KENTUCKY PUBLIC RIVERPORT CONSTRUCTION AND MAINTENANCE (KPRCM) APPLICATION

INSTRUCTIONS: *A guidance document is provided to assist in completing the application packet and may be accessed at* https://transportation.ky.gov/MultimodalFreight/Pages/KPRCM.aspx

See the guidance document for required attachments and acceptable methods of submittal.

SECTION 1: APPLICANT INFORMATION

PUBLIC RIVERPORT NAME	TOTAL PROJECT COST	KPRCM FUND
Paducah-McCracken County Riverport Authority	$500,000.00	$500,000.00

STREET ADDRESS	CITY	STATE	ZIP
2000 Wayne Sullivan Drive	Paducah	KY	42003

CONTACT NAME & TITLE	PHONE	EMAIL
James H. Garrett	270.442.9326	jgarrett@paducahriverport.org

SECTION 2: PROJECT DESCRIPTION

PROJECT TITLE	DURATION
Barge Cell Revitalization - Phase II	12 months 0 weeks

FACILITIES AFFECTED BY THE PROPOSED PROJECT

☑ Owned by Riverport Authority ☐ Leased to:

Briefly describe how the project will improve public riverport facilities and infrastructure, to capture the economic and trade potential offered by water transportation.: *(Text limited for accurate printing. Attach additional pages as needed.)*

Paducah-McCracken County Riverport Authority has two separate marine harbors, one supporting the bulk yard and another supporting the cargo yard. The bulk yard has four mooring cells, three of which provide mooring for barge unloading operations and one that supports the Sennebogen Material Handler. Note, Bulk Yard Cell No. 2 has the conveyor hopper and associated conveying system located atop the cell. The hopper and conveying system are the only means to unload barge to support the bulk yard operations supplying construction materials (sand and limestone aggregrate) to the surrounding community. Annually, more than 400,000 of bulk materials are unloaded and delivered to projects and industrial customers in Western Kentucky. The Cargo Yard has five mooring cells, all five provide mooring for barge unloading/loading operations. Each mooring cell is considered critical marine infrastructure for barge loading and unloading supporting break bulk and speciality cargo crane operations for manufacturing facilites in Western Kentucky. This includes the operational support for materials being shipped into FTZ 294 for future domestic markets. These cells were constructed in the 1970 era and have deteriorated to a point requiring extensive repairs in order to remain in useable condition. This project conmmenced under the KPRCM FY-2025 Grant Program. Work completed as of this date includes; researching and identifying permit requirements, damage survey perfromed above and below the waterline, scope of repairs developed for each cell. and consultant

Select ONE: ☐ Applicant plans to use their own manpower, equipment, or materials on the project (Force Account).
☑ Applicant plans to competitively bid out all work related to the project.

TRAFFIC	CURRENT	AFTER PROJECT
Trucks per day	85	85
Train cars per week	0	0
Barges per week	7	7

FOR KYTC USE ONLY

Date Received: _____	**WTAB Approval** ☐ Yes ☐ No	
Application Complete? ☐ Yes ☐ No	**Sec. Approval** ☐ Yes ☐ No	**Notification of Award:** _____
Eligible Applicant? ☐ Yes ☐ No	**Award Amount** _____	**MOA #:** _____
Permits Needed? ☐ Yes ☐ No	**Award Date:**	**Notice to Proceed:**

KENTUCKY PUBLIC RIVERPORT CONSTRUCTION AND MAINTENANCE (KPRCM) APPLICATION

SECTION 3: PERMITS AND APPROVALS

	YES	NO
Has the applicant consulted with state and federal agencies (US Army Corps of Engineers, US Coast Guard, US Fish & Wildlife Service, KY Division of Water, KY Heritage Council, etc.)?	☑	☐
Has state and federal agency consultation determined permits are needed?	☑	☐
Have all required permits (environmental, encroachment, etc.) been obtained?	☐	☑

SECTION 4: SUBMISSION CHECKLIST *(See guidance document for details.)*

- ☑ Kentucky Public Riverport Construction and Maintenance Application
- ☑ Statement of Work
- ☑ Scope of Work
- ☑ Purchase quote or cost estimate for the project
- ☑ Project Schedule/Timeline
- ☑ Maps, aerial photos, drawings, and photographs, as needed
- ☑ Engineering plans, schematics, details, drawings of the proposed project, as needed
- ☑ Copies of all correspondence or evidence of consultation that has occurred with state and federal agencies, if app
- ☑ Required Affidavit for Bidders, Offerors and Contractors from applicant

SECTION 5: CERTIFICATION

I have read the Kentucky Public Riverport Construction and Maintenance Project Guidance Document and understand and agree to abide by what is stated therein. I agree that incomplete applications, applications missing any of the above required supporting documents, or applications received after the deadline, will be deemed ineligible by Division staff without consideration for KPRCM funds and returned to applicant. I also hereby certify, subject to the provision of KRS 523.100 (unsworn falsification to authorities), that the above information is true and correct to the best of my

PRINTED NAME & TITLE	SIGNATURE	DATE
James H. Garrett, Executive Director	James H. Garrett	June 5 2025

Completed applications and all required attachments must be submitted electronically in PDF format. Paper copies will not be accepted. Emailed applications must be received by the Division by date indicated in call for projects. PDF copies shall be sent via email to: KYTC.ModalPrograms@ky.gov

PADUCAH-MCCRACKEN COUNTY
Riverport
AUTHORITY

Kentucky Public Riverport Construction & Maintenance (KPRCM) Application

Barge Cell Revitalization – Phase II

Point of Contact: James H. Garrett

Applicant: Paducah-McCracken County Riverport Authority

Applicant Address: 2000 Wayne Sullivan Drive

Paducah, KY 42003

Phone: Office (270) 442-9326 Ext 3610

Cell (270) 556-7734

Email: jgarrett@paducahriverport.org

Total Project Cost: **$ 500.000.00**

Grant Funding Application

Phase I of the Barge Cell Revitalization Project commenced under the KPRCM FY-2025 Grant with federal and state permitting research being performed. This followed up with an initial above and below the waterline condition survey being completed in the fall of 2024. The condition survey report was generated illustrating extensive deterioration of the integrity of the cell piling and below acceptable fill material levels.

These phase II grant funds, along with the balance of $711,750.00 remaining from the FY-2025 grant funds will be utilized to perform the necessary repairs on eight mooring cells to return each cell to a marine industry acceptable standard for barge mooring and material handling operation.

Qualifications and Eligibility

Paducah-McCracken County Riverport Authority (PMCRA) was founded in 1964 by the legislative bodies of McCracken County and the City of Paducah. The operating facility is located on the Tennessee River between river mile marker 1.3 and 2.0 on the left descending bank, near the confluence of the Ohio and Tennessee Rivers.

PMCRA is a major transhipper of bulk commodities servicing 14 counties in western Kentucky along with substantial shipments to TN, IL, and MO. Commodities transshipped through the port support State and Federal roadway projects, the expansion of the Kentucky Lock & Dam, commercial and residential construction projects, two manufacturing facilities employing over eighty (80) Kentuckians and the agriculture industry in Kentucky and the adjoining states. Our business partners have conveyed that the port directly supports over 600 jobs, not including those associated with the river industry or the four-state agriculture community.

The following picture provides an aerial view of the PMCRA facilities. These include a General Cargo Berth (GCB) and shoreside laydown cargo area. A separate Bulk Commodity Berth, (BCB) is used to discharge barges that is fed via conveyor to a 20-acre Bulk Commodity storage and transshipment yard. The Port also has over 100,000 square feet of warehousing, office buildings and additional outdoor storage areas. The two current areas associated with the Port's Radioactive Materials License (RAM) that

are utilized for UF-6-cylinder storage and transshipments are also identified in the picture.

Paducah-McCracken County Riverport Authority – Aerial View

Statement of Work

Phase II of the Barge Cell Revitalization Project will include the final obtainment of the necessary dredging permits to perform material removal in and around the cells before repairs can safely commence. Next, the repair work will be performed on eight cells in an order of priority to ensure the integrity of both the bulk yard and cargo yard mooring cells to extend the useful life for another 20 year period.

The cell repairs will include repairing the cell piling interlocks and/or the cell banding to ensure cell damages and gaps/openings are properly repaired to reestablish the integrity of cells. Upon the completion of repairs, each cell will be refilled with limestone aggregate.

Scope of Work

Phase II will commence with the obtainment of the required dredge permit from the United States Army Corps of Engineers and associated Kentucky state agencies approvals to perform dredging operations in and around all nine cells.

Upon securing the required permits, the "Scope of Repairs" developed by Marine Solutions, Inc. will be utilized to bid the repairs. The repairs for each cell have been prioritized as follows:

- Bulk Yard – BCB No. 2 – Install Patch Plate and Refill

  This cell has the conveyor hopper and conveyor tail section secured atop the cell.

- Bulk Yard – BCB No. 4 – Install Full Circumference Band and Refill
- Bulk Yard – BCB No. 1 - Install Full Circumference Band and Refill
- Bulk Yard – BCB No. 3 – Install Patch Plate and Refill
- Cargo Yard – GCB No. 1 – Install Full Circumference Band and Refill
- Cargo Yard – GCB No. 2 – Install Full Circumference Band and Refill
- Cargo Yard – GCB No. 3 – Install Full Circumference Band and Refill
- Cargo Yard – GCB No. 5 – Install Full Circumference Band and Refill

Following the repairs on each cell, the safety handrails, stairways, and access bridges will be replaced to reestablish the safety equipment atop each cell.

Note, each cell will be refilled with No. 3 Limestone Aggregate.

Project Purchase Quote and Cost Estimate

Due to the process of obtaining the environmental permit the overall project has not been bid at the time of this application. To establish a viable estimate for the repair cost per cell, Marine Solutions developed a cost estimate for repairs on GCB Cell Nos. 1 and 2. Below is a copy of the estimates for these two cells provided on February 13, 2025:

Item	Cost
Planning/Mobilization/Demobilization	$ 50,000
GCB-1 (26-ft-tall cell band, 25.5 ft. dia.) (600 tons of ballast)	$ 370,000
GCB-2 (30-ft-tall cell band, 20.5 ft. dia.) (400 tons of ballast)	$ 350,000
Total Fee	$ 770,000

Utilizing this most recent estimate of banding and refilling, and adjusting the costs per cell based on the circumference, the overall estimate for repairing all eight cells is as follows:

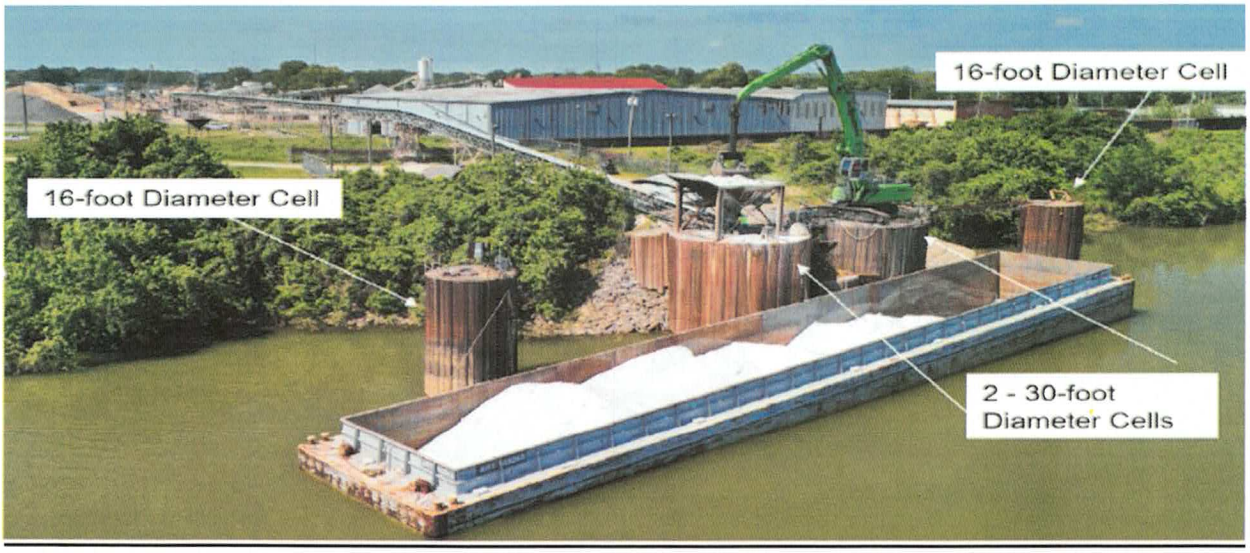
Cell No.	Cell Diameter	Cost Estimate
BCB No. 2	30'	$200,000
BCB No. 4	16'	$236,800
BCB No. 1	16'	$236,800
BCB No. 3	30'	$200,000
GCB No. 1	25'	$370,000
GCB No. 2	20'	$350,000
GCB No. 3	16'	$236,800
GCB No. 5	20'	$350,000
	Total	**$2,180,400**

The remaining $711,750 from FY-2025 Grant, along with this request of $500,000, will allow for the highest priority five cells to be repaired under the KPRCM Grant Program. The remaining unfunded $968,650 will be funded internally or through another grant source.

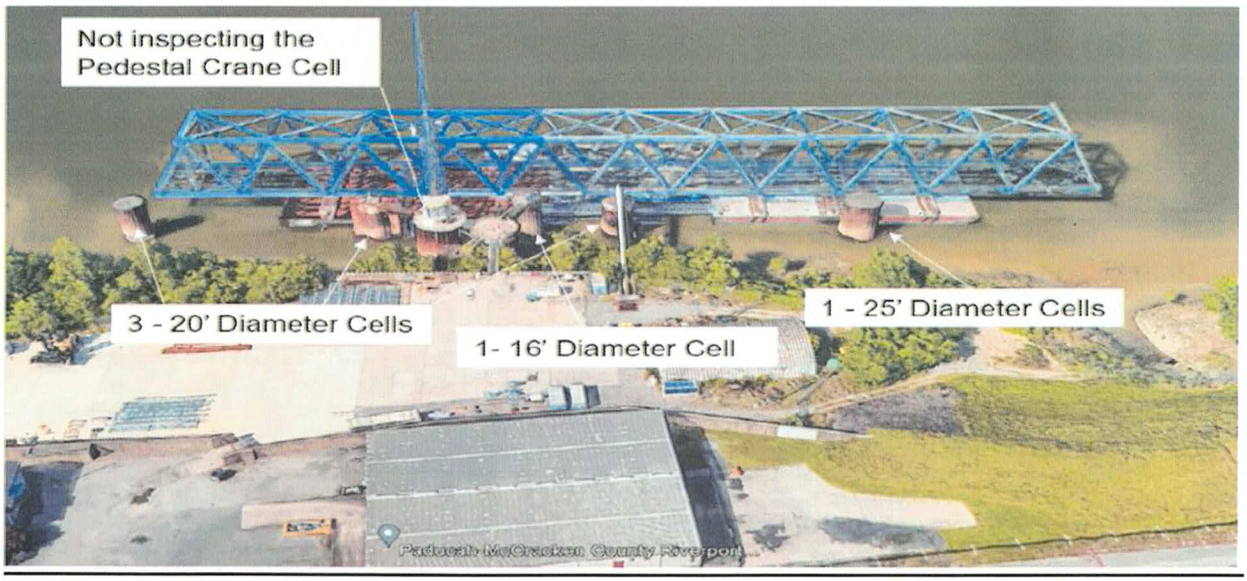
Project Schedule and Timeline

The permit identification will be concluded by June 30, 2025. The bidding process will be executed in July 2025 with a Notice to Proceed on August 1, 2025. The contract agreement will allow for an eight (8) month period to perform the repairs with a completion date of March 31, 2026.

Maps, Engineering Plans, or Consultation Correspondences



Bulk Yard Mooring Cells



Cargo Yard Cells

Please find attached as separate files the following reports:

- Exhibit No. 1 – Marine Solutions – Waterfront Inspection and Assessment Report
- Exhibit No. 2 – Marine Solutions – Bulk Yard - Scope of Repairs
- Exhibit No. 3 – Marine Solutions – Cargo Yard - Scope of Repairs

Consultations with Federal or State Agencies

During Phase I of this project the USACE, Kentucky Department of Fish and Wildlife, and Kentucky Energy and Environmental Cabinet were all contacted, and no permits were required for the initial inspection and assessment of Phase I.

In preparation for Phase II, BFW Marcum Engineering has been retained to perform the necessary assessment of the required federal and state permits and approval letters. BFW is scheduled to commence the permitting assessment in June 2025. It was previously identified that a USACE Section 404 Dredge Permit is required to remove the material from around the cell perimeters. A Mussel Study may be required as part of obtaining a Section 404 Permit.

Furthermore, no City of Paducah or McCracken County permits are required for this project.

Summary

On behalf of my colleagues at PMCRA, our business partners, and the citizens of the City of Paducah, McCracken County, and the adjacent Western Kentucky counties that we service, I would like to thank you for your consideration of this critical infrastructure refurbishment project within our facility. Should you have any questions or require any additional clarification, please do not hesitate to contact me.

Respectfully submitted,

James H. Garrett
Executive Director
Paducah-McCracken Country Riverport Authority

Rev. 9-16-22

Required Affidavit for Bidders, Offerors and Contractors
(KRS 45A.110 & 45A.115)

Affidavit Effective for One (1) Year from Date of Execution

Instructions: Pursuant to KRS 45A.110 and 45A.115, a bidder, offeror, or contractor ("Contractor") is required to submit a Required Affidavit for Bidders, Offerors, and Contractors to be awarded a contract, or for the renewal of a contract. An authorized representative of the contracting party must complete the attestation below, have the attestation notarized, and return the completed affidavit to the Commonwealth.

Attestation

As a duly authorized representative for the Contractor, I swear and affirm under penalty of perjury, that that the Contractor has not knowingly violated campaign finance laws of the Commonwealth of Kentucky and that the award of a contract will not violate any provision of the campaign finance laws of the Commonwealth. For purposes of this attestation, "Knowingly" means that the bidder or offeror is aware or should have been aware of the existence of a violation. The bidder or offer understands that the Commonwealth retains the right to request an updated affidavit at any time.

James H. Garrett
Signature

James H. Garrett
Printed Name

Executive Director
Title

06/04/2025
Date

Bidder or Offeror Name: Paducah McCracken County RIverport Authority

Address: 2000 Wayne Sullivan Drive
Paducah, KY 42003

Commonwealth of Kentucky Vendor Code (If known): _____

Subscribed and sworn to before me this 4 day of June, 2025.

