moffatt & nichol

645 G Street, Suite 100-1012
Anchorage, Alaska 99501

(907) 677-7500
www.moffattnichol.com

MEMORANDUM

To:	Don Porter, R&M Consultants, Inc.
From:	Paul Wallis, Moffatt & Nichol
Date:	February 13, 2024
Subject:	CP Cost Analysis
M&N Job No.:	232213
CC:	Tim Grier (R&M); Daryl English, Shaun McFarlane, Charles Balzarini (M&N)

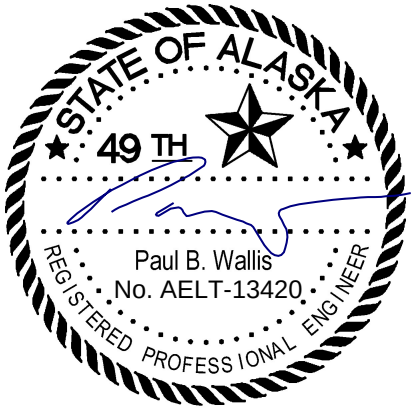
Don:

R&M has requested that we compare the cathodic protection costs for two designs for the Lutak Dock replacement.

Below please find the results of our analysis. Please contact me at your convenience to discuss, should you have any questions or concerns regarding this information.

Respectfully,

Paul Wallis, PE, SE



2/13/2024

INTRODUCTION

It has been requested that we compare the lifecycle costs for two designs for the Lutak Dock replacement. The first is a preliminary design by R&M Consultants, marked “Design and Development Concepts,” and dated February, 2022. The second is a design progress set by Turnagain Marine Construction (TMC), marked “95% Drawings,” and dated May 18, 2023.

BASIS OF ESTIMATE

The following distinctions between the two designs are noteworthy for the purposes of this exercise.

- The R&M design (hereafter referred to as the “rubble mound” approach) is a combination of partial bulkhead wharf and approach dock with dolphins.

- The Turnagain Marine Construction design (hereafter referred to as “combi wall bulkhead”) is a continuous wharf structure comprised of a pipe-pile wall assembly anchored against overturning with battered piles.

- The combi wall bulkhead design solution includes a taller (from mudline to MHHW) and considerably longer (in plan) bulkhead than the rubble mound design solution.

- The combi wall design bulkhead design solution does not include any ancillary structures (e.g. dolphins, pile-supported dock, etc.).

COMPARISON METHODOLOGIES

The following assumptions should be considered, with regard to the comparison of the aforementioned design solutions.

- For the purposes of this analysis, “lifecycle” costs will be predicated on initial cost of material and labor associated with passive (i.e. anodic) cathodic protection (CP).

    - For the purposes of comparison, the CP systems for both design solutions will be assumed to have at least a 20-year life span. This was noted as a design assumption for the combi wall design solution; while the rubble mound design solution was silent on anticipated CP lifespan.

    - For the purposes of comparison, the average rate of degradation of elements of construction exposed to seawater corrosion processes will be assumed to be the same for both design solutions. Neither design solution expresses the use of extraordinary protective measures (i.e. galvanized sheeting, high-performance epoxy coating, etc.); only passive CP using fixed anodes.

- The methods of comparison will include both unit rate cost comparison, as well as evaluation of total dollars' worth of CP for the given design solutions.

  For the unit rate cost comparison:

  - Direct comparison on a $/square foot of steel directly exposed to seawater, from mudline to MHHW, for the rubble wall and the combi wall design solutions.

  - For both the rubble wall and the combi wall design solutions, the estimated area of exposure noted above will be predicated on actual shapes used in each design solution. For example, for both a sheet pile wall and for a combi wall, the exposed area of steel per plan unit length of wall would necessarily be greater than for a smooth, flat profile.

  - Using the total CP cost noted in the rubble wall design solution, a unit cost in $/square foot of exposed steel will be calculated, and then that unit cost will be applied to the combi wall design solution exposed steel area, to ascertain an equivalent total CP cost.

    - The unit cost applied to the combi wall design solution will be increased in proportion to the (slightly) larger size of anode used for that design solution (i.e. 216 lb), as compared with that used for the rubble wall design solution (i.e. 200 lb).

