PORT OF BREMERTON
INVITATION FOR PROPOSAL #03-23-20019

Port of Bremerton Underwater Inspection of Marine Facilities

Proposals Due Monday, November 6, 2023, at 3:00 PM

INDEX

I. NOTICE

NOTICE IS HEREBY GIVEN that the PORT OF BREMERTON is hereby seeking proposals for public works contract work for the construction of the underwater inspection, condition assessment of underwater mooring systems at the Port Orchard Marina, Bremerton Marina & USS Turner Joy.

SCOPE AND NATURE OF WORK: Construction consists of a condition assessment of certain facilities based on an underwater inspection at various locations as described in section III "Scope".

PROPOSAL SUBMITTAL INFORMATION AND SITE VISIT: Submit proposals by 3:00 PM (PDT) November 6, 2023 to: Port of Bremerton, James Weaver, 8850 SW State Hwy 3, Bremerton, Washington 98312. Electronic proposals as accepted via e-mail to: jamesw@portofbremerton.org with cc to ellena@portofbremerton.org. Request a delivery and read receipt on electronically submitted proposals. A public bid opening will be held in the Airport Conference Room located at 8850 SW State Hwy 3, Bremerton, WA 98312.

For a site visit contact James Weaver at jamesw@portofbremerton.org or 360-813-0829.

CONTRACT ISSUES: **<u>This work is considered a public work contract under RCW Chapter 39</u>**. The successful contractor will be required to execute a short form contract with the Port. Among other requirements, Port public works 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 http://www.lni.wa.gov/TradesLicensing/PrevWage/WageRates/default.asp.

B. **Retainage**: By state law, the Port is required to retain five percent (5%) of the total contract amount for 30 days after final acceptance or until required state certificates of release are provided to the Port, whichever date is later.

C. **Bond Requirements**: The entity submitting the successful proposal will be required to deliver to the Port prior to contract signing a satisfactory performance bond in an amount equal to one hundred percent (100%) of the contract price. On contracts of one hundred fifty thousand dollars ($150,000) or less, the contractor may, in lieu of the bond, allow the Port to retain ten percent (10%) of the contract amount for up to 30 days following the date of final acceptance or until the retainage mentioned in B. above can be released as provided by law, whichever date is later.

D. **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 number of days bid and start the project following receiving a Notice to Proceed.
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 (electronic) 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 cause rejection of proposal.

II. PROPOSAL #03-23-20019
Port of Bremerton Underwater Inspection of Marine Facilities

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

Bremerton Marina & Turner Joy Inspection	$ ______________________
USS Turner Joy Buoy Reattachment	$ ______________________
(PLUS APPLICABLE STATE SALES TAX)	$ ______________________
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_____

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)

(continued on next page)

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. Additional work includes the reattachment of an existing mooring buoy to the existing USS Turner Joy anchor chain. 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, rear bridle connection, and cathodic protection components.

USS Turner Joy (Located at the Bremerton Marina) Mooring Buoy Reattachment scope:

- Reattach Existing 48" HDPE Mooring Buoy to existing anchor chain. Hardware (shackle & safety cable) to be provided by Port of Bremerton.

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.

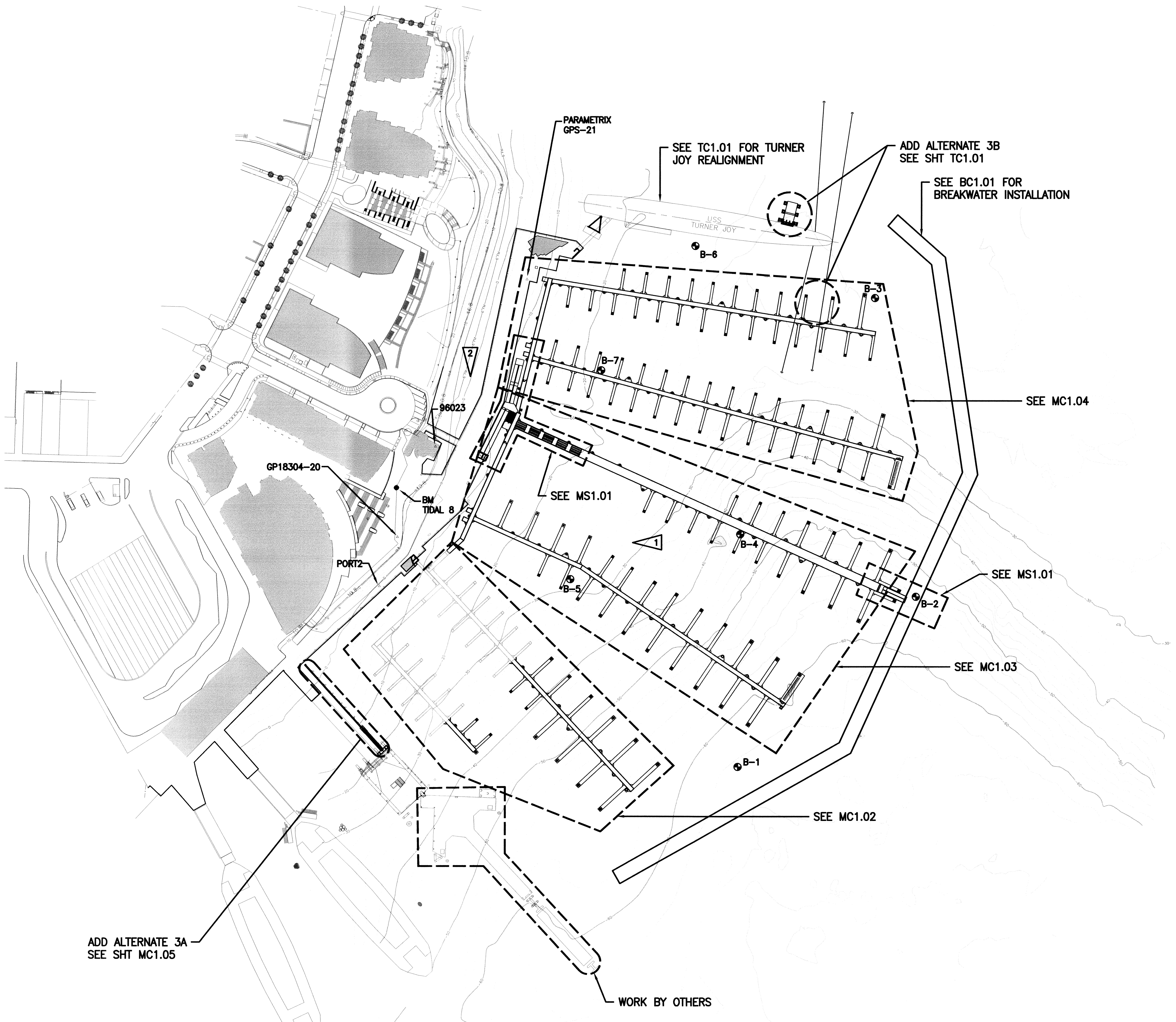
Deliverables:

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, 2024, with reporting delivered by March 15, 2024.



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

EDA AWARD No. 07-01-05806

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

EXPIRES 10-19-07

11-1-06

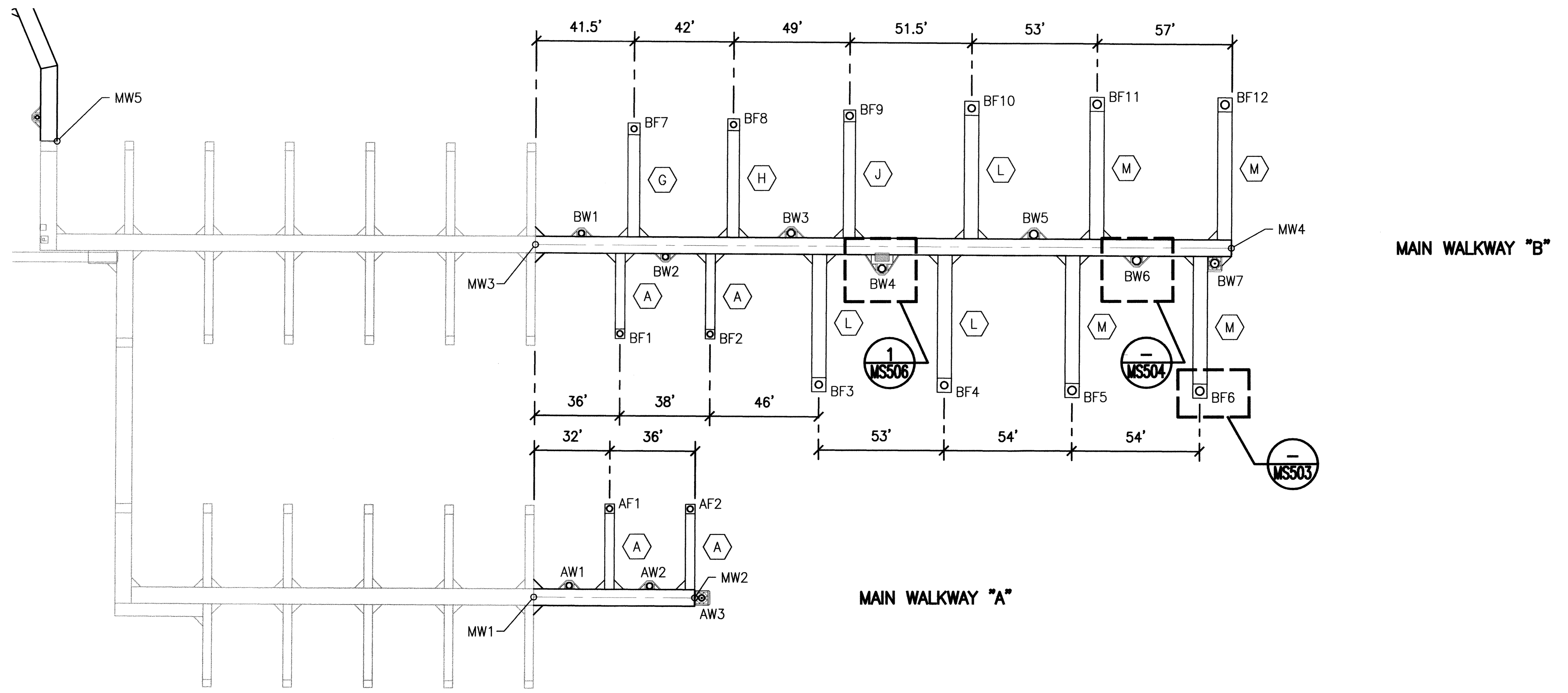
PORT OF BREMERTON
BREMERTON MARINA EXPANSION
MARINA INSTALLATION

DRAWN:	PJM
DESIGNED:	JRL
CHECKED:	RFH
DATE	03NOV06
REVISIONS:	BID SET
JOB NO	FWPOB077
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					