State of: Kentucky

Notary: Jessica L. McDowell

County of: McCracken

My Commission Expires: July 22,2027

OFFICIAL SEAL
Jessica Lynn McDowell
Notary Public ID No. KYNP72637
State at Large, Kentucky
My Commission Expires July 22, 2027

MARINE SOLUTIONS

PADUCAH-MCCRACKEN COUNTY RIVERPORT AUTHORITY

WATERFRONT INSPECTION AND ASSESSMENT

Paducah-McCracken County Riverport Authority

December 13, 2024

MARINE SOLUTIONS

ADDRESS	250 Lovelaceville Florence Station W Paducah, KY 42001
PHONE	270.953.0047
FAX	859.554.4100
WEB	www.MSImarinesolutions.com

PROJECT NUMBER	05-24-203
DOCUMENT NUMBER	R01
VERSION NUMBER	1
DATE OF ISSUE	01/13/2025
PREPARED BY	REH
CHECKED BY	JAG
APPROVED BY	SCA

Paducah-McCracken County Riverport Authority

Waterfront Inspection and Assessment

Paducah-McCracken County Riverport Authority

December 13, 2024

This report was prepared by me or under my direct personal supervision.

SIGNATURE: _____

Sean C. Anderson, P.E.

DATE: January 13, 2025

Executive Summary

Marine Solutions, Inc. (Marine Solutions) performed an inspection on the Paducah-McCracken County Riverport Authority Bulk Commodity Berth and General Cargo Berth from December 9 through December 13, 2024. The primary purpose of the inspection was to investigate the current condition of the mooring cells along the berthing line and provide a summary of recommended repairs to extend the service life of the facilities. The inspected structures included four mooring cells on the Bulk Commodity Berth (BCB) and five mooring cells on the General Cargo Berth (GCB). The inspection consisted of a below and above water examination of the cells, including the condition of the sheet piles, cell caps, and amount of aggregate fill material contained within the cell.

The inspected cells at each facility varied from poor to critical condition overall. Mooring cells BCB 2, BCB 4 and GCB 2 were in critical condition with severe defects that require immediate attention. Mooring cells BCB 2 and GCB 2 exhibited split interlocks causing a loss of ballast that significantly affected the structural capacity of the cells. Significant erosion and undermining were observed at the upstream end of the inland retaining sheets on BCB 2, compromising the stability of the embankment. Mooring cell GCB 2 was observed to have a large amount of ballast loss and fill material was observed actively spilling into the channel on the channel side of the cell. Mooring cell BCB 4 was missing a pan sheet, exposing ballast and significantly reducing the structural capacity of the cell. These defects pose structural concerns for the cells and repairs are recommended from high to immediate priority bases.

Mooring cells GCB 1, GCB 3, and GCB 5 were in serious condition with defects that need to be addressed within one calendar year. These cells exhibited split interlocks causing a loss of ballast on the channel side of the cell that significantly affected the structural capacity of the cell. These defects pose structural concerns for the cells and repairs are recommended on a high priority basis.

Mooring cells BCB 1 and BCB 3, were in poor condition with defects that need to be addressed before the next routine inspection cycle. These cells exhibited split interlocks on the channel side of the cell, but did not have any loss of ballast. The defects pose structural concerns for the cells and repairs are recommended on a medium priority basis.

The cells exhibited other non-structural defects that affect operations of the cell and create a safety hazard for onsite personnel. Mooring cells BCB 2 and BCB 3 exhibited a broken guardrail on the channel side of the cell and the staircase from BCB 2 that allows access to the peanut cell contained broken steps. The walkway connecting BCB 3 to BCB 4 exhibited structural defects and should be replaced to ensure safe operations. The top of BCB 4 was inaccessible during the inspection due to safety concerns. The ladders on BCB 3 and BCB 4 need to be repaired or replaced to provide safe climbing operations during future inspections.

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Appendices

1. Introduction

Marine Solutions, Inc. (Marine Solutions) conducted a baseline inspection of the waterfront structures at the Paducah-McCracken County Riverport Authority on December 9 through December 13, 2024. The purpose of this inspection was to observe and report the above and below water conditions of the structural components comprising the waterfront structures, collect river bottom soundings within the berthing area, and provide prioritized repair recommendations based on the findings. Marine Solutions executed the specified scope of services in accordance with proposal 05-24-P203 L01, submitted on November 19, 2024. A plan view of the terminal is shown below in Figure 1 and Figure 2.

Figure 1 Plan View of the Bulk Commodity Berth

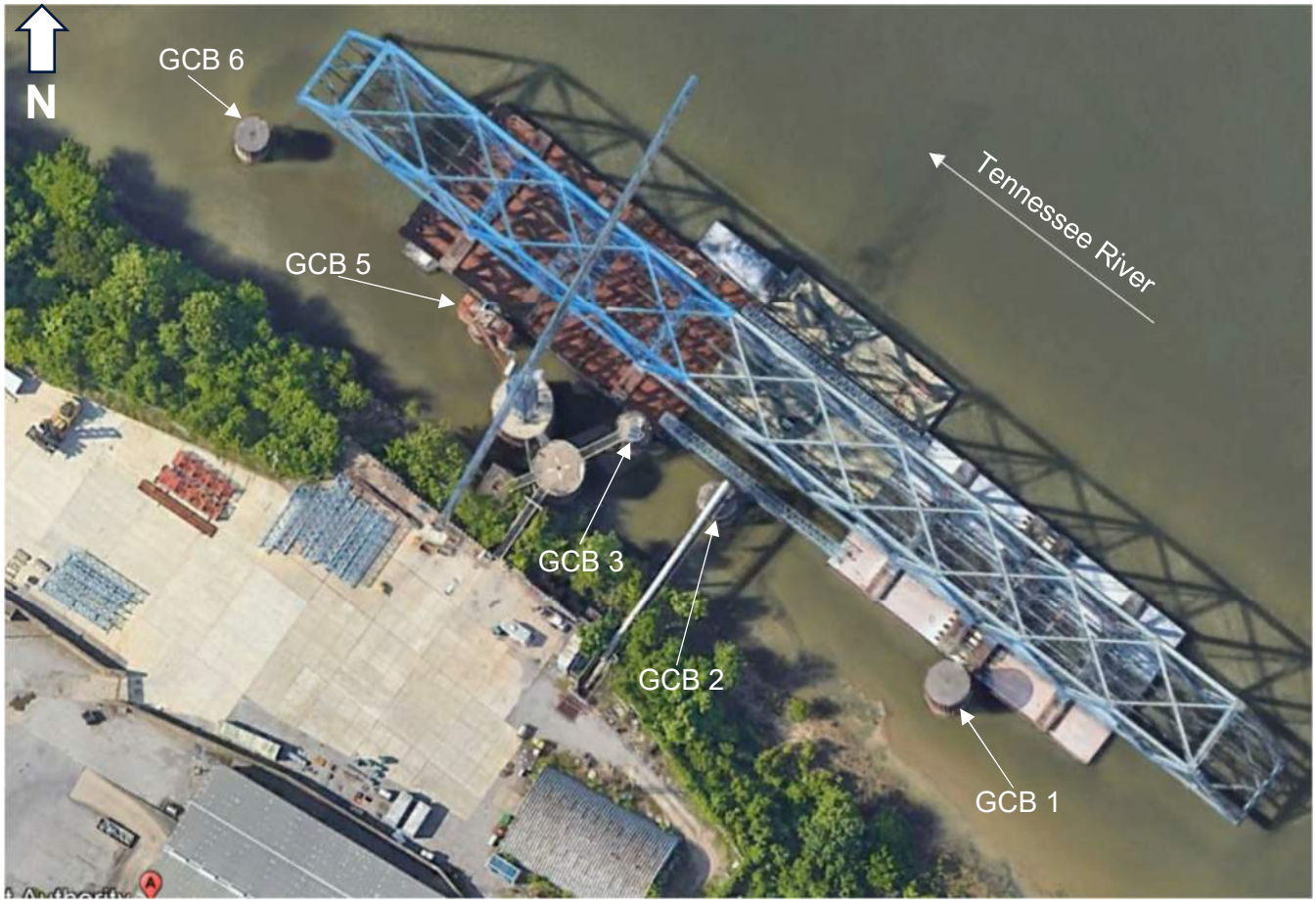


Figure 2 Plan view of the General Cargo Berth

The following paragraphs provide a description of the facility, inspection procedures, a summary of the inspection results, and recommendations. This report is a condition assessment of the facility and does not present the results of any structural or mooring analysis. Drawings consisting of a spot depth survey are provided in Appendix A. Structure inspection sheets documenting the observations at each structure are provided in Appendix B. Defect assessment rating criteria and recommended inspection intervals are provided in Appendix C.

1.1 Description of the Facility

The Paducah-McCracken County Riverport Authority's General Cargo and Bulk Commodity Berths are located on the left descending bank of the Tennessee River. The waterfront facilities at these berths include nine steel sheet pile mooring cells. The berthing line is generally aligned from east to west (upstream to downstream). The structures are numbered upstream to downstream from BCB 1 to BCB 4 for the Bulk Commodity Berth and GCB 1 to GCB 6 for the General Cargo Berth. The water surface elevation ranged from 309.8 feet to 309.9 feet (NAVD88) during the time of inspection.

Record drawings were not provided by Paducah-McCracken County Riverport Authority. There was no record of any previous inspections.

1.2 Inspection Procedures

The inspection was conducted utilizing a three-person inspection team under the direction of a qualified team leader. The inspection included an above and below water visual and tactile examination of the accessible waterfront facility surfaces. The orientation references of the structures were considered as channel (north), bank (south), upstream (east), and downstream (west). The sheet piles forming the mooring cells were labeled clockwise where Sheet Pile No. 1 was designated as the channel side center sheet pile. The position of the existing cell features (mooring rings, ladders, etc.) were used to designate and label sheet piles during this inspection. All elevations referenced within this report are relative to North American Vertical Datum of 1988 (NAVD88).

The inspected components were observed for signs of distress or deterioration including impact damage, cracks, corrosion, scour, loss of ballast material, and debris accumulation. Observed conditions, defects, and observations were identified by sheet or pile location and documented by notes and photographs. Non-destructive testing of the mooring cells and dolphins was performed using an ultrasonic thickness gauge to determine the remaining thicknesses of steel. Measurements were taken at the top of the cell, above the water surface, at the splash zone, at mid-depth, and near the mudline for each structure where possible. Inclination measurements were also performed on each quadrant to determine the plumbness of the cell.

The structures and structural elements were categorized by overall condition ratings and element level severity ratings. The assigned ratings were based on the American Society of Civil Engineers, *Waterfront Facilities Inspection and Assessment,* Manual and Reports on Engineering Practice No. 130, June 2015. The mooring structures and structural elements were categorized by overall conditions ratings and element level severity ratings. The rating criteria considered is presented in Table 1 and Table 2 below.

Table 1 Overall Condition Assessment Rating Criteria

ASSESSMENT RATING	DESCRIPTION
"Good"	No visible damage or only minor damage noted. Structural elements may show very minor deterioration, but no overstressing observed.
"Satisfactory"	Limited minor to moderate defects or deterioration observed but no overstressing observed.
"Fair"	All primary structural elements are sound but minor to moderate defects or deterioration observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure.
"Poor"	Advanced deterioration or overstressing observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure.
"Serious"	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary.
"Critical"	Very advanced deteriorations, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur and load restrictions should be implemented as necessary.

Table 2 Defect Assessment Rating Criteria (Steel Structures)

ASSESSMENT RATING	DESCRIPTION
"Severe"	Defect significantly affects the integrity, function or load bearing capacity of the member including bending, buckling, breakage, or displacement. The member has lost critical functionality and load carrying capacity.
"Major"	Partial loss of section, visible reduction in thickness, or a loss of nominal thickness between 30 to 50 percent at any location. The member has lost some functionality and load carrying capacity.
"Moderate"	Over 50 percent of the surface affected by corrosion at any elevation or section with loss of thickness of 15 to 30 percent at any location. Defect may affect the function or loading bearing capacity of the member.
"Minor"	Less than 50 percent of the surface affected by corrosion at any elevation or cross section with loss of thickness up to 15 percent of nominal at any location. The integrity, function or load bearing capacity of the member is not affected at this time.

Recommended actions have also been given a suggested “priority” to identify the urgency in which the recommended actions should be considered. The priority rating is based on the effect the observed conditions are estimated to have on the integrity and capabilities of the structure only and do not consider operational or other factors. As such, other factors should be considered in selecting actual priority for action. The suggested priority ratings are defined in Table 3.

Table 3 Repair Priority Timeframes

PRIORITY	TIMEFRAME
“Immediate”	In the immediate or very near future.
“High”	Within one calendar year.
“Medium”	Before the next inspection cycle.
“Low”	Prior to the next recommended inspection period based on the global facility recommendations.

Uncoated steel structures in a benign environment, such as freshwater with low currents (less than 0.75 knots), are recommended for inspection every six years when in good or satisfactory condition. For fair and poor conditions, the recommended intervals decrease to five and four years, respectively. As the condition worsens to serious or critical, the inspection intervals reduce significantly to two years and six months, ensuring timely detection of structural issues. These intervals account for the slower deterioration rates typical of benign environments while maintaining structural safety.

Table 4 ASCE MOP No. 130 Recommended Maximum Interval Between Routine Inspections (Years)

Table 2-2. Recommended Maximum Interval between Routine Inspections (Years)[a]

Condition Rating from Previous Inspection	CONSTRUCTION MATERIAL					
	Unwrapped Timber or Unprotected Steel (No Coating or Cathodic Protection)[d]		Concrete, Masonry, Wrapped Wood, Protected Steel, or Composite Materials[d]		Channel Bottom or Mudline Scour[e, f] (Soundings[g]/Direct Observation)	
	Benign[b] Environment	Aggressive[c] Environment	Benign[b] Environment	Aggressive[c] Environment	Benign[b] Environment	Aggressive[c] Environment
6 Good	6	4	6	5	6/6	2/5
5 Satisfactory	6	4	6	5	6/6	2/5
4 Fair	5	3	5	4	6/6	2/5
3 Poor	4	3	5	4	6/6	2/5
2 Serious	2	1	2	2	2/2	2/2
1 Critical	0.5	0.5	0.5	0.5	1/1	0.5/1

[a]The maximum interval between routine inspections may be reduced based on extent of deterioration, anticipated deterioration, and importance of the structure. Intervals may be increased for atypical cases where special construction materials are used. Regulations may dictate a maximum inspection interval.
[b]Benign environments include freshwater with low to moderate currents (current <0.75 knots).
[c]Aggressive environments include brackish water, seawater, polluted water, or waters with currents >0.75 knots. Facilities that handle chemicals containing elements detrimental to the structure's durability, such as chlorides, sulfates, or alkalis, are aggressive environments.
[d]The intervals indicate requirements for sounding timbers.
[e]The intervals indicate requirements for direct observation of the bottom for scour.
[f]Two maximum intervals are shown, one for the assessment of construction material (wood, concrete, steel, etc.) and one for scour (last two columns). The shorter interval should be used.
[g]Soundings may be performed at the time of the above water inspection.

2. Inspection Results

The following table summarizes the overall condition rating of each structure and prioritizes recommended actions and repairs. Documentation of the observations for each structure is provided in Appendix B. For a detailed discussion of conclusions and recommendations refer to Section 3.

Table 4 Summary of Waterfront Facility Inspection Results

STRUCTURE	CONDITION	PRIORITY	RECOMMENDATION
BCB 1	Poor	Medium	Install a full circumference cell band.
		Medium	Replace the lost ballast.
		Low	Install a patch plate at the damaged U-bolt.
		Low	Fill the gaps between the concrete cap and sheet piles.
BCB 2	Critical	Immediate	Encapsulate cell with sheet pile structure to enclose BCB 2 and BCB 3.
		High	Replace the lost ballast.
		High	Replace the broken guardrail.
		Medium	Replace the broken staircase to peanut cell.
BCB 3	Poor	High	Replace the broken guardrail.
		High	Repair the dislocated walkway bearing.
		High	Replace the walkway to BCB 4.
		Medium	Encapsulate cell with sheet pile structure to enclose BCB 2 and BCB 3.
		Low	Repair the impacted ladder on Sheet 8.
BCB 4	Critical	Immediate	Install a full circumference cell band.
		High	Install an externally mounted ladder.
		High	Replace the lost ballast.

STRUCTURE	CONDITION	PRIORITY	RECOMMENDATION
GCB 1	Serious	High	Install a full circumference cell band.
		Medium	Install an externally mounted ladder.
GCB 2	Critical	Immediate	Install a full circumference cell band.
		High	Replace the lost ballast.
		High	Remove the lost ballast from the channel bottom.
GCB 3	Serious	High	Install a full circumference cell band.
		High	Replace the lost ballast.
		High	Remove the lost ballast from the channel bottom.
		Low	Install a patch plate at the damaged mooring ring and sheet pile.
GCB 5	Serious	High	Install a full circumference cell band.
		High	Replace the lost ballast.
		High	Remove the lost ballast from the channel bottom.
		Low	Remove the timber debris from the channel bottom.
GCB 6	Fair	n/a	None.

The recommended actions and repairs do not consider further analysis or conceptual design efforts to provide project specific details, but instead provide general recommendations to aid scoping analysis/design efforts required to determine site specific details typically developed in a repair design project.

3. Conclusions and Recommendations

3.1 BCB 1

Mooring cell BCB 1 was in poor condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 25 percent. The maximum loss of section was approximately 40 percent and occurred near the waterline on the upstream side. Split interlocks were present on each of the knuckles from Sheet 1 to Sheet 3 up to 1 inch wide and up to 7 feet long. No ballast was exposed at these split interlocks. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed on a medium priority basis.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 29 percent. The steel at the top of the cell indicated an average loss of section of approximately 13 percent. The second U-bolt from the top of the cell on Sheet 37 is broken and the mooring ring was missing. It is recommended that the broken U-bolt is demolished and replaced with a patch plate on a low priority basis.

The concrete cap exhibited a gap at the top of the sheets up to 1 inch wide between the sheets and the concrete gap from Sheet 33 to Sheet 4. Additional gaps occurred at Sheets 12, 13, 15, and 21 up to 1/2 inch wide between the sheets and the concrete cap. It is recommended that these gaps be filled in with grouting material on a low priority basis. The ballast height measured 9 feet from the top of the concrete cap. It is recommended that the ballast be replaced on a medium priority basis.

3.2 BCB 2

Mooring cell BCB 2 was in critical condition. Ultrasonic thickness (UT) testing on select sheet piles were only performed above the waterline due to no portion of the cells being underwater at the time of inspection. The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 4 percent. The steel at the top of the cell indicated an average loss of section of approximately 8 percent. The maximum loss of section was approximately 23 percent and occurred near the top of the cell on the bank side.

Two holes were observed at Sheet 7 and Sheet 62 measuring up to 1/2 square foot in area. Isolated areas of impact damage were observed on Sheet 5 and Sheet 6 measuring up to 1 inch deep for the full height of the cell. The containment wall on the inboard side of Sheet 31 was undermined and exhibited an active spill of fill material. There was an area of erosion on the south side of the cell where material washed out around the containment wall. It is recommended that the undermined hole is patched on an immediate priority basis. It is recommended that the ballast be replaced on a high priority basis.

