PORT OF BREMERTON
INVITATION FOR PROPOSAL #03-24-30028

Bremerton Marina Underwater Inspections

Proposals Due Tuesday, November 19, 2024, at 3:00 PM

INDEX

I. NOTICE
II. PROPOSAL FORM
III. SCOPE OF WORK
IV. EXHIBITS
    i. Exhibit “A” Bremerton Marina
    ii. Exhibit “B” Bremerton Marina Inspection Report 2021

I. NOTICE

NOTICE IS HEREBY GIVEN that the PORT OF BREMERTON is hereby seeking proposals the underwater inspection, condition assessment of underwater mooring systems at the Bremerton Marina & USS Turner Joy.

SCOPE AND NATURE OF WORK: Condition assessment of certain facilities based on an underwater inspection at various locations as described in section III "Scope". The Bremerton Marina is located at 120 Washington Beach, Bremerton, WA 98337.

PROPOSAL SUBMITTAL INFORMATION AND SITE VISIT: Submit proposals by 3:00 PM (PDT) November 19, 2024, via e-mail (to jamesw@portofbremerton.org with cc to ellena@portofbremerton.org) or in a sealed envelope to: Port of Bremerton, Underwater Inspection of Marine Facilities, 8850 SW State Hwy 3, Bremerton, Washington 98312. For a site visit contact James Weaver at jamesw@portofbremerton.org or 360-813-0829. A public bid opening will be held in the Airport Conference Room located at 8850 SW State Hwy 3, Bremerton, WA 98312. For electronic submissions, request a read and delivery receipt.

CONTRACT ISSUES: This work is considered purchased services under chapter RCW 39.26. The successful contractor will be required to execute a Purchase Order with the Port. Among other requirements, Port contracts are subject to the following:

A. Prevailing Wage Provision: The workers of all contractors and subcontractors on all Port "public works" as defined by RCW 39.04.010, shall be paid the "prevailing rate of wage" including "usual benefits" and overtime, paid in the locality as those terms are defined by Chapter 39.12 RCW. The contractor is responsible for obtaining and completing all required government forms and submitting same to the proper authorities. In accordance with RCW 39.12.030, applicable prevailing wage rates can be found online at https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/.

B. Insurance. Contractor agrees to obtain at its own cost and expense, public liability insurance with combined bodily injury and property damage limits in the amount of $1,000,000 in a form satisfactory to the Port of Bremerton, naming the Port as an additional insured. Such insurance shall not be diminished or rescinded without first giving the Port thirty (30) days written notice.

BIDDER RESPONSIBILITY CRITERIA The contract will be awarded to the party submitting the "lowest responsible proposal," subject to any products and/or vendor preferences provided by applicable Washington State laws, taking into consideration the quality of the articles proposed to be supplied, their conformity with specifications, and the purposes for which required. The Port may reject any and all proposals.

In determining "lowest responsible proposal," in addition to price and other factors outlined above, the following criteria are used in determining the lowest responsible proposal:

1. At the time of bid submittal, have a certificate of registration in compliance with chapter 18.27 RCW;
2. Have a current state unified business identifier number;
3. If applicable, have industrial insurance coverage for the bidder's employees working in Washington as required in Title 51 RCW; an employment security department number as required in Title 50 RCW; and a state excise tax registration number as required in Title 82 RCW;
4. Not be disqualified from bidding on any public works contract under RCW 39.06.010

or 39.12.065(3);

5. Have completed or be exempt from the L&I required public works training per 39.04.350 and RCW 39.06.020,
6. Within the three-year period immediately preceding the date of the bid solicitation, not have been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW.

SUPPLEMENTAL BIDDER RESPONSIBILITY CRITERIA

1. Satisfactory completion of projects of similar size or scope within the past three years.
2. Availability of contractor to complete the work within the required schedule.
3. Quality and timely performance on any previous contracts with the Port of Bremerton.

If a bidder is determined to be non-responsive, the bidder will be notified by the Port in writing (electronically) as to the deficient criteria and allowed two working days to appeal the Port's determination in writing. Failure to properly complete this form may be cause for rejection of proposal.

Additional reference information may be located at: https://www.portofbremerton.org/bids-contracts. Answers to questions and addenda will be posted online at https://www.portofbremerton.org/bids-contracts and it is the bidder's responsibility to check the website for documents or changes to the solicitation prior to submitting a final bid. Questions must be received in writing via e-mail to ellena@portofbremerton.org and CC: jamesw@portofbremerton.org no later than November 8, 2024, at 3:00 PM.

II. PROPOSAL FORM

Bremerton Marina Underwater Inspections

This proposal is made in accordance with the invitation for proposal authorized by the Port of Bremerton.

LUMP SUM $ _____

(STATE SALES TAX 9.2%) $ _____

TOTAL PRICE (FULL PRICE INCLUDING TAX 9.2%) $ _____

ESTIMATED TIME OF COMPLETION AFTER NOTICE TO PROCEED _____ days

ADDENDA ACKNOWLEDGEMENT:

Receipt of all Addenda through No. _____ is (are) hereby acknowledged.

RESPONSIBLE BIDDER CERTIFICATION:

In accordance with RCW 9A.72.085, the undersigned bidder declares under penalty of perjury that said bidder is in compliance with the responsible bidder criteria requirement, and that within the three-year period immediately preceding the date of this bid solicitation, has not received a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgement entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW.

PROFESSIONAL REFERENCES:

Company Name: _____ Company Name: _____

Contact Name: _____ Contact Name: _____

Phone: _____ Phone: _____

PROPOSER/COMPANY NAME _____

ADDRESS _____

EMAIL _____ PHONE _____

Contractor License No: _____ Contractor UBI No: _____

Contractor ESD No: _____ Small Business*: YES _____ NO_____

(continued on next page)

I certify (or declare) under penalty of perjury under the laws of the state of Washington that the foregoing is true and correct:	
Signature:	Date:
Print Name and Title	Location or Place Executed: (City, State)

NOTE:

The contract will be awarded to the party submitting the "lowest responsible proposal," subject to any products and/or vendor preferences provided by applicable Washington State laws, taking into consideration the quality of the articles proposed to be supplied, their conformity with specifications, and the purposes for which required. The Port may reject any and all proposals.

*"Small business" means an in-state business, including a sole proprietorship, corporation, partnership, or other legal entity, that:(a) Certifies, under penalty of perjury, that it is owned and operated independently from all other businesses and has either: (i) Fifty or fewer employees; or (ii) A gross revenue of less than seven million dollars annually as reported on its federal income tax return or its return filed with the department of revenue over the previous three consecutive years; or (b) Is certified with the office of women and minority business enterprises under chapter 39.19 RCW.

III. SCOPE

Port of Bremerton
Underwater Inspection, Assessment of Marine Facilities

Scope of Services:

General- The Port is soliciting bids for a contractor to provide a condition assessment of certain facilities based on an underwater inspection. The inspection will consist of a thorough (Level I) visual inspection of the underwater structural, mechanical, mooring (mooring diagrams available upon request), pilings and cathodic protection systems at the following locations:

Bremerton Marina inspection scope:

- The floating wave attenuator (breakwater) associated mooring system and cathodic protection components.
- Marina steel pilot piles to include visual and ultrasonic wall thickness and corrosion potential. (Exhibit "B")

USS Turner Joy (Located at the Bremerton Marina) inspection scope:

- Bow anchors, chains, floats, pilings, rear bridle connection, and cathodic protection components.

The evaluation will consist of a written report including the inspection results, identifying significant problems and providing recommended corrective actions, with supplemental photo or video representative of 10% general conditions and specific identified problem areas.

1) Conduct visual inspections of the facilities as described above. At the end of the site inspections, Contractor will provide area specific reports summarizing their findings.

2) Contractor will provide presentation or additional planning documents as requested to assist the Port with future planning decisions.

