will not be adequate to support the adjacent structures and facilities for the extended future. If the seawall is not rehabilitated, there will be a negative impact on the transportation, public access, and commercial use of the seawall. Rehabilitation of the seawall will extend the life expectancy of the wall for a minimum of 50 years. The rehabilitation will also protect Harbor Drive and the Lakewalk from material washout and sinkholes. The rehabilitation will also provide adequate facilities for larger cruise ships which will help stimulate economic growth and resiliency in the city of Duluth.

Section 2.0 – Proposed Site Features and Project Components

The proposed site features for the coastal infrastructure rehabilitation includes installing a concrete wave return wall and beach nourishment in each of the five areas along Lake Superior and a new rehabilitation seawall along the backside of the DECC. The DECC Seawall rehabilitation would include the installation of new epoxy coated SSP and tieback system to support the new wall. The proposed site features and project components can be seen in the drawings in Appendix A and B. The proposed site features for each location are outlined in more detail, below.

2.1 Lake Superior Seawalls

AMI has designed many successful structures along the Lake Superior shoreline for residential and commercial applications. These structures include armor stone revetments, concrete walls and steel sheet pile seawalls. AMI proposes a colored concrete wave return wall with stone fill on the backside along the shoreline for the five Lake Superior seawall locations. Rendering of

the proposed wave return wall can be seen in Appendix A. The wave return would allow for a shorter concrete wall as water from breaking waves would be repelled back into Lake Superior instead of over-topping the wall. The stone on the backside of the wall would also prevent any erosion caused by any spray over the wall. Existing stone on site will be salvaged and stockpiled to be reused behind the wall. Additional stone will be placed behind the wall as part of a future phase to increase the durability of the system.

A similar design of a wave return wall was built in Grand Marais, MN roughly 120 miles north of Duluth, MN. This wall has successfully protected the harbor from severe storms while allowing public access to a natural rock beach (Figure 12). Concrete stairs will be built into the new concrete walls to allow for easy access to the beach along the Lakewalk. Similar to the return wall in Grand Marais, the concrete will be colored to blend into the natural bedrock color along the shoreline to maintain the aesthetics from the water. This color matching has been highly recommended by the Minnesota Department of Natural Resources (MnDNR).



Figure 12. Existing Wave Return Wall in Grand Marais, MN

A wave return wall was selected over a traditional armor stone revetment due to the available space and the desire to preserve the natural stone pebble beaches. Traditional armor stone revetments require a large area due to the size of the rock and required slopes. The concrete return walls will minimize the impacts to the area while maintaining public access to the beach. The five areas of interest are approximately 985 ft long when combined. The wall height will likely range from 4 to 8 ft tall with a 1 to 2 ft thick concrete footing which will be pinned to bedrock. Due to the varying elevation of the bedrock, material will need to be excavated and stored onsite while the concrete footing is pinned to sound competent bedrock. Any stone greater than 18 inches in diameter will be set aside and placed behind the wave return wall as additional

erosion protection. Renderings for the five Areas can be seen in Appendix A.

2.1.1. Shoreline Protection of Existing Features

In addition to maintaining public beaches, the wave return wall will serve as protection of existing utilities under the bike path, structures along the lakeshore and the critical infrastructure identified. A rendering of the proposed return wall can be seen in Appendix A.

WLSSD Force Main that runs along the lakeshore will be protected from additional erosion which could cause the pipe to fail and leak untreated raw sewage. Only a few feet away from the sewer force main is the rails for the BNSF Railroad. The construction of these wave return walls would also protect the railroad that BNSF and the Northshore Scenic Railroad utilize for their business from any damage. Additionally, adjacent to the BNSF Railroad is a 15 ft tall retaining wall which support the foundation of businesses as well as provides a divider between I-35 and the BNSF Railroad. These businesses and the traffic along I-35 are critical to the economic development of Duluth.

2.1.2. Lakewalk Proposed Site Summary

All of the site features presented are within 60 ft or less of the seawall, as shown in Figure 13. If the shoreline remains unprotected, any additional erosion could create a domino effect of failures. Lake Superior has shown over the last few years that losing 10 ft or more of shoreline during one storm event is not uncommon when not adequately protected. The installation of a wave return wall will increase the public safety, decrease the regular maintenance costs of the site features, protect the existing sewer force main, the interstate, railroad, and stimulate growth to the entire City by protecting local jobs and promoting tourism.

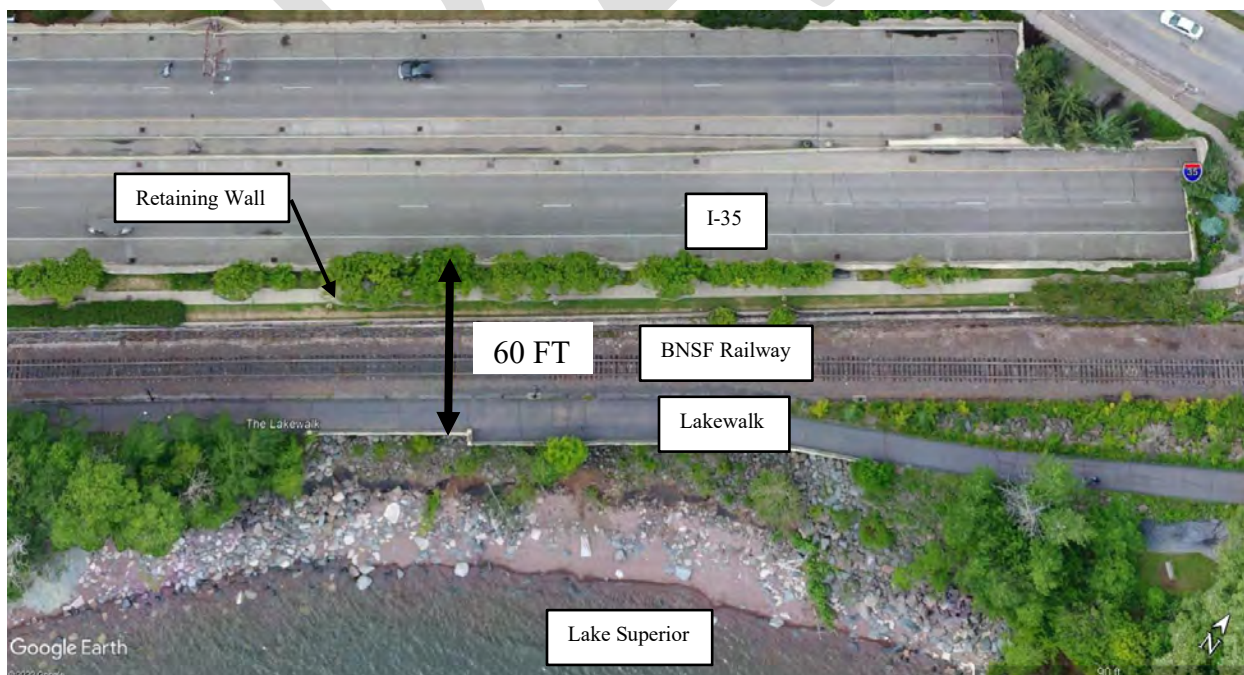


Figure 13. Distance from The Lakewalk to I-35

2.2 DECC Seawall

The rehabilitation of the seawall behind the DECC are in alignment with and integrated into other public investments within Duluth, which includes the redevelopment of the entire area. This future vision of the DECC seawall rehabilitation supports cadet training for Great Lakes commercial shipping workforce, coastal and marine research, the Coast Guard and other maritime vessels (Figure 14). However, this PER will focus on the items which are critical to the purpose and function of the DECC Seawall and the economic growth and resiliency of Duluth.



Figure 14. US Coast Guard docked at the DECC

The rehabilitation of the DECC seawall consists of a new epoxy coated steel sheet pile installed on the lakeside of the existing seawall. The epoxy coating will protect the steel from accelerated freshwater corrosion due to MIC. A new tieback system to support the new SSP will be installed behind the existing seawall. The new tieback system will consist of wales, tie rods, vertical steel piles, and helical anchors. The rehabilitation of the seawall will include a new retaining wall installed at a higher elevation to prevent any erosion and flooding from wave overtopping. The retaining wall will be set back from the edge of dock to provide unrestricted access along the seawall for vessels. This access is important due to the variety of vessels anticipated along the new seawall. The retaining wall will provide protection of Harbor drive, and the Lakewalk Trail. The retaining wall and other site features will be covered under subsequent funding from the City of Duluth through State bonding. A rendering of the new seawall structure can be seen in Appendix B and Figure 15.



Figure 15. DECC Seawall

2.3 Proposed Site Summary

The proposed site rehabilitation for both the Lake Superior and DECC seawalls will improve the overall public safety for the thousands of tourists and local residents who frequent these properties as well as providing stability and protection for existing roads, utilities, commercial, industrial properties. The DECC Seawall is along the last portion of the Lakewalk that ultimately leads to Bayfront Festival Park (Bayfront Park) which is an epicenter for festivals, concerts, and other public events that many vendors depend upon as part of their annual revenue. Visitors staying in Canal Park can access Bayfront Park from their hotels along the Lakewalk. Vessels can also utilize the seawall to allow for public access to canal park. The DECC seawall serves as a main hub for tourists, private and government vessels. The life expectancy of the rehabilitated coastal infrastructure is 50 years and part of a strategy to for economic resiliency and commercial growth in the City of Duluth.

Section 3.0 – Construction Feasibility

Initial inspection, planning, and preliminary design work has been completed at each site. Several site visits have been conducted by the City of Duluth and AMI. In addition, topographic surveying and drone imaging were performed to document the existing site conditions. Below is a summary of the feasibility for rehabilitating each area.

3.1 Lake Superior Seawall

AMI completed drone and topographic surveying to determine the areas along the shoreline that need immediate attention. Based on existing site access conditions, the construction will occur

from a barge or by slicklining the concrete from nearby roads. This would be the most economical and cause the least amount of damage to the shoreline. Due to the remoteness of these locations, these methods will cause the cost of construction to increase beyond what is considered more common for shoreline work. The Contractor will utilize an excavator to expose bedrock while storing any rocks which can be utilized on the backside of the wave return wall. By performing the required work from a barge, the existing vegetation can be preserved along the upper slope. This method would also allow for most of the Lakewalk to remain open during construction which will minimize impacts to nearby businesses. A concrete leveling course will be required to allow for the retaining walls to be built on a level surface. Due to the varying bedrock elevations the leveling course will be scribed to the bedrock to ensure a seamless transition from bedrock to concrete. Once completed, the wave return walls will provide shoreline protection for 50+ years, based on current water level projections.

3.2 DECC Seawall

AMI has extensive knowledge of the history of the DECC Seawall and its existing construction. AMI was the Engineer of Record during the rehabilitation of the seawall in 2018 and also performed the Construction Administration services during the construction. AMI has conducted topographic, hydrographic, and drone imaging surveys along the DECC Seawall to assist with the development of this PER.

The rehabilitation of the remaining DECC seawall could be completed from shore or by barge. The new tieback system would be installed at the same time as the new SSP. Once installed to the construction plans and specifications, the new SSP dock wall and tie-back system would be connected for lateral support. Additional bollards for mooring would then be installed for any future vessels. The concrete retaining wall would be installed last to protect new surfaces from erosion. Lastly the mudline will be dredged to a minimum depth of 24 ft as part of a future phase. The new SSP dock wall will provide a long-term, robust solution to extending the service life of the seawall while providing safe berthing options for future cruise ships.

3.3 Construction Feasibility Summary

Several scenarios were considered during the feasibility study. Due to the existing condition of the Lakewalk several portions of the trail would potentially have to be shut down if no repairs were made. If shoreline erosion continues along the Lake Superior seawall, there is risk that the WLSSD force main could be damaged, which would be detrimental to local residents, industry and businesses. The rehabilitation of the proposed areas will also ensure continued use of the BNSF railroad along the Northshore and the adjacent interstate. Slickline concrete or accessing the site from a barge does have its own unique challenges but it was determined to be the most cost-effective solution.

The most feasible option for restoring the Seawall at the DECC would be partial demolition of the existing structure and installation of a new seawall. This option meets the current needs for access to the Lakewalk, support for Harbor Dr., Vista Fleet berthing and the City of Duluth's projected needs for cruise ships. Sections of the Lakewalk would need to be shut down but access for pedestrians around the construction can be easily provided.

Section 4.0 – Permits Required

The proposed developments will require reviews and permits from regulatory agencies. Plans will be submitted to the Minnesota Department of Natural Resources (MnDNR), the United States Army Corp of Engineers (USACE), the Minnesota Pollution Control Agency (MPCA), and the City of Duluth (City). The review process of these agencies will be taken into account during the design phase of the project.

4.1 Minnesota Department of Natural Resources (MnDNR)

A DNR permit will be required for all of the rehabilitation work required along the Lakewalk. The sections of the Lake Superior seawall will require a DNR permits due to the shoreline impacts and the potential for impacting fish spawning. Any construction work may be limited during certain parts of the year prevent any impacts on fish spawning.

Two DNR permits will be required for the DECC seawall scope of work; one for dredging and one for installation of the new seawall. The dredging permit will cover the removal of material along the mudline to increase the draft depth to 24' below the Water Datum from the DNR of 601.1 ft. The dredging is required to provide the deep draft depth required by the larger cruise ships. A maintenance permit from the DNR will cover the rehabilitation of the seawall itself. Any construction work may be limited during certain parts of the year prevent any impacts on fish spawning.

4.2 USACE Permits

A USACE Permit may be required for the Lake Superior seawall depending on the location of the new concrete wave return wall. Any structures built in navigable waters will required a USACE Permit. Navigable waters are commonly defined as any structure built below the high-water datum of Lake Superior. During the design of the return walls, the final location of the walls will be determined.

Two DNR permits will be required for the DECC seawall scope of work; one for dredging and one for installation of the new seawall. The dredging permit will cover the removal of material along the mudline to increase the draft depth to 24' below the Water Datum from the DNR of 601.1 ft. The dredging is required to provide the deep draft depth required by the larger cruise ships. A maintenance permit from the DNR will cover the rehabilitation of the seawall itself. Any construction work may be limited during certain parts of the year prevent any impacts on fish spawning.

4.2 MPCA Permit

An MPCA permit will likely be required for the disposal of dredge material from in front of the new DECC Seawall. Material testing will be required to determine if contaminants are present in the dredge material. Time for coordination with the MPCA for testing requirements will be taken into account during the design phase of the project.

Section 5.0 – Construction Contracts and Method

There will be one master contract for the Lake Superior seawall and one master contract for the DECC seawall. Both projects will be secured by, sealed public bid process.