Due to the observed ballast loss and accumulation of ballast on the channel side of the cell, it is likely that splits or defects exist in the sheet piles below the area that was accessible during the inspection. To address this concern, it is recommended that the existing ballast on the exterior of the cell be removed to allow for a comprehensive evaluation of the underlying sheets. Additionally, an underwater inspection should be conducted to identify any holes or structural deficiencies in this area of the cell. These actions are necessary to ensure there are no hidden defects that could lead to further ballast loss and compromise the stability of the structure. It is recommended that the defects to BCB 2 and BCB 3 be addressed by encapsulating both structures with a sheet pile wall anchored to repaired cells or an

anchorage system upland of both structures. This encapsulation can address the erosion of the south side and the assumed buried deterioration of BCB 2 along with the observed defects of BCB 3. This repair for BCB 2 should be considered on an immediate priority basis due to the critical condition.

The concrete cap exhibited a missing guardrail along the outboard face at the top of the cell. It is recommended that the guardrail be replaced on a high priority basis. The staircase that is centered on Sheet 56 provides access to the peanut mooring cell. The staircase exhibited multiple broken steps recommending replacement on a medium priority basis. The ballast height measured almost 34 feet from the top of the concrete cap. It is recommended that the ballast be replaced on a high priority basis.

3.3 BCB 3

Mooring cell BCB 3 was in poor condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 17 percent. Split interlocks were present on each of the knuckles from Sheet 72 to Sheet 2 up to 1-1/2 inch wide and up to 4 feet long. No ballast was exposed at these split interlocks. It is recommended that the defects to BCB 2 and BCB 3 be addressed by encapsulating both structures with a sheet pile wall anchored to repaired cells or an anchorage system upland of both structures on a medium priority basis.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 24 percent. The maximum loss of section was approximately 43 percent and occurred 5 feet above the waterline on the downstream side. The steel at the top of the cell indicated an average loss of section of approximately 8 percent. There were three areas of impact damage on the cell measuring up to 16 square feet in area and up to 6 inches deep. The externally mounted ladder on Sheet 8 was damaged approximately 8 feet above the waterline. It is recommended that the impacted ladder be repaired on a low priority basis.

The concrete cap exhibited a broken guardrail throughout the cell. It is recommended that the guardrail be replaced on a high priority basis. The access walkway from BCB 3 to BCB 4 was in poor condition overall and should be replaced due to lack of structural integrity. The bearing on BCB 3 from the walkway was dislocated and not bearing properly. It is recommended that the walkway be replaced, and the bearing be repaired on a high priority basis.

3.4 BCB 4

Mooring cell BCB 4 was in critical condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 42 percent. The maximum loss of section was approximately 54 percent and occurred near the mudline on the channel side. Split interlocks were observed on each of the knuckles from Sheet 37 to Sheet 3 up to 1-1/2 inch wide and up to 7 feet long. No ballast was exposed at the split interlocks. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed on an immediate priority basis.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 20 percent. There were numerous areas of impact damage observed throughout the sheets measuring up to 1 inch deep. The steel channel pan sheet in the interior of the cut-in sheet ladder was missing on the bottom 20 feet of the ladder exposing the ballast and the empty cell above.

The top of mooring cell BCB 4 was not able to be inspected due to unsafe access. This was due to a lack of structural integrity of the walkway and the cut-in sheet ladder. It is recommended that an externally mounted ladder be installed on a high priority basis. The ballast was observed to only be 4 feet above the waterline. It is recommended that the ballast be replaced on a high priority basis.

3.5 GCB 1

Mooring cell GCB 1 was in poor condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 33 percent. The maximum loss of section was approximately 45 percent and occurred 5 feet above the waterline on the downstream side.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 40 percent. There were 3 split interlocks between Sheet 1 and Sheet 60 and a hole in the knuckle between Sheet 3 and Sheet 4. There was an area of impact damage on the cell measuring up to 42 square feet in area and up to 4 inches deep. The pan sheet behind the sheet ladder was split, exposing aggregate and causing active ballast loss. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed on a high priority basis.

The top of mooring cell GCB 1 was not able to be inspected due to unsafe access. This was due to a section of sheet ladder that was broken near the top of the cell and an obstruction from the mooring line. It is recommended that an externally mounted ladder be installed on a medium priority basis.

3.6 GCB 2

Mooring cell GCB 2 was in critical condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 36 percent. The maximum loss of section was approximately 59 percent and occurred near the waterline on the channel side. Split interlocks were observed on each of the knuckles from Sheet 47 to Sheet 3 and between Sheet 4 and Sheet 5. The split interlock between Sheet 2 and Sheet 3 was up to 6 inches wide and exhibited large amounts of exposed ballast with active loss. Each of the split interlocks exhibited active ballast loss resulting in a pile of fill material on the channel side of the cell. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed on an immediate priority basis. It is recommended that the ballast be removed from the channel bottom on a high priority basis.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 22 percent. There was an area of impact damage on the cell, centered at sheet 47, measuring up to 12 square feet in area and up to 3 inches deep. The pan sheet behind the sheet ladder was split, exposing aggregate and causing active ballast loss.

The concrete cap was in good condition overall with only minor defects observed. The manhole cover at the top of the cell could not be accessed due to obstruction by steel truss members. The ballast height measured nearly 30 feet from the top of the concrete cap through a 3-inch diameter hole. It is recommended that the ballast be replaced on a high priority basis.

The top of mooring cell BCB 4 was not able to be inspected due to unsafe access. This was due to a lack of structural integrity of the walkway and the cut-in sheet ladder. It is recommended that an externally mounted ladder be installed on a high priority basis. The ballast was observed to only be 4 feet above the waterline. It is recommended that the ballast be replaced on a high priority basis.

3.5 GCB 1

Mooring cell GCB 1 was in poor condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 33 percent. The maximum loss of section was approximately 45 percent and occurred 5 feet above the waterline on the downstream side.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 40 percent. There were 3 split interlocks between Sheet 1 and Sheet 60 and a hole in the knuckle between Sheet 3 and Sheet 4. There was an area of impact damage on the cell measuring up to 42 square feet in area and up to 4 inches deep. The pan sheet behind the sheet ladder was split, exposing aggregate and causing active ballast loss. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed on a high priority basis.

The top of mooring cell GCB 1 was not able to be inspected due to unsafe access. This was due to a section of sheet ladder that was broken near the top of the cell and an obstruction from the mooring line. It is recommended that an externally mounted ladder be installed on a medium priority basis.

3.6 GCB 2

Mooring cell GCB 2 was in critical condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 36 percent. The maximum loss of section was approximately 59 percent and occurred near the waterline on the channel side. Split interlocks were observed on each of the knuckles from Sheet 47 to Sheet 3 and between Sheet 4 and Sheet 5. The split interlock between Sheet 2 and Sheet 3 was up to 6 inches wide and exhibited large amounts of exposed ballast with active loss. Each of the split interlocks exhibited active ballast loss resulting in a pile of fill material on the channel side of the cell. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed on an immediate priority basis. It is recommended that the ballast be removed from the channel bottom on a high priority basis.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 22 percent. There was an area of impact damage on the cell, centered at sheet 47, measuring up to 12 square feet in area and up to 3 inches deep. The pan sheet behind the sheet ladder was split, exposing aggregate and causing active ballast loss.

The concrete cap was in good condition overall with only minor defects observed. The manhole cover at the top of the cell could not be accessed due to obstruction by steel truss members. The ballast height measured nearly 30 feet from the top of the concrete cap through a 3-inch diameter hole. It is recommended that the ballast be replaced on a high priority basis.

To ensure the structural integrity of the cell cap and the unloader structure, an additional investigation is recommended to confirm if the cap is supported by piles. This is crucial to assess the risk of collapse due to the loss of fill material. A core drill should be used to access below the cap, allowing a camera inspection to verify the presence of supporting piles and evaluate the foundation's stability.

3.7 GCB 3

Mooring cell GCB 3 was in serious condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 32 percent. The maximum loss of section was approximately 45 percent and occurred 5 feet above the waterline on the bank side. Split interlocks were observed on each of the knuckles from Sheet 1 to Sheet 3 and between Sheet 4 and Sheet 5. The split interlock between Sheet 2 and Sheet 3 was approximately 7 feet long and up to 4 inches wide and exhibited large amounts of exposed ballast with active loss. Each of the split interlocks exhibited active ballast loss resulting in an accumulation of fill material on the channel side of the cell. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed and the lost ballast be removed from the channel bottom on a high priority basis.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 21 percent. The pan sheet behind the sheet ladder was split, exposing aggregate and causing active ballast loss. The lowest elevation mooring ring was impacted and the U-bolt was pushed into the cell, causing a tear in Sheet 37. It is recommended that the torn sheet be patched and the mooring hardware replaced on a low priority basis.

The concrete cap was in good condition overall with only minor defects observed. The manhole cover at the top of the cell could not be accessed due to obstruction by steel structural members. The ballast height measured almost 30 feet from the top of the concrete cap. It is recommended that the ballast be replaced on a high priority basis.

3.8 GCB 5

Mooring cell GCB 5 was in serious condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 22 percent. The maximum loss of section was approximately 44 percent and occurred 5 feet above the waterline on the downstream side. Split interlocks were observed on each of the knuckles from Sheet 1 to Sheet 4. The split interlock between Sheet 2 and Sheet 3 was up to 5 inches wide and exhibited large amounts of exposed ballast with active loss. Each of the split interlocks exhibited active ballast loss resulting in an accumulation of fill material on the channel side of the cell. There was a tear in the web of Sheet 2 measuring 4 feet high and 4 inches wide with exposed ballast and active loss. It is recommended that a full circumference pretensioned cell band designed to provide replacement level confinement strength be installed and the lost ballast be removed from the channel bottom on a high priority basis. Timber debris measuring up to 8 inches in diameter was observed on the channel bottom. It is recommended that the timber debris be removed on a low priority basis.

The steel above the waterline exhibited heavy corrosion and UT readings indicated an average loss of section of approximately 23 percent. The patch plate installed from Sheet 48 to Sheet 2 was severely corroded near the waterline exhibiting up to 100 percent section loss.

The concrete cap was in good condition overall with only minor defects observed. The mooring rings were in fair condition overall with minor abrasion damage and minor corrosion throughout. The ballast height measured 34 feet from the concrete cap. It is recommended that the ballast be replaced on a high priority basis.

3.9 GCB 6

Mooring cell GCB 6 was in fair condition. Ultrasonic thickness (UT) testing on select sheet piles of the cell indicated that the average loss of section for underwater portions of the sheet piles was 15 percent. The maximum loss of section was approximately 32 percent and occurred near mid depth on the downstream side. The steel above the waterline exhibited minor corrosion and UT readings indicated an insignificant amount of section loss. There were two areas of impact damage on the cell measuring up to 36 square feet in area and up to 6 inches deep. The concrete cap was in good condition overall with only minor defects observed. There was a gap between the sheets and the cap from Sheet 10 to Sheet 12. No repairs are recommended for mooring cell GCB 6 at this time.

3.10 Terminal Inspection Frequency

Due to the Critical Condition of mooring cells BCB 2, BCB 4 and GCB 2, and the Serious condition of mooring cells GCB 1, GCB 3, and GCB 5, the terminal should be inspected every six (6) months based on guidance in ASCE MOP No. 130 for structures in critical condition in a benign environment.

Following repairs, the terminal should be periodically inspected as part of a routine inspection program or following significant events such as severe vessel impacts or flood conditions. Routine inspections are generally recommended not to exceed a period of five (5) years for similar structures in fair or better condition per guidelines presented in ASCE MOP No. 130.

Appendix A

Drawings

OVERALL
SCALE: 1" = 50'

0 25 50 100 FT
SCALE: 1"= 50'

NOTES:
1. DEPTH SOUNDINGS PERFORMED AT 10-FOOT INTERVALS FROM THE FACE OF THE RESPECTIVE CELLS.
2. AT THE TIME OF INSPECTION, THE WATERLINE WAS APPROXIMATELY 301.9 FEET NAVD88 IN REFERENCE TO USGS GAUGE 03611000, OHIO RIVER AT PADUCAH, KY.
3. THIS SKETCH IS INTENDED TO PROVIDE A CONCEPTUAL ILLUSTRATION OF CONDITIONS OBSERVED BELOW THE WATER SURFACE. ANY FEATURES OR DIMENSIONS SHOWN ARE APPROXIMATE.

LEGEND:

17.3' — SOUNDING LOCATIONS AND DEPTH BELOW NORMAL POOL

FLOW / FLOW — DIRECTION OF FLOW

— · · · — SHORELINE

MARINE SOLUTIONS

Paducah-McCracken County Riverport Authority

GRAPHIC SCALE: 1" = 50'
INSPECTION DATE: 12/12/2024
DRAWN BY: ASA | CKD BY: JAG
MSI PROJ NO.: 05-24-203
FILE NAME: 05-24-203_INSP.DWG

PADUCAH RIVERPORT AUTHORITY BARGE CELL REVITALIZATION PROJECT

GENERAL CARGO BERTH (GCB)
SOUNDING PLAN

SHEET NO.
1 of 2

OVERALL
SCALE: 1" = 20'

0 10 20 40 FT
SCALE: 1"= 20'

NOTES:
1. DEPTH SOUNDINGS PERFORMED AT 10-FOOT INTERVALS FROM THE FACE OF THE RESPECTIVE CELLS.
2. AT THE TIME OF INSPECTION, THE WATERLINE WAS APPROXIMATELY 301.9 FEET NAVD88 IN REFERENCE TO USGS GAUGE 03611000, OHIO RIVER AT PADUCAH, KY.
3. THIS SKETCH IS INTENDED TO PROVIDE A CONCEPTUAL ILLUSTRATION OF CONDITIONS OBSERVED BELOW THE WATER SURFACE. ANY FEATURES OR DIMENSIONS SHOWN ARE APPROXIMATE.

LEGEND:

17.3' — SOUNDING LOCATIONS AND DEPTH BELOW NORMAL POOL

FLOW / FLOW — DIRECTION OF FLOW

— · · · — SHORELINE

MARINE SOLUTIONS

Paducah-McCracken County Riverport Authority

GRAPHIC SCALE: 1" = 20'
INSPECTION DATE: 12/12/2024
DRAWN BY: ASA
CKD BY: JAG
MSI PROJ NO.: 05-24-203
FILE NAME: 05-24-203_INSP.DWG

PADUCAH RIVERPORT AUTHORITY BARGE CELL REVITALIZATION PROJECT

BULK CARGO BERTH (BCB)
SOUNDING PLAN

SHEET NO.
2 of 2

Appendix B

Structure Inspection Sheets

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 1

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Poor			
Corrosion: Major			
Split Interlocks:	Yes	Holes:	Yes
Loss of Ballast:	Yes	Impact Damage:	Yes
Broken Moorings:	No	Ladder Damage:	Yes
Waterway Information			
Water Surface Elevation:	301.9 feet NAVD88		
Normal Pool/Tide Range:	301.7 feet NAVD88		
Reference:	USGS Gauge 03611000		

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	38
Sheet Numbering/Direction:	Sheet 1 at the center of the cut-in ladder / CW
Dia. At Top of Cell:	15.1 feet
Mooring Fittings:	5 mooring rings on Sheet 37, 14 inches in diameter, spaced 7 feet on center. 1 additional mooring ring is located between Sheet 34 and Sheet 37.
Top of Sheet Elevation:	339.1 feet NAVD88
Sheet Pile Tip Elevation:	UKN
Cap Type & Thickness:	Concrete, 10 inches thick
Ballast Height (from top of cap):	9 feet, slopes to channel side

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	0.328	87.4%
Above Water	0.266	71.0%
Waterline	0.258	68.8%
Mid-Depth	0.313	83.6%
Mudline	0.271	72.2%

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. A cut-in sheet ladder was observed on Sheet 1 from the top of the patch plate to the top of the cell.
2. A Patch plate was installed from Sheet 38 to Sheet 2.
3. Five mooring rings were installed on Sheet 37 and were spaced 7 feet on-center. The top mooring ring was approximately 2 feet below the top of the cell.
4. A mooring ring on sheet 35 was observed approximately 4 feet from the top of the cell.
5. An externally mounted ladder was centered at Sheet 30.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. The sheets typically exhibited heavy corrosion consisting of rust scaling up to 1/8 inch thick and pitting up to 1/8 inch deep from the waterline up to approximately elevation 313.9 feet NAVD88.
2. The sheets were typically out of plane up to 1/2 inch along the horizontal joint at the sheet pile splices.
3. The sheets typically exhibited light to moderate surface corrosion above the waterline.
4. An area of impact damage was observed from Sheet 30 to Sheet 33 centered 10 feet below the top of the cell, measuring 4 feet wide by 3 feet high and up to 2 inches deep. The externally mounted ladder was broken at this location.
5. There was a split interlock between Sheet 1 and Sheet 2 from the waterline to approximately elevation 294.9 feet NAVD88 measuring up to 1 inch wide with no exposed ballast.
6. There was a split interlock between Sheet 2 and Sheet 3 from approximately elevation 300.9 feet NAVD88 to approximately elevation 294.9 feet NAVD88 measuring up to 1 inch wide with no exposed ballast.
7. The steel sheet piles typically exhibit moderate scaling up to 1/8 inch thick and moderate pitting up to 1/8 inch deep below the waterline.
8. The steel sheet piles typically exhibited minor biological growth up to 1/8 inch thick below the waterline.

Mooring Cell Cap

9. A gap was observed at the top of the sheets up to 1 inch wide between the sheets and the concrete cap from Sheet 33 to Sheet 4.
10. A gap was observed at Sheets 12, 13, 15, and 21 up to 1/2 inch wide between the sheets and the concrete cap.
11. The concrete cap was in good condition overall with isolated hairline cracking throughout.