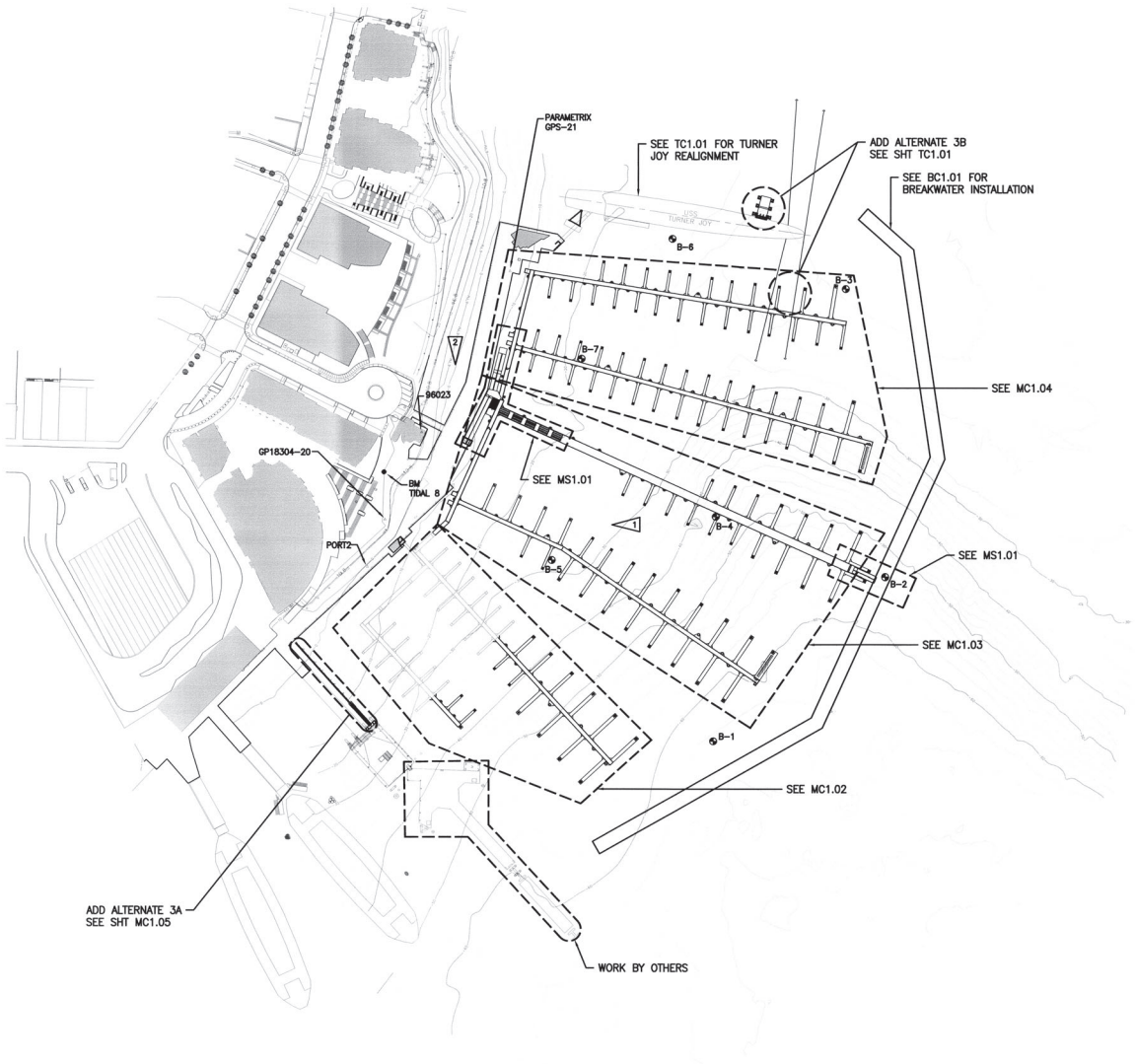
Deliverables:

1) Dive and Survey Reports summarizing finding (all photos, video, and print documents shall be provided in a jpeg, mp4 or similar, or pdf corresponding electronic format).
2) Presentation materials as requested.

All deliverables become and remain Port of Bremerton property.

Schedule:

Bremerton & Turner Joy underwater Work To be completed by February 15, 2025, with reporting delivered by March 15, 2025.



MARINA SITE PLAN
1" = 100'

CIVIL NOTES

1. HORIZONTAL CONTROL: NAD 83 / 91
2. VERTICAL CONTROL: MLLW (WSDOT)
3. HORIZONTAL CONTROL STATIONS: GP18304-20 (210,601.652 / 1,198,399.944)
   PORT2 (210,519.72 / 1,198,369.70)
   PARAMETRIX GPS-21 (211,030.50 / 1,198,615.41)
   96023 (210,752.12 / 1,198,463.18)
4. BENCHMARK: TIDAL 8 1988 RESET 1997, ELEVATION = 18.24
5. COORDINATES FOR WALKWAY FLOATS REPRESENT THE FLOAT CENTERLINE OR THE OUTSIDE EDGE OF RUB STRIP. FLOAT DIMENSIONS ARE FROM OUTSIDE EDGE OF RUB STRIP TO OUTSIDE EDGE OF RUB STRIP.
6. COORDINATES FOR PILES REPRESENT THE CENTER OF THE PILE SECTION.
7. SITE PLAN IS BASED ON A SURVEY BY PARAMETRIX, INC., DATED 20JUNE2002 AND REVISED ON 10MARCH 2005. JOB NUMBER 232-3941-002 P01 T01.
8. CONTRACTOR SHALL PROCURE AND PAY FOR ALL SURVEYING REQUIRED TO INSURE THAT THE WORK IS INSTALLED IN THE LOCATIONS INDICATED.

FLAG NOTES

1. LOCATE & MARK EXISTING SUBMARINE TELEPHONE CABLE THROUGHOUT CONSTRUCTION ZONE. DO NOT DAMAGE TELEPHONE CABLE.
2. LOCATE & PROTECT EXISTING SEWER FORCE MAIN BURIED IN BEACH WEST OF BOARDWALK & NORTH OF SECOND ST.

BOREHOLE COORDINATE SCHEDULE *

BOREHOLE	NORTHING	EASTING	MUDLINE ELEVATION (FT)	BOREHOLE DEPTH BELOW MUDLINE (FT)	MUDLINE ELEVATION (FT)
1	210,219.39	1,198,967.17	-66.0	30.9	-96.9
2	210,502.78	1,199,263.99	-56.5	60.5	-117.0
3	210,999.91	1,199,195.58	-25.0	67.7	-92.7
4	210,606.66	1,198,971.39	-47.0	41.9	-88.9
5	210,531.80	1,198,688.03	-29.0	51.5	-80.5
6	211,086.54	1,198,896.17	-22.0	48.8	-70.8
7	210,879.20	1,198,739.47	-20.0	37.0	-57.0

* FINAL GEOTECHNICAL REPORT BY GOLDER ASSOC., JUNE 12, 2006.

0 20' 40' 60' 80' 100' 150' 200' 300'
SCALE: 1" = 100'

IF SHEET IS NOT 22"x34" SCALE ACCORDINGLY

ART ANDERSON ASSOCIATES
202 PACIFIC AVE.
BREMERTON, WA 98337
(360) 479-5600

PE STATE OF WASHINGTON JAMES R. LEDDY 17186 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 10-19-07

PORT OF BREMERTON
BREMERTON MARINA EXPANSION
MARINA INSTALLATION

EDA AWARD No. 07-01-05806

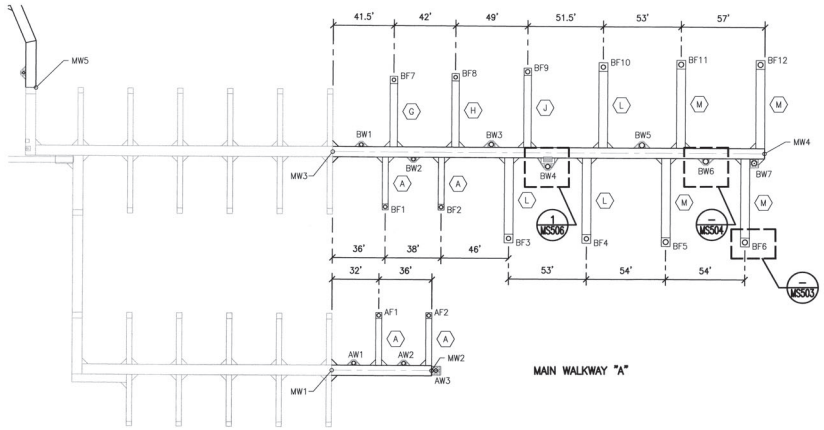
DRAWN:	PJM
DESIGNED:	JRL
CHECKED:	RFH
DATE:	03NOV06
REVISIONS:	BID SET
JOB NO:	FWP0B077
SHT TITLE:	MARINA SITE PLAN

SHT NO. 10 OF 95

MC1.01

FINGERFLOAT SCHEDULE

ID	SIZE
A	4' x 36'
B	4' x 38'
C	4' x 40'
D	4' x 42'
E	4' x 44'
F	5' x 46'
G	5' x 48'
H	5' x 50'
I	5' x 52'
J	5' x 54'
K	6' x 56'
L	6' x 58'
M	6' x 60'
N	11' x 50'
O	11' x 56'
P	5' x 40'



MAIN WALKWAY "A" & "B"
1" = 40'