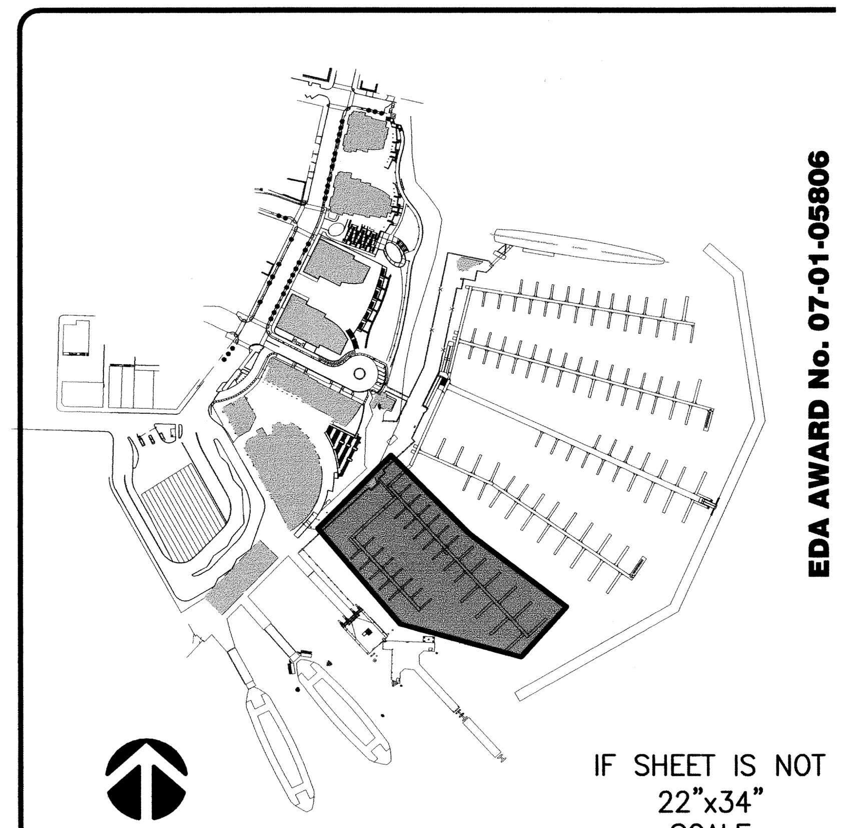
NOTE: PILE CUTOFF AT +20. DRIVE PILE TO TIP ELEVATION OR REFUSAL, WHICHEVER COMES FIRST. * EXISTING LOCATION, FIELD VERIFY *** ADD ALTERNATE 3C

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'



EDA AWARD No. 07-01-05806

IF SHEET IS NOT 22"x34" SCALE ACCORDINGLY

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202 PACIFIC AVE
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(360) 479-5600

EXPIRES 10-19-07

11-02-06

PORT OF BREMERTON
BREMERTON MARINA EXPANSION
MARINA INSTALLATION

DRAWN:	PJM
DESIGNED:	JRL
CHECKED:	RFH
DATE	03NOV06
REVISIONS	BID SET
JOB NO	FWPOB077
SHT TITLE	MARGINAL & MAIN WALKWAY "A" & "B" PLAN & COORDINATE SCHEDULE
SHT NO	11 OF 95

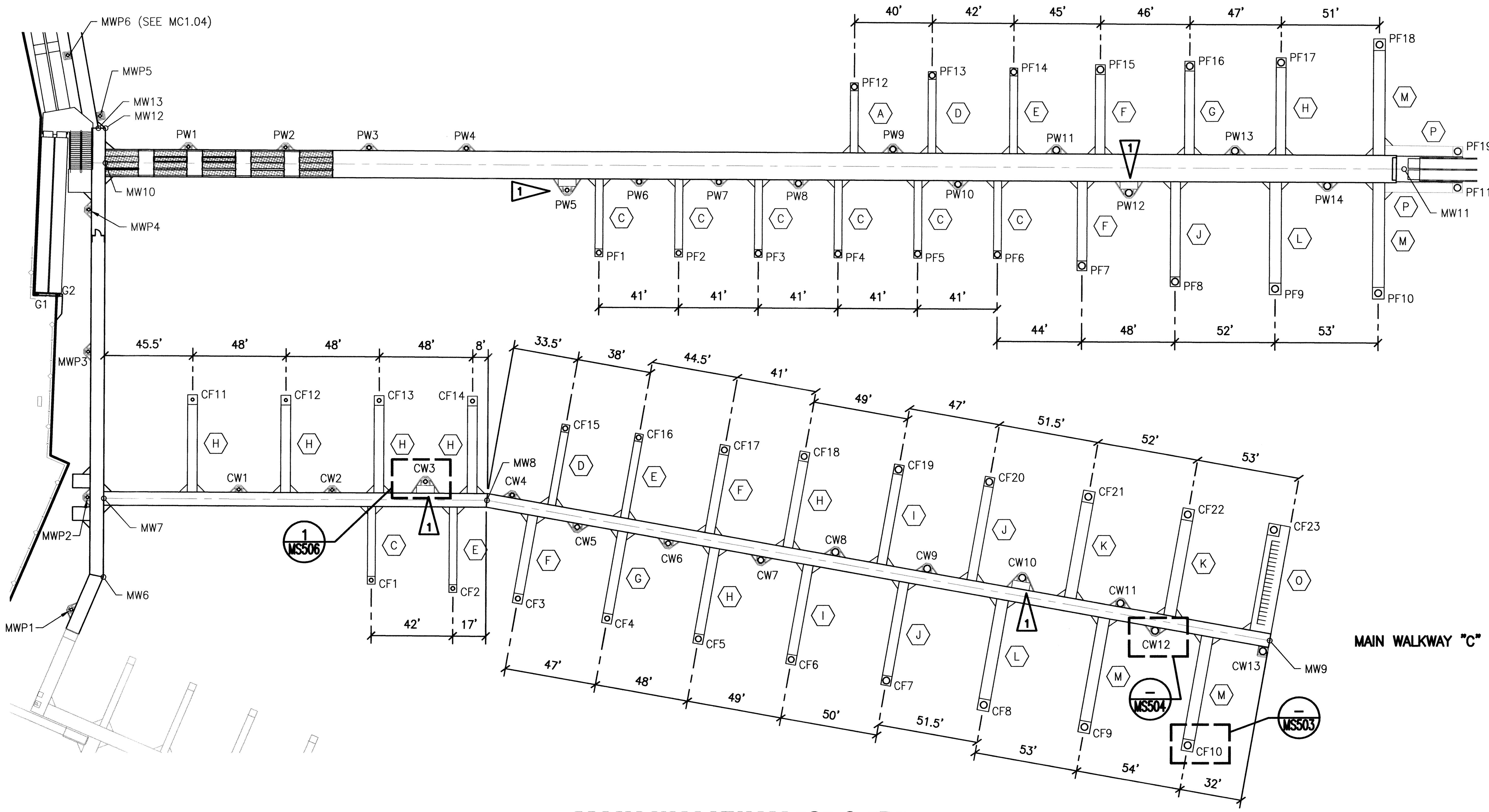
MC1.02

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

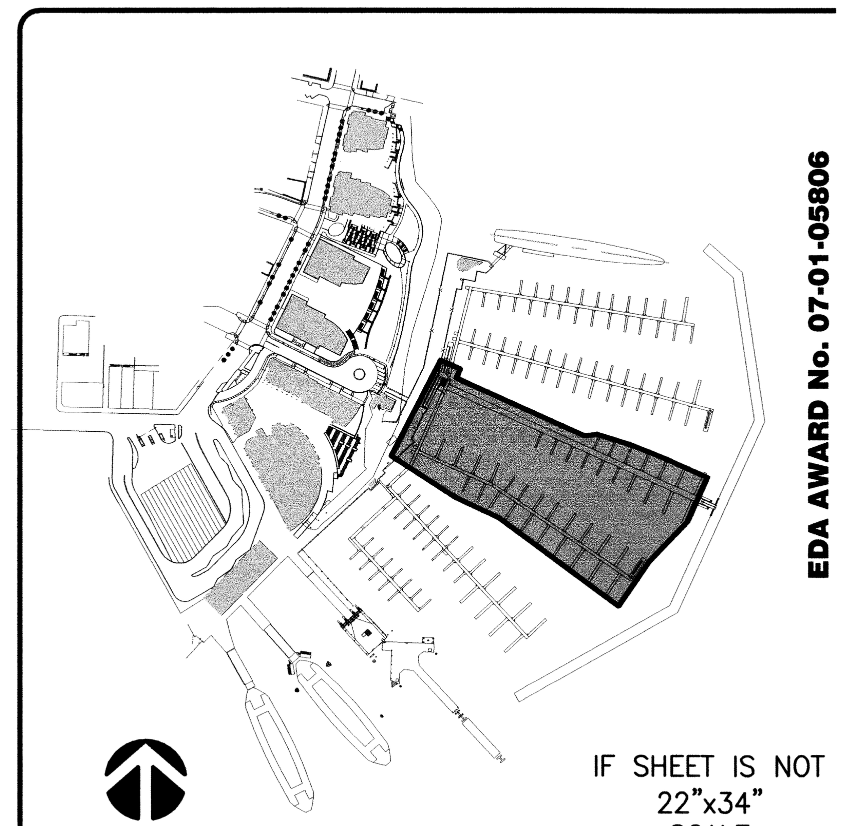
0 10' 20' 30' 40' 60' 80' 120'

SCALE: 1" = 40'

