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# **COST ENGINEERING APPENDIX**

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## **NORFOLK HARBOR NAVIGATION IMPROVEMENTS MEETING AREA VALIDATION REPORT/ SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT**

**VIRGINIA**

**APPENDIX B**

**NOVEMBER 2021**



**U.S. Army Corps  
of Engineers  
Norfolk District**



**THE PORT OF  
VIRGINIA®**

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## **COST ENGINEERING APPENDIX**

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**COMPLETE MII REPORT  
WITH  
MEETING AREAS 1 AND 2**

Estimated by Sean Jessup

Designed by Moffatt & Nichol

Prepared by Keith Butler

Preparation Date 11/17/2021

Effective Date of Pricing 11/17/2021

Estimated Construction Time 2,500 Days

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Designed by  
Moffatt & Nichol  
Estimated by  
Sean Jessup  
Prepared by  
Keith Butler

Design Document Preliminary  
Document Date 11/17/2021  
District Norfolk  
Contact Sean Jessup  
Budget Year 2022  
UOM System Original

**Direct Costs**

LaborCost  
EQCost  
MatlCost  
SubBidCost

**Timeline/Currency**

Preparation Date 11/17/2021  
Escalation Date 11/17/2021  
Eff. Pricing Date 11/17/2021  
Estimated Duration 2500 Day(s)

Currency US dollars  
Exchange Rate 1.000000

**Costbook CB08EB: MII English Cost Book 2008**

**Labor :**

Note: <http://www.wdol.gov/>

**Labor Rates**

LaborCost1  
LaborCost2  
LaborCost3  
LaborCost4

**Equipment :**

**02 MIDEAST**

Sales Tax 5.40  
Working Hours per Year 1,450  
Labor Adjustment Factor 1.07  
Cost of Money 5.25  
Cost of Money Discount 25.00  
Tire Recap Cost Factor 1.50  
Tire Recap Wear Factor 1.80  
Tire Repair Factor 0.15  
Equipment Cost Factor 1.00  
Standby Depreciation Factor 0.50

**Fuel**

Electricity 0.089  
Gas 3.030  
Diesel Off-Road 3.040  
Diesel On-Road 3.040

**Shipping Rates**

Over 0 CWT 7.31  
Over 240 CWT 7.32  
Over 300 CWT 6.32  
Over 400 CWT 5.97  
Over 500 CWT 3.56  
Over 700 CWT 3.56  
Over 800 CWT 4.88

**Date Author Note**

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Description	Quantity	UOM	ContractCost	Escalation	Contingency	SIOH	ProjectCost
<b>Project Cost Summary Report</b>			<b>359,625,931</b>	<b>0</b>	<b>205,371</b>	<b>0</b>	<b>359,831,302</b>
			<i>326,191,607.99</i>				<i>326,191,607.99</i>
<b>NHC - Segment 1</b>	<b>1.00</b>	<b>EA</b>	<b>326,191,608</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>326,191,608</b>
			<i>8,331,585.30</i>				<i>8,331,585.30</i>
<b>02 Relocations</b>	<b>1.00</b>	<b>EA</b>	<b>8,331,585</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,331,585</b>
			<i>8,331,585.30</i>				<i>8,331,585.30</i>
<b>CBBT Cover</b>	<b>1.00</b>	<b>EA</b>	<b>8,331,585</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,331,585</b>
			<i>291,899,395.01</i>				<i>291,899,395.01</i>
<b>12 Navigation Ports &amp; Harbors</b>	<b>1.00</b>	<b>EA</b>	<b>291,899,395</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>291,899,395</b>
			<i>46,177,712.24</i>				<i>46,177,712.24</i>
<b>AOC</b>	<b>1.00</b>	<b>EA</b>	<b>46,177,712</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>46,177,712</b>
			<i>15,004,600.00</i>				<i>15,004,600.00</i>
<b>TSC - East</b>	<b>1.00</b>	<b>EA</b>	<b>15,004,600</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15,004,600</b>
			<i>85,825,500.00</i>				<i>85,825,500.00</i>
<b>TSC - West</b>	<b>1.00</b>	<b>EA</b>	<b>85,825,500</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>85,825,500</b>
			<i>70,995,987.51</i>				<i>70,995,987.51</i>
<b>TSC - MA#1</b>	<b>1.00</b>	<b>EA</b>	<b>70,995,988</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>70,995,988</b>
			<i>10,865,400.00</i>				<i>10,865,400.00</i>
<b>TSC - MA#2</b>	<b>1.00</b>	<b>EA</b>	<b>10,865,400</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10,865,400</b>
			<i>63,030,195.26</i>				<i>63,030,195.26</i>
<b>Inner Harbor SP to LB</b>	<b>1.00</b>	<b>EA</b>	<b>63,030,195</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>63,030,195</b>
			<i>12,921,627.68</i>				<i>12,921,627.68</i>
<b>30 Planning, Engineering, &amp; Design</b>	<b>1.00</b>	<b>EA</b>	<b>12,921,628</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12,921,628</b>
			<i>13,039,000.00</i>				<i>13,039,000.00</i>
<b>31 Construction Management</b>	<b>1.00</b>	<b>EA</b>	<b>13,039,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,039,000</b>
			<i>33,434,323.03</i>				<i>33,434,323.03</i>
<b>NHC - Segment 2</b>	<b>1.00</b>	<b>EA</b>	<b>33,434,323</b>	<b>0</b>	<b>205,371</b>	<b>0</b>	<b>33,639,694</b>
			<i>29,545,576.14</i>				<i>29,545,576.14</i>
<b>12 Navigation Ports &amp; Harbors</b>	<b>1.00</b>	<b>EA</b>	<b>29,545,576</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29,545,576</b>
			<i>8,884,867.64</i>				<i>8,884,867.64</i>
<b>Anchorage F</b>	<b>1.00</b>	<b>EA</b>	<b>8,884,868</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,884,868</b>
			<i>20,660,708.50</i>				<i>20,660,708.50</i>
<b>CNN</b>	<b>1.00</b>	<b>EA</b>	<b>20,660,709</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20,660,709</b>
			<i>2,092,746.89</i>				<i>2,193,052.33</i>
<b>30 Planning Engineering &amp; Design</b>	<b>1.00</b>	<b>EA</b>	<b>2,092,747</b>	<b>0</b>	<b>100,305</b>	<b>0</b>	<b>2,193,052</b>
			<i>1,796,000.00</i>				<i>1,901,066.00</i>
<b>31 Construction Management</b>	<b>1.00</b>	<b>EA</b>	<b>1,796,000</b>	<b>0</b>	<b>105,066</b>	<b>0</b>	<b>1,901,066</b>

Standard USACE Report Sections

Description	Quantity	UOM	Contractor	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectCost
<b>Project Direct Costs Report</b>				<b>185,557</b>	<b>613,163</b>	<b>2,671,200</b>	<b>355,427,625</b>	<b>358,897,545</b>
				<i>185,556.96</i>	<i>613,163.22</i>	<i>2,671,200.00</i>	<i>321,993,301.69</i>	<i>325,463,221.87</i>
<b>NHC - Segment 1</b>	<b>1.00</b>	<b>EA</b>		<b>185,557</b>	<b>613,163</b>	<b>2,671,200</b>	<b>321,993,302</b>	<b>325,463,222</b>
				<i>185,556.96</i>	<i>613,163.22</i>	<i>2,671,200.00</i>	<i>4,133,279.00</i>	<i>7,603,199.18</i>
<b>02 Relocations</b>	<b>1.00</b>	<b>EA</b>		<b>185,557</b>	<b>613,163</b>	<b>2,671,200</b>	<b>4,133,279</b>	<b>7,603,199</b>
				<i>185,556.96</i>	<i>613,163.22</i>	<i>2,671,200.00</i>	<i>4,133,279.00</i>	<i>7,603,199.18</i>
<b>CBBT Cover</b>	<b>1.00</b>	<b>EA</b>		<b>185,557</b>	<b>613,163</b>	<b>2,671,200</b>	<b>4,133,279</b>	<b>7,603,199</b>
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>42.03</i>	<i>42.03</i>
Clamshell Dredge of Upper Layer of Sand Cover (Note: Based on CEDEP estimate.)	24,800.00	CY	No Markups	0	0	0	1,042,344	1,042,344
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>55.87</i>	<i>55.87</i>
Clamshell Dredge of Lower Layer of Sand Cover (Note: Based on CEDEP estimate.)	30,000.00	CY	No Markups	0	0	0	1,676,100	1,676,100
Clamshell Dredge Mob/ Demob (Note: Based on CEDEP estimate.)	1.00	LS	No Markups	0	0	0	1,064,835	1,064,835
				<i>1.16</i>	<i>3.80</i>	<i>84.80</i>	<i>0.00</i>	<i>89.76</i>
Rock Transported to CBBT (Note: 4000 hp Tug boat with 3000 ton barge with 4-man crew. Round trip takes 20 hours.)	31,500.00	TON	Prime Marine Work	36,530	119,807	2,671,200	0	2,827,537
				<i>4.73</i>	<i>15.66</i>	<i>0.00</i>	<i>0.00</i>	<i>20.39</i>
Rock Placement	31,500.00	TON	Prime Marine Work	149,027	493,356	0	0	642,383
Rock Mob/ Demob	1.00	LS	No Markups	0	0	0	350,000	350,000
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>291,899,395.01</i>	<i>291,899,395.01</i>
<b>12 Navigation Ports &amp; Harbors</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>291,899,395</b>	<b>291,899,395</b>
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>46,177,712.24</i>	<i>46,177,712.24</i>
<b>AOC</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>46,177,712</b>	<b>46,177,712</b>
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>2,175,164.00</i>	<i>2,175,164.00</i>
Atlantic Ocean Channel - Mob & Demob (Note: Calculated per CEDEP based on assumptions derived from mobilization costs from similar recent projects. Includes all contractor Markups. Assumes 2 mobilizations required.)	2.00	EA	No Markups	0	0	0	4,350,328	4,350,328
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>6.32</i>	<i>6.32</i>
Atlantic Ocean Channel Dredging (Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 59'. Maximum Pay Depth of 60')	6,618,257.00	CY	No Markups	0	0	0	41,827,384	41,827,384
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>15,004,600.00</i>	<i>15,004,600.00</i>
<b>TSC - East</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>15,004,600</b>	<b>15,004,600</b>
(Note: Contract Awarded with TSC- East for a total of \$39,525,000.)								
Thimble Shoal Channel - East of CBBT Dredging (Note: Price from Great Lakes Dredge & Dock Company, LLC Bid Currently Under Contract. Contract Awarded with TSC-MA#2 for a total of \$39,525,000. This MII does not include the estimate does not include the optional Beach Replenishment Cost totaling \$13,655,000.)	1.00	LS	No Markups	0	0	0	15,004,600	15,004,600
				<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>85,825,500.00</i>	<i>85,825,500.00</i>
<b>TSC - West</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>85,825,500</b>	<b>85,825,500</b>
Thimble Shoal Channel - West of CBBT Dredging &	1.00	LS	No Markups	0	0	0	85,825,500	85,825,500

Description	Quantity	UOM	Contractor	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectCost
Mobilization Under Contract)								
(Note: Price from Weeks Marine Bid Currently Under Contract. Modification due to adjustment in quantities increased this from the award price of \$78,625,500 to \$85,825,500 (\$7.2 M increase).)								
<b>TSC - MA#1</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>70,995,987.51</b>	<b>70,995,987.51</b>
Thimble Shoal Channel - MA #1 - Mob & Demob	2.00	LS		0	0	0	4,768,680	4,768,680
(Note: Calculated per CEDEP based on assumptions derived from mobilization costs from similar recent projects. Includes all contractor Markups. Note: This is a 2 Mobilization and Demobilization Event)								
Thimble Shoal Channel - MA #1 Dredging	4,589,557.00	CY		0	0	0	66,227,308	66,227,308
(Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 56 feet. Max pay depth of 57 feet. Unit price includes \$6,000 per day turtle troling costs (\$360,000 estimated total).)								
<b>TSC - MA#2</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>10,865,400.00</b>	<b>10,865,400.00</b>
Thimble Shoal Channel - MA #2 - MA #2 DredgingMob & Demob	1.00	LS	No Markups	0	0	0	10,865,400	10,865,400
(Note: Price from Great Lakes Dredge & Dock Company, LLC Bid Currently Under Contract. Contract Awarded with TSC- East for a total of \$39,525,000. This MII does not include the estimate does not include the optional Beach Replenishment Cost totaling \$13,655,000.)								
<b>Inner Harbor SP to LB</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>63,030,195.26</b>	<b>63,030,195.26</b>
Sewells Point to Lamberts Bend Dredging	6,941,078.00	CY	No Markups	0	0	0	60,179,146	60,179,146
(Note: Unit Price from CEDEP. Includes all contractor Markups. Required depth of 55 feet plus 1 ft of advanced maintenance. 1 additional ft of pay overdepth allowed in all reaches.)								
Sewells Point to Lamberts Bend - Mob & Demob	1.00	LS	No Markups	0	0	0	2,851,049	2,851,049
(Note: Unit Price from CEDEP. Includes all contractor Markups.)								
<b>30 Planning, Engineering, &amp; Design</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>12,921,627.68</b>	<b>12,921,627.68</b>
CBBT Cover - PED	1.00	LS	No Markups	0	0	0	682,500	682,500
AOC - Planning, Engineering, and Design	1.00	LS	No Markups	0	0	0	4,082,082	4,082,082
(Note: Based on Separate Estimate)								
TSC East - Planning, Engineering, and Design	1.00	LS	No Markups	0	0	0	1,073,019	1,073,019
(Note: Based on Separate Estimate)								
TSC West - Planning, Engineering, and Design	1.00	LS	No Markups	0	0	0	2,549	2,549
(Note: Design completed. \$4.035 million entered in TPCS as already spent. Remaining money for PED related issues during construction.)								
TSC MA#1 - Planning, Engineering, and Design	1.00	LS		0	0	0	2,637,141	2,637,141
(Note: Based on Separate Estimate)								
TSC MA#2 - Planning, Engineering, and Design	1.00	LS	No Markups	0	0	0	1,513,391	1,513,391
(Note: Based on Separate Estimate)								
SP to LB - Planning, Engineering, and Design	1.00	LS	No Markups	0	0	0	2,930,947	2,930,947
(Note: Based on Separate Estimate)								
<b>31 Construction Management</b>	<b>1.00</b>	<b>EA</b>	<b>No Markups</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,039,000.00</b>	<b>13,039,000.00</b>
CBBT Cover - Construction Management	1.00	LS	No Markups	0	0	0	914,000	914,000
AOC - Construction Management	1.00	LS	No Markups	0	0	0	2,429,600	2,429,600