COORDINATE SCHEDULE

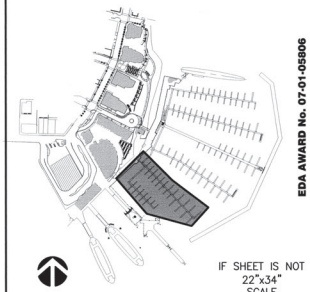
POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)	POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
MW1*	210295.74	1198483.01			BF3	210268.66	1198630.73	30"ø x ½"	-78
MW2	210245.73	1198529.086			BF4	210229.68	1198666.64	36"ø x ½"	-81
MW3*	210396.56	1198592.44			BF5	210188.61	1198701.75	36"ø x ½"	-84
MW4	210180.33	1198791.65			BF6	210148.90	1198738.34	36"ø x ½"	-87
MW5*	210587.14	1198488.39			BF7	210399.24	1198656.60	30"ø x ½"	-74
AW1	210288.05	1198496.80	30"ø x ½"	-68	BF8	210369.70	1198686.53	30"ø x ½"	-79
AW2	210263.04	1198519.83	30"ø x ½"	-70	BF9	210336.37	1198722.67	36"ø x ½"	-83
AW3	210243.52	1198531.12	30"ø x ½"	-71	BF10	210300.87	1198760.14	36"ø x ½"	-86
AF1	210297.62	1198532.27	30"ø x ½"	-70	BF11	210263.24	1198797.52	36"ø x ½"	-88
AF2	210272.61	1198555.31	30"ø x ½"	-72	BF12	210223.53	1198834.11	36"ø x ½"	-90
BW1	210385.51	1198609.23	30"ø x ½"	-71					
BW2	210352.81	1198626.13	30"ø x ½"	-75					
BW3	210320.78	1198669.59	30"ø x ½"	-79					
BW4	210282.45	1198684.80	36"ø x ½"	-81					
BW4***	210285.16	1198687.74	36"ø x ½"	-81					
BW5	210245.40	1198739.04	36"ø x ½"	-85					
BW6	210206.09	1198760.57	36"ø x ½"	-87					
BW7	210181.07	1198782.12	36"ø x ½"	-89					
BF1	210344.67	1198589.26	30"ø x ½"	-72					
BF2	210316.72	1198615.00	30"ø x ½"	-75					

NOTE: PILE CUTOFF AT +20. DRIVE PILE TO TIP ELEVATION OR REFUSAL, WHICHEVER COMES FIRST. * EXISTING LOCATION, FIELD VERIFY *** ADD ALTERNATE 3C

LEGEND

MW	MARGINAL OR MAIN WALKWAY
MWP	MARGINAL OR MAIN WALKWAY PILE
AW	MAIN WALKWAY "A" PILE
AF	MAIN WALKWAY "A" FINGER PILE
BW	MAIN WALKWAY "B" PILE
BF	MAIN WALKWAY "B" FINGER PILE
CW	MAIN WALKWAY "C" PILE
CF	MAIN WALKWAY "C" FINGER PILE
PW	MAIN WALKWAY "P" PILE
PF	MAIN WALKWAY "P" FINGER PILE
DW	MAIN WALKWAY "D" PILE
DF	MAIN WALKWAY "D" FINGER PILE
EW	MAIN WALKWAY "E" PILE
EF	MAIN WALKWAY "E" FINGER PILE

0 10' 20' 30' 40' 60' 80' 120'
SCALE: 1" = 40'



IF SHEET IS NOT 22"x34" SCALE ACCORDINGLY

EDA AWARD No. 07-01-05806

ART ANDERSON ASSOCIATES
702 PACIFIC AVE.
BREMERTON, WA 98337
(360) 479-5600

11-17-06
EXPIRES 10-19-07

PORT OF BREMERTON
BREMERTON MARINA EXPANSION
MARINA INSTALLATION

DRAWN: PJM
DESIGNED: JRL
CHECKED: RFH
DATE: 03NOV06
REVISIONS: BID SET
JOB NO: FWP08077
SHT TITLE: MARGINAL & MAIN WALKWAY "A" & "B" PLAN & COORDINATE SCHEDULE
SHT NO: 11 OF 95

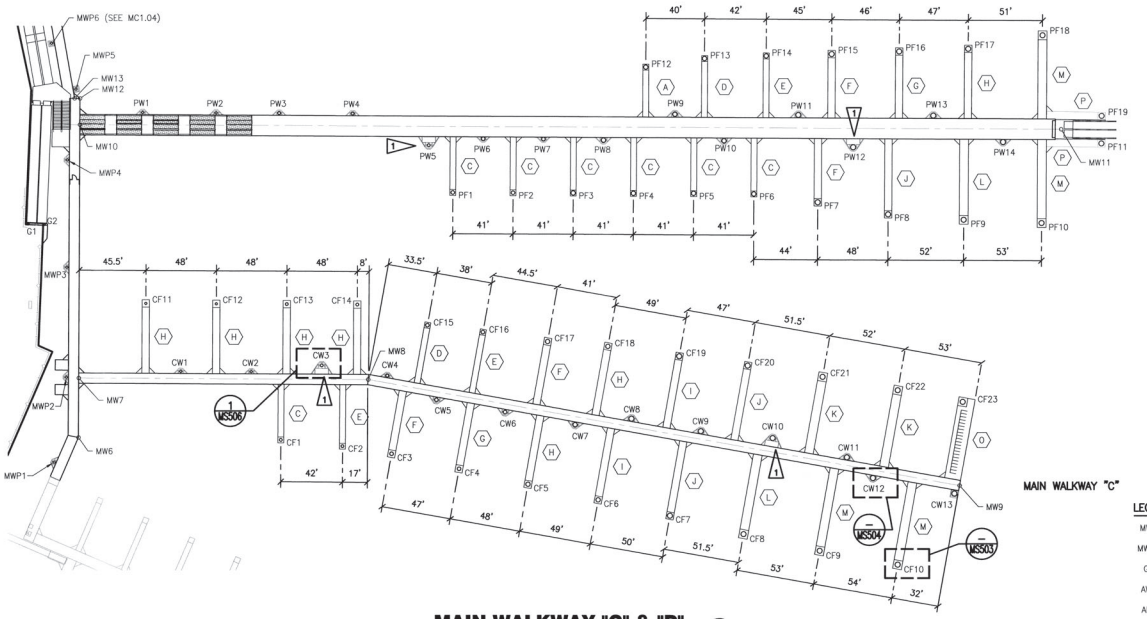
MC1.02

FINGERFLOAT SCHEDULE

ID	SIZE
A	4' x 36'
B	4' x 38'
C	4' x 40'
D	4' x 42'
E	4' x 44'
F	5' x 46'
G	5' x 48'
H	5' x 50'
I	5' x 52'
J	5' x 54'
K	6' x 56'
L	6' x 58'
M	6' x 60'
N	11' x 50'
O	11' x 56'
P	5' x 40'

FLAG NOTES

1. CONDITION SHOWN IS FOR BASE BID. EXCLUDE THE 4'x9' LOAD CENTER SUPPORT FLOAT & REPLACE LOAD CENTER PILE HOOP WITH 2/MS5.04 WALKWAY PILE HOOP FOR ADD ALTERNATE 3C.



MAIN WALKWAY "C" & "P"

1" = 40'

LEGEND

MW	MARGINAL OR MAIN WALKWAY
MWP	MARGINAL OR MAIN WALKWAY PILE
G	GANGWAY PILE
AW	MAIN WALKWAY "A" PILE
AF	MAIN WALKWAY "A" FINGER PILE
BW	MAIN WALKWAY "B" PILE
BF	MAIN WALKWAY "B" FINGER PILE
CW	MAIN WALKWAY "C" PILE
CF	MAIN WALKWAY "C" FINGER PILE
PW	MAIN WALKWAY "P" PILE
PF	MAIN WALKWAY "P" FINGER PILE
DW	MAIN WALKWAY "D" PILE
DF	MAIN WALKWAY "D" FINGER PILE
EW	MAIN WALKWAY "E" PILE
EF	MAIN WALKWAY "E" FINGER PILE

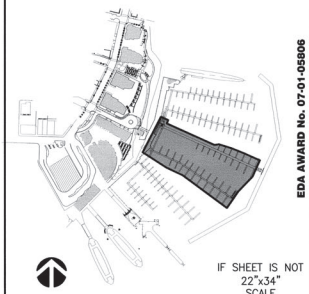
0 10' 20' 30' 40' 60' 80' 120'

SCALE: 1" = 40'