COORDINATE SCHEDULE

POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
MW6	210595.86	1198510.26		
MW7	210632.79	1198526.89		
MW8	210551.80	1198706.69		
MW9	210321.97	1199045.25		
MW10	210790.07	1198597.75		
MW11	210515.60	1199206.99		
MW12	210806.37	1198605.09		
MW13	210807.89	1198601.71		
MWP1	210587.14	1198488.39	24"ø x ½"	−48
MWP2	210636.70	1198519.44	24"ø x ½"	−47
MWP3	210704.98	1198550.20	24"ø x ½"	−46
MWP4	210771.52	1198580.18	24"ø x ½"	−46
MWP5	210813.22	1198605.11	24"ø x ½"	−46
G1	210742.50	1198538.40	12"ø x ½"	−42
G2	210737.70	1198548.15	12"ø x ½"	−42
CW1	210608.71	1198592.27	24"ø x ½"	−52
CW2	210588.99	1198636.03	30"ø x ½"	−60
CW3	210573.38	1198681.65	30"ø x ½"	−66
CW3***	210569.28	1198679.80	30"ø x ½"	−66
CW4	210548.89	1198719.69	30"ø x ½"	−69
CW5	210520.26	1198743.53	36"ø x ½"	−76
CW6	210493.58	1198782.83	36"ø x ½"	−80
CW7	210466.34	1198822.96	36"ø x ½"	−81
CW8	210454.49	1198859.63	36"ø x ½"	−79
CW9	210427.53	1198899.35	36"ø x ½"	−82
CW10	210403.32	1198942.14	42"ø x ½"	−85
CW10***	210400.01	1198939.89	42"ø x ½"	−85
CW11	210370.81	1198982.91	42"ø x ½"	−88
CW12	210350.64	1198993.40	42"ø x ½"	−89
CW13	210318.41	1199039.81	42"ø x ½"	−90
CF1	210538.32	1198635.57	30"ø x ½"	−62
CF2	210517.42	1198672.22	30"ø x ½"	−67
CF3	210499.04	1198700.72	30"ø x ½"	−72
CF4	210470.99	1198738.48	36"ø x ½"	−82
CF5	210442.37	1198777.08	36"ø x ½"	−84
CF6	210413.20	1198816.49	36"ø x ½"	−84
CF7	210383.46	1198856.74	36"ø x ½"	−85
CF8	210351.64	1198897.38	42"ø x ½"	−86
CF9	210320.22	1198940.11	42"ø x ½"	−88
CF10	210289.89	1198984.79	42"ø x ½"	−91
CF11	210660.60	1198589.32	24"ø x ½"	−48
CF12	210640.89	1198633.09	30"ø x ½"	−57
CF13	210621.17	1198676.86	30"ø x ½"	−66
CF14	210601.46	1198720.62	30"ø x ½"	−68
CF15	210569.14	1198758.58	30"ø x ½"	−72
CF16	210549.45	1198791.15	30"ø x ½"	−75
CF17	210525.70	1198828.81	36"ø x ½"	−79
CF18	210505.98	1198864.98	36"ø x ½"	−81
CF19	210480.12	1198906.64	36"ø x ½"	−83
CF20	210455.38	1198946.65	36"ø x ½"	−86
CF21	210427.69	1198990.10	42"ø x ½"	−85
CF22	210398.49	1199033.13	42"ø x ½"	−88
CF23	210373.21	1199070.36	42"ø x ½"	−90
PW1	210780.17	1198640.17	24"ø x ½"	−46
PW2	210759.63	1198685.76	24"ø x ½"	−50
PW3	210741.99	1198724.92	30"ø x ½"	−56
PW4	210721.45	1198770.51	30"ø x ½"	−64
PW5	210680.68	1198809.17	30"ø x ½"	−69
PW5***	210684.78	1198811.02	30"ø x ½"	−69
PW6	210669.58	1198844.76	30"ø x ½"	−74
PW7	210652.74	1198882.14	30"ø x ½"	−77
PW8	210635.45	1198919.31	30"ø x ½"	−79
PW9	210631.75	1198970.84	36"ø x ½"	−80
PW10	210601.76	1198994.08	36"ø x ½"	−84
PW11	210597.24	1199047.43	36"ø x ½"	−86
PW12	210561.97	1199072.67	36"ø x ½"	−89
PW12***	210565.62	1199074.31	36"ø x ½"	−89
PW13	210559.45	1199131.31	36"ø x ½"	−85
PW14	210523.72	1199167.31	42"ø x ½"	−87
PF1	210644.63	1198811.03	30"ø x ½"	−71
PF2	210627.79	1198848.41	30"ø x ½"	−74
PF3	210610.95	1198885.79	30"ø x ½"	−77
PF4	210594.11	1198923.17	30"ø x ⅝"	−79
PF5	210577.44	1198960.64	30"ø x ⅝"	−80
PF6	210560.43	1198997.94	30"ø x ⅝"	−86
PF7	210537.54	1199035.34	36"ø x ½"	−92
PF8	210510.53	1199075.82	36"ø x ½"	−90
PF9	210486.19	1199121.34	42"ø x ½"	−89
PF10	210462.60	1199168.84	42"ø x ½"	−89
PF11	210495.87	1199227.66	42"ø x ½"	−89
PF12	210669.23	1198965.80	30"ø x ⅝"	−79
PF13	210658.27	1199004.73	30"ø x ⅝"	−81
PF14	210642.84	1199043.84	30"ø x ⅝"	−84
PF15	210625.93	1199085.03	36"ø x ½"	−85
PF16	210608.86	1199127.79	36"ø x ½"	−84
PF17	210591.38	1199171.47	36"ø x ½"	−83
PF18	210579.30	1199221.41	42"ø x ½"	−84
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



IF SHEET IS NOT 22"x34" SCALE ACCORDINGLY

EDA AWARD No. 07-01-05806

ART ANDERSON ASSOCIATES

202 PACIFIC AVE
BREMERTON, WA 98337
(360) 479-5600

11-12-6

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	FWPOB077
SHT TITLE	MARGINAL & MAIN WALKWAY "C" & "P" PLAN & COORDINATE SCHEDULE
SHT NO	12 OF 95

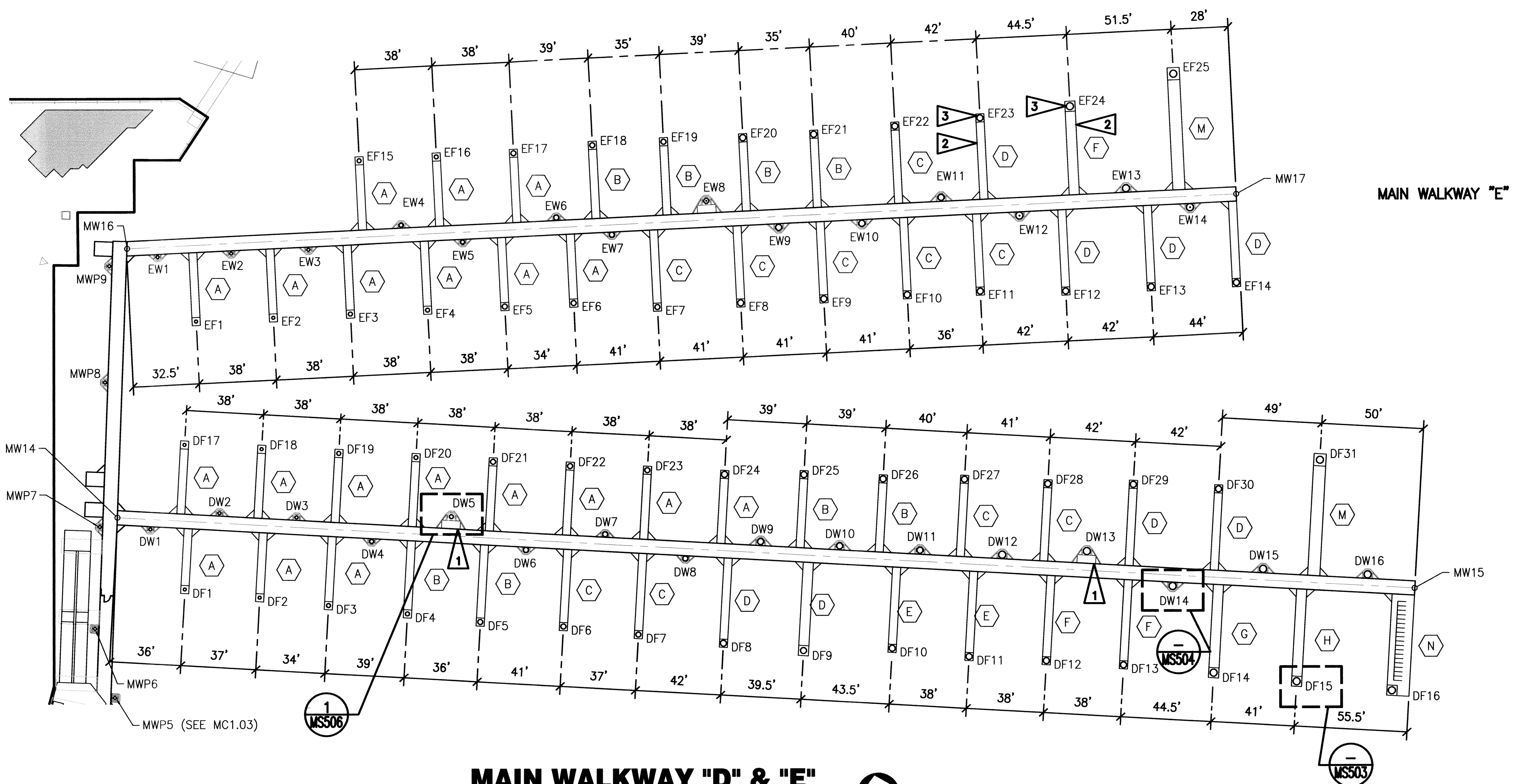
MC1.03

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

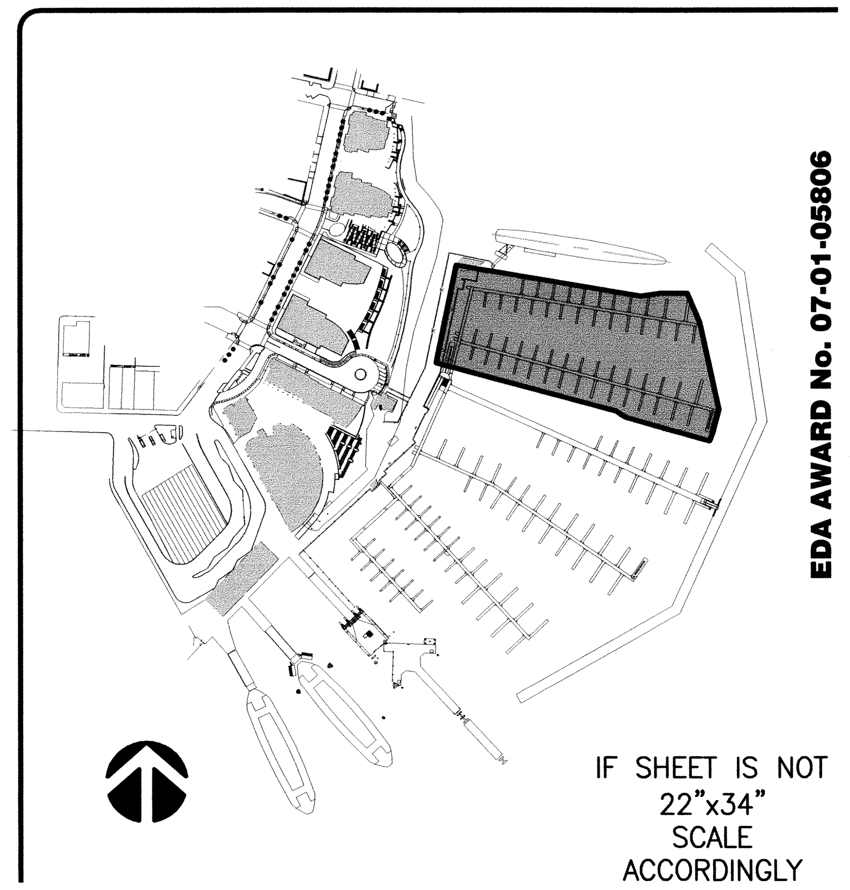
POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
MW14	210899.72	1198624.78		
MW15	210732.55	1199241.60		
MW16	211028.13	1198657.04		
MW17	210940.51	1199196.16		
MWP6	210848.53	1198602.64	24"ø x ½"	−45
MWP7	210897.01	1198615.44	24"ø x ½"	−44
MWP8	210965.98	1198632.77	24"ø x ½"	−43
MWP9	211021.55	1198646.72	24"ø x ½"	−42
DW1	210890.66	1198639.49	24"ø x ½"	−46
DW2	210891.35	1198674.39	24"ø x ½"	−48
DW3	210881.41	1198711.07	24"ø x ½"	−50
DW4	210862.15	1198744.70	24"ø x ½"	−51
DW5	210865.87	1198785.60	24"ø x ½"	−52
DW5***	210861.53	1198784.42	24"ø x ½"	−52
DW6	210842.27	1198818.05	24"ø x ½"	−56
DW7	210841.65	1198857.77	24"ø x ½"	−58
DW8	210821.73	1198893.82	30"ø x ½"	−60
DW9	210822.12	1198931.74	30"ø x ½"	−62
DW10	210811.92	1198969.38	30"ø x ½"	−67
DW11	210801.58	1199007.51	30"ø x ½"	−70
DW12	210790.99	1199046.60	30"ø x ½"	−72
DW13	210783.99	1199087.70	30"ø x ½"	−73
DW13***	210780.13	1199086.65	30"ø x ½"	−73
DW14	210758.47	1199125.33	36"ø x ½"	−73
DW15	210757.37	1199170.62	30"ø x ½"	−73

POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
DW16	210743.90	1199220.33	36"ø x ½"	−74
DF1	210858.22	1198649.87	24"ø x ½"	−46
DF2	210846.61	1198685.06	24"ø x ½"	−47
DF3	210835.78	1198717.35	24"ø x ½"	−48
DF4	210823.65	1198754.47	24"ø x ½"	−52
DF5	210812.30	1198788.69	24"ø x ½"	−58
DF6	210801.58	1198828.26	30"ø x ½"	−62
DF7	210789.97	1198863.45	30"ø x ½"	−62
DF8	210777.05	1198903.47	30"ø x ½"	−64
DF9	210765.27	1198941.20	30"ø x ½"	−68
DF10	210757.27	1198984.10	30"ø x ½"	−72
DF11	210745.40	1199020.25	30"ø x ½"	−75
DF12	210735.46	1199056.93	30"ø x ½"	−78
DF13	210725.52	1199093.61	30"ø x ½"	−78
DF14	210712.43	1199136.16	30"ø x ½"	−78
DF15	210699.77	1199175.21	30"ø x ½"	−76
DF16	210685.55	1199220.05	30"ø x ½"	−74
DF17	210927.79	1198664.58	24"ø x ½"	−46
DF18	210917.85	1198701.26	24"ø x ½"	−47
DF19	210907.91	1198737.93	24"ø x ½"	−48
DF20	210897.97	1198774.61	24"ø x ½"	−51
DF21	210888.03	1198811.29	24"ø x ½"	−54
DF22	210878.09	1198847.96	24"ø x ½"	−56
DF23	210868.15	1198884.64	24"ø x ½"	−58
DF24	210858.21	1198921.32	30"ø x ½"	−60

POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
DF25	210849.93	1198959.48	30"ø x ½"	−62
DF26	210839.73	1198997.13	30"ø x ½"	−64
DF27	210831.20	1199036.26	30"ø x ½"	−65
DF28	210820.47	1199075.83	30"ø x ½"	−70
DF29	210811.42	1199116.89	30"ø x ½"	−72
DF30	210800.43	1199157.43	30"ø x ½"	−72
DF31	210804.02	1199209.17	36"ø x ½"	−71
EW1	211020.92	1198670.93	24"ø x ½"	−45
EW2	211015.10	1198706.71	24"ø x ½"	−48
EW3	1198744.21	1198744.21	24"ø x ½"	−49
EW4	211011.26	1198791.36	24"ø x ½"	−51
EW5	210996.81	1198819.23	24"ø x ½"	−52
EW6	210998.99	1198866.87	24"ø x ½"	−54
EW7	210985.02	1198891.78	24"ø x ½"	−54
EW8	210991.56	1198940.63	24"ø x ½"	−56
EW8***	210987.12	1198939.91	24"ø x ½"	−56
EW9	210971.36	1198972.72	24"ø x ½"	−57
EW10	210964.78	1199013.19	24"ø x ½"	−59
EW11	210969.09	1199053.91	30"ø x ½"	−60
EW12	210952.35	1199089.68	30"ø x ½"	−65
EW13	210954.49	1199143.73	30"ø x ½"	−74
EW14	210938.87	1199172.60	30"ø x ⅝"	−75
EF1	210985.95	1198682.81	24"ø x ½"	−46
EF2	210979.86	1198720.31	24"ø x ½"	−48
EF3	210973.76	1198757.82	24"ø x ½"	−50

POINT ID	NORTHING	EASTING	PILE SIZE	TIP ELEV. (FT)
EF4	210967.66	1198795.33	24"ø x ½"	−51
EF5	210961.57	1198832.84	24"ø x ½"	−52
EF6	210956.11	1198866.40	24"ø x ½"	−53
EF7	210945.59	1198906.22	24"ø x ½"	−54
EF8	210939.01	1198946.69	24"ø x ½"	−56
EF9	210932.43	1198987.16	24"ø x ½"	−58
EF10	210925.86	1199027.63	30"ø x ½"	−60
EF11	210920.08	1199063.16	30"ø x ½"	−64
EF12	210911.37	1199104.30	30"ø x ½"	−70
EF13	210904.63	1199145.76	30"ø x ½"	−72
EF14	210897.89	1199187.21	30"ø x ½"	−74
EF15	211046.51	1198777.75	24"ø x ½"	−50
EF16	211040.41	1198815.26	24"ø x ½"	−52
EF17	211034.31	1198852.77	24"ø x ½"	−54
EF18	211030.03	1198891.58	24ø x ½"	−56
EF19	211024.42	1198926.13	24"ø x ½"	−57
EF20	211018.16	1198964.62	30"ø x ½"	−60
EF21	211012.54	1198999.17	30"ø x ½"	−62
EF22	211008.10	1199038.97	30"ø x ½"	−64
EF23**	211003.34	1199080.75	30"ø x ½"	−67
EF24**	210999.65	1199125.23	30"ø x ½"	−74
EF25	211004.71	1199178.23	36"ø x ½"	−74

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



IF SHEET IS NOT 22"x34" SCALE ACCORDINGLY

EDA AWARD No. 07-01-05806

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

11-12-6

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	FWPOB077
SHT TITLE	MARGINAL & MAIN WALKWAY "D" & "E" PLAN & COORDINATE SCHEDULE
SHT NO	13 OF 95

MC1.04

Underwater Inspection of Marine Facilities

Prepared by Seattle Diving Services
December 2021

TABLE OF CONTENTS

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.

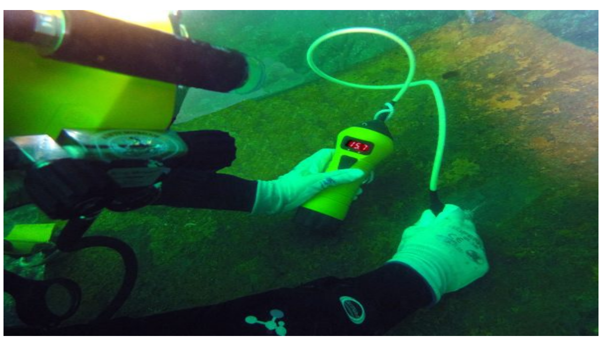
It may be in the port's best interest to have a level I inspection performed on E-dock piles to determine if there is an urgency for anode installation/ pile rehabilitation.

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.



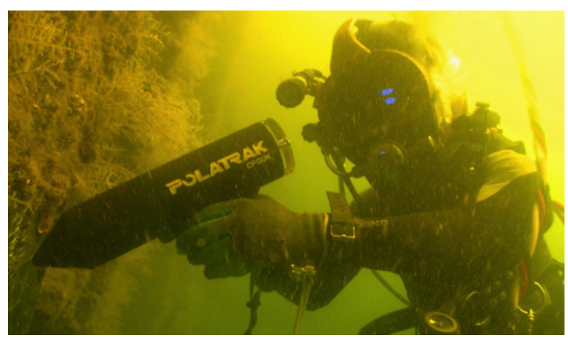
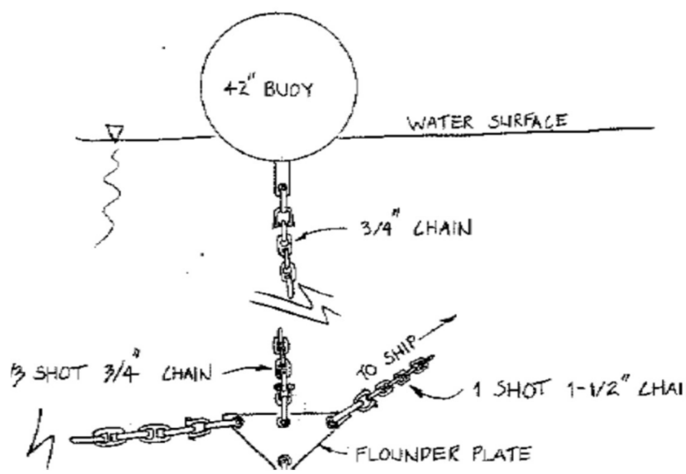


Exhibit C: USS Turner Joy – Buoy Attachment

Task includes attaching one(1) existing HDPE 48” buoy to USS Turner Joy bow anchor chain.

There is one anchor line with a single remaining existing steel buoy supported by an existing 1" chain. There is one anchor line with no buoy and with loose existing 1” chain underwater.

- The scope would include attachment of one (1) existing High-Density Polyethylene (HDPE) spherical buoy (provided by the Port of Bremerton) with 1” shackle (also provided by the Port of Bremerton) to the existing 1’ chain for each anchor line.



ART ANDERSON

TECHNICAL MEMORANDUM

Date:	October 19, 2020	**AAA Ref:**	FWPOB103.004
To:	James Weaver	**Client Ref:**	
Cc:	Fred Salisbury, Brian Robinson		
From:	Patrick Vasicek, P.E.		
Subject:	Turner Joy Marker Buoy Replacement and Requirement for Additional Mooring System Upgrades.		

Attachments

1. Neptune Quote dated 14 October 2020
2. Neptune 48" Float Ball – Assembly Drawing
3. Molding HDPE Copolymer Specifications
4. Elastopor Rigid Urethane Foam System Specifications
5. ROM Replace Four Marker Buoys – Construction Cost Estimate

References

A. Lake Union Drydock Company, letter of 31 March 2017
B. Seattle Diving Services Letter of November 2018
C. Art Anderson Associates Technical Memorandum of 15 June 2020.

PATRICK R. VASICEK
STATE OF WASHINGTON
41276
REGISTERED
PROFESSIONAL ENGINEER

830 Pacific Avenue, Bremerton, WA 98337 | 360-479-5600 | www.artanderson.com

Introduction

The Historical Ship, USS Turner Joy, which serves as the northern portion of the breakwater for the Bremerton Marina, was temporarily removed and drydocked for a period of 30 days in February – March 2017, as documented in Reference A. In November 2018, per Reference B, an underwater inspection of the USS Turner Joy Mooring system was conducted, finding considerable corrosion of chain and tackle and depletion of protective anodes after less than 2 years of service. In June 2020, Art Anderson Associates conducted an initial site visit and developed a concept assessment report, in Reference C. which identified a number of causes for the corrosion and made specific recommendations regarding prevention of galvanic corrosion caused by dissimilar metals used in construction and for improvements required to the Impressed Current Corrosion Protection system.

