REQUEST FOR QUALIFICATIONS (RFQ)

The City of Greenville, NC is seeking qualifications from engineering firms interested in providing the services required to prepare final design documents and construction administration for replacing the bulkhead at the Town Common. This project will require an aggressive design schedule due to federal funding and other planned improvements at the Town Common.

Interested firms are invited to submit proposals (in the required quantity and format) for the **"City of Greenville- Town Common Bulkhead and Esplanade Project"** by **2:00 pm, Thursday, June 16, 2022** to the following address:

Mr. Mark Nottingham, AICP
City of Greenville
Recreation and Park Department
2000 Cedar Ln
Greenville, N.C. 27858

The full RFQ can be retrieved at www.greenvillenc.gov or by contacting the Recreation and Parks Department at (252) 329-4567.

REQUEST FOR QUALIFICATIONS (RFQ) FOR PROFESSIONAL SERVICES

To Perform Professional Services for the Town Common Bulkhead Replacement

City of Greenville, North Carolina
May, 2022

I. Project Background

The City of Greenville, NC is requesting qualifications from engineering firms with experience in water front parks interested in providing the services required to perform engineering design, prepare construction documents, and perform construction engineering and inspection and materials testing for the replacement of the bulkhead and esplanade at the Town Common. The Town Common is the City of Greenville's "central park". Most large community events are held at this park and this project will have a major impact on the park. The steel sheet pile bulkhead runs east-west and separates the Town Common esplanade and the amphitheater from the south bank of the Tar River. The bulkhead is 1,570 feet long and consists of steel sheet piles. The bulkhead is approximately 55 years old and has reached the end of its serviceable life. The vision for the replacement of the bulkhead and esplanade would be a terraced system that would allow park patrons closer access to the water, allow for parallel boat docking, and would be constructed to withstand periodic inundations without requiring large cleanup efforts. A draft bulkhead condition assessment is attached for additional details on the current bulkhead (Attachment C).

II. Purpose

This contract will have three phases (task orders). The first task will involve surveying, geotechnical, developing design alternatives, and gaining consensus from the City and other stakeholders on a preferred alternative. The scope for task two will involve developing and preparing the necessary construction documents, obtaining all applicable permits, and assisting with the bid process. The third and last task will include construction engineering and inspection and materials testing services as detailed in the section below, and will be negotiated when the construction documents are approximately 90% complete.

It is envisioned all three tasks will be contracted with the same firm, however there are concerns about potential conflict of interest with utilizing the same firm for both design and construction administration. It is important to minimize the perception of this potential conflict of interest. The consultant will need to demonstrate or provide processes that will alleviate the City's concerns.

III. Scope of Work (Consultant Responsibilities)

The following summarizes the requested professional services:

Task Order 1 (Design Development)

- Review all available information pertaining to the project, including, but not limited to: previous studies, associated master plans, existing maps, proposed development, proposed infrastructure improvements associated with the area, etc.
- Prepare 3-4 design alternatives with projected construction costs.
- Present design alternatives to the City and stakeholders gaining consensus on a preferred alternative.

Task Order 2 (Final Design and Construction Documents)

- Prepare final design drawings to include utility relocation, specifications, construction schedules, traffic management plans, cost estimates and bid documents.
- Facilitate public meetings to review preliminary designs.
- Acquire all applicable permits.
- Advertise bids, prepare addenda (if necessary) and assist with selection of contractor from bid submittals.

Task Order 3 (Construction/Post-Construction Services)

- Pre-construction Conference - Outline project specifics. Inform contractor of project administration procedures.
- Management Information System (MIS) - Implement system for organizing, tracking, filing, and managing paper/electronic correspondence including letters, information requests, submittals, contracts, reports, O&M manuals, progress payments, change orders, etc.
- Review Traffic Control Plans
- Review Material Submittals - Review and approve contractor's submittals for materials.
- Weekly Meetings
- Schedule - Monitor contractor's schedule weekly. Notify parties of actual or potential deviation from schedule. Work with project team to correct noncompliance withschedule.
- Cost Control - Monitor project funding. Monitor project budgets. Review contract item payments, material quantities, and change order payments.
- Change Orders - Review potential change orders for contractual and technical merit. Prepare independent cost estimate and schedule analysis of work. Provide recommendation and prepare change orders for execution. Keep the City apprised of impact of cumulative change orders.
- Dispute Resolution - Make recommendations and implement procedures for reducing the likelihood of disputes and claims. Assist in the resolution ofdisputes.
- Quality Assurance/Inspection - Observe and monitor all aspects of project. Notify contractor when work is not in compliance. Prepare daily inspection reports. Provide photographic and video documentation of construction process. Encourage and stress quality in the constructed product. Schedule and conduct materials testing.
- Public Relations - Communicate with applicable community partners regarding temporary construction impacts, such as traffic changes, noise, limited access and construction schedule.
- Permit /Environmental Compliance - Review and enforce requirements stipulated in permits issued by regulatory and environmental agencies.
- Progress Payments - Review contractor's payment requests. Verify contractor pay items. Prepare payment documentation for execution.
- Monthly Status Reports
- Site Safety - Review and monitor contractor's safety program for compliance with OSHA. Notify contractor if unsafe condition is observed. Notify City if contractor refuses to rectify unsafe condition.
- Record Drawings - Collect, review, and transmit contractor's data to engineer.
- Final Walkthrough - Make final inspections. Prepare punch-list. Verify that required certificates of compliance, Review O&M manuals for completeness. Ensure record drawings and any O & M Manuals have been delivered to City.
- Project Completion Report - Process final progress payment to contractor. File Notice of Completion. Prepare final report to include lessons learned. Deliver project records to the City.

III. Deliverables

Task Order 1

- Design Alternatives with projected construction costs for each.

Task Order 2

- Required permits.
- Bid Manual and Construction Documents.
- Construction Cost Estimate.

Task Order 3

- Agenda and meeting minutes for all scheduled meetings.
- Management Information System (MIS) - Paper files, Digital files, and Correspondence logs.
- Review and recommendation on traffic control plan for approval by COG and NCDOT.
- Review and approved material submittals.
- Change Orders - Independent cost estimates and recommendations to include change orders ready for execution. Submittal of change order summary report.
- Schedule reports and recommendations.
- Budget reports and cost estimate reviews.
- Progress payment request documents.
- Quality Assurance/Inspection - Photography and videotapes. Project files to include daily inspection reports and correspondence. Testing plan for the project.
- Public Relations - Verbal and written notices delivered to community partners. Monthly Project newsletters for park visitors.
- Data for record drawings.
- Punchlist and Notice of Completion/Final Report.

IV. Schedule for Consultant Selection

The tentative schedule for selecting a consultant is outlined below. The actual schedule may vary.