  For the evaluation of total dollars' worth of CP for the given design solutions:

  - The total CP cost indicated in the rubble wall design solution drawings will be compared with the estimated CP cost indicated in (a) the document titled "GMP Pricing and Verification FULL Package 2.14 - Cathodic Protection.pdf" as well as (b) the estimated CP cost indicated in the document titled "Lutak Dock Replacement - GMP ICE 2023-02-21.pdf"; both of which were provided by R&M Consultants as additional background information.

    - It is presumed that supporting document (a) was originally produced by TMC, on 1/19/2023 for the combi wall design solution.

    - Supporting document (b) was produced by HMS, Incorporated, on behalf of R&M Consultants, on 2/21/2023, also appears to pertain to the combi wall design solution, at approximately 65% design completion.

INITIAL FINDINGS

Unit Rate Comparison:

The overall CP first cost for materials and installation for the rubble mound design solution was found to be approximately $204,000, based on the information contained in an estimate breakout in the drawings.

- The average CP cost per unit area of exposed steel for the entire rubble mound design solution (i.e. bulkhead wharf, as well as dolphins and approach dock) was found to be approximately $7.10/square foot.

The overall CP first cost for the materials and installation for the combi wall system, based on the unit rated cost comparison approach (using the rubble mound unit cost, slightly increased as described previously), was found to be roughly $318,406.

- The average CP cost per unit area of exposed steel for the combi wall bulkhead design solution was found to be roughly $5.42/square foot.

Refer to spreadsheet data in Appendix 1.

Total Dollars' Worth Comparison:

Based on cost estimate supporting document (a), the total estimated cost of CP for the combi wall design solution appears to be approximately $311,750.

Based on the cost estimate supporting document (b) by HMS, Inc., the total estimated cost for CP for the combi wall design solution appears to be approximately $264,990.

- It is worth noting that this latter figure should probably be increased by 16.77% to a total of $309,243, to account for "Labor Premium Time," based on HMS's approach to estimating sections 01 through 11.

Refer to supporting documents (a) and (b) in Appendix 2.

SUMMARY

Based on the Unit Rate Comparison, the following may be noted:

On a total installed first cost basis, the CP for the combi wall design solution is roughly $318,406 - $204,400 = $114,006 greater than the total installed first cost for the rubble wall design solution.

- Note: on a $/square foot of exposed steel basis, the rubble wall design solution is $7.10 – $5.42 = $1.68/square foot greater than the $/square foot cost for the combi wall design solution.

Based on the Total Dollars' Worth Comparison:

On a total installed first cost basis, the CP for the combi wall design solution as estimated by TMC is approximately $311,750 - $309,243 = $2,507 greater than that estimated by HMS.

- These estimates for the combi wall design solution agree to within less than one percent. Comparing the Unit Rate value for the combi wall design solution to the TMC's higher Total Dollars' Worth value for the combi wall design solution, these estimates agree to within approximately two percent.

CONCLUSIONS

The estimated total cost of the constructed design solutions ranges as follows:

- Rubble wall design solution = $25,157,000
- Combi wall design solution (TMC) = $21,045,022
- Combi wall design solution (HMS) = $29,056,402

Assuming the largest estimated difference in total installed cost of CP between the combi wall design solution and the rubble wall design solution (i.e. $114,004), the value of the premium associated with the combi wall design solution ranges from 0.39% minimum to 0.54% maximum, depending on the estimated total cost of construction considered.

Likewise, the long-term costs for maintenance and replacement of the CP systems for the two docks is expected to be very similar; when considered from the standpoint of first cost of materials and installation for each.

ADDITIONAL CONSIDERATIONS

It is unknown to what extent the CP design was actually completed, at the time that each of the above design solutions was produced.

The presumption is that the design solution for the rubble wall design solution would have been much more preliminary (i.e. “Design and Development Concepts”) than for the combi wall design solution (i.e. “95% Drawings”).

This could explain the apparent difference in lb/square feet of CP; which was not a considered metric for this report.