Description	Quantity	UOM	Contractor	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectCost
(Note: Based on Separate Estimate)								
TSC East - Construction Management	1.00	LS	No Markups	0	0	0	810,260	810,260
(Note: Based on Separate Estimate)								
TSC West - Construction Management	1.00	LS	No Markups	0	0	0	3,166,940	3,166,940
(Note: Based on Separate Estimate)								
TSC MA#2 - Construction Management	1.00	LS	No Markups	0	0	0	3,871,600	3,871,600
(Note: Based on Separate Estimate)								
TSC MA#2 - Construction Management	1.00	LS	No Markups	0	0	0	916,600	916,600
(Note: Based on Separate Estimate)								
SP to LB - Construction Management	1.00	LS	No Markups	0	0	0	930,000	930,000
(Note: Based on Separate Estimate)								
				0.00	0.00	0.00	33,434,323.03	33,434,323.03
<b>NHC - Segment 2</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>33,434,323</b>	<b>33,434,323</b>
				0.00	0.00	0.00	29,545,576.14	29,545,576.14
<b>12 Navigation Ports &amp; Harbors</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>29,545,576</b>	<b>29,545,576</b>
				0.00	0.00	0.00	8,884,867.64	8,884,867.64
<b>Anchorage F</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>8,884,868</b>	<b>8,884,868</b>
Anchorage F - Mob & Demob	1.00	LS	No Markups	0	0	0	1,380,731	1,380,731
(Note: Mobilization and Demobilization assumed to be \$2,761,461 based on CEDEP for one hydraulic dredge mobilization. Cost is split evenly between Anchorage F and Channel to Newport News, as both areas are expected to be dredged in one contract.)								
				0.00	0.00	0.00	5.72	5.72
Anchorage F Dredging	1,311,912.00	CY	No Markups	0	0	0	7,504,137	7,504,137
(Note: Unit Price from CEDEP. Includes all contractor Markups. Assumes expanded diameter of anchorage to 3,620 feet. Dredged to a nominal depth of 51 feet. Required Depth of 51 Feet. Maximum pay depth of 52 feet.)								
				0.00	0.00	0.00	20,660,708.50	20,660,708.50
<b>CNN</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>20,660,709</b>	<b>20,660,709</b>
Channel to Newport News - Mob & Demob	1.00	LS	No Markups	0	0	0	1,380,731	1,380,731
(Note: Mobilization and Demobilization assumed to be \$2,759,247 based on CEDEP for one hydraulic dredge mobilization. Cost is split evenly between Anchorage F and Channel to Newport News, as both areas are expected to be dredged in one contract.)								
				0.00	0.00	0.00	8.75	8.75
Channel to Newport News Dredging	2,203,426.00	CY	No Markups	0	0	0	19,279,978	19,279,978
(Note: Unit Price from CEDEP. Includes all contractor Markups. Required depth of 55 feet. Max pay depth of 56 feet.)								
				0.00	0.00	0.00	2,092,746.89	2,092,746.89
<b>30 Planning Engineering &amp; Design</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>2,092,747</b>	<b>2,092,747</b>
CNN - Planning, Engineering, and Design	1.00	LS	No Markups	0	0	0	1,235,435	1,235,435
(Note: Based on Separate Estimate)								
Anchorage F - Planning, Engineering, and Design	1.00	LS		0	0	0	857,311	857,311
(Note: Based on Separate Estimate)								
				0.00	0.00	0.00	1,796,000.00	1,796,000.00
<b>31 Construction Management</b>	<b>1.00</b>	<b>EA</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>1,796,000</b>	<b>1,796,000</b>
CNN - Construction Management	1.00	LS	No Markups	0	0	0	898,000	898,000
(Note: Based on Separate Estimate)								

<b>Description</b>	<b>Quantity</b>	<b>UOM</b>	<b>Contractor</b>	<b>DirectLabor</b>	<b>DirectEQ</b>	<b>DirectMatl</b>	<b>DirectSubBid</b>	<b>DirectCost</b>
Anchorage F - Construction Management (Note: Based on Separate Estimate)	1.00	LS		0	0	0	898,000	898,000

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**COST ENGINEERING APPENDIX**

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**MEETING AREA 1**

**HOPPER ESTIMATE WORKSHEET**

253,772 pay c.y. per month  
 428 c.y. per hour  
 3.0 Loads/Day

UNIT COST.. \$14.43 PER C.Y.  
 EXCAV. COST \$66,227,308  
 TIME..... 17.57 MONTHS

**Select Dredge**  
 GENERIC LARGE

PROJECT TITLES: PG 1 of 9

Project Name..... NHC Cost Recertification - MA1 Ver. 7.1  
 Project Location..... Hampton Roads, Virginia For Information, Call:  
 Invit. or Contr. No..... Preliminary Estimate Fletcher: 904-232-3295  
 Date of Estimate..... August 2021  
 Estimator..... SBJ  
 Checked by..... JAG

(Input Project Descriptions on Sheet A)

Mobilization Bid Item..... 1 Goto Sheet A  
 Excavation Bid Item..... 2 Goto Input Page 1a

TYPE OF ESTIMATE PG 2 of 9

Type of Estimate..... 1 Planning Estimate  
 (1) Planning, (2) Bid, or (3) Mod Estimate Descriptions

INDIRECT COSTS:

Contractor's Overhead... 15.0 Percent of contract  
 Contractor's Profit..... 10.0 Percent of contract

Contractor's Bond..... 1.0 Percent of contract

ESTIMATED DREDGING QUANTITY: PG 3 of 9

Non-Pay Computation Method: 1  
 (1) Surface Area, (2) % of Pay O.D., (3) % of Net Pay, (4) % of Gross

DREDGING AREA: 10,700,000 SQ. FT. Using 2D area for 1' paid O.D. limits

DREDGING PRISM:

Required....	4,227,546	C.Y.	56' Required
+ 1-ft Pay O.D....	362,011	C.Y.	
Bid Quantity	4,589,557	C.Y.	
- Not Dug..	130,778	C.Y.	
Net Pay	4,458,779	C.Y.	@ 11.30 ft pay
+ Non-Pay	368,600	C.Y.	@ 0.93 ft overdig
Gross Volume	4,827,379	C.Y.	12.23 FT. BANK HT.

PRODUCTION WORKSHEET: part 1 of 3 PG 4 of 9

Material Classification: 50 % MUD Some of the mud will be aggitated out of the channel  
 50 % SAND  
 0 % GRAVEL

Volume of Hopper (cyds)..... 7,600 (From Database)  
 Max Safe Load (cyds of Sand).... 4,500 (From Database)

	Override	Calculated	Used
Effect Capacity (cyds)..	0	3,040	3,040
Excavation Rate (cy/hr)			
using 2 Dragheads.....	0	3,150	3,150
		Database	
Dragheads Used (ea).....	0	2	2
Excavation based upon 2.0 Dragheads. (cy/hr).....			3,150

(Excavation Time per Cycle = 58 min)

In obtaining an economic load more sand will load and there will be some aggitation of mud

PRODUCTION WORKSHEET: part 2 of 3 PG 5 of 9

Turns/Cycle..... 1 Each  
 Time Per Turn..... 5 Minutes Travel speed based on avg. of industry dredges (>4,000 CY)  
 (Turning Time per Cycle = 5 min)

One-Way Haul Distance..... 25 Miles (Statute)

Speed to Disposal Area..... 9 mph  
 Max Speed Loaded..... 15.0 mph  
 Speed Used to D/A..... 9 mph  
 (Hauling Time to D/A per Cycle = 167 min)

Speed from Disp Area..... 9.75 mph  
 Max Speed Light..... 17.3 mph  
 Speed Used from D/A..... 9.8 mph  
 (Hauling Time from D/A per Cycle = 153 min)  
 (Total Haul Time = 320 min)

PRODUCTION WORKSHEET: part 3 of 3 PG 6 of 9

Will Pumpout be Used?..... 0 NO (1=YES)

<-Used With Pumpout Only  
 0 <-Used With Pumpout Only

Gravity Dumping Time.... 5 Minutes per Cycle

HOPPER DREDGE ESTIMATE

253,772 pay c.y. per month  
 428 c.y. per hour  
 3.0 Loads/Day

UNIT COST.. \$14.43 PER C.Y.  
 EXCAV. COST \$66,227,308  
 TIME..... 17.57 MONTHS

Select Dredge  
 GENERIC LARGE

Cleanup Dredging..... 10 % Additional Time  
 Time Efficiency..... 88.0 % of Effective Working Time  
 642 Hours Per Month

PLANT OWNERSHIP AND OPERATING: part 1 of 2 PG 7 of 9

DREDGE	Override	Database	Used
Dredge Acquisition.....		\$35,000,000	\$ 35,000,000
Capital Improvements %..		10%	10%
REQUIRED PLANT (Monthly Costs)			
Dredge Propulsion Tug...		self prop.	self prop.
Survey Vessel.....	\$36,000	\$12,000	\$36,000

Goto Input Page 7a

PLANT OWNERSHIP AND OPERATING: part 2 of 2 PG 8 of 9

OPTIONAL PLANT (Monthly Costs)	Include?	Override	Database	Used
Booster.....	0	NO (1=YES)	\$346,000	<--Database
.....Override>			\$0	<--Used
Crane Barge.....	0	NO (1=YES)	\$86,000	<--Database
.....Override>			\$0	<--Used
Tender Tug.....	0	NO (1=YES)	\$136,000	<--Database
.....Override>			\$0	<--Used
Other Marine.....			\$0	
Shore Equip.....			\$0	

OTHER PRICING ADJUSTMENTS: PG 9 of 9

Other Monthly Costs: Goto Input Page 9a

1st Input..... Per Month  
 Description.....  
 (For Additional Inputs Go to Sheet D/3) Goto Sheet D/3

Fixed Costs: \$360,000 Lump Sum  
 Description..... Estimatedd Turtle Trolling Costs

(For Additional Inputs Go to Sheet E)

(To Adjust Labor Go To Sheet DB\_L) Goto Sheet DB\_L  
 (To Adjust Equipment Go to Sheet DB\_E) Goto Sheet DB\_E

LOCAL AREA FACTORS: PG 1a of 9

Present Year..... 2021 (Equipment Calculations) Fiscal Year  
 Economic Index..... 9513 (EP-1110-1-8, APP E) 30 Nov 18 Version  
 Labor Adjustment Factor. 1.020 (EP-1110-1-8, APP B) Local Labor Utilized  
 Full Cost of Money Rate. 1.125 Percent per Year  
 Dates for Money Rate.... Jul-Dec 2021 Return

Annual Months Available for Dredging:  
 Pipeline.... n/a Months per Year  
 Bucket..... n/a Months per Year  
 Hopper..... 6.85 Months per Year  
 Current Fuel Price..... \$3.86 Per Gallon Fisherman's Wharf Marina, 10/24/2019

DREDGE OPERATING ADJUSTMENT FACTORS (OPTIONAL): PG 7a of 9

	Override	Assumed	Used
Pump Load Factor.....		50%	50%
Adj to Exist Repair Cost... (Range .80 to 1.20)		1.00	1.00
NO Jet Pump Avail		0%	0%
	Override	Calculated	Used
Fuel Usage (Gal/Day)....		8,366	8,366

Return

TRAVEL & PROVISIONS: PG 9a of 9

TRAVEL FOR DREDGE CREW:  
 Frequency Of Travel..... 21 days  
 Cost of Ticket..... \$750 per Round Trip Return

EXTRA MEALS PROVIDED:  
 Gov Personnel On Dredge HOPPER DREDGE ESTIMATE 3 <-

253,772 pay c.y. per month	UNIT COST..	\$14.43	PER C.Y.	<b>Select Dredge</b> GENERIC LARGE ▼
428 c.y. per hour	EXCAV. COST	\$66,227,308		
3.0 Loads/Day	TIME.....	17.57	MONTHS	
Prov & Supplies.....		\$25.00	/Man-Day	

TESTING FOR OCEAN DISPOSAL \$0.00 CY

A DESCRIPTION AND QUANTITY SUMMARY

1 PROJECT	<u>NHC Cost Recertification - MA1</u>	DATE OF ESTIMATE	<u>August 2021</u>
2 LOCATION	<u>Hampton Roads, Virginia</u>	INVIT. OR CONTR. NO.	<u>Preliminary Estimate</u>
3 ESTIMATED BY	<u>SBJ</u>	CHECKED BY	<u>JAG</u>
4 TYPE OF DREDGE	<u>7600 CYD HOPPER DREDGE</u>	TYPE OF ESTIMATE	<u>Planning Estimate</u>
5 DESCRIPTION OF WORK	<u>Deepening of the Thimble Shoals Channel for Navigation purposes.</u>		
	<u>Costs assume that overflow is allowed to obtain an economic load (85% of max safe load).</u>		
	<u> </u>		
	<u> </u>		
	<u> </u>		
	<u> </u>		
	<u> </u>		
	<u> </u>		
	<u> </u>		
	<u> </u>		

6 EXCAVATION		REMARKS
A. REQUIRED	<u>4,227,546 CY</u>	<u>10,700,000 s.f. of Dredging Area</u>
B. PAY OVERDEPTH	<u>+ 362,011 CY</u>	
C. MAX. PAY YARDAGE	<u>= 4,589,557 CY</u>	<u>(YARDAGE USED ON BID FORM)</u>
D. O.D. NOT DREDGED	<u>- 130,778 CY</u>	
E. NET PAY YARDAGE	<u>= 4,458,779 CY</u>	<u>(YARDAGE USED TO FIGURE UNIT PRICE PER C.Y.)</u>
F. NON-PAY YARDAGE	<u>+ 368,600 CY</u>	<u>0.9 ft overdig</u>
G. GROSS YARDAGE	<u>= 4,827,379 CY</u>	<u>(YARDAGE USED TO FIGURE PRODUCTION TIME &amp; COST)</u>

