

Ecological No Net Loss Assessment Report

Prepared for

**Eckhard Evers Residence
4456 Ferncroft Road
Mercer Island, WA 98040**

Prepared by



**Northwest Environmental Consulting, LLC
600 North 36th Street, Suite 425
Seattle, WA 98103
206-234-2520**

July 2022

Revised September 2023

Purpose

The purpose of this report is to fulfill the requirements of City of Mercer Island Municipal Code (MICC) Shoreline Master Program by assessing overall project impacts and proposed mitigation to determine if the project meets the “No Net Loss” General Regulation of the Shoreline Master Program.

No Net Loss is defined as “An ecological concept whereby conservation losses in one geographic or otherwise defined area are equaled by conservation gains in function in another area.”

Permits are being applied for a dock repair and reconfiguration and removal of existing boat lifts. The report includes analysis of a double personal watercraft lift (PWC) that was installed without permits.

Location

The subject property is located at 4456 Ferncroft Road (King County parcel number 8106100105) in the City of Mercer Island, Washington (see Appendix A – Sheet A1.0). The parcel is on the waterfront of Lake Washington, a shoreline of the state, that contains several endangered fish species listed under the Endangered Species Act and Washington State designated priority fish species.

Project Description

The work on the dock will include repairing and reconfiguring the existing dock and pile repair. The existing dock will be removed and reconstructed. The work will include narrowing the dock within the first 30 feet from 6 feet wide to 4 feet wide. The finger pier and ell will be removed on the north side of the dock and the two existing boat lifts removed. A new finger pier and access pier will be constructed on the south side of the dock. The existing moorage cover and shed will remain and one of the existing lifts. Thirty-seven of the existing timber piles will be replaced with 20 new 8-inch steel piles and 2 4-inch pin piles. Two approximately 12-inch timber mooring piles will be removed and replaced with two 10-inch steel mooring piles. A double personal watercraft lift was installed about 50 feet from shore and is also being included in this analysis for retroactive permitting.

The reconfiguration in the first 30 feet of the shoreline will include removal of existing concrete stairs and concrete groin as mitigation. The existing wood decking will be replaced with thruflow grated decking on existing and new decked areas. Project drawings are included in Attachment A.

During construction, a floating boom will surround the work barge and dock. (See Appendix A – Sheets A6.0)

A shoreline vegetation plan is proposed, that will add two native conifer trees and 3 native deciduous shrubs. These shoreline plantings will provide shade and allow allochthonous material to enter the lake along the shoreline and improve shoreline conditions (see Appendix A – Planting Plan).

Approach

Northwest Environmental Consulting LLC (NVEC) biologist Brad Thiele conducted a site visit on June 3, 2022 to evaluate conditions on site and adjacent to the site. NVEC also consulted the following sources for information on potential critical fish and wildlife habitat along this shoreline:

- Washington Department of Fish and Wildlife (WDFW): Priority Habitats and Species online database (<http://apps.wdfw.wa.gov/phsontheweb/>)
- WDFW SalmonScape online database of fish distribution and ESA listing units (<https://apps.wdfw.wa.gov/salmonscape/>)
- Mercer Island GIS online database (<https://chgis1.mercergov.org/Html5Viewer/Index.html?viewer=PubMaps&viewer=PubMaps>)

Site Description

The subject property is a shoreline tract in a residential neighborhood. It has shoreline on its northern boundary with single-family homes to the north and south along the shoreline and waterward of the parcel.

The only existing structures on the property are the house, and the existing wood decked dock.

The shoreline is landscaped with lawn to ornamental beds along the landward side of the bulkhead. Vegetation includes azaleas, boxwoods, hydrangeas, and groundcovers. The bulkhead is concrete and has steps down to the beach. The substrates are sand and gravel along the shore shifting with cobble mixing in about 20 feet from shore. Milfoil is present about 75 feet from the shore.

The neighboring properties are similar in shoreline conditions and have docks. See attached photos.

Species Use

WDFW's PHS mapping and SalmonScape mapping tools show the following salmonid species using Lake Washington for migration and/or rearing: residential coastal cutthroat (*Oncorhynchus clarkii*), winter steelhead (*O. mykiss*), Dolly Varden/bull trout (*Salvelinus malma*), sockeye salmon (*O. nerka*), fall Chinook (*O. tshawytscha*), coho salmon (*O. kisutch*), and kokanee (*O. nerka*). The SalmonScape database maps the site as accessible to the Endangered Species Units (ESU) of Threatened Chinook and steelhead. Juveniles migrate and may rear in the waters near the project when traveling from spawning sites on other lake tributaries to the lake's outlet at the Hiram M. Chittenden Locks. The project site is accessible to any fish migrating or rearing in the lake. The shoreline is mapped as a sockeye salmon spawning location.

Priority Habitats and Species mapping does not list any priority species or habitats within 1,000 feet of the project other than Lake Washington as mentioned above.

The Mercer Island GIS does not show any environmental layers at the location.

Project Impacts and Conservation Measurements

Direct Impacts:

Sediments: Sediment disturbance will occur below the OHWM and along the shoreline of Lake Washington during pile installation, removal of boat lifts and docks, and construction of new docks and double personal water craft lift. Additionally, the tug and barge propwash may disturb sediments temporarily when making trips to/from the site.

Impacts to sediments should be minimal from installation of the pilings and lifts and are expected to stay within State Water Quality Standards.

Removal of the concrete groin and steps has the potential to create a sediment plume. A floating silt fence will surround the work area and prevent and suspended solids from leaving the area.

The boat lift is in the deepest water possible on the site so that disturbance from castoff and docking will be minimized. The personal watercraft are shallow draft and are not usually a source of prop wash during castoff and docking and operation of the new double PWC will not be likely to be a source of significant turbidity.

Shoreline: Planting additional native vegetation, especially a native cedar tree and native willow trees, will increase the habitat functions of the shoreline by creating shade along the shoreline that will be an improvement from the existing baseline habitat conditions at the project site. These plants will provide overhanging cover for fish, structural diversity for birds and wildlife, detritus for aquatic invertebrates and long-term recruitment of woody material and other allochthonous food sources. The proposed planting plan is included (see Appendix A – Planting Plan).

Lakebed: Installation of 20 new 8-inch diameter piles and 2 10-inch steel mooring piles will displace 8.1 square feet of lakebed. The removal of 37 12-inch timber piles will restore 29 square feet of lakebed resulting restoration of 21 square feet of lakebed.

Noise: Construction equipment will create noise audible to neighbors and in-water. Noise disturbance will be short-term and should have negligible effects on fish and wildlife in the area. Work will be completed during the in-water work window when juvenile fish are not expected to be present.

Potential spills: Short-term risks include the potential for petroleum spills that can occur with any equipment operation. The level of impact to the aquatic environment is expected to be reduced because a crew competent using spill containment measures will be on site and employ these measures should a spill occur.

Indirect Impacts:

Shading: The proposed decking will be ThruFlow grated decking. Grated decking allows more light to penetrate the waters below a dock, which can increase productivity in the water column, and reduce the full shade favored by salmonid predators. Salmonid predators are known to use

hard shadowing under solid-decked docks to ambush juvenile salmonids. Reducing these hard shadows limits their ability to effectively hunt salmonids.

ThruFlow grated decking has measured performance at 43 percent light penetration (ThruFlow, 2021). Thus, the increase in lighting under the pier is effectively 57% of the area of a solid decked structure.

The existing 1,383 square-foot wood deck will be replaced with ThruFlow grated decking. The dock will also be narrowed within the first 30 feet of the shoreline reducing the main dock by 49.4 square feet. The existing 311 square-foot finger pier and ell on the north side of the dock will be removed and a new 300-square-foot finger/access pier will be constructed on the south side of the dock removing an additional 11 square feet of overwater coverage resulting in a reduction of 60.4 square feet of overwater coverage. Using ThruFlow decking will reduce the effective overwater coverage at the site by 763 square feet.

The personal watercraft lifts include a catwalk made of grated decking. The walkway adds about 14 square feet of overwater coverage and is fully grated. The personal watercraft walkway will therefore add about 8 square feet of effective overwater coverage. With the reduction in 49.4 square feet of overwater coverage within 30 feet of shore and 11 square feet at the end of the dock, the net reduction with the personal watercraft will be 46.4 square feet.

In addition, reducing the overwater coverage within the first 30 feet of shoreline may reduce salmon outmigration times. Juvenile salmon follow the shoreline and overwater coverage may cause them to hesitate before passing under the structure.

The personal watercraft lift will keep the craft out of the water when not in use. The footprint of these watercraft is small and lifting them above the water will allow light underneath.

Recreational Boating: The project supports continued recreational boating, which has been identified as a limiting factor for salmonid populations in Lake Washington. The pier will not introduce additional boating to Lake Washington, as the owners could still access the lake from a public boat launch or private moorage facility.

Other Conservation measures:

Work window: The work will be completed during the prescribed in-water work window for this area of Lake Washington (July 16 to April 30). Operating within this time frame helps protect Chinook salmon, steelhead, bull trout and other salmonid fish species by doing work when juvenile fish are not expected to be present.

Best Management Practices: Applicable BMPs will be used, such as a floating boom around the in-water work area, to contain any floating debris that may escape during construction. The barge will have a perimeter containment sock to absorb oil and grease that might inadvertently wash from the barge during construction. A silt curtain will be installed around the shoreline during removal of existing concrete to prevent turbidity from leaving the work area.

Hazardous material containment materials such as spill absorbent pads and trained personnel will be required onsite during any phase of construction where machinery is in operation near surface waters.

Conclusion

Juvenile Chinook salmon, and other salmonids, rear and migrate along the Lake Washington shoreline.

There will be temporary impacts from noise and disturbed sediments during construction. The new personal watercraft lift will be set on the bottom and minimally disturbs the lakebed. The project will improve shoreline conditions by removing approximately 115 (SF) of concrete from the shoreline. The concrete groin modifies beach flows and acts as a barrier to juvenile fish migration.

The reconfiguration of the dock and addition of the personal watercraft lift will result in a decrease in overwater coverage by 46 square feet, in addition narrowing the dock within 30 feet of shore may reduce the occurrence of juvenile salmonid from hesitating to pass under the dock increasing outmigration times. The new dock surface and PWC lift catwalk will be grated with Thru-flow decking resulting in a decrease of 763 square feet of effective overwater coverage. The project will also result in net decrease of 17 pilings and restore 21 square feet of lakebed. The grating reduces the hard shadows favored by salmonid predators and increases productivity under the pier. Two boat lifts will be removed from the site.