APPENDIX 1

RUBBLE WALL DESIGN SOLUTION

Dolphins	Qty	Dia	Avg $L_{Exposed}$	$A_{Exposed}$	Anodes	CP Cost
	ea	in	ft	ft^3	Total $	$ / Sq Ft
Plumb Piles	12	36	52	5,881		
Batter Piles	12	30	62	5,843		
			Total	11,724	78,000	6.65

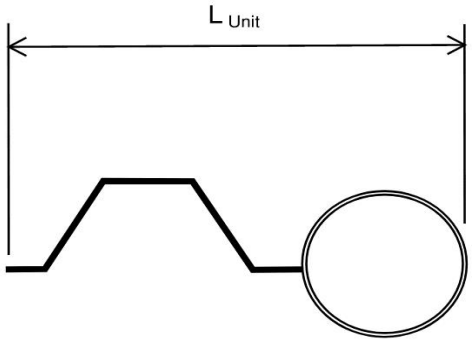
Approach Dock	Qty	Dia	Avg $L_{Exposed}$	$A_{Exposed}$	Anodes	CP Cost
	ea	in	ft	ft^3	Total $	$ / Sq Ft
Plumb Piles	9	30	38	2,686		
			Total	2,686	54,000	20.10

Bulkhead	Area $_{Surface}$	Units	$H_{Exposed}$	$A_{Exposed}$	Anodes	CP Cost
	sq ft / unit	ea	LF	ft^3	Total $	$ / Sq Ft
NZ-19 Sheet	6.18	61.6	23	8,762		
King Pile, 30" dia	3.93	61.6	23	5,567		
			Total	14,329	72,000	5.02

1. L_{Unit} = (2 x 27.56 + 30)/12 = 7.09 ft (straight line)
2. $L_{Bulkhead}$ = 25.17 + 338.94 + 72.92 = 437 ft (straight line)
3. Bulkhead anodes = 200 lb

Total CP Cost = $204,000

Avg CP Cost 1 = (Total CP Cost) / Sum ($A_{Exposed}$) = $7.10 / sq ft



COMBI WALL DESIGN SOLUTION

Dolphins	Qty	Dia	Avg $L_{Exposed}$	$A_{Exposed}$	CP Cost	Anodes
	ea	in	ft	ft^3	$ / Sq Ft	Total $
Plumb Piles	n/a					
Batter Piles	n/a					
			Total	0	0.00	0

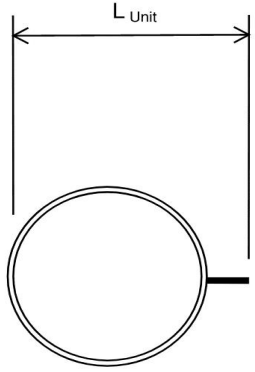
Approach Dock	Qty	Dia	Avg $L_{Exposed}$	$A_{Exposed}$	CP Cost	Anodes
	ea	in	ft	ft^3	$ / Sq Ft	Total $
Plumb Piles	n/a					
			Total	0	0.00	0

Bulkhead	Area $_{Surface}$	Units	$H_{Exposed}$	$A_{Exposed}$	CP Cost [4]	Anodes
	sq ft / unit	ea	LF	ft^3	$ / Sq Ft	Total $
Sheet	n/a					
Combi Wall Pile 42" dia.	6.25	200.0	47	58,729		
			Total	58,729	5.42	318,406

1. L_{Unit} = (42 + 9)/12 = 4.25 ft (straight line)
2. $L_{Bulkhead}$ = 64 + 45.5 + 307 +307 +42.5 + 81.25 = 847 ft (straight line)
3. Bulkhead anodes = 216 lb
4. Cost adjusted by 216 lb/200 lb = 1.08x

Total CP Cost = $318,406

Avg CP Cost = $5.42 / sq ft



APPENDIX 2

Crew: PILE6 PILE DRIVING CREW - 6 MAN Prod: S 5 Eff: 100.00 Crew Hrs: 50.00 Labor Pcs: 6.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8BCRNBARGE	Brightwater 40%75	1.00	50.00	HR	813.00	100.00	347.25	17,362.50
8PD46DELMAG	Delmag D-46	1.00	50.00	HR	45.00	100.00	45.00	2,250.00
8V44B	ICE 44B Vibro	1.00	50.00	HR	92.00	100.00	92.00	4,600.00
DB	DOCKBUILDER	3.00	150.00	MH	41.00	121.43	83.66	12,549.67
FOREMAN	FOREMAN	1.00	50.00	MH	52.00	121.43	99.33	4,966.29
OILER	OILER	1.00	50.00	MH	37.00	121.43	73.13	3,656.47
OP1	CRANE OPERATOR - 100-199 TON	1.00	50.00	MH	52.00	121.43	94.49	4,724.29