B DREDGING COST

BID ITEM # 2

REMARKS

1	GROSS YARDAGE	<u>4,827,379</u> CY	<u>FROM SHEET A, ITEM 6 G.</u>
2	PRODUCTION RATE	<u>/ 274,776</u> CY/MO	<u>FROM SHEET C, ITEM 9.</u>
3	DREDGING TIME	= <u>17.57</u> MONTHS	<u>4,458,779 Net Pay CY ÷ 17.57 MO = 274,776 Pay CY/MO</u>
4	TOTAL MONTHLY COST	<u>x \$2,845,136</u>	<u>FROM SHEET D</u>
	SUBTOTAL.....=	<u>\$49,989,035</u>	
5	FIXED COSTS	<u>+ \$360,000</u>	<u>FROM SHEET E</u>
	SUBTOTAL.....=	<u>\$50,349,035</u>	
6	OVERHEAD	<u>15.0% + \$7,552,355</u>	<u>Home office overhead only; Field overhead accounted for on Sheet D4</u>
	SUBTOTAL.....=	<u>\$57,901,390</u>	
7	PROFIT	<u>10.0% + \$5,790,139</u>	<u>Profit is based on USACE Weighted Guidelines</u>
	SUBTOTAL.....=	<u>\$63,691,529</u>	
8	BOND	<u>1.0% + \$636,915</u>	
9	GROSS PRODUCTION COS	= <u>\$64,328,444</u>	
10	NET PAY YARDAGE	<u>/ 4,458,779</u> CY	<u>FROM SHEET A, ITEM 6 E.</u>
10a	TESTING FOR OCEAN DISPOSAL	<u>\$ -</u> CY	<u>FROM EXC INPUT</u>
11	UNIT COST	= <u>\$14.43</u> /CY	
12	MAX PAY YARDAGE	<u>x 4,589,557</u> CY	<u>FROM SHEET A, ITEM 6 C.</u>
13	DREDGING COST	= <u>\$66,227,308</u>	



C

MONTHLY PRODUCTION SUMMARY

BID ITEM # 2

REMARKS

1 AVERAGE UNADJUSTED CYCLE TIME         388 min/load         SEE SHEET C \ 1, ITEM 3.

2 CLEANUP FACTOR         \_\_\_\_\_ / 0.91         10% ADDITIONAL DREDGING TIME ( 100% / 110% )

3 AVERAGE CYCLE TIME         = 426 min/load         \_\_\_\_\_

4 CONVERSION TO HOURS         60 min/hr         \_\_\_\_\_

5 AVERAGE CYCLE TIME         / 426 min/load         THIS SHEET, ITEM 3.

6 EFFECTIVE HOPPER CAPACITY         x 3,040 cy/load         \_\_\_\_\_

7 GROSS PRODUCTION         = 428 CY/HR         \_\_\_\_\_

8 OPERATING TIME:

REMARKS

A. TIME EFFICIENCY         88.0%         % OF EFFECTIVE WORKING TIME

B. MAX DREDGE TIME         \_\_\_\_\_ x 730 HRS/MO         \_\_\_\_\_

C. OPERATING TIME         = 642 HRS/MO         \_\_\_\_\_

9 PRODUCTION RATE         = 274,776 CY/MO         428 CY/HR x 642 HRS/MO

10 LOADS PER DAY         3.0         (1440 MIN/DAY ÷ 426 MIN/LOAD) X 88.0% EWT

11 PROJECT DURATION         17.57 MONTHS         \_\_\_\_\_

PRODUCTION WORK SHEET

C \ 1

BID ITEM # 2

CYCLE TIME

1 DREDGE USED:

A. DESCRIPTION OF DREDGE 7600 CYD HOPPER DREDGE

B. EFFECTIVE HOPPER CAPACITY 3,040 cy/load

REMARKS

2 TIME PER AVERAGE LOAD CYCLE:

A. EXCAVATING 58 min ( 3,040 cy ÷ 3,150 cy/hr ) x 60 min/hr.

B. TURNING + 5 min 1 turns at 5 minutes per turn.

C. TO DISPOSAL OR MOORING + 167 min ( 25.0 miles ÷ 9.0 mph ) x 60 min/hr.

D. DUMPING OR CONNECT TO PIPELINE + 5 min TYPE OF DISPOSAL-----> GRAVITY DUMPING

E. PUMPOUT THROUGH PIPELINE +        min (        cy ÷        cy/hr ) x 60 min/hr.

F. FROM DISPOSAL OR MOORING        + 153 min ( 25.0 miles ÷ 9.8 mph ) x 60 min/hr.

3 AVERAGE UNADJUSTED CYCLE TIME = 388 min/load

D MONTHLY COST SUMMARY

BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

REMARKS

1 LABOR COSTS		<u>\$621,645</u> /MO	FROM SHEET D \ 1
<hr/>			
2 EQUIPMENT			
<hr/>			
A. DREDGE	+	\$1,932,582 /MO	FROM SHEET D \ 2
PROPULSION TUG	+	<u>self prop.</u> /MO	
<hr/>			
B. CREW/SURVEY VESSEL	+	<u>\$36,000</u> /MO	
<hr/>			
C. BOOSTER	+	<u>\$0</u> /MO	
<hr/>			
D. CRANE BARGE	+	<u>\$0</u> /MO	
<hr/>			
E. TENDER TUG	+	<u>\$0</u> /MO	
<hr/>			
F. OTHER MARINE	+	<u>\$0</u> /MO	<u>Spill Barge</u>
<hr/>			
G. SHORE EQUIPMENT	+	<u>\$0</u> /MO	<u>Spud Barge</u>
<hr/>			
3 TRAVEL EXPENSE	+	<u>\$19,556</u> /MO	<u>(30.42 dys/mo / 21 dys x \$750 rt x 18 ea)</u>
<hr/>			
4 OTHER MONTHLY COSTS	+	<u>\$235,353</u> /MO	FROM SHEET D \ 3
<hr/>			
5 TOTAL MONTHLY COST	=	<u>\$2,845,136</u>	

D \ 1 LABOR COSTS

BID ITEM # 2

Last Update...Oct 19

DREDGE SIZE: 7600 CYD HOPPER DREDGE

		Social Security Tax	7.65%
		Employ. Liability Tax	0.00%
Overtime %	33.33%	Workers comp.	25.00%
Vacation & Holiday %	0.00%	Unemployment tax	7.08%
	-----		-----
COMPOSITE.....	33.33%	COMPOSITE.....	39.73%

EA	CREW	O.T.		SUB-TOTAL	TAXES INSUR	SUB-TOTAL	FRINGE BENEFITS	HRLY COST	HOURS PER MONTH	MONTHLY COST
		BASIC HRLY WAGE	VACATION & HOLIDAY 33.33% AMOUNT							
Dredgecrew...										
1	CAPTAIN	52.52	+ 17.50	= 70.02	+ 27.82	= 97.84	+ 12.00	= 109.84	x 365	= \$40,092
1	CHIEF ENG	54.43	+ 18.14	= 72.57	+ 28.83	= 101.40	+ 12.00	= 113.40	x 365	= \$41,391
2	ENGINEER	52.52	+ 17.50	= 70.02	+ 27.82	= 97.84	+ 12.00	= 109.84	x 730	= \$80,183
2	MATE	35.82	+ 11.94	= 47.76	+ 18.98	= 66.74	+ 12.00	= 78.74	x 730	= \$57,480
2	DRAGTENDER	56.02	+ 18.67	= 74.69	+ 29.67	= 104.36	+ 12.00	= 116.36	x 730	= \$84,943
2	WATCH AB	44.00	+ 14.67	= 58.67	+ 23.31	= 81.98	+ 12.00	= 93.98	x 730	= \$68,605
1	COOK	35.82	+ 11.94	= 47.76	+ 18.98	= 66.74	+ 12.00	= 78.74	x 365	= \$28,740
1	STEWARD	35.82	+ 11.94	= 47.76	+ 18.98	= 66.74	+ 12.00	= 78.74	x 365	= \$28,740
2	SEAMAN AB	44.00	+ 14.67	= 58.67	+ 23.31	= 81.98	+ 12.00	= 93.98	x 730	= \$68,605
2	AB WIPER	44.00	+ 14.67	= 58.67	+ 23.31	= 81.98	+ 12.00	= 93.98	x 730	= \$68,605
0	LAUNCHMAN	52.52	+ 17.50	= 70.02	+ 27.82	= 97.84	+ 12.00	= 109.84	x 0	= \$0
2	OTHER	33.46	+ 11.15	= 44.61	+ 17.72	= 62.33	+ 12.00	= 74.33	x 730	= \$54,261
18 Crew on Dredge										TOTAL DREDGE MONTHLY LABOR COST = \$621,645

Shorecrew...										
0	SUPERINT	31.81	+ 10.60	= 42.41	+ 16.85	= 59.26	+ 12.00	= 71.26	x 0	= \$0
0	DUMP FOREMN	27.94	+ 9.31	= 37.25	+ 14.80	= 52.05	+ 12.00	= 64.05	x 0	= \$0
0	EQUIP OPER	30.81	+ 10.27	= 41.08	+ 16.32	= 57.40	+ 12.00	= 69.40	x 0	= \$0
0	SHOREMAN	22.68	+ 7.56	= 30.24	+ 12.01	= 42.25	+ 12.00	= 54.25	x 0	= \$0
0	OTHER	0.00	+ 0.00	= 0.00	+ 0.00	= 0.00	+ 12.00	= 12.00	x 0	= \$0
0	OTHER	0.00	+ 0.00	= 0.00	+ 0.00	= 0.00	+ 12.00	= 12.00	x 0	= \$0
0	OTHER	0.00	+ 0.00	= 0.00	+ 0.00	= 0.00	+ 12.00	= 12.00	x 0	= \$0

18 Total Crew TOTAL MONTHLY LABOR COST = \$621,645

(Average Gross Wage = \$94.62 per manhour)

D \ 2 DREDGE OWNERSHIP & OPERATING COST SUMMARY

BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

1. OWNERSHIP COSTS:

	<u>RATES</u>	<u>MOB/DEMOB RATES</u>
Ownership Elements	\$ 443,073 /MO	\$ 443,073 /MO
Facilities Capitol Cost of Money (FCCM)	\$ 28,959 /MO	\$ 28,959 /MO
<b>TOTAL</b>	<b>= \$ 472,032 /MO</b>	<b>\$ 472,032 /MO</b>

2. OPERATING COSTS:

Fuel	\$ 1,529.10 /HR	\$ 1,559.40 /HR
Lubricants	\$ 44.00 /HR	\$ 44.00 /HR
Repairs and Maintenance	\$ 641.00 /HR	
Pump and Pipe Wear & Repairs	\$ 36.40 /HR	
Provisions and Supplies	\$ 24.90 /HR	\$ 21.88 /HR
<b>SUBTOTAL</b>	<b>= \$ 2,275 /HR</b>	<b>\$ 1,625 /HR</b>
Effective Working Time = (730 HRS/MO x 88.0% EWT)	x 642 HRS/MO	
Calendar Time per Month (Mob/Demob uses Calendar Time)		x 730 HRS/MO
<b>TOTAL</b>	<b>= \$ 1,460,550 /MO</b>	<b>\$ 1,186,250 /MO</b>

3. TOTAL OWNERSHIP & OPERATING COSTS:

Total Ownership Costs	\$ 472,032 /MO	\$ 472,032 /MO
Total Operating Costs	\$ 1,460,550 /MO	\$ 1,186,250 /MO
<b>TOTAL</b>	<b>= \$ 1,932,582 /MO</b>	<b>\$ 1,658,282 /MO</b>

D \ 2A DREDGE OWNERSHIP COSTS

BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

ACQUISITION COST (A):	\$ 35,000,000
CAPITAL IMPROVEMENTS (I) @ 10% OF (A):	\$ 3,500,000
<b>(A + I)</b>	<b>\$ 38,500,000</b>

COST OF MONEY (FULL RATE):	1.125%	USE MONTHS PER YEAR (UMPY):	7 months
DISCOUNTED MONEY RATE:	0.900%	MARINE INSURANCE (MI):	1.50%
SALVAGE VALUE FACTOR (S):	10%	TAXES (TA):	1.00%
ECONOMIC LIFE (N):	20 yrs	LAYUP (LU):	\$51,000 per layup month
YEAR COMMISSIONED:	1981	YARD COST (Y):	\$10,700 per month

CALCULATIONS

1. OWNERSHIP ELEMENTS:

A. DEPRECIATION = (A+I)*[1-S]/N = (\$38,500,000) x [1 - 10%] / 20 yrs	= \$	1,732,500	/YR
B. MARINE INSURANCE = MI(A+I) = 1.50% x (\$38,500,000)	= \$	577,500	/YR
C. TAXES = TA(A+I) = 1.00% x (\$38,500,000)	= \$	385,000	/YR
E. LAYUP = (LU)(12-1-UMPY) = (\$51,000 per mo) x (12 mo/yr - 1 mo - 7 mo)	= \$	211,650	/YR
F. YARD = 12(Y) = 12 mo x (\$10,700 per mo)	= \$	128,400	/YR
G. YEARLY OWNERSHIP = (Sum of Items 1.a. thru 1.f.)	= \$	3,035,050	/YR
H. MONTHLY OWNERSHIP = (yrly Ownership / UMPY) = (\$3,035,050 / 7 mo)	= \$	443,073	/MO

2. FACILITIES CAPITAL COST OF MONEY (FCCM):

A. YEARLY FCCM = (A+I)[(N-1)(1+S)+2] x Discounted Money Rate / 2N			
= (\$38,500,000) [(20 yrs - 1)(1 + 10%) + 2] x (0.90%) / [(2)(20 yrs)]	= \$	198,371	/YR
B. MONTHLY FCCM = (yrly FCCM / UMPY) = (\$198,371 / 7 mo)	= \$	28,959	/MO

D \ 2B OPERATING COSTS - FUEL BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

1 FUEL

A. TABLE A. FUEL CONSUMPTION FACTORS:

<u>Type of Work</u>	<u>FUEL FACTOR ( GAL / BHP - HR )</u>			
	<u>%</u>	<u>factor</u>	<u>%</u>	<u>factor</u>
			<u>Pumps</u>	<u>Aux &amp; Misc</u>
			<u>%</u>	<u>factor</u>

Excavating	45	0.024	50	0.027	30	0.016
Haul and Return	80	0.042	0	0.000	25	0.013
Pumpout	0	0.000	80	0.042	25	0.013
Non-Effective	0	0.000	0	0.000	25	0.013

**B. POWER REQUIREMENTS FOR FUEL CONSUMPTION FOR THE DREDGE (From Database):**

<u>DESCRIPTION</u>	<u>SUMMARY OF RATED HP (1)</u>		<u>TOTAL</u>
	<u>ELECTRIC</u>	<u>DIESEL</u>	<u>REQUIRED HP (2)</u>
Propulsion	0	9,000	9,000
Dredge Pump(s)	0	3,000	3,000
Jet Pump	0	0	0
Pumpout Pump(s)	0	3,000	3,000
Auxillary & Misc	1,000	765	2,000

(1). Rated hp is the output power of drive engines or motors or equivalent hp of other misc electrical loads.