Using the lifts is less impacting than leaving the personal watercraft moored to the dock. The personal watercraft lift will keep the craft out of the water when not in use which will allow light under the personal watercraft and reduce maintenance that can result in cleaners and other solvents from being washed into the water. The lift itself is made of tubing and has a minimal footprint.

A shoreline planting plan will be implemented and will add 2 native trees and 3 shrubs to the shoreline that will provide natural shading, allochthonous food sources and will eventually be a source of woody materials and will improve shoreline conditions at the site in the long-term to offset temporary construction impacts.

The project will minimize construction effects on the environment by following the prescribed fish window and using applicable BMPs to prevent construction spills, turbidity, and floating debris from escaping the area. The construction crew will retrieve all dropped items from the bottom and dispose of them properly.

This project has been designed to meet current residential dock standards and will use Best Management Practices to reduce project impacts. The conservation measures are designed to improve ecological functions or prevent further degradation of habitat **and will result in No Net Loss of ecological functions**. Removal of the groin and effective overwater coverage, coupled with the planting plan **will result increased ecological functions** as the site.

Document Preparers

Brad Thiele

Biologist

29 years of experience

Northwest Environmental
Consulting, LLC (NVEC)

The conclusions and findings in this report are based on field observations and measurements and represent our best professional judgment and to some extent rely on other professional service firms and available site information. Within the limitations of project scope, budget, and seasonal variations, we believe the information provided herein is accurate and true to the best of our knowledge. Northwest Environmental Consulting does not warrant any assumptions or conclusions not expressly made in this report, or based on information or analyses other than what is included herein.

REFERENCES

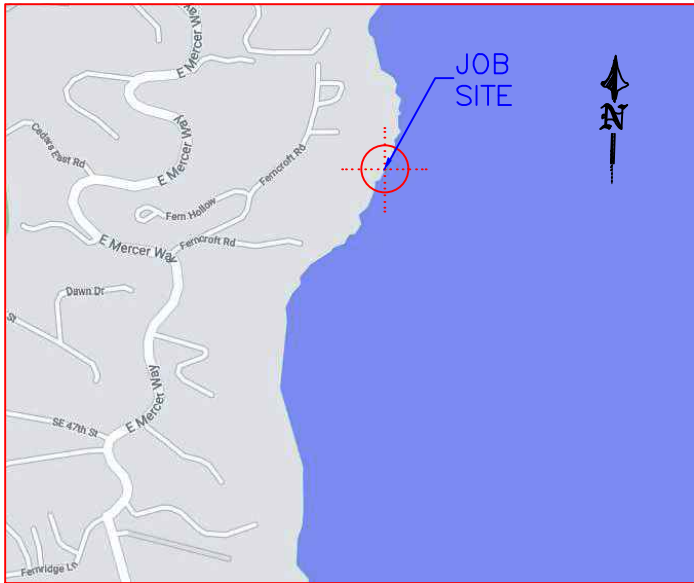
King County. 2022. King County iMap. Online database. Accessed June 2022 at <https://gismaps.kingcounty.gov/iMap/>

Washington Department of Fish and Wildlife (WDFW). 2022. Priority Habitats and Species. Online database. Accessed April 2021 at <http://apps.wdfw.wa.gov/phsontheweb/>

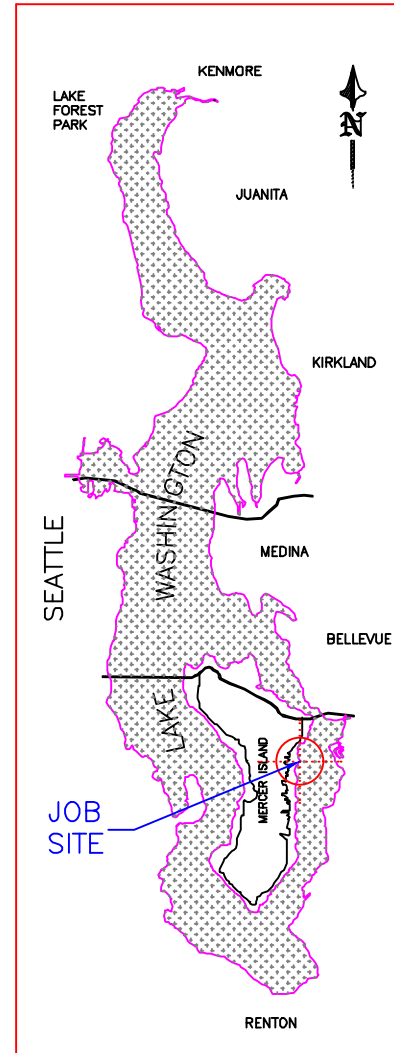
WDFW. 2022. SalmonScape. Online database. Accessed June 2022 at <http://apps.wdfw.wa.gov/salmonscape/>

Appendix A: Project Drawings

VICINITY MAP/NO SCALE



AREA MAP/NO SCALE



LEGAL DESCRIPTION

SECTION: SE-18-24-05 LAT: 47.565560 (47° 33' 56.016" N)
 TAXLOT #: 004610-0453 LONG: -122.208440 (122° 12' 30.384" W)

ADAMS LAKE WASHINGTON TRS POR OF N 22.12 FT OF 6 & OF S 17.88 FT OF 5 E OF LN RNNG N 00 DEG 43 MIN 30 SEC W FR PT ON S LN SD POR OF 6 314.41 FT E OF C/L OF PRIVATE RD & SH LDS ADJ & POR OF S 20 FT OF N 42.12 FT OF 6 E OF LN RNNG S 00 DEG 43 MIN 30 SEC E FR PT ON N LN SD S 20 FT 285.41 FT E OF C/L OF PRIVATE RD SH LDS ADJ

REVISED
09/07/2023

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ADJACENT OWNERS:

- ① ERIKA ONEIL
4452 FERNCROFT ROAD
MERCER ISLAND, WA 98040
- ② LAWRENCE HILE
4508 FERNCROFT ROAD
MERCER ISLAND, WA 98040

APPLICATION#:

PROPOSED: PIER REPAIR

PURPOSE: RESTORE STRUCTURAL INTEGRITY

DATUM: C.O.E. MLLW=0.0'

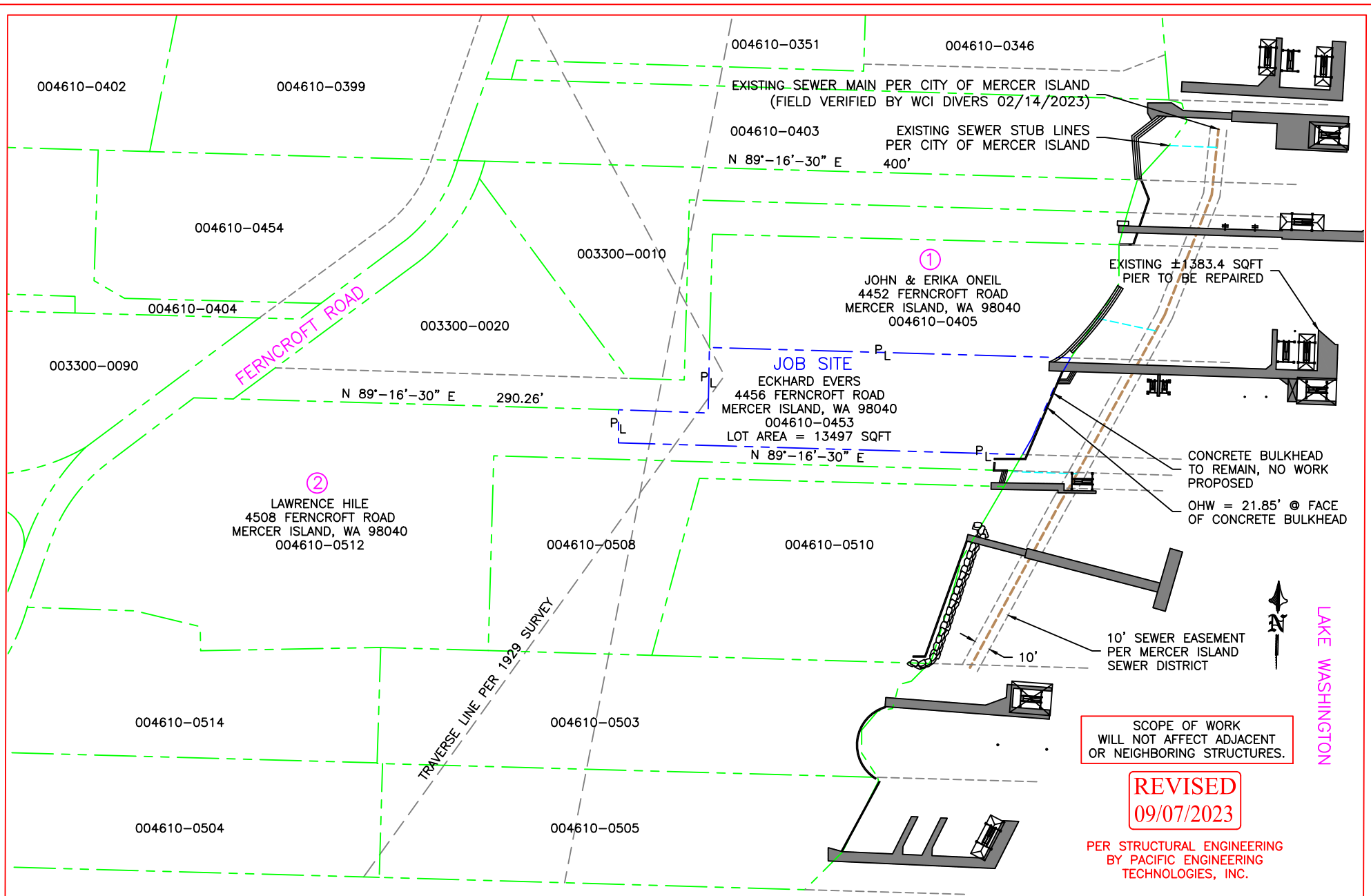
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APPLICANT: ECKHARD EVERS

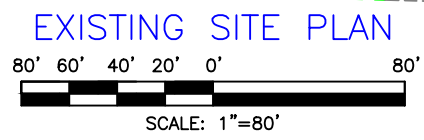
SITE ADD. 4456 FERNCROFT ROAD
MERCER ISLAND, WA 98040

MAIL ADD. (SAME AS ABOVE)