Biditem

110

Cathodic

Takeoff Qty: 1.000 LS

Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	CONTINGENC	Total
U. Cost	0.00	0.00	0.00	0.00	193,500.00	0.00	118,250.00	0.00	311,750.00
Total	0.00	0.00	0.00	0.00	193,500.00	0.00	118,250.00	0.00	311,750.00

Activity: 110.01 F&I Anodes Quantity: 430.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	CONTINGENC	Total
U. Cost	0.00	0.00	0.00	0.00	450.00	0.00	275.00	0.00	725.00
Total	0.00	0.00	0.00	0.00	193,500.00	0.00	118,250.00	0.00	311,750.00

Calendar: 710 7 day 10 hours Hrs/Shift: 10 WC: USLH USL & H

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ANODE	Anodes	1.00	430.00	EA	450.00	100.00	450.00	193,500.00
4DIVE	DIVER SUPPORT	1.00	430.00	DAY	275.00	100.00	275.00	118,250.00

Report Summary

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	CONTINGENC	Total
Total	660,989	399,465	1,060,453	1,316,094	15,735,365	647,859	2,285,250	0	21,045,022

Job Notes

Estimate created on: 01/19/2023 by User#: 3 - Jason Davis
Source estimate used: L:\HEAVYBID\EST\22-022_LUTAK

Calendars Used In Estimate

710 7 day 10 hours

In equipment resources, Rent % and EOE % that are not 100% are represented as XXX%YYY, where XXX = Rent % and YYY = EOE %

HMS Project No. 23015

65% GMP COMPARATIVE DESIGN SUBMITTAL
CONSTRUCTION COST ESTIMATE

LUTAK DOCK REPLACEMENT
HAINES, ALASKA

PREPARED FOR:

R&M Consultants, Inc.
9101 Vanguard Drive
Anchorage, Alaska 99507

February 21, 2023

4103 Minnesota Drive • Anchorage, Alaska 99503 p: 907.561.1653 • f: 907.562.0420 • e: mail@hmsalaska.com

HMS Project No.: 23015

NOTES REGARDING THE PREPARATION OF THIS ESTIMATE

DRAWINGS AND DOCUMENTS

Level of Documents:	(23) 65% construction document drawings
Date:	January 30, 2023
Provided By:	R&M Consultants, Inc. and their subconsultants of Anchorage, Alaska

RATES

Pricing is based on current material, equipment and freight costs.

Labor Rates:	A.S. Title 36 working 60 hours per week
Premium Time:	16.70%
Subcontractor's Mark-Up:	30.00%

BIDDING ASSUMPTIONS

Contract:	Standard construction contract without restrictive bidding clauses
Bidding Situation:	Sole source negotiated
Bid Date:	N/A
Start of Construction:	June 2023
Months to Complete:	Within (5) months

EXCLUDED COSTS

1. A/E design fees
2. Administrative and management costs
3. Furniture, furnishings and equipment (except those specifically included)
4. Remediation of contaminated soils or abatement of any hazardous materials, if found during construction
5. Owner furnished equipment or materials

NOTES REGARDING THE PREPARATION OF THIS ESTIMATE (Continued)

GENERAL

When included in HMS Inc.'s scope of services, opinions or estimates of probable construction costs are prepared on the basis of HMS Inc.'s experience and qualifications and represent HMS Inc.'s judgment as a professional generally familiar with the industry. However, since HMS Inc. has no control over the cost of labor, materials, equipment or services furnished by others, over contractor's methods of determining prices, or over competitive bidding or market conditions, HMS Inc. cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from HMS Inc.'s opinions or estimates of probable construction cost.

