



October 9, 2023

Heather Becker
Lake Saint Louis Community Association
100 Cognac Court
Lake Saint Louis, Missouri 63367-1624
hbecker@lslca.com

RE: CONSTRUCTION DOCUMENT
WINDJAMMER MARINA IMPROVEMENTS – PHASE I
LAKE SAINT LOUIS, MISSOURI

Dear Mrs. Becker:

Enclosed are the construction drawings, bidding document, additional explorations letter and our geotechnical feasibility study dated January 31, 2022 for the project. These documents can be transmitted to contractors for bidding purposes. We are looking forward on providing our construction monitoring services for the Windjammer Marina Improvements – Phase I Construction. If you have questions concerning this submittal, please contact me.

Sincerely,

SHANNON & WILSON

Vonmarie Martinez
Senior Professional II

VMC:PMK:TJA/tad

Enc. Construction Drawings
Bidding Document

Geotechnical Feasibility Study, Lake Saint Louis Seawalls, Lake Saint Louis, Missouri prepared by Shannon & Wilson, Inc. for the Lake Saint Louis Community Association, dated January 31, 2022.

Additional Explorations Letter, Windjammer Marina Improvement Project – Phase I, Lake Saint Louis, Missouri prepared by Shannon & Wilson, Inc. for the Lake Saint Louis Community Association, dated October 6, 2023.

WINDJAMMER MARINA IMPROVEMENT PROJECT

PHASE 1

LAKE SAINT LOUIS, MO

LAKE SAINT LOUIS COMMUNITY ASSOCIATION

SHEET NO	SHEET TITLE
1	COVER
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3	DEMOLITION PLAN
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PROFESSIONAL ENGINEERING CORPORATION
MISSOURI CERTIFICATE OF AUTHORITY #000413

Name: VONMARIE MARTINEZ
Discipline: CIVIL ENGINEER



Drawn by TAT Designed by VMC Checked by PMK

Windjammer Marina
Improvement
Project - Phase 1
Lake Saint Louis, MO

Signature

Date

Description

Revisions

Job Number: 110860-001

Date: 10/06/2023

COVER PAGE

Sheet 1 of 9



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Vonmarie Martinez
10/09/2023
Professional Seal

CONTROL POINT LEGEND				
POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	1081110.852	742251.429	506.94	GPS CONTROL POINT MAG SET IN SIDEWALK SEAM
101	1080933.160	742304.214	506.57	GPS CONTROL POINT MAG SET IN SIDEWALK SEAM
102	1080950.249	742557.626	507.93	GPS CONTROL POINT CUT X ON SIDEWALK
103	1080891.252	742585.756	506.08	GPS CONTROL POINT CUT X ON CURB
104	1081175.025	742468.103	515.00	GPS CONTROL POINT CUT X ON CURB
105	1081329.725	742444.636	518.94	GPS CONTROL POINT CUT X ON SIDEWALK

SURVEY DATUM:
- MISSOURI STATE PLANE COORDINATE
SYSTEM, EAST ZONE 2401

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VMC

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PMK

Windjammer Marina
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Lake Saint Louis, MO

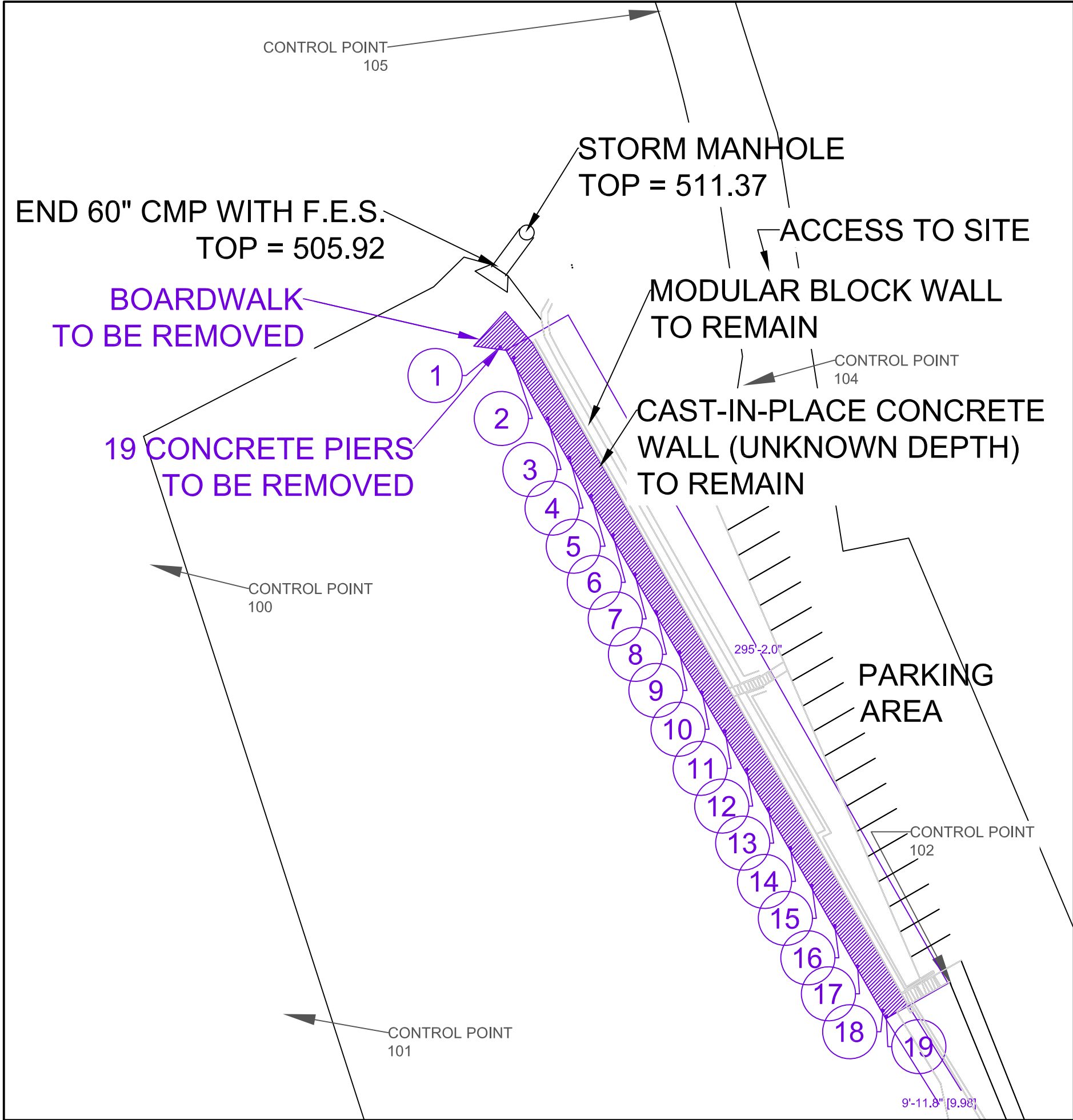
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EXISTING CONDITIONS

Sheet 2 of 9



- NOTES:
1. CONTRACTOR SHALL REMOVE EXISTING BOARDWALK WHICH CONSISTS OF WOOD BOARDS SUPPORTED BY STEEL H-BEAMS.
 2. CONTRACTOR SHALL PULL EXISTING CONCRETE PIERS (19).
 3. CONTRACTOR SHALL DISPOSE MATERIALS OFF-SITE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, COUNTY, AND MUNICIPAL LAWS AND REGULATIONS.
 4. EXISTING FLOATING DOCKS WILL BE MOVED BY OWNER.