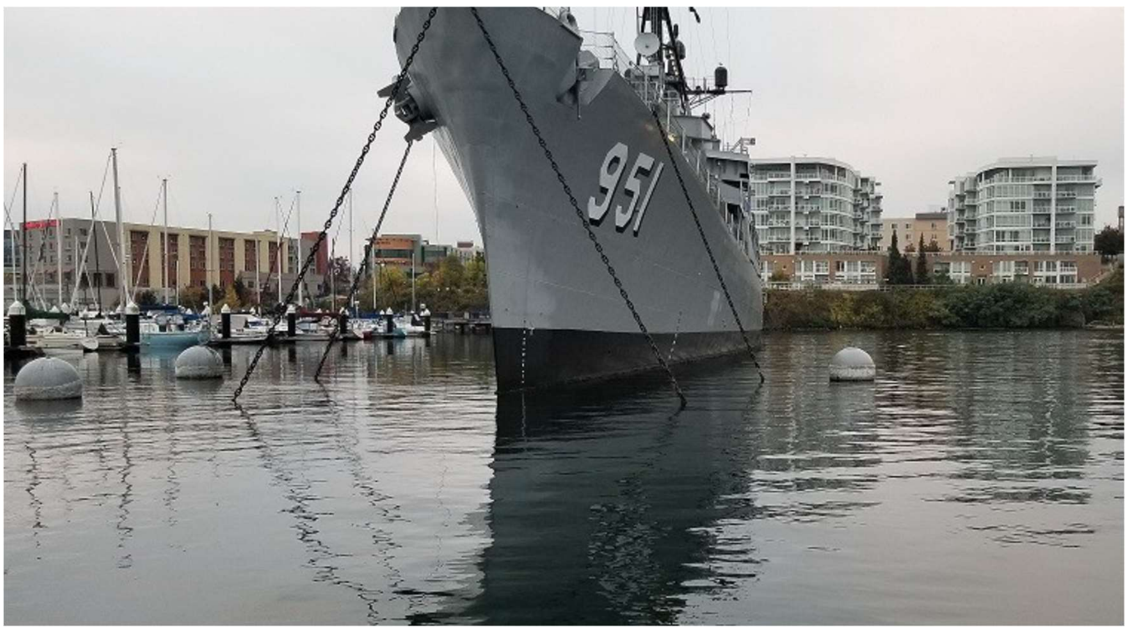


Figure 1 – Current Marker Buoy Situation

Marker Buoy Replacement Analysis and Recommendations

Since the marker buoys have had a pattern of breaking loose over the last 3 years, and since they are dented and leaking in some cases, the Port of Bremerton staff offered a suggestion regarding the possible use of non-metallic instead of steel buoys. This possibility will be examined with the following considerations:

1. Availability and cost of appropriate size and shape buoys made of a suitable non-metallic material.
2. Durability of the non-metallic buoy considering the environmental conditions and the potential for impacts by debris at the site.
3. Buoyant capacity of the buoy

The original design drawing for the USS Turner Joy Mooring system, dated 14 May 1990, shows the original marker buoys to be 42” in diameter and supported by a ¾” chain. Reference A states that the existing buoys are 58" in diameter and are supported by a 1" chain. It remains questionable as to what is the actual diameter of the existing buoys, but it is estimated that they are probably 48-52" in diameter.

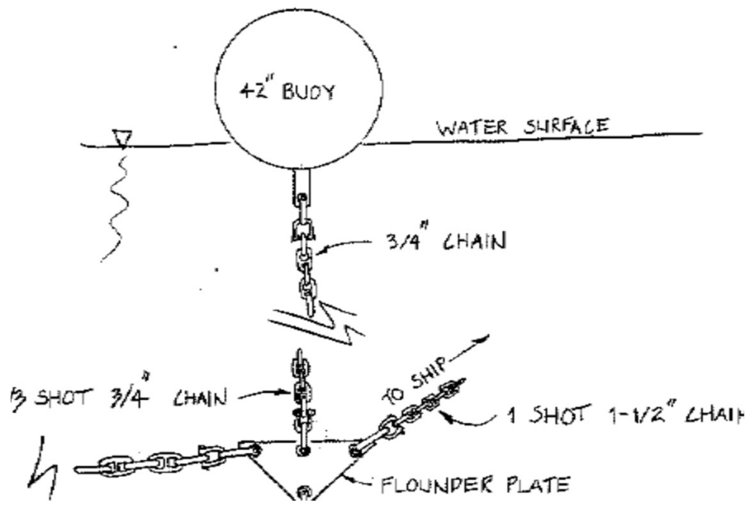
A comprehensive search of the availability of non-metallic buoys was carried out with the discovery of several potential sources for this type of buoy. The most suitable material for the external surface of a buoy available in the marketplace was High Density Polyethylene (HDPE). The Port staff also provided Art Anderson with some information obtained from Neptune Floatation in Indianapolis, Indiana regarding an HDPE spherical buoy system. We entered into discussions with Neptune and obtained a quote for a 48" HDPE buoy (Attachment 1), buoy drawings (Attachment 2), Molding HDPE Copolymer Specifications (Attachment 3) and Elastopor Rigid Urethane Foam System Specifications (Attachment 4). In addition, the sales representative stated that these buoys are routinely used for flotation systems in Alaskan rivers that are subject to ice flows on an annual basis. There have not been any failures or warranty claims for these buoys over many years.

HDPE is a common and suitable material for use in float construction and is a very durable product. The HDPE copolymer used in the Neptune buoy (Attachment 3) is an excellent material for this buoy application as it is a non-tearing and very rigid material which would probably out-perform steel with no corrosion potential. Based on this information, our judgement is that it would be acceptable to replace the existing steel buoys with 48" HDPE Neptune buoys. An additional advantage of these HDPE buoys is that they are filled with rigid urethane foam, which would enable the buoy to retain its buoyant capacity even if a leak in the outer wall should occur. Since it is the Port's desire to execute this project in 2020, a construction cost estimate for this buoy replacement is included in Attachment 5.

It may be feasible for the Port to buy the buoys and hire a diving company to install them on the existing 1" chains. The chain would need to be handled via a chain fall as used by Lake Union Drydock (when the Turner Joy was temporarily removed for maintenance) or a crane. If the chain has minimal corrosion, per the dive inspection scheduled to occur in the next week, and the chain could be handled by a smaller vessel or via rigging to the existing buoys, rather than via a crane barge, the following requirements would need to be included in the contract for the installation of the new buoys:

1. Port of Bremerton to purchase 48" Neptune HDPE buoys and 1" shackles – ensure no dissimilar metals
2. Remove existing shackles and replace with new shackles using same alloy of steel as the chain. And alternative option offered by the Port Staff is to use a High Modulus Polyethylene (HMPE) line section (Such as Amsteel Blue), in lieu of a shackle, for buoy connection. This is considered a viable option as long as the line splice is as strong as the line itself. If this option is used, we recommend coating the metal elements (buoy pad eye and chain) with TEMCOAT 3000, but it is not necessary to cost the HMPE line section.
3. Clean marine growth from existing chain down to the mud line
4. Ensure the buoy connection pad eye system is the same alloy of steel as the shackle and chain.
5. Use cotter pin locking wire that is the same alloy of steel as all other components
6. Coat entire chain, shackles, and buoy connection completely with Trenton TEMCOAT 3000

7. Installation would follow the detail of the original design shown below:



In the event the above scenario is not acceptable, please advise if you would like Art Anderson to develop a more detailed drawing and specification package for this construction contract.

ICCP System Improvement Recommendations

The Impressed Current Corrosion Protection system currently installed on the USS Turner Joy is an essential component of the overall corrosion protection system for the entire vessel, the mooring systems, and the marker buoys. Based on the preliminary site inspection conducted on 5 June 2020, it was noted that the system as currently installed is not protecting the ship in a symmetrical fashion, and in fact, could be causing galvanic corrosion to accelerate in many locations, instead of protecting the entire vessel and its mooring systems.

While it was requested in Reference C that as-built drawings for the existing ICCP system be provided if available, these drawings may be of limited value, even if found. Based on our initial site visit, it appears that significant changes have been made to this system, and that it is not wired according to code, suggesting the need for conducting an as built survey of the existing system in order to make recommendations that will provide the comprehensive protection required to prevent both vessel and mooring system corrosion issues in the future. Any documentation that can be found will still be useful as a baseline for the purpose of documenting the changes discovered during this new site visit.

Please advise if it would be acceptable to submit a proposal for this site visit and the subsequent comprehensive design package for upgrades to the ICCP system.

Buoy Replacement Construction Cost Estimate

Using the approach discussed above, the estimated cost of repairs is $40,000. A ROM cost breakdown is included as Attachment 5 to this report.

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PART NUMBER	DESCRIPTION	DIAMETER	WEIGHT (Lbs)	BUOYANCY @ 50% SUBMERSION (Lbs)	Pricing		
					1-9	10-49	50+
SUBMERSION (Lbs)							
BF13-GALV	13 Inch Ball Float with 1/2" Galv. Rod and 1 eye	13"	6	15	$ 132	$ 115	$ 104
BF16-GALV	16 Inch Ball Float with 1/2" Galv. Rod and 1 eye	16"	13	31	$ 151	$ 132	$ 120
BF18-GALV	18 Inch Ball Float with 1/2" Galv. Rod and 1 eye	18"	13	45	$ 181	$ 158	$ 143
BF21-GALV	21 Inch Ball Float with 1/2" Galv. Rod and 1 eye	21"	21	70	$ 272	$ 239	$ 217
BF25-GALV	25 Inch Ball Float with 1/2" Galv. Rod and 1 eye	25"	27	110	$ 312	$ 273	$ 248
BF30-GALV	30 Inch Ball Float with 1/2" Galv. Rod and 1 eye	30"	40	226	$ 479	$ 418	$ 380
BF36-GALV	36 Inch Ball Float with 1/2" Galv. Rod and 1 eye	36"	64	407	$ 571	$ 500	$ 455
BF48-GALV	48 Inch Ball Float with 1/2" Galv. Rod and 1 eye	48"	100	996	$ 785	$ 687	$ 623

GREAT FEATURES:

- Tough, crack resistant, UV inhibiting polymer resin ensures a long life
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- **Boat Traffic Control**
- **Mooring Buoys**