Submit Proposals	June 16, 2022
Interviews (if needed)	June 28, 2022
Contract/s Awarded	August 2022
Final Design Completed	December 2023
Advertise for Construction	January 2024
Construction Bids Received and Evaluated	March 2024
Construction Contract(s) Awarded	April 2024

V. RFQ Requirements

Proposals shall be limited to a maximum of twenty (20) pages, excluding resumes. The following information shall be included in the submittal:

- Corporate Profile
- Highlight of Project Team, to include:
  - organizational chart,
  - availability of staff,

    - expertise of key team members; and
    - previous experience on similar projects (provide client name and contact information, estimated and realized design/construction cost and schedule)
- Approach or methodology to accomplish objectives specific to this project
- Statement regarding firm's(') possible conflict of interest for the work
- Attachment A: Certification Regarding Lobbying
- Attachment B: Supplemental Vendor Information

Detailed approaches, scopes, and fees will be developed during contract negotiations with the selected firm prior to initiation of each task order. Fees shall not be submitted with this RFQ.

VI. Consultant Selection Criteria

Criteria for the selection of the Consultant will include, but not necessarily be limited to, the following:

- Quality and completeness of response to the RFQ (20%);
- Applicable experience of team proposed by the Consultant. Highlight similar projects on which this team has worked together in the past. Provide information on why the experience is relevant and what roles the proposed team members played. This experience should demonstrate your ability to develop effective, real life solutions for challenging and sometimes highly publicized problems (30%);
- Qualifications of individual(s) proposed for the duties (20%);
- Approach and methodology of how Consultant will meet City's objectives for this project within schedule and on budget (30%).

The selection team will consist of the Director of Engineering, Senior Engineer (Capital Projects), Director of Recreation and Parks, and the Parks Planner. The team will evaluate the RFQ's based on the aforementioned items and corresponding percentages. If several firms appear to have similar qualifications the City may request those firms attend an interview and provide a brief presentation.

Fee negotiations will be initiated with the firm found to be most qualified for this work by the selection committee. As part of negotiations, the selected firm will be expected to develop a detailed Scope of Work for all components of the project.

VII. Requirements of the Selected Firm

Insurance

The City of Greenville requires the selected firm to have a minimum of $1,000,000 of professional errors and omissions insurance prior to entering into an agreement with the City.

Acceptance of Terms

Submission of a proposal shall constitute acknowledgment and acceptance of all terms and conditions hereinafter set forth in the RFQ unless otherwise expressly stated in the proposal.

Right of Rejection by the City

The City reserves the right to accept the proposal that best fits the Scope of Services as defined by the City of Greenville and is deemed to be in the best interest of the City; or the City can reject all proposals.

Financial Responsibility

The firm making the proposal understands and agrees that the City shall have no financial responsibility for any costs incurred by the firm in responding to this RFQ prior to the issuing of an agreement. This includes but is not limited to costs related to site visit(s) and estimate preparation(s) for contract negotiations.

VIII. Special Conditions: Federal Requirements

This Contract will be funded in whole or in part with federal funding. As such, federal laws, regulations, policies and related administrative practices apply to this Contract. The most recent of such federal requirements, including any amendments made after the execution of this Contract shall govern the Contract, unless the federal government determines otherwise. This section identifies the federal requirements that may be applicable to this contract. The Vendor is responsible for complying with all applicable provisions, updates or modifications that occur in the future relating to these clauses.

The federal requirements contained in the most recent version of the Uniform Administrative Requirements for federal awards (Uniform Rules) codified at 2.C.F.R., Part 200, including any certifications and contractual provisions required by any federal statutes or regulation referenced therein to be included in this contract are deemed incorporated into this contract by reference and shall be incorporated into any sub-agreement or subcontract executed by the Vendor pursuant to its obligations under this Contract. The Vendor and its sub-contractors, if any, hereby represent and covenant that they are have complied and shall comply in the future with the applicable provisions of the original contract then in effect and with all applicable federal, state, and local laws, regulations, and rules and local policies and procedures, as amended from time to time, relating to Work to be performed under this contract.

No Obligation by Federal Government

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

Program Fraud and False or Fraudulent Statements or Related Acts

The contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the contractor's actions pertaining to this contract.

Access to Records

The following access to records requirements apply to this contract:

(1) The contractor agrees to provide the City of Greenville, the Comptroller General of the United States, or any of their authorized representative's access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.
(2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
(3) The contractor agrees to provide City access to construction or other work sites pertaining to the work being completed under the contract.

Changes

Any change in the contract cost, modification, change order, or constructive change must be allowable, allocable, within the scope of its funding, grant or cooperative agreement, and reasonable for the completion of project scope. All changes and/or amendments to the contract will be outlined in detail, formalized in writing, and signed by the authorized representative of each party. A Contractor's failure to do so shall constitute a material breach of the contract.

Termination for Convenience (General Provision)

The City may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Government's best interest. The Contractor shall be paid its costs, including contract close-out costs, and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the City to be paid the Contractor. If the Contractor has any property in its possession belonging to the City, the Contractor will account for the same, and dispose of it in the manner the City directs.

Termination for Default [Breach or Cause] (General Provision)

If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or, if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the City may terminate this contract for default. Termination shall be effected by serving a notice of termination on the contractor setting forth the manner in which the Contractor is in default. The contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract.
If it is later determined by the City that the Contractor had an excusable reason for not performing, such as a strike, fire, or flood, events which are not the fault of or are beyond the control of the Contractor, the City, after setting up a new delivery of performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

Opportunity to Cure (General Provision)

The City in its sole discretion may, in the case of a termination for breach or default, allow the Contractor ten (10) calendar days in which to cure the defect. In such case, the notice of termination will state the time period in which cure is permitted and other appropriate conditions.

If Contractor fails to remedy to the City's satisfaction the breach or default of any of the terms, covenants, or conditions of this Contract within ten (10) calendar after receipt by Contractor of written notice from the City setting forth the nature of said breach or default, the City shall have the right to terminate the Contract without any further obligation to Contractor. Any such termination for default shall not in any way operate to preclude the City from also pursuing all available remedies against Contractor and its sureties for said breach or default.

Waiver of Remedies for any Breach

In the event that the City elects to waive its remedies for any breach by Contractor of any covenant, term or condition of this Contract, such waiver by the City shall not limit the City's remedies for any succeeding breach of that or of any other term, covenant, or condition of this Contract.

Equal Opportunity

"During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, 3 and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
(4) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
(5) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
(7) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States."

Energy Conservation

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state conservation plan issued in compliance with the Energy Policy and Conservation Act.

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.

Suspension and Debarment Certification

By signing and submitting its bid or proposal, the bidder or proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by the City. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to the City, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

The bidder or proposer agrees to comply with the requirements of 49 CFR 29, Subpart C while this offer is valid and throughout the period of any Contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

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

Each tier certifies to the tier above 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. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

IX. Minority Business Enterprises and Women's Business Enterprises

The City of Greenville is committed to an annual goal of 4% for Minority Business Enterprises (MBE) and 4% for Women's Business Enterprises (WBE) participation for all professional services contracts. Firms demonstrating a commitment to assist the City in attaining these goals by designating a percentage of the contract to be assigned to qualified MBE/WBE firms will be given priority consideration. See Attachment B for additional information. This form shall be completed and submitted with your proposal.

X. Supervision of Consultant

The Consultant will be under the supervision of the Director of Recreation and Parks for the City of Greenville or her designee.