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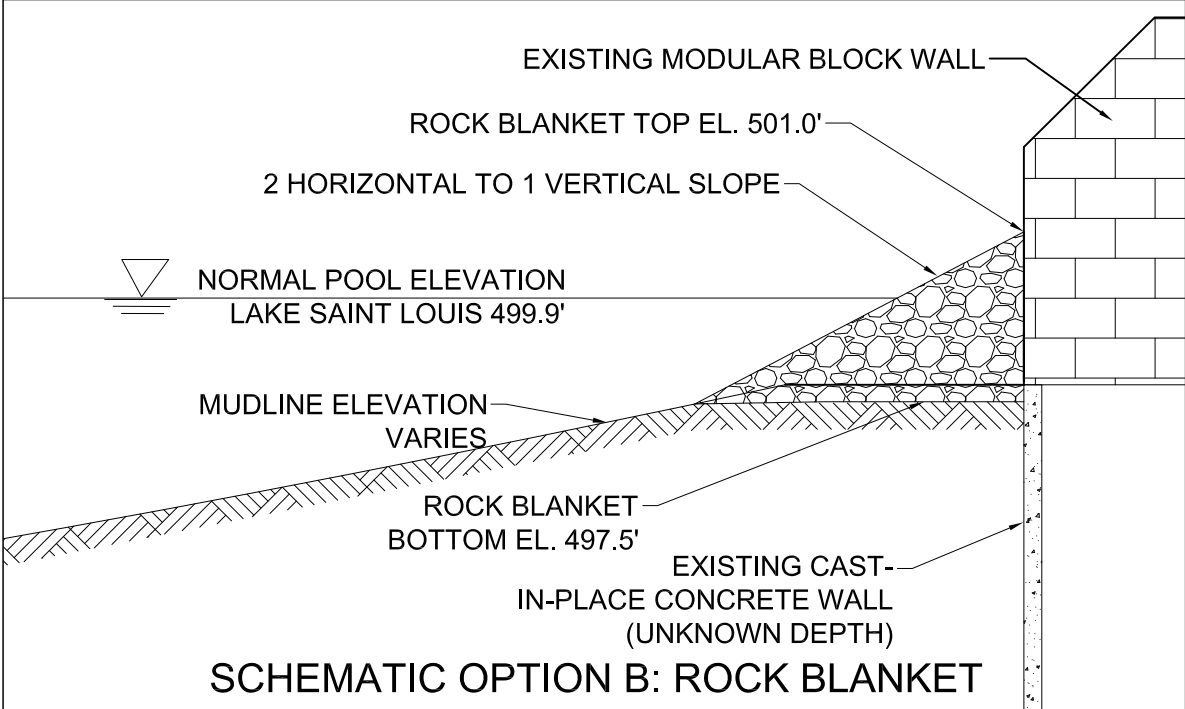
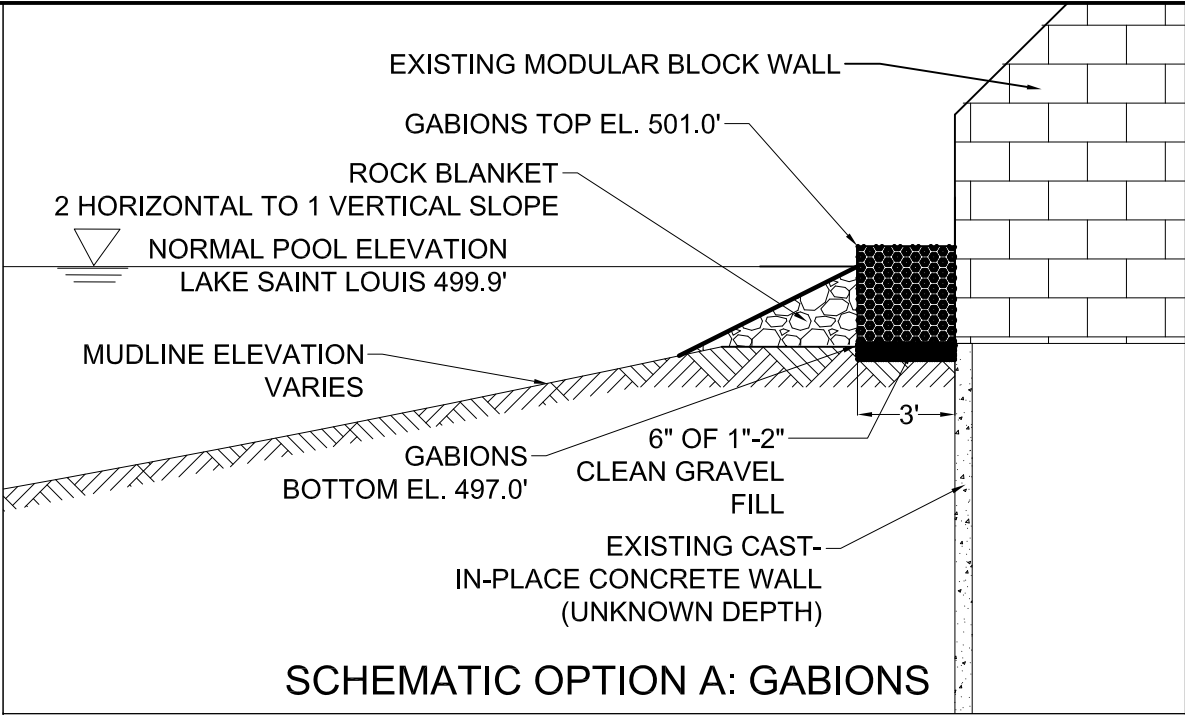
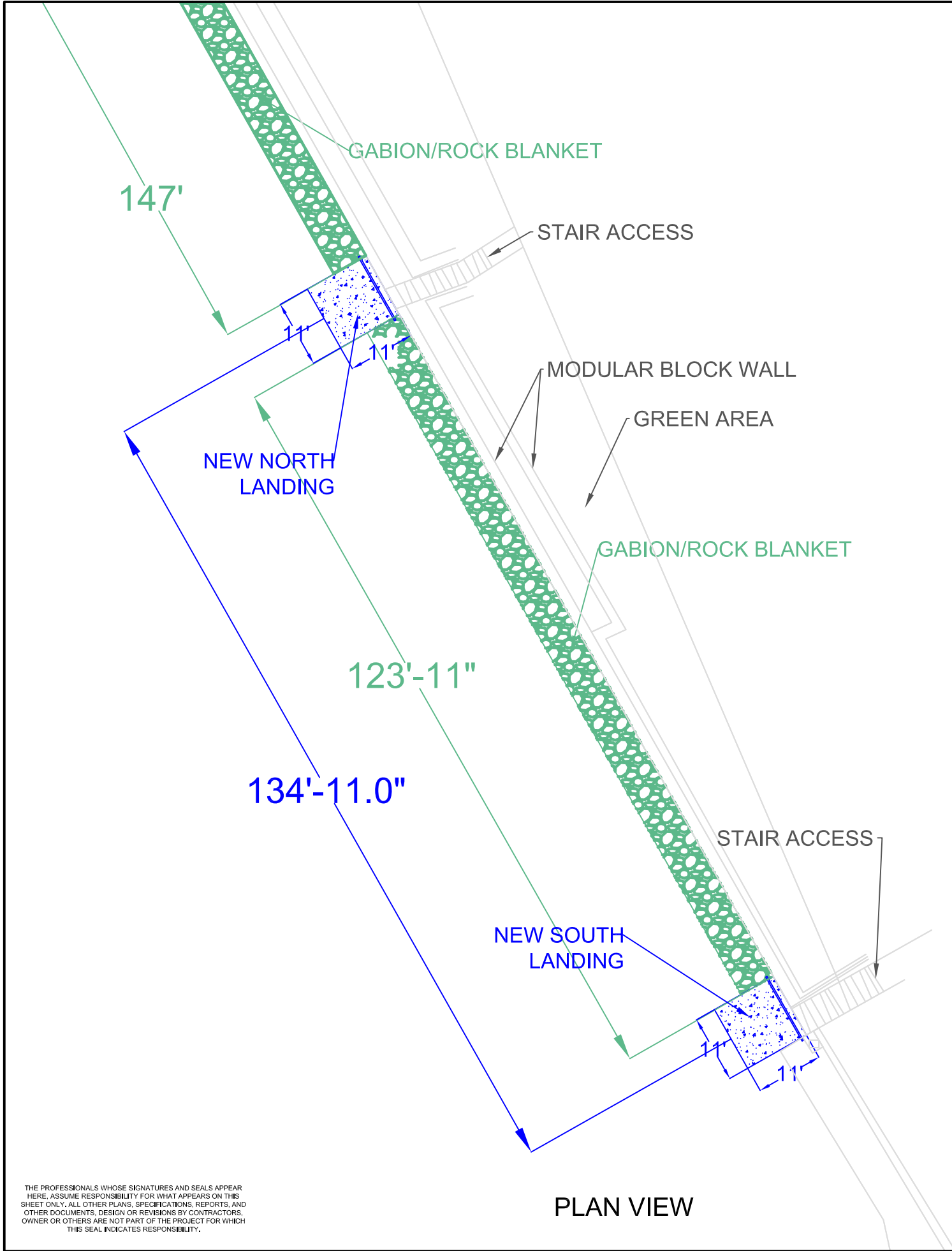