Section 6.0 – Construction timeline

6.1. Lake Superior Seawall

It is expected that the design and permitting for the five Lake Superior seawall sites will take 40 working days (8 weeks) and that the construction will take 140 working days (28 weeks) to complete. It is projected that the design will be completed by March of 2021 and construction will be completed by November 2021. A detailed project timeline is provided below.

January 2020 – Geotechnical Testing and Topographic Survey. Additional topographic survey data will be required to determine quantities of stone needed for backfill. Bedrock depths may need to be determined for Area 1 and 5 as the bedrock depth varies along the longer stretches of beach. Also, at this time any bedrock quality test will be performed to determine what areas have sound competent bedrock. The permitting process will also begin once topographic information is processed and preliminary layouts are developed.

February 2020 - March 2021 – Complete Design of the Site. The marine structural and marine coastal designs will be finalized. The wave return wall design and 60%, 90% and 100% plans will be submitted to the City of Duluth and permitting agencies for approval. Permit applications will be submitted and expected to take about two - three month to obtain permits. Final plans, specifications and cost estimates will be submitted to the EDA for review and approval prior to bid solicitation.

April 2021 – Solicitation of Bids and Contractor Selection. During April 2021, a pre-bid meeting will be held onsite with potential contractors. Any questions or concerns from contractors will be addressed in formal written addendums. Upon completion of the meeting, Contractors will have two weeks to submit their bids. Once bids are submitted it will take approximately one week to select the Contractor. It is expected that this portion will take 20 working days (4 weeks) to complete.

May 2021 – Demolition and Site Prep. During the first month, the Contractor will mobilize to the site by haul in equipment and begin excavating the beach rock down to bedrock. Any fractured bedrock will be scrapped off until sound competent bedrock is exposed. All beach rock and stone removed from area will be stockpiled and reused once the wave return wall is built.

June 2021 - July 2021 – Concrete Footing. The following two months will consist of setting forms for the leveling course and the concrete footings. Each location will require forms to be set to specified elevations with boards scribed to the variations in the bedrock for a leveling course. This will create smooth seamless finish and will also make the design more resilient. Once the forms are set each area will be filled with colored concrete and left to cure for 3-7 days.

August 2021 - October 2021 – Concrete Wall. The following three months will consist of forming and pouring the wave return walls in 50 ft long sections. The concrete will need to cure for a set amount of time before forming up the next sections.

November 2021 – Backfill. Once the concrete wave return walls are complete, the stone

salvaged during excavation will be placed behind the wall as additional erosion control from wave spray. Any new stone placed behind the wall will be performed as part of a future phase.

6.2. DECC Seawall

It is expected that the design and permitting for the DECC seawall portion will take 90 working days (18 weeks) and that the construction will take 200 working days (40 weeks) to complete. It is projected that the design will be completed by August of 2021 and construction will be completed by June of 2022. A detailed project timeline is provided below.

April 2021 - June 2021 – Bathymetric and Topographic Survey. Additional topographic survey data will need to be collected to determine quantities of material needed for backfill and additional layouts for sidewalk, bike path, and any adjustments to Harbor Drive. Also, at this time, additional underwater inspections may be conducted to determine locations of any obstruction near the drive line for the SSP and other potential defects in the wall that may have developed since the previous underwater inspection. The permitting process with the MnDNR, USACE and MPCA will also begin once preliminary layouts are completed.

July 2021 - August 2021 – Complete Design of the Site. The marine structural and marine civil departments will finalizing the DECC seawall and tie-back system. Additional site excavations may be conducted near the seawall to determine condition of existing anchor wall for potential conflict with proposed design. Final plans, specifications and cost estimates will be submitted to the EDA, City of Duluth and permitting agencies for review and approval prior to bid solicitation.

September 2021 – Solicitation of Bids and Contractor Selection. During September 2021, a pre-bid meeting will be held onsite with potential contractors. Any questions or concerns from contractors will be addressed in formal written addendums. Upon completion of the meeting, Contractors will have two weeks to submit their bids. Once bids are submitted it will take approximately one week to select the Contractor. It is expected that this portion will take 20 working days (4 weeks) to complete.

October 2021 - December 2021 – Demolition and Site Prep. For the first three months the Contractor will procure materials for new seawall and tie-back system. The Contractor will haul equipment to the sites and begin coating the new SSP with a marine grade two part epoxy. Existing monuments will be moved and partial demolition near the site will begin. Harbor Dr. will be left open until after Grandma's marathon.

January 2022 – February 2022 – Installation of a new seawall. Materials will be delivered to the site for the installation of the new seawall. The existing seawall will be partially deconstructed to accommodate the new tie-back system. Excavation on the backside of the new seawall will also begin for the installation of the new tie-back system.

March 2022 - June 2022 – Installation of Tie-back System and New SSP. The installation of the new SSP tie-back system will be completed. By connecting to two elements together with horizontal tie rods. Backfill will then be placed between new SSP and existing with crushed

aggregate and concrete cap. Additional backfill will be placed over the new anchor system. The new retaining wall and mooring bollards will be formed. The site will be graded, and concrete will be poured for the new concrete surfaces. Installation of a new bike path along the Lakewalk will be completed and there will be additional time for potential repairs to existing structures.

Section 7.0 – Construction Budget

A detailed construction budget can be seen in Appendix C. The estimated total cost for the projects is approximately \$13,000,000. The City of Duluth is applying for \$4,375,000 in EDA funds with a 20% match provided by the City of Duluth. Of the \$4.375 million, \$2.5 million would be allocated to the DECC Seawall while the remaining \$1.875 million would be allocated to the Lakewalk Seawall.

7.1 Administrative and Legal Expenses

No costs for required permits, grant reporting, and administrative time is expected for this project. The total cost for this section is \$0.00

7.2 Land, Structures, Right-of-way, Appraisals, etc.

No Land, Structure, Right-of-way, Appraisals are expected for this project. The total cost for this section is \$0.00.

7.3 Relocation Expenses and Payments

No relocation expenses are expected for this project. The total cost for this section is \$0.00.

7.4 Architectural and Engineering Fees

No architectural and engineering fees are being funded by the grant. The total cost for this section is \$0.00

7.5 Other Architectural and Engineering Fees

No other architectural and engineering fees are being funded by the grant. The total cost for this section is \$0.00

7.6 Project Inspection Fees

No project inspection fees are being funded by the grant. The total cost for this section is \$0.00

7.7 Site Work

No site work expenses are expected for this project. The total cost for this section is \$0.00.

7.8 Demolition and Removal

No demolition and removals are expected for this project. The total cost for this section is \$0.00.

7.9 Construction

This section includes the rehabilitation of the coastal infrastructure which includes the required site work, wave return walls and steel sheet pile as outlined in the engineers cost estimates in Appendix C. The total cost for this section is \$4,375,000.00.

7.10 Equipment

No equipment expenses are expected for this project. The total cost for this section is \$0.00.

7.11 Miscellaneous

No miscellaneous expenses are expected in the project.

7.12 Contingencies

Contingency costs will not be requested as part of the application. The total cost for this section is \$0.00

Respectfully,

Mat Burich, EIT
Assistant Marine Civil Engineering Manager
AMI Consulting Engineers, P.A.

Ryan Dagger, EIT
Marine Civil Engineer
AMI Consulting Engineers, P.A.

Reviewed By,

Chad W. Scott, PE
Principal
AMI Consulting Engineers, P.A.

Chase A. Dewhirst, PE
Marine Civil Engineering Manager
AMI Consulting Engineers, P.A.

Appendix A: Lake Superior Section:

- T1.0 – Title Sheet
- C1.0A – Existing Conditions: Lake Superior Section
- C1.1A – Existing Conditions: Area 1 & 1A
- C1.2A – Existing Conditions: Area 2
- C1.3A – Existing Conditions: Area 3
- C1.4A – Existing Conditions: Area 4
- C1.5A – Existing Conditions: Area 5
- C2.0A – Proposed Typical Cross Section: Areas 1 - 4
- C2.1A – Proposed Typical Cross Section: Area 5
- R1.0A – Proposed Typical Lake Superior Section
- R2.0A – Existing Conditions: Areas 1 – 1A
- R2.1A Proposed Seawall Rendering: Areas 1 – 1A
- R3.0A – Existing Conditions: Area 2
- R3.1A Proposed Seawall Rendering: Area 2
- R4.0A – Existing Conditions: Area 3
- R4.1A Proposed Seawall Rendering: Area 3
- R5.0A – Existing Conditions: Area 4
- R5.1A Proposed Seawall Rendering: Area 4
- R6.0A – Existing Conditions: Area 5
- R6.1A Proposed Seawall Rendering: Area 5

CITY OF DULUTH

EDA GRANT SUBMITTAL

1532 WEST MICHIGAN ST.

DULUTH, MN

SITE IMAGE - DECC



SITE IMAGE - LAKE SUPERIOR



OWNER

OWNER CONTACT

CITY OF DULUTH
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CRONCHETTI@DULUTHMN.GOV
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DULUTH, MN

DESIGN TEAM

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SHEET INDEX

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|-------|---|-------|--------------------------------------|
| T1.0 | TITLE SHEET | C1.0B | EXISTING CONDITIONS - DECC PLAN VIEW |
| C1.0A | EXISTING CONDITIONS - LAKE SUPERIOR SECTION | S1.0B | EXISTING DECC SEAWALL SECTION |
| C1.1A | EXISTING CONDITIONS - AREAS 1 & 1A | S2.0B | PROPOSED DECC SEAWALL SECTION |
| C1.2A | EXISTING CONDITIONS - AREA 2 | R1.0B | PROPOSED DECC SEAWALL SECTION |
| C1.3A | EXISTING CONDITIONS - AREA 3 | R2.0B | EXISTING CONDITIONS DECC SEAWALL |
| C1.4A | EXISTING CONDITIONS - AREA 4 | R2.1B | PROPOSED DECC SEAWALL RENDERING |
| C1.5A | EXISTING CONDITIONS - AREA 5 | | |
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| R5.1A | PROPOSED SEAWALL RENDERING: AREA 4 | | |
| R6.0A | EXISTING CONDITIONS: AREA 5 | | |
| R6.1A | PROPOSED SEAWALL RENDERING: AREA 5 | | |

GOVERNING SPECIFICATIONS

THE CURRENT EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION
STANDARD SPECIFICATIONS FOR CONSTRUCTION AND THE CURRENT EDITION OF
THE CITY OF DULUTH, MN CONSTRUCTION STANDARDS SHALL GOVERN.

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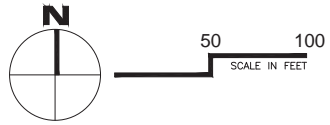
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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION 1532 W. MICHIGAN ST. DULUTH, MN 55806 | TITLE SHEET --- |
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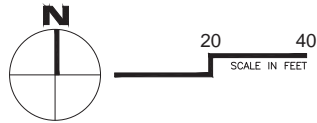
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SITE LEGEND:

- 37.7% FLOW ARROW AND GRADE
- 608 EXISTING MINOR CONTOUR
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- FM APPROXIMATE FORCE MAIN LOCATION
- TDP TOP OF SLOPE FAILURE OR TOP OF STONE
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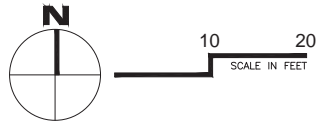
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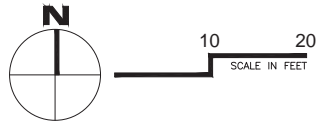
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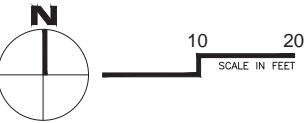
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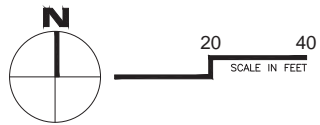
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AREA 5





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| DRAWN BY: SAJ | | | | | |
| DESIGNED BY: MJB | | | | | |
| SHEET: | | | | | |
| R3.0A | | | | | |



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| CITY OF DULUTH | | DATE: | REV: | DESCRIPTION | BY: |
| COASTAL INFRASTRUCTURE REHABILITATION | | | | | |
| DULUTH, MINNESOTA | | | | | |
| PROPOSED SEAWALL RENDERING | | | | | |
| AREA 2 | | | | | |

JOB No: 201187
DATE:
DRAWN BY: SAJ
DESIGNED BY: MJB

SHEET:
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| COASTAL INFRASTRUCTURE REHABILITATION | | | | | |
| DULUTH, MINNESOTA | | | | | |
| EXISTING CONDITIONS | | | | | |
| AREA 3 | | | | | |
| JOB No: 201187 | | | | | |
| DATE: | | | | | |
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| COASTAL INFRASTRUCTURE REHABILITATION | | | | | |
| DULUTH, MINNESOTA | | | | | |
| PROPOSED SEAWALL RENDERING | | | | | |
| AREA 3 | | | | | |
| JOB No: 201187 | | | | | |
| DATE: | | | | | |
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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION | | DATE: | REV: | DESCRIPTION | BY: |
| DULUTH, MINNESOTA | | | | | |
| EXISTING CONDITIONS AREA 4 | | | | | |
| JOB No: 201187 | | | | | |
| DATE: | | | | | |
| DRAWN BY: SAJ | | | | | |
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| COASTAL INFRASTRUCTURE REHABILITATION | | | | | |
| DULUTH, MINNESOTA | | | | | |
| PROPOSED SEAWALL RENDERING | | | | | |
| AREA 4 | | | | | |
| JOB No: 201187 | | | | | |
| DATE: | | | | | |
| DRAWN BY: SAJ | | | | | |
| DESIGNED BY: MJB | | | | | |
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| DULUTH, MINNESOTA | | | | | |
| EXISTING CONDITIONS | | | | | |
| AREA 5 | | | | | |
| JOB No: 201187 | | | | | |
| DATE: | | | | | |
| DRAWN BY: SAJ | | | | | |
| DESIGNED BY: MJB | | | | | |
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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION | | DATE: | REV: | DESCRIPTION | BY: |
| DULUTH, MINNESOTA | | | | | |
| PROPOSED SEAWALL RENDERING AREA 5 | | | | | |
| JOB No: 201187 | | | | | |
| DATE: | | | | | |
| DRAWN BY: SAJ | | | | | |
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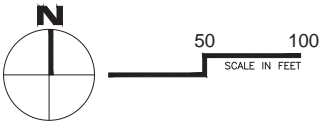
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Appendix B: DECC

- C1.0B – Existing Conditions: DECC Plan View
- S1.0B – Existing DECC Seawall Section
- S2.0B – Proposed DECC Seawall Section
- R1.0B – Proposed DECC Seawall Section
- R2.0B – Existing Conditions: DECC Seawall
- R2.1B – Proposed DECC Seawall Rendering



DULUTH & SUPERIOR HARBOR



SITE LEGEND:

- 608 — EXISTING MINOR CONTOUR
- 605 — EXISTING MAJOR CONTOUR
- 606.2 — EXISTING SPOT ELEVATION

GENERAL PROJECT NOTES:

- EXISTING TOPOGRAPHIC AND BOUNDARY INFORMATION TAKEN FROM SURVEY BY AMI CONSULTING ENGINEERS, PA DATED 07/01/2020.