(2). Total required hp is the rated bhp of engines when the type of power is diesel, or the rated bhp of generator engines providing the power when the type of power is electric.

D \ 2C OPERATING COSTS - FUEL BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

**1. FUEL (CONT.)**

**C. FUEL USE DURING DREDGING: FUEL USE CONSUMPTION SUMMARY**

<u>DESCRIPTION</u>	<u>EXCAVATING</u>	<u>TURNING, SAILING &amp; DISPOSAL</u>	<u>PUMPOUT</u>	<u>TOTAL NON-EFFECTIVE TIME</u>	<u>TOTALS</u>	<u>JET @ 0% OF EXCAV TIME</u>
Cycle Time In Min.	58	330		53	441	0
% Of Total Cycle Time	13.2%	74.8%	0.0%	12.0%	100.0%	0.0%
<b>FUEL CONSUMPTION IN GAL/HR (1)</b>						
Propulsion	28.5	282.7	0.0		311.2	
Pumps (2 dragheads used)	10.7	0.0	0.0		10.7	0.0
Auxillary & Misc.	4.2	19.4	0.0	3.1	26.7	
Subtotals:	43.4	302.1	0.0	3.1	348.6	0.0

Average Hourly Fuel Consumption (Effective and Non-Effective Time): 348.6 GAL/HR

Historical Fuel Consumption DATA Not Available or Not Used.....

Average Hourly Fuel Cost @ \$3.86 per gallon = \$ 1,345.60 /HR

FUEL RATE ( Adjusted to Effective Time Basis: \$1345.60 / 88.0% ) = \$ 1529.10 /HR

D. DURING MOB & DEMOB OPERATION:

Propulsion = (Propulsion hp x Propulsion factor during sailing) = 378.0 GAL/HR

Aux. & Misc. = (Aux. & Misc. hp x Aux. & Misc. factor during Mob & Demob) = 26.0 GAL/HR

Average Hourly Fuel Consumption (During Mob & Demob): 404.0 GAL/HR

FUEL RATE (Average Hourly Fuel Cost @ \$3.86 per gallon) = \$ 1559.40 /HR

NOTES: (1). Computations = (% of Total Cycle Time) x (Fuel Factor from Table A.) x (Horsepower).

D \ 2D OPERATING COSTS - LUBRICANTS BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

Base Price Level (Cost in Tables B & C)	1988
Base Index (EP 1110-1-8, App E, EK 105)	3920
Current Price Level (Cost in Tables B & C)	2021
Current Index (EP 1110-1-8, App E, EK 105)	9513

TABLE B. LUBRICANTS, REPAIRS AND MAINTENANCE.

<u>TOTAL INSTALLED HP OF DREDGE</u>	<u>LUBE \$/HR</u> <u>(1)</u>	<u>REPAIRS &amp; MAINTENANCE \$/HR</u> <u>(2)</u>
0 - 3999 HP	\$10.70	\$265.00
4000 - 4999 HP	\$13.70	\$296.00
5000 - 5999 HP	\$16.70	\$328.00
6000 - 6999 HP	\$19.80	\$366.00
7000 - 7999 HP	\$22.80	\$400.00
8000 - 8999 HP	\$25.80	\$434.00
9000 - 9999 HP	\$28.90	\$468.00
10000 - 10999 HP	\$31.90	\$502.00
11000 - 11999 HP	\$34.90	\$536.00
12000 - 12999 HP	\$38.00	\$570.00



13000 - 13999 HP	\$41.00	\$604.00
14000 - 14999 HP	\$44.00	\$641.00
15000 - 15999 HP	\$47.10	\$670.00
16000 - 16999 HP	\$50.10	\$709.00
17000 - 17999 HP	\$53.10	\$743.00

(1) LUBRICANTS Includes materials only.

(2) Includes all repairs and maintenance to all components except pumps and discharge piping for pumpout, including parts, labor, small tools, equipment and drydocking.

2 LUBRICANTS (From Table B.)

TOTAL INSTALLED POWER = 14,000 HP \$ 44.00 /HR

3 REPAIRS AND MAINTENANCE (From Table B.)

TOTAL INSTALLED POWER = 14,000 HP \$ 641.00 /HR

D \ 2E OPERATING COSTS - PUMP & PIPELINE BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

DREDGED QUANTITIES:			PUMPOUT QUANTITIES:	
TYPE	%	TOTAL CY	%	TOTAL CY
Mud:	50%	2,413,690	0%	0
Sand:	50%	2,413,690	0%	0
Gravel:	0%	0	0%	0
Combined:	100%	4,827,379	0%	0

TABLE C. COST DATA FOR PUMP & PIPE WEAR AND REPAIRS

DISCHARGE DIAM.	PUMP WEAR COST / CY OF MATERIAL PUMPED		
	MUD	SAND	GRAVEL
16	\$0.022	\$0.068	\$0.194
18	\$0.024	\$0.078	\$0.221

20	\$0.027	\$0.090	\$0.248
24	\$0.034	\$0.109	\$0.301
28	\$0.039	\$0.131	\$0.352
34	\$0.049	\$0.163	\$0.432

PUMPOUT PIPE WEAR COST PER (CY PUMPED x LF OF PUMPOUT PIPE)

<u>DISCHARGE DIAM.</u>	<u>MUD</u>	<u>SAND</u>	<u>GRAVEL</u>
12	\$0.000049	\$0.000063	\$0.000097
14	\$0.000044	\$0.000056	\$0.000085
16	\$0.000036	\$0.000049	\$0.000075
18	\$0.000034	\$0.000044	\$0.000066
22	\$0.000029	\$0.000039	\$0.000058
27	\$0.000027	\$0.000034	\$0.000051
30	\$0.000024	\$0.000027	\$0.000044

D \ 2F OPERATING COSTS - PUMP & PIPELINE BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

4 PUMP AND PIPE WEAR AND REPAIRS

DESCRIPTION	<u>TOTAL WEAR AND REPAIRS COST</u>		
	MUD	SAND	GRAVEL
PUMP SIZE: 34"			
QUANTITY DREDGED (CY)	2,413,690 CY	2,413,690 CY	0 CY
% PUMPOUT	0%	0%	0%
PUMPS: (From Table C.)			
Dredge Pumps	\$ 94,134	\$ 316,193	\$ 0
Pumpout Pumps	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
SUBTOTALS: PUMPS -	94,134	316,193	\$ <u><u>0</u></u>
TOTAL PUMP WEAR.....			\$ 410,327
DISCHARGE PIPES:			
Pumpout Line Length	0 LF	0 LF	0 LF
Pipe Wear Cost	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
SUBTOTALS: DISCHARGE PIPES -	\$ 0	\$ 0	\$ <u><u>0</u></u>
TOTAL PIPE WEAR.....			\$ 0
TOTAL COST FOR PUMP AND PIPE WEAR AND REPAIR			\$ 410,327 TOTAL

AVERAGE COST PER CY EXCAVATED: \$ 0.09 /CY

TOTAL COST/HR = TOTAL WEAR COST/(TOTAL JOB EFFECTIVE HRS) = \$ 36.40 /HR

5 PROVISIONS & SUPPLIES

ACTUAL CREW = 18 EA

GOVERNMENT PERSONNEL ON DREDGE = 3 EA

TOTAL PROVISIONS @ (\$25.00/ MAN-DAY x 21 ea) / 24 HRS/DAY = \$ 21.88 /HR

PROV & SUPPL RATE ( Adjusted to Effective Time Basis: \$21.88 / 88.0% ) = \$ 24.90 /HR

D \ 2G DREDGE INFO FROM DATABASE BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

Table with 2 columns: Name Of Plant and DREDGE INFO FROM DATABASE. Rows include Acquisition Cost (\$35,000,000), Capital Improvements (10% Added Cost), Year Commissioned (1981), Economic Life (20 years), Salvage Factor (0.10), Propulsion Tug Needed? (NO), Propulsion Tug Cost (self prop.), Marine Insurance (1.5%), Taxes (1%), Layup Cost (\$51,000 /mo), Yard Cost (\$10,700 /mo), Water Volume of Hopper (7,600 cy), Max. Safe Load (Sand) (4,500 cy), Mud Capacity of Hopper (2,280 cy), Sand Capacity of Hopper (3,800 cy), Gravel Capacity of Hopper (3,040 cy), Mud Production Rate (4,200 cy/hr), Sand Production Rate (2,520 cy/hr), Gravel Production Rate (840 cy/hr), # Of Dragheads Available (2), Suction Pipe Diam. (33.5 inches), Discharge Pipe Diam. (33.5 inches), Min. Digging Depth (18 ft), Max. Digging Depth (80 ft), Draft Loaded (22.4 ft), Speed Loaded (mph) (15.0 (13.0 knots)), Speed Light (mph) (17.3 (15.0 knots)), Pumpout Available (YES), Pumpout Pipe Diam. (33.5 inches).

Max. Pumpout Length ----->	6,000 lf
Pumpout Rate ----->	4,200 cy/hr
Total Installed Horsepower ---->	14,000
Propulsion Horsepower ----->	9000 (Diesel)
Dredge Pump Horsepower ----->	3000 (Diesel)
Pumpout Horsepower ----->	3000 (Diesel)
Jet Pump Not Available	
Auxiliary Engine Horsepower --->	1000 (Electric)
Auxiliary Engine Horsepower --->	765 (Diesel)
Main Generator Horsepower --->	1235 (Diesel)
Survey Vessel Cost ----->	\$12,000 /mo
Pumpout Booster Cost ----->	\$346,000 /mo
Crane Barge Cost ----->	\$86,000 /mo
Tender Tug Cost ----->	\$136,000 /mo
Crew Size ----->	18

D \ 3 OTHER MONTHLY COSTS

BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

REMARKS

1	0		\$0 /MO	0	
2	Field Overhead	+	\$66,250 /MO		Proj Mgr, Site Mgr, Office Mgr, Proj Engr, 3 Site Engr, Safety, QC
3	Contractor's Office	+	\$7,200 /MO		Office Trailer including storage, office equipment, and sanitary facilities
4	Safety Training & Supplies	+	\$3,000 /MO		Allowance for safety supplies and meetings
5	Vehicles	+	\$19,600 /MO		7 Vehicles @ \$2,800
6	Subsistence	+	\$50,670 /MO		Subsistence (9 people) - \$185/day*30.42 days/mo = \$5,630/mo/person
7	Travel	+	\$1,200 /MO		Travel for Home Office Personnel
8	Survey	+	\$6,000 /MO		Survey supplies
9	Security	+	\$5,000 /MO		Allow for fencing & nighttime security
10	Small Tools & Supplies	+	\$31,460 /MO		Small Tools @ 7.5% of BL - \$419,466/mo*0.075 = \$31,460
11	Unscheduled Overtime	+	\$20,973 /MO		Premium Unsch. Overtime @ 5% of BL - \$419,466/mo*0.05 = \$20,973
12	Turtle Observer	+	\$24,000 /MO		24 Hour Turtle Watch. Quoted at \$800 / Day
13	>	+	/MO		
14	>	+	/MO		
<hr/>					
15	TOTAL OTHER MONTHLY COSTS	=	\$235,353 /MO		

E FIXED COSTS

BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

REMARKS

1	Estimatedd Turtle Trolling Costs	<u>\$360,000</u>	<u>Allow \$7,500 for 10 days for pre- and post-dredge surveys</u>
2	>	+ <u>\$0</u>	
3	>	+ <u>\$0</u>	
4	>	+ <u>\$0</u>	
5	>	+ <u>\$0</u>	
6	>	+ <u>\$0</u>	
7	>	+ <u>\$0</u>	
8	>	+ <u>\$0</u>	
9	>	+ <u>\$0</u>	
10	>	+ <u>\$0</u>	
11	>	+ <u>\$0</u>	
12	>	+ <u>\$0</u>	
13	>	+ <u>\$0</u>	
14	>	+ <u>\$0</u>	
15	FIXED COSTS =	<u>\$360,000</u>	

MOB & DEMOB COST \$2,384,340

MOBILIZATION ITEMS:

1. PREPARE DREDGE FOR TRANSFER TO JOBSITE:  
 Mobilization Time..... 7 Days
2. TRANSFER PLANT TO JOBSITE:  
 Mobilization Distance.... 650 Miles  
 Travel Speed Override... 0 Miles per Day  
                                   Default                                   350 Miles per Day  
                                   Used:   350 Miles per Day
3. PERMANENT PERSONNEL & MISC.:  
 Include Computed Costs?.. 1 YES (0=NO)
4. PREPARE DREDGE FOR WORK AT JOBSITE:  
 Mobilization Time..... 6 Days
5. OTHER:  
 Mobilization Item..... 0  
 Cost..... \$0

DEMOBILIZATION ITEMS:

1. PREPARE DREDGE FOR TRANSFER AWAY FROM JOBSITE:  
 Demobilization Time..... 5 Days
2. TRANSFER PLANT AWAY FROM JOBSITE:  
 Demobilization Distance... 650 Miles
3. PERMANENT PERSONNEL & MISC.:  
 Include Computed Costs? 1 YES (0=NO)
4. PREPARE DREDGE FOR LAYUP AFTER TRANSFER:  
 Demobilization Time..... 2 Days
5. OTHER:  
 Demobilization Item.....    
 Cost.....