Drawn by TAT
Designed by VMC
Checked by PMK

Windjammer Marina Improvement Project - Phase 1 Lake Saint Louis, MO	Signature
	Date
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NOTE: CONTRACTOR SHALL PROVIDE COST ESTIMATE FOR BOTH OPTION A AND OPTION B.

OPTION A: GABIONS

- GABIONS SHALL BE PER ST. CHARLES COUNTY STANDARD SPECIFICATIONS FOR ARTERIAL HIGHWAY CONSTRUCTION (REV. 7/2020) SECTION 611.70.
- ROCK BLANKET SHALL BE PER MISSOURI DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 2023 SECTION 611.30.2. MATERIAL SHALL MEET THE REQUIREMENTS OF TYPE 1 ROCK BLANKET.

OPTION B: ROCK BLANKET

- ROCK BLANKET SHALL BE PER MISSOURI DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 2023 SECTION 611.30.2. MATERIAL SHALL MEET THE REQUIREMENTS OF TYPE 1 ROCK BLANKET.

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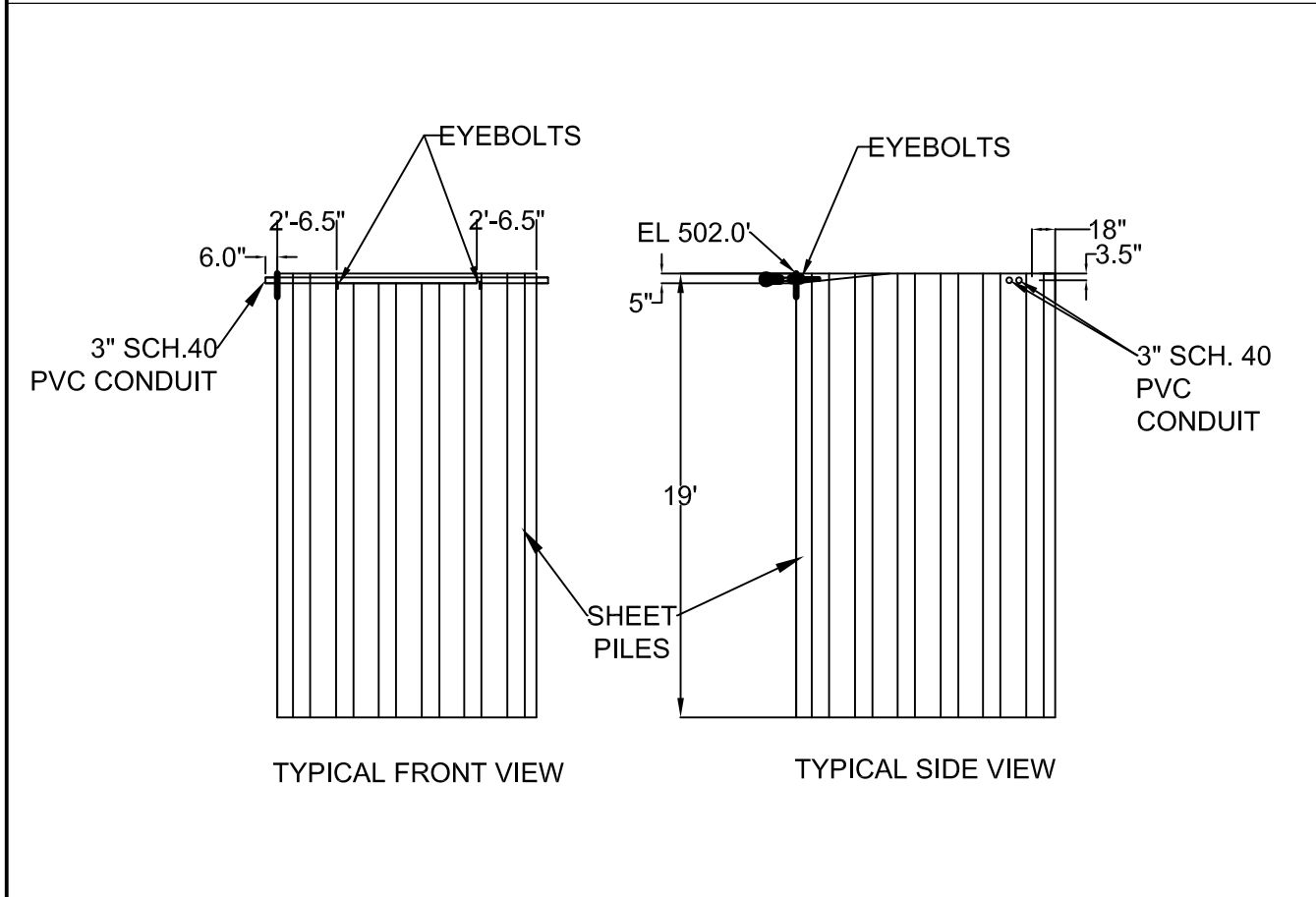
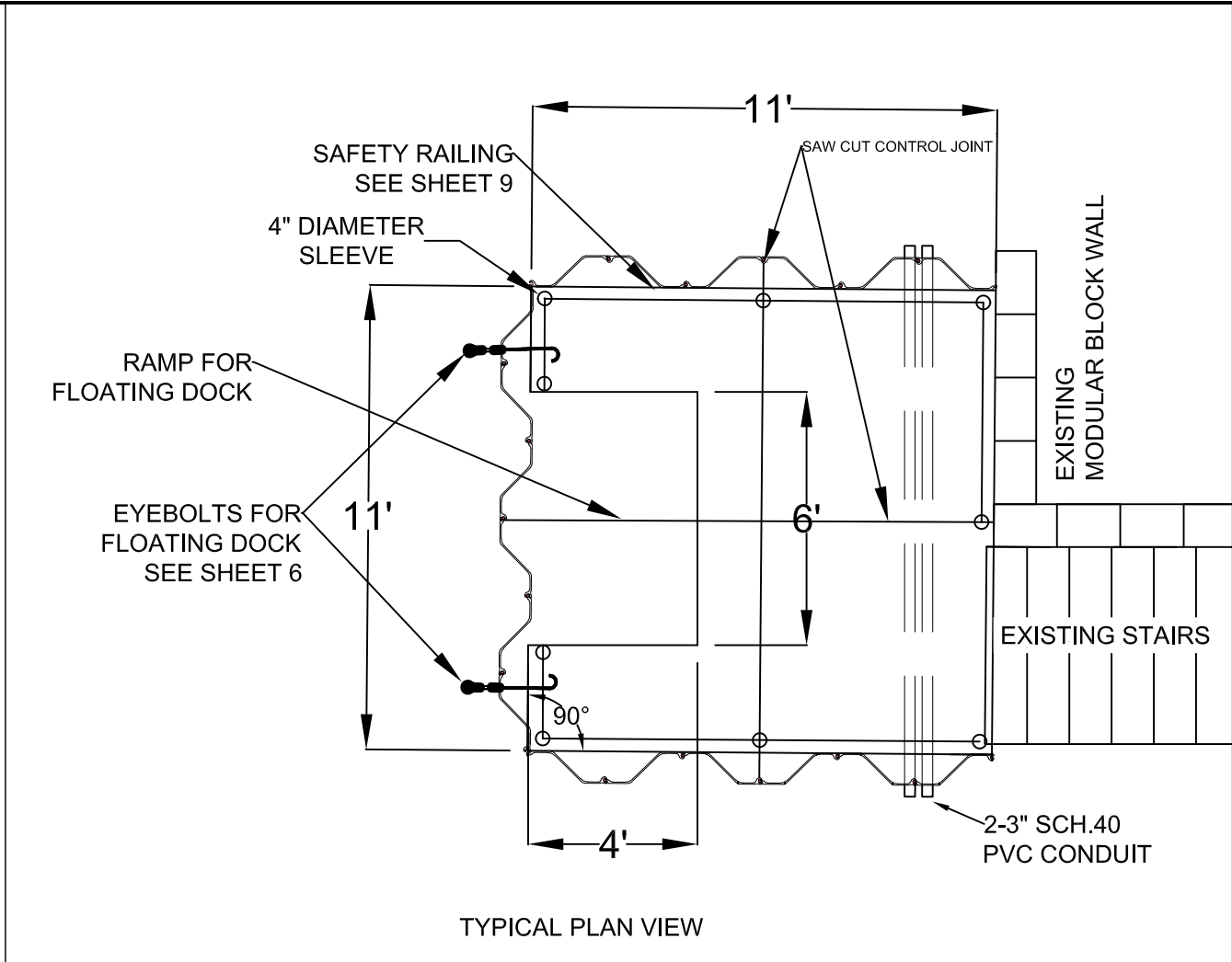
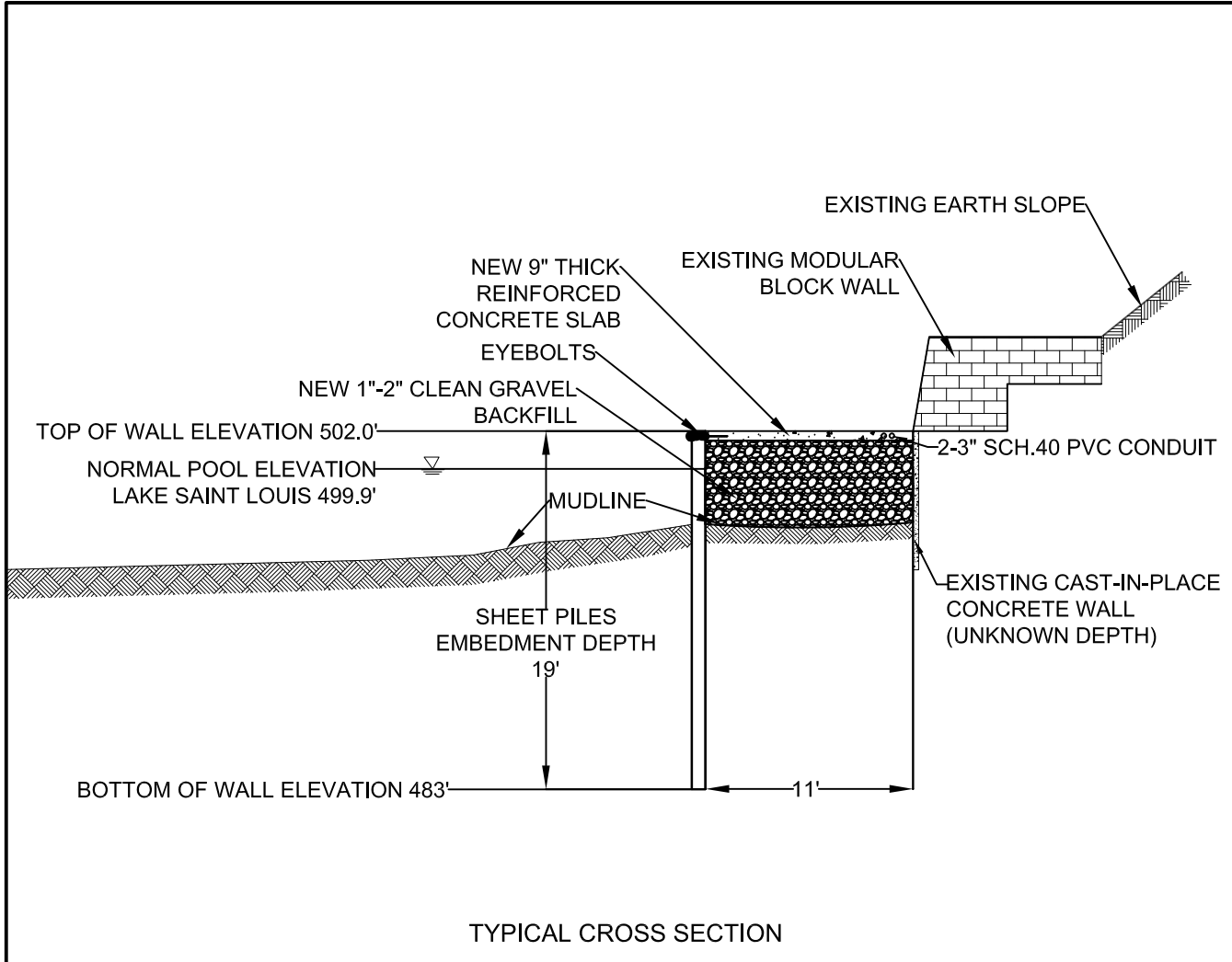
Vonmarie
Martinez-Chalaisant
NUMBER
PE-2016003092
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Windjammer Marina
Improvement
Project - Phase 1
Lake Saint Louis, MO