PAGE: 1 OF: 14 DATE: 06/28/2022



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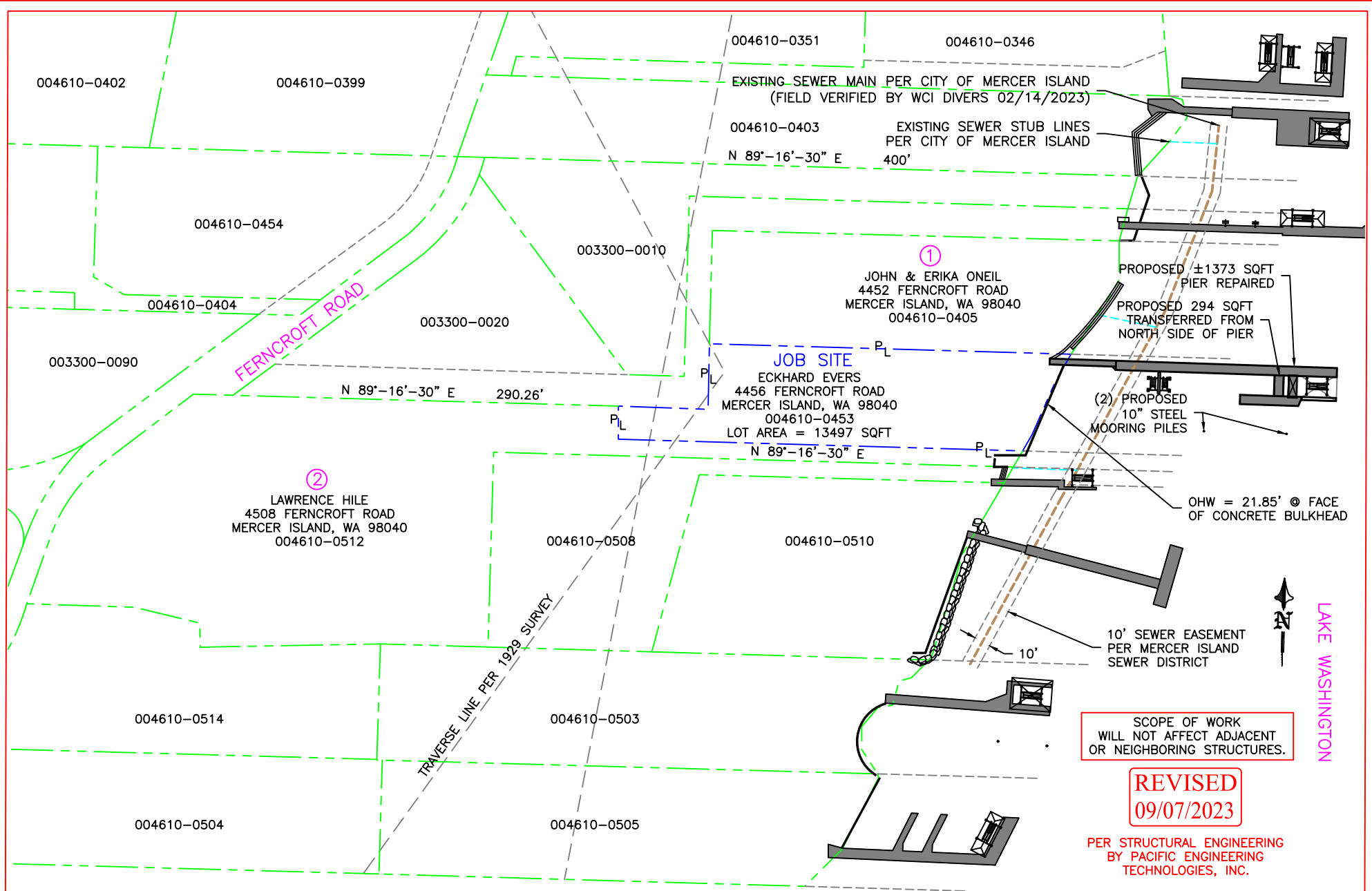


SCOPE OF WORK WILL NOT AFFECT ADJACENT OR NEIGHBORING STRUCTURES.

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DATE: 06/28/2022	DWG#: 21-32061-A6-2	



FERNCROFT ROAD

LAKE WASHINGTON

EXISTING SEWER MAIN PER CITY OF MERCER ISLAND
(FIELD VERIFIED BY WCI DIVERS 02/14/2023)

EXISTING SEWER STUB LINES
PER CITY OF MERCER ISLAND
N 89°-16'-30" E 400'

①
JOHN & ERIKA ONEIL
4452 FERNCROFT ROAD
MERCER ISLAND, WA 98040
004610-0405

JOB SITE
ECKHARD EVERS
4456 FERNCROFT ROAD
MERCER ISLAND, WA 98040
004610-0453
LOT AREA = 13497 SQFT
N 89°-16'-30" E

②
LAWRENCE HILE
4508 FERNCROFT ROAD
MERCER ISLAND, WA 98040
004610-0512

PROPOSED ±1373 SQFT
PIER REPAIRED

PROPOSED 294 SQFT
TRANSFERRED FROM
NORTH SIDE OF PIER

(2) PROPOSED
10" STEEL
MOORING PILES

OHW = 21.85' @ FACE
OF CONCRETE BULKHEAD

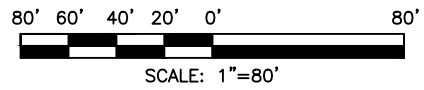
10' SEWER EASEMENT
PER MERCER ISLAND
SEWER DISTRICT

SCOPE OF WORK
WILL NOT AFFECT ADJACENT
OR NEIGHBORING STRUCTURES.

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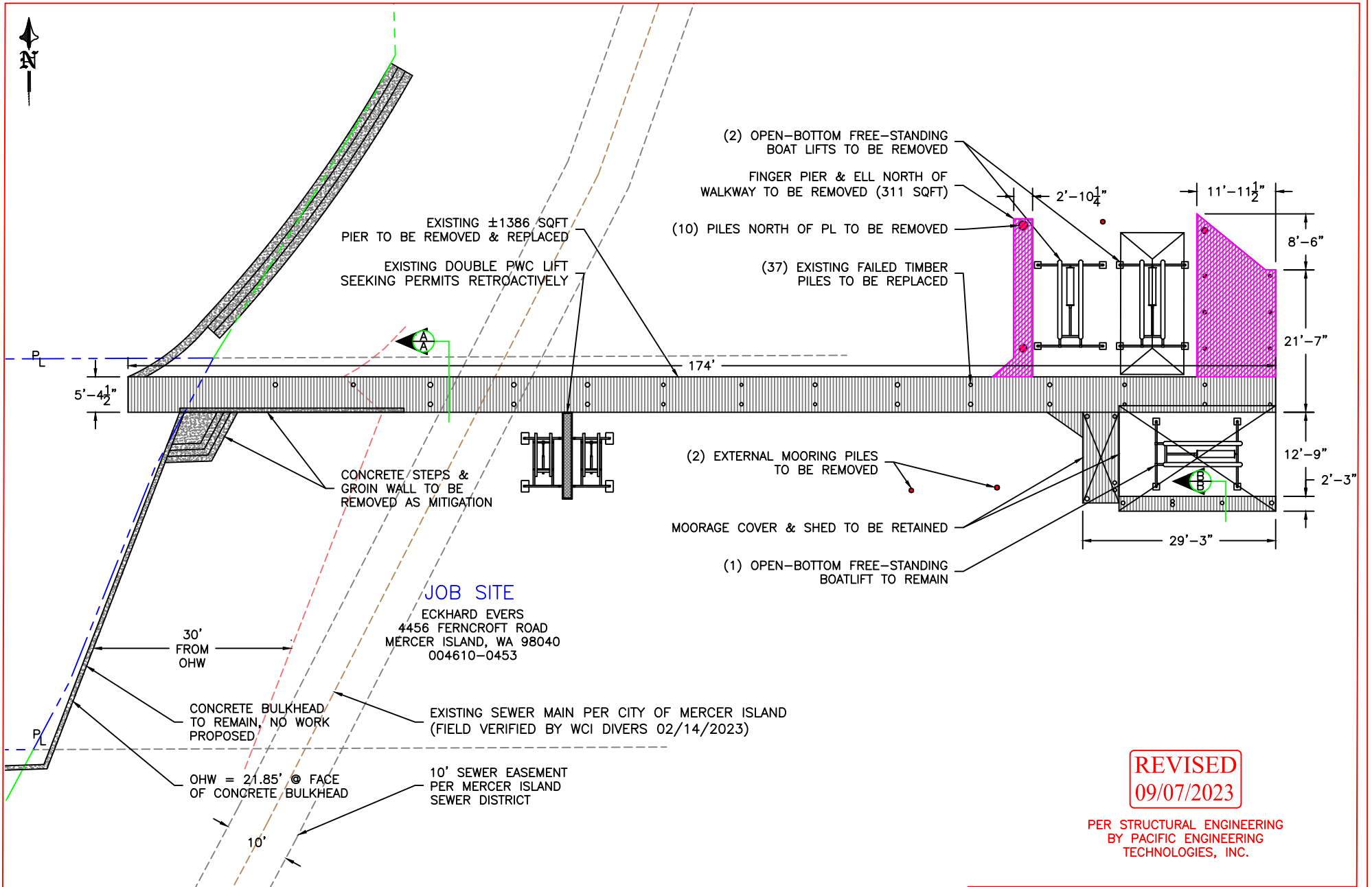
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PROPOSED SITE PLAN



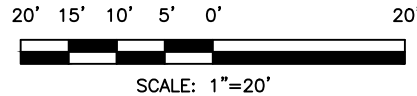
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EXISTING SITE PLAN DETAIL