Know what's below.
Call before you dig.

STATE LAW: 48 HOURS BEFORE EXCAVATING OR DEMOLISHING BUILDINGS, CALL 811 FOR FIELD LOCATION OF UNDERGROUND UTILITY LINES. THIS SERVICE LOCATES UTILITY OWNED LINES BUT NOT PRIVATE LINES.

THE LOCATIONS OF UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED. THE EXACT LOCATION OF ALL UTILITIES (PUBLIC AND PRIVATE) MUST BE DETERMINED BEFORE COMMENCING WORK.

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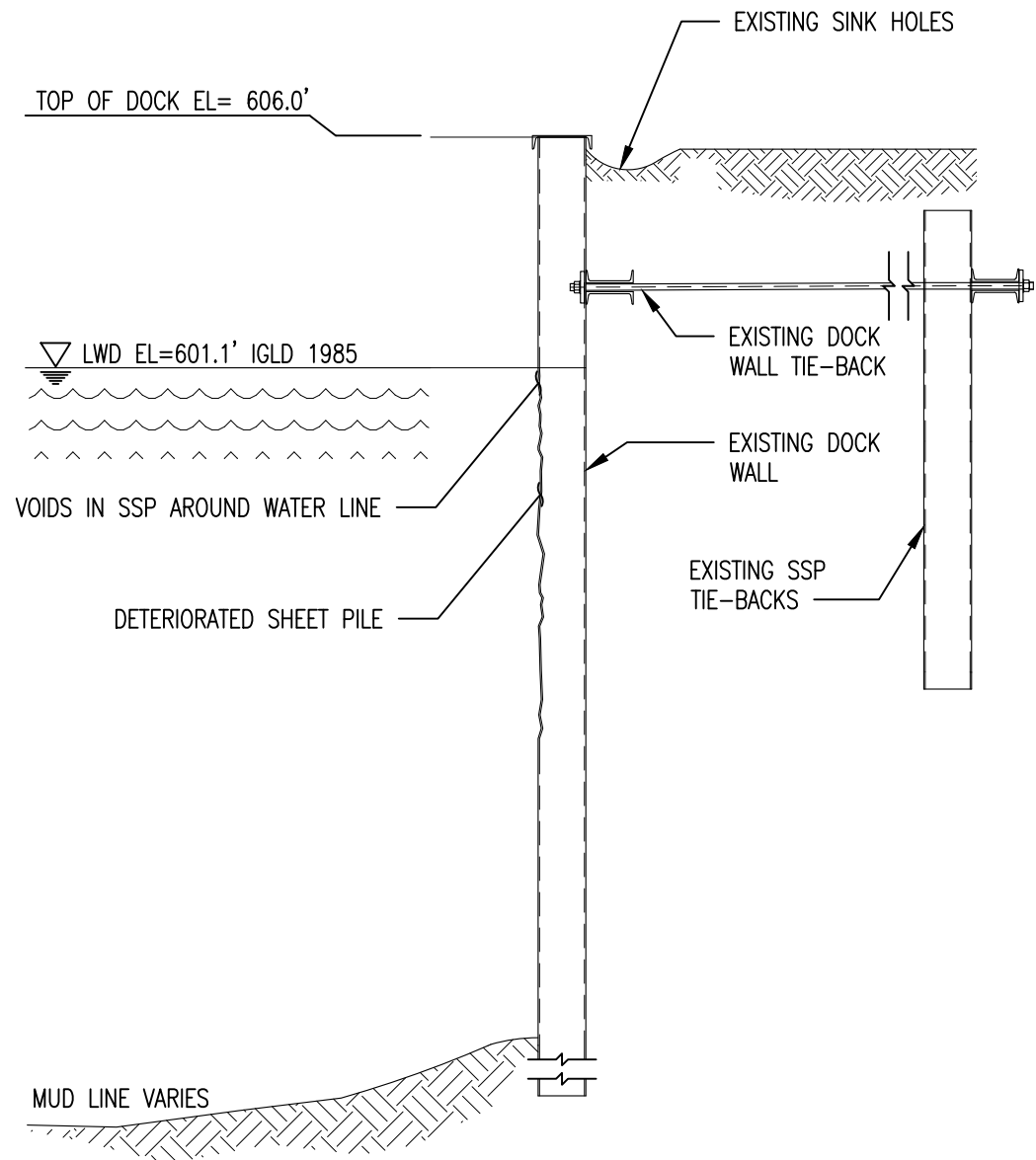
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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION 1532 W. WICHIGAN ST. DULUTH, MN 55806 | EXISTING CONDITIONS DECC |
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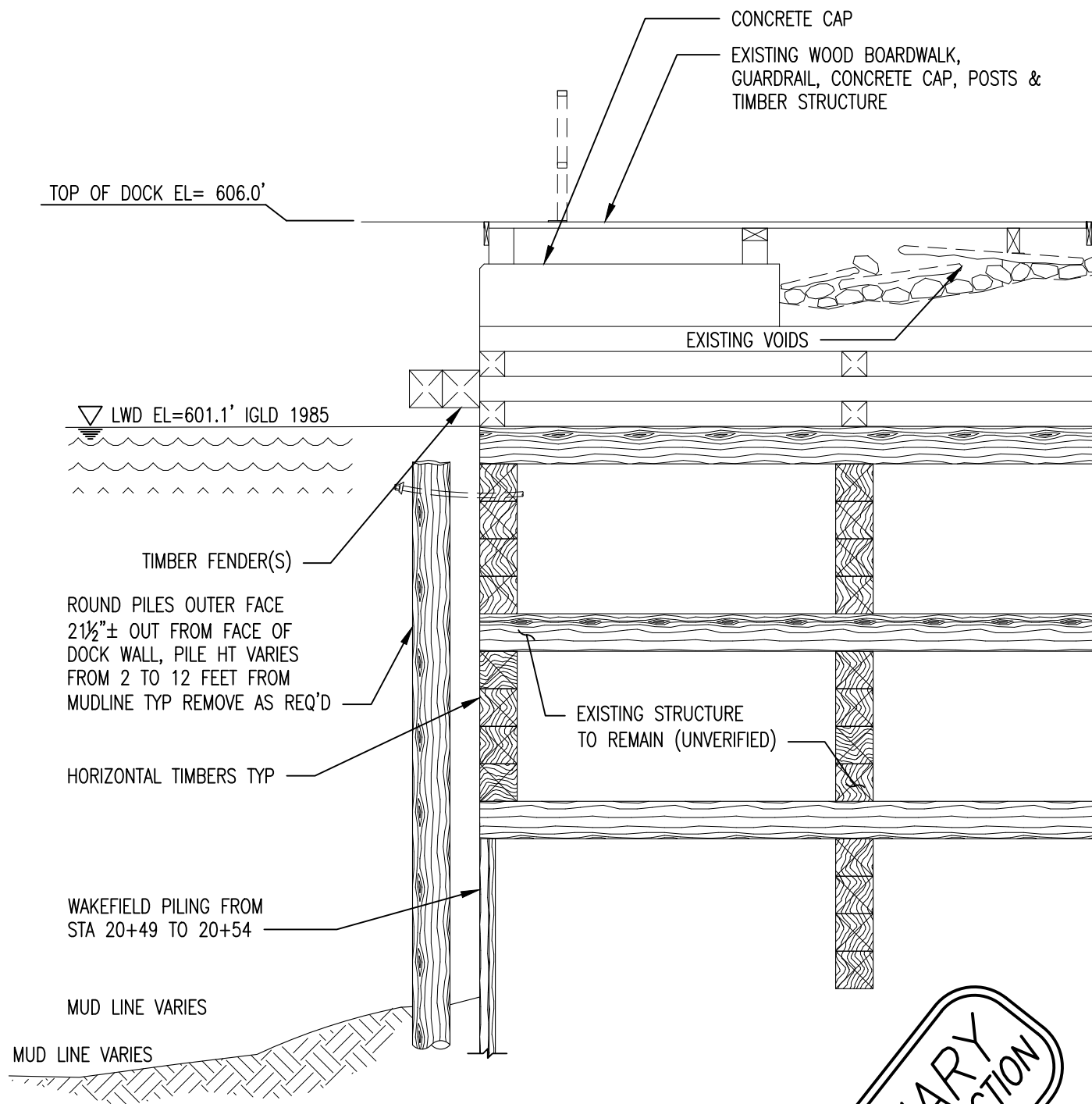
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S1.0
EXISTING DOCK SECTION
@ STA 7+50
SCALE: 1/4" = 1'-0"



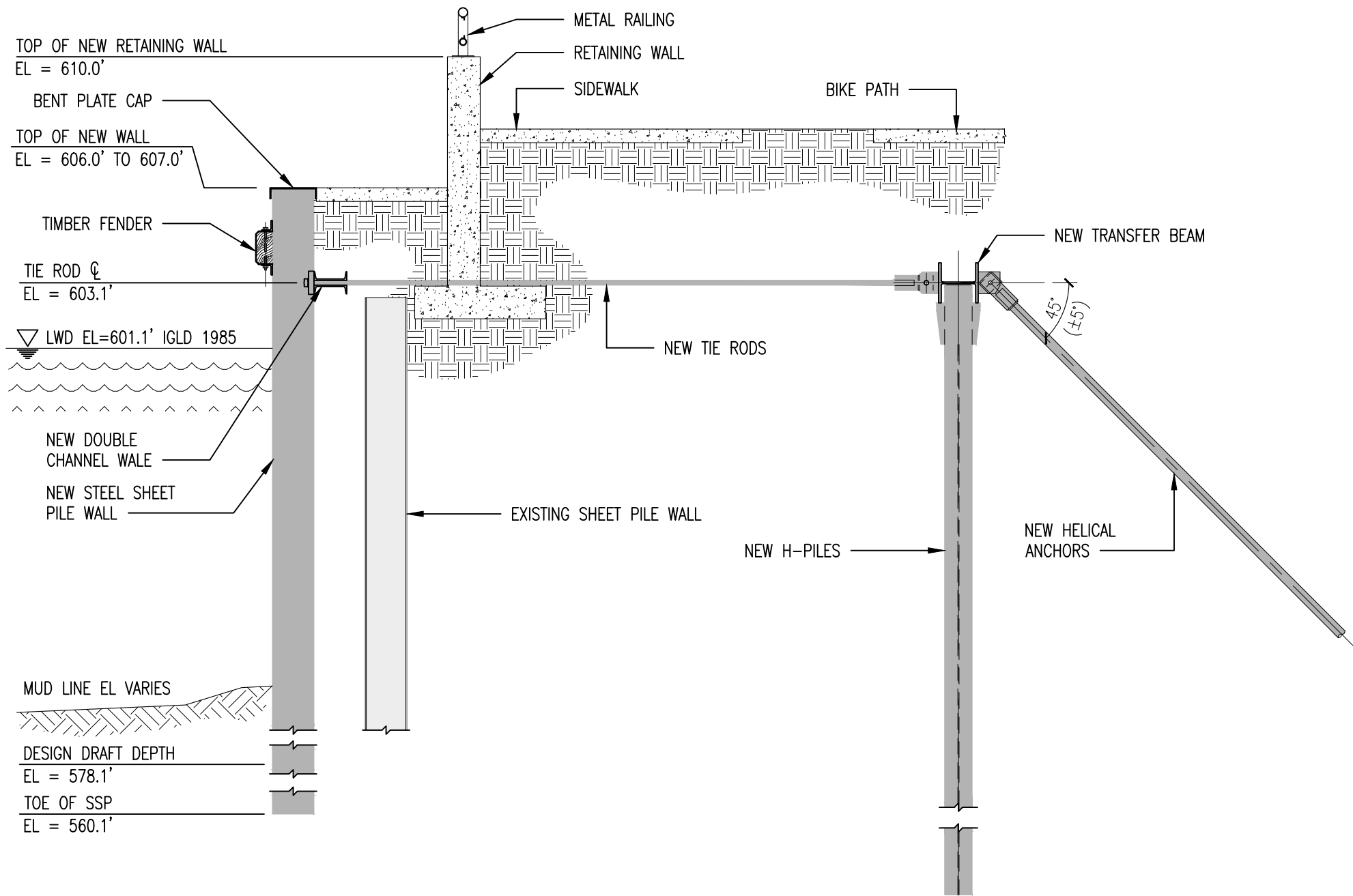
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S1.0
EXISTING DOCK SECTION
@ STA 1+00
SCALE: 1/4" = 1'-0"

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| CITY OF DULUTH | | | COASTAL INFRASTRUCTURE REHABILITATION | | |
| DULUTH, MINNESOTA | | | | | |
| EXISTING DECC SEAWALL SECTION | | | | | |
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| S1.0 | | | | | |