COORDINATE SCHEDULE

POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)	POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)	POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)	POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
MW6	210595.86	1198510.26			CW7	210466.34	1198822.96	36"ø x ½"	−81	CF15	210569.14	1198758.58	30"ø x ½"	−72	PW12***	210565.62	1199074.31	36"ø x ½"	−89
MW7	210632.79	1198526.89			CW8	210454.49	1198859.63	36"ø x ½"	−79	CF16	210549.45	1198791.15	30"ø x ½"	−75	PW13	210559.45	1199131.31	36"ø x ½"	−85
MW8	210551.80	1198706.69			CW9	210427.53	1198899.35	36"ø x ½"	−82	CF17	210525.70	1198828.81	36"ø x ½"	−79	PW14	210523.72	1199167.31	42"ø x ½"	−87
MW9	210321.97	1199045.25			CW10	210403.32	1198942.14	42"ø x ½"	−85	CF18	210505.98	1198864.98	36"ø x ½"	−81	PF1	210644.63	1198811.03	30"ø x ½"	−71
MW10	210790.07	1198597.75			CW10***	210400.01	1198939.89	42"ø x ½"	−85	CF19	210480.12	1198906.64	36"ø x ½"	−83	PF2	210627.79	1198848.41	30"ø x ½"	−74
MW11	210515.60	1199206.99			CW11	210370.81	1198982.91	42"ø x ½"	−88	CF20	210455.38	1198946.65	36"ø x ½"	−86	PF3	210610.95	1198885.79	30"ø x ½"	−77
MW12	210806.37	1198605.09			CW12	210350.64	1198993.40	42"ø x ½"	−89	CF21	210427.69	1198990.10	42"ø x ½"	−85	PF4	210594.11	1198923.17	30"ø x 8"	−79
MW13	210807.89	1198601.71			CW13	210318.41	1199039.81	42"ø x ½"	−90	CF22	210398.49	1199033.13	42"ø x ½"	−88	PF5	210577.44	1198960.64	30"ø x 8"	−80
MWP1	210587.14	1198488.39	24"ø x ½"	−48	CF1	210538.32	1198635.57	30"ø x ½"	−62	CF23	210373.21	1199070.36	42"ø x ½"	−90	PF6	210560.43	1198997.94	30"ø x 8"	−86
MWP2	210636.70	1198519.44	24"ø x ½"	−47	CF2	210517.42	1198672.22	30"ø x ½"	−67	PW1	210780.17	1198640.17	24"ø x ½"	−46	PF7	210537.54	1199035.34	36"ø x ½"	−92
MWP3	210704.98	1198550.20	24"ø x ½"	−46	CF3	210499.04	1198700.72	30"ø x ½"	−72	PW2	210759.63	1198685.76	24"ø x ½"	−50	PF8	210510.53	1199075.82	36"ø x ½"	−90
MWP4	210771.52	1198580.18	24"ø x ½"	−46	CF4	210470.99	1198738.48	36"ø x ½"	−82	PW3	210741.99	1198724.92	30"ø x ½"	−56	PF9	210486.19	1199121.34	42"ø x ½"	−89
MWP5	210813.22	1198605.11	24"ø x ½"	−46	CF5	210442.37	1198777.08	36"ø x ½"	−84	PW4	210721.45	1198770.51	30"ø x ½"	−64	PF10	210462.60	1199168.84	42"ø x ½"	−89
G1	210742.50	1198538.40	12"ø x ½"	−42	CF6	210413.20	1198816.49	36"ø x ½"	−84	PW5	210680.68	1198809.17	30"ø x ½"	−69	PF11	210495.87	1199227.66	42"ø x ½"	−89
G2	210737.70	1198548.15	12"ø x ½"	−42	CF7	210383.46	1198856.74	36"ø x ½"	−85	PW5***	210684.78	1198811.02	30"ø x ½"	−69	PF12	210669.23	1198965.80	30"ø x 8"	−79
CW1	210608.71	1198592.27	24"ø x ½"	−52	CF8	210351.64	1198897.38	42"ø x ½"	−86	PW6	210669.58	1198844.76	30"ø x ½"	−74	PF13	210658.27	1199004.73	30"ø x 8"	−81
CW2	210588.99	1198636.03	30"ø x ½"	−60	CF9	210320.22	1198940.11	42"ø x ½"	−88	PW7	210652.74	1198882.14	30"ø x ½"	−77	PF14	210642.84	1199043.84	30"ø x 8"	−84
CW3	210573.38	1198681.65	30"ø x ½"	−66	CF10	210289.89	1198984.79	42"ø x ½"	−91	PW8	210635.45	1198919.31	30"ø x ½"	−79	PF15	210625.93	1199085.03	36"ø x ½"	−85
CW3***	210569.28	1198679.80	30"ø x ½"	−66	CF11	210660.60	1198589.32	24"ø x ½"	−48	PW9	210631.75	1198970.84	36"ø x ½"	−80	PF16	210608.86	1199127.79	36"ø x ½"	−84
CW4	210548.89	1198719.69	30"ø x ½"	−69	CF12	210640.89	1198633.09	30"ø x ½"	−57	PW10	210601.76	1198994.08	36"ø x ½"	−84	PF17	210591.38	1199171.47	36"ø x ½"	−83
CW5	210520.26	1198743.53	36"ø x ½"	−76	CF13	210621.17	1198676.86	30"ø x ½"	−66	PW11	210597.24	1199047.43	36"ø x ½"	−86	PF18	210579.30	1199221.41	42"ø x ½"	−84
CW6	210493.58	1198782.83	36"ø x ½"	−80	CF14	210601.46	1198720.62	30"ø x ½"	−68	PW12	210561.97	1199072.67	36"ø x ½"	−89	PF19	210512.94	1199235.44	42"ø x ½"	−88

NOTE: PILE CUTOFF AT +20. DRIVE PILE TO TIP ELEVATION OR REFUSAL, WHICHEVER COMES FIRST. * EXISTING LOCATION, FIELD VERIFY *** ADD ALTERNATE 3C



EDA AWARD No. 07-01-05806

IF SHEET IS NOT 22"x34" SCALE ACCORDINGLY

ART ANDERSON ASSOCIATES
702 PACIFIC AVE.
BREMERTON, WA 98337
(360) 479-5600

EXPIRES: 10-19-07

11-12-6

PORT OF BREMERTON
BREMERTON MARINA EXPANSION
MARINA INSTALLATION

DRAWN: PJM
DESIGNED: JRL
CHECKED: RFH
DATE: 03NOV06
REVISIONS: BID SET
JOB NO: FWP08077
SHT. TITLE: MARGINAL & MAIN WALKWAY "C" & "P" PLAN & COORDINATE SCHEDULE
SHT NO: 12 OF 95

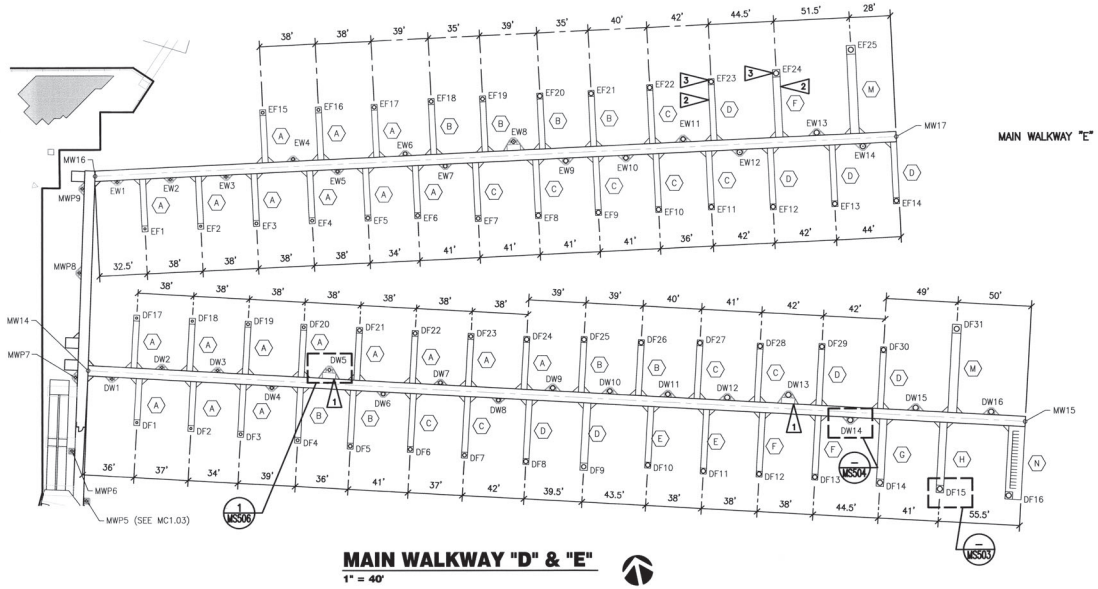
MC1.03

FINGERFLOAT SCHEDULE

ID	SIZE
A	4' x 36'
B	4' x 38'
C	4' x 40'
D	4' x 42'
E	4' x 44'
F	5' x 46'
G	5' x 48'
H	5' x 50'
I	5' x 52'
J	5' x 54'
K	6' x 56'
L	6' x 58'
M	6' x 60'
N	11' x 50'
O	11' x 56'
P	5' x 40'

FLAG NOTES

1. CONDITION SHOWN IS FOR BASE BID. EXCLUDE THE 4'x9' LOAD CENTER SUPPORT FLOAT & REPLACE LOAD CENTER PILE HOOP WITH 2/MS5.04 WALKWAY PILE HOOP FOR ADD ALTERNATE 3C.
2. CONDITION SHOWN IS FOR ADD ALTERNATE 3B. EXCLUDE THIS FINGER FLOAT FROM BASE BID.
3. EXCLUDE THIS PILE FROM BASE BID. INCLUDE THIS PILE AS PART OF ADD ALTERNATE 3B.