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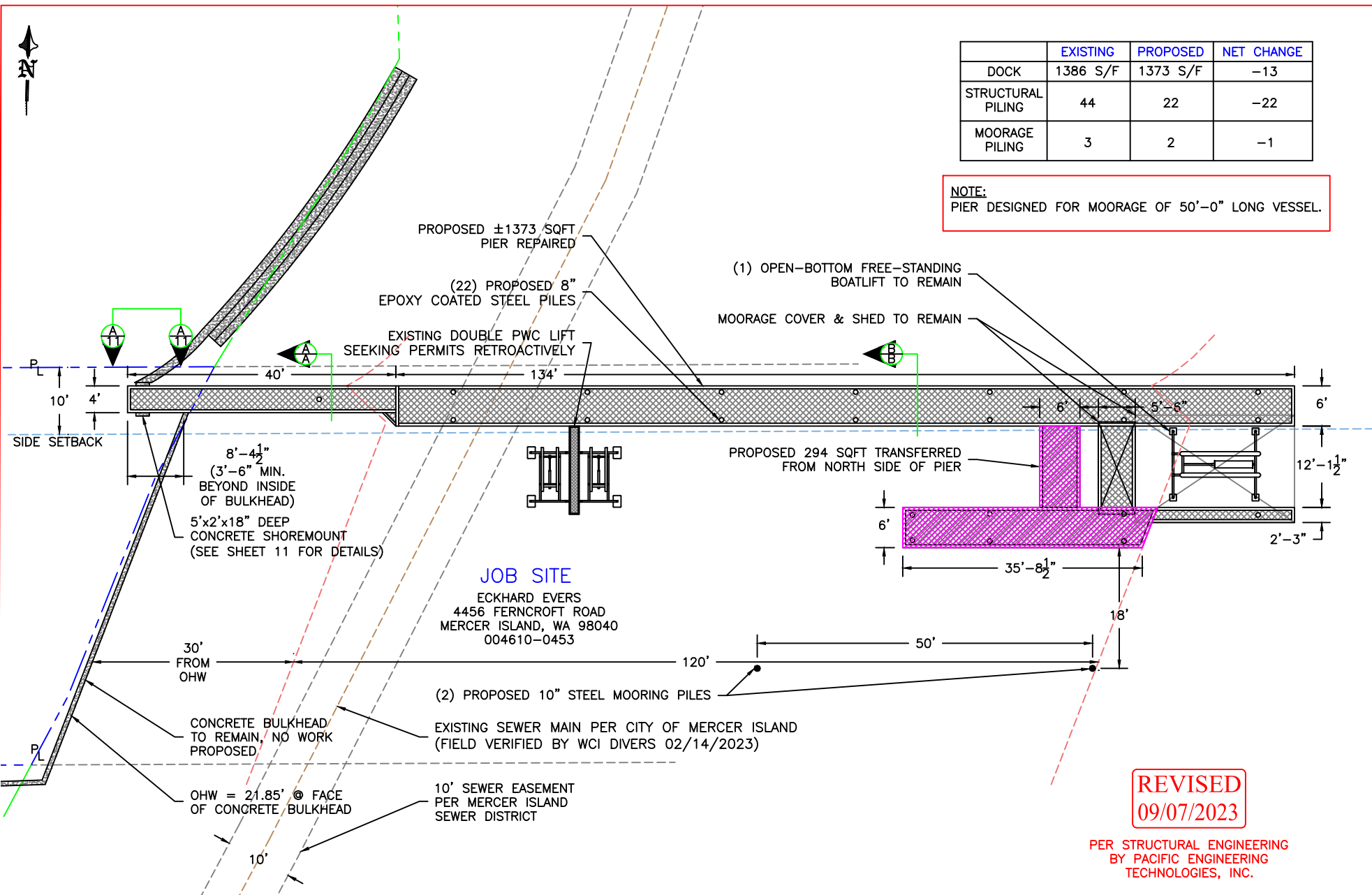
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	EXISTING	PROPOSED	NET CHANGE
DOCK	1386 S/F	1373 S/F	-13
STRUCTURAL PILING	44	22	-22
MOORAGE PILING	3	2	-1

NOTE:
PIER DESIGNED FOR MOORAGE OF 50'-0" LONG VESSEL.



JOB SITE
ECKHARD EVERS
4456 FERNCROFT ROAD
MERCER ISLAND, WA 98040
004610-0453

PROPOSED SITE PLAN DETAIL

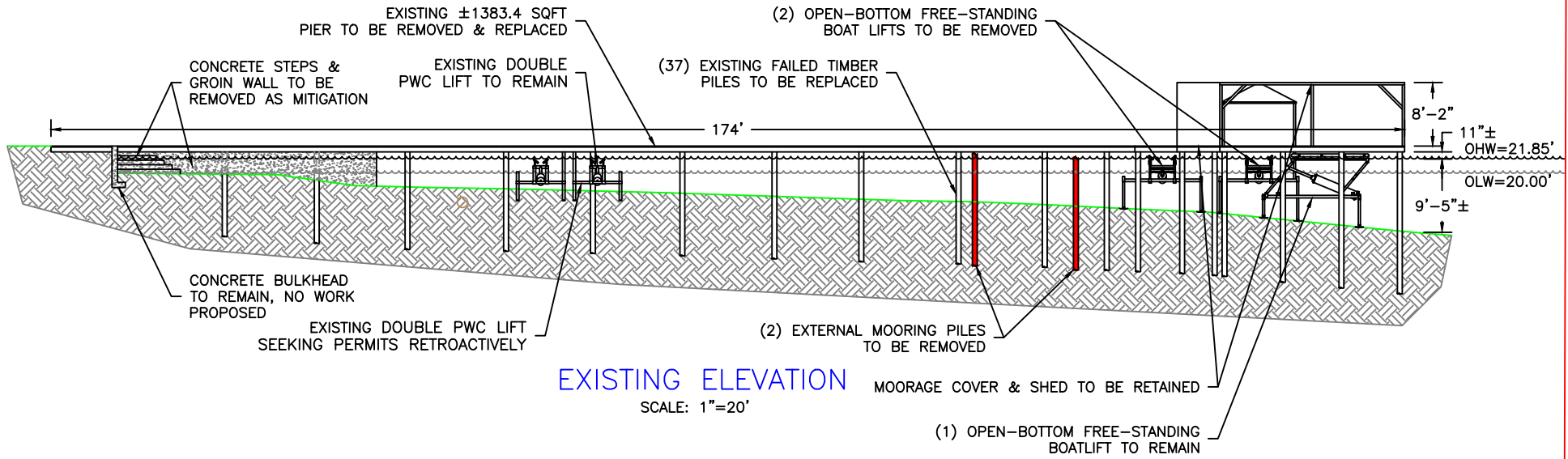


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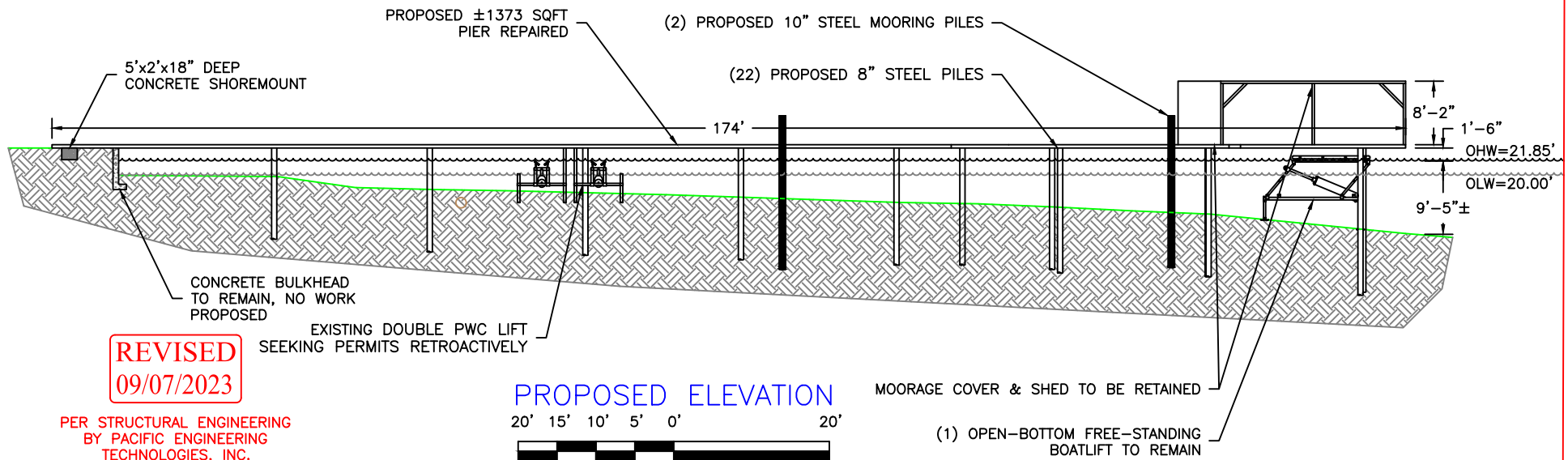
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DWG#: 21-32061-A6-5	



EXISTING ELEVATION

SCALE: 1"=20'



PROPOSED ELEVATION

20' 15' 10' 5' 0' 20'



SCALE: 1"=20'