Due to the lingering effects of the COVID-19 pandemic on the global supply chain and labor market, as well as ongoing geopolitical impacts to energy prices, HMS Inc. has included an additional contingency titled '**Unique Market Risk**'. This amount provided for in the estimate will be adjusted as the situation continues to change and the effect on construction pricing becomes better understood.

This estimate assumes escalation based on the most recent 3-month rolling average of the U.S. Consumer Price Index. HMS Inc. will continue to monitor this, as well as other international, domestic and local events, and the resulting construction climate, and will adjust costs and contingencies as deemed appropriate.

GROSS FLOOR AREA

N/A

HMS Project No.: 23015

65% GMP COMPARATIVE DESIGN COST SUMMARY

	Material	*Labor*	*Total*
01 - SITE WORK			
Site Preparation	$ 157,655	$ 299,220	$ 456,875
Site Mechanical	130,000	0	130,000
Site Electrical	66,313	38,580	104,893
02 - SUBSTRUCTURE	0	0	0
03 - SUPERSTRUCTURE	0	0	0
04 - EXTERIOR CLOSURE	0	0	0
05 - ROOF SYSTEMS	0	0	0
06 - INTERIOR CONSTRUCTION	0	0	0
07 - CONVEYING SYSTEMS	0	0	0
08 - MECHANICAL	0	0	0
09 - ELECTRICAL	4,485	2,549	7,034
10 - EQUIPMENT	0	0	0
11 - SPECIAL CONSTRUCTION	17,469,695	2,944,796	20,414,491
SUBTOTAL:	*$ 17,828,148*	*$ 3,285,145*	*$ 21,113,293*
12 - GENERAL REQUIREMENTS			5,958,477
SUBTOTAL:			*$ 27,071,770*
13 - CONTINGENCIES			1,984,632
TOTAL ESTIMATED CONSTRUCTION COST:			***$ 29,056,402***

HMS Project No.: 23015

01 - SITE WORK ***Site Preparation***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Select fill material	3,500	CY	30.00	105,000	10.00	35,000	40.00	140,000
Base course driving surface, 4" assumed	733	CY	35.00	25,655	12.00	8,796	47.00	34,451
Finish grade	60,025	SF			0.20	12,005	0.20	12,005
Vibrocompaction probe	1	EA	27000.00	27,000	5100.00	5,100	32100.00	32,100
Dock interior probe (8-person crew, 8 per day)	230	EA			850.00	195,500	850.00	195,500
SUBTOTAL:				*$ 157,655*		*$ 256,401*		*$ 414,056*
Labor Premium Time	16.70%					42,819		42,819
TOTAL ESTIMATED COST:				***$ 157,655***		***$ 299,220***		***$ 456,875***

HMS Project No.: 23015

01 - SITE WORK ***Site Mechanical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Allowance for new freeze free water riser	1	LOT	50000.00	50,000			50000.00	50,000
Allowance for new fire hydrant	1	LOT	50000.00	50,000			50000.00	50,000
SUBTOTAL:				*$ 100,000*				*$ 100,000*
Labor Premium Time	16.70%							
SUBTOTAL:				*$ 100,000*				*$ 100,000*
Subcontractor's Overhead and Profit on Material and Labor	30.00%			30,000				30,000

TOTAL ESTIMATED COST:	***$ 130,000***	***$ 130,000***

HMS Project No.: 23015

01 - SITE WORK ***Site Electrical***	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE *$*	*TOTAL* *$*	*RATE* *$*	*TOTAL* *$*	*UNIT RATE* *$*	*MATERIAL/LABOR* *$*
Allowance for high mast light pole with fixture and base	2	EA	16000.00	32,000	4500.00	9,000	20500.00	41,000
Exterior video camera in heated enclosure	2	EA	2800.00	5,600	780.00	1,560	3580.00	7,160
Exterior conventional outlet	2	EA	55.00	110	85.00	170	140.00	280
Trench and backfill	350	LF	7.00	2,450	11.00	3,850	18.00	6,300
Conduit and conductor	350	LF	18.00	6,300	17.00	5,950	35.00	12,250
Conduit and Cat 6 to video cameras	350	LF	13.00	4,550	14.00	4,900	27.00	9,450
SUBTOTAL:				*$ 51,010*		*$ 25,430*		*$ 76,440*
Labor Premium Time	16.70%					4,247		4,247
SUBTOTAL:				*$ 51,010*		*$ 29,677*		*$ 80,687*
Subcontractor's Overhead and Profit on Material and Labor	30.00%			15,303		8,903		24,206
TOTAL ESTIMATED COST:				***$ 66,313***		***$ 38,580***		***$ 104,893***