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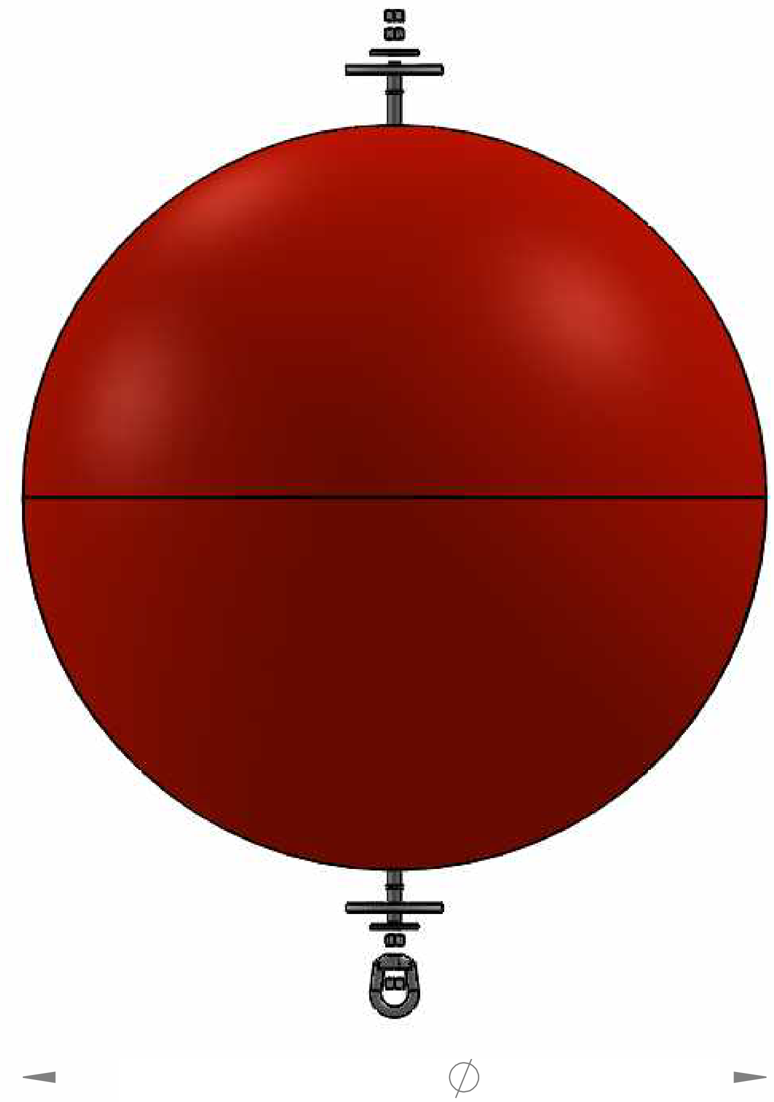
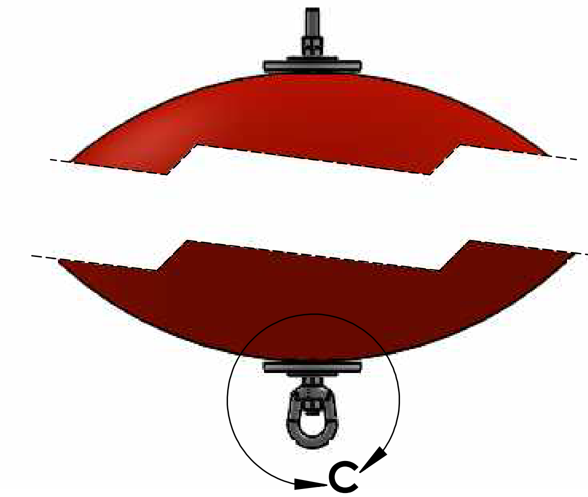
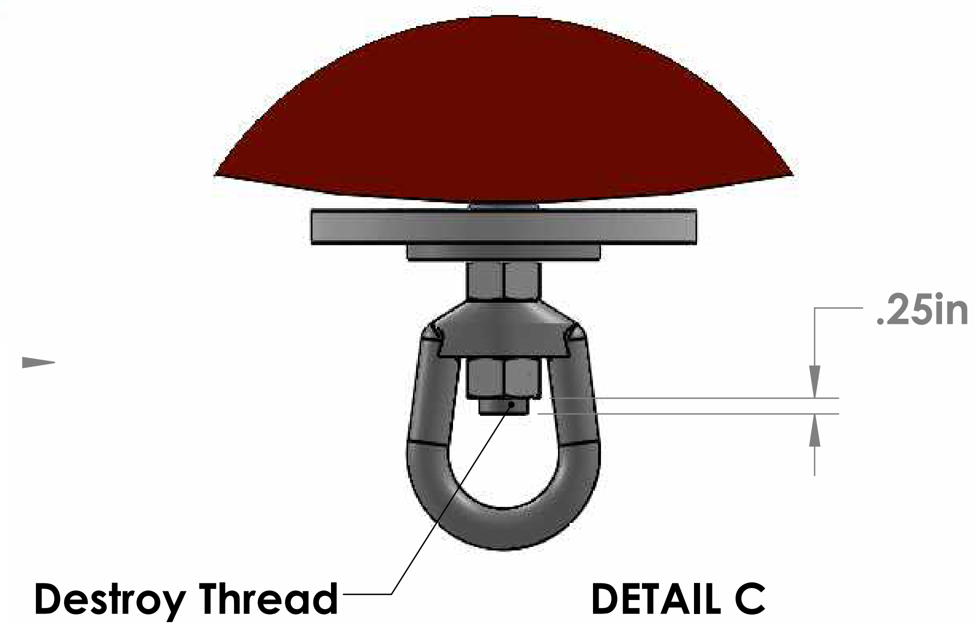
Phone: 317-588-3600 Fax: 317-588-3700 Email: sales@pipefloat.com

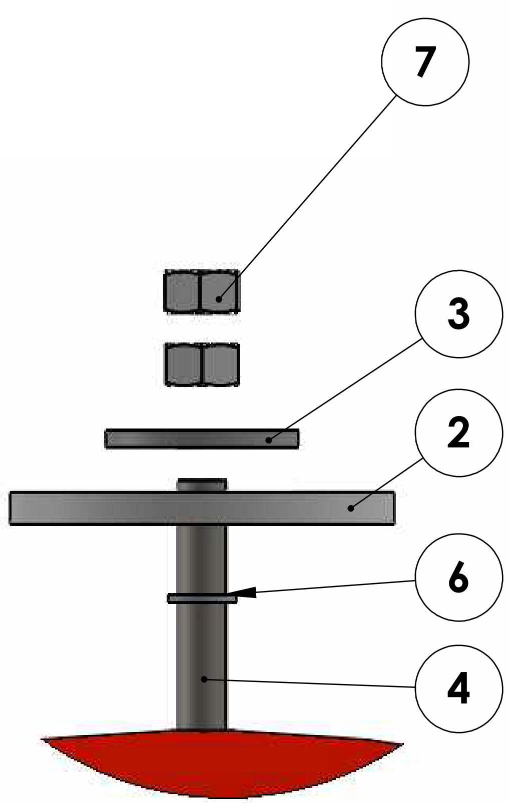
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	48 Inch Float Ball	48 Inch Float Ball with Urethane Foam	1
2	Plastic Washer Plate Nationwide Plastic # 26004520	PE Plastic Washer cut from plate	2
3	McMaster #98970A150	Hot Dipped Galvanized Washer for Screws 3/4"; OD = 3"	2
4	Threaded Steel Rod	Threaded 3/4"-10 Hot Dipped Galvanized Rod Thread 3/4"-10; Length = 54"	1
5	McMaster # 3019T21	Hot Dipped Galvanized Eye Nut; Thread 3/4"-10	1
6	Hose Washer MCMaster # 5456K7	Neopren Washer 1-1/16"OD-x 5/8"ID x 1/8"	2
7	McMaster # 90371A055	Hot Dipped Galvanized Hex Nut; Thread 3/4"-10	4



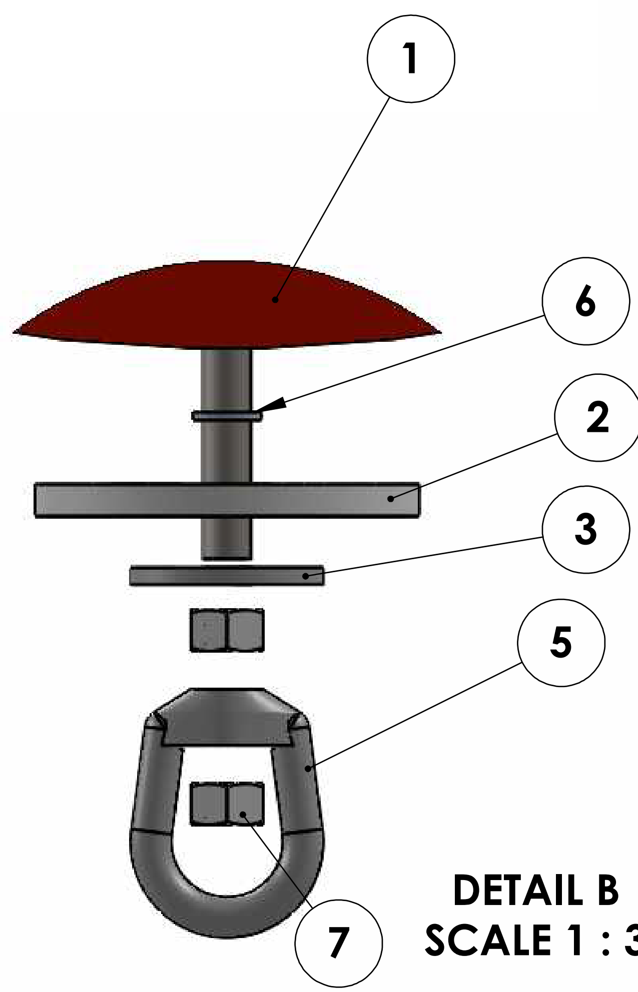




DETAIL C
SCALE 1 : 3



DETAIL A
SCALE 1 : 3



DETAIL B
SCALE 1 : 3

NOT IN SCALE	DRAWN BY	DATE
STATUS: CONCEPT	AB	08/08/2019

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TOLERANCES
ANGULAR = ±1/2°
LINEAR = ±1% OF DIMENSION

TITLE: Assembly of 48" Float Ball

REVISION 0

SHEET 1 OF 2

PART NO.

ENG. ID. 48 Inch Float Ball Assembly

ExxonMobil Chemical

ExxonMobil HD 8660
Rotational Molding HDPE

Material Description
HD 8660 is a high density hexene copolymer designed to offer superior toughness and stiffness. This resin is ideally suited for applications that require the optimum balance of low temperature toughness, creep resistance, stiffness, ESCR, and tear properties.

Typical Applications
Large agricultural tanks
Intermediate bulk containers
Industrial products

HD 8660.29 Pellet Form; Long term UV8 stabilization
HDP8660.29 35 US Mesh Powder; Long term UV8 stabilization

Resin Properties	**Test Based On[4]**	**Units**	**Typical Value[1]**
Melt Index	ASTM D-1238	g/10 min.	2.0
Density	ASTM D-4883 or ASTM D-1505	g/cm^3	0.942
Melting Point	ExxonMobil Method	°C (°F)	129 (264)
Molded Properties[2]			
Tensile Strength at Yield[3]	ASTM D-638	MPa (psi)	20.3 (2950)
Tensile Break Elongation	ASTM D-638	%	> 1000
Flexural Modulus 1% Secant	ASTM D-790 Procedure B	MPa (psi)	888 (129,000)
Impact Strength @ -40°C	ARM	J ($ft\text{-}lbs_f$)	
1/8" (3.17 mm) thickness			108 (80)
1/4" (6.35 mm) thickness			244 (180)
Environmental Stress Crack Resistance (ESCR), F_{50}	ASTM D-1693 Condition A	hr	
	100% Igepal		550
	10% Igepal		48
Deflection Temperature	ASTM D-648	°C (°F)	
@ 66 psi (455 Kpa)			67 (153)
@ 264 psi (1820 Kpa)			41 (106)

1. Values given are typical and should not be interpreted as specifications. Values may change with future development.
2. All physical properties were measured on rotomolded samples, except for ESCR, which was measured on compression molded samples.
3. Tensile testing was conducted at a crosshead speed of 50 mm/min. The tensile strength reported refers to the maximum stress reached during the test.
4. ASTM test procedures may be modified to accommodate operating conditions or facility limitations.
5. Grades have NSF and UL recognition. Contact your ExxonMobil representative for details.

Food Packaging
Grades have FDA compliance. Restrictions may apply, contact your ExxonMobil representative for more details.

12/01

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Technical Product Data

Urethane Specialties

ELASTOPOR® P 15390R RESIN/ELASTOPOR® P 1001U ISOCYANATE RIGID URETHANE FOAM SYSTEM

DESCRIPTION

ELASTOPOR® P 15390R Resin/ELASTOPOR® P 1001U Isocyanate is a two-component polymeric MDI based system utilizing water and HFC-245fa as blowing agents.