Job Number: 118060-001
Date: 10/06/2023

PROPOSED CONSTRUCTION Sheet 4 of 9



- NOTES:
1. SOIL, ROCK FRAGMENTS, AND DEBRIS ENCLOSED IN THE LANDINGS SHALL BE EXCAVATED 12 INCHES OR AS INDICATED BY THE ENGINEER.
 2. A 4-INCH DIAMETER SLEEVE SHALL BE INSTALLED FOR THE SAFETY RAILING POSTS.
 3. SLEEVES MAY CONSISTS OF SCH. 40 PVC PIPE 30-INCHES BELOW GRADE OR AS SPECIFIED BY MANUFACTURER.
 4. SLEEVE AND SAFETY RAILING POSTS LOCATION TO BE COORDINATED IN THE FIE.D.

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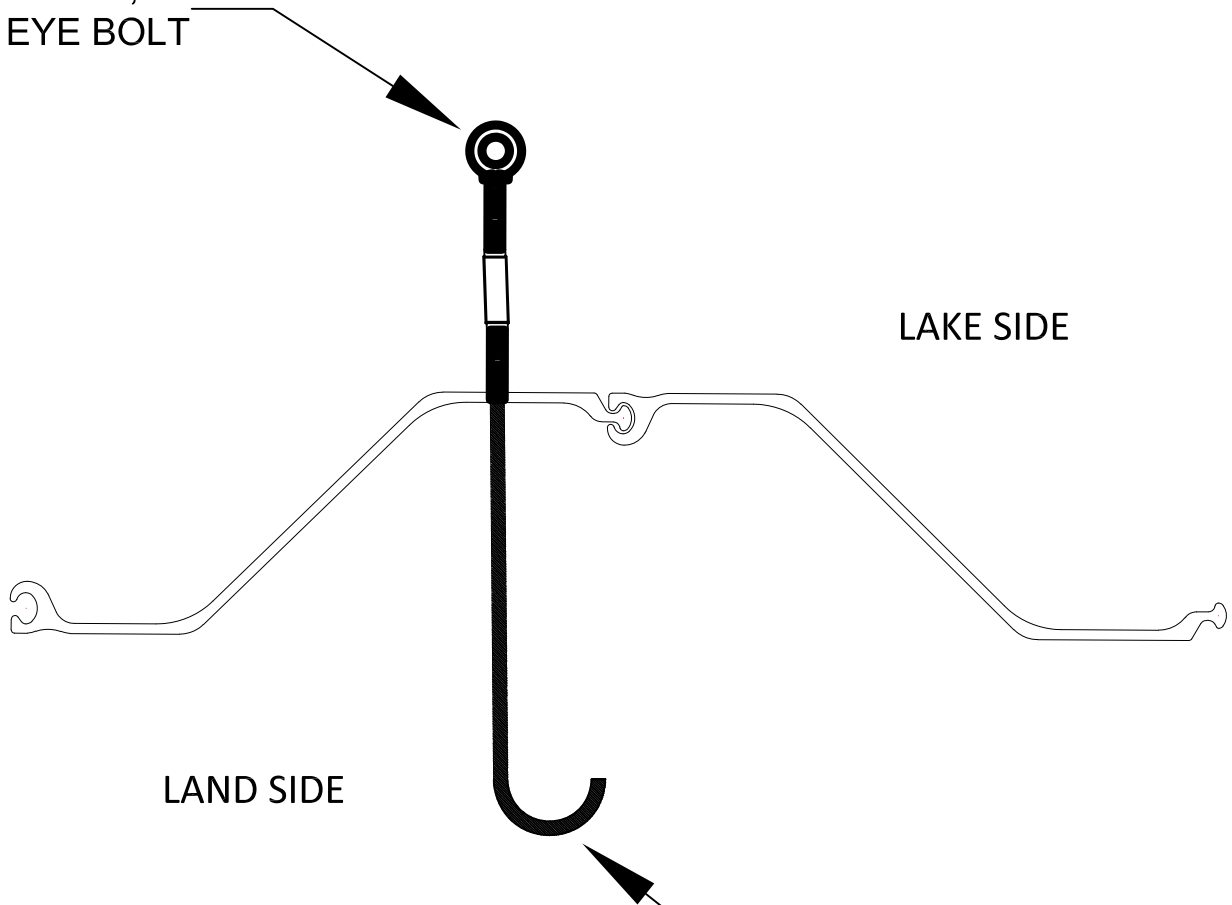
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LANDING DETAILS

Sheet 5 of 9

1" DIAMETER SHANK,
SHOULDER NUT EYE BOLT



LAKE SIDE

LAND SIDE

1" DIAMETER 180° HOOK TO
EXTEND 18" INTO REINFORCED
CONCRETE SLAB

DOCK MOORING LINE CONNECTION NOTES:

1. EYE BOLT SHALL BE INSTALLED IN THE MIDDLE OF THE CONCRETE SLAB.
2. EYE BOLT AND EYE NUT SHALL BE FORGED STEEL OR STAINLESS STEEL. EYE BOLT, EYE NUT, AND ALL RELATED HARDWARE SHALL BE HOT DIPPED GALVANIZED FOR FORGED STEEL, OR STAINLESS STEEL COMPONENTS SHALL BE PROVIDED FOR APPLICATIONS WHERE GALVANIZATION IS NOT SUITABLE.
3. EYE BOLT WORKING LOAD LIMIT SHALL BE AT LEAST 13,000 LBS (IN-LINE PULL).
4. AN APPROPRIATELY RATED TURNBUCKLE SHALL BE INCLUDED BETWEEN THE EYE NUT AND SHEET PILE.