HMS Project No.: 23015

09 - ELECTRICAL	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
Allowance for new electrical panel board	1	EA	2800.00	2,800	1400.00	1,400	4200.00	4,200
Disconnect switch	1	EA	650.00	650	280.00	280	930.00	930
SUBTOTAL:				*$ 3,450*		*$ 1,680*		*$ 5,130*
Labor Premium Time	16.70%					281		281
SUBTOTAL:				*$ 3,450*		*$ 1,961*		*$ 5,411*
Subcontractor's Overhead and Profit on Material and Labor	30.00%			1,035		588		1,623
TOTAL ESTIMATED COST:				***$ 4,485***		***$ 2,549***		***$ 7,034***

11 - SPECIAL CONSTRUCTION	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL UNIT RATE*	*TOTAL MATERIAL/LABOR*
			RATE	*TOTAL*	*RATE*	*TOTAL*		
			$	*$*	*$*	*$*	*$*	*$*
DEMOLITION								
Demolish fender assembly	8	EA			1250.00	10,000	1250.00	10,000
Demolish mooring dolphin	4	EA			3000.00	12,000	3000.00	12,000
Demolish guardrail	307	LF			6.50	1,996	6.50	1,996
Demolish concrete curb	600	LF			7.00	4,200	7.00	4,200
Demolish top of concrete pile cap at new pile cap location	506	CF	45.00	22,770	170.00	86,020	215.00	108,790
TIE BACK PILE								
36"x1/2" tie back driven steel pile	188	TON	3000.00	564,000			3000.00	564,000
Spare pile (2 each)	21	TON	3000.00	63,000			3000.00	63,000
Drive to embedment (assume three piles per day)	18	EA			2600.00	46,800	2600.00	46,800
Reinforcement at concrete shaft at 120 lbs. per CY	14,880	LBS	1.15	17,112	1.00	14,880	2.15	31,992
Concrete at reinforced shaft and concrete filled pile	223	CY	400.00	89,200	90.00	20,070	490.00	109,270
36" diameter drill to anchor at bedrock	450	VLF	250.00	112,500	270.00	121,500	520.00	234,000
Cut pile to elevation	18	EA	55.00	990	450.00	8,100	505.00	9,090

11 - SPECIAL CONSTRUCTION	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
TIE BACK PILE (Continued)								
2" shear plate (576 SF)	47,046	LBS	1.70	79,978	0.95	44,694	2.65	124,672
20"x1 1/2" diameter shear stud	720	EA	26.00	18,720	9.00	6,480	35.00	25,200
PIPE-PIPE COMBI-WALL PILE								
42"x1" pipe-pipe combi-wall pile	4,431	TON	3000.00	13,293,000			3000.00	13,293,000
Spare pile (6 each)	132	TON	3000.00	396,000			3000.00	396,000
Drive to embedment	219	EA			2200.00	481,800	2200.00	481,800
42" diameter drill to anchor at bedrock	2,190	VLF	320.00	700,800	350.00	766,500	670.00	1,467,300
Cut pile to elevation	219	EA	64.00	14,016	525.00	114,975	589.00	128,991
THICKEN SLAB AT TIE BACK PILE CAP								
Concrete	173	CY	400.00	69,200	100.00	17,300	500.00	86,500
Reinforcement	17,300	LBS	1.05	18,165	0.75	12,975	1.80	31,140
CONCRETE APRON								
Concrete	517	CY	400.00	206,800	90.00	46,530	490.00	253,330
Cure and finish	13,300	SF	0.30	3,990	1.70	22,610	2.00	26,600