XI. Proposal Submission and Deadline

Interested firms are invited to submit one (1) electronic copy, in searchable PDF format, and four (4) hard copies of its response to this RFQ no later than 2:00 pm, June 16, 2022, to the following address:

Mr. Mark Nottingham, AICP, Parks Planner
Town Common Bulkhead RFQ Submittal
City of Greenville
Recreation and Parks Department
2000 Cedar Ln
Greenville, NC 27858

For questions regarding this Request for Qualifications, contact Lynn Raynor, Senior Engineer at (252) 329-4620 and lraynor@greenvillenc.gov or Mark Nottingham, Parks Planner at (252) 329-4242 and mnottingham@greenvillenc.gov.

ATTACHMENT A: CERTIFICATION REGARDING LOBBYING (Submit with Proposal)

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned [Contractor] certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal Contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal Contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal Contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq.*)]

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subContracts, subgrants, and Contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.]

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. A 3801, *et seq.,* apply to this certification and disclosure, if any.

_____Signature of Contractor's Authorized Official

_____Name and Title of Contractor's Authorized Official

_____Date

ATTACHMENT B: SUPPLEMENTAL VENDOR INFORMATION (Submit with Proposal)

MWBE AND ELIGIBLE LOCAL BIDDERS

Minority and Women Business Enterprises (MWBEs) consist of minority, women and disabled business firms that are at least fifty-one percent owned and operated by an individual(s) of these categories. Also included are disabled business enterprises and non-profit work centers for the blind and severely disabled. Eligible Local Bidders consist of firms located within the Greenville city limits or ETJ that meet other criteria as outlined in Resolutions 031-15, 020-16.

Pursuant to G.S. 143-128.2, 143-48, 143-128.4, and the City of Greenville MWBE Plan along with Resolutions 031-15 and 020-16, the City invites and encourages participation in this procurement process by businesses owned by minorities, women, disabled business enterprises and non-profit work centers for the blind and severely disabled and local bidders. This includes utilizing subcontractors to perform the required functions in this solicitation.

Any questions concerning MWBE or Local Bidder status, contact the MWBE Coordinator, Tish Williams, at 252.329.4462.

The Vendor shall respond to the questions below.

a) Are you an MWBE firm? ☐ **Yes** ☐ **No**

b) Are you certified with North Carolina as a Historically Underutilized Business (MWBE)? ☐**Yes** ☐ **No**

c) Are you a certified Disadvantaged Business Enterprise (DBE) with the Department of Transportation?

☐**Yes** ☐ **No**

d) Are you a local bidder? ☐ **Yes** ☐ **No**

Please provide complete *physical* address of firm:

_____

_____

moffatt & nichol

Bulkhead Condition Assessment Report

Town Common Park | Greenville, NC

Produced for The East Group

April 28, 2022

Document Verification

Client	The East Group
Project name	Town Common Park | Greenville NC
Document title	Structural Condition Assessment of Bulkhead
Status	Draft Report
Date	April 28, 2022
Project number	220606
File reference	File Name

Revision	Description	Issued by	Date	Checked
00	Draft Report	DJJ	4/28/2022	MAP

Produced by:
Moffatt & Nichol
4700 Falls of Neuse Road, Suite 300
Raleigh, NC 27609
919.781.4626
www.moffattnichol.com

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1. Executive Summary

1.1. Introduction

The services to be provided in the preparation of this report include a structural condition assessment for the Town Common bulkhead and concrete esplanade at the Tar River in Greenville, North Carolina. Additionally, the suitability of the existing bulkhead for proposed improvements at Town Commons such as a new Civic Center are being evaluated. This report is prepared under the direction of The East Group, P.A. and provides the development of conceptual corrective alternatives or replacement along with associated costs.

The waterfront facilities consist of approximately 1,570-feet of anchored steel sheet pile bulkhead, delineating the edge of the riverfront. There is a 15-foot wide concrete slab-on-grade behind the bulkhead. Town Common is located just north of 1st Street between North Side Drive and South Green Street along the Tar River. For a Vicinity and Location Map of the site, see Figure 1, Appendix A. The bulkhead and esplanade were constructed in 1967-1968 according to Drawing Number 1858, Sheets 9 through 11, provided to Moffatt & Nichol (M&N) previously by Rivers and Associates.

M&N performed the site investigation portion of the project on March 1st, 2022, however strong river currents prevented an inspection on the waterside of the bulkhead. A second site investigation was performed on April 21st, 2022. M&N has previously performed an inspection at this location in May 2004. Results from that inspection are used as a reference to compare how the structure has changed over the last 18 years.

The purpose of this site investigation was to perform a Level 3 general visual inspection survey with ultrasonic thickness measurements of the steel bulkhead above water of the previously indicated riverfront structures. The site investigation allowed verification of the construction methods and materials, with those indicated on the provided drawings, including documentation of existing conditions. Inspection procedures for the steel sheet piles and concrete slab included a visual verification of member sizes and condition. An inventory of the extent of damage and problems was maintained. In addition, photographic documentation was made to record typical conditions, as well as typical deficiencies in all structures.

1.2. Recommendations

During the site investigation, ultrasonic thickness measurements of the steel sheet pile bulkhead at the waterline revealed that there has been an average section loss of 24% and in some locations as much as 36%. An analysis of the bulkhead calculated that the bulkhead is overstressed over its allowable capacity approximately 48% by vehicular loads, and 30% by pedestrian loads. Due to this deterioration and overstressing, the bulkhead is assessed as being in poor condition.

Inspections of the bulkhead should be performed at an interval not to exceed 2 years to monitor for signs of continued deterioration of the bulkhead.

Potential repairs to strengthen the bulkhead at the waterline would involve cleaning marine growth off the sheet piles, welding cover plates to strengthen the bulkhead above and below water the entire length of the bulkhead, replacing weep holes, repairing the outfalls, and filling voids behind the bulkhead. Due to the amount of underwater welding that would be required, any potential repairs would be cost prohibitive.

The existing bulkhead is approximately 55 years old, and due to the section loss is reaching the end of its service life. It is therefore recommended that the existing bulkhead be replaced.

2. Existing Structure Description and Condition Assessment

2.1. Structure Description

The steel sheet pile bulkhead runs east-west and serves to delineate the Town Common esplanade and amphitheater park on the south bank of the Tar River. The anchored bulkhead is approximately 1,570-feet long and consists of MP-116 steel sheet piles. The top of the bulkhead is at EL +15 with the tips of the sheet piles at EL –17, with the design riverbed depth at EL –5. Behind the bulkhead is a 6-inch thick concrete slab-on-grade that extends back 15-feet to a 9½-inch thick brick retaining wall that is 3-feet high. The brick wall retains fill for the grass park area that is located behind it. See Figure 2 in Appendix A and Photograph 2.1 below for a typical elevation of the bulkhead and esplanade.

PHOTOGRAPH 2.1: VIEW OF ESPLANADE LOOKING EAST

A continuous steel C12x20.7 channel cap is welded to the top of the sheet piles with clip angles. There is a 3'-6" high steel handrail welded to the top of the cap at each post location. The "I"-shaped posts are spaced at 6-feet on center and are braced at the bottom with steel gusset plates. The top and intermediate rail consist of tube sections that are welded to the posts. The entire handrail and channel cap have been coated with a black zinc based paint. In addition, a black PVC coated chain link mesh has been attached to the handrail, most likely to meet current building codes.