Mooring Rings

12. The second U-bolt from the top of cell was broken and the mooring ring was missing.

Channel Bottom

13. The channel bottom in the vicinity of the cell consisted of sand, gravel, and riprap up to 16 inches in diameter.

MARINE SOLUTIONS

Structure Inspection Sheet

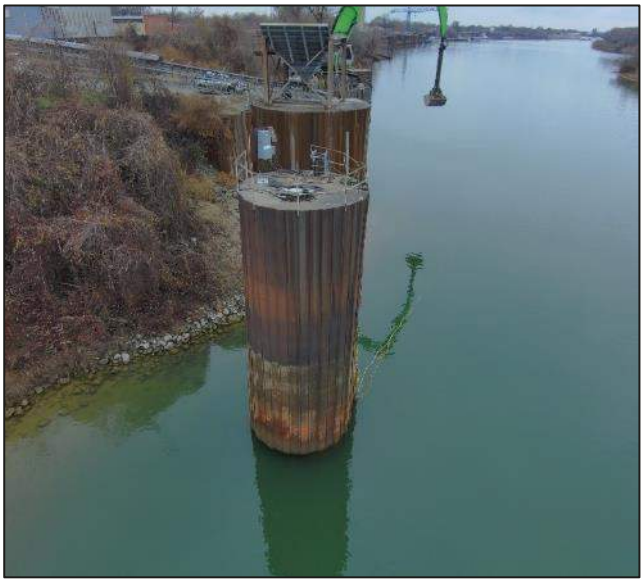
Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 1

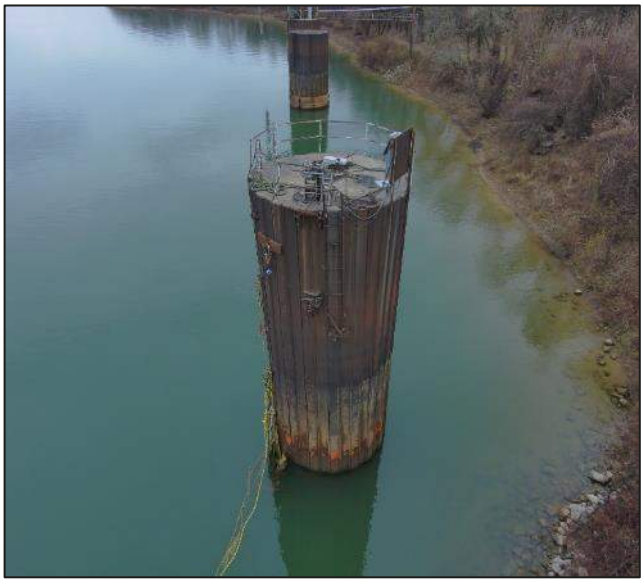
Photographs

Photograph 1 Elevation – Channel Side

Photograph 2 Elevation – Bank Side

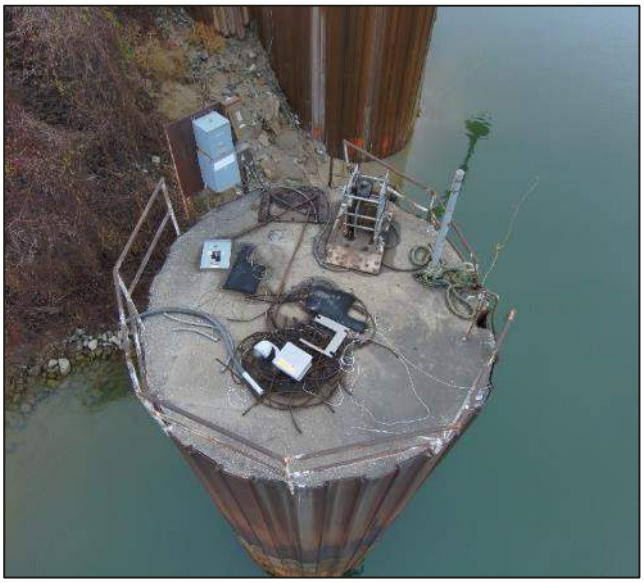


Photograph 3 Elevation – Upstream Side



Photograph 4 Elevation – Downstream Side

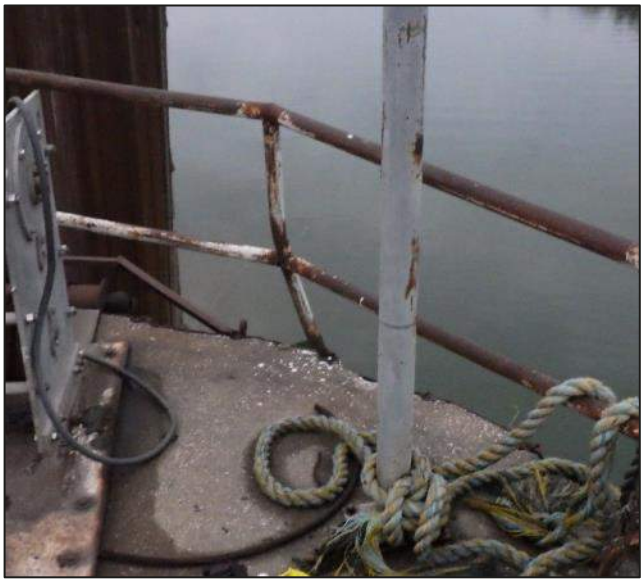
Photographs



Photograph 5 View of BCB 1 concrete cap.

Photograph 6 View of the typical concrete condition.

Photograph 7 View of the fill material inside the cell.



Photograph 8 View of impacted and damaged guardrail at Sheet 30.

Photographs

Photograph 9 View of broken U-bolt at Sheet 37.

Photograph 10 View of additional mooring ring on Sheet 35.

Photograph 11 View of impact damage and broken ladder at Sheet 30.

Photograph 12 Underwater view of typical sheet pile condition.

Photographs

Photograph 13 Underwater view of split interlock between Sheet 1 and Sheet 2.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 1

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings Original Thickness (in.): 0.375			Cell Band Thickness Readings			
Location	**Plumbness (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): 13 Sheet: 3	-2	Top of Cell	0.300	80.0%	Top of Cell	-	-	-
		Above Water	0.260	69.3%	Above Water		-	-
		Waterline	0.263	70.2%	Waterline		-	-
		Mid-Depth	0.265	70.7%	Mid-Depth		-	-
		Mudline	0.292	77.8%	Mudline		-	-
Downstream Depth (ft): 12 Sheet: 10	0.75	Top of Cell	0.307	81.8%	Top of Cell	-	-	-
		Above Water	0.237	63.1%	Above Water		-	-
		Waterline	0.298	79.6%	Waterline		-	-
		Mid-Depth	0.375	100.0%	Mid-Depth		-	-
		Mudline	0.310	82.7%	Mudline		-	-
Bank Depth (ft): 4 Sheet: 19	-2.6	Top of Cell	0.355	94.7%	Top of Cell	-	-	-
		Above Water	0.275	73.3%	Above Water		-	-
		Waterline	0.243	64.9%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	0.250	66.7%	Mudline		-	-
Upstream Depth (ft): 7 Sheet: 30	-2.25	Top of Cell	0.350	93.3%	Top of Cell	-	-	-
		Above Water	0.293	78.2%	Above Water		-	-
		Waterline	0.227	60.4%	Waterline		-	-
		Mid-Depth	0.300	80.0%	Mid-Depth		-	-
		Mudline	0.232	61.8%	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone Original Thickness (in.): 0.375			Average Cell Band Thickness Readings By Location			
Zone	**Remaining Thickness (in.)**	**% Remaining**	**Location**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	0.328	87.4%	Top of Cell	-	-	-
Above Water	0.266	71.0%	Above Water	-	-	-
Waterline	0.258	68.8%	Waterline	-	-	-
Mid-Depth	0.313	83.6%	Mid-Depth	-	-	-
Mudline	0.271	72.2%	Mudline	-	-	-

Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 2

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Critical			
Corrosion: Major			
Split Interlocks:	No	Holes:	Yes
Loss of Ballast:	Yes	Impact Damage:	Yes
Broken Moorings:	N/A	Ladder Damage:	Yes
Waterway Information			
Water Surface Elevation:	301.9 feet NAVD88		
Normal Pool/Tide Range:	301.7 feet NAVD88		
Reference:	USGS Gauge 03611000		

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	72
Sheet Numbering/Direction:	Sheet 1 centred at patch plate / CW
Dia. At Top of Cell:	31.5 feet
Mooring Fittings:	5 mooring rings on Sheet 69, 14 inches in diameter, spaced 7 feet on center
Top of Sheet Elevation:	340.1 feet NAVD88
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, 1.8 - 2.6 feet, sloped inwards
Ballast Height (from top of cap):	33.6 feet

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	0.339	90.4%
Above Water	0.360	96.0%
Waterline	-	-
Mid-Depth	-	-
Mudline	-	-

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. There was a patch plate approximately 4 feet wide from Sheet 2 through Sheet 72 from the waterline to approximately elevation 316.9 feet NAVD88.
2. There was a patch plate from Sheet 70 to Sheet 72 for the full height of the cell.
3. A staircase providing access to a lower elevation mooring cell was centered at sheet 56.
4. The connector cell wall of the intermediate cell connected from Sheet 60 on BCB 2 to Sheet 13 on BCB 3. The first sheet was a half flat sheet welded to Sheet 60 on BCB 2 and the last sheet was Sheet 17 welded to Sheet 13 on BCB 3.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. The sheets typically exhibited heavy corrosion consisting of rust scaling up to 1/8 inch thick and pitting up to 1/8 inch deep from the channel bottom to approximately elevation 313.9 feet NAVD88.
2. The sheets were typically out of plane up to 1/2 inch at sheet pile splice locations.
3. A hole due to impact damage was observed on Sheet 7 approximately 3 feet from the top of the cell measuring 8 inches high by 6 inches wide.
4. A hole was observed on Sheet 62 centered 2 feet below the top of the cell measuring 8 inches high by 8 inches wide.
5. Isolated areas of impact damage were observed on Sheets 5 and 6 measuring up to 1 inch deep from approximately elevation 316.9 feet NAVD88 to the top of the cell.
6. The sheet pile typically exhibited minor biological growth up to 1/8 inch thick from the waterline to the channel bottom.
7. The containment wall on the inboard side of Sheet 31 was undermined and exhibited an active spill of filling material. There was an area of erosion on the south side of the cell where material washed out around the containment wall.

Mooring Cell Cap

8. The concrete cap typically exhibited hairline cracking up to 1/8 inch wide where the concrete was exposed.
9. The guardrail was missing along the outboard face at the top of the cell.
10. The staircase centered on Sheet 56 that provides access to peanut mooring cell exhibited multiple broken steps.

Channel Bottom

11. The channel bottom in the vicinity of the cell consisted of sand, gravel, and riprap up to 16 inches in diameter.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

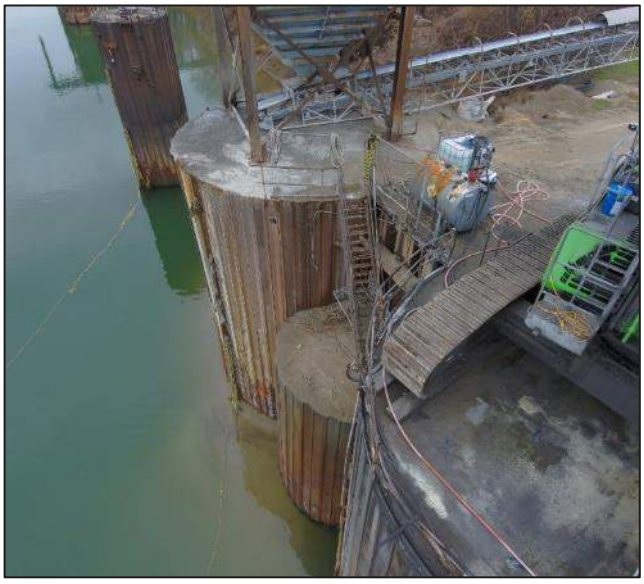
Site: Paducah, Kentucky
Structure: BCB 2

Photographs

Photograph 1 Elevation – Channel Side

Photograph 2 Elevation – Bank Side

Photograph 3 Elevation – Upstream Side



Photograph 4 Elevation – Downstream Side

Photographs

Photograph 5 View of BCB 2 concrete cap.

Photograph 6 View of typical concrete condition.

Photograph 7 View of lost ballast material inside cell.

Photograph 8 View of missing guardrail on the channel side of the cell.

Photographs

Photograph 9 View of the bottom side of the concrete cap and bases of the unloader columns.

Photograph 10 View of the columns supporting the concrete cap.

Photograph 11 View of hole on Sheet 7.

Photograph 12 View of hole on Sheet 62.

Photographs

Photograph 13 View of damaged staircase centered at Sheet 56.

Photograph 14 View of isolated impact damage on Sheet 5 and Sheet 6.

Photograph 15 View of erosion and undermining of the containment sheets attached to Sheet 31.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 2

Ultrasonic Thickness Readings

Location	Plumbness (degrees)	Sheet Pile Web Thickness Readings (Original Thickness (in.): 0.375) Zone	Remaining Thickness (in.)	% Remaining	Cell Band Thickness Readings Zone	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Channel Depth (ft): Sheet: 2	0.1	Top of Cell	0.367	97.8%	Top of Cell	-	-	-
		Above Water	0.360	96.0%	Above Water		-	-
		Waterline	-	-	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Downstream Depth (ft): Sheet: 52		Top of Cell	0.355	94.7%	Top of Cell	-	-	-
		Above Water	-	-	Above Water		-	-
		Waterline	-	-	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Bank Depth (ft): Sheet: 36		Top of Cell	0.290	77.3%	Top of Cell	-	-	-
		Above Water	-	-	Above Water		-	-
		Waterline	-	-	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Upstream Depth (ft): Sheet: 18	-2.5	Top of Cell	0.345	92.0%	Top of Cell	-	-	-
		Above Water	0.360	96.0%	Above Water		-	-
		Waterline	-	-	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone (Original Thickness (in.): 0.375) Zone	Remaining Thickness (in.)	% Remaining	Average Cell Band Thickness Readings By Location Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	0.339	90.4%	Top of Cell	-	-	-
Above Water	0.360	96.0%	Above Water	-	-	-
Waterline	-	-	Waterline	-	-	-
Mid-Depth	-	-	Mid-Depth	-	-	-
Mudline	-	-	Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 3

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Poor			
Corrosion: Major			
Split Interlocks:	Yes	Holes:	No
Loss of Ballast:	No	Impact Damage:	Yes
Broken Moorings:	No	Ladder Damage:	Yes
Waterway Information			
Water Surface Elevation:	301.9 feet NAVD88		
Normal Pool/Tide Range:	301.7 feet NAVD88		
Reference:	USGS Gauge 03611000		

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	72
Sheet Numbering/Direction:	Clockwise
Dia. At Top of Cell:	30.1 feet
Mooring Fittings:	5 mooring rings on Sheet 70, 14 inches in diameter, spaced 8 feet on center
Top of Sheet Elevation:	340.2 feet NAVD88
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, 27 inches thick
Ballast Height (from top of cap):	36 inches

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	0.346	92.3%
Above Water	0.286	76.2%
Waterline	0.324	86.4%
Mid-Depth	-	-
Mudline	0.300	80.0%

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. There was a patch plate welded from Sheet 72 to Sheet 2 from the waterline to approximately elevation 326.9 feet NAVD88.
2. An externally mounted sheet ladder was centered on Sheet 8.
3. Five mooring rings were located on Sheet 70 and were spaced approximately 8 feet on center. The top mooring ring was approximately 3 feet below the top of the cell.
4. The connector cell wall of the intermediate cell connected from Sheet 60 on BCB 2 to Sheet 13 on BCB 3. The first sheet was a half flat sheet welded to Sheet 60 on BCB 2 and the last sheet was Sheet 17 welded to Sheet 13 on BCB 3.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. The sheets typically exhibit heavy corrosion consisting of rust scaling up to 1/8 inch thick and pitting up to 3/16 inch deep from the waterline to approximately elevation 313.9 feet NAVD88.
2. An area of impact damage was observed measuring 4 feet high by 4 feet wide and up to 6 inches deep on Sheet 67 centered approximately 15 feet below the top of the cell.
3. An area of impact damage was observed measuring 2 feet high by 2 feet wide and up to 3 inches deep on Sheet 66 centered at approximately elevation 309.9 feet NAVD88.
4. An area of impact damage was observed measuring 3 feet wide by 2 feet high and up to 2 inches deep on Sheet 67 centered at approximately elevation 304.9 feet NAVD88.
5. The sheets were typically out of plane up to 1/2 inch at sheet pile splice locations.
6. The ladder on Sheet 8 exhibited impact damage 8 feet above the waterline.
7. The top of the sheets on the peanut cell was approximate elevation 326.6 feet NAVD88, and the water depth was less than 1.0 feet deep.
8. UT readings on the peanut cell measured 0.300 inches 5 feet above the waterline and 0.225 inches at the splash zone on Sheet 9.
9. There was a split interlock between Sheet 72 and Sheet 1 that extended into the web of Sheet 1 from the waterline to approximately elevation 297.9 feet NAVD88 at the channel bottom up to 1-1/2 inches wide with no exposed ballast.
10. There was a split interlock between Sheet 1 and Sheet 2 from approximately elevation 300.8 feet NAVD88 to approximately elevation 297.9 feet NAVD88 at the channel bottom up to 1 inch wide with no exposed ballast.
11. The steel sheet piles typically exhibit moderate scaling up to 1/8 inch thick and moderate pitting up to 1/8 inch deep from the waterline to the channel bottom.
12. The steel sheet piles typically exhibited minor biological growth up to 1/8 inch thick from the waterline to the channel bottom.

Mooring Cell Cap

13. The guardrail on the top of the cell was broken throughout.

14. The access walkway from BCB 3 to BCB 4 was in poor condition overall and should be replaced. There was visible impact damage on structural members throughout.
15. The bearing for the walkway from BCB 3 to BCB 4 was dislocated on the end of the walkway.

Mooring Rings

16. The mooring rings were in fair condition overall with minor abrasion damage and minor corrosion consisting of scaling up to 1/16 inch and minor pitting up to 1/16 inch deep.

Channel Bottom

17. The channel bottom in the vicinity of the cell consisted of sand, gravel, and riprap up to 16 inches in diameter.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

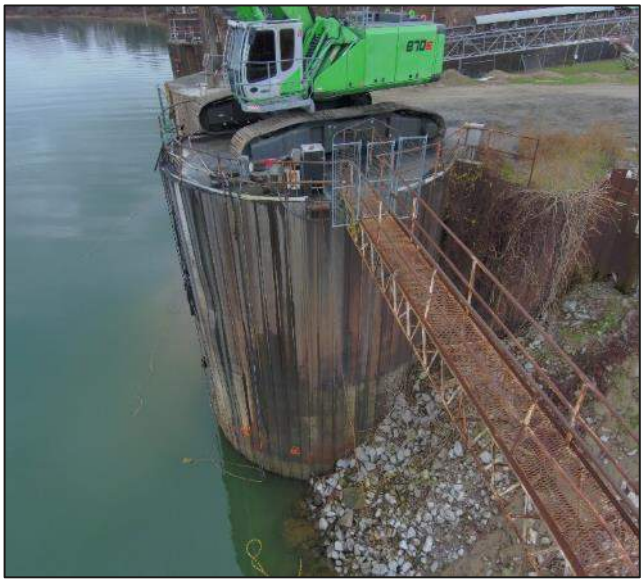
Site: Paducah, Kentucky
Structure: BCB 3

Photographs

Photograph 1 Elevation – Channel Side

Photograph 2 Elevation – Bank Side

Photograph 3 Elevation – Upstream Side



Photograph 4 Elevation – Downstream Side

Photographs

Photograph 5 View of BCB 3 concrete cap.