11 - SPECIAL CONSTRUCTION	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
CONCRETE APRON (Continued)								
Form edge	1,631	SF	4.00	6,524	4.80	7,829	8.80	14,353
Reinforcement at 100 lbs. per CY	51,700	LBS	1.05	54,285	0.75	38,775	1.80	93,060
CONCRETE AT PIPE PILE								
Concrete in pipe pile	328	CY	400.00	131,200	90.00	29,520	490.00	160,720
CONCRETE AT CAP								
Concrete at pile cap	826	CY	400.00	330,400	95.00	78,470	495.00	408,870
Edge and curb forms	8,850	SF	4.60	40,710	5.20	46,020	9.80	86,730
Soffit forms	5,310	SF	11.00	58,410	18.00	95,580	29.00	153,990
Concrete at curb	33	CY	400.00	13,200	105.00	3,465	505.00	16,665
Cap reinforcement at 120 lbs. per CY	142,440	LBS	1.05	149,562	0.85	121,074	1.90	270,636
Cure and finish at cap	5,310	SF	0.30	1,593	1.70	9,027	2.00	10,620
MISCELLANEOUS								
150 ton mooring bollard, including reinforcing anchor bolts	14	EA	18000.00	252,000	1500.00	21,000	19500.00	273,000
Freight for bollard	14	EA	1000.00	14,000			1000.00	14,000

HMS Project No.: 23015

11 - SPECIAL CONSTRUCTION	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
MISCELLANEOUS (Continued)								
Allowance to realign AML brace ramp	1	EA	7500.00	7,500	15000.00	15,000	22500.00	22,500
Rip rap (4,537 SF)	504	CY	120.00	60,480	75.00	37,800	195.00	98,280
Fender assembly, complete	14	EA	39000.00	546,000	3500.00	49,000	42500.00	595,000
CATHODIC PROTECTION								
Anode	438	EA	305.00	133,590			305.00	133,590
Installation (diver)	438	EA			300.00	131,400	300.00	131,400
SUBTOTAL:				*$ 17,469,695*		*$ 2,523,390*		*$ 19,993,085*
Labor Premium Time	16.70%					421,406		421,406
TOTAL ESTIMATED COST:				***$ 17,469,695***		***$ 2,944,796***		***$ 20,414,491***

12 - GENERAL REQUIREMENTS	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
MOBILIZATION								
Mobilization/demobilization and set-up	1	LOT	50000.00	50,000	75000.00	75,000	125000.00	125,000
Barge freight (material and equipment not included with unit rates)	500	TONS	325.00	162,500	150.00	75,000	475.00	237,500
Return equipment freight	400	TONS	325.00	130,000	200.00	80,000	525.00	210,000
Miscellaneous air freight	2,500	LBS	1.25	3,125	0.25	625	1.50	3,750
OPERATION COSTS								
Project manager	6	MOS			13000.00	78,000	13000.00	78,000
Superintendent	5	MOS	200.00	1,000	13000.00	65,000	13200.00	66,000
Field engineering	100	HRS			150.00	15,000	150.00	15,000
Expediting	5	MOS	150.00	750	3550.00	17,750	3700.00	18,500
Scheduling and estimating	5	MOS	150.00	750	5500.00	27,500	5650.00	28,250
Site offices and equipment	5	MOS	2550.00	12,750	450.00	2,250	3000.00	15,000
Consumables	5	MOS	800.00	4,000			800.00	4,000
Clerical/time keeper	5	MOS	150.00	750	3000.00	15,000	3150.00	15,750
Construction equipment and tools	5	MOS	4000.00	20,000	500.00	2,500	4500.00	22,500

12 - GENERAL REQUIREMENTS	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
OPERATION COSTS (Continued)								
Temporary utilities	5	MOS	1500.00	7,500	50.00	250	1550.00	7,750
Communications, faxes, etc.	5	MOS	500.00	2,500			500.00	2,500
Daily loading/unloading	5	MOS	250.00	1,250	1500.00	7,500	1750.00	8,750
Dumpster	5	MOS	400.00	2,000			400.00	2,000
Porta can and maintenance	5	MOS	350.00	1,750	80.00	400	430.00	2,150
Temporary barriers, protection, signage, etc.	1	LOT	2500.00	2,500	1250.00	1,250	3750.00	3,750
As-builts, schedules, submittals, etc.	1	LOT	350.00	350	2550.00	2,550	2900.00	2,900
Regular clean-up	5	MOS	100.00	500	750.00	3,750	850.00	4,250
Regular debris disposal	5	MOS	200.00	1,000	500.00	2,500	700.00	3,500
Miscellaneous materials testing	1	LOT						By Owner
Alaska Dept. of Labor contract labor filing fee	1	LOT	5000.00	5,000			5000.00	5,000
Per diem	350	MD	250.00	87,500			250.00	87,500
Travel from Anchorage	12	RT	300.00	3,600			300.00	3,600