ELASTOPOR® P 15390R RESIN COMPONENT

Appearance	Amber liquid
Odor	Amine
Density, @ 55°F	9.06 lbs/gal
Viscosity, @ 73°F	360 cps
Flash Point, ASTM 3278-89	>200°F
HFC-245fa, % Resin	7.6%

ELASTOPOR® P 1001U ISOCYANATE COMPONENT

Appearance	Dark brown liquid
Odor	Slight Amine
Density, @77°F	10.2 lbs/gal
Viscosity, @77°F	200 cps
Flash Point	>400°F
Vapor Pressure, at 20°C	0.00016 mm Hg

APPLICATION

Mix Ratio: Parts by weight — 92 Resin/100 Isocyanate

Foam Reactivity & Density	Handmix	High-Pressure
Jiffy Mixer RPM	1720	--
Component Pressures, Resin/Isocyanate	--	1500psi/1500psi
Component Temps, Resin/Isocyanate	55°F / 70°F	70°F / 70°F
Mix time, seconds	8	--
Cream time, seconds	24	5
Gel time, seconds	100	60
Tack Free time, seconds	210	140
Free Rise Density, #10 Cup, lb/ft^3	2.0	2.0

BASF Corporation
1419 Biddle Avenue
Wyandotte, Michigan 48192-3799
(734) 324-6100
(734) 324-6482 (Fax)

Revision Date: 1/03/2006

BASF
The Chemical Company

Technical Product Data

Urethane Specialties

ELASTOPOR® P 15390R RESIN/ELASTOPOR® P 1001U ISOCYANATE RIGID URETHANE FOAM SYSTEM

TYPICAL PHYSICAL PROPERTIES		ASTM
Molded Panel		
Core Density, pcf	2.6	D-1622
Parallel:		
Compressive Strength @10% deflection, psi	43	D-1621
Compressive Modulus, psi	1086	D-1621
Perpendicular:		
Compressive Strength @10% deflection, psi	28	D-1621
Compressive Modulus, psi	669	D-1621
Tensile Strength, psi	52	D-1623
Elongation, %	11	D-1623
Tensile Modulus, psi	661	D-1623
Flexural Strength, psi	51	D-790
Flexural Modulus, psi	1148	D-790
Water absorption, lbs./sq. f	0.032	D-2842
Water absorption, %	1.8	D-2842
Closed Cells, % (uncorrected)	88	C-6226
K Factor, BTU-IN/HR-FT2-°F		
Initial	0.154	C-518
UL® 94 Flame Class (File E112987)	HBF	

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Dimensional Stability, % Volume Change		ASTM
158°F/100% RH 28 days	-1.0	D-2126
200°F 28 days	-1.0	D-2126
-20°F 28 days	-0.5	D-2126

CERTIFICATION

US COAST GUARD: (CGD 75- 168) Flotation Material
Rigid polyurethane samples prepared from Elastopor® P 15390 chemicals have been tested at an independent laboratory. Molded samples have passed the U.S. Coast Guard immersion tests (CGD 75-168), and meet or exceed Performance criteria set out in D.O.T. – Coast Guard – Flotation Materials, Par. 183.114, Federal Regulatations Volume 43, No. 233, 1/5/2005

US COAST GUARD: (CITE: 33CFR183.516) Encase Fuel Tanks. Rigid polyurethane foam samples has been tested by an independent laboratory. Molded samples have passed the ASTM D-471 and Military specification MIL P-21929B sections of 33CFR183.516. 12/23/2005.

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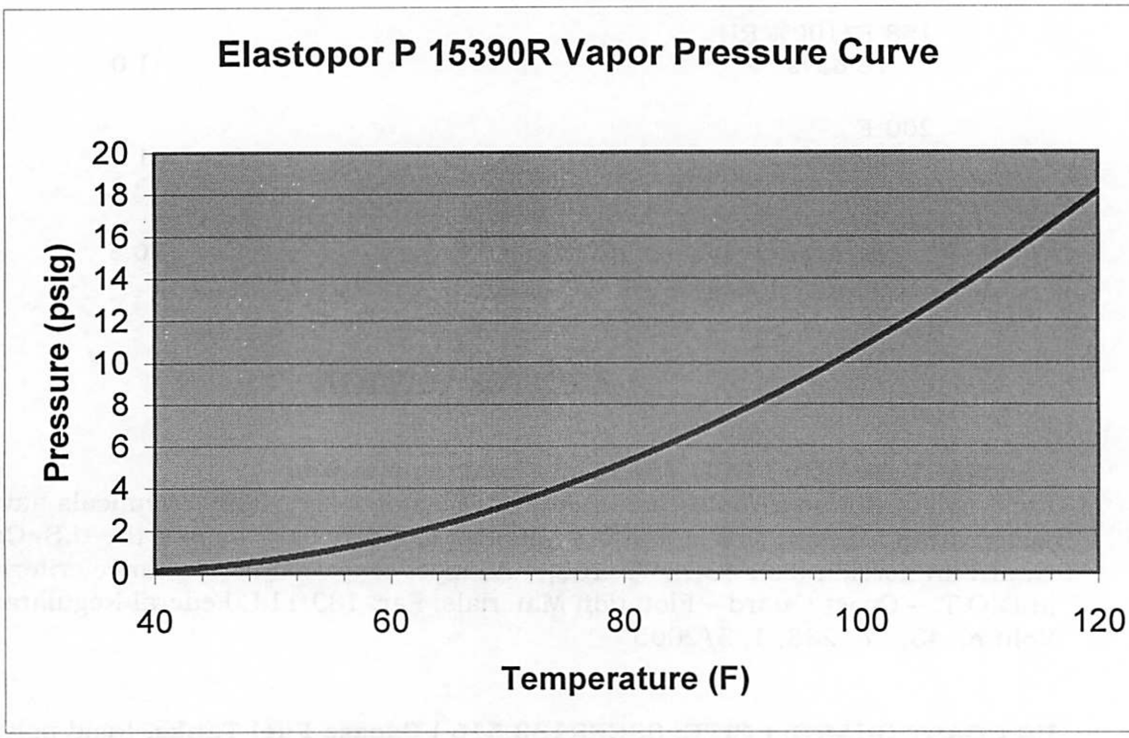

Important! The information, data and products presented herein are based upon information reasonably available to BASF Corporation at the time of publication, and are presented in good faith, but are not to be construed as guarantees or warranties, express or implied, regarding performance, results to be obtained from use comprehensiveness merchantability, or that said information, data or products can be used without infringing patents of third parties. You should thoroughly test any application, and independently determine satisfactory performance before commercialization.

"Warning" These products can be used to prepare a variety of polyurethane products. Polyurethanes are organic materials and must be considered combustible.

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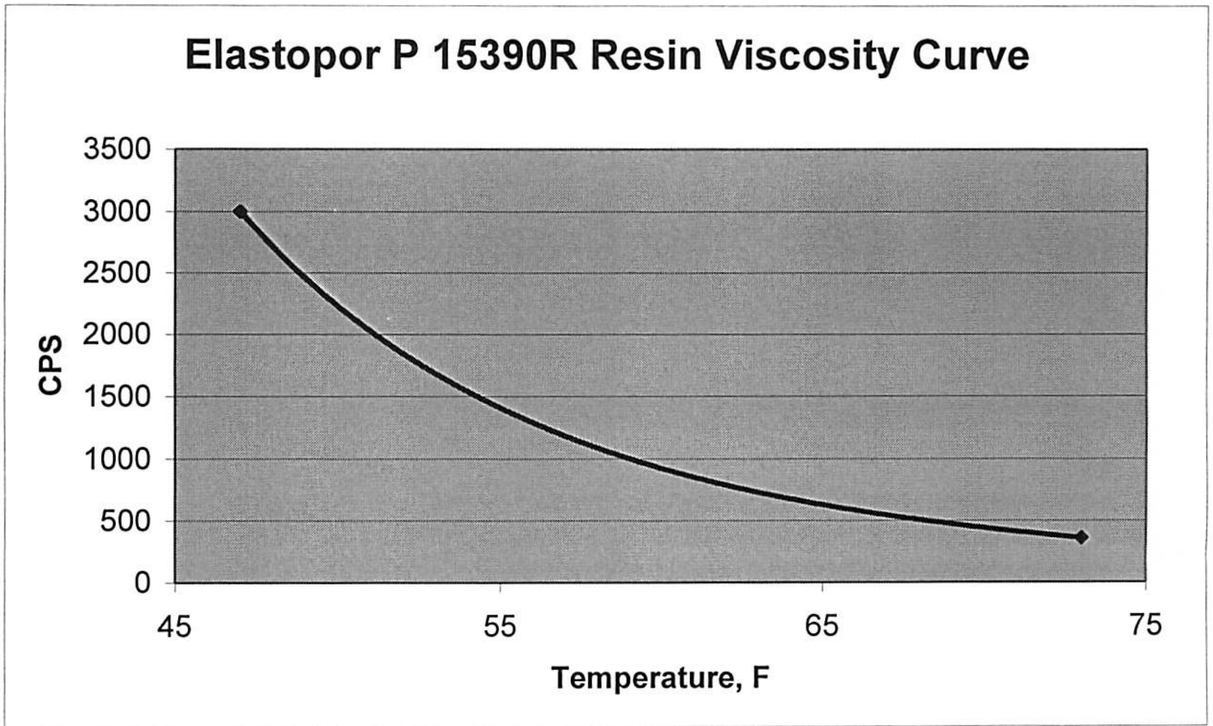

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ROM Cost Estimate

A R T   A N D E R S O N   A S S O C I A T E S

ESTIMATED BY: AAA	PROJECT No. **FWPOB103.004**
PROJECT & CITY: Port of Bremerton USS Turner Joy Marker Buoy Replacement	CONTRACT No.
DATE: October 20, 2020	PURPOSE **ROM Est**
EST. VALID TO: ROM = N/A	SHEET 1 OF 1

SCOPE OF WORK:

SCOPE OF WORK:

Replace Existing Steel Marker Buoys with HDPE Buoys

LS = Lump Sum Allowance value used

LINE ITEMS	**QUANTITY**		**LINE ITEM COST**			**TOTALS**
DESCRIPTION OF WORK	#	UNIT	UNIT($)	SUM TOT ($)		SUM TOTS ($)
HDPE Buoys	4	Ea.	$785.00	$3,140		$3,140
Mobilization	1	LS	$3,000.00	$3,000		$3,000
Barge/Vessel Rental	1	LS	$4,500.00	$4,500		$4,500
Dive Team - one day	1	LS	$5,000.00	$5,000		$5,000
Locate and Rig Chains for cleaning (Missing buoy)	1	LS	$1,000.00	$1,000		$1,000
Clean marine growth from chains	1	LS	$1,500.00	$1,500		$1,500
Remove three buoys and install 4 new buoys	1	LS	$2,000.00	$2,000		$2,000
Coat entire installation with TEMCOAT 3000	1	LS	$2,000.00	$2,000		$2,000
				$0		$0
				$0		$0
				$0		$0
				$0		$0
				$0		$0
				$0		$0
				$0		$0
				$0		$0
				$0		$0
				$0		$0
Demobilize	1	LS	$2,000.00	$2,000		$2,000
				$0		$0
				$0		$0
LINE ITEM SUBTOTAL						**$24,140**
GENERAL CONDITIONS ITEMS	**QUANTITY**			**COST**		
Description of Item	#	UNIT	UNIT($)	SUM TOT ($)		SUM TOTS ($)
SUBTOTAL						**$24,140**
CONTRACTOR'S OVERHEAD	15%					$7,242
CONTRACTOR'S PROFIT	10%					$5,552
Sales Tax (on above subtotals+OH/P)	9.00%					$5,497
CONTRACTOR'S BONDS & INSURANCE	5%					$1,847
SUBTOTAL						**$36,934**
CONTINGENCY						
DESIGN + CONSTRUCTION CONTINGENCY	5%	0	$0.00	$0.00	$0.00	**$3,054**
ESCALATION CONTINGENCY (Assume 2020)	0%	0	$0.00	$0.00	$0.00	**$0**
CONSTRUCTION COST TOTAL						**$39,988**
DESIGN & ENGINEERING (Repair/Replacement Design)						
DESIGN & ENGINEERING (Permit Docs) - Use NWP-3	10%					
						$0
SUBTOTAL						**$39,988**
GRAND TOTAL						**$39,988**

Port of Bremerton

8850 SW State Hwy 3
Bremerton, WA 98312
360.674.2381 Fax 360.674.2807

PURCHASE ORDER

P.O. NUMBER:

This purchase order number must appear on all related correspondence, shipping papers, and invoices

To:

Ship To:
Port of Bremerton
8850 SW State Hwy 3
Bremerton, WA 98312

P.O. DATE	REQUISITIONER	SHIP VIA	F.O.B. POINT	TERMS
October 18, 2023				

QTY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
				$0.00
				$0.00

SAMPLE

This Purchase Order is deemed to be a public works contract pursuant to RCW Ch. 39. By acceptance of this Purchase Order, the Contractor agrees not to discriminate against any employee or applicant for employment on the basis of race, color, religion, national origin, ancestry, sex or age. All employees of Contractor shall be paid the prevailing rate of wage and usual benefits in kind pursuant to RCW Ch. 39. Once notified by Washington State Department of Labor & Industries, the Contractor shall file Intent to Pay Prevailing Wages form and Affidavit of Wages Paid form with L&I and pay for all fees associated with filing the forms. Contractor shall submit a retained percentage form; a performance and payment bond OR an election to retain 10% of contract amount in lieu of bond (if bond is provided, 5% retainage rate applies); and a certificate of liability insurance with combined bodily injury and property damage limits in the amount of $1,000,000 naming the Port as an additional insured.