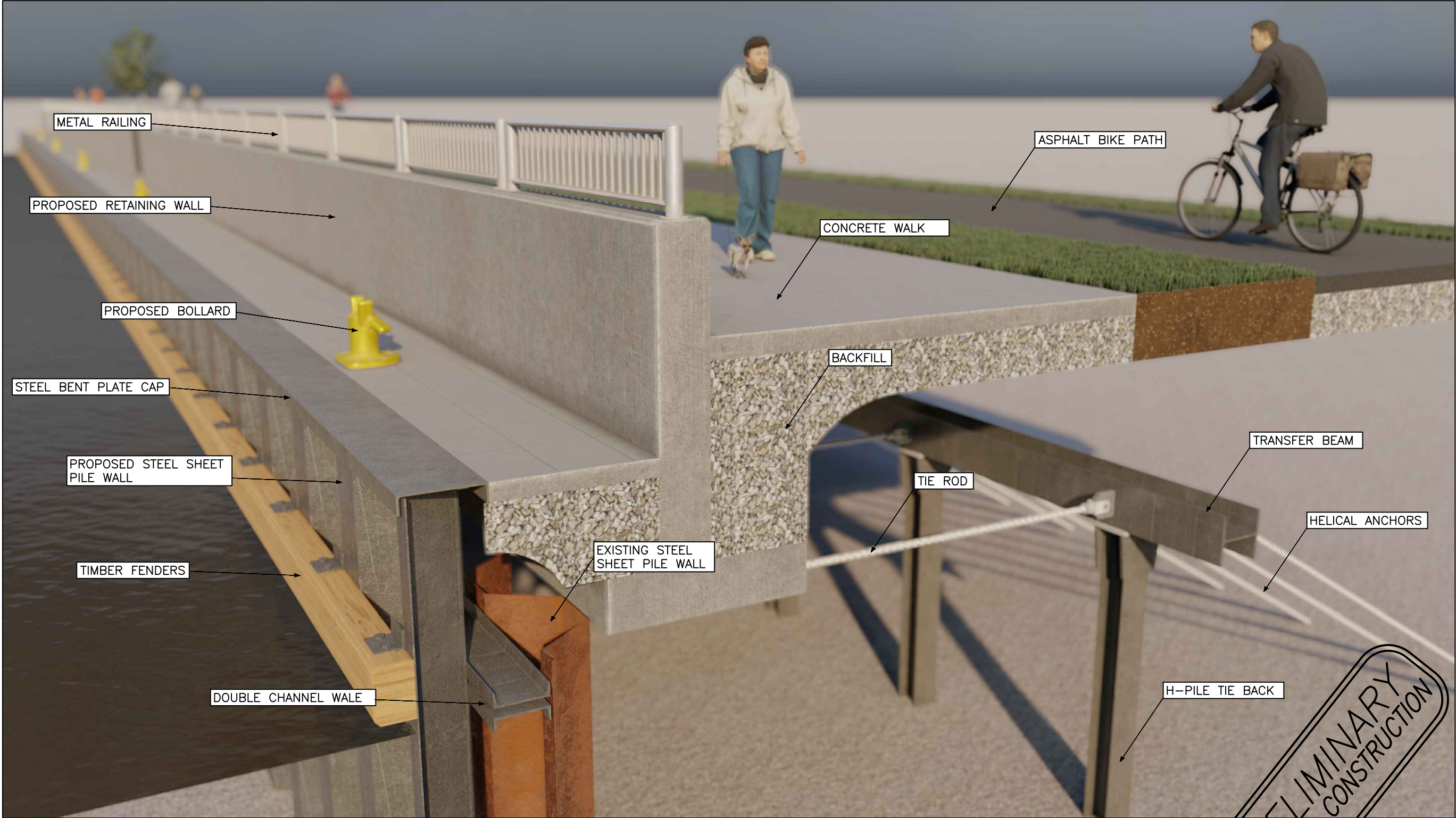
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S2.0 PROPOSED DECC WALL SECTION
SCALE: 1/4" = 1'-0"

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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION DULUTH, MINNESOTA | | DATE: | REV: | DESCRIPTION | BY: |
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| PROPOSED DECC SEAWALL SECTION | | | | | |
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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION | DULUTH, MINNESOTA |
| PROPOSED DECC SEAWALL SECTION | |

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| CITY OF DULUTH | | DATE: | REV: | DESCRIPTION | BY: |
| COASTAL INFRASTRUCTURE REHABILITATION | | | | | |
| DULUTH, MINNESOTA | | | | | |
| EXISTING DECC SEAWALL | | | | | |
| DECC AREA | | | | | |
| JOB No: 201187 | | | | | |
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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION | | DATE: | REV: | DESCRIPTION | BY: |
| DULUTH, MINNESOTA | | | | | |
| PROPOSED DECC SEAWALL RENDERING | | | | | |
| DECC AREA | | | | | |
| JOB No: 201187 | | | | | |
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Appendix C: Detailed Engineer's Cost Estimate

ENGINEERS ESTIMATE

NOTE: All costs are to be considered in-place costs. Include cost for all materials, hardware, shipping, fabrication, labor, equipment, insurance, bonds, permits state and local taxes, overhead and profit to properly install items listed under each system.

| System | Item | Type | Unit | Qty | Cost per Unit | TOTAL COST |
|---|-------------------------------------|---|-----------------------|-------|---------------|-----------------|
| BASE BID - SHORELINE PROTECTION - AREA 1 &1A | | | | | | |
| 1.01 | SWPPP & Site Preparation | Includes SWPP, Site Preparation, Demolition, and Salvaging | LS | 1 | \$ 10,000.00 | \$ 10,000.00 |
| 1.02 | Excavation & Disposal | Includes General Excavation. Also Includes Disposal of Driftwood, Trees, Old Debris, Fabric, etc. | LS | 1 | \$ 30,000.00 | \$ 30,000.00 |
| 1.03 | Salvage Existing Armor Stone | Salvage 0.25 - 4 ton Stone, Stockpile, & Place Behind Wall (Larger stone to be blaced at top) | LS | 1 | \$ 25,000.00 | \$ 25,000.00 |
| 1.04 | Concrete Retaining Wall and Footing | Concrete Retaining Wall and Footing | CY | 250 | \$ 2,000.00 | \$ 500,000.00 |
| 1.05 | Geotextile Fabric | High Strength Non-Woven Geotextile Behind Retaining Wall | SY | 300 | \$ 5.00 | \$ 1,500.00 |
| 1.06 | Granular Backfill | Select Granular Backfill Along Eroded Slopes | LS | 1 | \$ 20,000.00 | \$ 20,000.00 |
| 1.07 | Site Restoration | Includes Topsoil, MnDOT Slope Stability Native Seed Mix, and Erosion Control Blankets | LS | 1 | \$ 30,000.00 | \$ 30,000.00 |
| 1.08 | Install New Stone | Place 12" to 18" Stone Behind Retaining Wall | TN | 500 | \$ 160.00 | \$ 80,000.00 |
| TOTAL | | | | | | \$ 696,500.00 |
| BASE BID - SHORELINE PROTECTION - AREA 2 | | | | | | |
| 2.01 | SWPPP & Site Preparation | Includes SWPP, Site Preparation, Demolition, and Salvaging | LS | 1 | \$ 3,000.00 | \$ 3,000.00 |
| 2.02 | Excavation & Disposal | Includes General Excavation. Also Includes Disposal of Driftwood, Trees, Old Debris, Fabric, etc. | LS | 1 | \$ 5,000.00 | \$ 5,000.00 |
| 2.03 | Salvage Existing Armor Stone | Salvage 0.25 - 4 ton Stone, Stockpile, & Place Behind Wall (Larger stone to be blaced at top) | LS | 1 | \$ 5,000.00 | \$ 5,000.00 |
| 2.04 | Concrete Retaining Wall and Footing | Concrete Retaining Wall and Footing | CY | 35 | \$ 2,300.00 | \$ 80,500.00 |
| 2.05 | Geotextile Fabric | High Strength Non-Woven Geotextile Behind Retaining Wall | SY | 35 | \$ 5.00 | \$ 175.00 |
| 2.06 | Granular Backfill | Select granular backfill along eroded slopes | LS | 1 | \$ 20,000.00 | \$ 20,000.00 |
| 2.07 | Site Restoration | Includes Topsoil, MnDOT Slope Stability Native Seed Mix, and Erosion Control Blankets | LS | 1 | \$ 15,000.00 | \$ 15,000.00 |
| 2.08 | Install New Stone | Place 12" to 18" Stone Behind Retaining Wall | TN | 75 | \$ 160.00 | \$ 12,000.00 |
| TOTAL | | | | | | \$ 140,675.00 |
| BASE BID - SHORELINE PROTECTION - AREA 3 | | | | | | |
| 3.01 | SWPPP & Site Preparation | Includes SWPP, Site Preparation, Demolition, and Salvaging | LS | 1 | \$ 3,000.00 | \$ 3,000.00 |
| 3.02 | Excavation & Disposal | Includes General Excavation. Also Includes Disposal of Driftwood, Trees, Old Debris, Fabric, etc. | LS | 1 | \$ 10,000.00 | \$ 10,000.00 |
| 3.03 | Salvage Existing Armor Stone | Salvage 0.25 - 4 ton Stone, Stockpile, & Place Behind Wall (Larger stone to be blaced at top) | LS | 1 | \$ 5,000.00 | \$ 5,000.00 |
| 3.04 | Concrete Retaining Wall and Footing | Concrete Retaining Wall and Footing | CY | 60 | \$ 2,300.00 | \$ 138,000.00 |
| 3.05 | Geotextile Fabric | High Strength Non-Woven Geotextile Behind Retaining Wall | SY | 60 | \$ 5.00 | \$ 300.00 |
| 3.06 | Granular Backfill | Select granular backfill along eroded slopes | LS | 1 | \$ 20,000.00 | \$ 20,000.00 |
| 3.07 | Site Restoration | Includes Topsoil, MnDOT Slope Stability Native Seed Mix, and Erosion Control Blankets | LS | 1 | \$ 15,000.00 | \$ 15,000.00 |
| 3.08 | Install New Stone | Place 12" to 18" Stone Behind Retaining Wall | TN | 125 | \$ 160.00 | \$ 20,000.00 |
| TOTAL | | | | | | \$ 211,300.00 |
| BASE BID - SHORELINE PROTECTION - AREA 4 | | | | | | |
| 4.01 | SWPPP & Site Preparation | Includes SWPP, Site Preparation, Demolition, and Salvaging | LS | 1 | \$ 5,000.00 | \$ 5,000.00 |
| 4.02 | Excavation & Disposal | Includes General Excavation. Also Includes Disposal of Driftwood, Trees, Old Debris, Fabric, etc. | LS | 1 | \$ 10,000.00 | \$ 10,000.00 |
| 4.03 | Salvage Existing Armor Stone | Salvage 0.25 - 4 ton Stone, Stockpile, & Place Behind Wall (Larger stone to be blaced at top) | LS | 1 | \$ 10,000.00 | \$ 10,000.00 |
| 4.04 | Concrete Retaining Wall and Footing | Concrete Retaining Wall and Footing | CY | 100 | \$ 2,100.00 | \$ 210,000.00 |
| 4.05 | Geotextile Fabric | High Strength Non-Woven Geotextile Behind Retaining Wall | SY | 100 | \$ 5.00 | \$ 500.00 |
| 4.06 | Granular Backfill | Select granular backfill along eroded slopes | LS | 1 | \$ 5,000.00 | \$ 5,000.00 |
| 4.07 | Site Restoration | Includes Topsoil, MnDOT Slope Stability Native Seed Mix, and Erosion Control Blankets | LS | 1 | \$ 20,000.00 | \$ 20,000.00 |
| 4.08 | Install New Stone | Place 12" to 18" Stone Behind Retaining Wall | TN | 200 | \$ 160.00 | \$ 32,000.00 |
| TOTAL | | | | | | \$ 292,500.00 |
| BASE BID - SHORELINE PROTECTION - AREA 5 | | | | | | |
| 5.01 | SWPPP & Site Preparation | Includes SWPP, Site Preparation, Demolition, and Salvaging | LS | 1 | \$ 10,000.00 | \$ 10,000.00 |
| 5.02 | Excavation & Disposal | Includes General Excavation. Also Includes Disposal of Driftwood, Trees, Old Debris, Fabric, etc. | LS | 1 | \$ 25,000.00 | \$ 25,000.00 |
| 5.03 | Salvage Existing Armor Stone | Salvage 0.25 - 4 ton Stone, Stockpile, & Place Behind Wall (Larger stone to be blaced at top) | LS | 1 | \$ 30,000.00 | \$ 30,000.00 |
| 5.04 | Concrete Retaining Wall and Footing | Concrete Retaining Wall and Footing | CY | 200 | \$ 2,000.00 | \$ 400,000.00 |
| 5.05 | Geotextile Fabric | High Strength Non-Woven Geotextile Behind Retaining Wall | SY | 200 | \$ 5.00 | \$ 1,000.00 |
| 5.06 | Granular Backfill | Select granular backfill along eroded slopes | CY | 1,000 | \$ 40.00 | \$ 40,000.00 |
| 5.07 | Site Restoration | Includes Topsoil, MnDOT Slope Stability Native Seed Mix, and Erosion Control Blankets | LS | 1 | \$ 30,000.00 | \$ 30,000.00 |
| 5.08 | Install New Stone | Place 12" to 18" Stone Behind Retaining Wall | TN | 1,100 | \$ 160.00 | \$ 176,000.00 |
| TOTAL | | | | | | \$ 712,000.00 |
| BASE BID - SHORELINE PROTECTION FOR AREAS 1 - 5 | | | | | | |
| 6.00 | Mobilization / Demobilization | Lump Sum | LS | 1 | \$ 400,000.00 | \$ 400,000.00 |
| SHORELINE PROTECTION PROJECT TOTALS | | | | | | |
| | ITEM | | | | | TOTAL COST |
| | BASE BID | | | | | \$ 2,452,975.00 |
| | PAYMENT / PERFORMANCE BOND | | | | 1% | \$ 24,529.75 |
| | ENGINEERING & PERMITTING | | | | 5% | \$ 122,648.75 |
| | PROJECT ADMINISTRATION | | | | 6% | \$ 147,178.50 |
| | CONTINGENCY | | | | 10% | \$ 245,297.50 |
| | | | PROJECT TOTAL | | | \$ 2,992,629.50 |
| | | | EDA FUNDED PORTION OF | | | \$ 1,328,500.00 |

ENGINEERS ESTIMATE

NOTE: All costs are to be considered in-place costs. Include cost for all materials, hardware, shipping, fabrication, labor, equipment, insurance, bonds, permits state and local taxes, overhead and profit to properly install items listed under each system.