Photograph 6 View of open ballast height.

Photograph 7 View of typical condition of concrete cap.

Photograph 8 View of broken guardrail.

Photographs

Photograph 9 View of dislocated bearing on BCB 3.

Photograph 10 View of impact damage at Sheet 67.

Photograph 11 View of impact damage at Sheet 66.

Photograph 12 View of ladder damage on Sheet 8.

Photographs

Photograph 13 View of typical waterline condition.

Photograph 14 Underwater view of typical sheet pile condition.

Photograph 15 View of split interlock between Sheet 72 and Sheet 1.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 3

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings Original Thickness (in.): 0.375			Cell Band Thickness Readings			
Location	**Plumbness (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): 4 Sheet: 3	0.3	Top of Cell	0.335	89.3%	Top of Cell	-	-	-
		Above Water	0.215	57.3%	Above Water		-	-
		Waterline	0.348	92.9%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	0.300	80.0%	Mudline		-	-
Downstream Depth (ft): Sheet: 59	-1	Top of Cell	0.365	97.3%	Top of Cell	-	-	-
		Above Water	0.357	95.1%	Above Water		-	-
		Waterline	0.300	80.0%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Bank Depth (ft): Sheet:		Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	-	-	Above Water		-	-
		Waterline	-	-	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Upstream Depth (ft): Sheet: 18		Top of Cell	0.338	90.2%	Top of Cell	-	-	-
		Above Water	-	-	Above Water		-	-
		Waterline	-	-	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone Original Thickness (in.): 0.375			Average Cell Band Thickness Readings By Location			
Zone	**Remaining Thickness (in.)**	**% Remaining**	**Location**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	0.346	92.3%	Top of Cell	-	-	-
Above Water	0.286	76.2%	Above Water	-	-	-
Waterline	0.324	86.4%	Waterline	-	-	-
Mid-Depth	-	-	Mid-Depth	-	-	-
Mudline	0.300	80.0%	Mudline	-	-	-

Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 4

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Critical			
Corrosion: Major			
Split Interlocks:	Yes	Holes:	Yes
Loss of Ballast:	Yes	Impact Damage:	Yes
Broken Moorings:	No	Ladder Damage:	Yes

Waterway Information	
Water Surface Elevation:	301.9 feet NAVD88
Normal Pool/Tide Range:	301.7 feet NAVD88
Reference:	USGS Gauge 03611000

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	38
Sheet Numbering/Direction:	Sheet 1 at the center of the cut-in ladder / CW
Dia. At Top of Cell:	16.7 feet (measured at waterline)
Mooring Fittings:	5 mooring rings on Sheet 37, 14 inches in diameter, spaced 8 feet on center
Top of Sheet Elevation:	UNK
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, UNK thickness
Ballast Height (from top of cap):	From waterline, 4 feet above waterline observed at sheet ladder.

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-
Above Water	0.299	79.7%
Waterline	0.236	62.8%
Mid-Depth	-	-
Mudline	0.202	53.8%

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. A cut-in sheet ladder was observed on Sheet 1 from approximately elevation 304.9 feet NAVD88 to the top of the cell.
2. Five mooring rings were installed on Sheet 37 and were spaced 8 feet on-center. The top mooring ring was approximately 3 feet below the top of the cell.
3. A walkway was installed connecting the top of cell BCB 3 to BCB 4 centered at Sheet 14.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. The sheets typically exhibited major corrosion consisting of rust scaling up to 1/8 inch thick and pitting up to 3/16 inch deep from the waterline to approximately elevation 313.9 feet NAVD88.
2. The steel channel that typically conceals the sheet ladder was missing from approximately elevations 305.9 to 317.9 feet NAVD88. The cell was open at that location and empty with exposed ballast consisting of sand.
3. numerous areas of impact damage were observed throughout the sheets on the cell typically less than 1 inch deep.
4. The sheets were typically out of plane up to 1/2 inch at sheet pile splice locations.
5. A split interlock was observed between Sheet 1 and Sheet 2 from approximately elevation 301.4 feet NAVD88 to approximately elevation 295.9 feet NAVD88 up to 1 inch wide with no exposed ballast.
6. A split interlock was observed between Sheet 2 and Sheet 3 from approximately elevation 299.9 feet NAVD88 to approximately elevation 295.9 feet NAVD88 up to 1/4 inch wide with no exposed ballast.
7. A split interlock was observed between Sheet 38 and Sheet 1 from approximately elevation 300.9 feet NAVD88 to approximately elevation 295.9 feet NAVD88 up to 1 inch wide with no exposed ballast.
8. A split interlock was observed between Sheet 37 and Sheet 38 from approximately elevation 300.9 feet NAVD88 to approximately elevation 294.9 feet NAVD88 up to 1-1/2 inch wide with no exposed ballast.
9. The steel sheet piles typically exhibited moderate scaling up to 1/8 inch thick and moderate pitting up to 1/8 inch deep from the waterline to the channel bottom.

Mooring Cell Cap

10. The inspection team was unable to access and inspect the top of the cell cap due to safety concerns. The walkway truss had numerous areas of impact damage, the BCB 3 Cell bearing was shifted off the bearing.

Channel Bottom

11. The channel bottom in the vicinity of the cell consisted of sand, gravel, riprap up to 16 inches in diameter, and steel debris consisting of various steel members and cable strands.

MARINE SOLUTIONS

Structure Inspection Sheet

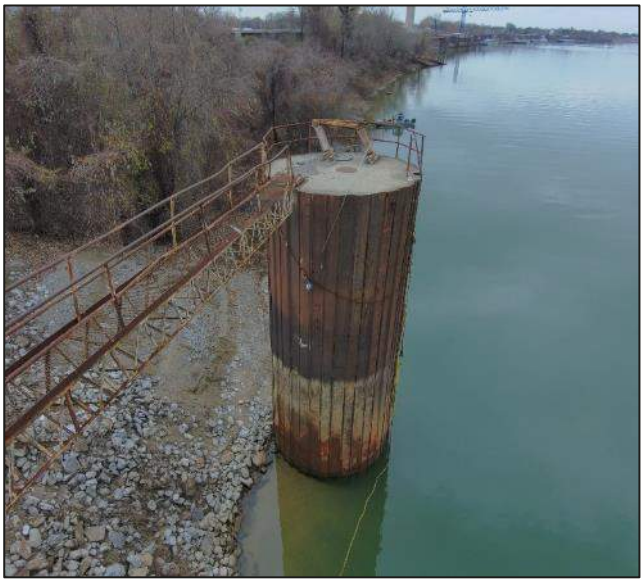
Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 4

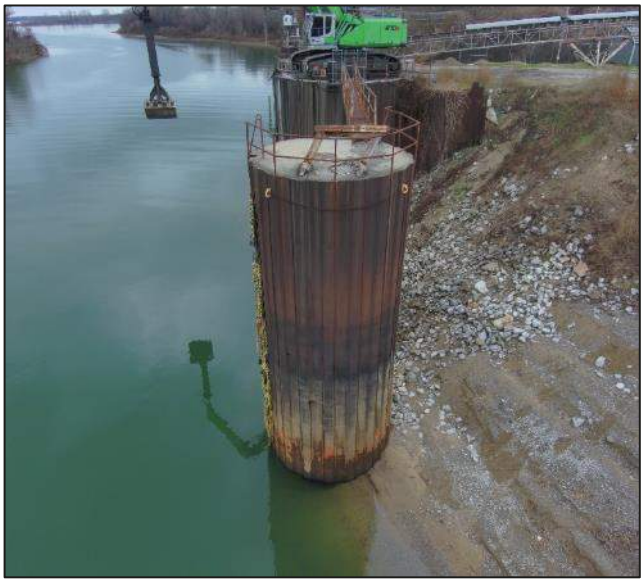
Photographs

Photograph 1 Elevation – Channel Side

Photograph 2 Elevation – Bank Side



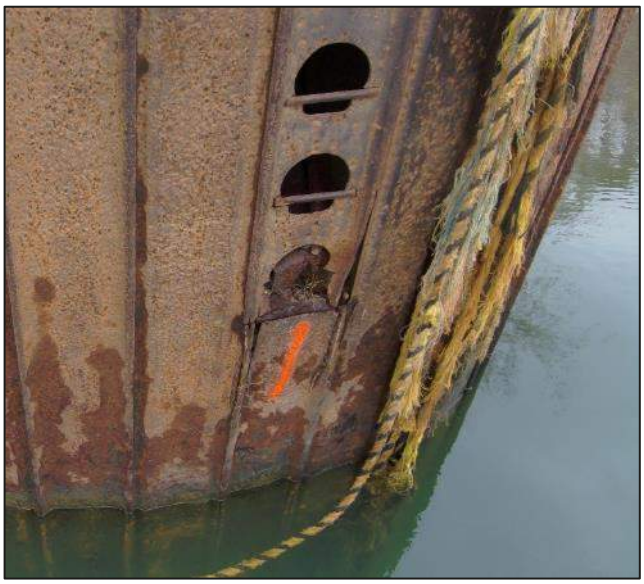
Photograph 3 Elevation – Upstream Side



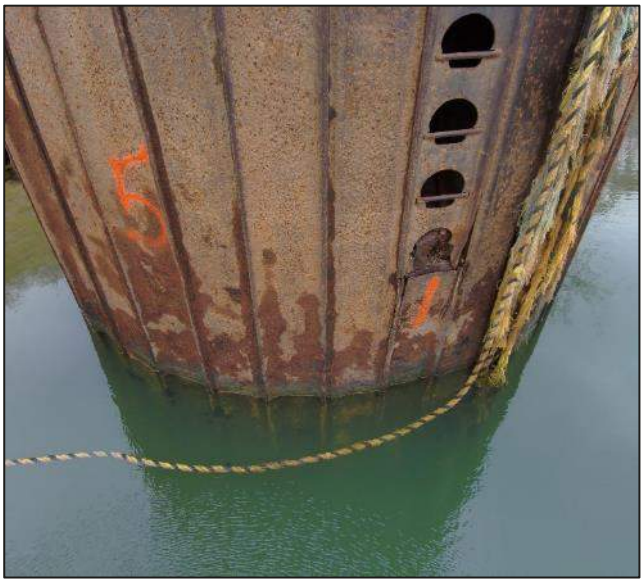
Photograph 4 Elevation – Downstream Side

Photographs

Photograph 5 View of BCB 4 concrete cap.



Photograph 6 View of split interlocks and the crack on the sheet ladder.



Photograph 7 View of typical waterline condition.

Photograph 8 Underwater view of typical sheet pile condition.

Photographs

Photograph 9 Underwater view of split interlock between Sheet 37 and Sheet 38.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 10, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: BCB 4

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings Original Thickness (in.): 0.375			Cell Band Thickness Readings			
Location	**Plumbness (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): 5 Sheet: 2	-1.6	Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.203	54.2%	Above Water		-	-
		Waterline	0.233	62.2%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	0.172	45.8%	Mudline		-	-
Downstream Depth (ft): Sheet: 29	-2.7	Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.345	92.0%	Above Water		-	-
		Waterline	0.223	59.6%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Bank Depth (ft): Sheet: 19		Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.343	91.6%	Above Water		-	-
		Waterline	-	-	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Upstream Depth (ft): Sheet: 10		Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.303	80.9%	Above Water		-	-
		Waterline	0.250	66.7%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	0.232	61.8%	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone Original Thickness (in.): 0.375		
Zone	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	-	-
Above Water	0.299	79.7%
Waterline	0.236	62.8%
Mid-Depth	-	-
Mudline	0.202	53.8%

Average Cell Band Thickness Readings By Location			
Location	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 1

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Serious			
Corrosion: Major			
Split Interlocks:	Yes	Holes:	Yes
Loss of Ballast:	Yes	Impact Damage:	Yes
Broken Moorings:	No	Ladder Damage:	N/A

Waterway Information	
Water Surface Elevation:	301.9 feet NAVD88
Normal Pool/Tide Range:	301.7 feet NAVD88
Reference:	USGS Gauge 03611000

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	60
Sheet Numbering/Direction:	Sheet 1 at the center of the cut-in ladder / CW
Dia. At Top of Cell:	UNK
Mooring Fittings:	5 mooring rings on Sheet 59 spaced 7 feet on-center
Top of Sheet Elevation:	UNK
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, UNK thick
Ballast Height (from top of cap):	Based on soundings with a hammer, The ballast height is approximately 8 feet above the waterline on the channel side

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-
Above Water	0.224	59.8%
Waterline	0.236	62.9%
Mid-Depth	-	-
Mudline	0.267	71.1%

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. A sheet ladder was located on Sheet 1 from approximately elevation 303.9 feet NAVD88 to the top of the cell.
2. There are 5 mooring rings located on Sheet 59, measuring 16 inches in diameter and spaced vertically 7 feet on center.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. An area of impact damage was observed on Sheet 10 centered at approximately elevation 306.9 feet NAVD88 measuring 2 feet wide by 2 feet high by up to 2 inches deep.
2. There were 3 split knuckles on Sheet 1 at elevations 310.9, 312.9, and 314.9 feet NAVD88.
3. An area of impact damage was observed from Sheet 1 to Sheet 6 centered at approximately elevation 317.9 feet NAVD88 measuring 6 feet high by 7 feet wide by up to 4 inches deep.
4. A split in the pan behind the ladder sheet was observed up to 6 inches wide by 6 feet high with exposed aggregate with active fill loss beginning at the water surface and continuing to approximately elevation 307.9 feet NAVD88.
5. A hole in the interlock of Sheets 3 and 4 was observed centered approximately 10 feet below the top of the cell measuring 8 inches high by 1 inch wide.
6. The sheets typically exhibit major corrosion consisting of rust scaling up to 1/8 inch thick and pitting less than 3/16 inch deep from approximately elevation 313.9 feet NAVD88 to the channel bottom.

Mooring Cell Cap

7. The inspection team was unable to access the mooring cell cap due to safety concerns. The top of the sheet ladder was broken.

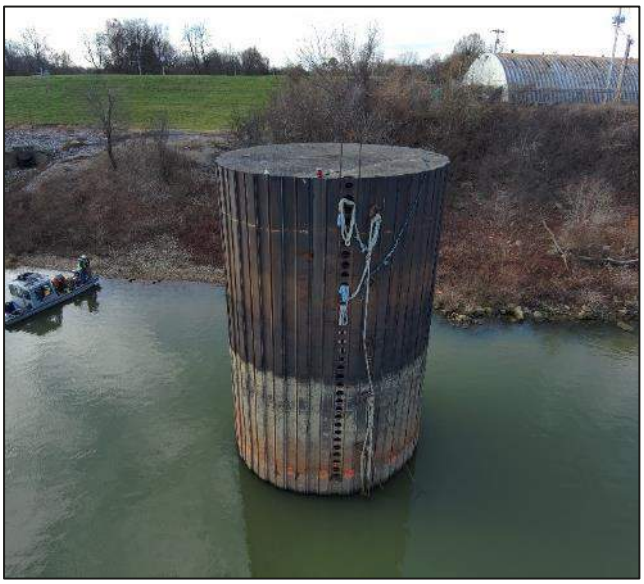
MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 1

Photographs



Photograph 1 Elevation – Channel Side

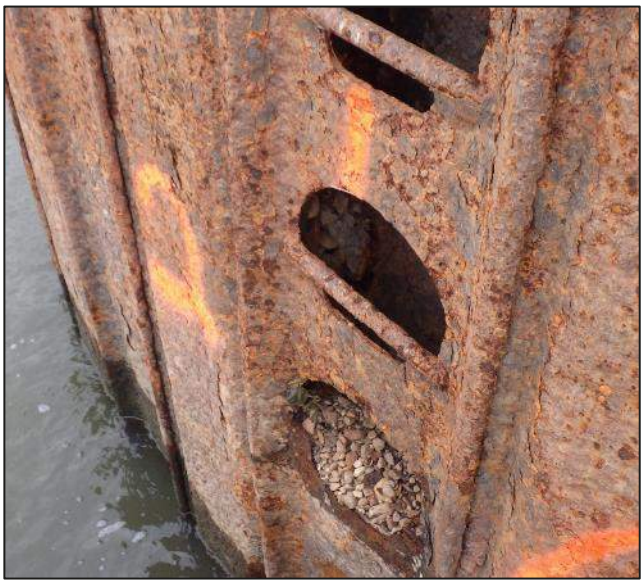
Photograph 2 Elevation – Bank Side

Photograph 3 Elevation – Upstream Side

Photograph 4 Elevation – Downstream Side

Photographs

Photograph 5 View of CGB 1 concrete cap.



Photograph 6 View of split pan sheet with active loss of fill on Sheet 1.

Photograph 7 View of impact damage on Sheet 3.

Photograph 8 View of splits on Sheet 1.

Photographs

Photograph 9 View of interlock hole between Sheet 3 and Sheet 4.