Prevailing Wage information may be attained at: http://www.lni.wa.gov/TradesLicensing/PrevWage/default.asp

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.

Contractor's UBI Number: ______________________ Contractor's Registration Number: ______________________

Contractor Acceptance: ____
Authorized Signature Date

SUBTOTAL	$0.00
SALES TAX	
SHIPPING & HANDLING	
OTHER	
TOTAL	$0.00

For Port Use Only:

Justification:

Recommended by:

____
Authorized by

Port of Bremerton Terms and Conditions
Purchase Order – Public Works less than $50k

This order is subject to the following instructions, terms, and conditions of the Port of Bremerton (8850 State Hwy 3, Bremerton, WA 98312).

1. Definitions: "Port" means Port of Bremerton. "Contractor" means the party with whom Port is contracting. The term "purchase order", or “contract” shall mean the name or title of the instrument of contracting, including all documents, exhibits, and attachments referenced therein.

2. TERMS: Payment terms are NET 30. All invoices must reference a valid Purchase Order number. Invoices are to be e-mailed to ap@portofbremerton.org (preferred). Invoices which include items or services other than those shown on this order will not be paid. All payments to Contractor shall be remitted by mail, unless other arrangements have previously been made. Furthermore, the provisions of monies due under this contract shall only be assignable with prior written consent of the Port.

3. CONFORMITY OF GOODS/SERVICES: All goods to be delivered or services to be performed shall conform in every respect to the Specifications issued by the Port in conjunction with its solicitation of bids or proposals. In the event no such Specifications were issued, the goods or services shall conform to the proposal submitted by Contractor.

4. PUBLIC WORKS: This Purchase Order is deemed to be a public works contract pursuant to RCW Ch. 39. The Contractor shall pay prevailing wages as required and shall comply with Chapters 39.12 and 49.28 RCW, and all other applicable laws. 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 at http://www.lni.wa.gov/TradesLicensing/PrevWage/WageRates/default.asp. Any dispute in connection with this contract which the parties cannot resolve among themselves shall be referred to the director of Washington State Department of Labor & Industries for arbitration, and the director’s decision shall be final, conclusive and binding on all parties to the dispute.

5. DELIVERY, TRANSPORTATION, INSPECTION, REJECTION, EXCESS SHIPMENT: All shipments are to be made "F.O.B. Destination". When articles are sold "Freight Allowed" and the Port’s Purchase Order so confirms, please prepay shipping charges and record prepaid charges as a separate item on invoice. It is understood that title of the merchandise appearing on this order will not pass until the merchandise is accepted at the delivery destination. The Port reserves the right to reject COD deliveries.

In addition to other rights provided by law, the Port reserves the right (a) to inspect articles delivered and to return those which do not meet specifications or reasonable standards of quality, (b) to reject articles shipped contrary to instructions or in containers which do not meet recognized standards, and (c) to cancel the order if not filled within the time specified. The Port may return rejected articles or excess shipment on this order or may hold the articles subject to the Contractor's order and at his risk and expense and may in either event charge the vendor with the cost of shipping, unpacking, inspecting, repacking, reshipping, and other like expenses. Delivery shall be made between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday, except holidays, and such delivery shall be made and articles shall be placed inside the building or designated rooms at no additional charge.

6. CONFLICTS: In the event the terms and conditions herein expressed conflict with the terms and conditions of any Specifications issued by the Port in conjunction with this purchase, the Specifications shall supersede. Alteration in any of the terms, conditions, delivery, prices, quality, quantities, or specifications of this order will not be effective without written order of the Chief Executive Officer or designee. Unauthorized substitutions will be made entirely at Contractor's risk and, at Port's option, may be returned without prior authorization at Contractor's expense. If a court of competent jurisdiction declares any provision of the PO to be invalid, the other provisions and the rights and obligations of the parties remain in effect.

7. WARRANTY: Contractor warrants that articles supplied under this order conform to specifications herein and are fit for the purpose for which such goods are ordinarily employed, except that if a particular purpose is stated, the material must also be fit for that particular purpose. Contractor warrants and represents that all the goods and materials ordered herein are free and clear of all liens, claims, or encumbrances of any kind.

8. TAXES: Unless otherwise specified, Port agrees to pay all state of Washington sales or use tax. No charge by Contractor shall be made for federal excise taxes and Port agrees to provide exemption certificates when required. Applicable taxes must be included in the invoice and included in cost proposals or quotes accepted by the Port of Bremerton.

9. INSURANCE: The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the State of Washington and reasonably acceptable to the Port, an occurrence-based Commercial General Liability Insurance policy, which shall provide bodily injury and property damage liability on the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by subcontractors of any tier or by anyone directly or indirectly employed by any of them including owned, non-owned and hired vehicles, or by anyone for whose acts any of them may be liable.

The insurance will name the Port, its consultants and employees, and any required governmental agencies as additional named insureds by way of a policy endorsement for Work performed under this Contract and the policy shall be designated primary for both defense and indemnity. Such limits of liability insurance shall not be less than the following:

a) $1,000,000.00 per occurrence for bodily injury liability including sickness, disease or death, and $2,000,000.00 bodily injury liability for all occurrences (other than automobiles);

b) $1,000,000.00 for property damage liability (other than automobiles) because of damage to or destruction of property of others including loss of use thereof caused by one occurrence, and $1,000,000.00 property damage liability for all occurrences;

c) As an alternate to subparagraphs a) and b) above, the Contractor may insure for $1,000,000.00 Combined Single Limit protection for both bodily injury and property damage liability per occurrence and $2,000,000.00 general aggregate stop loss;

d) $1,000,000.00 per accident for bodily injury liability including sickness, disease or destruction of property of others, including loss of use thereof arising out of the operation of automobiles; and;

e) $1,000,000.00 for claims for damages insured by personal injury liability covered (included and defined in the Commercial General Liability Insurance Policy) which are sustained: (1) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or; (2) by another person.

In addition, the Contractor shall purchase and maintain insurance for claims under workers' compensation (industrial insurance), disability benefit, and other similar employee benefit acts in the State statutory amount, and Employer's Liability with coverage of at least $250,000.00/$500,000.00. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment.

Before commencing Work, the Contractor shall furnish the Port with Certificates of Insurance as evidence of all insurance required by the Contract Documents. No Progress Payment will be due until all such Certificates are furnished. All policies and certificates must be signed copies. Furthermore, the policies of insurance required herein (except for Workers' Compensation Insurance) shall: (i) be written as a primary policy; (ii) expressly provide that such insurance may not be materially changed, amended or canceled with respect to Lessor except upon forty-five (45) days' prior written notice from the insurance company to Lessor; (iii) contain an express waiver of any right of subrogation by the insurance company against the Port and its elected officials, employees or agents; (iv) expressly provide that the defense and indemnification of the Port as an "additional insured" will not be effected by any act or omission by Contractor which might otherwise result in a forfeiture of said insurance; (v) contain a separation of insureds provision such that the policy applies separately to each insured that is subject of a claim or suit; (vi) not contain a cross-claim, cross-suit, or other exclusion that eliminates coverage by one insured against another; and (vii) provide for coverage for damage to the Port's property caused by the Contractor.

10. INDEMNIFICATION: To the fullest extent permitted by law, Contractor agrees to defend, indemnify, and hold harmless the Port and its officers, agents, and employees from and against claims, damages, losses and expenses, including but not limited to attorneys' fees and costs, consulting fees, expert fees, and expenses, arising out of or resulting from performance of the Work. Contractor's indemnity and defense obligations do not extend to liability resulting from the sole negligence of the Port and their agents. Contractor's duty to indemnify and defend the Port for liability for damages arising out of bodily injury to persons or damage to property caused by or resulting from the concurrent negligence of (a) the Port and their agents; and (b) Contractor or its agents, employees, and subcontractors and suppliers of any tier, shall apply only to the extent of the negligence of Contractor, its agents, employees, and subcontractors and suppliers of any tier.

By signing on the Acceptance line of this Purchase Order, the Contractor and Port agree to the following: FOR PURPOSES OF THE FOREGOING INDEMNIFICATION PROVISION, AND ONLY TO THE EXTENT OF CLAIMS AGAINST CONTRACTOR BY THE PORT UNDER

SUCH INDEMNIFICATION PROVISION, CONTRACTOR SPECIFICALLY WAIVES ANY IMMUNITY IT MAY BE GRANTED UNDER THE WASHINGTON STATE INDUSTRIAL INSURANCE ACT, TITLE 51 RCW, THE UNITED STATES LONGSHORE AND HARBOR WORKERS COMPENSATION ACT, 33 USC §901-950, OR ANY OTHER SIMILAR WORKERS' COMPENSATION SCHEMES. THE INDEMNIFICATION OBLIGATION UNDER THIS CONTRACT SHALL NOT BE LIMITED IN ANY WAY BY ANY LIMITATION ON THE AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE TO OR FOR ANY THIRD PARTY UNDER WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS, OR OTHER EMPLOYEE BENEFIT ACTS. THE FOREGOING PROVISION WAS SPECIFICALLY NEGOTIATED AND AGREED UPON BY THE PARTIES HERETO.

11. FORCE MAJEURE: Neither the Port, nor Seller shall be held responsible for delay or default caused by fire, riot, acts of God, war, or any other cause which is beyond the party's reasonable control. Contractor shall, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon the cessation of the cause, diligently pursue performance of its obligations under the Contract. The Port may terminate this purchase order upon written notice after reasonably determining that such delay or default will likely prevent successful performance of the purchase order.

12. GOVERNING LAW; JURISDICTION; VENUE: This Purchase Order is governed by the laws of the State of Washington and performable in Kitsap County. Any claim, action, suit, or proceeding (collectively, "the claim") between the Port and the contractor that arises from or relates to this purchase order shall be brought and conducted solely and exclusively within the District Court of Kitsap County. Provided, however, if the claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States Federal District Court of Western Washington.