The sheet pile bulkhead is anchored with 1-5/8" diameter tie rods that are located at EL +10 and are spaced at 8-feet on center. The tie rods are anchored 30-feet back to individual concrete deadmen at EL +7.5 for the first 1,050-feet of bulkhead and then tapering to EL +5 for the last 520-feet. The wale for the tie rods is located on the back of the sheet piles and consists of dual steel C7x12.5 channels. The wale is anchored to the bulkhead with a combination of the tie rods and 1" diameter anchor bolts, which are bolted to the outside of the sheet

piles. Steel access ladders are spaced approximately 30-feet on center and extend from the top of the bulkhead down to EL 0.0. The rungs consist of smooth #5 bars that have been bent and welded to the sheet piles and spaced at 1 foot on center.

Weep holes for the bulkhead are located at 5'-4" on center, at alternating recessed pockets along the sheet pile bulkhead. The weep holes are located at EL +2.5 or EL +5, depending on their location along the bulkhead. The weep holes consist of a 2-inch by 3-inch hole burned into the sheet pile. The hole is covered on the outside with an ultra-lightweight cinder paving block supported between two angles, to prevent backfill from spilling out from behind the sheet piles. A detail of the existing weep hole is shown on Figure 2 in Appendix A.

In addition to the weep holes, there are three outfall penetrations located along the length of the bulkhead. The penetrations consist of a steel pipe welded to the sheet pile to provide sleeves for corrugated metal pipe (CMP) outfalls. The invert for the three outfalls is located at EL +1.5. The first and second outfalls are 24-inches in diameter and are located at Station 4+18 and Station 10+38, respectively. The catch basins for these pipes are approximately 35 feet behind the bulkhead. The third outfall is 30-inches in diameter and is located at Station 13+60. The catch basin for the 30-inch diameter outfall is located approximately 67-feet behind the existing bulkhead. It should be noted that the stationing noted in this report and during the inspection is based on the linear feet of bulkhead, starting at the southeast corner. Per the original details for the pipe sleeve, the space between the CMP pipe and steel pipe sleeve was to be caulked with packing to prevent losing fill from behind the bulkhead. In addition, the detail indicated the CMP outfall was 14 gauge metal and was to be coated on both sides with bituminous material.

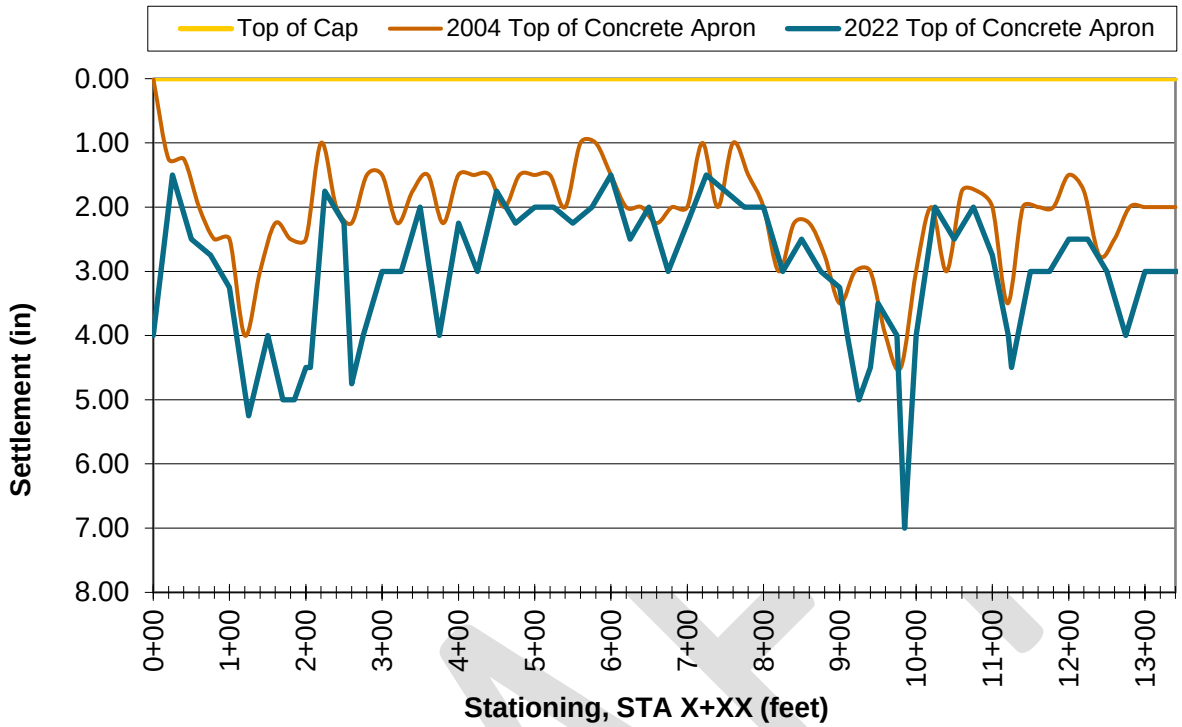
The concrete slab-on-grade behind the bulkhead is 6-inches thick and reinforced with one layer of welded wire fabric. It is supported on compacted granular fill and is sloped down toward the river at ¼-inch per foot. The top of the steel channel cap and top of the concrete were constructed at the same elevation to permit storm water drainage to flow over the cap and into the river. The transverse joints in the concrete slab are spaced at approximately 15-feet on center. There are expansion joints at the interface between the slab and bulkhead and slab and brick retaining wall. The brick retaining wall is 3-feet high and is set back 15-feet from the back face of the channel cap. The retaining wall has 2-inch diameter weep holes spaced at 20-feet on center and located approximately 3¼-inches from the top of the concrete slab.

2.2. Condition Assessment

During the site visit a topside and above water inspection was conducted of the bulkhead and esplanade area. The overall condition of the steel sheet pile bulkhead and concrete slab-on-grade is satisfactory to poor.

The concrete slab is in satisfactory condition, with minor to no cracking and very minor spalling of concrete around the joints. The slab has experienced between 2-inch to 7-inches of settlement, as can be seen in Graph 2.1 below and Photograph 2.2 below. Graph 2.1 shows the height difference between the top of the slab and the top of the steel sheet pile cap with a comparison to the height difference measured in 2004. The concrete apron has generally settled an additional 1-inch compared to 2004. This is not necessarily indicative of the void depth below the slab but does identify possible overall settlement or loss of fill behind the bulkhead. For instance, at Station 1+85, the top of the concrete apron was approximately 5" below the sheet pile cap, however it was possible to measure a gap behind the concrete and a void was measured to 16" below the sheet pile cap.