MAIN WALKWAY "D" & "E"
1" = 40'

LEGEND

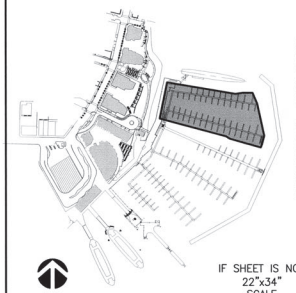
MW	MARGINAL OR MAIN WALKWAY
MWP	MARGINAL OR MAIN WALKWAY PILE
AW	MAIN WALKWAY "A" PILE
AF	MAIN WALKWAY "A" FINGER PILE
BW	MAIN WALKWAY "B" PILE
BF	MAIN WALKWAY "B" FINGER PILE
CW	MAIN WALKWAY "C" PILE
CF	MAIN WALKWAY "C" FINGER PILE
PW	MAIN WALKWAY "P" PILE
PF	MAIN WALKWAY "P" FINGER PILE
DW	MAIN WALKWAY "D" PILE
DF	MAIN WALKWAY "D" FINGER PILE
EW	MAIN WALKWAY "E" PILE
EF	MAIN WALKWAY "E" FINGER PILE

0 10' 20' 30' 40' 60' 80' 120'
SCALE: 1" = 40'

COORDINATE SCHEDULE

POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)	POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)	POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)	POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
MW14	210899.72	1198624.78			DW16	210743.90	1199220.33	36"ø x ½"	−74	DF25	210849.93	1198959.48	30"ø x ½"	−62	EF4	210967.66	1198795.33	24"ø x ½"	−51
MW15	210732.55	1199241.60			DF1	210858.22	1198649.87	24"ø x ½"	−46	DF26	210839.73	1198997.13	30"ø x ½"	−64	EF5	210961.57	1198832.84	24"ø x ½"	−52
MW16	211028.13	1198657.04			DF2	210846.61	1198685.06	24"ø x ½"	−47	DF27	210831.20	1199036.26	30"ø x ½"	−65	EF6	210956.11	1198866.40	24"ø x ½"	−53
MW17	210940.51	1199196.16			DF3	210835.78	1198717.35	24"ø x ½"	−48	DF28	210820.47	1199075.83	30"ø x ½"	−70	EF7	210945.59	1198906.22	24"ø x ½"	−54
MWP6	210848.53	1198602.64	24"ø x ½"	−45	DF4	210823.65	1198754.47	24"ø x ½"	−52	DF29	210811.42	1199116.89	30"ø x ½"	−72	EF8	210939.01	1198946.69	24"ø x ½"	−56
MWP7	210897.01	1198615.44	24"ø x ½"	−44	DF5	210812.30	1198788.69	24"ø x ½"	−58	DF30	210800.43	1199157.43	30"ø x ½"	−72	EF9	210932.43	1198987.16	24"ø x ½"	−58
MWP8	210965.98	1198632.77	24"ø x ½"	−43	DF6	210801.58	1198828.26	30"ø x ½"	−62	DF31	210804.02	1199209.17	36"ø x ½"	−71	EF10	210925.86	1199027.63	30"ø x ½"	−60
MWP9	211021.55	1198646.72	24"ø x ½"	−42	DF7	210789.97	1198863.45	30"ø x ½"	−62	EW1	211020.92	1198670.93	24"ø x ½"	−45	EF11	210920.08	1199063.16	30"ø x ½"	−64
DW1	210890.66	1198639.49	24"ø x ½"	−46	DF8	210777.05	1198903.47	30"ø x ½"	−64	EW2	211015.10	1198706.71	24"ø x ½"	−48	EF12	210911.37	1199104.30	30"ø x ½"	−70
DW2	210891.35	1198674.39	24"ø x ½"	−48	DF9	210765.27	1198941.20	30"ø x ½"	−68	EW3	1198744.21	1198744.21	24"ø x ½"	−49	EF13	210904.63	1199145.76	30"ø x ½"	−72
DW3	210881.41	1198711.07	24"ø x ½"	−50	DF10	210757.27	1198984.10	30"ø x ½"	−72	EW4	211011.26	1198791.36	24"ø x ½"	−51	EF14	210897.89	1199187.21	30"ø x ½"	−74
DW4	210862.15	1198744.70	24"ø x ½"	−51	DF11	210745.40	1199020.25	30"ø x ½"	−75	EW5	210996.81	1198819.23	24"ø x ½"	−52	EF15	211046.51	1198777.75	24"ø x ½"	−50
DW5	210865.87	1198785.60	24"ø x ½"	−52	DF12	210735.46	1199056.93	30"ø x ½"	−78	EW6	210998.99	1198866.87	24"ø x ½"	−54	EF16	211040.41	1198815.26	24"ø x ½"	−52
DW5***	210861.53	1198784.42	24"ø x ½"	−52	DF13	210725.52	1199093.61	30"ø x ½"	−78	EW7	210985.02	1198891.78	24"ø x ½"	−54	EF17	211034.31	1198852.77	24"ø x ½"	−54
DW6	210842.27	1198818.05	24"ø x ½"	−56	DF14	210712.43	1199136.16	30"ø x ½"	−78	EW8	210991.56	1198940.63	24"ø x ½"	−56	EF18	211030.03	1198891.58	24ø x ½"	−56
DW7	210841.65	1198857.77	24"ø x ½"	−58	DF15	210699.77	1199175.21	30"ø x ½"	−76	EW8***	210987.12	1198939.91	24"ø x ½"	−56	EF19	211024.42	1198926.13	24"ø x ½"	−57
DW8	210821.73	1198893.82	30"ø x ½"	−60	DF16	210685.55	1199220.05	30"ø x ½"	−74	EW9	210971.36	1198972.72	24"ø x ½"	−57	EF20	211018.16	1198964.62	30"ø x ½"	−60
DW9	210822.12	1198931.74	30"ø x ½"	−62	DF17	210927.79	1198664.58	24"ø x ½"	−46	EW10	210964.78	1199013.19	24"ø x ½"	−59	EF21	211012.54	1198999.17	30"ø x ½"	−62
DW10	210811.92	1198969.38	30"ø x ½"	−67	DF18	210917.85	1198701.26	24"ø x ½"	−47	EW11	210969.09	1199053.91	30"ø x ½"	−60	EF22	211008.10	1199038.97	30"ø x ½"	−64
DW11	210801.58	1199007.51	30"ø x ½"	−70	DF19	210907.91	1198737.93	24"ø x ½"	−48	EW12	210952.35	1199089.68	30"ø x ½"	−65	EF23**	211003.34	1199080.75	30"ø x ½"	−67
DW12	210790.99	1199046.60	30"ø x ½"	−72	DF20	210897.97	1198774.61	24"ø x ½"	−51	EW13	210954.49	1199143.73	30"ø x ½"	−74	EF24**	210999.65	1199125.23	30"ø x ½"	−74
DW13	210783.99	1199087.70	30"ø x ½"	−73	DF21	210888.03	1198811.29	24"ø x ½"	−54	EW14	210938.87	1199172.60	30"ø x ⅝"	−75	EF25	211004.71	1199178.23	36"ø x ½"	−74
DW13***	210780.13	1199086.65	30"ø x ½"	−73	DF22	210878.09	1198847.96	24"ø x ½"	−56	EF1	210985.95	1198682.81	24"ø x ½"	−46					
DW14	210758.47	1199125.33	36"ø x ½"	−73	DF23	210868.15	1198884.64	24"ø x ½"	−58	EF2	210979.86	1198720.31	24"ø x ½"	−48					
DW15	210757.37	1199170.62	30"ø x ½"	−73	DF24	210858.21	1198921.32	30"ø x ½"	−60	EF3	210973.76	1198757.82	24"ø x ½"	−50					