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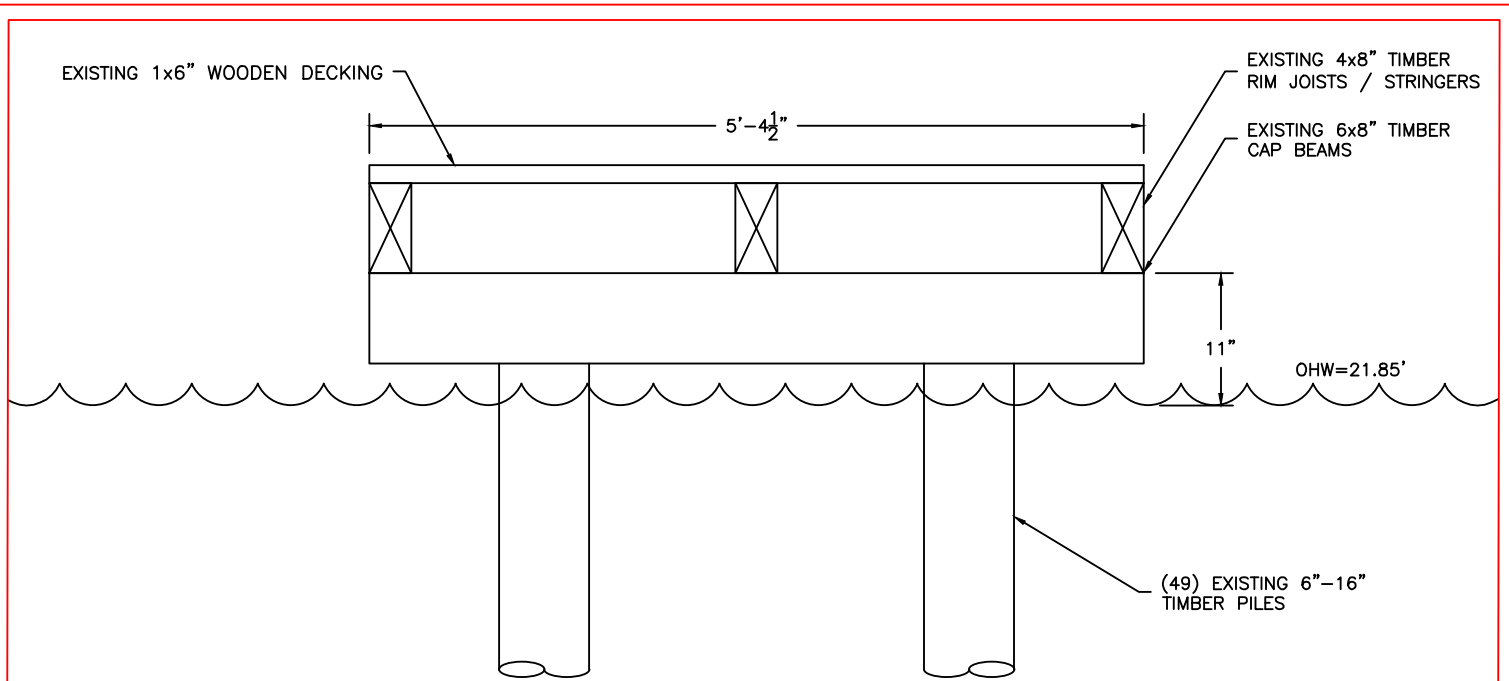
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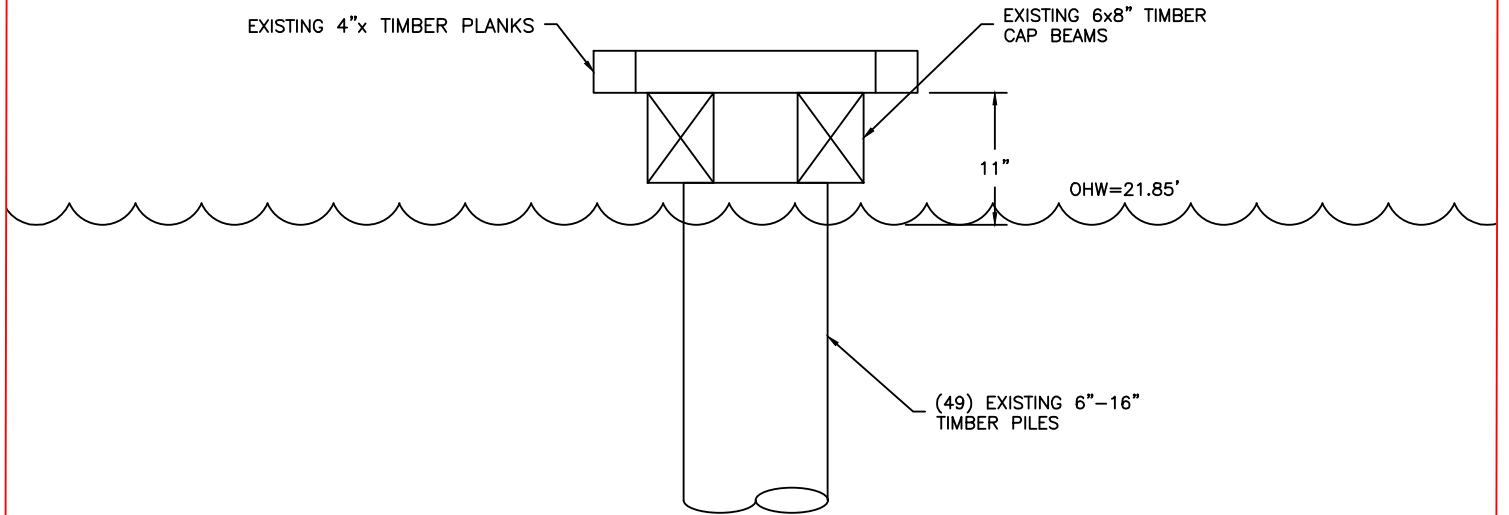
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EXISTING SECTION A-A
SCALE: 3/4"=1'



EXISTING SECTION B-B
SCALE: 3/4"=1'

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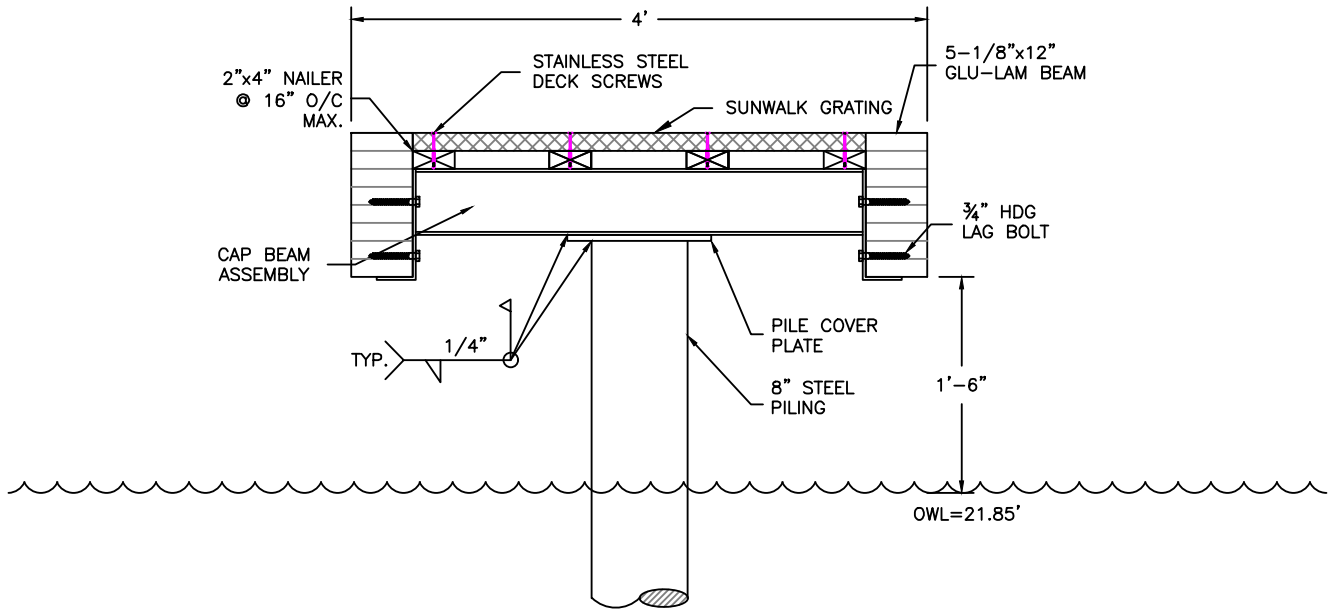
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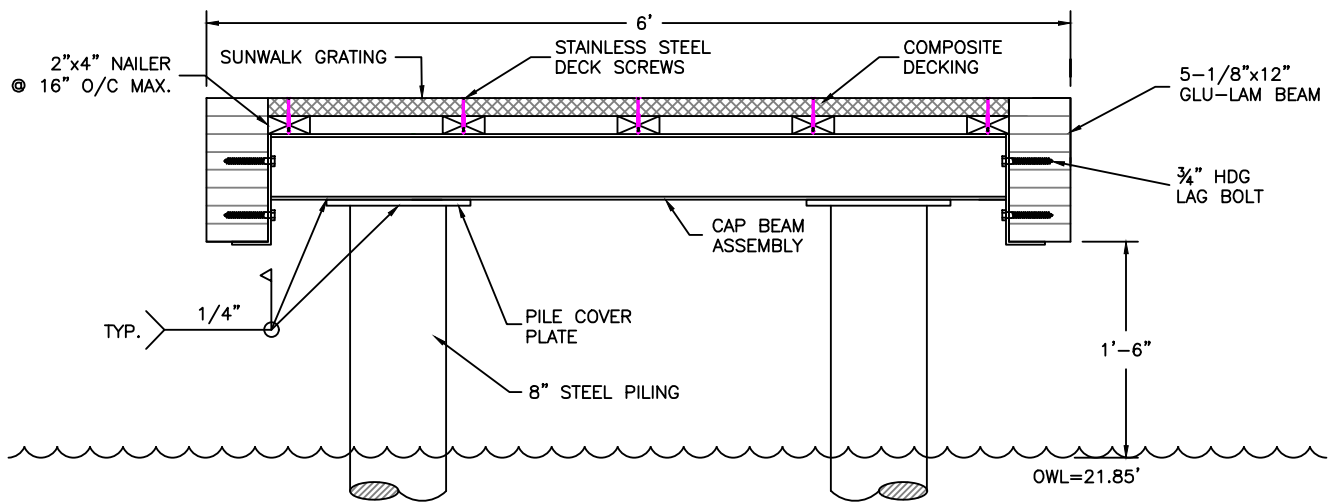
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PROPOSED SECTION A-A
SCALE: 3/4"=1'



PROPOSED SECTION B-B
12" 6" 3" 0' 1'
SCALE: 3/4"=1'