Photograph 10 Underwater view of typical sheet pile condition.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 1

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings Original Thickness (in.): 0.375			Cell Band Thickness Readings			
Location	**Plumbness (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): 6 Sheet: 2	-1.6	Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.253	67.6%	Above Water		-	-
		Waterline	0.242	64.4%	Waterline		-	-
		Mid-Depth			Mid-Depth		-	-
		Mudline	0.218	58.2%	Mudline		-	-
Downstream Depth (ft): 6 Sheet: 45	0.75	Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.205	54.7%	Above Water		-	-
		Waterline	0.212	56.4%	Waterline		-	-
		Mid-Depth			Mid-Depth		-	-
		Mudline	0.258	68.9%	Mudline		-	-
Bank Depth (ft): 5 Sheet: 30	-0.3	Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.212	56.4%	Above Water		-	-
		Waterline	0.225	60.0%	Waterline		-	-
		Mid-Depth			Mid-Depth		-	-
		Mudline	0.253	67.6%	Mudline		-	-
Upstream Depth (ft): 11 Sheet: 15	-0.6	Top of Cell	-	-	Top of Cell	-	-	-
		Above Water	0.227	60.4%	Above Water		-	-
		Waterline	0.265	70.7%	Waterline		-	-
		Mid-Depth	0.258	68.9%	Mid-Depth		-	-
		Mudline	0.337	89.8%	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone Original Thickness (in.): 0.375			Average Cell Band Thickness Readings By Location			
Zone	**Remaining Thickness (in.)**	**% Remaining**	**Location**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	-	-	Top of Cell	-	-	-
Above Water	0.224	59.8%	Above Water	-	-	-
Waterline	0.236	62.9%	Waterline	-	-	-
Mid-Depth	-	-	Mid-Depth	-	-	-
Mudline	0.267	71.1%	Mudline	-	-	-

Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 2

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Critical			
Corrosion: Major			
Split Interlocks:	Yes	Holes:	Yes
Loss of Ballast:	Yes	Impact Damage:	Yes
Broken Moorings:	No	Ladder Damage:	Yes

Waterway Information	
Water Surface Elevation:	301.9 feet NAVD88
Normal Pool/Tide Range:	301.7 feet NAVD88
Reference:	USGS Gauge 03611000

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	48
Sheet Numbering/Direction:	Sheet Ladder is Sheet 1/Clockwise
Dia. At Top of Cell:	20.5 feet
Mooring Fittings:	5 mooring rings on Sheet 47
Top of Sheet Elevation:	37.8 feet to the waterline from the top of Sheet 1
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, 12 inches
Ballast Height (from top of cap):	29.5 feet

Ultrasonic Thickness Reading Averages

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	0.373	99.3%
Above Water	0.216	57.6%
Waterline	0.217	57.8%
Mid-Depth	0.267	71.1%
Mudline	0.239	63.7%

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. A sheet ladder was located on Sheet 1.
2. There were 5 mooring rings on Sheet 47, measuring 16 inches in diameter and spaced 7 feet on center.
3. A patch plate was installed from Sheet 2 to Sheet 4 from the waterline extending to 2 feet below the top of the cell.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. A split in the pan sheet behind the ladder sheet was observed measuring up to 3 inches wide by 4 high with exposed aggregate and active fill loss from approximately elevation 303.9 feet NAVD88 to approximately elevation 307.9 feet NAVD88.
2. An area of impact damage was observed on Sheet 47 at approximately elevation 322.9 feet NAVD88 measuring 4 feet high by 3 feet wide by up to 3 inches deep.
3. An area of impact damage was observed on Sheet 43 at approximately elevation 308.9 feet NAVD88 measuring 10 feet high by 6 feet wide by up to 4 inches deep.
4. A split interlock was observed between Sheet 1 and Sheet 2 from approximately elevation 302.9 feet NAVD88 at the bottom of the patch plate that is welded to the sheets to approximately elevation 299.9 feet NAVD88 measuring up to 1.5 inches wide with active ballast loss and a large pile of ballast exposed and piled up at the cell.
5. A split interlock was observed between Sheet 2 and Sheet 3 from approximately elevation 302.9 feet NAVD88 at the bottom of the patch plate that is welded to the sheets to approximately elevation 300.9 feet NAVD88 measuring up to 6 inches wide with active ballast loss and a large pile of ballast exposed and piled up at the cell.
6. A split interlock was observed between Sheet 4 and Sheet 5 from approximately elevation 300.9 feet NAVD88 to approximately elevation 298.9 feet NAVD88, where it continues below to the pile of ballast up to 1 inch wide with active ballast loss and a large pile of ballast exposed and piled up at the cell.
7. A split interlock was observed between Sheet 48 and Sheet 1 from approximately elevation 299.9 feet NAVD88 to approximately elevation 298.9 feet NAVD88, where it continues below the pile of ballast up to 1/2 inch wide with active ballast loss and a large pile of ballast exposed and piled up at the cell.
8. A split interlock was observed between Sheet 47 and Sheet 48 from the waterline to approximately elevation 299.9 feet NAVD88, where it continues below the pile of ballast up to 1 inch wide with active ballast loss and a large pile of ballast exposed and piled up at the cell.
9. The sheets typically exhibit major corrosion consisting of rust scaling up to 3/16 inch thick and pitting up to 3/16 inch deep from approximately elevation 313.9 feet NAVD88 to the channel bottom.

Mooring Cell Cap

10. The manhole was obstructed by truss members and could not be accessed.
11. The concrete cap was in good condition overall with minor scaling up to 1/16 inch deep and minor hairline cracking throughout.

Channel Bottom

12. The channel bottom in the vicinity of the cell consisted of silty sand, gravel, and riprap up to 16 inches in diameter.
13. A large pile a cell ballast on the channel side of the cell consisting of number 57 sized gravel.

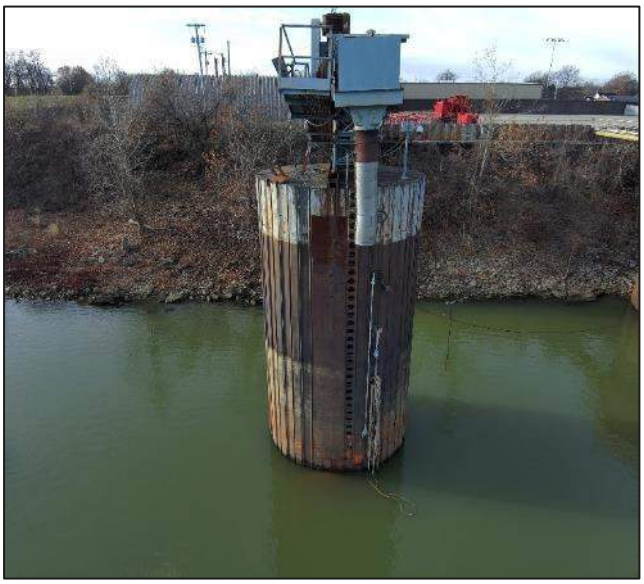
MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 2

Photographs



Photograph 1 Elevation – Channel Side

Photograph 2 Elevation – Bank Side

Photograph 3 Elevation – Upstream Side

Photograph 4 Elevation – Downstream Side

Photographs

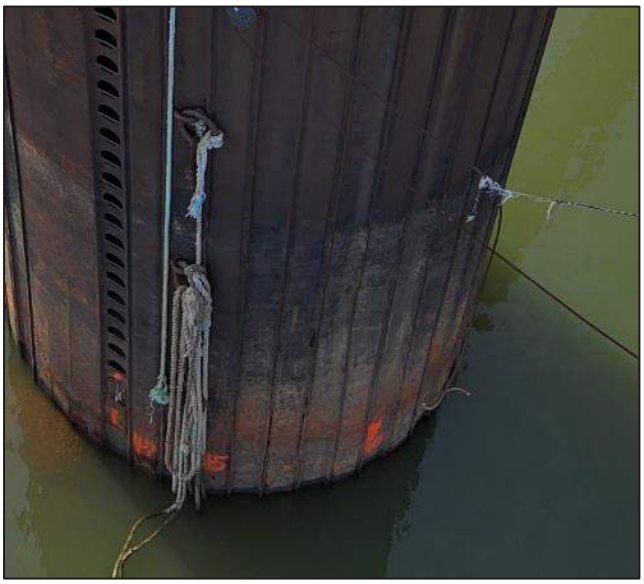
Photograph 5 View of CGB 2 concrete cap.

Photograph 6 View of pan sheet with active loss of fill.

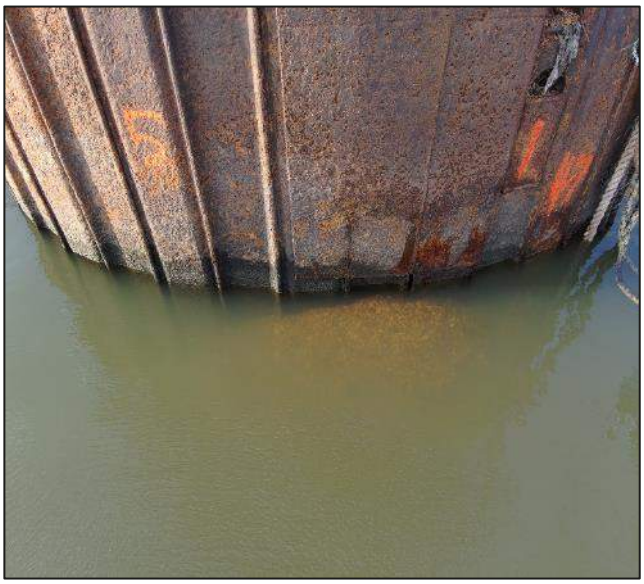
Photograph 7 View of split interlock between Sheet 2 and Sheet 3 showing exposed fill material.

Photograph 8 View of impact damage at Sheet 47.

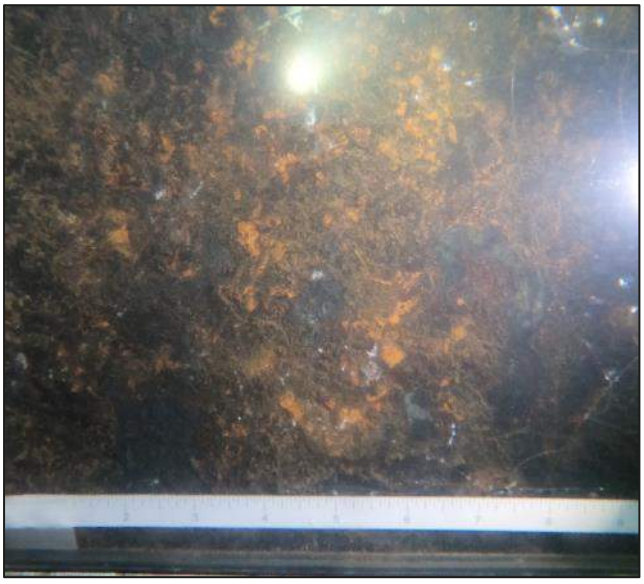
Photographs



Photograph 9 View of impact damage on Sheet 43.



Photograph 10 View of the typical waterline condition.



Photograph 11 Underwater view of typical sheet pile condition.

Photograph 12 Underwater view of split between Sheet 2 and Sheet 3.

Photographs

Photograph 13 Underwater view of split between Sheet 48 and Sheet 1

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 2

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings Original Thickness (in.): 0.375			Cell Band Thickness Readings			
Location	**Plumbness (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): 15 Sheet: 48	-2.6	Top of Cell	0.390	104.0%	Top of Cell	-	-	-
		Above Water	0.200	53.3%	Above Water		-	-
		Waterline	0.153	40.9%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Downstream Depth (ft): 8 Sheet: 36	-0.6	Top of Cell	0.360	96.0%	Top of Cell	-	-	-
		Above Water	0.213	56.9%	Above Water		-	-
		Waterline	0.213	56.9%	Waterline		-	-
		Mid-Depth	0.273	72.9%	Mid-Depth		-	-
		Mudline	0.228	60.9%	Mudline		-	-
Bank Depth (ft): 5 Sheet: 24	0	Top of Cell	0.370	98.7%	Top of Cell	-	-	-
		Above Water	0.225	60.0%	Above Water		-	-
		Waterline	0.275	73.3%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	0.235	62.7%	Mudline		-	-
Upstream Depth (ft): 8 Sheet: 12	0.4	Top of Cell	0.370	98.7%	Top of Cell	-	-	-
		Above Water	0.225	60.0%	Above Water		-	-
		Waterline	0.225	60.0%	Waterline		-	-
		Mid-Depth	0.260	69.3%	Mid-Depth		-	-
		Mudline	0.253	67.6%	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone Original Thickness (in.): 0.375			Average Cell Band Thickness Readings By Location			
Zone	**Remaining Thickness (in.)**	**% Remaining**	**Location**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	0.373	99.3%	Top of Cell	-	-	-
Above Water	0.216	57.6%	Above Water	-	-	-
Waterline	0.217	57.8%	Waterline	-	-	-
Mid-Depth	0.267	71.1%	Mid-Depth	-	-	-
Mudline	0.239	63.7%	Mudline	-	-	-

Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 3

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Serious			
Corrosion: Major			
Split Interlocks:	Yes	Holes:	No
Loss of Ballast:	Yes	Impact Damage:	No
Broken Moorings:	Yes	Ladder Damage:	N/A

Waterway Information	
Water Surface Elevation:	301.9 feet NAVD88
Normal Pool/Tide Range:	301.7 feet NAVD88
Reference:	USGS Gauge 03611000

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	38
Sheet Numbering/Direction:	Sheet 1 at the center of the cut-in ladder / CW
Dia. At Top of Cell:	16.2 feet
Mooring Fittings:	5 mooring rings on Sheet 37, spaced 7 feet on center, measuring 16 inches in diameter.
Top of Sheet Elevation:	340.0 feet NAVD88
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, 12 inches thick
Ballast Height (from top of cap):	29.3 feet

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	0.373	99.4%
Above Water	0.216	57.6%
Waterline	0.232	61.8%
Mid-Depth	0.275	73.4%
Mudline	0.262	69.9%

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Channel	Top of Cell	-	-
Channel	Above Water	-	-
Downstream	Waterline	-	-
Bank	Mid-Depth	-	-
Upstream	Mudline	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 3

Configuration & Previous Repairs

1. A sheet ladder is located at Sheet 1.
2. There were 5 mooring rings on Sheet 37, measuring 16 inches in diameter and spaced 7 feet on center.
3. The access walkway was located from Sheet 21 to Sheet 25

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. A split in the pan sheet behind the ladder sheet was observed measuring 5 feet high by up to 6 inches wide by with exposed aggregate and active fill loss beginning at approximately 303.9 feet NAVD88 to approximately 308.9 feet NAVD88.
2. A split interlock was observed between Sheet 1 and Sheet 2 from approximately 306.9 feet NAVD88 to approximately elevation 294.9 feet NAVD88 measuring up to 2 inches wide with active ballast loss, creating a pile on the channel bottom at the bottom of the split.
3. A split interlock was observed between Sheet 2 and Sheet 3 from approximately 306.9 feet NAVD88 to approximately elevation 294.9 feet NAVD88 measuring up to 4 inches wide with active ballast loss, creating a pile on the channel bottom at the bottom of the split.
4. A split interlock was observed between Sheet 4 and Sheet 5 from approximately 300.9 feet NAVD88 to approximately elevation 293.9 feet NAVD88 measuring up to 4 inches wide with active ballast loss, creating a pile on the channel bottom at the bottom of the split.
5. The sheets typically exhibit major corrosion consisting of rust scaling up to 3/16 inch thick and pitting up to 3/16 inch deep from approximately elevation 313.9 feet NAVD88 to the channel bottom.

Mooring Cell Cap

6. The manhole could not be accessed due to an obstruction of steel bars placed over the cover.
7. The concrete cap is in good condition overall with minor scaling up to 1/16 inch deep and minor hairline cracking throughout.

Mooring Rings

8. The lowest elevation mooring ring exhibited an area of impact damage, resulting in a damaged U-bolt and tear in Sheet 37.

Channel Bottom

9. The channel bottom in the vicinity of the cell consisted of silty sand, gravel, and riprap up to 16 inches in diameter.

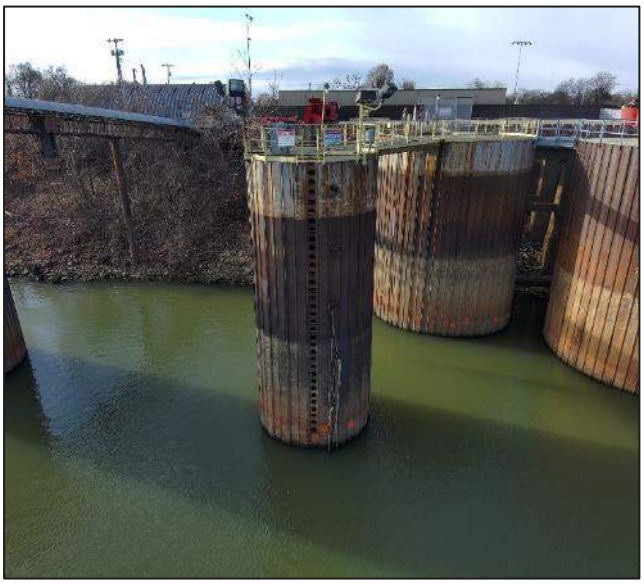
MARINE SOLUTIONS

Structure Inspection Sheet

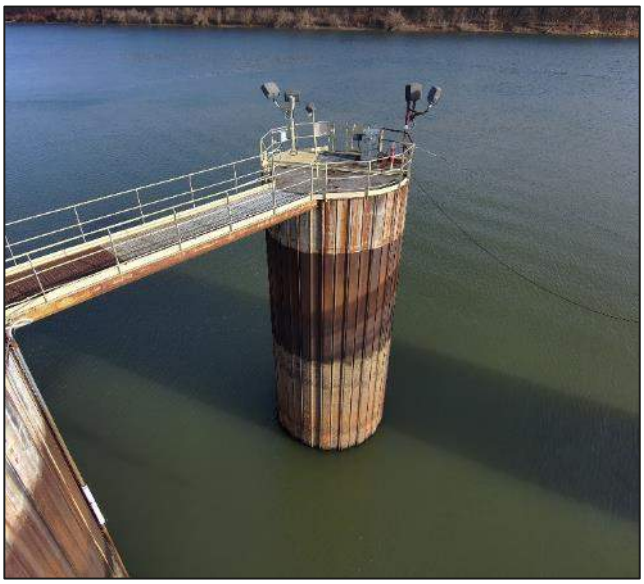
Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 3

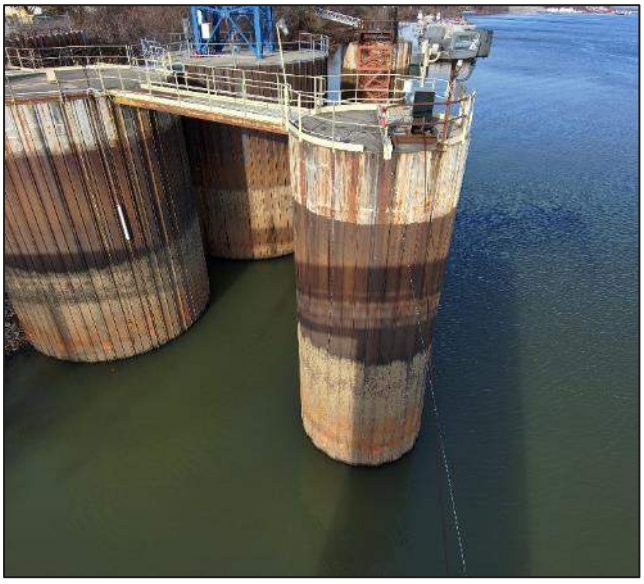
Photographs



Photograph 1 Elevation – Channel Side



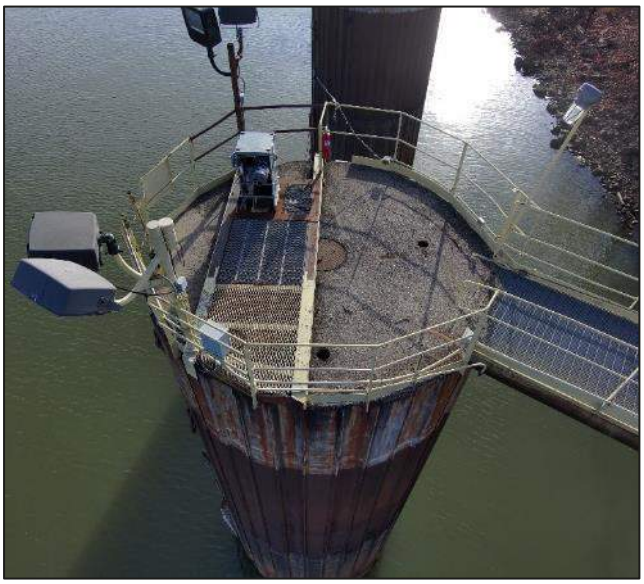
Photograph 2 Elevation – Bank Side



Photograph 3 Elevation – Upstream Side

Photograph 4 Elevation – Downstream Side

Photographs



Photograph 5 View of CGB 3 concrete cap.