GRAPH 2.1: CONCRETE SLAB SETTLEMENT AT BULKHEAD CAP



PHOTOGRAPH 2.2: SETTLEMENT OF SLAB AT EDGE OF BULKHEAD CAP (STATION 1+85)

The handrail along the top sheet pile bulkhead is in satisfactory condition. The majority of the posts and rails are structurally sound, but the coating is in poor condition. The coating is peeling off and the metal underneath is lightly corroded as shown in Photograph 2.3 below. The PVC coated chain link mesh is in good condition, with very little corrosion. The two triangular gusset plates located on the first post at Station 0+02 are heavily corroded, with severe loss of section. It also appears that in this area the cap or handrail was impacted by some type of equipment or vehicle, as shown by the gap between the cap and concrete in Photograph 2.4 below. Overall, the steel channel cap is in good condition, but the paint is starting to peel, in isolated areas, and the underlying steel is corroding.

PHOTOGRAPH 2.3: TYPICAL CONDITION OF EXISTING HANDRAIL

PHOTOGRAPH 2.4: CONDITION OF FIRST HANDRAIL POST AT STATION 0+02

The sheet piles are lightly corroded from the top down to approximately EL +7. From EL +7 down to the riverbed, the sheet piles are moderately to heavily pitted with moderate organic growth. The tie rods and wale anchor bolts are lightly corroded with one 1-inch diameter bolt missing at Station 1+78. In addition, many of the nuts for the tie rods are not completely threaded onto the rod. The end of the rod is approximately ½ inch from the outside face of the nut, see Photograph 2.5 below for a typical example.

PHOTOGRAPH 2.5: TIE ROD NUT

As part of the inspection, ultrasonic thickness measurements were taken of the sheet piles to determine the amount of corrosion that has occurred over the past 55 years. Measurements were taken of the flange and web thickness at the top (EL +14) and at approximately EL +3 on the sheet pile, as shown in Table 2-1 below. EL +2/+3 is around the area that would see the most significant corrosion due to the wetting and drying from rising and falling river levels. The readings were obtained approximately every 130-feet along the length of the bulkhead. The original thickness of the MP-116 sheet piles is 3/8 (0.375) inch for the flange and webs.

The average measurement at the top of the bulkhead is 0.369-inches, indicating very little loss of section. While the average measurements at EL +3 is 0.285-inches, which equates to an average 24% loss of section, with some locations having as much as 36% section loss. Please note that due to the pitting of the sheet pile at the waterline, it was difficult to obtain quality readings.

In 2004, the average measurements of the sheet pile thickness at EL +2 is 0.347-inches, which equates to approximately 8% loss of section. Therefore, over the last 18 years there has been accelerated section loss resulting in moderate to major damage to the steel sheet pile. Due to this deterioration at the waterline, the bulkhead is rated as in poor condition according to criteria found in the American Society of Civil Engineers (ASCE), Manual No. 130, Waterfront Facilities Inspection and Assessment.

TABLE 2-1: ULTRASONIC THICKNESS MEASUREMENTS ON THE MP-116 BULKHEAD

Sheet Pile Thickness						
Station	2022 Measurements				2004 Measurements	
	Top of Sheet (EL +14)		EL +3.0		EL +2.0	
	Flange (in)	Web (in)	Flange (in)	Web (in)	Flange (in)	Web (in)
0+60	0.385	0.354	0.369	0.372	0.380	0.360
1+42	0.380	0.362	0.265	0.259	0.360	0.380
2+66	0.380	0.375	0.278	0.259	0.365	0.350
3+95	0.372	0.368	0.301	0.265	0.350	0.355
5+24	0.370	0.368	0.278	0.275	0.365	0.310
6+52	-	-	0.249	0.289	0.360	0.325
7+80	0.360	0.359	0.238	0.280	0.350	0.355
9+10	0.378	0.372	0.277	0.258	0.370	0.365
10+40	0.362	0.365	0.254	0.268	0.330	0.330
11+65	0.371	0.362	0.276	0.289	0.295	0.320
12+95	0.376	0.377	0.279	0.280	0.355	0.335
13+95	0.365	0.348	0.298	0.277	0.355	0.345
14+55	0.376	0.380	0.345	0.334	0.345	0.315
Average	**0.373**	**0.366**	**0.285**	**0.285**	**0.352**	**0.342**

Another significant deficiency in the existing bulkhead is the poor condition of the weep holes and outfall penetrations. The angles that hold the cinder paving bricks over the weep holes are either severely corroded

or have completely deteriorated and fallen off the sheet piles as shown in Photograph 2.6 below. Subsequently, the bricks are either missing or not fully covering the holes. This allows the finer backfill material to flow out from behind the bulkhead, creating sinkholes in the backfill and settlement of the concrete slab above. Since the inspection in 2004, vegetation growing through the existing weep holes have greatly increased in size causing some ladders to be unusable. See Photograph 2.7 below for a comparison of tree/vegetation size between 2004 and 2022.

PHOTOGRAPH 2.6: TYPICAL CONDITION OF SHEET PILE WEEP HOLES

PHOTOGRAPH 2.7: VEGETATION GROWTH BETWEEN 2004 (LEFT) AND 2022 (RIGHT)

In addition to the weep holes, a similar problem is occurring at the outfall penetrations. The packing material that sealed the joint between the pipe sleeve and the CMP outfall has deteriorated. The gap is approximately

two to three inches, which allows some of the larger backfill material to flow out from behind the bulkhead. Photograph 2.8 below shows the gap between the CMP outfall and the steel pipe sleeve at Station 10+38. In addition, it appears that the CMP outfall may have had a partial collapse approximately 10-feet back from the face of the bulkhead. There are sections of the CMP pipe and a buildup of sand lying on the bottom of the pipe. The outfall at Station 4+18 has been lined with a 20-inch diameter HDPE pipe, probably due to holes that formed in the existing CMP outfall. The annulus between the HDPE pipe and steel pipe sleeve was not filled with grout; therefore, there is a small gap that is allowing fill to flow out. Photograph 2.9 below shows the condition at this outfall location.

PHOTOGRAPH 2.8: CONDITION OF CMP OUTFALL AND STEEL PIPE SLEEVE AT STATION 10+38

PHOTOGRAPH 2.9: CONDITION OF CMP OUTFALL AND STEEL PIPE SLEEVE AT STATION 4+18

In the grass area from Station 13+66 to the end, sinkholes have formed behind the bulkhead, which are located directly above an open weep hole in the concrete. The largest of the sinkholes is located at Station 13+66 and is 12-feet wide by 4-feet deep and is undermining the adjacent concrete apron. Photograph 2.10 below shows a comparison of how the sink holes of changed in size between 2004 and 2022.