M

MOB & DEMOB

BID ITEM # 1

DREDGE SIZE: 7600 CYD HOPPER DREDGE

	MOBILIZATION			DEMOBILIZATION		
	# DAYS	\$/DAY	TOTAL	# DAYS	\$/DAY	TOTAL
1. PREPARE DREDGE FOR TRANSFER	<u>7</u>	x <u>\$76,132</u>	= <u>\$532,924</u>	<u>5</u>	x <u>\$76,132</u>	= <u>\$380,660</u>
2. TRANSFER ALL PLANT	650 MILES			650 MILES		
@ 350 miles/day =	<u>1.9</u>	x <u>\$76,132</u>	= <u>\$144,651</u>	<u>1.9</u>	x <u>\$76,132</u>	= <u>\$144,651</u>
3. PERMANENT PERSONNEL & MISC.	<u>L.S.</u>		= <u>\$27,125</u>	<u>L.S.</u>		= <u>\$27,125</u>
4. PREPARE DREDGE AFTER TRANSFER	<u>6</u>	x <u>\$76,132</u>	= <u>\$456,792</u>	<u>2</u>	x <u>\$76,132</u>	= <u>\$152,264</u>
5. OTHER	<u>0</u>		= <u>\$0</u>	<u>0</u>		= <u>\$0</u>
	SUBTOTAL MOBILIZATION			SUBTOTAL DEMOBILIZATION		
			= <u>\$1,161,492</u>			= <u>\$704,700</u>

REMARKS

6. SUBTOTAL MOBILIZATION & DEMOBILIZATION		=	<u>\$1,866,192</u>			
7. OVERHEAD	<u>15.0%</u>	+	<u>\$279,929</u>			
SUBTOTAL.....=			<u>\$2,146,121</u>			
8. PROFIT	<u>10.0%</u>	+	<u>\$214,612</u>			
SUBTOTAL.....=			<u>\$2,360,733</u>			
9. BOND	<u>1.0%</u>	+	<u>\$23,607</u>			
10. TOTAL MOBILIZATION & DEMOBILIZATION		=	<u>\$2,384,340</u>			

M \ 1

MOBIL MONTHLY COST SUMMARY

BID ITEM # 1

DREDGE SIZE: 7600 CYD HOPPER DREDGE



REMARKS

1	LABOR COSTS	<u>\$621,645</u> /MO	<u>FROM SHEET D \ 1</u>
2	EQUIPMENT		
	A. DREDGE	+ \$1,658,282 /MO	FROM SHEET D \ 3
	PROPULSION TUG	+ <u>self prop.</u> /MO	
	B. CREW/SURVEY VESSEL	+ <u>\$36,000</u> /MO	
	C. BOOSTER	+ <u>\$0</u> /MO	
	D. CRANE BARGE	+ <u>\$0</u> /MO	
	E. TENDER TUG	+ <u>\$0</u> /MO	
	F. OTHER MARINE	+ <u>\$0</u> /MO	
	G. SHORE EQUIPMENT	+ <u>\$0</u> /MO	
3	TOTAL MONTHLY RATE	= <u>\$2,315,927</u> /MO	
4	CONVERSION TO DAILY RATE	<u>                  </u> / <u>30.42</u> dys/mo	
<hr/>			
5	DAILY RATE	= <u>\$76,132</u> /day	
<hr/>			

PERMANENT PERSONNEL & MISC.

18 men @ 8 hrs/day @ \$94.62 per hour @ 1 DAY  
 Travel Expenses \$750 per man

MOBILIZATION

\$13,625  
\$13,500

DEMOBILIZATION

\$13,625  
\$13,500

TOTAL

\$27,125

\$27,125

MOBIL & DEMOB COST: \$2,384,340

BID QUANTITY 4,589,557 C.Y.  
 UNIT COST... \$14.43 PER C.Y.  
 EXCAV. COST. \$66,227,308  
 TIME..... 17.57 MONTHS

NHC Cost Recertification - MA1

CHECKLIST FOR INPUT DATA.

PG 1 OF 9: PROJECT TITLES

PROJECT - NHC Cost Recertification - MA1  
 LOCATION - Hampton Roads, Virginia  
 INVIT # - Preliminary Estimate  
 DATE OF EST. - August 2021  
 EST. BY - SBJ  
 MOB. BID ITEM # - 1  
 EXCAV. BID ITEM # - 2

PG 1a OF 9: LOCAL AREA FACTORS

PRESENT YEAR - 2021  
 ECONOMIC INDEX - 9513  
 LAF - 1.02  
 INTEREST RATE - 1.125% /yr  
 TIME PERIOD - Jul -Dec 2021  
 PIPELINE AVAILABILITY - n/a mos/yr  
 BUCKET AVAILABILITY - n/a mos/yr  
 HOPPER AVAILABILITY - 6.85 mos/yr  
 FUEL PRICE - \$3.86 /gal

PG 2 OF 9: TYPE OF EST & IND COSTS

TYPE OF EST. - Planning Estimate  
 CONTRACTOR'S O.H. - 15.0%  
 CONTRACTOR'S PROFIT - 10.0%  
 CONTRACTOR'S BOND - 1.0%

PG 3 OF 9: EXCAVATION QTY'S

DREDGING AREA - 10,700,000 sf  
 REQ'D EXCAVATION - 4,227,546 cyds  
 PAY OVERDEPTH - 362,011 cyds  
 CONTRACT AMOUNT - 4,589,557 cyds  
 NOT DREDGED - 130,778 cyds  
 NET PAY - 4,458,779 cyds  
 NONPAY YARDAGE - 368,600 cyds  
 GROSS YARDAGE - 4,827,379 cyds  
 NONPAY HEIGHT - 0.9 ft overdig  
 TOTAL BANK HEIGHT - 12.2 ft

PG 4 OF 9: PRODUCTION

TYPE OF MATERIAL - 50% MUD  
 - 50% SAND  
 - 0% GRAVEL  
 HOPPER CAPACITY - 7,600 cyds  
 EFF. HOPPER CAP. - 3,040 cyds  
 DRDGE RATE (ALL HEADS) - 3,150 cy/hr  
 ACT. DRAGHDS USED - 2 ea  
 DRDGE RATE USED - 3,150 cy/hr

PG 5 & 6 OF 9: PRODUCTION (CONT.)

URNS/CYCLE - 1 ea  
 MIN. PER TURN - 5 min  
 DISPOSAL DIST - 25 mi  
 TRVL SPD TO DISP - 9.0 mph  
 TRVL SPD FROM DISP - 9.8 mph  
 DUMP/CONNECT TIME - 5 min  
 TYPE OF DISPOSAL - Gravity Dump  
 PIPELINE USED - 0 lf  
 CLEANUP - 10% More Time  
 % EFF WORK TIME - 88.0%

PG 7 & 8 OF 9: PLANT OWN. & OPER.

DREDGE SELECTED - GENERIC LARGE  
 DREDGE ACQUIS COST - \$35,000,000  
 DREDGE CAPITAL IMPROV - 10%  
 PROPULSION TUG - self prop. /mo  
 SURVEY VESSEL - \$36,000 /mo  
 BOOSTER - \$0 /mo  
 CRANE BARGE - \$0 /mo  
 TENDER TUG - \$0 /mo  
 OTHER MARINE - \$0 /mo  
 SHORE EQUIP - \$0 /mo

PG 7a OF 9: DREDGE OPER ADJ FACTORS

PUMP LOAD FACTOR - 50%  
 RPR & MAINT. ADJ - 1.00  
 JET PUMP USEAGE - 0%

PG 9 OF 9: OTHER ADJUSTMENTS

SPECIAL COST/MO (1ST) - \$0 0  
 SP COST/MO (2ND-14TH) - \$235,353 From Sheet D\3  
 SPECIAL COST LS (1ST) - \$360,000 Estimatedd Turtle Trolling Costs  
 SP COST LS (2ND-14TH) - \$0 From Sheet E

PG 9a OF 9: TRAVEL & PROVISIONS

FREQ PD TRAVEL - 21 days  
 RT TRAVEL COST - \$750  
 GOVT. PERSONNEL - 3 ea  
 PROVISIONS & SUPP - \$25 /man

LOADS PER DAY - 3.0  
 PRODUCTION - 428 gross cy per hour  
 OPERATING TIME - 642 hours per month  
 GROSS PRODUCTION - 274,776 cy per month  
 PAY PRODUCTION - 253,772 pay cy per month

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**COST ENGINEERING APPENDIX**

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**MEETING AREA 2**

**HOPPER ESTIMATE WORKSHEET**

395,184 pay c.y. per month  
678 c.y. per hour  
3.6 Loads/Day

UNIT COST.. \$8.58 PER C.Y.  
EXCAV. COST \$12,258,581  
TIME..... 3.44 MONTHS

Select Dredge  
GENERIC LARGE

PROJECT TITLES:

PG 1 of 9

Project Name..... NHC Cost Recertification - TSC MA2  
Project Location..... Hampton Roads, Virginia  
Invit. or Contr. No..... Preliminary Estimate  
Date of Estimate..... February 2020  
Estimator..... SBJ  
Checked by..... JAG

Ver. 7.1  
For Information, Call:  
Fletcher: 904-232-3295

(Input Project Descriptions on Sheet A)

Mobilization Bid Item..... 1

Goto Sheet A

Excavation Bid Item..... 2

Goto Input Page 1a

TYPE OF ESTIMATE

PG 2 of 9

Type of Estimate..... 1

Planning Estimate

(1) Planning, (2) Bid, or (3) Mod

Estimate Descriptions

INDIRECT COSTS:

Contractor's Overhead... 15.0

Percent of contract

Contractor's Profit..... 10.0

Percent of contract

Contractor's Bond..... 1.0

Percent of contract

ESTIMATED DREDGING QUANTITY:

PG 3 of 9

Non-Pay Computation Method: 1

(1) Surface Area, (2) % of Pay O.D., (3) % of Net Pay, (4) % of Gross

DREDGING AREA: 5,670,420

SQ. FT.

Using 2D area for 1' paid O.D. limits

DREDGING PRISM:

Required.... 1,224,022

C.Y.

56' Required

+ 0-ft Pay O.D.... 204,717

C.Y.

Bid Quantity 1,428,739

C.Y.

- Not Dug.. 69,305

C.Y.

AVE. BANK HEIGHT:

Net Pay 1,359,434

C.Y.

@

6.50 ft pay

+ Non-Pay 138,600

C.Y.

@

0.66 ft overdig

Adjusted

Gross Volume 1,498,034

C.Y.

7.16 FT. BANK HT.

PRODUCTION WORKSHEET:

part 1 of 3

PG 4 of 9

Material Classification: 0

% MUD

100

% SAND

0

% GRAVEL

Volume of Hopper (cyds)..... 7,600

(From Database)

Max Safe Load (cyds of Sand).... 4,500

(From Database)

Override 4,000

Calculated 3,800

Used 4,000

Material is finer than offshore in AOC

Excavation Rate (cy/hr) using 2 Dragheads..... 0

2,520

2,520

Database

Dragheads Used (ea)..... 0

2

2

Excavation based upon 2.0 Dragheads. (cy/hr).....

2,520

2,520

(Excavation Time per Cycle = 95 min)

395,184 pay c.y. per month  
 678 c.y. per hour  
 3.6 Loads/Day

UNIT COST.. \$8.58 PER C.Y.  
 EXCAV. COST \$12,258,581  
 TIME..... 3.44 MONTHS

Select Dredge  
 GENERIC LARGE

PRODUCTION WORKSHEET:

part 2 of 3

PG 5 of 9

Turns/Cycle..... 1 Each  
 Time Per Turn..... 5 Minutes  
 (Turning Time per Cycle = 5 min)

Travel speed based on avg. of industry dredges (>4,000 CY)

One-Way Haul Distance..... 17 Miles (Statute)

Speed to Disposal Area..... 9 mph  
 Max Speed Loaded..... 15.0 mph  
 Speed Used to D/A..... 9 mph  
 (Hauling Time to D/A per Cycle = 113 min)

Speed from Disp Area..... 9.75 mph  
 Max Speed Light..... 17.3 mph  
 Speed Used from D/A..... 9.8 mph  
 (Hauling Time from D/A per Cycle = 104 min)  
 (Total Haul Time = 217 min)

PRODUCTION WORKSHEET:

part 3 of 3

PG 6 of 9

Will Pumpout be Used?..... 0 NO (1=YES)

<-Used With Pumpout Only  
 0 <-Used With Pumpout Only

Gravity Dumping Time.... 5 Minutes per Cycle

Cleanup Dredging..... 10 % Additional Time  
 Time Efficiency..... 88.0 % of Effective Working Time  
 642 Hours Per Month

PLANT OWNERSHIP AND OPERATING: part 1 of 2

PG 7 of 9

DREDGE	Override	Database	Used
Dredge Acquisition.....		\$35,000,000	\$ 35,000,000
Capital Improvements %..	%	10%	10%
REQUIRED PLANT (Monthly Costs)			
Dredge Propulsion Tug...		self prop.	self prop.
Survey Vessel.....	\$36,000	\$12,000	\$36,000

Goto Input Page 7a

PLANT OWNERSHIP AND OPERATING: part 2 of 2

PG 8 of 9

OPTIONAL PLANT (Monthly Costs)

Booster..... Include? 0 NO (1=YES) \$346,000 <--Database  
 .....Override> \$0 <--Used  
 Crane Barge..... Include? 0 NO (1=YES) \$86,000 <--Database  
 .....Override> \$0 <--Used  
 Tender Tug..... Include? 0 NO (1=YES) \$136,000 <--Database

395,184 pay c.y. per month  
678 c.y. per hour  
3.6 Loads/Day

UNIT COST.. \$8.58 PER C.Y.  
EXCAV. COST \$12,258,581  
TIME..... 3.44 MONTHS

Select Dredge  
GENERIC LARGE

.....Override> \$0 <--Used  
Other Marine..... \$0  
Shore Equip..... \$0

OTHER PRICING ADJUSTMENTS:

PG 9 of 9

Other Monthly Costs:

1st Input..... Per Month  
Description.....  
(For Additional Inputs Go to Sheet D\3)

Goto Input Page 9a

Goto Sheet D\3

Fixed Costs:

1st Input..... Lump Sum  
Description.....  
(For Additional Inputs Go to Sheet E)

(To Adjust Labor Go To Sheet DB\_L)

Goto Sheet DB\_L

(To Adjust Equipment Go to Sheet DB\_E)