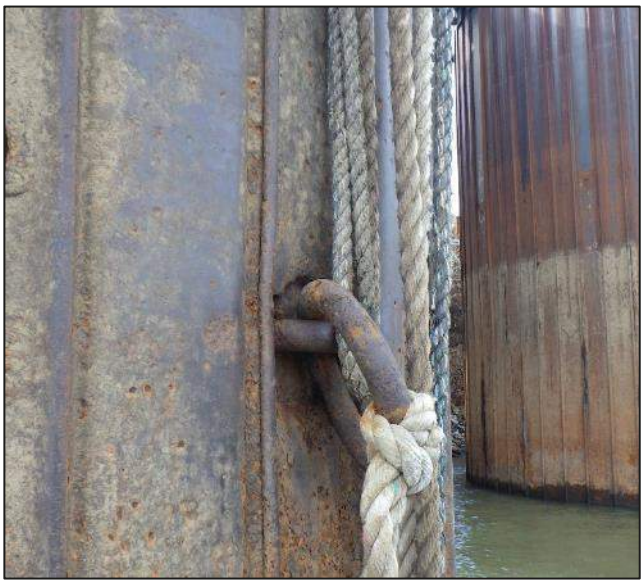
Photograph 6 View of the typical concrete condition.

Photograph 7 View of split in pan sheet.

Photograph 8 View of split interlock between Sheet 1 and Sheet 2.

Photographs

Photograph 9 View of split interlock between Sheet 2 and Sheet 3.



Photograph 10 View of impacted mooring ring on Sheet 37.

Photograph 11 View of the typical waterline condition.

Photograph 12 Underwater view of typical condition of sheet piles.

Photographs

Photograph 13 Underwater view of split between Sheet 2 and Sheet 3

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 3

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings Original Thickness (in.): 0.375			Cell Band Thickness Readings			
Location	**Plumbness (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): 8 Sheet: 2	-1.5	Top of Cell	0.370	98.7%	Top of Cell	-	-	-
		Above Water	0.225	60.0%	Above Water		-	-
		Waterline	0.232	61.8%	Waterline		-	-
		Mid-Depth	0.242	64.4%	Mid-Depth		-	-
		Mudline	0.228	60.9%	Mudline		-	-
Downstream Depth (ft): 14 Sheet: 30	0	Top of Cell	0.390	104.0%	Top of Cell	-	-	-
		Above Water	0.218	58.2%	Above Water		-	-
		Waterline	0.228	60.9%	Waterline		-	-
		Mid-Depth	0.288	76.9%	Mid-Depth		-	-
		Mudline	0.270	72.0%	Mudline		-	-
Bank Depth (ft): 11 Sheet: 20	1.5	Top of Cell	0.350	93.3%	Top of Cell	-	-	-
		Above Water	0.205	54.7%	Above Water		-	-
		Waterline	0.247	65.8%	Waterline		-	-
		Mid-Depth	0.293	78.2%	Mid-Depth		-	-
		Mudline	0.258	68.9%	Mudline		-	-
Upstream Depth (ft): 13 Sheet: 10	-0.25	Top of Cell	0.382	101.8%	Top of Cell	-	-	-
		Above Water	0.215	57.3%	Above Water		-	-
		Waterline	0.220	58.7%	Waterline		-	-
		Mid-Depth	0.278	74.2%	Mid-Depth		-	-
		Mudline	0.292	77.8%	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone Original Thickness (in.): 0.375		
Zone	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	0.373	99.4%
Above Water	0.216	57.6%
Waterline	0.232	61.8%
Mid-Depth	0.275	73.4%
Mudline	0.262	69.9%

Average Cell Band Thickness Readings By Location			
Location	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel	Top of Cell	-	-
Channel	Above Water	-	-
Downstream	Waterline	-	-
Bank	Mid-Depth	-	-
Upstream	Mudline	-	-

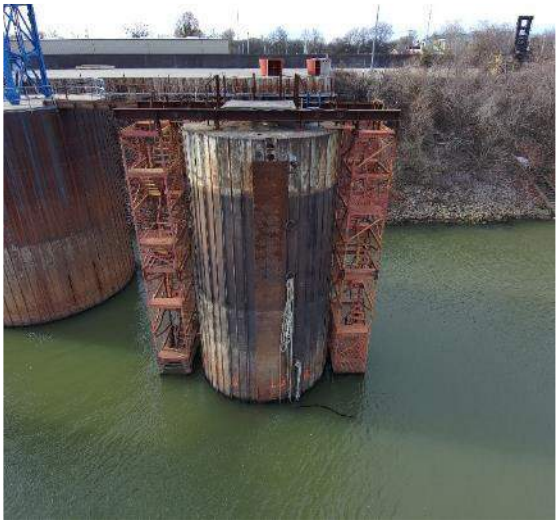
Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 5

Team Leader: Joseph Guthrie			
Inspection Type: Baseline			
General Conditions			
Overall Rating: Serious			
Corrosion: Major			
Split Interlocks:	Yes	Holes:	Yes
Loss of Ballast:	Yes	Impact Damage:	Yes
Broken Moorings:	No	Ladder Damage:	No



Waterway Information	
Water Surface Elevation:	301.9 feet NAVD88
Normal Pool/Tide Range:	301.7 feet NAVD88
Reference:	USGS Gauge 03611000

Configuration	
Sheet Pile Type/Size:	PSA23
No. of Sheets:	48
Sheet Numbering/Direction:	Sheet 1 at the center of the cut-in ladder / CW
Dia. At Top of Cell:	20.7 feet from Sheet 38 to Sheet 14
Mooring Fittings:	5 mooring rings on Sheet 47, 16 inches in diameter, spaced 7 feet on center.
Top of Sheet Elevation:	339.9 feet NAVD88
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, 12 inches
Ballast Height (from top of cap):	34 feet

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	0.349	93.1%
Above Water	0.225	60.0%
Waterline	0.285	76.0%
Mid-Depth	0.298	79.6%
Mudline	0.298	79.4%

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. The sheet ladder was located on Sheet 1.
2. There were 5 mooring rings on Sheet 47, measuring 16 inches in diameter and spaced 7 feet on center.
3. A patch plate was installed from Sheet 48 to Sheet 2 from the waterline to 2 feet below the top of the cell.
4. There were two access stairways on the upstream and downstream ends of the cells located between Sheets 10 and 18 and Sheets 34 and 41, respectively. The stairways were suspended from two I-beams secured to the top of the cell.
5. The access walkway from GCB 5 to the crane cell was located from Sheet 20 to Sheet 23.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. A split interlock was observed between Sheet 1 and Sheet 2 from approximately elevation 304.9 feet NAVD88 where the split extends underneath a patch plate to approximately elevation 298.9 feet NAVD88 up to 3 inches wide with exposed ballast, creating a pile of ballast on the channel bottom at the bottom of the split.
2. A split interlock was observed between Sheet 2 and Sheet 3 from approximately elevation 304.9 feet NAVD88 where the split extends underneath a patch plate to approximately elevation 298.9 feet NAVD88 up to 5 inches wide with exposed ballast, creating a pile of ballast on the channel bottom at the bottom of the split.
3. A split in the web of Sheet 2 was observed from approximately 302.9 feet NAVD88 to approximately elevation 298.9 feet NAVD88 up to 4 inches wide with exposed ballast, creating a pile of ballast on the channel bottom at the bottom of the split.
4. The patch plate is severely corroded and exhibits 100% loss of section between Sheet 1 and Sheet 2 from the waterline to approximately elevation 302.9 feet NAVD88.
5. A split interlock was observed between Sheet 3 and Sheet 4 from approximately elevation 300.9 feet NAVD88 where the split extends underneath a patch plate to approximately elevation 298.9 feet NAVD88 up to 1 inch wide with exposed ballast, creating a pile of ballast on the channel bottom at the bottom of the split.
6. The sheets typically exhibit major corrosion consisting of rust scaling up to 3/16 inch thick and pitting up to 3/16 inch deep from approximately elevation 313.9 feet NAVD88 to the channel bottom.

Mooring Cell Cap

7. The concrete cap was in good condition overall with minor scaling up to 1/16 inch deep and minor hairline cracking throughout.

Channel Bottom

8. The channel bottom in the vicinity of the cell consisted of silty sand, gravel, and debris consisting of sticks and limbs up to 8 inches in diameter and steel framing members. There was a large pile a cell ballast on the channel side of the cell consisting of number 57 sized gravel.

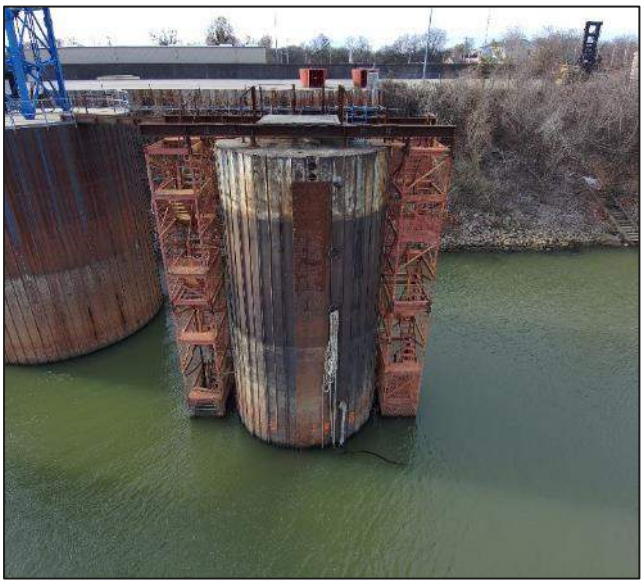
MARINE SOLUTIONS

Structure Inspection Sheet

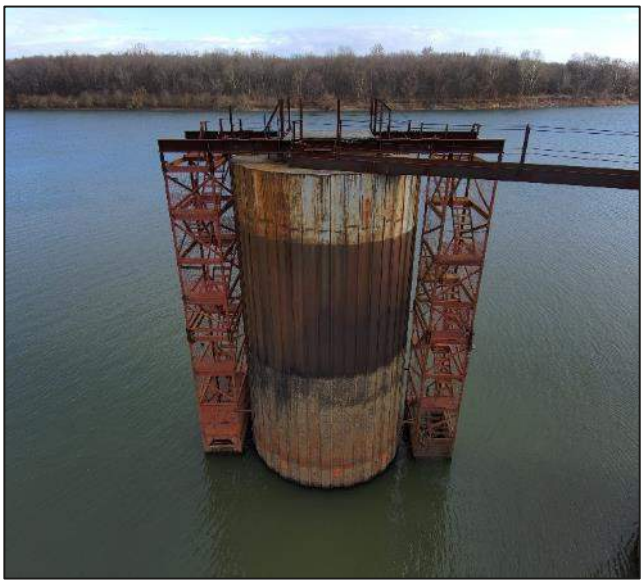
Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 5

Photographs



Photograph 1 Elevation – Channel Side



Photograph 2 Elevation – Bank Side

Photograph 3 Elevation – Upstream Side

Photograph 4 Elevation – Downstream Side

Photographs

Photograph 5 View of CGB 5 concrete cap.

Photograph 6 View of ballast height inside cell.

Photograph 7 View of the typical concrete condition.

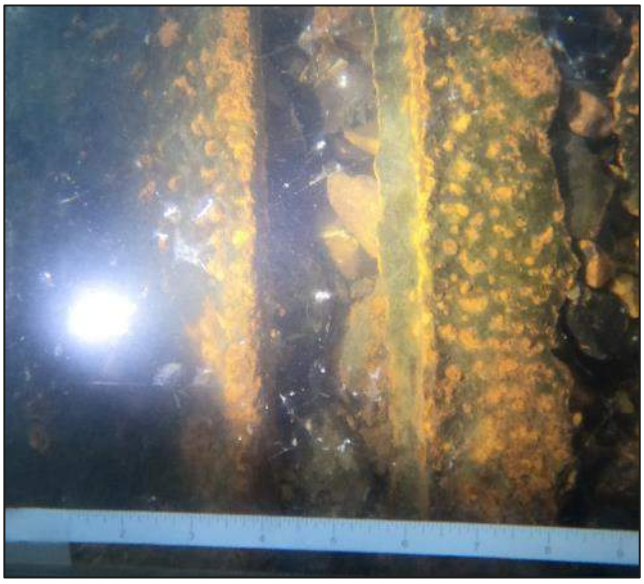
Photograph 8 View of split interlock between Sheet 2 and Sheet 3.

Photographs

Photograph 9 View of split interlock between Sheet 1 and Sheet 2.

Photograph 10 View of the typical waterline condition.

Photograph 11 Underwater view of typical sheet pile condition.



Photograph 12 Underwater view of split interlock between Sheet 2 and Sheet 3.

Photographs

Photograph 13 Underwater view of split web on Sheet 2.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 5

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings			Cell Band Thickness Readings			
		Original Thickness (in.):		0.375				
Location	**Plumbnes (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): Sheet: 3	-2.1	Top of Cell	0.355	94.7%	Top of Cell	-	-	-
		Above Water	0.220	58.7%	Above Water		-	-
		Waterline	0.233	62.2%	Waterline		-	-
		Mid-Depth	-	-	Mid-Depth		-	-
		Mudline	-	-	Mudline		-	-
Downstream Depth (ft): 8 Sheet: 36	0.6	Top of Cell	0.362	96.4%	Top of Cell	-	-	-
		Above Water	0.212	56.4%	Above Water		-	-
		Waterline	0.302	80.4%	Waterline		-	-
		Mid-Depth	0.340	90.7%	Mid-Depth		-	-
		Mudline	0.365	97.3%	Mudline		-	-
Bank Depth (ft): 10 Sheet: 24	0.3	Top of Cell	0.355	94.7%	Top of Cell	-	-	-
		Above Water	0.233	62.2%	Above Water		-	-
		Waterline	0.293	78.2%	Waterline		-	-
		Mid-Depth	0.280	74.7%	Mid-Depth		-	-
		Mudline	0.247	65.8%	Mudline		-	-
Upstream Depth (ft): 8 Sheet: 12	-2.2	Top of Cell	0.325	86.7%	Top of Cell	-	-	-
		Above Water	0.235	62.7%	Above Water		-	-
		Waterline	0.312	83.1%	Waterline		-	-
		Mid-Depth	0.275	73.3%	Mid-Depth		-	-
		Mudline	0.282	75.1%	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone			Average Cell Band Thickness Readings By Location			
Original Thickness (in.):		0.375				
Zone	**Remaining Thickness (in.)**	**% Remaining**	**Location**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	0.349	93.1%	Top of Cell	-	-	-
Above Water	0.225	60.0%	Above Water	-	-	-
Waterline	0.285	76.0%	Waterline	-	-	-
Mid-Depth	0.298	79.6%	Mid-Depth	-	-	-
Mudline	0.298	79.4%	Mudline	-	-	-

Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 6

Team Leader: Joseph Guthrie

Inspection Type: Baseline

General Conditions

Overall Rating: Fair

Corrosion: Moderate

Split Interlocks:	No	Holes:	No
Loss of Ballast:	No	Impact Damage:	Yes
Broken Moorings:	No	Ladder Damage:	No

Waterway Information

Water Surface Elevation:	301.9 feet NAVD88
Normal Pool/Tide Range:	301.7 feet NAVD88
Reference:	USGS Gauge 03611000

Configuration

Sheet Pile Type/Size:	PSA23
No. of Sheets:	48
Sheet Numbering/Direction:	Sheet 1 at the center of the cut-in ladder / CW
Dia. At Top of Cell:	20.6 feet
Mooring Fittings:	5 mooring rings on Sheet 47, 16 inches in diameter, spaced 7 feet on center.
Top of Sheet Elevation:	339.9 feet NAVD88
Sheet Pile Tip Elevation:	UNK
Cap Type & Thickness:	Concrete, 12 inches
Ballast Height (from top of cap):	2.4 feet

Ultrasonic Thickness Reading Averages

Average Sheet Pile Web Thickness Readings By Zone
Original Thickness (in.): 0.375

Zone	Remaining Thickness (in.)	% Remaining
Top of Cell	0.383	102.0%
Above Water	0.359	95.8%
Waterline	0.312	83.2%
Mid-Depth	0.310	82.8%
Mudline	0.325	86.8%

Average Cell Band Thickness Readings By Location

Location	Original Thickness (in.)	Remaining Thickness (in.)	% Remaining
Top of Cell	-	-	-
Above Water	-	-	-
Waterline	-	-	-
Mid-Depth	-	-	-
Mudline	-	-	-

Damage Ratings (ASCE MOP 130)		
	Minor > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Configuration & Previous Repairs

1. The sheet ladder was located on Sheet 1.
2. There were 5 mooring rings on Sheet 47, measuring 16 inches in diameter and spaced 7 feet on center.

Conditions

Mooring Cell Sheet Piles & Cell Bands

1. An area of impact damage was observed on Sheet 5 at approximately elevation 337.9 feet NAVD88 measuring 6 feet wide by 6 feet high by up to 6 inches deep.
2. An area of impact damage was observed on Sheets 10 through 12 at approximately elevation 335.9 feet NAVD88 measuring 5 feet wide by 4 feet high by up to 2 inches deep.
3. The sheets typically exhibited moderate corrosion consisting of rust scaling up to 1/8 inch thick and pitting up to 1/8 inch deep from approximately elevation 313.9 feet NAVD88 to the channel bottom.
4. The sheet pile typically exhibited minor biological growth up to 1/8 inch thick from the waterline to the channel bottom.

Mooring Cell Cap

5. The concrete cap was in good condition overall with minor scaling up to 1/16 inch deep and minor hairline cracking throughout.
6. A gap was observed at Sheets 10through 12 up to 1 inch wide between the concrete cap and the sheets.