NOTE: PILE CUTOFF AT +20. DRIVE PILE TO TIP ELEVATION OR REFUSAL, WHICHEVER COMES FIRST. * EXISTING LOCATION, FIELD VERIFY ** ADD ALTERNATE 3B *** ADD ALTERNATE 3C



EDA AWARD No. 07-01-05806

IF SHEET IS NOT 22"x34" SCALE ACCORDINGLY

ART ANDERSON ASSOCIATES
505 PACIFIC AVE.
BREMERTON, WA 98337
(360) 479-5600

11-12-06

EXPIRES: 10-19-07

PORT OF BREMERTON
BREMERTON MARINA EXPANSION
MARINA INSTALLATION

DRAWN:	PJM
DESIGNED:	JRL
CHECKED:	RFH
DATE:	03NOV06
REVISIONS:	BID SET
JOB NO:	FWP08077
SHT TITLE:	MARGINAL & MAIN WALKWAY "D" & "E" PLAN & COORDINATE SCHEDULE
SHT NO:	13 OF 95
	MC1.04

EXHIBIT B

Underwater Inspection of Marine Facilities

Prepared by Seattle Diving Services
December 2021

TABLE OF CONTENTS

	Page No.
Introduction & Condition Rating Descriptions	3
USS Turner Joy	4
Breakwater	9
Pilot Pilings	19

Introduction

Seattle Diving Services, LLC completed an underwater inspection of the Marine Facilities of the Port of Bremerton Marina. The inspection was performed by a dive team under the direction of Seattle Diving Services, LLC, and included a visual and tactile inspection of the Marina's Breakwater Mooring Systems, Pilot Piles, and the USS Turner Joy's Mooring System.

Summary

The underwater portions of the substructure components were found to be in overall *Fair* condition due to the advanced amount of deterioration since the last inspection. No major defect or failure critical to the integrity of the marina was observed. However, there are some issues that will need to be addressed as soon as possible. The conditions of the underwater inspection are based on Level I visual & tactile inspection from the high tide line to the seabed. The task also included visual inspection, ultrasonic thickness & corrosion potential readings of ten steel pilot piles throughout the marina. Visual representation are provided of the general conditions and specified problem areas. The information contained within this report is based on the conditions at the time of inspection.

CONDITION RATING DESCRIPTIONS

Good - No visible damage, or only minor damage is noted. Structural elements may show very minor deterioration, but no overstressing is observed. No repairs are required.

Satisfactory - Limited minor to moderate defects or deterioration are observed, but no overstressing is observed. No repairs are required.

Fair - All primary structural elements are sound, but minor to moderate defects or deterioration is observed. Localized areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended, but the priority of the recommended repairs is low.

Poor - Advanced deterioration or overstressing is observed on widespread portions of the structure, but does not significantly reduce the load-bearing capacity of the structure.
Repairs may need to be carried out with moderate urgency.

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. Repairs may need to be carried out on a high-priority basis with urgency.

Critical - Very advanced deterioration, 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. Repairs may need to be carried out on a very high priority basis with strong urgency.

USS TURNER JOY - MOORING SYSTEM

The objective of this project is to provide a general description and assessment with recommendations of the underwater condition of the bow anchors, chains, floats, cathodic protection components, & rear bridle connection of the USS Turner Joy. The structures are generally covered in moderate marine growth and representative areas were cleaned using hand tools for closer examination. The photos within this report provide a visual representation of the typical underwater conditions and deterioration.

Observations

The mooring systems are in generally fair condition overall with limited areas of advanced deterioration & corrosion. The deterioration is generally concentrated at the upper half of the mooring systems. The upper portions of the mooring systems showed accelerated deterioration due to ordinary wear under the influence of waves, currents, electro-chemical corrosion and action from the motion of the floats. Surface rust and severe deterioration was observed on all hardware from the submerged portion of the bow chains to the upper portion of the bottom heavy chains.

The mooring float chains have advanced surface rust and do not have a strong enough bond to the rest of the mooring system to receive residual cathodic protection from the bow chain or heavy chain's anodes. Shackles on some of the bottom of the float chains have deterioration and missing seizing wire.

Anodes were present on the bow chains . U-bolt anode were secured to the bow chains & rod anodes were secured to the bottom heavy chains. However, the bow chain anodes were installed over the bow chain's coating with no metal to metal contact. One anode already had nuts backing off and it is assumed that all anode hardware will begin to back off since none of them were secured snug to the chain with double nuts. Bow chains were cleaned to approximately MLLW. The wax coating applied was only existent to the upper portion of the splash zone however. The chains factory coating at the bottom of each chain was non existent & has signs of surface corrosion & minor deterioration <10%.

Two anodes were installed on each heavy chain. One near the upper portion of the mooring chain, and one near the middle of the mooring chain. All anodes were rod-thru type and were installed over existing hard growth or corrosion. Most were installed loosely & none were found to have a snug, metal to metal connection, providing no cathodic protection to the bottom chains.

The upper portions of the bottom chains, specifically the last few feet before reaching the bow chain, clump weight, float connection, were found to have advanced corrosion of up to 40% deterioration. Minor surface corrosion was present throughout the heavy chain resting on bottom as well as the anchors.

A-1, A-2, & A-3 anchor flukes were dug into the seabed. Anchor flukes on Anchor A-4 were not dug into the seabed. Since the last inspection, the anchor had become un-buried with only 10% of the anchor physically touching the sea floor. If the anchor had tried to be re-set, the anchor needed to be flipped over since it is possible the flukes may be stuck in a fixed position. If no attempts were made to re-set the anchor, it is possible the anchor has become un-buried from heavy current action and may have even began to move position slightly (within a few feet of previous location). All other bottom

chains were partially buried indicating secure anchoring for the Turner Joy. With the exception of A-4, there are no obvious signs of shifting or movement of the anchoring system.

The rear bridle connections consist of three pivoting brackets allowing for tidal fluctuations between the fixed piles and the USS Turner Joy stern. Brackets, bolts and connections to the concrete pile cap were covered in heavy barnacle growth and appear to be in good, secure condition. Typical but minor surface corrosion was found on brackets and bolts. The USS Turner Joy has a male pivot bracket welded directly to the hull that mates up to the female bracket on the steel bridle. Both brackets were in good condition with no marine growth and relatively little iron oxidation on the surface. Also found were hardened clumps of grease resting on the side of the bracket pins with little fresh grease on the pins themselves. Bolts joining the two halves of the bridal were subject to advanced corrosion and deterioration as they are in the splash zone of the bracket and subject to the most electro-chemical corrosion. No anodes are currently installed.

Assessments

Based on our underwater inspection, the underwater condition of the USS Turner Joy's Mooring System is *fair* due to isolated areas of advanced deterioration and anode installation. The deterioration noted in this report is considered moderate and rehabilitation may be required as a result of the underwater structures. Detailed examinations of the bottom heavy chain and anchors were observed to be in *fair/ poor* condition due to their isolated areas of corrosion. The detailed examination of the floats, clump weights, and top end hardware, determined that mooring system exposed to higher oxygen levels, wave action, and underwater electrolysis requires immediate rehabilitation to provide an extended service life.

Recommendations & Repairs

The USS Turner Joy serves as the breakwater for the northern end of Bremerton Marina. The vessel's mooring systems are exposed to unique and harsh currents from Sinclair Inlet. The mooring floats have a history of breaking free if hardware is not secured. Any shackle connecting the float to the mooring systems should have seizing wire installed as soon as possible. Any shackle showing significant deterioration should be replaced as soon as possible.

The top end of the bottom chains are progressively deteriorating, port engineer should review the information in this report to determine if bottom chain A-3 has a remaining service life.

None of the recently installed anodes have a snug metal to metal connection. Anodes should be removed, installation location be cleaned down to bare metal, and anodes be re-installed. In addition, the bow chain anodes should be re-positioned to the bottom of the bow chains since the chains are factory coated & there is no existing coating in this location, in addition to it being the area for the

highest corrosion potential & accelerated deterioration. U-bolt anodes should be snug and video to be provided to the report.

The mooring float chains have advanced surface rust and do not have a strong enough bond to the rest of the mooring system to receive residual cathodic protection from the bow chain or heavy chain's anodes. Without a dedicated anode, these chains will deteriorate faster than their intended service life., dedicated anodes should be considered.

The rear bridle connections appear to be in good condition. It is unknown when the last time the pins were greased or how often they are greased. These connections should be cleaned of marine growth and greased. If they are not already part of a maintenance schedule, they should be placed on one.