Goto Sheet DB\_E

LOCAL AREA FACTORS:

PG 1a of 9

Present Year..... 2021 (Equipment Calculations)  
Economic Index..... 9513 (EP-1110-1-8, APP E)  
Labor Adjustment Factor. 1.020 (EP-1110-1-8, APP B)  
Full Cost of Money Rate. 1.125 Percent per Year  
Dates for Money Rate... Jul -Dec 2021  
Annual Months Available for Dredging:  
Pipeline.... n/a Months per Year  
Bucket..... n/a Months per Year  
Hopper..... 6.85 Months per Year  
Current Fuel Price..... \$3.86 Per Gallon

Fiscal Year  
30 Nov 18 Version  
Local Labor Utilized

Return

Fisherman's Wharf Marina, 10/24/20

DREDGE OPERATING ADJUSTMENT FACTORS (OPTIONAL):

PG 7a of 9

	Override	Assumed	Used
Pump Load Factor.....	%	50%	50%
Adj to Exist Repair Cost... (Range .80 to 1.20)		1.00	1.00
NO Jet Pump Avail	%	0%	0%
	Override	Calculated	Used
Fuel Usage (Gal/Day)....		8,141	8,141

Return

TRAVEL & PROVISIONS:

PG 9a of 9

TRAVEL FOR DREDGE CREW:

Frequency Of Travel..... 21 days

Cost of Ticket..... \$750 per Round Trip

Return

395,184 pay c.y. per month  
678 c.y. per hour  
3.6 Loads/Day

UNIT COST.. \$8.58 PER C.Y.  
EXCAV. COST \$12,258,581  
TIME..... 3.44 MONTHS

<b>Select Dredge</b>
GENERIC LARGE ▼

EXTRA MEALS PROVIDED:

Gov Personnel On Dredge.	3	<-
Prov & Supplies.....	\$25.00	/Man-Day

TESTING FOR OCEAN DISPOSAL \$0.00 CY

A DESCRIPTION AND QUANTITY SUMMARY

1 PROJECT NHC Cost Recertification - TSC MA2 DATE OF ESTIMATE February 2020

2 LOCATION Hampton Roads, Virginia INVIT. OR CONTR. NO. Preliminary Estimate

3 ESTIMATED BY SBJ CHECKED BY JAG

4 TYPE OF DREDGE 7600 CYD HOPPER DREDGE TYPE OF ESTIMATE Planning Estimate

5 DESCRIPTION OF WORK Deepening of the Thimble Shoals Channel for Navigation purposes.  
Costs assume that overflow is allowed to obtain an economic load (85% of max safe load).

6 EXCAVATION		REMARKS
A. REQUIRED	<u>1,224,022</u> CY	<u>5,670,420 s.f. of Dredging Area</u>
B. PAY OVERDEPTH	<u>+ 204,717</u> CY	
C. MAX. PAY YARDAGE	<u>= 1,428,739</u> CY	<u>(YARDAGE USED ON BID FORM)</u>
D. O.D. NOT DREDGED	<u>- 69,305</u> CY	
E. NET PAY YARDAGE	<u>= 1,359,434</u> CY	<u>(YARDAGE USED TO FIGURE UNIT PRICE PER C.Y.)</u>
F. NON-PAY YARDAGE	<u>+ 138,600</u> CY	<u>0.7 ft overdig</u>
G. GROSS YARDAGE	<u>= 1,498,034</u> CY	<u>(YARDAGE USED TO FIGURE PRODUCTION TIME &amp; COST)</u>



B DREDGING COST

BID ITEM # 2

REMARKS

1	GROSS YARDAGE	<u>1,498,034</u> CY	<u>FROM SHEET A, ITEM 6 G.</u>
2	PRODUCTION RATE	<u>/ 435,276</u> CY/MO	<u>FROM SHEET C, ITEM 9.</u>
3	DREDGING TIME	= <u>3.44</u> MONTHS	<u>1,359,434 Net Pay CY ÷ 3.44 MO = 435,276 Pay CY/MO</u>
4	TOTAL MONTHLY COST	<u>x \$2,654,688</u>	<u>FROM SHEET D</u>
	SUBTOTAL.....=	<u>\$9,132,126</u>	
5	FIXED COSTS	<u>+ \$0</u>	<u>FROM SHEET E</u>
	SUBTOTAL.....=	<u>\$9,132,126</u>	
6	OVERHEAD	<u>15.0% + \$1,369,819</u>	<u>Home office overhead only; Field overhead accounted for on Sheet D4</u>
	SUBTOTAL.....=	<u>\$10,501,945</u>	
7	PROFIT	<u>10.0% + \$1,050,195</u>	<u>Profit is based on USACE Weighted Guidelines</u>
	SUBTOTAL.....=	<u>\$11,552,140</u>	
8	BOND	<u>1.0% + \$115,521</u>	
9	GROSS PRODUCTION COS	= <u>\$11,667,661</u>	
10	NET PAY YARDAGE	<u>/ 1,359,434</u> CY	<u>FROM SHEET A, ITEM 6 E.</u>
10a	TESTING FOR OCEAN DISPOSAL	<u>\$ -</u> CY	<u>FROM EXC INPUT</u>
11	UNIT COST	= <u>\$8.58</u> /CY	
12	MAX PAY YARDAGE	<u>x 1,428,739</u> CY	<u>FROM SHEET A, ITEM 6 C.</u>
13	DREDGING COST	= <u>\$12,258,581</u>	

C

MONTHLY PRODUCTION SUMMARY

BID ITEM # 2

REMARKS

1 AVERAGE UNADJUSTED CYCLE TIME 322 min/load SEE SHEET C \ 1, ITEM 3.

2 CLEANUP FACTOR 0.91 / 10% ADDITIONAL DREDGING TIME ( 100% / 110% )

3 AVERAGE CYCLE TIME = 354 min/load

4 CONVERSION TO HOURS 60 min/hr

5 AVERAGE CYCLE TIME / 354 min/load THIS SHEET, ITEM 3.

6 EFFECTIVE HOPPER CAPACITY x 4,000 cy/load

7 GROSS PRODUCTION = 678 CY/HR

8 OPERATING TIME:

REMARKS

A. TIME EFFICIENCY 88.0% % OF EFFECTIVE WORKING TIME

B. MAX DREDGE TIME x 730 HRS/MO

C. OPERATING TIME = 642 HRS/MO

9 PRODUCTION RATE = 435,276 CY/MO 678 CY/HR x 642 HRS/MO

10 LOADS PER DAY 3.6 (1440 MIN/DAY ÷ 354 MIN/LOAD) X 88.0% EWT

11 PROJECT DURATION 3.44 MONTHS

PRODUCTION WORK SHEET

C \ 1

BID ITEM # 2

CYCLE TIME

1 DREDGE USED:

A. DESCRIPTION OF DREDGE 7600 CYD HOPPER DREDGE

B. EFFECTIVE HOPPER CAPACITY 4,000 cy/load

REMARKS

2 TIME PER AVERAGE LOAD CYCLE:

A. EXCAVATING 95 min ( 4,000 cy ÷ 2,520 cy/hr ) x 60 min/hr.

B. TURNING + 5 min 1 turns at 5 minutes per turn.

C. TO DISPOSAL OR MOORING + 113 min ( 17.0 miles ÷ 9.0 mph ) x 60 min/hr.

D. DUMPING OR CONNECT TO PIPELINE + 5 min TYPE OF DISPOSAL----> GRAVITY DUMPING

E. PUMPOUT THROUGH PIPELINE +          min (          cy ÷          cy/hr ) x 60 min/hr.

F. FROM DISPOSAL OR MOORING          + 104 min ( 17.0 miles ÷ 9.8 mph ) x 60 min/hr.

3 AVERAGE UNADJUSTED CYCLE TIME = 322 min/load

D MONTHLY COST SUMMARY

BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

REMARKS

1 LABOR COSTS		<u>\$423,493</u> /MO	FROM SHEET D \ 1
2 EQUIPMENT			
<hr/>			
A. DREDGE	+	\$1,940,286 /MO	FROM SHEET D \ 2
PROPULSION TUG	+	<u>self prop.</u> /MO	
<hr/>			
B. CREW/SURVEY VESSEL	+	<u>\$36,000</u> /MO	
<hr/>			
C. BOOSTER	+	<u>\$0</u> /MO	
<hr/>			
D. CRANE BARGE	+	<u>\$0</u> /MO	
<hr/>			
E. TENDER TUG	+	<u>\$0</u> /MO	
<hr/>			
F. OTHER MARINE	+	<u>\$0</u> /MO	<u>Spill Barge</u>
<hr/>			
G. SHORE EQUIPMENT	+	<u>\$0</u> /MO	<u>Spud Barge</u>
<hr/>			
3 TRAVEL EXPENSE	+	<u>\$19,556</u> /MO	<u>(30.42 dys/mo / 21 dys x \$750 rt x 18 ea)</u>
<hr/>			
4 OTHER MONTHLY COSTS	+	<u>\$235,353</u> /MO	FROM SHEET D \ 3

5 TOTAL MONTHLY COST		= <u>\$2,654,688</u>	
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D \ 1 LABOR COSTS

BID ITEM # 2

Last Update...Oct 19

DREDGE SIZE: 7600 CYD HOPPER DREDGE

		Social Security Tax	7.65%
		Employ. Liability Tax	0.00%
Overtime %	33.33%	Workers comp.	25.00%
Vacation & Holiday %	0.00%	Unemployment tax	7.08%
	-----		-----
COMPOSITE.....	33.33%	COMPOSITE.....	39.73%

EA	CREW	O.T.		SUB-TOTAL	TAXES INSUR	SUB-TOTAL	FRINGE BENEFITS	HRLY COST	HOURS PER MONTH	MONTHLY COST
		BASIC HRLY WAGE	VACATION & HOLIDAY 33.33% AMOUNT							
Dredgecrew...										
1	CAPTAIN	31.81	+ 10.60	= 42.41	+ 16.85	= 59.26	+ 12.00	= 71.26	x 365	= \$26,010
1	CHIEF ENG	31.81	+ 10.60	= 42.41	+ 16.85	= 59.26	+ 12.00	= 71.26	x 365	= \$26,010
2	ENGINEER	30.81	+ 10.27	= 41.08	+ 16.32	= 57.40	+ 12.00	= 69.40	x 730	= \$50,662
2	MATE	28.22	+ 9.41	= 37.63	+ 14.95	= 52.58	+ 12.00	= 64.58	x 730	= \$47,143
2	DRAGTENDER	35.63	+ 11.88	= 47.51	+ 18.88	= 66.39	+ 12.00	= 78.39	x 730	= \$57,225
2	WATCH AB	22.68	+ 7.56	= 30.24	+ 12.01	= 42.25	+ 12.00	= 54.25	x 730	= \$39,603
1	COOK	22.68	+ 7.56	= 30.24	+ 12.01	= 42.25	+ 12.00	= 54.25	x 365	= \$19,801
1	STEWARD	28.22	+ 9.41	= 37.63	+ 14.95	= 52.58	+ 12.00	= 64.58	x 365	= \$23,572
2	SEAMAN AB	22.68	+ 7.56	= 30.24	+ 12.01	= 42.25	+ 12.00	= 54.25	x 730	= \$39,603
2	AB WIPER	22.68	+ 7.56	= 30.24	+ 12.01	= 42.25	+ 12.00	= 54.25	x 730	= \$39,603
0	LAUNCHMAN	30.81	+ 10.27	= 41.08	+ 16.32	= 57.40	+ 12.00	= 69.40	x 0	= \$0
2	OTHER	33.46	+ 11.15	= 44.61	+ 17.72	= 62.33	+ 12.00	= 74.33	x 730	= \$54,261
18 Crew on Dredge										TOTAL DREDGE MONTHLY LABOR COST = \$423,493

Shorecrew...										
0	SUPERINT	31.81	+ 10.60	= 42.41	+ 16.85	= 59.26	+ 12.00	= 71.26	x 0	= \$0
0	DUMP FOREMN	27.94	+ 9.31	= 37.25	+ 14.80	= 52.05	+ 12.00	= 64.05	x 0	= \$0
0	EQUIP OPER	30.81	+ 10.27	= 41.08	+ 16.32	= 57.40	+ 12.00	= 69.40	x 0	= \$0
0	SHOREMAN	22.68	+ 7.56	= 30.24	+ 12.01	= 42.25	+ 12.00	= 54.25	x 0	= \$0
0	OTHER	0.00	+ 0.00	= 0.00	+ 0.00	= 0.00	+ 12.00	= 12.00	x 0	= \$0
0	OTHER	0.00	+ 0.00	= 0.00	+ 0.00	= 0.00	+ 12.00	= 12.00	x 0	= \$0
0	OTHER	0.00	+ 0.00	= 0.00	+ 0.00	= 0.00	+ 12.00	= 12.00	x 0	= \$0

18 Total Crew										TOTAL MONTHLY LABOR COST = \$423,493
										(Average Gross Wage = \$64.46 per manhour)

D \ 2 DREDGE OWNERSHIP  
& BID ITEM # 2  
OPERATING COST SUMMARY

DREDGE SIZE: 7600 CYD HOPPER DREDGE

<u>1. OWNERSHIP COSTS:</u>	<u>RATES</u>	<u>MOB/DEMOb RATES</u>
Ownership Elements	\$ 443,073 /MO	\$ 443,073 /MO
Facilities Capitol Cost of Money (FCCM)	\$ 28,959 /MO	\$ 28,959 /MO
<b>TOTAL</b>	<b>= \$ 472,032 /MO</b>	<b>\$ 472,032 /MO</b>

<u>2. OPERATING COSTS:</u>		
Fuel	\$ 1,487.90 /HR	\$ 1,559.40 /HR
Lubricants	\$ 44.00 /HR	\$ 44.00 /HR
Repairs and Maintenance	\$ 641.00 /HR	
Pump and Pipe Wear & Repairs	\$ 88.80 /HR	
Provisions and Supplies	\$ 24.90 /HR	\$ 21.88 /HR
<b>SUBTOTAL</b>	<b>= \$ 2,287 /HR</b>	<b>\$ 1,625 /HR</b>
Effective Working Time = (730 HRS/MO x 88.0% EWT)	x 642 HRS/MO	
Calendar Time per Month (Mob/Demob uses Calendar Time)		x 730 HRS/MO
<b>TOTAL</b>	<b>= \$ 1,468,254 /MO</b>	<b>\$ 1,186,250 /MO</b>