| System | Item | Type | Unit | Qty | Cost per Unit | TOTAL COST |
|---|---|--|------------------------------|--------|-----------------|------------------------|
| BASE BID - NEW SHEET PILE DOCK WALL - PHASE II | | | | | | |
| 1.1 | Steel Sheet Pile Installation | 1166 feet with sheets 45 feet long (Materials & Installation) | SF | 52,470 | \$ 27.50 | \$ 1,442,925.00 |
| 1.2 | Transfer Beam over H-Piles at Bollards | W14x120 (Materials & Installation) | LF | 40 | \$ 300.00 | \$ 12,000.00 |
| 1.3 | Steel H Piles | 136 - HP10x42 @ 30 feet long (Materials & Installation) | LF | 4,080 | \$ 45.00 | \$ 183,600.00 |
| 1.4 | Tie Rods & Hardware | 1-3/4" DIA x Threaded Rod (75 ksi) | LF | 2,584 | \$ 46.00 | \$ 118,864.00 |
| 1.5 | Helical Anchors | Complete anchor and attachments to H Pile | EA | 144 | \$ 4,000.00 | \$ 576,000.00 |
| 1.6 | Bent Plate Steel Sheet Pile Cap | A36 3/8" bent plate | LF | 1,166 | \$ 100.00 | \$ 116,600.00 |
| 1.7 | Double Channel Wale | 2 - C12x30 wale | LF | 1,072 | \$ 155.00 | \$ 166,160.00 |
| 1.8 | Steel Guardrails | New Steel Guardrails on top of retaining wall | LF | 1,166 | \$ 80.00 | \$ 93,280.00 |
| 1.9 | Concrete Retaining Wall | Concrete Retaining Wall | CY | 375 | \$ 1,000.00 | \$ 375,000.00 |
| 1.10 | Common Excavation | Common Excavation | CY | 3,790 | \$ 30.00 | \$ 113,700.00 |
| 1.11 | Granular Backfill | Select granular backfill (coarse sand) - compacted above waterline | CY | 2,600 | \$ 37.00 | \$ 96,200.00 |
| 1.12 | Removal & Disposal of Misc. Debris | Removal & Disposal of Misc. Debris | CY | 200 | \$ 45.00 | \$ 9,000.00 |
| 1.13 | Crushed Stone Fill | 3/4" Vibro Compacted Crushed Stone | CY | 3,050 | \$ 70.00 | \$ 213,500.00 |
| 1.14 | Concrete Core Drilling | Concrete Core Drilling for Wall Anchorage | LF | 10 | \$ 105.00 | \$ 1,050.00 |
| 1.15 | Wall Anchorage | Wall Anchorage (7/8" Diameter) | LF | 10 | \$ 105.00 | \$ 1,050.00 |
| 1.16 | Dense Graded Base | 4" Layer of Dense Base (class 5) beneath concrete | CY | 175 | \$ 60.00 | \$ 10,500.00 |
| 1.17 | New Bollards & New Foundations | New 30 Ton Bollards | EA | 4 | \$ 25,000.00 | \$ 100,000.00 |
| 1.18 | Single Row Timber (Rub Rail) Fender | 6"x12" Oak No. 2 Timbers Along Lower Platform | LF | 1,137 | \$ 150.00 | \$ 170,550.00 |
| 1.19 | Demolition | Partial Demolition of Existing Dock for Installation of New Dock | LS | 1 | \$ 75,000.00 | \$ 75,000.00 |
| 1.20 | Concrete Flatwork | 4" Thick Slabs, sidewalks and ramps | SF | 16,750 | \$ 6.00 | \$ 100,500.00 |
| 1.21 | Concrete Fill | Between exist cap and new sheet pile wall | CY | 263 | \$ 400.00 | \$ 105,200.00 |
| 1.22 | Safety Ladders | A36 Steel - Painted Safety Yellow | EA | 4 | \$ 1,500.00 | \$ 6,000.00 |
| 1.23 | Protective Steel Coating (Applied According to Plans & Specs) | 20 MIL DFT minimum, Engineer Approved Coating | SF | 18,656 | \$ 24.00 | \$ 447,744.00 |
| 1.24 | Curb & Gutter | Curb & Gutter | LF | 850 | \$ 20.00 | \$ 17,000.00 |
| 1.25 | Bike Path | Bituminous for Bike Path | LS | 1 | \$ 40,000.00 | \$ 40,000.00 |
| 1.26 | Storm Improvements | Storm sewer structures, Outfall improvements | LS | 1 | \$ 75,000.00 | \$ 75,000.00 |
| 1.27 | Electrical Installation | Electrical Installation | LS | 1 | \$ 1,000,000.00 | \$ 1,000,000.00 |
| 1.28 | DNR Fish Habitat Restoration | DNR Fish Habitat Restoration | LS | 1 | \$ 150,000.00 | \$ 150,000.00 |
| 1.29 | Mobilization / Demobilization | Lump Sum | LS | 1 | \$ 375,000.00 | \$ 375,000.00 |
| PHASE II PROJECT TOTALS | | | | | | |
| | ITEM | | | | | TOTAL COST |
| | BASE BID | | | | | \$ 6,191,423.00 |
| | PERMITS | | | | | \$ 100,000.00 |
| | PAYMENT / PERFORMANCE BOND | | | | 3% | \$ 185,742.69 |
| | ENGINEERING | | | | 5% | \$ 309,571.15 |
| | PROJECT ADMINISTRATION | | | | 10% | \$ 619,142.30 |
| | CONTINGENCY | | | | 10% | \$ 619,142.30 |
| | | | PROJECT TOTAL | | | \$ 8,025,021.44 |
| | | | EDA FUNDED PORTION OF | | | \$ 2,499,549.00 |

CITY OF DULUTH

DECC SEAWALL PHASE II

DULUTH, MN



OWNER

CITY OF DULUTH
PROPERTIES AND FACILITIES
1532 W. MICHIGAN ST.
DULUTH, MN 55806

SCHEMATIC DESIGN TEAM

AMI CONSULTING ENGINEERS, P.A.
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715-718-5638

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CHASE.DEWHIRST@AMIENGINEERS.COM

COASTAL ENGINEER
ZAC MORRIS, PE
ZAC.MORRIS@AMIENGINEERS.COM

SHEET INDEX

| | |
|------|---|
| G0.0 | TITLE SHEET |
| C1.0 | EXISTING CONDITIONS - DECC COASTAL INFRASTRUCTURE |
| S1.0 | EXISTING DECC SEAWALL SECTIONS |
| S1.1 | EXISTING DECC SEAWALL SECTIONS |
| S2.0 | PROPOSED DECC SEAWALL SSP SECTION |
| S2.1 | PROPOSED DECC SEAWALL SSP SECTION |
| S3.0 | PROPOSED DECC SEAWALL -WAKE FIELD WALL |
| S3.1 | PROPOSED DECC SEAWALL - TIMBER CRIB |
| R1.0 | PROPOSED SSP REHAB RENDERING |
| R1.1 | PROPOSED TIMBER CRIB REHAB RENDERING |
| R2.0 | DECC SEAWALL - SSP EXISTING CONDITIONS |
| R2.1 | DECC SEAWALL - PROPOSED SSP REHAB RENDERING |
| R3.0 | DECC SEAWALL - TIMBER CRIB EXISTING CONDITIONS |
| R3.1 | DECC SEAWALL - PROPOSED TIMBER CRIB REHAB RENDERING |



Know what's below.
Call before you dig.

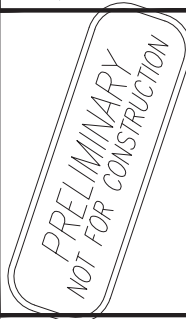
STATE LAW: 48 HOURS BEFORE EXCAVATING OR DEMOLISHING BUILDINGS, CALL 811 FOR FIELD LOCATION OF UNDERGROUND UTILITY LINES. THIS SERVICE LOCATES UTILITY OWNED LINES BUT NOT PRIVATE LINES.

THE LOCATIONS OF UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED. THE EXACT LOCATION OF ALL UTILITIES (PUBLIC AND PRIVATE) MUST BE DETERMINED BEFORE COMMENCING WORK.

Survey Layout Information
Coordinate System: US State Plane
1983 – MN North 2201
Datum: NAD 1983
Geoid: G12B–US

GOVERNING SPECIFICATIONS

THE CURRENT EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND THE CURRENT EDITION OF THE CITY OF DULUTH, MN CONSTRUCTION STANDARDS SHALL GOVERN.



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| CITY OF DULUTH DECC SEAWALL PHASE II | DULUTH, MN TITLE SHEET |
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EXISTING SPOT ELEVATION

GENERAL PROJECT NOTES:

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EXISTING TOPOGRAPHIC AND BOUNDARY INFORMATION TAKEN FROM SURVEY BY AMI CONSULTING ENGINEERS, PA DATED 07/01/2020.

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CITY OF DULUTH
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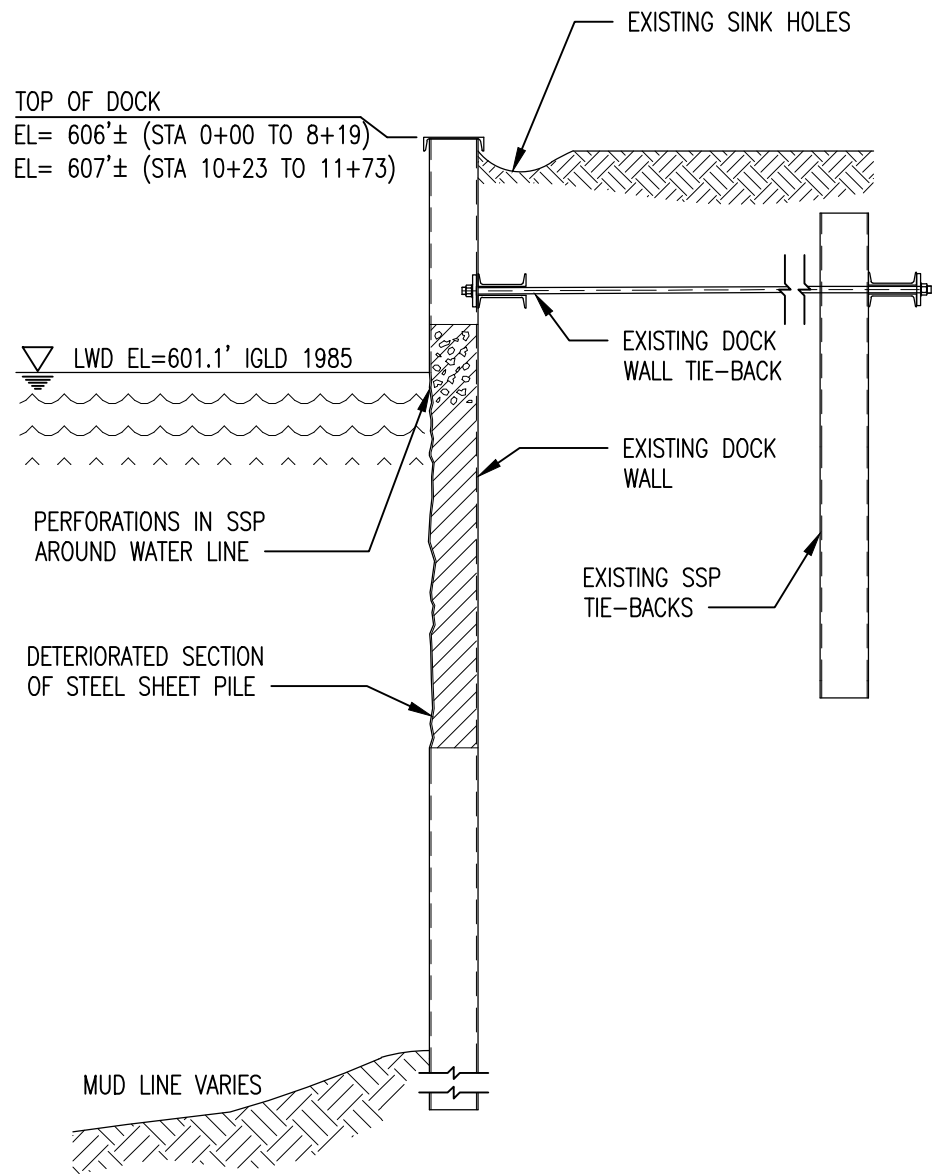
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EXISTING CONDITIONS

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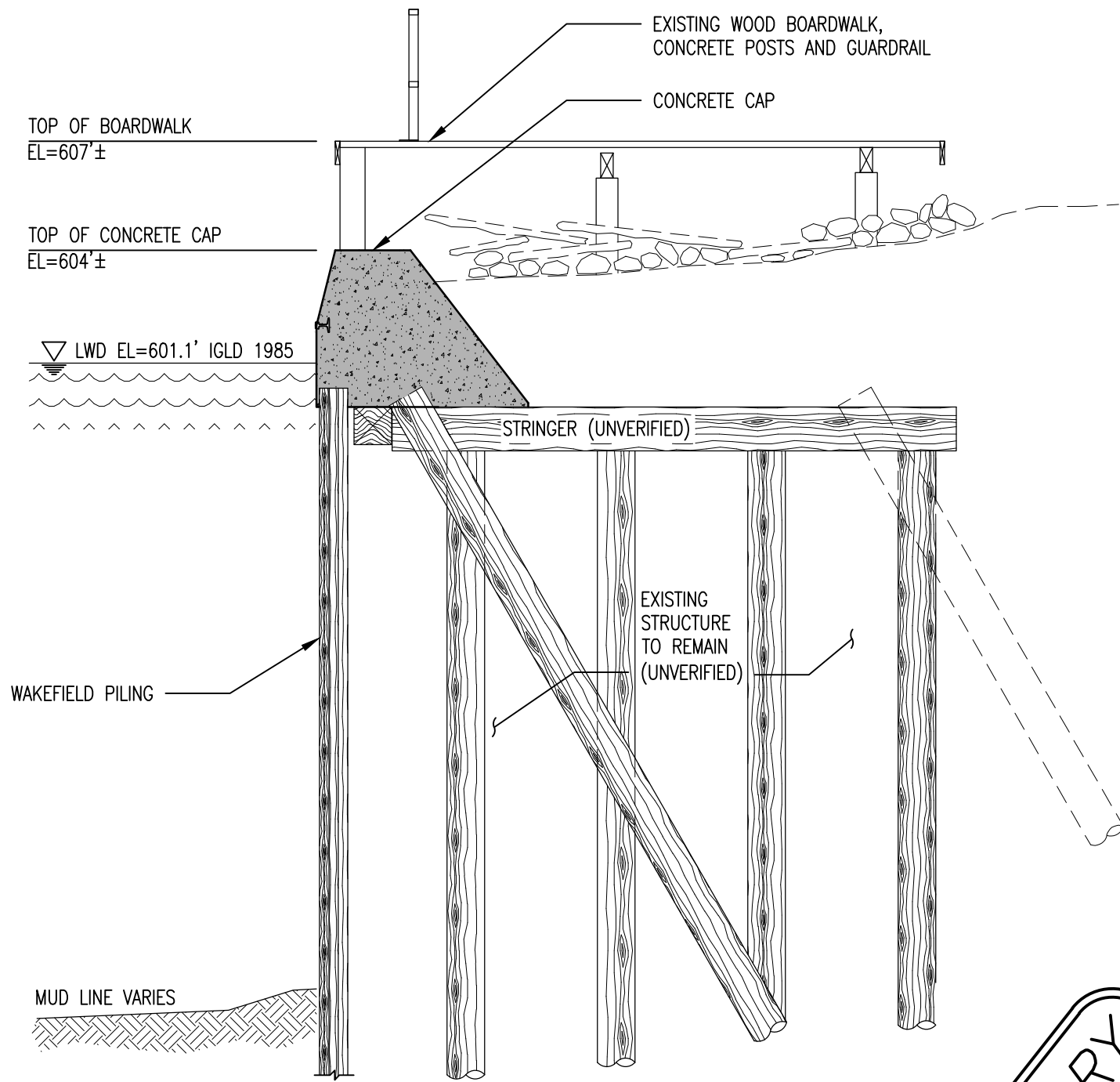
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TYP EXISTING SSP SEAWALL
STA 0+00 TO 8+19 AND 10+23 TO 11+43
1/4" = 1'-0"