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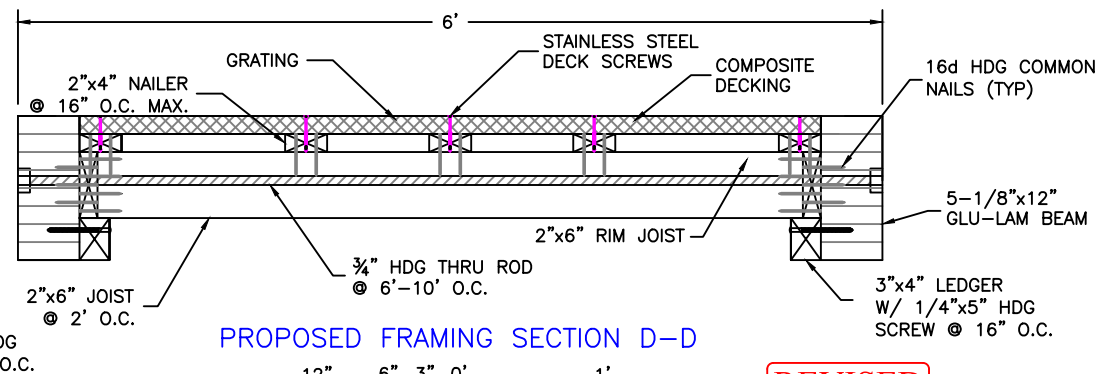
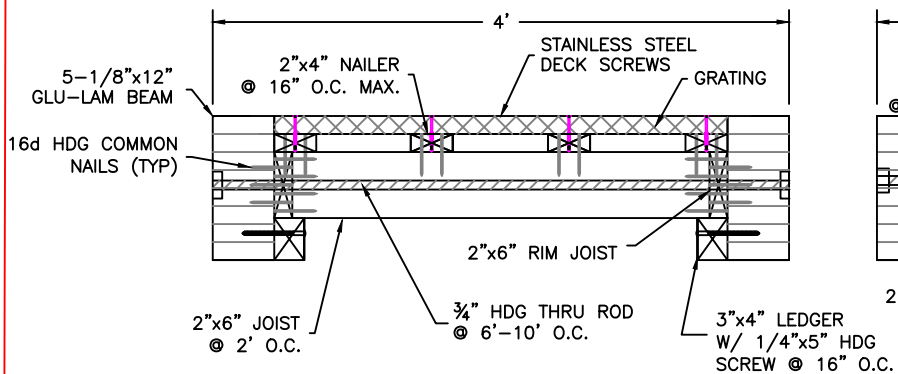
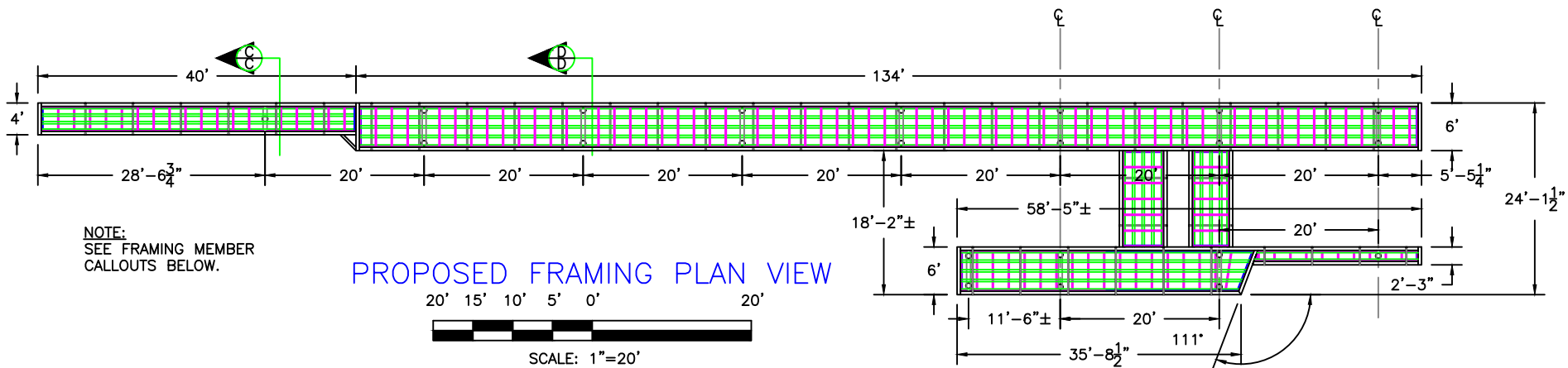
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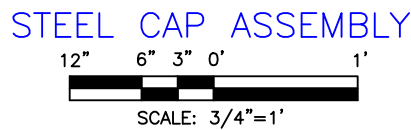
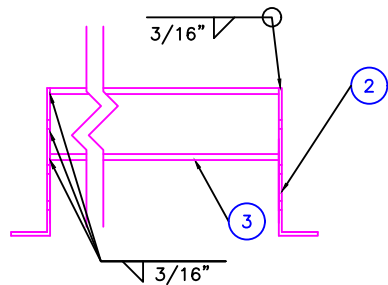
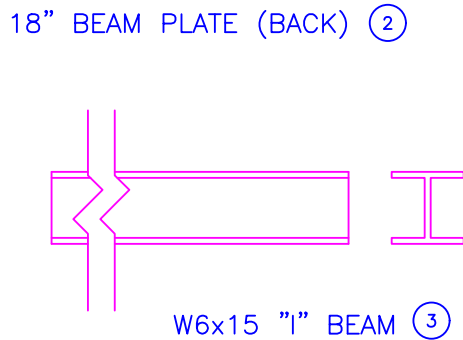
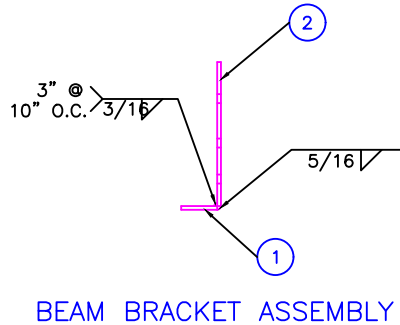
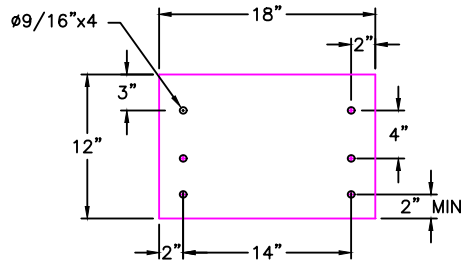
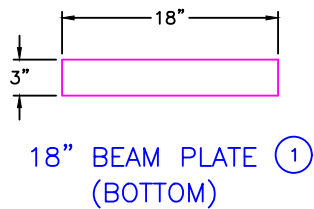
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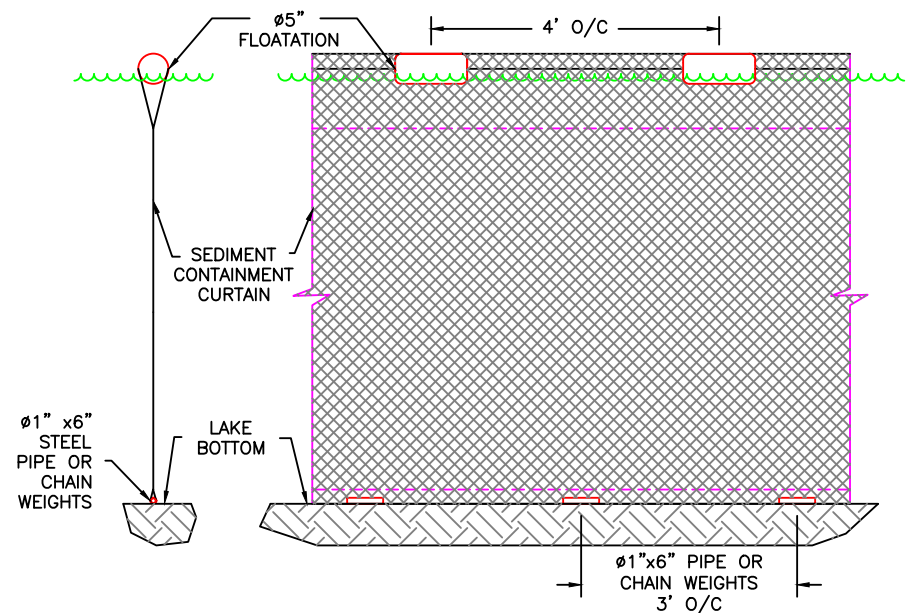
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REFERENCE #:		
APPLICANT: ECKHARD EVERS		
PROPOSED: PIER REPAIR		
SHEET: 9	OF: 14	NEAR/AT: MERCER ISLAND
DATE: 06/28/2022	DWG#: 21-32061-A6-9	



REVISED
09/07/2023

PER STRUCTURAL ENGINEERING
BY PACIFIC ENGINEERING
TECHNOLOGIES, INC.



MATERIAL LIST

PART	SPECS	TREATMENT
NAILERS	2"x4" DF #2 OR BTR	ACZA
LEDGERS	3"x4" DF #2 OR BTR	ACZA
GRATING	MOLDED PLASTIC	NONE
HARDWARE	STEEL	STAINLESS OR HDG.
PILING	X-STRONG 4", 8" & 10"	EPOXY-COATED
CAPS	W6x15 "1" BEAM	GALVANIZED
GLU-LAMS	5 1/8"x12" DF	ACZA
JOIST	2"x6" DF #2 OR BTR	ACZA
RIM JOIST	2"x6" DF #2 OR BTR	ACZA

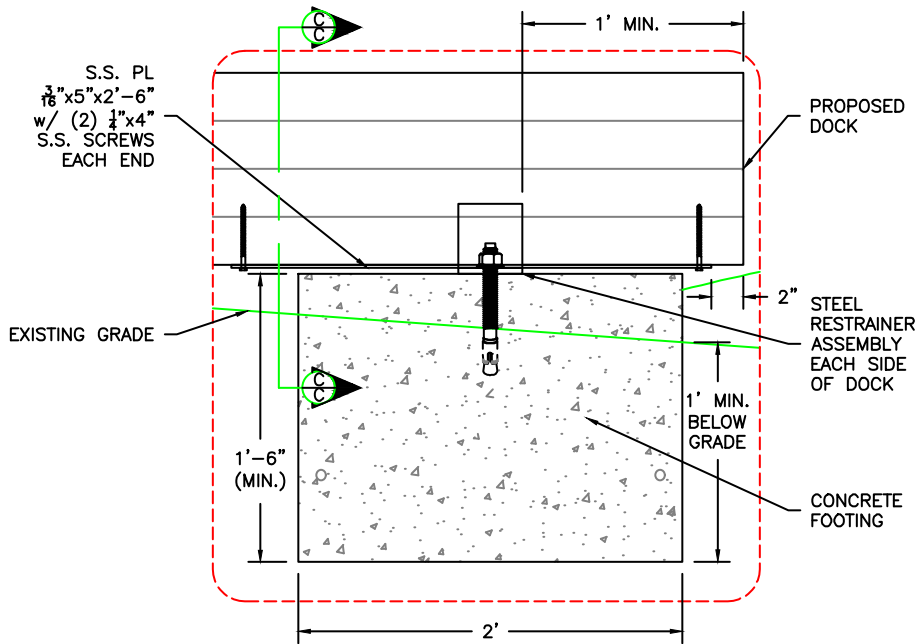
PART #	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION
3	W6x15 "1" BEAM	6" 15 LB PER FOOT I-BEAM
2	18" BACK BEAM PLATE	18"x18"x5/16" STEEL PLATE
1	18" BOTTOM BEAM PLATE	18"x3"x5/16" STEEL PLATE

PROJECT DESIGNED BY:

Waterfront Construction Inc.