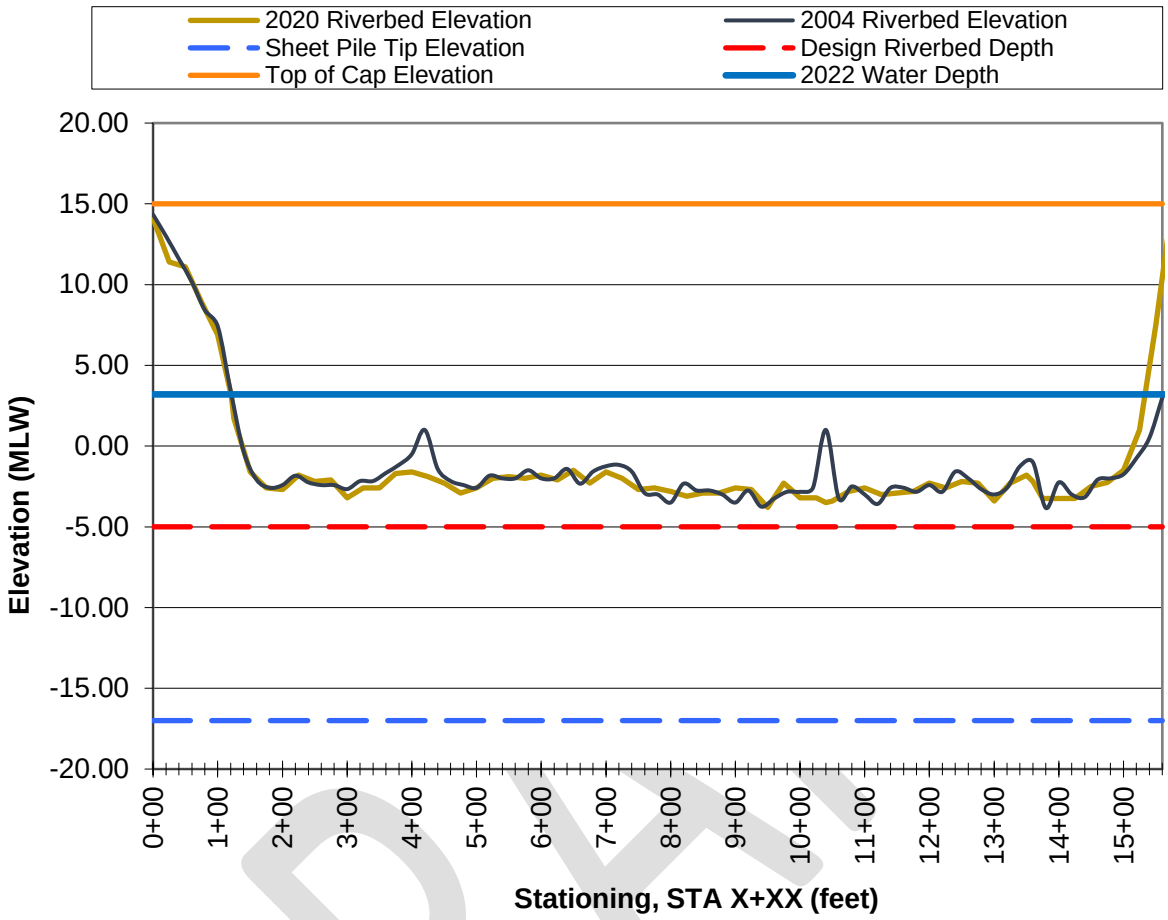
PHOTOGRAPH 2.10: SETTLMENT AT STATION 13+66 BETWEEN 2004 (LEFT) AND 2022 (RIGHT)

The steel access ladders are in fair condition, with minor corrosion between EL +4 to EL +15 and moderate to heavy corrosion below EL +4. The bottom 3 to 4 rungs have heavier corrosion due to their proximity relative to the water level. The bottom four rungs at Stations 4+60, 5+56, 6+20, 6+52, 11+01, 11+32, and 11+98 are severely corroded and have experienced significant loss of section with some rungs missing, as shown in Photograph 2.11 below.

PHOTOGRAPH 2.11: MISSING BOTTOM RUNGS OF AN ACCESS LADDER (STATION 11+65)

The riverbed elevation varies along the length of the steel sheet pile bulkhead. Graph 2.2 below shows the existing riverbed elevations, design riverbed depths, and sheet pile tip elevations, based on soundings performed during the site inspection in 2022 and 2004. Per this graph it can be seen that the existing riverbed is above the design depth along the entire length of the bulkhead and there has been minimal change over the previous 18 years.

GRAPH 2.2: BULKHEAD SOUNDINGS (2022 & 2004)