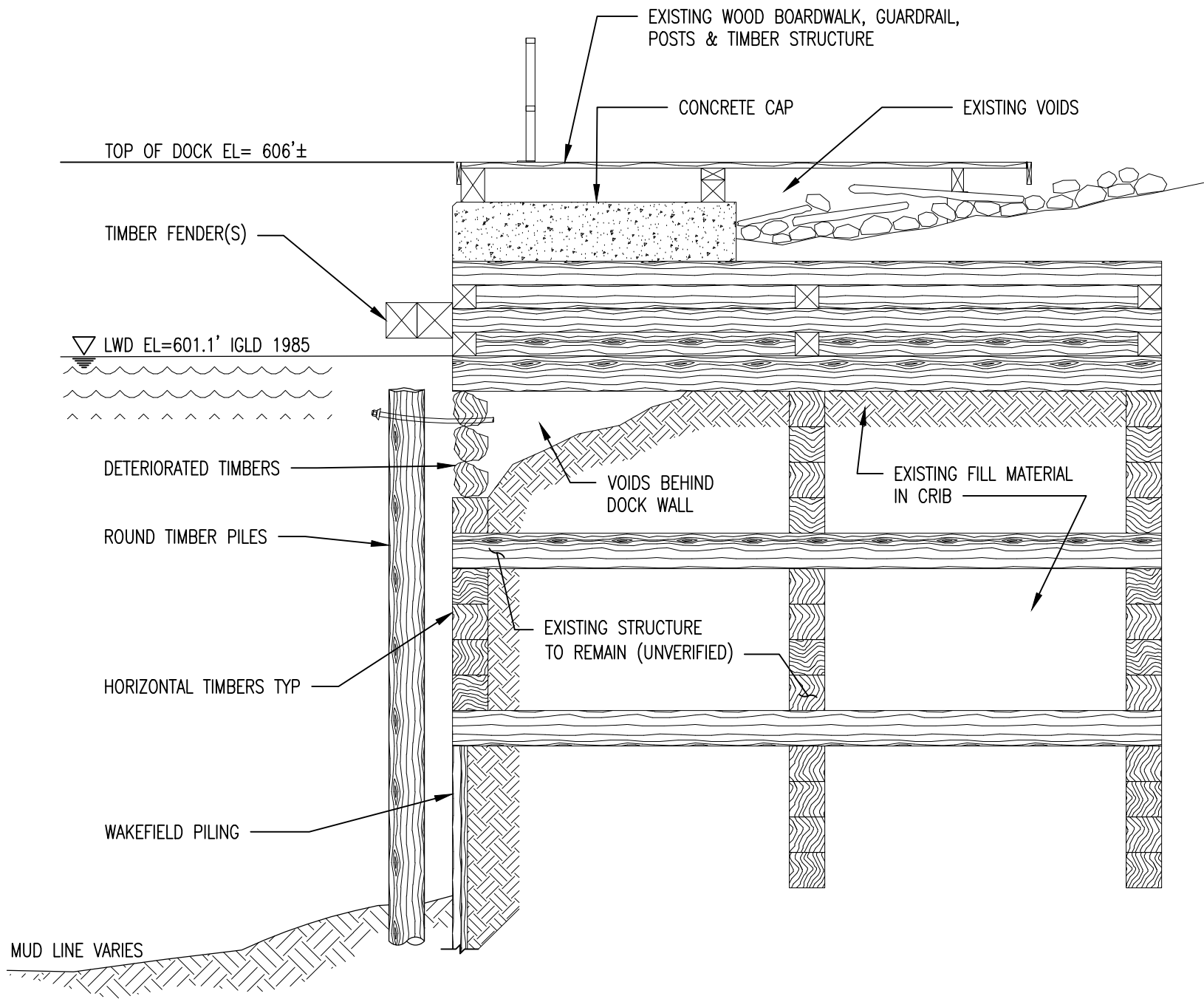


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STA 8+19 TO 8+84
1/4" = 1'-0"

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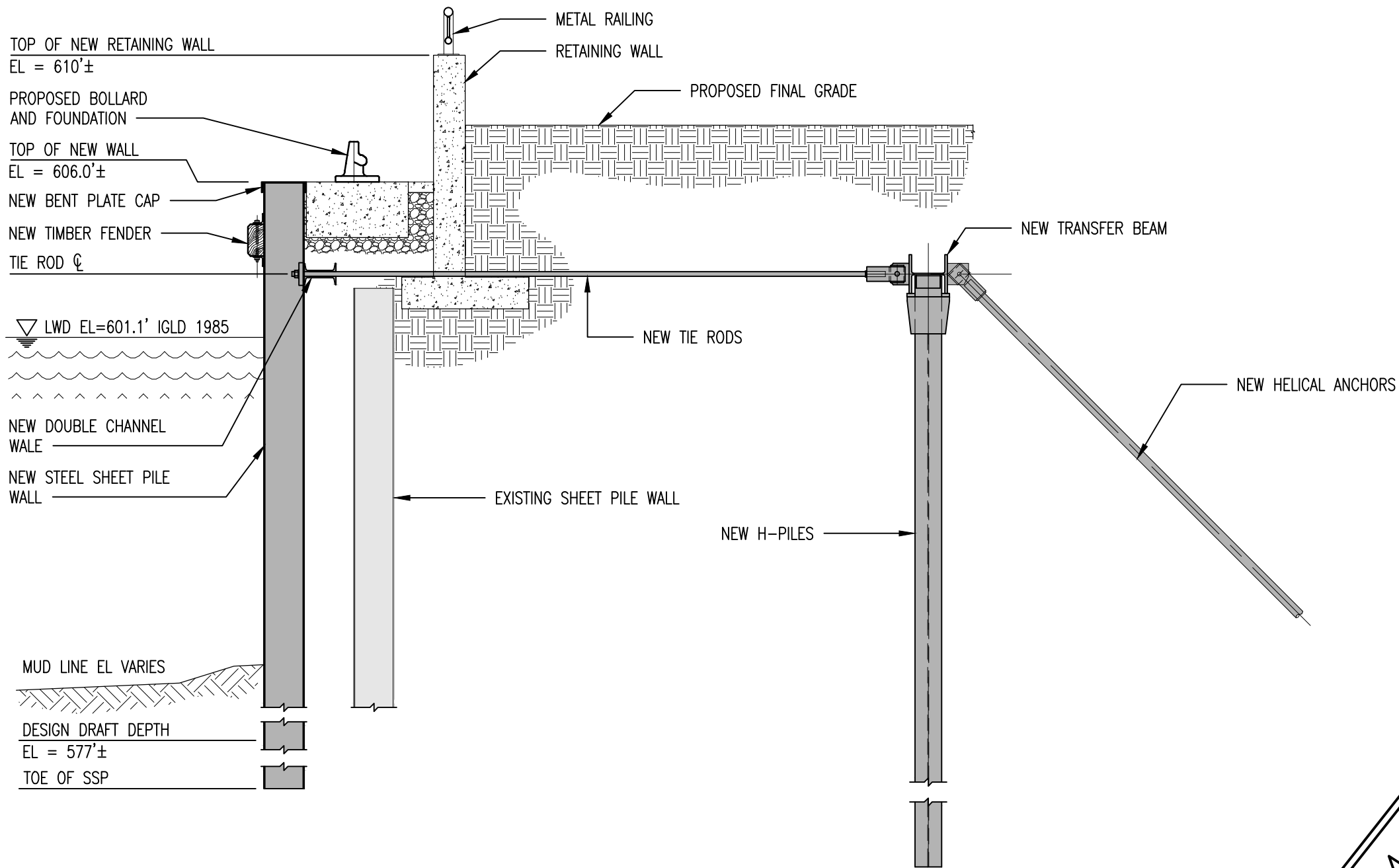


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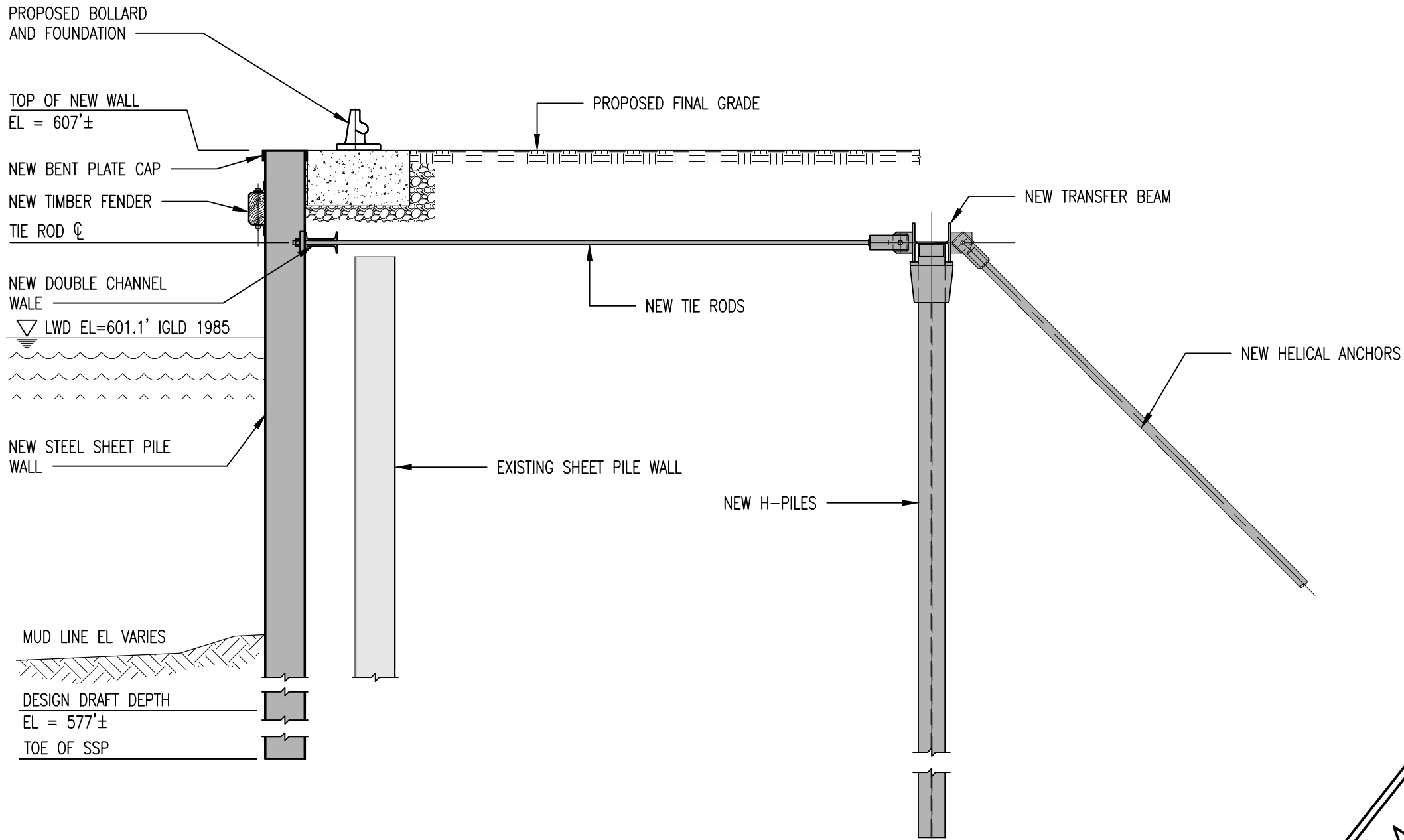
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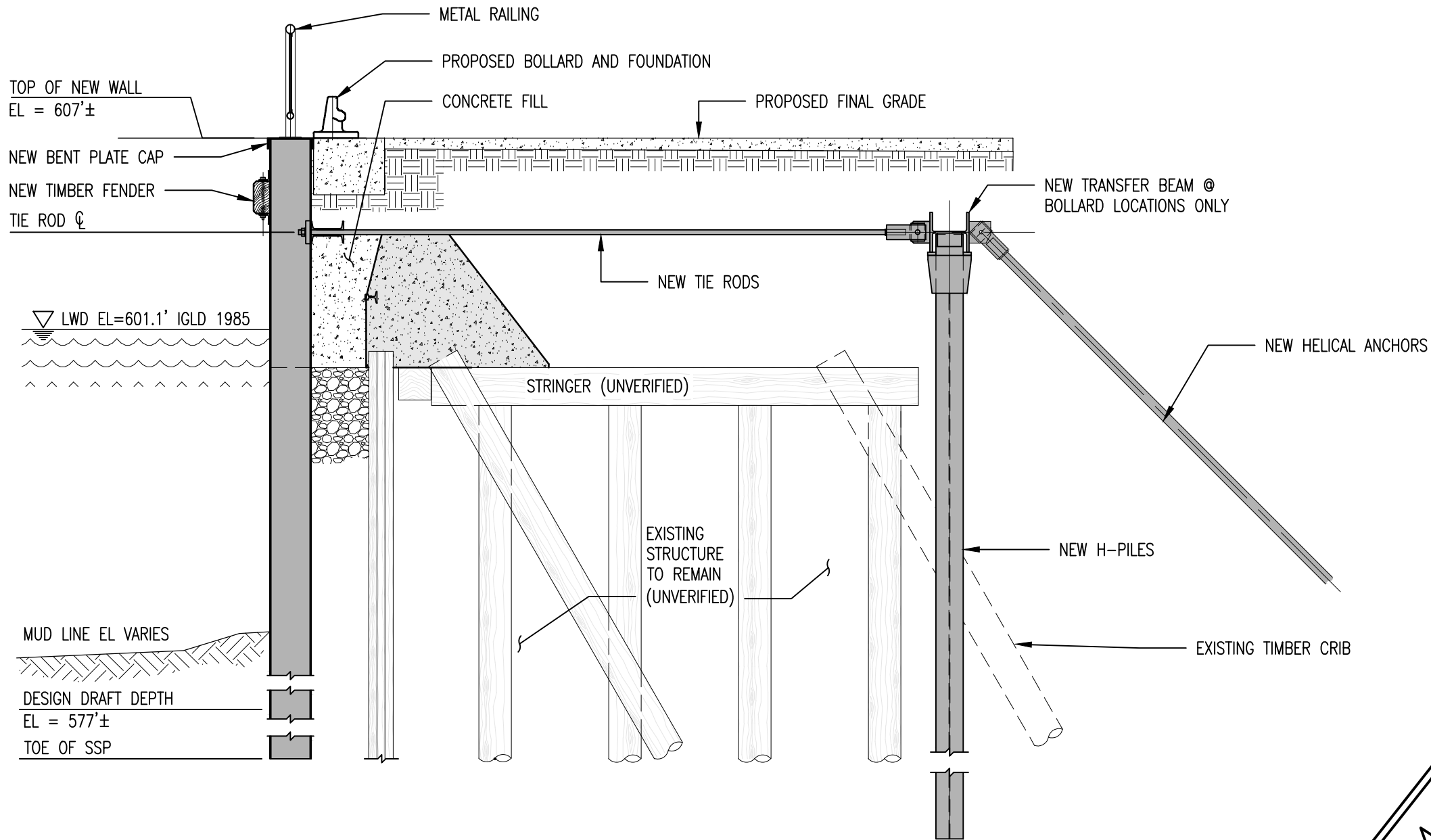
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1 PROPOSED DECC SEAWALL REHAB - STEEL SHEET PILE (STA 10+73 TO 11+43)
S2.1 1/4" = 1'-0"