<u>3. TOTAL OWNERSHIP &amp; OPERATING COSTS:</u>		
Total Ownership Costs	\$ 472,032 /MO	\$ 472,032 /MO
Total Operating Costs	\$ 1,468,254 /MO	\$ 1,186,250 /MO
<b>TOTAL</b>	<b>= \$ 1,940,286 /MO</b>	<b>\$ 1,658,282 /MO</b>

D \ 2A DREDGE OWNERSHIP COSTS BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

ACQUISITION COST (A):	\$ 35,000,000
CAPITAL IMPROVEMENTS (I) @ 10% OF (A):	\$ 3,500,000
(A + I)	<u>\$ 38,500,000</u>

COST OF MONEY (FULL RATE):	1.125%	USE MONTHS PER YEAR (UMPY):	7 months
DISCOUNTED MONEY RATE:	0.900%	MARINE INSURANCE (MI):	1.50%
SALVAGE VALUE FACTOR (S):	10%	TAXES (TA):	1.00%
ECONOMIC LIFE (N):	20 yrs	LAYUP (LU):	\$51,000 per layup month
YEAR COMMISSIONED:	1981	YARD COST (Y):	\$10,700 per month

CALCULATIONS

1. OWNERSHIP ELEMENTS:

A. DEPRECIATION = (A+I)*[1-S]/N = (\$38,500,000) x [1 - 10%] / 20 yrs	= \$	1,732,500 /YR
B. MARINE INSURANCE = MI(A+I) = 1.50% x (\$38,500,000)	= \$	577,500 /YR
C. TAXES = TA(A+I) = 1.00% x (\$38,500,000)	= \$	385,000 /YR
E. LAYUP = (LU)(12-1-UMPY) = (\$51,000 per mo) x (12 mo/yr - 1 mo - 7 mo)	= \$	211,650 /YR
F. YARD = 12(Y) = 12 mo x (\$10,700 per mo)	= \$	128,400 /YR
G. YEARLY OWNERSHIP = (Sum of Items 1.a. thru 1.f.)	= \$	3,035,050 /YR
H. MONTHLY OWNERSHIP = (yrly Ownership / UMPY) = (\$3,035,050 / 7 mo)	= \$	443,073 /MO

2. FACILITIES CAPITAL COST OF MONEY (FCCM):

A. YEARLY FCCM = (A+I)[(N-1)(1+S)+2] x Discounted Money Rate / 2N		
= (\$38,500,000) [(20 yrs - 1)(1 + 10%) + 2] x (0.90%) / [(2)(20 yrs)]	= \$	198,371 /YR
B. MONTHLY FCCM = (yrly FCCM / UMPY) = (\$198,371 / 7 mo)	= \$	28,959 /MO

D \ 2B OPERATING COSTS - FUEL BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

1 FUEL

A. TABLE A. FUEL CONSUMPTION FACTORS:

<u>Type of Work</u>	<u>FUEL FACTOR ( GAL / BHP - HR )</u>					
	Propulsion		Pumps		Aux & Misc	
	%	factor	%	factor	%	factor

Excavating	45	0.024	50	0.027	30	0.016
Haul and Return	80	0.042	0	0.000	25	0.013
Pumpout	0	0.000	80	0.042	25	0.013
Non-Effective	0	0.000	0	0.000	25	0.013

**B. POWER REQUIREMENTS FOR FUEL CONSUMPTION FOR THE DREDGE (From Database):**

<u>DESCRIPTION</u>	<u>SUMMARY OF RATED HP (1)</u>		<u>TOTAL</u>
	<u>ELECTRIC</u>	<u>DIESEL</u>	<u>REQUIRED HP (2)</u>
Propulsion	0	9,000	9,000
Dredge Pump(s)	0	3,000	3,000
Jet Pump	0	0	0
Pumpout Pump(s)	0	3,000	3,000
Auxillary & Misc	1,000	765	2,000

(1). Rated hp is the output power of drive engines or motors or equivalent hp of other misc electrical loads.

(2). Total required hp is the rated bhp of engines when the type of power is diesel, or the rated bhp of generator engines providing the power when the type of power is electric.

D \ 2C      OPERATING COSTS - FUEL      BID ITEM #      2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

1. FUEL (CONT.)

C. FUEL USE DURING DREDGING:      FUEL USE CONSUMPTION SUMMARY

<u>DESCRIPTION</u>	<u>EXCAVATING</u>	<u>TURNING, SAILING &amp; DISPOSAL</u>	<u>PUMPOUT</u>	<u>TOTAL NON-EFFECTIVE TIME</u>	<u>TOTALS</u>	<u>JET @ 0% OF EXCAV TIME</u>
Cycle Time In Min.	95	227		44	366	0
% Of Total Cycle Time	26.0%	62.0%	0.0%	12.0%	100.0%	0.0%
<b>FUEL CONSUMPTION IN GAL/HR (1)</b>						
Propulsion	56.2	234.4	0.0		290.6	
Pumps (2 dragheads used)	21.1	0.0	0.0		21.1	0.0
Auxillary & Misc.	8.3	16.1	0.0	3.1	27.5	
Subtotals:	85.6	250.5	0.0	3.1	339.2	0.0



Average Hourly Fuel Consumption (Effective and Non-Effective Time): 339.2 GAL/HR

Historical Fuel Consumption DATA Not Available or Not Used.....

Average Hourly Fuel Cost @ \$3.86 per gallon = \$ 1,309.31 /HR

FUEL RATE ( Adjusted to Effective Time Basis: \$1309.31 / 88.0% ) = \$ 1487.90 /HR

D. DURING MOB & DEMOB OPERATION:

Propulsion = (Propulsion hp x Propulsion factor during sailing) = 378.0 GAL/HR

Aux. & Misc. = (Aux. & Misc. hp x Aux. & Misc. factor during Mob & Demob) = 26.0 GAL/HR

Average Hourly Fuel Consumption (During Mob & Demob): 404.0 GAL/HR

FUEL RATE (Average Hourly Fuel Cost @ \$3.86 per gallon) = \$ 1559.40 /HR

NOTES: (1). Computations = (% of Total Cycle Time) x (Fuel Factor from Table A.) x (Horsepower).

D \ 2D OPERATING COSTS - LUBRICANTS BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

Base Price Level (Cost in Tables B & C)	1988
Base Index (EP 1110-1-8, App E, EK 105)	3920
Current Price Level (Cost in Tables B & C)	2021
Current Index (EP 1110-1-8, App E, EK 105)	9513

TABLE B. LUBRICANTS, REPAIRS AND MAINTENANCE.

<u>TOTAL INSTALLED HP OF DREDGE</u>	<u>LUBE \$/HR</u> <u>(1)</u>	<u>REPAIRS &amp; MAINTENANCE \$/HR</u> <u>(2)</u>
0 - 3999 HP	\$10.70	\$265.00
4000 - 4999 HP	\$13.70	\$296.00
5000 - 5999 HP	\$16.70	\$328.00
6000 - 6999 HP	\$19.80	\$366.00
7000 - 7999 HP	\$22.80	\$400.00
8000 - 8999 HP	\$25.80	\$434.00
9000 - 9999 HP	\$28.90	\$468.00
10000 - 10999 HP	\$31.90	\$502.00
11000 - 11999 HP	\$34.90	\$536.00
12000 - 12999 HP	\$38.00	\$570.00

13000 - 13999 HP	\$41.00	\$604.00
14000 - 14999 HP	\$44.00	\$641.00
15000 - 15999 HP	\$47.10	\$670.00
16000 - 16999 HP	\$50.10	\$709.00
17000 - 17999 HP	\$53.10	\$743.00

(1) LUBRICANTS Includes materials only.

(2) Includes all repairs and maintenance to all components except pumps and discharge piping for pumpout, including parts, labor, small tools, equipment and drydocking.

2 LUBRICANTS (From Table B.)

TOTAL INSTALLED POWER = 14,000 HP \$ 44.00 /HR

3 REPAIRS AND MAINTENANCE (From Table B.)

TOTAL INSTALLED POWER = 14,000 HP \$ 641.00 /HR

D \ 2E OPERATING COSTS - PUMP & PIPELINE BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

DREDGED QUANTITIES:			PUMPOUT QUANTITIES:		
TYPE	%	TOTAL CY	TYPE	%	TOTAL CY
Mud:	0%	0	Mud:	0%	0
Sand:	100%	1,498,034	Sand:	0%	0
Gravel:	0%	0	Gravel:	0%	0
Combined:	100%	1,498,034	Combined:	0%	0

TABLE C. COST DATA FOR PUMP & PIPE WEAR AND REPAIRS

DISCHARGE DIAM.	PUMP WEAR COST / CY OF MATERIAL PUMPED		
	MUD	SAND	GRAVEL
16	\$0.022	\$0.068	\$0.194
18	\$0.024	\$0.078	\$0.221

20	\$0.027	\$0.090	\$0.248
24	\$0.034	\$0.109	\$0.301
28	\$0.039	\$0.131	\$0.352
34	\$0.049	\$0.163	\$0.432

PUMPOUT PIPE WEAR COST PER (CY PUMPED x LF OF PUMPOUT PIPE)

<u>DISCHARGE DIAM.</u>	<u>MUD</u>	<u>SAND</u>	<u>GRAVEL</u>
12	\$0.000049	\$0.000063	\$0.000097
14	\$0.000044	\$0.000056	\$0.000085
16	\$0.000036	\$0.000049	\$0.000075
18	\$0.000034	\$0.000044	\$0.000066
22	\$0.000029	\$0.000039	\$0.000058
27	\$0.000027	\$0.000034	\$0.000051
30	\$0.000024	\$0.000027	\$0.000044

D \ 2F      OPERATING COSTS - PUMP & PIPELINE      BID ITEM #      2

DREDGE SIZE: 7600 CYD    HOPPER DREDGE

4 PUMP AND PIPE WEAR AND REPAIRS

DESCRIPTION	<u>TOTAL WEAR AND REPAIRS COST</u>		
	MUD	SAND	GRAVEL
PUMP SIZE: 34"			
QUANTITY DREDGED (CY)	0 CY	1,498,034 CY	0 CY
% PUMPOUT	0%	0%	0%
PUMPS: (From Table C.)			
Dredge Pumps	\$ 0	\$ 196,242	\$ 0
Pumpout Pumps	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
SUBTOTALS: PUMPS -	0	196,242	\$ <u><u>0</u></u>
TOTAL PUMP WEAR.....			\$ 196,242
DISCHARGE PIPES:			
Pumpout Line Length	0 LF	0 LF	0 LF
Pipe Wear Cost	\$ <u>0</u>	\$ <u>0</u>	\$ <u>0</u>
SUBTOTALS: DISCHARGE PIPES -	\$ 0	\$ 0	\$ <u><u>0</u></u>
TOTAL PIPE WEAR.....			\$ 0
TOTAL COST FOR PUMP AND PIPE WEAR AND REPAIR			\$ 196,242 TOTAL

AVERAGE COST PER CY EXCAVATED: \$ 0.13 /CY

TOTAL COST/HR = TOTAL WEAR COST/(TOTAL JOB EFFECTIVE HRS) =  
 = \$196,242 / (3.44 mo x 730 hrs/mo x 88.0% EWT) = \$ 88.80 /HR

5 PROVISIONS & SUPPLIES

ACTUAL CREW = 18 EA

GOVERNMENT PERSONNEL ON DREDGE = 3 EA

TOTAL PROVISIONS @ (\$25.00/ MAN-DAY x 21 ea) / 24 HRS/DAY = \$ 21.88 /HR

PROV & SUPPL RATE ( Adjusted to Effective Time Basis: \$21.88 / 88.0% ) = \$ 24.90 /HR

D \ 2G DREDGE INFO FROM DATABASE BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

Name Of Plant ----->	GENERIC LARGE
Acquisition Cost ----->	\$35,000,000
Capital Improvements ----->	10% Added Cost
Year Commisioned ----->	1981
Economic Life ----->	20 years
Salvage Factor ----->	0.10
Propulsion Tug Needed ? ----->	NO
Propulsion Tug Cost ----->	self prop.
Marine Insurance ----->	1.5 %
Taxes ----->	1 %
Layup Cost ----->	\$51,000 /mo
Yard Cost ----->	\$10,700 /mo
Water Volume of Hopper ----->	7,600 cy
Max. Safe Load (Sand) ----->	4,500 cy
Mud Capacity of Hopper ----->	2,280 cy
Sand Capacity of Hopper ----->	3,800 cy
Gravel Capacity of Hopper ----->	3,040 cy
Mud Production Rate ----->	4,200 cy/hr
Sand Production Rate ----->	2,520 cy/hr
Gravel Production Rate ----->	840 cy/hr
# Of Dragheads Available ----->	2
Suction Pipe Diam. ----->	33.5 inches
Discharge Pipe Diam. ----->	33.5 inches
Min. Digging Depth ----->	18 ft
Max. Digging Depth ----->	80 ft
Draft Loaded ----->	22.4 ft
Speed Loaded (mph) ----->	15.0 (13.0 knots)
Speed Light (mph) ----->	17.3 (15.0 knots)
Pumpout Available ----->	YES
Pumpout Pipe Diam. ----->	33.5 inches

Max. Pumpout Length ----->	6,000 lf
Pumpout Rate ----->	4,200 cy/hr
Total Installed Horsepower ---->	14,000
Propulsion Horsepower ----->	9000 (Diesel)
Dredge Pump Horsepower ----->	3000 (Diesel)
Pumpout Horsepower ----->	3000 (Diesel)
Jet Pump Not Available	
Auxiliary Engine Horsepower --->	1000 (Electric)
Auxiliary Engine Horsepower --->	765 (Diesel)
Main Generator Horsepower --->	1235 (Diesel)
Survey Vessel Cost ----->	\$12,000 /mo
Pumpout Booster Cost ----->	\$346,000 /mo
Crane Barge Cost ----->	\$86,000 /mo
Tender Tug Cost ----->	\$136,000 /mo
Crew Size ----->	18