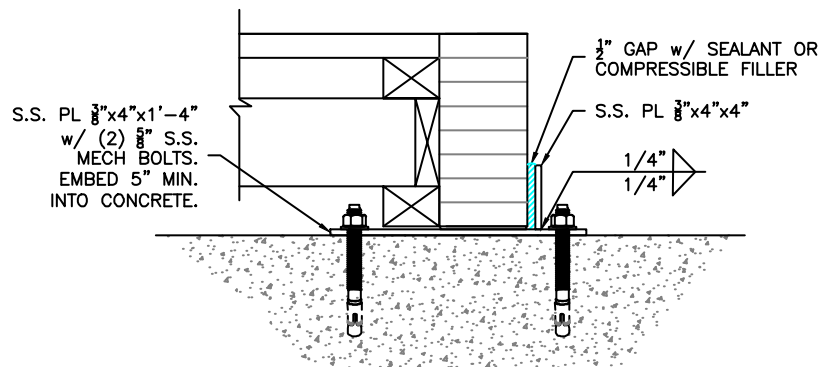
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REFERENCE #:	
APPLICANT: ECKHARD EVERS	
PROPOSED: PIER REPAIR	
SHEET: 10	OF: 14
NEAR/AT: MERCER ISLAND	
DATE: 06/28/2022	DWG#: 21-32061-A6-10

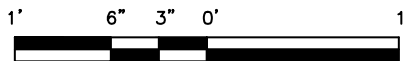


PIER TO CONC. SHOREMOUNT: A-11

SCALE: 1"=1'



SECTION C-C



SCALE: 1"=1'

REVISED
09/07/2023

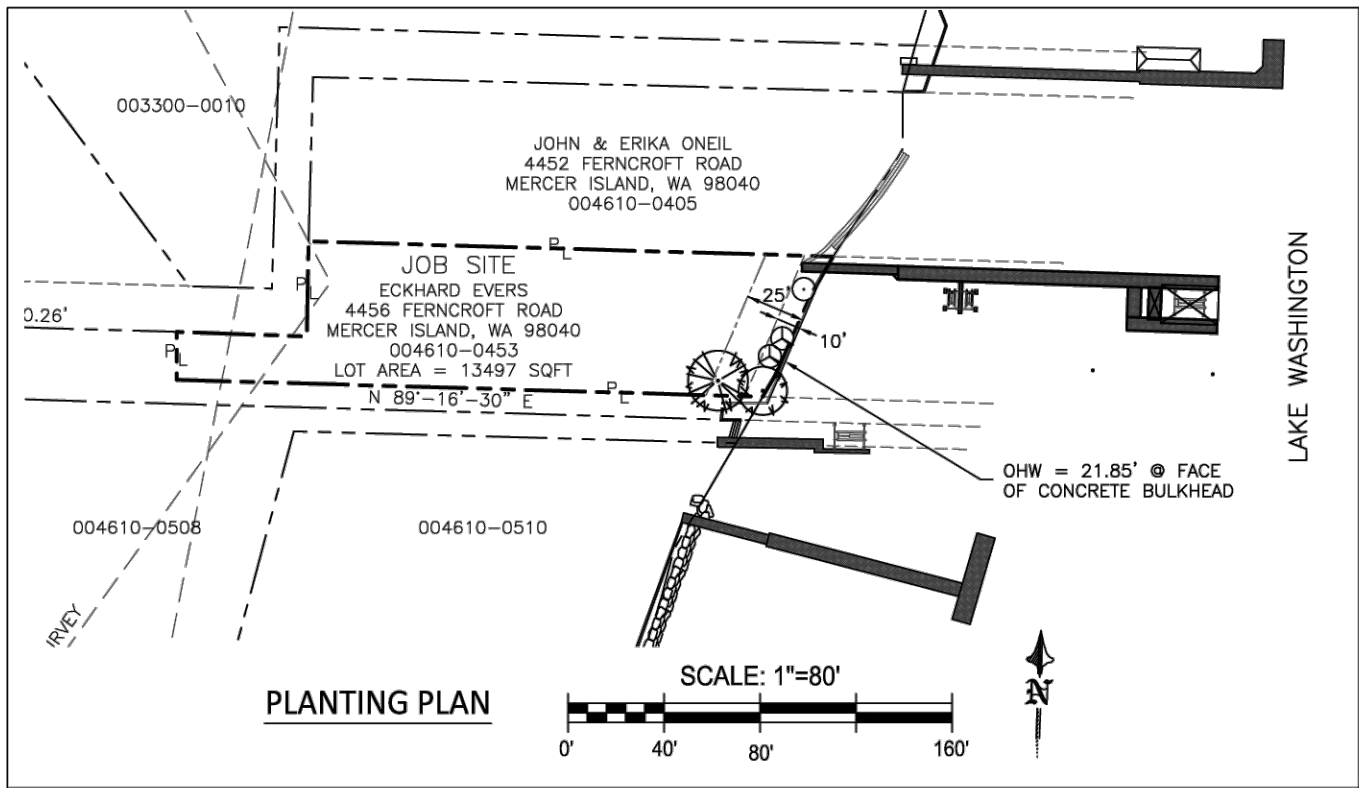
PER STRUCTURAL ENGINEERING
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PROJECT DESIGNED BY:

Waterfront Construction Inc.

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APPLICANT: ECKHARD EVERS		
PROPOSED: PIER REPAIR		
SHEET: 11	OF: 14	NEAR/AT: MERCER ISLAND
DATE: 06/28/2022	DWG #: 21-32061-A6-11	



PLANTING PLAN

PLANTING NOTES:

1. REMOVE ALL HIMALAYAN BLACKBERRY, JAPANESE KNOTWEED, BAMBOO, AND ENGLISH IVY FROM PLANTING AREA USING KING COUNTY RECOMMENDATIONS. RETAIN AND PROTECT ALL EXISTING NATIVE VEGETATION.
2. PLANT MATERIAL SHALL BE LOCALLY GROWN (PUGET SOUND REGION) AND CONFORM TO THE MOST RECENT ANLA STANDARDS. THE OWNER RESERVES THE RIGHT TO REFUSE ANY AND ALL PLANT MATERIAL THAT DOES NOT MEET STANDARDS.
3. PLANT LOCATIONS ARE SCHEMATIC AND MAY NEED ADJUSTMENT TO MEET ACTUAL FIELD CONDITIONS. WHEN A CONFLICT WITH FIELD CONDITIONS OCCURS CONSULT WITH THE PROJECT BIOLOGIST. MAINTAIN A MINIMUM OF 2 FEET FROM EXISTING SHRUBS, AND 3 FEET FROM EXISTING TREES.

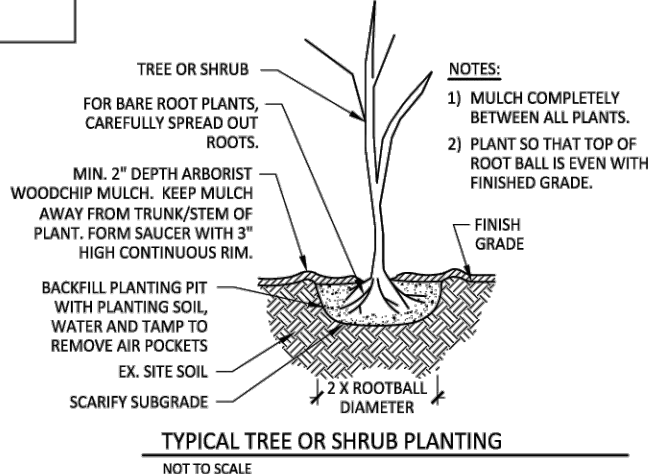
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09/07/2023

PER STRUCTURAL ENGINEERING
BY PACIFIC ENGINEERING
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PLANT SCHEDULE					
Symbol	Common Name	Scientific Name	Size	Condition	Qty
	Douglas Fir	<i>Pseudotsuga menziesii</i>	6'-8' height	Bare root or container	1
	Shore Pine	<i>Pinus contorta</i>	6'-8' height	Bare root or container	1
	Red Elderberry	<i>Sambucus racemosa</i>	#2	Container	1
	Red Flowering Current	<i>Ribes sanguineum</i>	#2	Container	2
				Total Trees:	2
				Total Shrubs:	3
				Total Plants:	5

PLANTING SEQUENCE:

1. PLANTING AREA SHALL BE PLANTED WITH THE SPECIES INDICATED IN THE PLANTING SCHEDULE. DIG A HOLE FOR EACH PLANT THAT IS TWICE THE SIZE OF THE ROOT BALL OR PLANT CONTAINER. REMOVE LARGE ROCKS AND OTHER DEBRIS INCLUDING ROOTS FROM PIT. SOAK PIT WITH WATER BEFORE PLANTING. BARK MULCH SHOULD NOT BE USED TO BACKFILL THE PLANTING HOLE.
2. PULL BACK MULCH FROM PLANTINGS TO CREATE A MULCH RING AROUND PLANTS.
3. PLANTINGS SHOULD BE WATERED THROUGHOUT THE SUMMER MONTHS IF DROUGHT CONDITIONS OCCUR.
4. TWO 5-GALLON BUCKETS OF ARBORIST CHIPS OR MULCH SHALL BE PLACED AROUND EACH PLANTING.



TYPICAL TREE OR SHRUB PLANTING

NOT TO SCALE

PROJECT DESIGNED BY:



3639 PALATINE AVE N
SEATTLE, WA 98103
206-634-9193

REFERENCE #:	
APPLICANT:	ECKHARD EVERS
PROPOSED:	PIER REPAIR
SHEET:	12 OF 14 NEAR/AT: MERCER ISLAND
DATE:	12/16/2022 DWG#

STRUCTURAL NOTES

CODE:

THE INTERNATIONAL BUILDING CODE (IBC) 2018 EDITION AND THE 2018 INTERNATIONAL EXISTING BUILDING CODE (IEBC), WITH THE STATE OF WASHINGTON AMENDMENTS.

THE 2009 UNIFIED FACILITIES CRITERIA (UFC).

LIVE LOADS:

RESIDENTIAL PIER 40 PSF

LATERAL LOADS (BASED ON ASCE 7):

WIND DESIGN DATA:

WIND SPEED 98 MPH
IMPORTANCE FACTOR I
RISK CATEGORY II
EXPOSURE C
TOPOGRAPHICAL FACTOR 1

FOUNDATION:

BEFORE WORK BEGINS, LOCATE ALL UNDERGROUND UTILITIES BY CONTACTING "CALL BEFORE YOU DIG" AT 1-800-424-5555 OR 811. HOWEVER, THIS SERVICE DOES NOT HAVE A COMPLETE DATABASE OF ALL OBSTRUCTIONS, THEREFORE OTHER LOCATING SERVICES MAY ALSO BE NECESSARY.