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NOT FOR CONSTRUCTION

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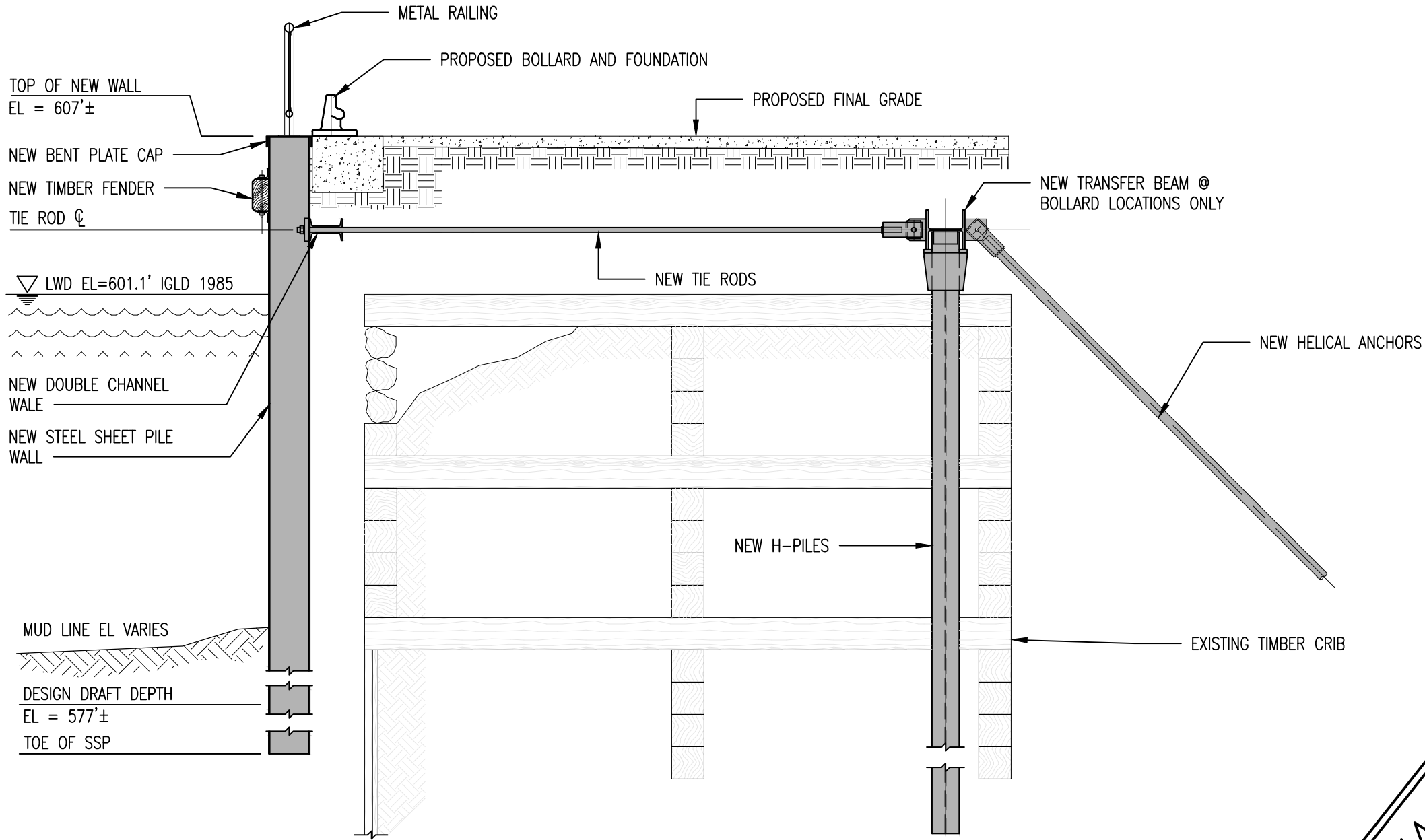
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PROPOSED DECC SEAWALL REHAB - WAKEFIELD WALL (STA 8+19 TO 8+84)

1/4" = 1'-0"

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PROPOSED DECC SEAWALL REHAB - TIMBER CRIB
1/4" = 1'-0"

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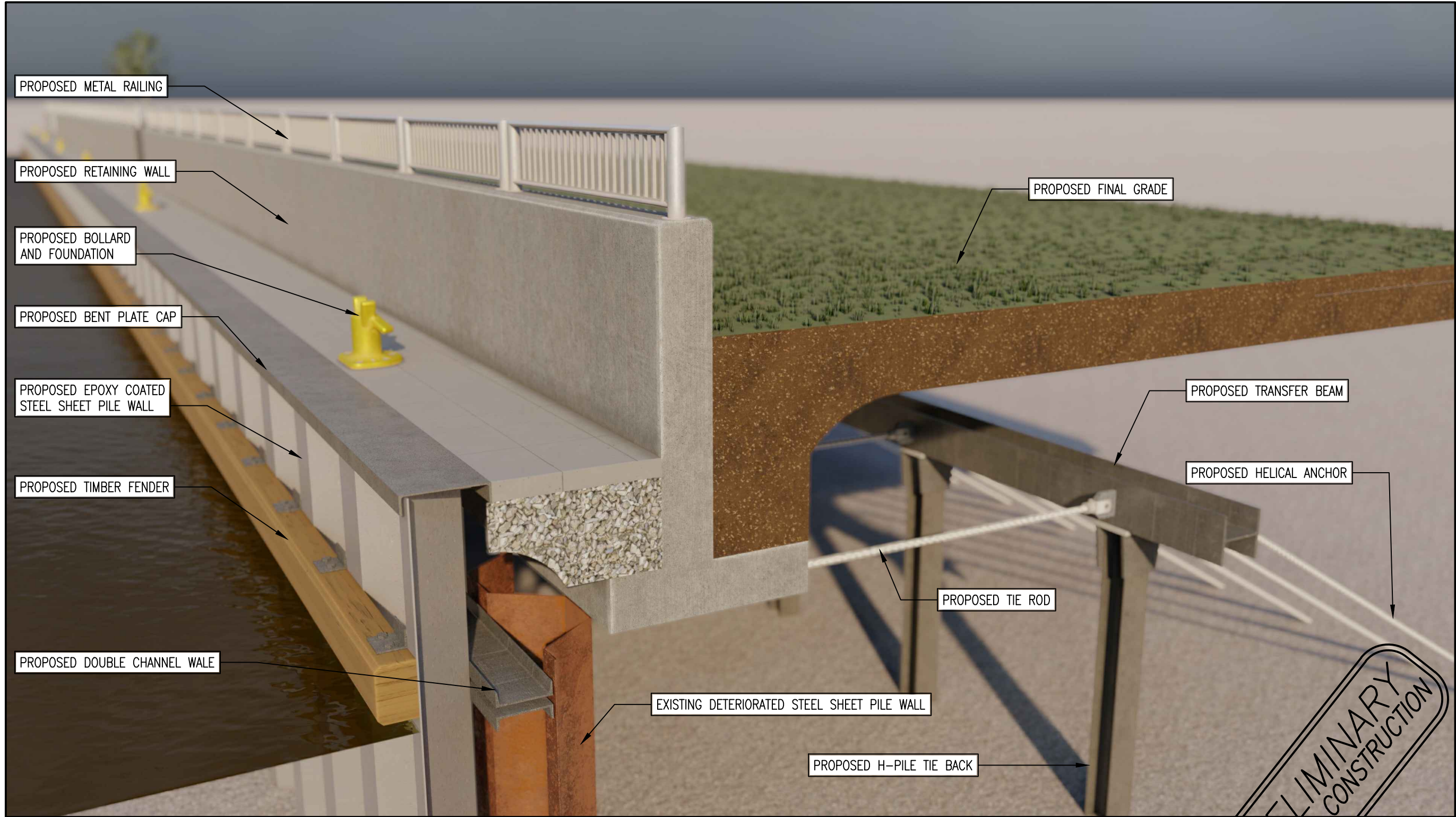


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DECC SEAWALL - PROPOSED SSP REHAB RENDERING



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1
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DECC SEAWALL - PROPOSED TIMBER CRIB REHAB RENDERING

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| <div>CITY OF DULUTH DECC COASTAL INFRASTRUCTURE REHABILITATION DULUTH, MINNESOTA</div> <div>PROPOSED GREAT LAKES AQUARIUM WALL SECTION</div> | | | | DATE: | REV: | DESCRIPTION | BY: |
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| CITY OF DULUTH COASTAL INFRASTRUCTURE REHABILITATION DULUTH, MINNESOTA DECC SEAWALL SSP EXISTING CONDITIONS | DATE: | REV: | DESCRIPTION | BY: |
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DECC SEAWALL - PROPOSED SSP
REHAB RENDERING



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DECC SEAWALL - PROPOSED
TIMBER CRIB REHAB RENDERING



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Duluth, City of

Project Narrative

(\$ in thousands)

Duluth Coastal Infrastructure Rehabilitation - Lakewalk and Harbor Sea Walls

AT A GLANCE**2020 Request Amount:** \$13,500**Priority Ranking:** 1

Project Summary: \$13.5 million is requested for the final phase rehabilitation of Duluth's storm-damaged coastal infrastructure at two adjoining locations of the Lakewalk and Harbor sea walls. The project will restore coastal infrastructure that is the centerpiece of a nationally significant tourist destination and supports the busiest port by tonnage in the Great Lakes.

Project Description

Aging infrastructure and wave damage from Lake Superior storms have combined to cause coastal infrastructure failures that grow worse with each new storm. Failures in the form of compromised sea walls, disintegrating coastal armoring, disappearing park and trail amenities, sink holes, and wave-pummeled infrastructure increasingly threaten public safety, recreational access, and Duluth's six-million-visitors-per-year tourism economy.

Phase I

Phase I rehabilitation work on the Lakewalk and adjoining harbor sea walls began in 2018 and will continue through 2020. Phase I included construction of 1300 feet of new sheet pile sea wall at Minnesota Slip and repair of portions of the Lakewalk damaged by a series of three state and federal storm disasters.

The attached Map I, Sea Wall Section Map, shows all of the harbor seawall infrastructure in question. Sections H, G, F, and E at Minnesota Slip were repaired in Phase I for a total of \$7.3 million. The current request is for repair of Sections A, B, C, D, and K and adjoining trail infrastructure and roadway behind the Duluth Entertainment and Convention Center (DECC).

The attached Maps II-to-VI, Lakewalk Damage Sections, show all of the Lakewalk infrastructure that needs to be reconstructed. The legend of the map indicates which Lakewalk sections are included in Phase I and which are included in the Phase II project for which we are now requesting funding.

Phase II

Area I, Harbor Sea Walls, Trail Infrastructure, and Roadway. \$8,100,00 is requested for Area I to rehabilitate the 1,200 feet of sea wall and adjoining trail infrastructure and roadway behind the DECC. This infrastructure is extremely aged and portions are in immediate danger of failing or have already failed. The sea wall, trail infrastructure, and roadway are structurally integrated such that reconstruction of one strongly recommends reconstruction of all three.

Area II, Lakewalk. \$5,400,000 is requested for the rehabilitation of the Lakewalk inclusive of shoreline armoring and trail infrastructure. Lakewalk facilities are over 30 years old and failing or not accessible. The shoreline from Canal Park to 21st Ave East is highly unstable clay that is collapsing due to the storms and wave action that is expected to continue.

Area I: Harbor Sea Walls, Trail Infrastructure, and Roadway

This portion of the project rehabilitates the remaining approximately 1,200 linear feet of sea wall infrastructure along the Duluth harbor sea wall in front of the DECC, and will complete the overall rehabilitation of the entire contiguous dock wall structure spanning from Minnesota Slip to the Great Lakes Aquarium. This is a two-phase project broken down into sections that correspond to locations and age as identified below. Please refer again to Map 1: Sea Wall Section Map which refers to rehabilitation of:

- i. Sections C and E. These are dock sea walls built in the late 1880's to the 1950's, now requiring complete replacement. These areas are showing signs of eminent failure and represent significant public safety concerns as well as access concerns as the Vista Fleet operates from section E.
- ii. Sections A, B, and D. These are dock sea walls built from the 1950's to 1980's with different types of steel sheet pile. They are significantly deteriorated due to the caustic properties of the water that accelerate corrosion, but can be salvaged by repairing, reinforcing and protecting them from further deterioration. Reconstruction of Section D is essential to plan to meet the growing demand to establish Duluth as an international destination for cruiseships.
- iii. Section K. This sea wall is debris and old pilings that remain from old dock structures and impede safe access to Minnesota Slip.
- iv. Harbor Drive. The drive services the entire DECC complex as well as the public harbor access along the sea wall and is over 60 years old. The road is undermined with voids caused by the sloughing sea wall infrastructure and suffers from continual ponding and damage after rain or storm events.

Note: the areas labeled as I and J on the map are not part of this request due to ownership uncertainty.

Area II: Lakewalk (Canal Park to 21st Ave East)

The infrastructure in this area is integral to the Lakewalk - the centerpiece of Duluth's six-million-visitors-per-year tourism economy. The Lakewalk connects the Bayfront Park areas to Canal Park, Gitchi ode' Akiing, the Rose Garden, Leif Erikson Park, downtown Duluth, and two nationally significant trail systems – US Bicycle Route 41 and the North Country Trail. Portions of this public corridor were impacted by the same storms that destroyed large sections of Canal Park and the Bayfront, and the need to improve these areas to ensure future resiliency in the face of high lake water levels and storm water action, warrants inclusion in the Lakewalk General Obligation Bond request. Activities include:

- i. Shoreline: The plan for the shoreline will vary with location but includes new stone revetment with a slope of 2:1 with stone toe protection with regrading, geotextile fabric, stone core fill, and stone armor layer that provides a stable slope for the bluff and lateral stability for the boardwalk and paved trail.
- ii. Trails: Paved trails will be 10 - 12 feet wide and will conform to recommendations contained within the 2007 "MnDOT Bikeway Facility Design Manual" developed by the Minnesota Department of Transportation.
- iii. Boardwalk: New, upgraded, wood boardwalk will replace boardwalk sections damaged by storms and bank failure with wider, better-protected versions. Other, connecting stretches that were not damaged will be upgraded to reset their lifecycle.
- iv. Signs: standard regulatory signs, wayfinding and directional signs and interpretive signs that tell the story of the lakewalk and shoreline restoration as well the science and need behind resiliency methods ranging from erosion control, habitat protection and pollinator gardens.
- v. Infrastructure: Storm water control is a hybrid of grey and green infrastructure to achieve zero runoff which will preserve slope and shoreline stability. Railings and fences and lighting will increase safety with photovoltaic lighting technology for net zero energy consumption. Family assist restrooms will low water consumption fixtures. Other amenities may include benches, picnic facilities and the like.
- vi. Park amenities: Beach nourishment where appropriate; invasive species control with native

plantings to include trees, pollinator gardens, and low/no mow options to increase carbon sequestration. Family friendly options could include nature play-scapes and rest areas along the trail corridor.