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10/09/2023
Professional Seal

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STATE OF MISSOURI

Vonmarie Martinez-Chaluisant

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PROFESSIONAL ENGINEER

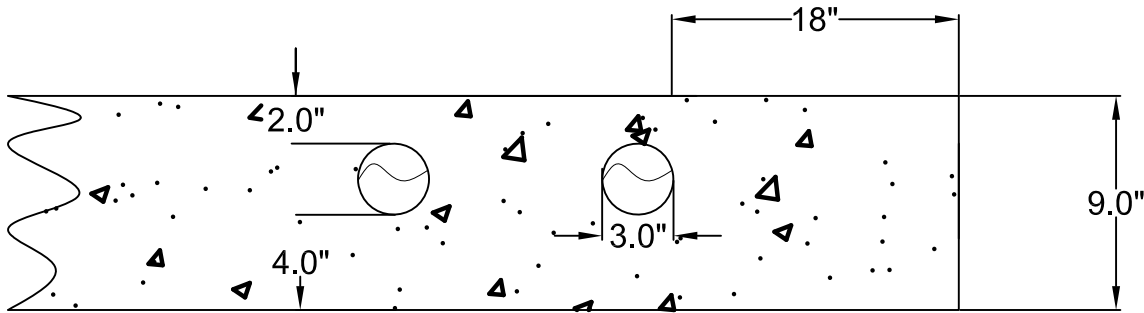
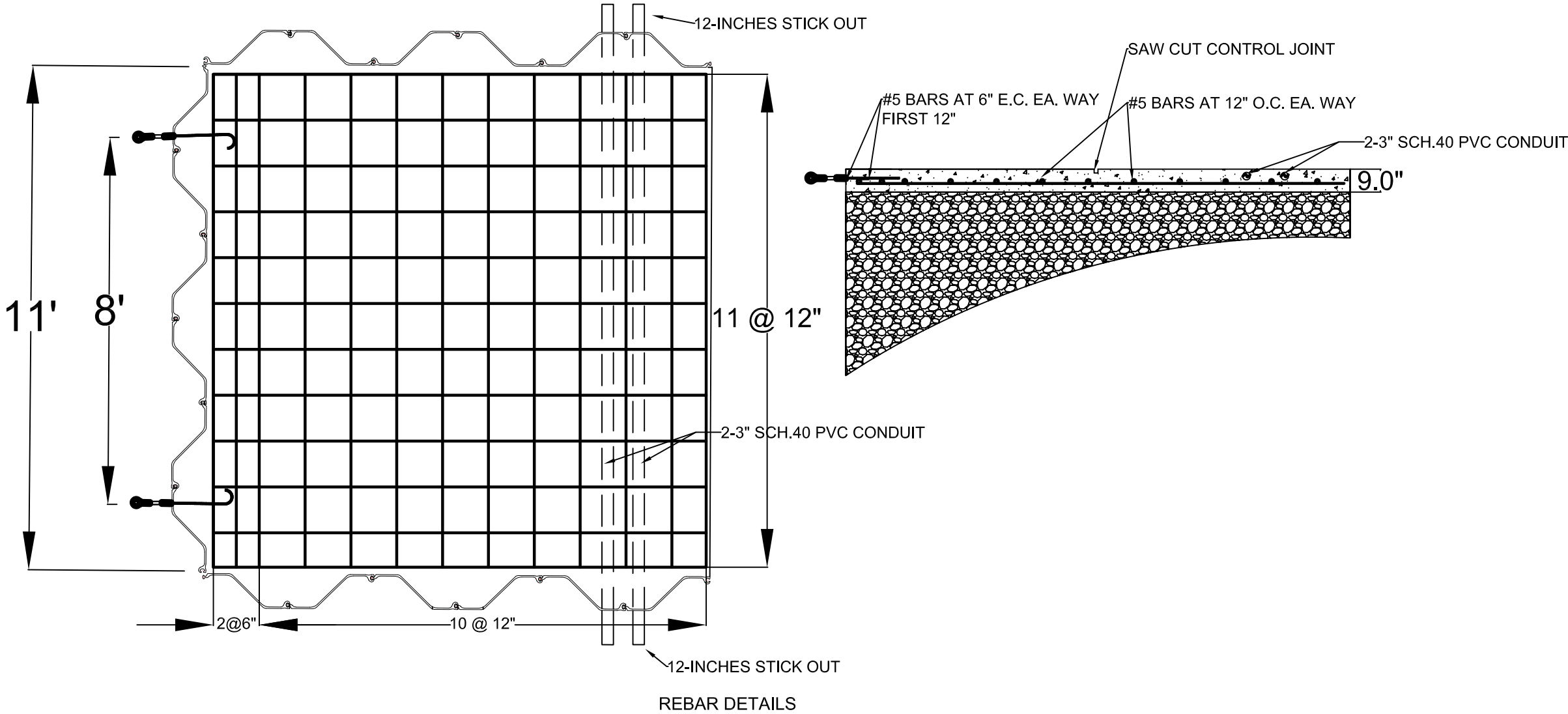
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DETAILS Sheet 7 of 9



- NOTES:
- #5 BAR TO BE USED.
 - #5 BAR TO BE PLACED WITH A CLEAR COVER OF 3".
 - REINFORCED CONCRETE SLAB TO BE 9" IN THICKNESS.
 - SCH. 40 PVC CONDUIT LOCATION TO BE COORDINATED IN THE FIELD.

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1 SUMMARY OF WORK

- A. The work consists of the removal and disposal of an existing boardwalk and concrete piers, and the construction of two landings and installation of gabions/rock blanket along an existing retaining wall, and all site work associated with the project.
- B. Contractor shall be responsible for determining the Contractor's means and methods.
- C. Existing asphaltic and concrete pavement, concrete sidewalks, block retaining wall, and safety railing damaged due to construction shall be repaired by the Contractor at the Contractor's expense after construction is completed and before demobilization from site. Contractor shall photo document existing conditions and existing damage or distress to existing facilities prior to the start of work.
- D. Owner will provide laydown areas in the premises of the Work. Contractor shall assume full responsibility for the protection and safekeeping of Products and Materials stored on the site.
- E. Owner will remove floating docks and air pump equipment to avoid damage and reinstall at Owner's expense.

2 EXISTING RETAINING WALL, BOARDWALK AND CONCRETE PILES

- A. The shoreline is currently protected by a cast-in-place concrete wall from an unknown depth to the boardwalk bottom elevation and by a modular block retaining wall. The modular block retaining wall has a safety railing, backslope and a parking lot at the top. No deterioration of the existing cast-in-place concrete wall and modular block retaining wall has been observed to date. The footings of the cast-in-place concrete wall may extend into the lake side and be present along the wall alignment and impede sheet pile installation. Modifications of the new sheet pile wall due to obstructions will be coordinated with Owner and Engineer during construction.
- B. The existing boardwalk has wood boards supported by steel beams and 19 concrete piers.
- C. Contractor shall remove the boardwalk, steel beams, and concrete piers. Materials removed shall be disposed of off-site by Contractor in accordance with all federal, state, county, and municipal laws and regulations.
- D. Excavated soil and rock from the inside of the landings shall be dispose off-site by Contractor in accordance with all federal, state, county, and municipal laws and regulations.
- E. Other construction trash is considered part of, and incidental to construction and shall be dispose off-site by Contractor in accordance with all federal, state, county, and municipal laws and regulations.

3 STEEL SHEET PILES FOR LANDINGS CONSTRUCTION

3.1 General

3.1.1 Summary

This section covers all members to be used in the construction of the landings using steel sheet pile sections. This specification also covers the installation of steel sheet piling and trimming of the sheets to the lines and grades shown in the Drawings or as required by Owner and/or Engineer.

3.1.2 Submittals

- A. Provide qualifications of proposed steel sheet pile installer.
- B. Contractor shall provide information from the manufacturer that indicates the steel sheet piling meets or exceeds the specifications listed in this section.
- C. Contractor shall submit verification from the manufacturer that the hammer can deliver the required energy.