EXTEND FOOTINGS TO FIRM UNDISTURBED SOIL OF 1500 PSF BEARING CAPACITY.

STEEL PILING:

8" PILING SHALL BE X-STRONG ASTM A252, GRADE "3" $F_y = 45,000$ PSI
10" PILING SHALL BE STANDARD OR X-STRONG ASTM A252, GRADE "3" $F_y = 45,000$ PSI.

CORROSION PROTECTION TO BE PROVIDED BY OTHERS.

PILE INSTALLATION:

THE PILES SHALL BE DRIVEN TO REFUSAL USING A VIBRATOR OR DIESEL HAMMER. OUR DESIGN ASSUMES THAT THERE IS A LAYER OF SOFT SOIL BELOW THE MUDLINE THAT IS UP TO 20 FEET DEEP THAT IS UNDERLAIN BY DENSE SOIL THAT IS SUFFICIENT FOR BEARING. THE DEPTH OF THIS SOFT SOIL LAYER SHOULD BE MONITORED AND RECORDED TO CONFIRM THAT IT IS NOT MORE THAN 20 FEET THICK. NOTIFY ENGINEER IF THE SOFT SOIL LAYER IS MORE THAN 20 FEET THICK. THE PILES SHALL BE DRIVEN A MINIMUM OF 5 FEET INTO THE DENSE BEARING SOIL. THE DEPTH OF EMBEDMENT INTO THE DENSE BEARING SOIL SHOULD BE MONITORED AND RECORDED TO CONFIRM THAT THE MINIMUM EMBEDMENT IS ACHIEVED. THE TOTAL EMBEDMENT DEPTH SHALL BE 16 FEET MINIMUM. IF THE MINIMUM EMBEDMENTS ARE NOT REACHED, THEN OVERDRIVING OF THE PILES WILL BE NECESSARY.

CONCRETE:

CONCRETE $f'_c = 3,000$ PSI AT 28 DAYS. CONCRETE EXPOSED TO THE WEATHER IS TO BE AIR-ENTRAINED.

CONCRETE PROTECTION FOR REINFORCING SHALL BE AS FOLLOWS:

BOTTOM OF FOOTINGS 3"
CONCRETE EXPOSED TO EARTH & WEATHER (#5 & SMALLER) 1 1/2"

ALL CONCRETE IN FOOTINGS SHALL BE PLACED IN A MONOLITHIC POUR UNLESS SHOWN OTHERWISE OR APPROVED BY THE ENGINEER PRIOR TO PLACING. ALUMINUM CONDUIT AND ACCESSORIES SHALL NOT BE EMBEDDED IN CONCRETE.

REINFORCING STEEL:

DEFORMED BILLET STEEL CONFORMING TO ASTM A615 (STANDARD 04, 2013 CURRENT), GRADE 60.

STRUCTURAL STEEL:

WIDE-FLANGE BEAMS ASTM A992 $F_y = 50,000$ PSI. CHANNELS, ANGLES, AND PLATES ASTM A36 $F_y = 36,000$ PSI. ALL FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF AISC "STEEL CONSTRUCTION MANUAL."

ALL WELDS SHALL BE 3/16" MINIMUM CONTINUOUS FILLET WELDS USING AWS D1.1 CLASS E70 ELECTRODES UNLESS NOTED OTHERWISE. ALL WELDING SHALL BE PERFORMED BY WELDERS CERTIFIED BY WABO.

ALL STEEL SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123. REPAIR ALL SCRAPES, DINGS, WELDS, ETC., IN ACCORDANCE WITH ASTM A780.

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REVISED
09/07/2023

PER STRUCTURAL ENGINEERING
BY PACIFIC ENGINEERING
TECHNOLOGIES, INC.

REFERENCE #:

APPLICANT: ECKHARD EVERS

PROPOSED: PIER REPAIR

SHEET: 13 OF 14 NEAR/AT: MERCER ISLAND

DATE: 06/28/2022 DWG#: 21-32061-A6-13

STRUCTURAL NOTES CONT:

STEEL BOLTS:

ALL BOLTS AND THREADED RODS SHALL BE ASTM A307 HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153-CLASS C UNLESS NOTED OTHERWISE. GALVANIZED BOLTS SHOULD BE INSTALLED IN STANDARD SIZE HOLES UNLESS NOTED OTHERWISE.

ALL BOLTS NOT SPECIFIED AS SLIP CRITICAL ARE TO BE ASSEMBLED "SNUG TIGHT" MEANING FULL EFFORT USING A STANDARD HAND-HELD WRENCH OR A FEW IMPACTS OF AN IMPACT WRENCH AFTER FINGER TIGHTENING.

STRUCTURAL LUMBER:

ALL LUMBER SHALL BE GRADED IN ACCORDANCE WITH CURRENT WWA STANDARD GRADING RULES FOR WESTERN LUMBER. USE THE FOLLOWING SPECIES AND MINIMUM GRADE:

JOISTS & RAFTERS D.F.-L #1 Fb=1,000 PSI OR #2 Fb=900 PSI

GLUED LAMINATED LUMBER:

DOUGLAS FIR-LARCH GRADE 24F-V4 (Fb=2400 PSI) FOR SINGLE SPAN BEAMS AND 24F-V8 FOR BEAMS CONTINUOUS OVER SUPPORTS, COMBINATION 3 FOR COLUMNS Fc = 2,300 PSI. ALL GLULAM MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AITC A190.1 AND BE STAMPED WITH AN AITC QUALITY MARK OR AN APA-EWS TRADEMARK. ADHESIVES USED IN THE GLULAM MANUFACTURING PROCESS SHALL CONFORM TO AITC 405 FOR WET USE ADHESIVES. GLULAM MEMBERS SHALL BE MANUFACTURED FROM DOUGLAS FIR LAMINATING LUMBER. ALL BEAMS SHALL HAVE ZERO CAMBER UNLESS NOTED OTHERWISE. MEMBERS NOT EXPOSED TO VIEW IN THE COMPLETED WORK SHALL BE INDUSTRIAL APPEARANCE GRADE. MEMBERS EXPOSED TO VIEW IN THE COMPLETED WORK SHALL BE ARCHITECTURAL APPEARANCE GRADE.

WOOD FOR OVER-WATER AND IN-WATER:

ALL WOOD PARTIALLY OR FULLY SUBMERGED IN WATER SHALL BE TREATED WITH AMMONIACAL COPPER ZINC ARSENATE (ACZA), EXCEPT WHEN WOOD IS IN STATE-OWNED AQUATIC LANDS (SOAL) MANAGED BY THE DEPARTMENT OF NATURAL RESOURCES (DNR) WHERE TREATMENT TO WOOD IN WATER/IN SPLASH ZONE IS PROHIBITED. ALL WOOD INSTALLED ABOVE WATER (WHERE CLEARLY OUT OF THE SPLASH ZONE) SHALL BE TREATED WITH AMMONIACAL COPPER ZINC ARSENATE (ACZA). WOOD TREATED WITH PENTACHLOROPHENOL, CREOSOTE, CHROMATE COPPER ARSENATE (CCA), OR COMPARABLY TOXIC COMPOUNDS IS PROHIBITED FOR PIERS, DOCKS, AND PILING.

WOOD SHALL BE TREATED IN ACCORDANCE WITH AWWA STANDARD U1. USE THE FOLLOWING MINIMUM AWWA USE CATEGORIES:

WOOD OVER WATER: UC4B
WOOD IN WATER: UC4C

TREAT CUT ENDS OF AND HOLES IN TREATED WOOD WITH SAFECOAT'S DYNOSEAL OR SEAL-IT-GREEN XTREME PLANT BASED STAIN.

MISCELLANEOUS:

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD. REPETITIVE FEATURES MAY BE DRAWN OR CALLED OUT ONCE BUT SHALL BE COMPLETELY PROVIDED AS IF DRAWN IN FULL. ALL WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY STANDARDS. PROVIDE TEMPORARY BRACING AS REQUIRED UNTIL ALL PERMANENT CONNECTIONS AND STIFFENINGS HAVE BEEN INSTALLED.

SAFETY:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION, TEMPORARY BRACING, SHORING, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES IN CONNECTION WITH THE WORK.

THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR THE CONDITION ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

THE REQUIRED AND/OR IMPLIED DUTY OF THE ENGINEER TO CONDUCT CONSTRUCTION REVIEW OF CONTRACTOR'S PERFORMANCE DOES NOT, AND IS NOT INTENDED TO, INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES IN, ON, OR NEAR THE CONSTRUCTION SITE.

THE ENGINEERING SEAL ON THESE CALCULATIONS REPRESENTS THE FOLLOWING LIMITED SCOPE OF STRUCTURAL ENGINEERING DESIGN:

- DESIGN OF THE PIER FRAMING MEMBERS: GLULAM BEAMS AND JOISTS.
- DESIGN PILES FOR BOAT IMPACT LOADS AND WIND FORCES.
- DESIGN OF THE GLULAM CONNECTION.
- DESIGN OF FOOTING FOR THE CONNECTION OF THE PIER TO THE INSIDE OF THE BULKHEAD.

DESIGN IS IN ACCORDANCE WITH THE 2018 INTERNATIONAL BUILDING CODE WITH WASHINGTON STATE AMENDMENTS. OUR SCOPE OF WORK DOES NOT INCLUDE THE DESIGN OF THE MOORAGE COVER, SHED, GRATING, BULKHEAD, UPLAND STRUCTURES, ETC.

THE SITE INFORMATION, DIMENSIONS, AND PLAN LAYOUT HAVE BEEN PROVIDED TO US BY WATERFRONT CONSTRUCTION, INC.

PACIFIC ENGINEERING JOB NUMBER: 23191.00

PROJECT DESIGNED BY:

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REVISED
09/07/2023

PER STRUCTURAL ENGINEERING
BY PACIFIC ENGINEERING
TECHNOLOGIES, INC.

REFERENCE #:

APPLICANT: ECKHARD EVERS

PROPOSED: PIER REPAIR

SHEET: 14

OF: 14

NEAR/AT: MERCER ISLAND

DATE: 06/28/2022

DWG# 21-32061-A6-14

Appendix B: Site Photographs



Photo 1 - Existing dock looking waterward.



Photo 2 - Existing dock looking landward.



Photo 3 - Shoreline conditions north of dock



Photo 4 - Shoreline conditions south of dock. Note concrete stairs to be removed.



Photo 5 - Shoreline conditions south of the site. Note broken mooring piles to be removed.



Photo 6 - Shoreline conditions north of the site.