Project Rationale

Project Rationale – Area I

The City of Duluth has serious concerns for public safety, which have been confirmed through detailed engineering inspections and investigations of existing harbor sea wall conditions. This project will address these issues:

- Resiliency to withstand increasingly frequent and severe coastal storms,
- General public access and safety,
- Corrosion on existing sheet pile walls,
- Failing wood cribs and Wakefield walls,
- Failing 1880's relieving platforms and docks,
- Development of sink holes and undermining of docks,
- Operational reliability and safety issues with the Minnesota Slip Bridge,
- Failing steel sheet pile along the Baywalk,
- Underwater obstructions and debris,
- Shallow drafts next to existing dock walls,
- The need for environmental dredging along the failing docks,
- Navigation and environmental protection,
- Outdated shore services for vessels,
- Connectivity, trail development.

As critical health and safety issues were identified, they were immediately mitigated via temporary fencing, signs, and gates. In recent years, the waterfront area has experienced large deep sinkholes, soil erosion, ground settlement under concrete gathering areas, which are hazards to those who are walking and biking along the waterfront as well as vessels accessing the harbor and lake. These partial dock collapses are a precursor to a potential complete dock collapse. Failing and unstable docks create a hazard to vessels during mooring and berthing. The removal of these areas from public access due the major safety concerns greatly restricts the public's uses of the waterfront during major events. These areas also require significant staff maintenance and patrols to ensure the public does not enter the hazard areas.

Project Rationale – Area II

This project rehabilitates approximately 3,000 linear feet of shoreline, 7.5 miles of paved trail, and 5 acres of parkland. Please refer to Maps 2 - 6: Lakewalk Damage Sections. Please note that the shoreline areas labeled to illustrate FEMA, Minnesota Public Assistance, MNDot and Bonding funding.

Shoreline areas designated as FEMA, MN Public Assistance, or MN DOT are those areas that have failed and are in the process of repair or will be repaired using non-bonding dollars. The areas designated for bonding request are showing signs of eminent failure and represent significant public safety concerns. The obsolescence of the existing infrastructure undermines and reduces public safety, access, and enjoyment. This project will address these issues:

- Resiliency to withstand increasingly frequent and severe coastal storms ,
- General public access and safety,
- Failing shorelines not covered by FEMA or State Disaster Public Assistance funding,
- Accessibility upgrades,
- Energy consumption - reduced via photo voltaic lighting - goal is zero net energy,
- Stormwater control - systems will eliminate runoff over the bluff - goal is zero runoff,
- Environmental protection - carbon sequestration via planting native trees, pollinator species, removal of invasive species and beach nourishment,
- Connectivity, trail upgrades.

As part of the overall restoration, there is a need to improve connectivity between numerous connecting trails and the paved trail and boardwalk, update signage, provide safe and family friendly gathering space and access points, safe lake access areas, and update critical public infrastructure like restrooms, seating, railing/fencing and lighting. In keeping with the City's resiliency goals, crucial updates include storm water control to eliminate bank erosion; Solar Electric integration to offset lighting and other loads; greens space that is low/no mow, pollinator friendly, eliminates invasive species, promotes native species, sequesters carbon, and nourishes beaches.

Project Timeline

Bid: Quarter 4, 2020

Permitting and prep work: 2020

Implementation period: 2021 construction season

Other Considerations

The Lakewalk and the adjoining harbor are the centerpiece of a national tourist destination that serves six million visitors per year. The Duluth Lakewalk is well-known to all who live in or visit Duluth. It consistently is listed as one of the top attractions on tourism and visitor websites and guides. Loved by locals and tourists alike, the Duluth Lakewalk and its unique location on the shores of Lake Superior continues to draw high number of users in all four seasons and continually acts as a focal point for community events and bicycle/pedestrian commuters.

This area supports year round public activities along the Duluth waterfront. These major activities include Grandma's Marathon, Northshore Inline Marathon, Tall Ships Duluth Festival, Visiting Cruise and Research Vessels, Vista Fleet Harbor Tours, the Irvin Ore Ship Tours, Military Vessels, DECC Sports and Convention activities, Bayfront Festival Park, Bentleyville Tour of Lights, and The Great Lakes Aquarium. All activities in this area depend on providing safe walking and biking trails to the public along the waterfront.

The seawalls are also an integral part of the busiest port in the Great Lakes and the mooring location for a planned international cruise ship destination.

Impact on State Operating Subsidies

State operating dollars are not being requested for this project

Who will own the facility?

City of Duluth

Who will operate the facility?

City of Duluth and the Duluth Entertainment and Convention Center (DECC)

Who will use or occupy the facility?

City of Duluth, DECC, and the general public

Public Purpose

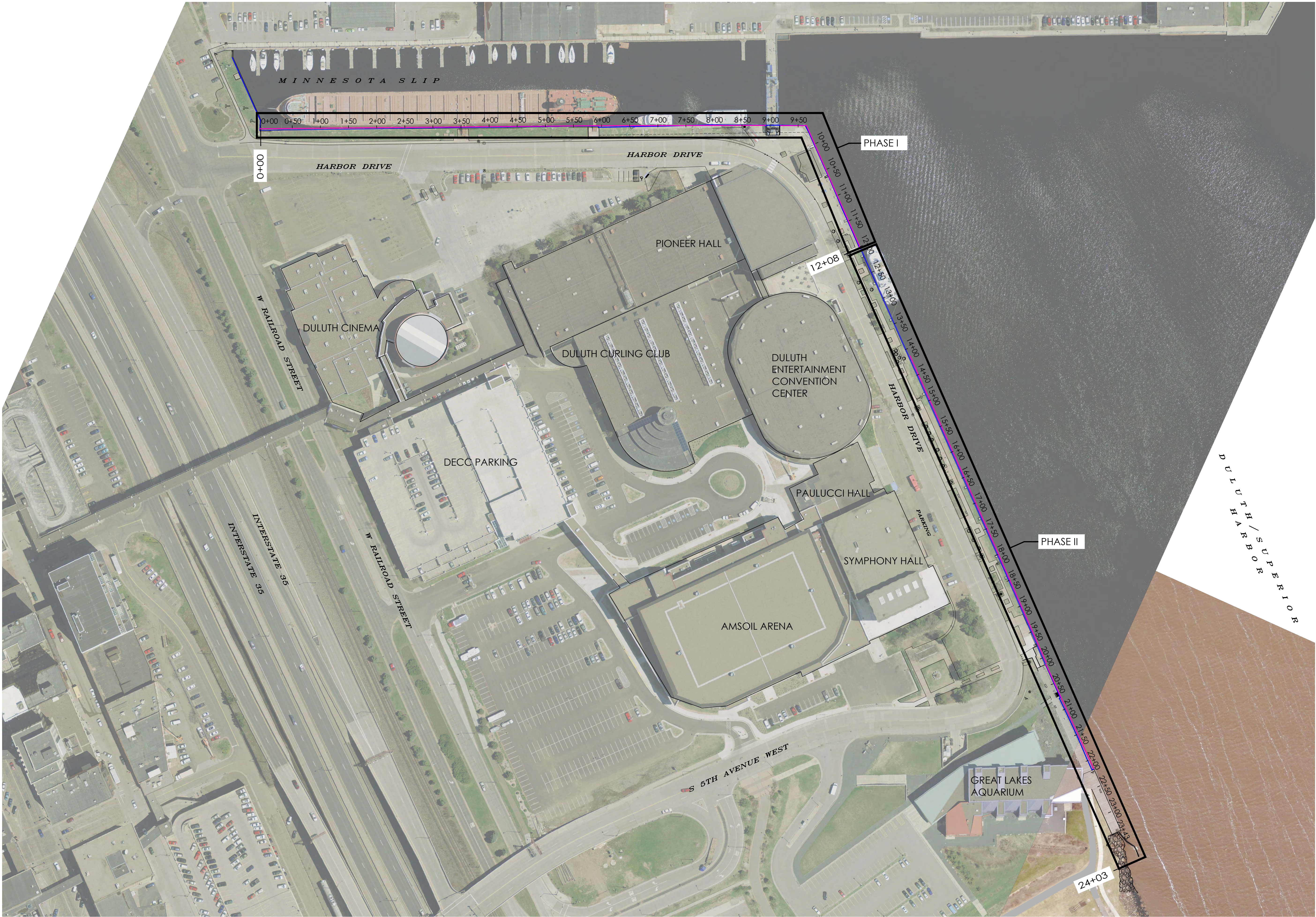
The Duluth waterfront is a public asset that supports numerous activities and events. Rehabilitation of the Harbor sea walls and Lakewalk is required to ensure public safety and continued use of the waterfront by the public.

Description of Previous Appropriations

None

Project Contact Person

Erik Birkeland
Property and Facilities Manager
218-576-7396
ebirkeland@DuluthMN.gov



| DATE | REV | DESCRIPTION | REV BY |
|------|-----|-------------|--------|
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DECC Seawall Project
City of Duluth
350 Harbor Drive
Duluth, Minnesota
Project Overview Plan

JOB No: 161080
DATE:
DRAWN BY: PJB
DESIGNED BY: CWS

SHEET:
S1.0



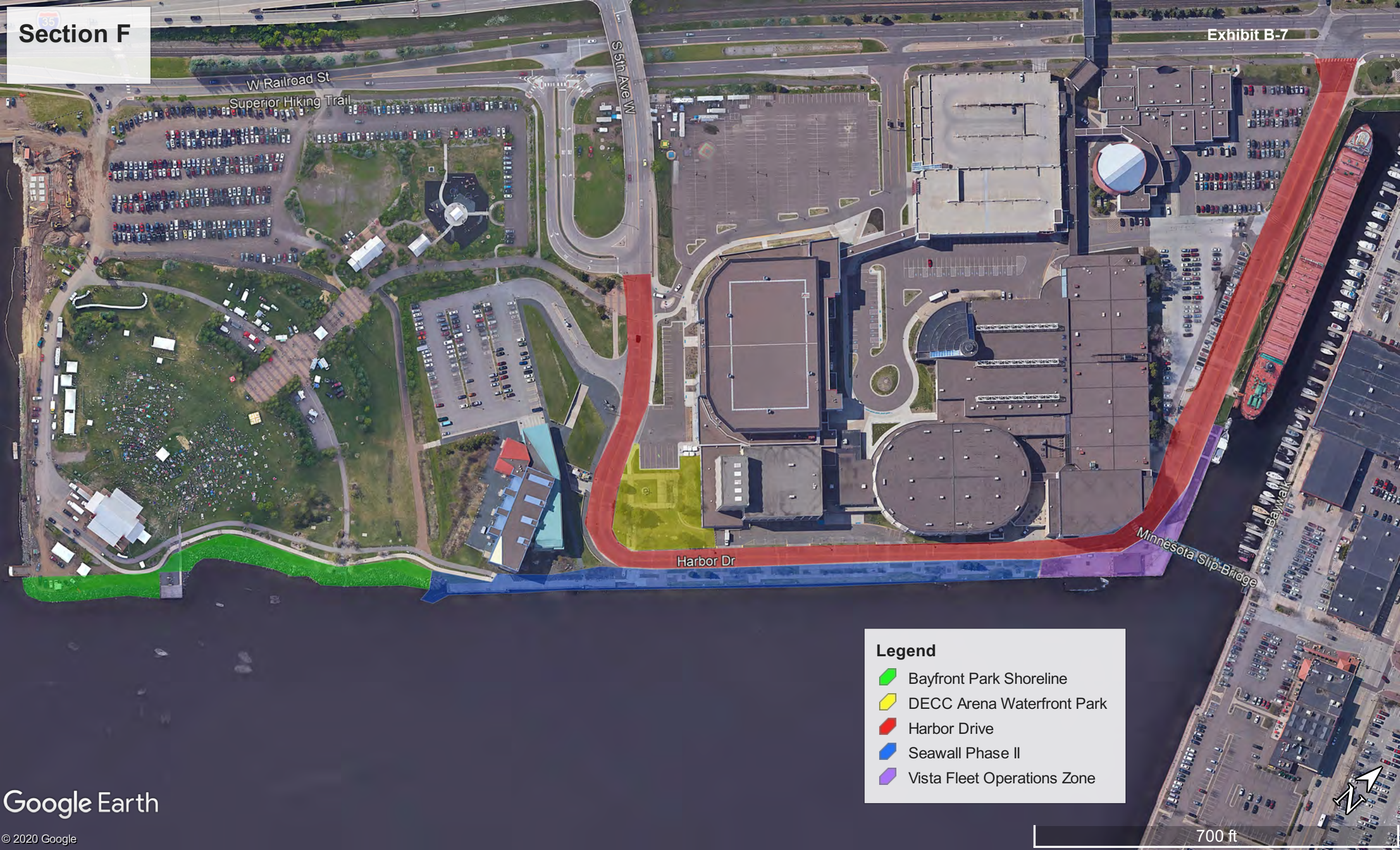
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|---|---|--------------------------------------|--|-------|------|-------------|----------|
| <div>6/4/2015 7:55 AM 2/20/15/151065 City of Duluth-Bayfront Dock Wall/DECC Area Wall Repairs.dwg</div> <div>Exhibit B-6 © COPYRIGHT - AMI CONSULTING ENGINEERS P.A. - 2004</div> | <div>31'± A 122'± B 205'± C 771'± D 325'± E 320'± F 255'± G 215'± H 150'± I 200'± J</div> | City of Duluth Bayfront Dock Wall | | DATE: | REV: | DESCRIPTION | REV. BY: |
| | | Duluth, Minnesota | | | | | |
| | | DECC Rehab Cost Estimates | | | | | |

PRELIMINARY
NOT FOR CONSTRUCTION

AMI
Consulting Engineers P.A.
91 Main Street
Superior, WI 54880
PH 715.718.2193 Fax 877.761.7058

Section F

Exhibit B-7



Legend

- Bayfront Park Shoreline
- DECC Arena Waterfront Park
- Harbor Drive
- Seawall Phase II
- Vista Fleet Operations Zone