D. Splice locations, if necessary, shall be reviewed and accepted by Engineer prior to installation.

3.2 Products

3.2.1 General

- A. The condition of the sheet piling, whether new or used, shall be identified by the contractor as part of the Bid. If the Contractor proposes to install used steel sheet piles, the sheets shall not be dented, twisted, torn or otherwise damaged; and the Contractor shall obtain acceptance of the steel sheet piles in writing from Owner and/or Engineer before installation.
- B. Sheet piles rejected by Owner and/or Engineer shall be removed from the site at no cost to Owner.
- C. Sheet piles and special fabricated shapes shall be of a design that ensures continuous interlock throughout the entire length when in place.

3.2.2 Materials

- A. The wall shall be constructed using PZ-22 pile sections, ASTM A572 Grade 50.
- a. EZ-88 pile sections may be used as an alternative to the PZ-22.
- b. All installed piles should be the same section.
- B. Additional length beyond those indicated on the Drawings may be required to provide for trimming of tops of sheet piling.
- C. The interlocks between steel sheet pile sections shall be configured such that the average width of the annular space between all contact points of the interlocks shall be a maximum of one-eight (1/8) inch.
- D. Sheet piles and interlocks shall not have excessive kinks or twist that would prevent the pile from reasonably free sliding to grade.
- E. All fabricated connections shall be made with the use of angles or bent plates, as necessary, and shall be adequately welded or connected with high strength bolts as accepted by Engineer.
- F. If handling holes/lifting lugs are provided, they shall be above the finished wall elevation, and shall be cut off after installation.
- G. Contractor shall provide certification from the steel manufacturer for the steel.

3.2.3 Storage and Handling

- A. Do not subject piles to damage by impact bending stresses in transporting to and storing piles onsite.
- B. Store and handle piles such that piles are not damaged.

3.3 Execution

3.3.1 Examination

Do not begin pile installation until existing boardwalk and concrete piers are removed.

3.3.2 Installation

- A. General
1. All welding or gas cutting shall be in accordance with the current standards of the American Welding Society.
2. Steel piles shall be driven to the elevations shown on the Drawings.
- B. Pile Driving

1. Sheet piling shall be driven to form a tight bulkhead.
2. Any piling which is damaged in driving or which has broken interlock between sections shall be pulled and replaced at Contractor's expense. Joints that do not interlock will be rejected and require removal and re-installation of the pile.
3. Sheet piling shall be driven within the following tolerances:
- a. Alignment:
- i. Each landing side shall be to the dimensions shown on the plans within a tolerance of two inches, and the walls shall be at right angles with each other and the existing cast-in-place concrete wall at the shoreline.
- b. Plumbness:
- i. Each individual pile section shall be driven vertical, within a horizontal tolerance land side, before backfill, of two percent (2%) of any vertical length measured along the pile.
- c. Elevation:
- i. Tops to be trimmed in a smooth line.
- ii. Tops of pile sections shall be within a tolerance of one (1) inch from the plan elevations shown on Drawings.
- iii. Contractor shall not be paid for excess pile trimmed off the end of the pile to meet final grade.
- C. The landing walls have been designed for the grades of the final configuration denoted on the Drawings only. Other temporary configurations during the construction period shall not be allowed.
- D. Care shall be taken during driving to keep from causing deformations of the top of the piles, splitting of section, or breaking of the interlock between sections. Care shall also be taken during driving to prevent and correct any tendency of steel piles to twist or get out of plumb.

3.3.3 Finished Elevation

- A. Drawings indicate piling top and bottom elevation. Cut off tops of piles as necessary to achieve top elevation.
- B. The landings shall be finished with a concrete slab and safety railing as shown on the drawings.
- C. A ramp for the floating dock bridges shall be provided as shown on the Drawings.

4 WALL BACKFILL

- A. Soil, rock, and debris enclosed in the landings shall be excavated 12 inches or as indicated by the Engineer.
- B. Wall backfill shall consist of 1-inch clean rock or crushed limestone aggregate meeting Missouri Department of Transportation Standard Specifications for Highway Construction 2023 Grade 4B Aggregate for Drainage in accordance with Section 1009.3.4.



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Vonmarie Martinez

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NOTES Sheet 8 of 9

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5 CONCRETE SLABS

- A. Landings shall be covered by a reinforced concrete slab. Refer to Drawings for reinforcement location.
- B. Concrete shall conform with the requirements set forth in A.C.I. 301 and shall have a 28-days compressive strength of 4,000 psi.
- C. Maximum water-cementitious materials ratio not to exceed 0.45.
- D. Slump limit = 4 inches +/- 1 inch.
- E. Air-entraining admixture - ASTM C260. Air content = 6.0 +/- 1.5 percent.
- F. Control joints shall be saw cut to provide 1/8" maximum width. Saw cutting of control joints shall be done as the concrete sets sufficiently to permit cutting without chipping, spalling or tearing, but not more than 24 hours after placing.
- G. Reinforcement shall be #5 bars with a minimum yield strength of 60,000 psi.

6 DOCK ANCHORS

- A. Two dock anchor points shall be provided on face of steel sheet piling at each landing as shown on Drawings.
- B. Refer to Drawings for location, size, capacity, and installation.
- C. Dock anchors shall have 180 degrees hooks that extend 18 inches into the reinforced concrete slab and 1-inch diameter steel deformed bars with a yield strength of 60,000 psi.
- D. Contractor shall indicate if they are using forged steel or stainless steel.

7 SAFETY RAILING

- A. Contractor shall procure and install safety railings to match existing railings at the site. See image below for existing railings. Product literature regarding railing materials shall be provided to Owner for review and approval before purchase.
- B. Type:
 - 1. Safety railing shall be at least 48 inches tall.
 - 2. Safety railing shall be installed using both a top rail and a bottom rail.
 - 3. Color shall be black.
 - 4. All related hardware shall be galvanized or aluminum, and powder coated black.



C. Installation:

- 1. 4-inch diameter sleeves shall be installed in the concrete slab and be 30-inches below grade Schedule #40 PVC pipe or to manufacturer specifications.
- 2. Safety railing shall be installed on the landings concrete slab. Posts shall be spaced evenly along the railing at intervals of 6 feet or less. Post locations shall be field coordinated with Owner's representative.
- 3. Posts shall be embedded at least 30 inches below finish grade. Embedment holes should be at least 4 inches in diameter or to manufacturer specifications and backfilled with concrete.

8 BEST MANAGEMENT PRACTICES

The best management practices (BMP) are listed below.