12 - GENERAL REQUIREMENTS	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
EQUIPMENT								
250 ton Manitowoc 999 crawler crane with 300'0" boom	5	MOS	52500.00	262,500			52500.00	262,500
Freight for crane	2	LOTS	85800.00	171,600			85800.00	171,600
Set up crane (3 days, 6 people)	1	LOT			15300.00	15,300	15300.00	15,300
Tear down crane (3 days, 6 people)	1	LOT			15300.00	15,300	15300.00	15,300
Pile leads and template allowance	5	MOS	10000.00	50,000			10000.00	50,000
Over water working platform	5	MOS	15000.00	75,000			15000.00	75,000
Excavator	5	MOS	11750.00	58,750			11750.00	58,750
Loader	5	MOS	17900.00	89,500			17900.00	89,500
Roller	5	MOS	7500.00	37,500			7500.00	37,500
Telehandler	5	MOS	7425.00	37,125			7425.00	37,125
Welder	5	MOS	3075.00	15,375			3075.00	15,375
Grader	5	MOS	9450.00	47,250			9450.00	47,250
Generator	5	MOS	2100.00	10,500			2100.00	10,500
Light plant	5	MOS	1250.00	6,250			1250.00	6,250

12 - GENERAL REQUIREMENTS	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
EQUIPMENT (Continued)								
Clamshell bucket	5	MOS	1550.00	7,750			1550.00	7,750
Man lift	5	MOS	4600.00	23,000			4600.00	23,000
Pickup truck (4)	5	MOS	3150.00	15,750			3150.00	15,750
Diesel hammer	5	MOS	9375.00	46,875			9375.00	46,875
Vibratory hammer	5	MOS	9875.00	49,375			9875.00	49,375
Mobilization/demobilization of equipment	30	EA	2700.00	81,000	1700.00	51,000	4400.00	132,000
Barge	5	MOS	14100.00	70,500			14100.00	70,500
Tugboat	5	MOS	12400.00	62,000			12400.00	62,000
Small work boat	5	MOS	900.00	4,500			900.00	4,500
Large work boat	5	MOS	13400.00	67,000			13400.00	67,000
Mobilization/demobilization of barge	1	EA	100000.00	100,000			100000.00	100,000
Mechanic with oiler truck for maintenance of equipment (full time)	5	MOS	30000.00	150,000			30000.00	150,000
Fuel for equipment (6,000 gallons per month)	5	MOS	30000.00	150,000			30000.00	150,000
SUBTOTAL:				*$ 2,190,175*		*$ 553,425*		*$ 2,743,600*

HMS Project No.: 23015

12 - GENERAL REQUIREMENTS	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
Home Office	3.00%							715,707
Overhead and Profit	8.00%							1,965,808
Bonds	0.85%							225,576
Insurances	1.15%							307,786

TOTAL ESTIMATED COST: ***$ 5,958,477***

HMS Project No.: 23015

13 - CONTINGENCIES	*QUANTITY*	*UNIT*	*MATERIAL*		*LABOR*		*TOTAL*	*TOTAL*
			RATE	*TOTAL*	*RATE*	*TOTAL*	*UNIT RATE*	*MATERIAL/LABOR*
			$	*$*	*$*	*$*	*$*	*$*
ESTIMATOR'S CONTINGENCY								
The estimator's allowance for architectural and engineering requirements that may change at final design or by addendum and unknown site conditions, addenda, etc.	5.00%							$ 1,353,589
ESCALATION CONTINGENCY								
The allowance for escalation from the date of estimate to the proposed start of construction of June 2023 at the rate of 6.67% per annum (4 months)	2.22%							$ 631,043

TOTAL ESTIMATED COST: ***$ 1,984,632***