Channel Bottom

7. The channel bottom in the vicinity of the cell consisted of silty sand, gravel, and debris consisting of sticks and limbs up to 10 inches in diameter.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 6

Photographs

Photograph 1 Elevation – Channel Side

Photograph 2 Elevation – Bank Side

Photograph 3 Elevation – Upstream Side

Photograph 4 Elevation – Downstream Side

Photographs

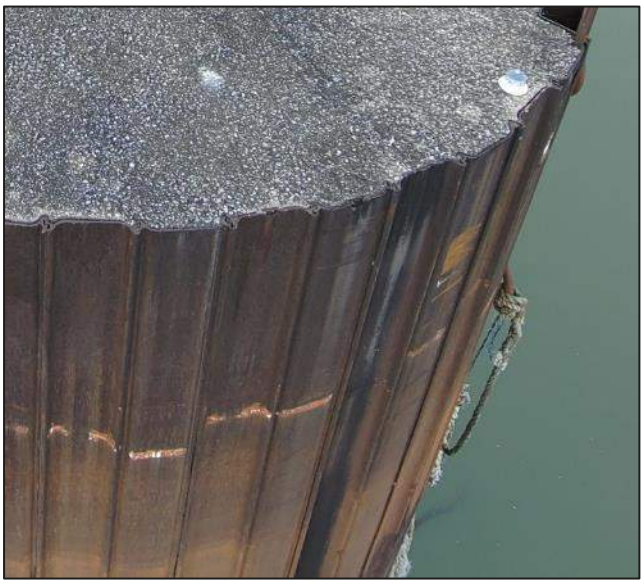
Photograph 5 View of CGB 6 concrete cap.

Photograph 6 View of the ballast height of the cell.

Photograph 7 View of the typical concrete condition.

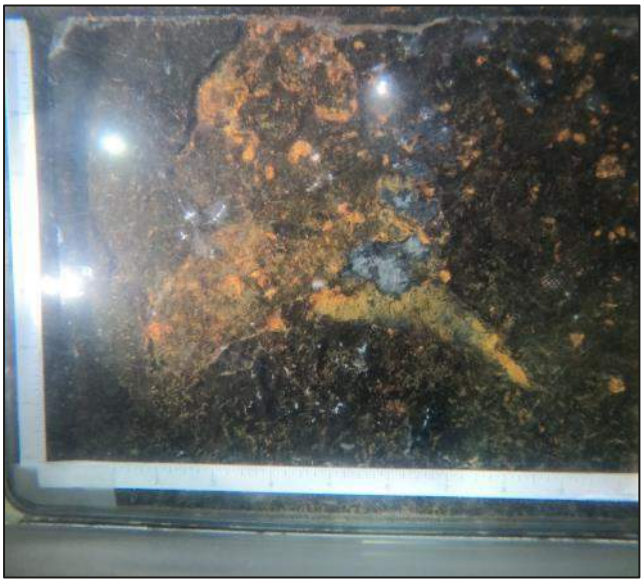
Photograph 8 View of the gap between the cap and the sheets at Sheet 10 through Sheet 12.

Photographs



Photograph 9 View of impact damage on Sheet 5.

Photograph 10 View of impact damage on Sheet 10 through Sheet 12.



Photograph 11 Underwater view of typical sheet pile condition.

MARINE SOLUTIONS

Structure Inspection Sheet

Date: December 12, 2024
Client: Paducah-McCracken County Riverport

Site: Paducah, Kentucky
Structure: GCB 6

Ultrasonic Thickness Readings

		Sheet Pile Web Thickness Readings			Cell Band Thickness Readings			
			Original Thickness (in.):	0.375				
Location	**Plumbnes (degrees)**	**Zone**	**Remaining Thickness (in.)**	**% Remaining**	**Zone**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Channel Depth (ft): 18 Sheet: 48	-0.4	Top of Cell	0.380	101.3%	Top of Cell	-	-	-
		Above Water	0.350	93.3%	Above Water		-	-
		Waterline	0.353	94.1%	Waterline		-	-
		Mid-Depth	0.382	101.8%	Mid-Depth		-	-
		Mudline	0.390	104.0%	Mudline		-	-
Downstream Depth (ft): 16 Sheet: 36	0.4	Top of Cell	0.375	100.0%	Top of Cell	-	-	-
		Above Water	0.342	91.1%	Above Water		-	-
		Waterline	0.280	74.7%	Waterline		-	-
		Mid-Depth	0.255	68.0%	Mid-Depth		-	-
		Mudline	0.272	72.4%	Mudline		-	-
Bank Depth (ft): 16 Sheet: 24	0.15	Top of Cell	0.380	101.3%	Top of Cell	-	-	-
		Above Water	0.382	101.8%	Above Water		-	-
		Waterline	0.290	77.3%	Waterline		-	-
		Mid-Depth	0.308	82.2%	Mid-Depth		-	-
		Mudline	0.278	74.2%	Mudline		-	-
Upstream Depth (ft): 18 Sheet: 12	-0.65	Top of Cell	0.395	105.3%	Top of Cell	-	-	-
		Above Water	0.363	96.9%	Above Water		-	-
		Waterline	0.325	86.7%	Waterline		-	-
		Mid-Depth	0.297	79.1%	Mid-Depth		-	-
		Mudline	0.362	96.4%	Mudline		-	-

Average Sheet Pile Web Thickness Readings By Zone			Average Cell Band Thickness Readings By Location			
Original Thickness (in.):		0.375				
Zone	**Remaining Thickness (in.)**	**% Remaining**	**Location**	**Original Thickness (in.)**	**Remaining Thickness (in.)**	**% Remaining**
Top of Cell	0.383	102.0%	Top of Cell	-	-	-
Above Water	0.359	95.8%	Above Water	-	-	-
Waterline	0.312	83.2%	Waterline	-	-	-
Mid-Depth	0.310	82.8%	Mid-Depth	-	-	-
Mudline	0.325	86.8%	Mudline	-	-	-

Damage Ratings (ASCE MOP 130)	**Minor** > 85% Remaining	**Moderate** 85% - 70% Remaining
	Major 70% - 50% Remaining	**Severe** < 50% Remaining

Appendix C

Photographs

Photograph 1 Overview of the General Cargo Berth, looking northwest

Photograph 2 Overview of the General Cargo Berth, looking southwest

Photograph 3 Overview of the Bulk Commodity Berth, looking northwest

Photograph 4 Overview of the Bulk Commodity Berth, looking southwest

PADUCAH MCCRACKEN COUNTY RIVERPORT AUTHORITY
Barge Mooring Cell Revitalization Project

Technical Specifications for Repair of Bulk Commodity Berths

A. Provide engineering, material, labor and equipment to perform the following scope of work at the Paducah-McCracken County Riverport Authority (Riverport) General Cargo Berth (GCB) and Bulk Commodity Berth (BCB) located along the left descending bank of the Tennessee River in Paducah, Kentucky.

B. References:

1. Marine Solutions, Inc. inspected the structure on the facility on December 12,2024. The report is included as a reference with this scope of work.
2. Kentucky Standard Specification for Road and Bridge Construction 2019 edition referred to hereafter as Standard Specification

C. Scope and Priorities:

The mooring cells and repair description are listed below in Table 1. The detailed technical specifications are laid out in subsequent sections.

Priority	Structure	Repair Description
	BCB 2	Install patch plate and refill lost ballast
	BCB 4	Install full circumference cell band and refill lost ballast
	All	Perform dredging operations in accordance with LRL-2016-355-sew

Table 1

D. Sheet Pile Mooring Cell Repairs Requirements:

1. General Mooring Cell Repair Requirements:
   i. The bidder is responsible to field verify the existing conditions, dimensions, and elevations prior to work. Any change of conditions that could have been identified by a preconstruction inspection will be considered at the bidder's risk if no field verification is performed.
   ii. The bidder is to provide engineered drawings signed and sealed by a professional engineer licensed in the state of Kentucky. These drawings will be submitted for approval by the Riverport before drawings are issued for construction.

iii. Bidder to identify all structures, mooring rings/pad eyes, walkways, platforms, ladders and equipment that may need to be removed to facilitate installation of the repairs at each structure. List the items identified for anticipated removal for each structure with bid.

2. Patch Plate Repair Type Requirements:

   i. Remove spilled cell ballast fill and/or other material to natural channel bottom to facilitate installation of the patch plate.

   ii. Fabricate, construct and install a patch plate as directed on the cell to address the lose of cell fill ballast consisting of sheet pile section loss and/or split interlocks. The patch plate should be installed to contain replacement cell ballast fill material.

   iii. The exact location of fill loss was not found due to built up fill on the outside of the cell along the channel bottom. If the contractor finds additional damage below this bottom of patch plate elevation, notify the Riverport immediately for further direction.

   iv. The bidder shall inspect the sheet piles on the berthing face of the cell exposed following the removal of spilled cell ballast fill. The bidder shall submit a written report of all defects found to the Riverport upon completion of the inspection.

   v. The BCB 2 patch plate shall conform to the following dimensions:

      1. The bottom of patch plate: EL. 294.0 feet NAVD88.
      2. The top of the patch plate: EL. 314.0 feet NAVD88.
      3. The plate shall be 3/8 inch thick ASTM A36 steel plate.
      4. The plate shall extend 16 feet wide, centered on the berthing face of the cell. The width of the plate may be made up of multiple plates to allow tight fitup to the existing sheet piles; however, any vertical joints shall be joined continuously by a single bevel partial penetration welded joint.
      5. Any horizontal plate plate joints shall be joined continuously by a single bevel partial penetration welded joint.

3. Full Circumference Cell Band Requirements:

   i. Design, fabricate, construct and install a full circumference cell band on the cell to address the sheet piles section loss, split interlocks and damaged knuckles. The bands should be designed and installed to restore the structural integrity (hoop strength) of the original sheet piles and improve barge impact resistance.

   ii. Remove/dredge material around the cell as required so that the bottom of the band is installed down to elevations as follows:

      1. BCB 4 - EL. 294.5 feet NAVD88.

iii. Backfill any area dredged below the natural channel bottom with sand (see Standard Specification Section 804.03) following cell band installation to restore existing river bottom elevations.

iv. Cell bands are to have the following overall heights:

1. BCB 4 – 24 feet.

v. Provide 1/2 inch minimum thick ASTM A36 steel plates on the channel side band segments and 3/8 inch minimum thick ASTM A36 steel plates on the remaining band segments.

1. Provide cut outs in the band segment plates to accommodate locations of existing and/or new mooring rings. Cut outs shall be sized minimum required dimensions to fit over mooring ring assemblies and shall have radiused corners.

2. For the horizontal plate joints, use a 3/8 inch single bevel partial penetration joint (PJP).

3. Provide continuous and full height threaded rod splices along the vertical joints between segments that connects the steel plate sections.

4. Band segment splice locations must not be located in areas where they can be contacted/impacted by barges during normal berthing operations or no nearer to the berthing line than one sheet pile beyond the mooring hardware.

5. Provide 1-1/8 inch diameter ASTM A615, Grade 75 or 80 threaded rods (non-galvanized) anchor rods to connect band segments at splice locations.

a. Threaded rods are to be pre and post-tensioned using a hydraulic ram or Riverport approved equivalent method.

b. All splice connections shall be tensioned to a minimum of 20 percent of ultimate threaded rod strength unless otherwise approved.

c. Document the ram lock off force, and perform it in a skip and tension pattern until final desired rod tensions are met. Final tensions to be provided to Riverport.

d. Provide double nut or lock nuts to be used to prevent the threaded rods from loosening.

6. Once the band is installed and tensioned, weld the top of the band to the cells "outward" panned or alternating sheet piles, use ASTM A36 plate shims as required.

4. Refilling Lost Mooring Cell Ballast Requirements:

i. Complete patch plate or cell band installation prior to refilling mooring cells designated replacement of lost ballast material.

ii. Refill designated mooring cells with Size No. 3 Crushed Stone Aggregate (Standard Specification Section 805.15).

iii. The new fill shall be installed to within 1 foot of the bottom of the concrete cell cap.

iv. Refer to the Marine Solutions inspection report for the documented distance from the top of cell fill to the bottom of the cell cap recorded at the time of inspection. Bidder shall verify these dimensions during preconstruction inspection.

E. Demolition and Removal of Existing Structures:

1. The bidder is responsible for the material to be hauled offsite and disposed in a legal manner complying with all applicable permits.

F. General Conditions:

1. It is the responsibility of the bidder to be familiar with the site location and load cell.
2. The bidder will have the Riverport's crane and portions of the laydown area available to them for use subject to operational and operator availability during construction process. The bidder is responsible for coordinating with the Riverport for planning the use of the crane. No causes for requested delay or extension of contract time will be considered because of the Riverport's crane availability.
3. Bidder will provide any and all equipment and material needed to complete the dredging, demolition and installation activities—including but not limited to work boats, crew boats, cranes, divers and diving equipment, travel permits, trucks, trailers, lifts, forklifts, portable toilets, dumpsters, consumable and non-consumable items.
4. All cranes provided by the bidder to be used on site will show proof of Annual Certification. The Riverport reserves the right to request third party certification.
5. All crane operators allowed to operate on property will have to provide at least one (1) of the following licenses: National Commission for the Certification of Crane Operators (NCCCO) or Operators union license.
6. Work will not commence until all waterway construction permits have been approved by regulatory authorities.
7. Work shall comply with all conditions and requirements included in the permit authorizations.

PADUCAH MCCRACKEN COUNTY RIVERPORT AUTHORITY
Barge Mooring Cell Revitalization Project

Technical Specifications
for
Repair of General Cargo Berth

A. Provide engineering, material, labor and equipment to perform the following scope of work at the Paducah-McCracken County Riverport Authority (Riverport) General Cargo Berth (GCB) located along the left descending bank of the Tennessee River in Paducah, Kentucky.

B. References:

1. Marine Solutions, Inc. inspected the structure on the facility on December 12,2024. The report is included as a reference with this scope of work.
2. Kentucky Standard Specification for Road and Bridge Construction 2019 edition referred to hereafter as Standard Specification

C. Scope and Priorities:

The mooring cells and repair description are listed below in Table 1. The detailed technical specifications are laid out in subsequent sections.

Priority	Structure	Repair Description
	GCB 1	Install full circumferene cell band.
	GCB 2	Install full circumference cell band and refill lost ballast.
	GCB 3	Install full circumference cell band and refill lost ballast.
	GCB 5	Install full circumference cell band and refill lost ballast.

Table 1

D. Sheet Pile Mooring Cell Repair Requirements:

1. General Mooring Cell Repair Requirements:
   i. The bidder is responsible to field verify the existing conditions, dimensions, and elevations prior to work. Any change of conditions that could have been identified by a preconstruction inspection will be considered at the bidder's risk if no field verification is performed.
   ii. The bidder is to provide engineered drawings signed and sealed by a professional engineer licensed in the state of Kentucky. These drawings will be submitted for approval by the Riverport before drawings are issued for construction.

iii. Bidder to identify all structures, mooring rings/pad eyes, walkways, platforms, ladders and equipment that may need to be removed to facilitate installation of the repairs at each structure. List the items identified for anticipated removal for each structure with bid.

2. Full Circumference Cell Band Requirements:

   i. Design, fabricate, construct and install a full circumference cell band on the cell to address the sheet piles section loss, split interlocks and damaged knuckles. The bands should be designed and installed to restore the structural integrity (hoop strength) of the original sheet piles and improve barge impact resistance.

   ii. Remove/dredge material around the cell as required so that the bottom of the band is installed down to elevations as follows:

      1. GCB 1 - EL: 288.5 feet NAVD88
      2. GCB 2 – EL: 284.5 feet NAVD88
      3. GCB 3 – EL: 285.5 feet NAVD88
      4. GCB 5 – EL: 290.0 feet NAVD88

   iii. Backfill any area dredged below the natural channel bottom with sand (see Standard Specification Section 804.03) following cell band installation to restore existing river bottom elevations.

   iv. Cell bands are to have the following overall heights:

      1. GCB 1 - 34 feet.
      2. GCB 2 – 42 feet.
      3. GCB 3 – 32 feet
      4. GCB 5 – 28 feet

   v. Provide 1/2 inch minimum thick ASTM A36 steel plates on the channel side band segments and 3/8 inch minimum thick ASTM A36 steel plates on the remaining band segments.

      1. Provide cut outs in the band segment plates to accommodate locations of existing and/or new mooring rings. Cut outs shall be sized minimum required dimensions to fit over mooring ring assemblies and shall have radiused corners.
      2. For the horizontal plate joints, use a 3/8 inch single bevel partial penetration joint (PJP).
      3. Provide continuous and full height threaded rod splices along the vertical joints between segments that connects the steel plate sections.

4. Band segment splice locations must not be located in areas where they can be contacted/impacted by barges during normal berthing operations or no nearer to the berthing line than one sheet pile beyond the mooring hardware.
5. Provide 1-1/8 inch diameter ASTM A615, Grade 75 or 80 threaded rods (non-galvanized) anchor rods to connect band segments at splice locations.
    a. Threaded rods are to be pre and post-tensioned using a hydraulic ram or Riverport approved equivalent method.
    b. All splice connections shall be tensioned to a minimum of 20 percent of ultimate threaded rod strength unless otherwise approved.
    c. Document the ram lock off force, and perform it in a skip and tension pattern until final desired rod tensions are met. Final tensions to be provided to Riverport.
    d. Provide double nut or lock nuts to be used to prevent the threaded rods from loosening.
6. Once the band is installed and tensioned, weld the top of the band to the cells "outward" panned or alternating sheet piles, use ASTM A36 steel bar/plate shims as required.

3. Refilling Lost Mooring Cell Ballast Requirements:
    i. Complete patch plate or cell band installation prior to refilling mooring cells designated replacement of lost ballast material.
    ii. Refill designated mooring cells with Size No. 3 Crushed Stone Aggregate (Standard Specification Section 805.15).
    iii. The new fill shall be installed to within 1 foot of the bottom of the concrete cell cap.
    iv. Refer to the Marine Solutions inspection report for the documented distance from the top of cell fill to the bottom of the cell cap recorded at the time of inspection. Bidder shall verify these dimensions during preconstruction inspection.

E. Demolition and Removal of Existing Structures:
1. The bidder is responsible for the material to be hauled offsite and disposed in a legal manner complying with all applicable permits.

F. General Conditions:
1. It is the responsibility of the bidder to be familiar with the site location and load cell.
2. The bidder will have the Riverport's crane and portions of the laydown area available to them for use subject to operational and operator availability during construction process. The bidder is responsible for coordinating with the Riverport for planning the use of the crane. No causes for requested delay or extension of contract time will be considered because of the Riverport's crane availability.

3. Bidder will provide any and all equipment and material needed to complete the demolition and installation activities—including but not limited to work boats, crew boats, cranes, divers and diving equipment, travel permits, trucks, trailers, lifts, forklifts, portable toilets, dumpsters, consumable and non-consumable items.
4. All cranes provided by the Offeror to be used on site will show proof of Annual Certification. The Riverport reserves the right to request third party certification.
5. All crane operators allowed to operate on property will have to provide at least one (1) of the following licenses: National Commission for the Certification of Crane Operators (NCCCO) or Operators union license.
6. Work will not commence until all waterway construction permits have been approved by regulatory authorities.