Annual inspection of the Turner Joy & associated mooring system should continue to be inspected annually.

Mooring Line #	Bow Chain	Float Chain & Associated Hardware	Anchor Chain & Anchor
A1	Fair – Advanced surface corrosion on bottom 4’ of chain, <10% material loss, new anode has nut missing from u-bolt	Poor- Advanced surface corrosion throughout entire chain & hardware, <10% material loss, no seizing wire on bottom shackle	Fair – Typical/ minor surface corrosion, advanced surface corrosion near bow chain connection, <10% material loss. Rods from new anodes have have poor connection. Anchor has typical/ minor surface corrosion with flukes dug in properly.
A2	Fair – Advanced surface corrosion on bottom 2’ of chain, <10% material loss, new anode u-bolt had nut backing off, was tightened during inspection	Poor- Advanced surface corrosion throughout entire chain & hardware, <20% material loss, bottom shackle weld is cracked and shackle has <40% material loss	Fair – Typical/ minor surface corrosion, advanced surface corrosion near bow chain connection, <10% material loss. Rods from new anodes have have poor connection. Anchor has typical/ minor surface corrosion with flukes dug in properly.
A3	Fair – Advanced surface corrosion on bottom 2’ of chain, <10% material loss, new anode u-bolt had nuts backing off	Poor- Advanced surface corrosion throughout entire chain & hardware, <20% material loss, bottom shackle <60% material loss & is on verge of failing within months	Poor – Typical/ minor surface corrosion, advanced surface corrosion near bow chain connection, <40% material loss. Rods from new anodes have have poor connection. Anchor has typical/ minor surface corrosion with flukes dug in properly.
A4	Fair – Advanced surface corrosion on bottom 2’ of chain, <10% material loss, new anode u-bolt had nuts backing off	Poor- Advanced surface corrosion throughout entire chain & hardware, <10% material loss, no seizing wire on bottom shackle	Poor – Typical/ minor surface corrosion, advanced surface corrosion near bow chain connection, <10% material loss. Rods from new anodes have have poor connection. Anchor has typical/ minor surface corrosion. Anchor was un-buried with flukes facing upward, only 10% of the anchor is touching the sea floor. It is not clear whether the anchor will drag but status has worsened since the 2020 inspection.

Mooring Line #	Bow Chain Anode %	Upper Anchor Chain Anode %	Lower Anchor Chain Anode %
A1	100	100	100
A2	100	100	100
A3	100	100	100
A4	100	100	100

FLOATING WAVE ATTENUATOR (BREAKWATER)

The objective of this project is to provide a general description and assessment with recommendations of the underwater condition of the floating breakwater's mooring system and cathodic components. The structures are generally covered in heavy marine growth which limited some of the level I inspection. Representative areas were cleaned using hand tools for closer examination. The photos within this report provide a visual representation of the typical underwater conditions and deterioration.

Observations

The floating breakwater, associated mooring system, connections, and cathodic protection are generally in overall Fair condition with limited areas of advanced deterioration. The majority of the mooring cables are showing signs of iron oxidation & surface corrosion which is a new finding and is a cause for concern. In addition, a handful of bottom chains are showing advanced corrosion & even deterioration.

Over time it appears some of the anodes had completely depleted, leaving the remaining anodes on that line to protect more than their fair share. This drastically shortened the service life between maintenance schedules. In addition, none of the anodes installed in 2021 were found to be tightened snug to the cables or chains. Every anode with a u-bolt connection was found to have single galvanized nuts which were in the process of backing off, or due to the constant wave action, had backed off and failed completely. A handful of anodes appeared to be installed improperly as they were missing hardware such as backing plates or nuts, some anodes were already on the sea floor.

The rod style anodes were found to have a tighter connection, however these connection points were usually over existing growth or heavy surface corrosion. Any anodes including old ones with any issues are listed in the mooring line condition table. Current anode percentages are listed in the mooring anode percentage table.

At least ten bottom chains & associated hardware was found to have significant increases in deterioration. Most of which have up to 20% material loss with at least one with nearly 40% material loss. Most of the bottom chains are in fair condition, but most bottom chain anodes have depleted completely. In addition, it was typical to see moderate surface rust beginning to form on the anchors, shackle, and chain near the anchors. Since the cable to bottom-chain connection point was used as the anode location, it appears that the anchor end of the chain is not fully protected. Some bottom chains also enter the sea floor and pop up again at the anchor location.

All old anodes were covered in a thick calcification layer, heavy marine growth, or both. Preventing the anodes from corroding properly & efficiently. When cleaned with hand tools, selected anodes showed roughly 25% inactive material at the anode surface.

Assessments

Based on our underwater inspection, the floating breakwater, associated mooring systems, connections, and cathodic protection are generally in overall Fair condition due to localized areas of advanced deterioration. The defects noted in this report should be considered for rehabilitation as soon as possible.

The detailed examination of the cathodic protection components determined that the identified lines exposed to underwater electrolysis without cathodic protection requires rehabilitation and repair to provide an extended service life.

Recommendations

There has been a significant increase in surface corrosion & deterioration since the last two inspections were performed. It also appears the anodes have an estimated service life of two years before they calcify & harden over, become completely covered in marine growth, or corrode completely, all of which are rendering them inactive within a 3 year time period. Once all mooring lines have cathodic protection installed, the replacement schedule should consider replacing anodes every two years. All anodes 50% or below should be considered for replacement as soon as possible. Due to the importance & complexity of the mooring lines, anytime anodes are installed, video should be provided to the port upon completion.

Any location where an anode is being installed, should be cleaned of growth & corrosion and have a tight & snug fit. Rod style anodes may be a better option for installation. It may also be in the port's interest to have established locations with anode hardware which remains permanently fixed to the mooring lines. The anodes would be replaced at these fixed locations rather than adding new hardware and anodes every maintenance schedule. This did appear to be the case with previous years contractors reusing the existing u-bolt connections by adding the new anode & securing them with double nuts.

All recently installed anodes were found to have loose, improper, or failed connections. Based on the findings, it is likely that at least half of the anodes installed in 2021 will fall off within the few months of 2022. These anodes should be re-connected properly as soon as possible to ensure protection of the mooring lines, video to be provided to the port.

Some of the bottom chains have significant increases in deterioration. The affected bottom chains appear to have service life remaining if corrective action is taken. The port engineer should review the information provided in this report and provide a plan for rehabilitation as soon as possible. If the port engineer finds the affected bottom chains to have a remaining service life, bottom chains should continue to be inspected quarterly after any maintenance is performed until corrosion/ deterioration symptoms subside.

Mooring lines and cathodic protection components should continue to be inspected annually.

Mooring Line #	Top Chain	Cable	Bottom Chain
1S	Good – Typical/ minor surface corrosion	Good – Typical/ minor surface corrosion	Poor – Chain deterioration, up to 20% material loss
1N	Good – Typical/ minor surface corrosion	Poor – Black surface corrosion entire cable, new anodes have poor connection	Fair – Moderate surface rust throughout chain & anchor
2	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion, new anode has poor connection	Fair – Typical/ minor surface corrosion
3	Good – Typical/ minor surface corrosion, anode has poor connection	Fair – Typical/ minor surface corrosion, new anodes have decent connection	Fair – Typical/ minor surface corrosion
4	Fair – Typical/ minor surface corrosion, anode has poor connection	Fair – Typical/ minor surface corrosion, new anodes have poor connection	Fair – Moderate surface rust throughout chain & anchor
5	Good – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Typical/ minor surface corrosion, chain enters seabed
6S	Good – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion, new anodes have poor connection	Fair – Moderate surface rust throughout chain & anchor
6N	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion, new anode has poor connection	Fair – Typical/ minor surface corrosion
7	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion, chain enters seabed
8	Good – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion, new anode has poor connection	Fair – Typical/ minor surface corrosion, chain enters seabed

9	Good – Typical/ minor surface corrosion	Good – Typical/ minor surface corrosion	Good – Typical/ minor surface corrosion, chain enters seabed
10	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Poor – Minor deterioration beginning on chain, <10% material loss
11	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Poor – Minor deterioration beginning on chain, <10% material loss
12	Good – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion, new anodes have poor connection	Poor – Minor deterioration beginning on chain, <10% material loss
13	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion
14	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion
15	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Moderate surface rust throughout chain & anchor
16	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion	Poor – Minor deterioration beginning on chain, <10% material loss
17S	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Typical/ minor surface corrosion
17N	Poor – Advanced surface corrosion throughout entire chain, no material loss	Fair – Typical/ minor surface corrosion	Good – Typical/ minor surface corrosion, chain enters seabed
18	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion