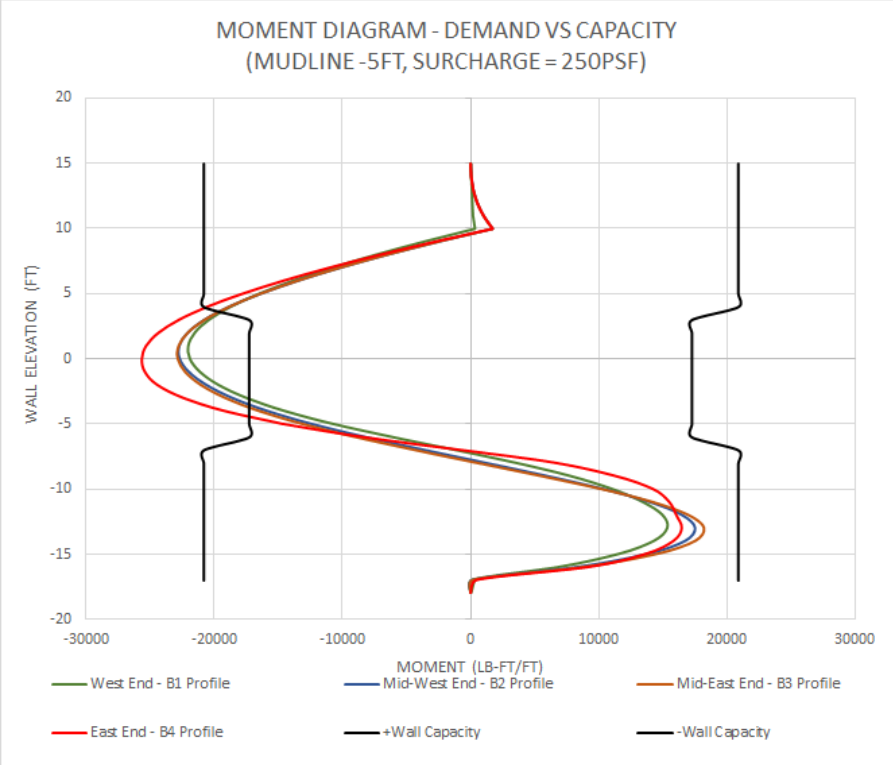


2.3. Bulkhead Analysis

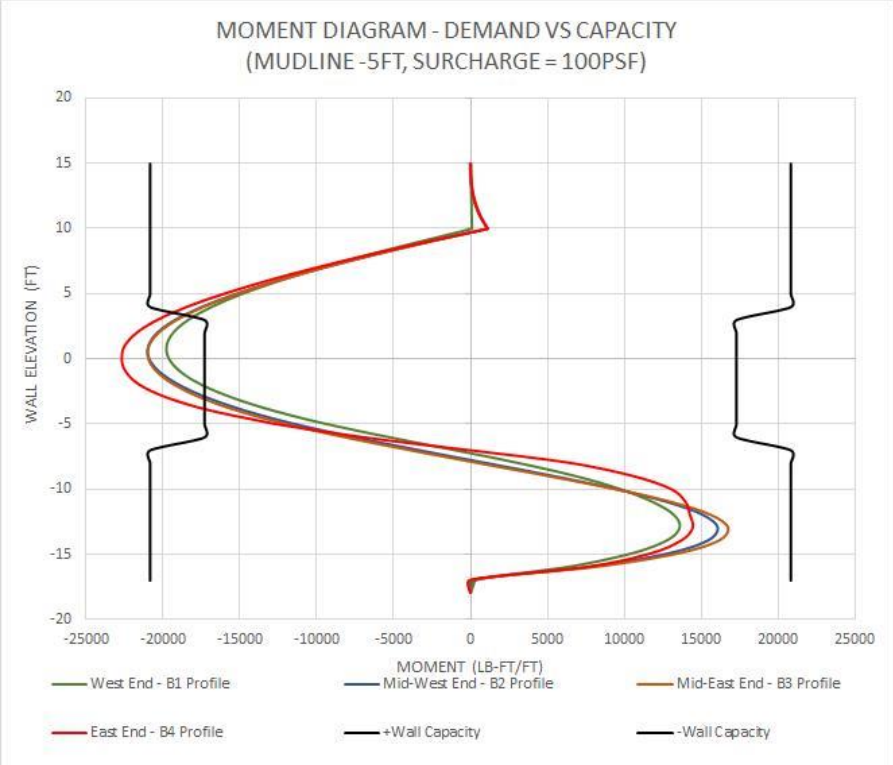
A geotechnical report was prepared by Terracon for the proposed Town Common Civic Center and analyzing the potential impacts on the bulkhead from the potential site improvements. This geotechnical report was provided to M&N by The East Group. An analysis of the bulkhead was performed based on the soil profiles and properties included in the report.

The analysis considered four soil profiles along the length of the bulkhead and two typical bulkhead loadings, 250-pounds per square foot which is typical of light vehicular loads, and 100-pounds per square foot which is typical of pedestrian loads. The results of this analysis were compared against the reduced allowable capacity of the bulkhead based on the section loss measured near the waterline during the inspection. A comparison of the demand versus capacity for the bulkhead is shown in Graph 2.3 and Graph 2.4 below. The results indicate that the bulkhead is currently overstressed approximately 48% under light vehicular loadings, and approximately 30% under pedestrian loadings.

GRAPH 2.3: BULKHEAD CAPACITY AND DEMAND WITH 250 PSF SURCHARGE (LIGHT VEHICULAR LOADING)



GRAPH 2.4: BULKHEAD CAPACITY AND DEMAND WITH 100 PSF SURCHARGE (PEDESTRIAN LOADING)



Other structural components of the bulkhead were also analyzed. Analysis results indicate that the bulkhead wale and tie-rods do not exceed their allowable capacities in the loading conditions described above.

Since the bulkhead steel sheet piles are overstressed in the current loadings due to the section loss at the mudline, no analysis of increased loading on the bulkhead due to future site improvements as part of construction of the Civic Center have been performed yet. M&N is still evaluating what setback distance from the bulkhead is required to not increase the loading on the bulkhead. The final version of this report will be updated to include this information. It is noted that the proposed location of the Civic Center is in the vicinity of the controlling soil profile.

The bulkhead analysis was performed based on standard engineering practice and available geotechnical parameters. As shown, the analysis indicates that the steel sheet piles are significantly overstressed under typical pedestrian and vehicular loadings. The actual field conditions do not show signs of overstress such as excessive deflections indicating imminent collapse. However, it is not possible to state based on engineering practice that the bulkhead in its current condition is safe. Continued inspection and monitoring of the bulkhead are required in addition to structural repairs or replacement.

3. Description of Proposed Solutions

3.1. Inspection Frequency

ASCE Manual 130, "Waterfront Facilities Inspection and Assessment", recommends that structures such as the bulkhead which have unprotected steel be inspected on a maximum interval of 3 to 4 years. Given the level of overstress, it is recommended that inspections be performed on interval not to exceed 2 years. During those inspections, ultrasonic thickness measurements could be taken to see if section loss is continuing to occur, or visible signs of overloading are present such as increased deflections of the wall.

3.2. Bulkhead Repairs

Potential repairs to strengthen the bulkhead at the waterline would involve cleaning marine growth off the sheet piles, welding cover plates to strengthen the bulkhead above and below water the entire length of the bulkhead, replacing weep holes, repairing the outfalls, and filling voids behind the bulkhead. Due to the amount of underwater welding that would be required, any potential repairs would be cost prohibitive.

Strengthening repairs would also need to eliminate the potential for continued section loss of the steel sheet piles. If the cover plates are welded to a sheet pile that continues to deteriorate, the repair will cease to be effective. Methods to limit further section loss typically include installation of cathodic protection systems, or construction of a concrete fascia. Both options have high upfront costs and would require varying levels of ongoing maintenance.

3.3. Bulkhead Replacement

The existing bulkhead is approximately 55 years old, and due to the section loss is reaching the end of its service life. It is M&N experience that for bulkheads with similar issues it is more cost effective to install a new anchored bulkhead in front of the existing bulkhead rather than make repairs described above. It is therefore recommended that the existing bulkhead be replaced. During the design of the replacement bulkhead, different anchoring systems could be evaluated such as soil anchors or a new concrete deadman similar to the existing anchorage system. Typically, it is difficult to reuse an existing bulkhead's anchor system, and it would be necessary to do exploratory digging to assess the condition of the 55 year old steel tie-rods and concrete deadman.

A conceptual level opinion of probable cost to replace the existing bulkhead in kind is provided in Appendix B. It is noted that in the current business environment, construction costs are escalating quickly, and it is difficult to forecast future construction costs.

4. Conclusions and Recommendations

During the site investigation, ultrasonic thickness measurements of the steel sheet pile bulkhead at the waterline revealed that there has been an average section loss of 24% and in some locations as much as 36%. An analysis of the bulkhead calculated that the bulkhead is overstressed over its allowable capacity approximately 51% by vehicular loads, and 34% by pedestrian loads. Due to this deterioration and overstressing, the bulkhead is assessed as being in poor condition.

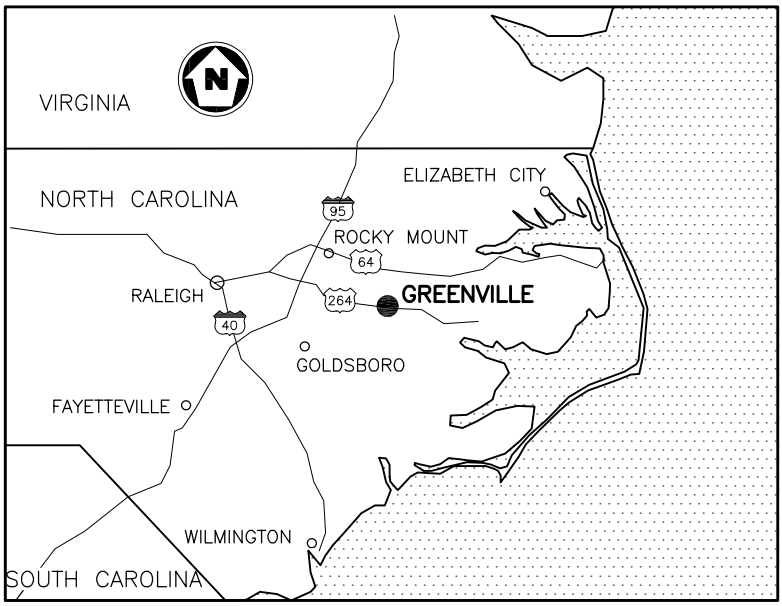
Additionally, most of the existing weep holes are damaged or missing and soil was observed to be migrating through the weep holes and gaps around outfalls. This has resulted in multiple sink holes on the west end of the bulkhead and voids under the concrete sidewalk.