- A. Care shall be taken to keep machinery out of the water way as much as possible. If work in the water way is unavoidable, it shall be performed in a way that minimizes the duration and amount of any disturbance to banks, substrate and vegetation to prevent increases in turbidity. Fuel, oil and other petroleum products, equipment, construction materials and any solid waste shall not be stored below the ordinary high water mark at any time or in the adjacent flood-prone areas beyond normal working hours. All precautions shall be taken to avoid the release of wastes or fuel to streams and other adjacent waters as a result of this operation.
- B. Petroleum products spilled into any water or on the banks where the material may enter waters of the state shall be immediately cleaned up and disposed of properly. Any such spills of petroleum shall be reported as soon as possible, but no later than 24 hours after discovery to the Department of Natural Resources' Environmental Emergency Response number at 573-634-2436 or website at <http://dnr.mo.gov/env/esp/esp-eer.htm>.
- C. Only clean, nonpolluting fill shall be used. The following materials are not suitable where contact with water is expected and shall not be used due to their potential to cause violations of the general and numeric criteria of the Water Quality Standards:
 - 1. Earthen fill.
 - 2. Broken concrete.
 - 3. Concrete with exposed rebar.
 - 4. Tires, vehicles or vehicle bodies, construction or demolition debris are solid waste and are excluded from placement in the waters of the state.
 - 5. Liquid concrete, including grouted riprap, if not placed as part of an engineered structure.
 - 6. Any material containing chemicals that would result in violation of water quality standards.
- D. Clearing of vegetation and trees shall be the minimum necessary to accomplish the activity except for the removal of invasive or noxious species and placement of ecologically beneficial practices.

9 ADDITIONAL NOTES

- A. The contractor should anticipate that work will occur in the wet with the lake at normal pool (i.e. within 6 inches above or below the lake spillway sill). Lower lake levels may occur during scheduled lake maintenance periods but cannot be guaranteed at this time.



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SAINT CHARLES COUNTY, MISSOURI
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PHASE 1

BIDDING DOCUMENT

Prepared by:



October 9, 2023

BIDDING REQUIREMENTS

- A. Bids for the construction of the Windjammer Marina Improvement Project – Phase 1 will be received by the Lake Saint Louis Community Association (LSLCA), Attention to Heather Becker, 100 Cognac Court, Lake Saint Louis, Missouri 63367-1624 or by email hbecker@lslca.com until November 3, 2023 at 5:00 pm. Bids shall be on a lump sum basis.
- B. Bidder shall submit a Bid for both options as indicated on Exhibits 1 and 2.
- C. Bidders are encouraged to attend the pre-bid meeting onsite on October 19, 2023 at 1:30 pm. Please confirm your attendance by email to hbecker@lslca.com.

BID FORM

- A. In submitting this Bid, the Bidder represents that:
 - 1. Bidder has examined and carefully studied the provided documents, and any data and reference items identified in the provided documents.
 - 2. Bidder has visited the Site, conducted a thorough, visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - 3. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - 4. Bidder has carefully studied the geotechnical feasibility study and additional explorations letter, which describe the subsurface conditions at the Site, and all Drawings of physical conditions relating to existing surface at the Site and proposed construction.
 - 5. Bidder has given the Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the provided documents and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
 - 6. The provided documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

B. Bidder shall include:

1. Project schedule.
2. Evidence of authority to do business in the State of Missouri.
3. List of similar projects completed in the last 5 years.

Exhibit 1 Basis of Bid Option A: Gabions with Riprap

Item Description	Estimated Quantity	Estimated Cost (\$)
Sheet Pile Wall		
PZ-22	36 Sheet Piles	
Gabion (include basket and rock)	120 Cubic Yards	
Rock Blanket	40 Cubic Yards	
1"-2" Clean Gravel Backfill (for landings and base rock for gabions)	65 Cubic Yards	
Concrete Pad	8 Cubic Yards	
Rebar	530 lineal feet (or 550 pounds)	
3" SCHD 40 PVC Conduit	60 lineal feet	
Safety Fence		
Safety Fence Installation and Materials	54 Linear Feet	
Miscellaneous		
Mobilization/Demobilization	1	
Dock Anchors	4	
Boardwalk Removal	1	
Pier Removal	19	
Existing asphaltic and concrete pavement, concrete sidewalks, block retaining wall, and safety railing repairs	As needed	
Lump Sum Cost		

Notes:

- 1 Estimated quantities are given for bidding purposes only. Bid shall be lump sum for total project.

Exhibit 2 Basis of Bid Option B: Rock Blanket

Item Description	Estimated Quantity	Estimated Cost (\$)
Sheet Pile Wall		
PZ-22	36 Sheet Piles	
Rock Blanket	125 Cubic Yards	
1"-2" Clean Gravel Backfill	50 Cubic Yards	
Concrete Pad	8 Cubic Yards	
Rebar	530 lineal feet (or 550 pounds)	
3" SCHD 40 PVC Conduit	60 lineal feet	
Safety Fence		
Safety Fence Installation and Materials	54 Linear Feet	
Miscellaneous		
Mobilization/Demobilization	1	
Dock Anchors	4	
Boardwalk Removal	1	
Pier Removal	19	
Existing asphaltic and concrete pavement, concrete sidewalks, block retaining wall, and safety railing repairs	As needed	
Lump Sum Cost		

Notes:

- 1 Estimated quantities are given for bidding purposes only. Bid shall be lump sum for total project.

Bid Submittal

Bidding Entity:

By (Signature):

By (Printed Name):

Submittal Date:

October 9, 2023

Heather Becker
Lake Saint Louis Community Association
100 Cognac Court
Lake Saint Louis, MO 63367

RE: ADDITIONAL EXPLORATIONS LETTER
 WINDJAMMER MARINA IMPROVEMENT PROJECT – PHASE I
 LAKE SAINT LOUIS, MO

Dear Mrs. Becker:

This letter presents the results of additional explorations performed as part of our design and engineering services for the Windjammer Marina Improvement Project – Phase 1. The information presented herein should be considered as a Supplement to the *Geotechnical Feasibility Study, Lake Saint Louis Seawalls, Lake Saint Louis, Missouri* prepared by Shannon & Wilson dated January 31, 2022 and included in this package submittal.

We completed two additional explorations at the locations, SW-08 and SW-09, indicated on Exhibit 1. The borings were blind drilled to refusal with a hydraulic rotary drill rig. No soil or rock samples were collected during the site investigation. We also completed a survey of the project area to obtain location and elevations of the mudline, existing dock and modular block wall.

The purpose of the explorations was to measure the top of rock elevation at the approximate location of the proposed sheet pile installation, to confirm that there was enough overburden to support the sheet piles. The top of rock is assumed to be at auger refusal elevation. Borings SW-08 and SW-09 refused at elevations 479.6 and 478.8 feet, respectively. Our engineering analysis and design of the sheet piles indicate that the bottom of the sheet piles need to reach elevation 483 feet.

Based on our explorations and analysis, we expect that bedrock elevation will be below the termination depth of the sheet piles.



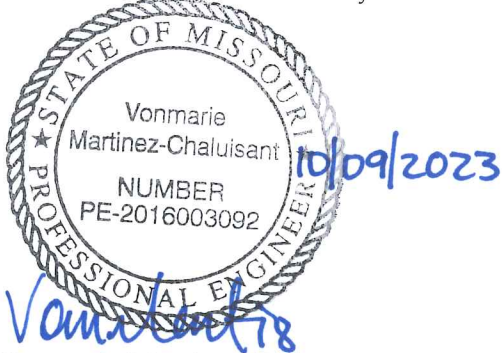
Exhibit 1 Additional Explorations

Sincerely,

SHANNON & WILSON

Professional Engineering Corporation

Missouri Certificate of Authority #000413



Vonmarie Martinez, P.E.
Senior Professional II

VMC:PMK:TJA/tad