19	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable, new anode has poor connection, nuts are backing off	Fair – Typical/ minor surface corrosion
20S	Good – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion, new anodes have poor connection, nuts on both anodes are backing off	Fair – Typical/ minor surface corrosion
20N	Poor – Advanced surface corrosion throughout entire chain, no material loss	Poor – Advanced surface corrosion throughout entire cable, new anode has poor connection, u-bolt is missing a nut, on verge of falling off, new anode has loose nuts backing off	Fair – Typical/ minor surface corrosion, anode has loose connection
21	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion	Fair – Moderate surface rust throughout chain & anchor
22	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable, new anode disconnected laying on seabed	Poor – Advanced surface corrosion throughout entire chain & anchor, <10% material loss
23	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion, new anode has poor connection, u-bolt is missing a nut, on verge of falling off.	Poor – Advanced surface corrosion throughout entire chain & anchor, no material loss
24	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable, upper anode missing u-bolt plate, on verge of falling off	Fair – Typical/ minor surface corrosion

25	Good – Typical/ minor surface corrosion	Good – Typical/ minor surface corrosion	Poor – Chain deterioration, up to 20% material loss
26	Poor – Advanced surface corrosion throughout entire chain, no material loss	Poor – Advanced surface corrosion throughout entire cable	Poor – Advanced surface corrosion throughout entire chain & anchor, no material loss
27	Fair – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion, new anode has poor connection, nuts are backing off	Fair – Typical/ minor surface corrosion
28	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion, new anode disconnected laying on seabed	Fair – Typical/ minor surface corrosion
29	Fair – Typical/ minor surface corrosion, new anode has poor connection & loose hardware	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion
30	Good – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable	Poor – Advanced surface deterioration on chain near cable connection, up to 40% material loss
31S	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable, new anode has poor connection, u-bolt is missing a nut, on verge of falling off.	Poor – Advanced surface deterioration, no material loss
31N	Good – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Good – Typical/ minor surface corrosion
32	Good – Typical/ minor surface corrosion, typical chaffing from opposing mooring chain	Poor – Advanced surface corrosion throughout entire cable	Fair – Typical/ minor surface corrosion, no material loss

33	Fair – Typical/ minor surface corrosion, typical chaffing from opposing mooring chain	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Poor – Advanced surface corrosion throughout entire chain & anchor, no material loss
34	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable, two new anodes have poor connection, nuts are backing off	Fair – Typical/ minor surface corrosion, no material loss
35	Good – Typical/ minor surface corrosion	Fair – Typical surface corrosion, isolated areas of advanced corrosion	Fair – Typical/ minor surface corrosion, no material loss
36S	Fair – Typical/ minor surface corrosion, typical chaffing from opposing mooring chain	Fair – Typical/ minor surface corrosion, typical chaffing from opposing mooring chain, isolated areas of advanced corrosion	Fair – Typical/ minor surface corrosion, no material loss
36N	Fair – Typical/ minor surface corrosion, typical chaffing from opposing mooring chain	Poor – Advanced surface corrosion throughout entire cable, two new anodes have poor connection, u-bolts missing nuts, on verge of falling off.	Fair – Typical/ minor surface corrosion, no material loss
37	Fair – Typical/ minor surface corrosion, no material loss	Poor – Advanced surface corrosion throughout entire cable	Fair – Typical/ minor surface corrosion, no material loss
38	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable, no material loss	Fair – Typical/ minor surface corrosion throughout entire chain, no material loss
39	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion
40	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion

41	Poor – Advanced surface corrosion throughout entire chain, no material loss	Poor – Advanced surface corrosion throughout entire cable, new anodes have poor connection, one u-bolt is missing a nut, on verge of falling off.	Fair – Typical/ minor surface corrosion, bridle in good condition
42	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire chain & anchor, no material loss
43	Fair – Typical/ minor surface corrosion	Poor – Advanced surface corrosion throughout entire cable	Poor – Advanced surface corrosion throughout entire chain, no material loss
44	Fair – Typical/ minor surface corrosion	Fair – Typical/ minor surface corrosion, new anode has poor connection	Fair – Typical/ minor surface corrosion

Mooring Line #	Top Chain Anode %	Cable Anode %	Bottom Chain Anode %
1S	0	60/10	50
1N	80	70/50/100/100	0
2	30	100/100	0
3	0	100/100/100	0
4	80	100/60	0
5	30	90/40/40	0
6S	90	20/100/100	0
6N	60	100/10	0
7	30	100/100/60	10
8	0	100/100	0
9	50	30/70/30/30/80	10
10	40	60	10
11	0	70	10
12	70	50/100/60/70	0
13	90	40	10
14	80	80/50	10
15	0	60/100/50	0
16	50	50	50
17S	0	60/10	30
17N	0	0/70/0	0
18	0	60/60/50	0
19	40	70/100	60
20S	80	100/100/60	50
20N	10/80/20	100/100/60	90/20
21	20	10/40	60/60
22	40/50	0/0	0
23	80/40	100/30	0
24	30/40/80	100/40/20	30/0
25	40/80	60/0	0
26	80	40/60/50	50
27	100	70	10

28	0/50	40/30/50	0
29	100	30/20	20
30	0	0/30	40/20
31S	80	100/70/50	40
31N	80	30/30	80
32	0	20/20	20
33	0	10/10/50	0
34	0	100/100	0
35	80	0/0/0	50
36S	80	40/20/100/30	0
36N	0	30/80	0
37	80	20/80	50
38	0	30/10/10	0
39	40	20/100/10	10
40	80	50/40	40
41	20	100/50/100/20	0
42	70	60	0
43	0	50/100/50	0
44	0	50/100/50	0

BREMERTON MARINA PILOT PILES (10-Piles)

The objective of this project is to provide a general description and assessment with recommendations for the (10) outlined Pilot Piles. Visual, ultrasonic, and corrosion potential inspections were performed. The structures are generally covered in heavy marine growth and representative areas were cleaned using hand tools for closer examination. The photos within this report provide a visual representation of the typical underwater conditions and deterioration.

Observations

The ten pilot piles are generally in overall satisfactory condition with isolated areas of moderate deterioration. The deterioration was most severe just above on piling E-26. This pile observed to have moderate surface rust throughout inter-tidal zone, down to the sea floor. This form of corrosion is common and although moderate, should be considered when planning future rehabilitation. Piling E-26 & B-45 did not have any remaining cathodic protection. Neither pile had interzone coating applied however, B-45 did have galvanized coating still intact. All other pilot piles had 100# aluminum anodes welded directly to them & CP readings determined the installation adequate for cathodic protection. All welded anodes have 100% material remaining.

Assessments

Based on our underwater inspection, the underwater condition of these structures is *fair* due to isolated areas of moderate deterioration. The deterioration noted in this report is considered minor and no load reductions are required as a result of the underwater structures. Detailed visual and thickness examinations of the pilot piles determined that the tidal & submerged zones may require future rehabilitation to provide an extended service life.

Recommendations

Pilings B-45 & E-26 did not have cathodic protection installed and there was moderate surface rust in the inter-tidal & submerged zones of pile E-26. Since E-26 is showing advanced deterioration then it is likely other pilings in the area are as well.

It may be in the port's best interest to have a level I inspection performed on E-dock piles to determine if there is an urgency for anode installation/ pile rehabilitation.

Pilot piles should continue to have UT, CP, and visual inspections annually. At annual intervals, the anode burn rate can be better assessed & anodes should be cleaned at the time to ensure active metal is exposed.

	THICKNESS READING				CP READING		
Location	**Waterline**	**Mid-Water**	**Seabed**	**Depth**	**Waterline**	**Mid-Water**	**Seabed**
A-15	.375	.370	.385	35	-1048	-1079	-1043
A-26	.390	.385	.365	15	-1102	-1099	-1043
B-44	.385	.380	.390	20	-1112	-1117	-1107
B-45	.390	.385	.385	21	-726	-843	-857
C-49	.560	.575	.575	20	-1027	-1019	-1037
P-2	.565	.575	.575	65	-1020	-1015	-1005
P-35	.570	.565	.570	25	-1013	-1018	-1016
E-26	.575	.575	.575/.475*	32	-663	-660	-667
E-49	.580	.585	.575	25	-1057	-1071	-1050
D-39	.560	.575	.570	30	-703	-701	-702

*(E-26 was noted to have multiple sections of material loss with readings of .475)

Thickness readings were taken using a Tritex Multigauge 3000 Underwater Thickness Meter which was calibrated and tested on-site using a 0.500 testing block. CP Measurements were taken using a Polatrak CP Gun which was calibrated and tested on-site using a 0.500 testing block.