Inspections of the bulkhead should be performed at an interval not to exceed 2 years to monitor for signs of continued deterioration of the bulkhead.

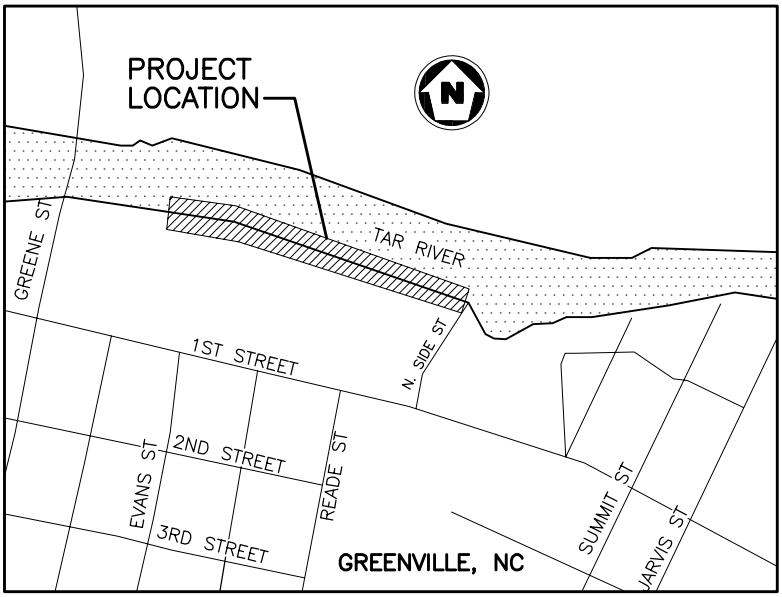
Potential repairs to address the noted deficiencies in the bulkhead could be developed, such as strengthening the steel sheet pile, providing new weep holes, and filling voids behind the bulkhead. However, any potential repairs are anticipated to be cost prohibitive and are not recommended.

The existing bulkhead is approximately 55 years old, and due to the section loss is reaching the end of its service life. It is therefore recommended that the existing bulkhead be replaced. A conceptual level opinion of probable cost to replace the existing bulkhead in kind is provided in Appendix B. This cost estimate is based on similar sized bulkheads bid in the last two years in Eastern North Carolina. It is noted that in the current business environment, construction costs are escalating quickly, and it is difficult to forecast future construction costs. During development of the bulkhead replacement, consideration could be given to alternate replacement options which might reduce the project cost or provide features which enhance the user experience.

Appendix A: Figures



VICINITY MAP



LOCATION MAP

FIGURE 1

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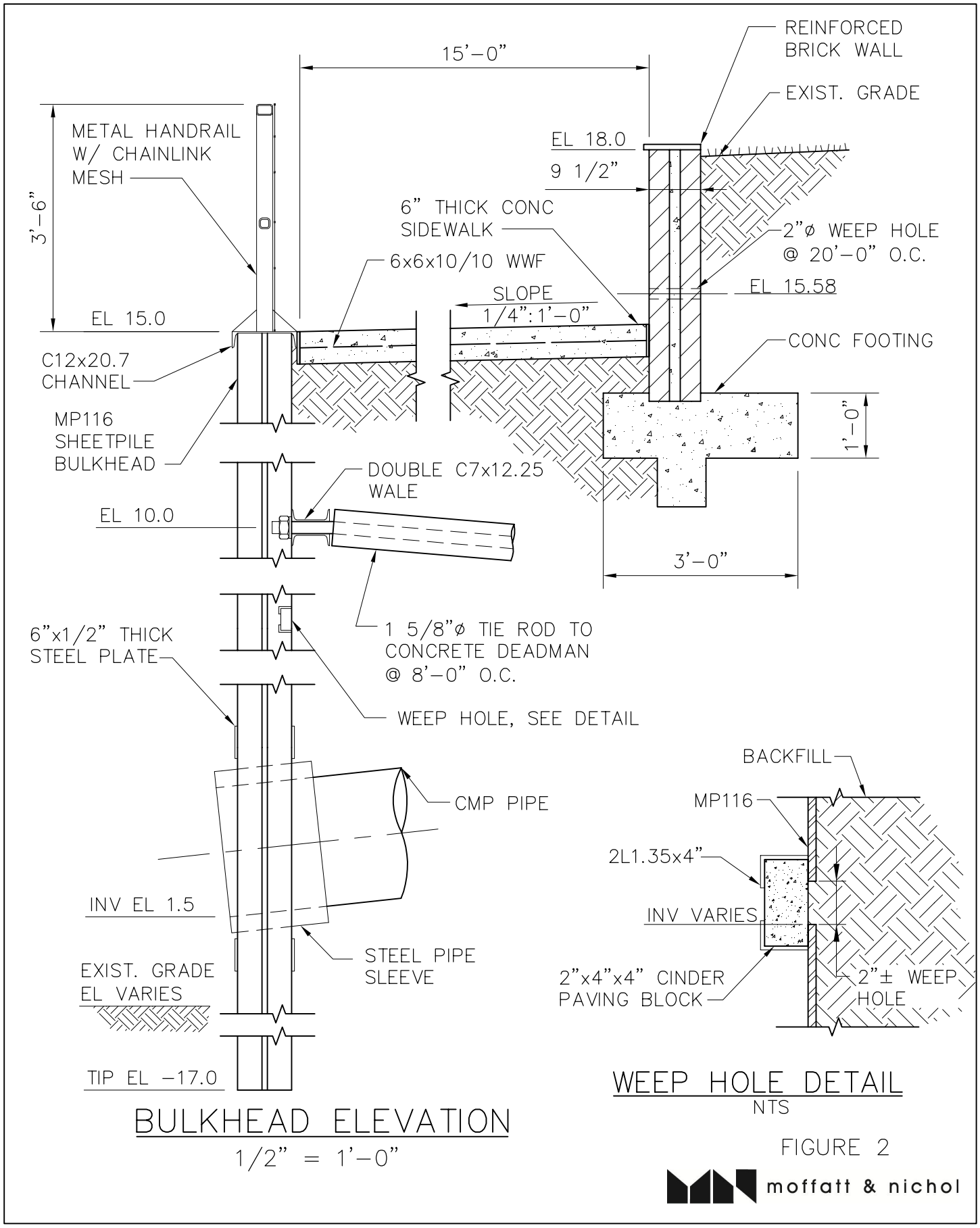

FIGURE 2

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