D \ 3 OTHER MONTHLY COSTS

BID ITEM # 2

DREDGE SIZE: 7600 CYD HOPPER DREDGE

REMARKS

1	0		\$0 /MO	0	
2	Field Overhead	+	\$66,250 /MO		Proj Mgr, Site Mgr, Office Mgr, Proj Engr, 3 Site Engr, Safety, QC
3	Contractor's Office	+	\$7,200 /MO		Office Trailer including storage, office equipment, and sanitary facilities
4	Safety Training & Supplies	+	\$3,000 /MO		Allowance for safety supplies and meetings
5	Vehicles	+	\$19,600 /MO		7 Vehicles @ \$2,800
6	Subsistence	+	\$50,670 /MO		Subsistence (9 people) - \$185/day*30.42 days/mo = \$5,630/mo/person
7	Travel	+	\$1,200 /MO		Travel for Home Office Personnel
8	Survey	+	\$6,000 /MO		Survey supplies
9	Security	+	\$5,000 /MO		Allow for fencing & nighttime security
10	Small Tools & Supplies	+	\$31,460 /MO		Small Tools @ 7.5% of BL - \$419,466/mo*0.075 = \$31,460
11	Unscheduled Overtime	+	\$20,973 /MO		Premium Unsch. Overtime @ 5% of BL - \$419,466/mo*0.05 = \$20,973
12	Turtle Observer	+	\$24,000 /MO		24 Hour Turtle Watch. Quoted at \$800 / Day
13	>	+	/MO		
14	>	+	/MO		
<hr/>					
15	TOTAL OTHER MONTHLY COSTS	=	\$235,353 /MO		

E            FIXED COSTS

BID ITEM #          2      

DREDGE SIZE: 7600 CYD HOPPER DREDGE

REMARKS

1	0		<u>      \$0      </u>	<u>Allow \$7,500 for 10 days for pre- and post-dredge surveys</u>
2	>	+	<u>      \$0      </u>	
3	>	+	<u>      \$0      </u>	
4	>	+	<u>      \$0      </u>	
5	>	+	<u>      \$0      </u>	
6	>	+	<u>      \$0      </u>	
7	>	+	<u>      \$0      </u>	
8	>	+	<u>      \$0      </u>	
9	>	+	<u>      \$0      </u>	
10	>	+	<u>      \$0      </u>	
11	>	+	<u>      \$0      </u>	
12	>	+	<u>      \$0      </u>	
13	>	+	<u>      \$0      </u>	
14	>	+	<u>      \$0      </u>	
15	FIXED COSTS	=	<u>      \$0      </u>	

MOB & DEMOB COST \$2,175,164

MOBILIZATION ITEMS:

1. PREPARE DREDGE FOR TRANSFER TO JOBSITE:

Mobilization Time..... 7 Days

2. TRANSFER PLANT TO JOBSITE:

Mobilization Distance.... 650 Miles

Travel Speed Override... 0 Miles per Day

Default 350 Miles per Day

Used: 350 Miles per Day

3. PERMANENT PERSONNEL & MISC.:

Include Computed Costs?.. 1 YES (0=NO)

4. PREPARE DREDGE FOR WORK AT JOBSITE:

Mobilization Time..... 5 Days

5. OTHER:

Mobilization Item..... 0

Cost..... \$0

DEMOBILIZATION ITEMS:

1. PREPARE DREDGE FOR TRANSFER AWAY FROM JOBSITE:

Demobilization Time..... 6 Days

2. TRANSFER PLANT AWAY FROM JOBSITE:

Demobilization Distance... 650 Miles

3. PERMANENT PERSONNEL & MISC.:

Include Computed Costs? 1 YES (0=NO)

4. PREPARE DREDGE FOR LAYUP AFTER TRANSFER:

Demobilization Time..... 2 Days

5. OTHER:

Demobilization Item..... 0

Cost..... \$0



M

MOB & DEMOB

BID ITEM # 1

DREDGE SIZE: 7600 CYD HOPPER DREDGE

	MOBILIZATION			DEMOBILIZATION		
	# DAYS	\$/DAY	TOTAL	# DAYS	\$/DAY	TOTAL
1. PREPARE DREDGE FOR TRANSFER	<u>7</u>	x <u>\$69,618</u>	= <u>\$487,326</u>	<u>6</u>	x <u>\$69,618</u>	= <u>\$417,708</u>
2. TRANSFER ALL PLANT	650 MILES			650 MILES		
@ 350 miles/day =	<u>1.9</u>	x <u>\$69,618</u>	= <u>\$132,274</u>	<u>1.9</u>	x <u>\$69,618</u>	= <u>\$132,274</u>
3. PERMANENT PERSONNEL & MISC.	<u>L.S.</u>		= <u>\$22,782</u>	<u>L.S.</u>		= <u>\$22,782</u>
4. PREPARE DREDGE AFTER TRANSFER	<u>5</u>	x <u>\$69,618</u>	= <u>\$348,090</u>	<u>2</u>	x <u>\$69,618</u>	= <u>\$139,236</u>
5. OTHER	<u>0</u>		= <u>\$0</u>	<u>0</u>		= <u>\$0</u>
	SUBTOTAL MOBILIZATION			SUBTOTAL DEMOBILIZATION		
			= <u>\$990,472</u>			= <u>\$712,000</u>

REMARKS

6. SUBTOTAL MOBILIZATION & DEMOBILIZATION		=	<u>\$1,702,473</u>			
7. OVERHEAD	<u>15.0%</u>	+	<u>\$255,371</u>			
SUBTOTAL.....=			<u>\$1,957,844</u>			
8. PROFIT	<u>10.0%</u>	+	<u>\$195,784</u>			
SUBTOTAL.....=			<u>\$2,153,628</u>			
9. BOND	<u>1.0%</u>	+	<u>\$21,536</u>			
10. TOTAL MOBILIZATION & DEMOBILIZATION		=	<u>\$2,175,164</u>			

M \ 1

MOBIL MONTHLY COST SUMMARY

BID ITEM # 1

DREDGE SIZE: 7600 CYD HOPPER DREDGE

REMARKS

1	LABOR COSTS	<u>\$423,493</u> /MO	<u>FROM SHEET D \ 1</u>
2	EQUIPMENT		
	A. DREDGE	+ \$1,658,282 /MO	FROM SHEET D \ 3
	PROPULSION TUG	+ <u>self prop.</u> /MO	
	B. CREW/SURVEY VESSEL	+ <u>\$36,000</u> /MO	
	C. BOOSTER	+ <u>\$0</u> /MO	
	D. CRANE BARGE	+ <u>\$0</u> /MO	
	E. TENDER TUG	+ <u>\$0</u> /MO	
	F. OTHER MARINE	+ <u>\$0</u> /MO	
	G. SHORE EQUIPMENT	+ <u>\$0</u> /MO	
3	TOTAL MONTHLY RATE	= <u>\$2,117,775</u> /MO	
4	CONVERSION TO DAILY RATE	<u>                  </u> / <u>30.42</u> dys/mo	
<hr/>			
5	DAILY RATE	= <u>\$69,618</u> /day	
<hr/>			

PERMANENT PERSONNEL & MISC.

18 men @ 8 hrs/day @ \$64.46 per hour @ 1 DAY  
 Travel Expenses \$750 per man

MOBILIZATION

DEMOBILIZATION

\$9,282  
\$13,500

TOTAL \$22,782 \$22,782

MOBIL & DEMOB COST: \$2,175,164

BID QUANTITY 1,428,739 C.Y.

UNIT COST... \$8.58 PER C.Y.

NHC Cost Recertification - TSC MA2

EXCAV. COST. \$12,258,581

CHECKLIST FOR INPUT DATA.

TIME..... 3.44 MONTHS

PG 1 OF 9: PROJECT TITLES

PROJECT - NHC Cost Recertification - TSC MA2  
 LOCATION - Hampton Roads, Virginia  
 INVIT # - Preliminary Estimate  
 DATE OF EST. - February 2020  
 EST. BY - SBJ  
 MOB. BID ITEM # - 1  
 EXCAV. BID ITEM # - 2

PG 1a OF 9: LOCAL AREA FACTORS

PRESENT YEAR - 2021  
 ECONOMIC INDEX - 9513  
 LAF - 1.02  
 INTEREST RATE - 1.125% /yr  
 TIME PERIOD - Jul -Dec 2021  
 PIPELINE AVAILABILITY - n/a mos/yr  
 BUCKET AVAILABILITY - n/a mos/yr  
 HOPPER AVAILABILITY - 6.85 mos/yr  
 FUEL PRICE - \$3.86 /gal

PG 2 OF 9: TYPE OF EST & IND COSTS

TYPE OF EST. - Planning Estimate  
 CONTRACTOR'S O.H. - 15.0%  
 CONTRACTOR'S PROFIT - 10.0%  
 CONTRACTOR'S BOND - 1.0%

PG 3 OF 9: EXCAVATION QTY'S

DREDGING AREA - 5,670,420 sf  
 REQ'D EXCAVATION - 1,224,022 cyds  
 PAY OVERDEPTH - 204,717 cyds  
 CONTRACT AMOUNT - 1,428,739 cyds  
 NOT DREDGED - 69,305 cyds  
 NET PAY - 1,359,434 cyds  
 NONPAY YARDAGE - 138,600 cyds  
 GROSS YARDAGE - 1,498,034 cyds  
 NONPAY HEIGHT - 0.7 ft overdig  
 TOTAL BANK HEIGHT - 7.2 ft

PG 4 OF 9: PRODUCTION

TYPE OF MATERIAL - 0% MUD  
 - 100% SAND  
 - 0% GRAVEL  
 HOPPER CAPACITY - 7,600 cyds  
 EFF. HOPPER CAP. - 4,000 cyds  
 DRDGE RATE (ALL HEADS) - 2,520 cy/hr  
 ACT. DRAGHDS USED - 2 ea  
 DRDGE RATE USED - 2,520 cy/hr

PG 5 & 6 OF 9: PRODUCTION (CONT.)

URNS/CYCLE - 1 ea  
 MIN. PER TURN - 5 min  
 DISPOSAL DIST - 17 mi  
 TRVL SPD TO DISP - 9.0 mph  
 TRVL SPD FROM DISP - 9.8 mph  
 DUMP/CONNECT TIME - 5 min  
 TYPE OF DISPOSAL - Gravity Dump  
 PIPELINE USED - 0 lf  
 CLEANUP - 10% More Time  
 % EFF WORK TIME - 88.0%

PG 7 & 8 OF 9: PLANT OWN. & OPER.

DREDGE SELECTED - GENERIC LARGE  
 DREDGE ACQUIS COST - \$35,000,000  
 DREDGE CAPITAL IMPROV - 10%  
 PROPULSION TUG - self prop. /mo  
 SURVEY VESSEL - \$36,000 /mo  
 BOOSTER - \$0 /mo  
 CRANE BARGE - \$0 /mo  
 TENDER TUG - \$0 /mo  
 OTHER MARINE - \$0 /mo  
 SHORE EQUIP - \$0 /mo

PG 7a OF 9: DREDGE OPER ADJ FACTORS

PUMP LOAD FACTOR - 50%  
 RPR & MAINT. ADJ - 1.00  
 JET PUMP USEAGE - 0%

PG 9 OF 9: OTHER ADJUSTMENTS

SPECIAL COST/MO (1ST) - \$0 0  
 SP COST/MO (2ND-14TH) - \$235,353 From Sheet D\3  
 SPECIAL COST LS (1ST) - \$0 0  
 SP COST LS (2ND-14TH) - \$0 From Sheet E

PG 9a OF 9: TRAVEL & PROVISIONS

FREQ PD TRAVEL - 21 days  
 RT TRAVEL COST - \$750  
 GOVT. PERSONNEL - 3 ea  
 PROVISIONS & SUPP - \$25 /man

LOADS PER DAY - 3.6  
 PRODUCTION - 678 gross cy per hour  
 OPERATING TIME - 642 hours per month  
 GROSS PRODUCTION - 435,276 cy per month  
 PAY PRODUCTION - 395,184 pay cy per month

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**COST ENGINEERING APPENDIX**

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**COMBINED NORFOLK HARBOR CHANNEL  
TPCS  
UPDATED NOVEMBER 2021**

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: **Norfolk Harbor Navigation Improvements**  
PROJECT NO: **P2 # 396150**  
LOCATION: **Norfolk, VA**

DISTRICT: **Norfolk District**

PREPARED: **11/16/2021**

POC: **CHIEF, COST ENGINEERING, XXX**

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)	Program Year (Budget EC):	TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
										Effective Price Level Date:					
										2022 1-Oct- 21					
										1-Oct-19					
<b>12</b>	NAVIGATION PORTS & HARBORS	\$382,524	\$44,628	\$0	\$427,152	\$ -	\$382,524	\$44,628	\$427,152	\$109,282	\$536,434	\$0	\$410,925	\$48,316	\$568,523
<b>02</b>	RELOCATIONS	\$8,332	\$833	\$0	\$9,165	\$ -	\$8,332	\$833	\$9,165		\$9,165	\$0	\$8,557	\$856	\$9,412
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$390,856	\$45,462		\$436,317		\$390,856	\$45,462	\$436,317	\$109,282	\$545,599	7.4%	\$419,482	\$49,172	\$577,936
01	LANDS AND DAMAGES														
30	PLANNING, ENGINEERING & DESIGN	\$27,563	\$3,159	\$0	\$30,722	\$ 0.34	\$27,563	\$10,246	\$37,809	\$12,174	\$49,983	\$0	\$28,214	\$3,242	\$43,630
31	CONSTRUCTION MANAGEMENT	\$20,734	\$1,969	\$0	\$22,704	\$ 0.02	\$20,734	\$2,357	\$23,091	\$398	\$23,488	\$0	\$22,194	\$2,550	\$25,142
	<b>PROJECT COST TOTALS:</b>	\$439,153	\$50,590	12%	\$489,743		\$439,153	\$58,064	\$497,217	\$121,853	\$619,071	5.6%	\$469,891	\$54,964	\$646,708

CHIEF, COST ENGINEERING, XXX

PROJECT MANAGER, XXX

CHIEF, REAL ESTATE, XXX

CHIEF, PLANNING, XXX

CHIEF, ENGINEERING, XXX

CHIEF, OPERATIONS, XXX

CHIEF, CONSTRUCTION, XXX

CHIEF, CONTRACTING, XXX

CHIEF, PM-PB, xxxx

CHIEF, DPM, XXX

**ESTIMATED TOTAL PROJECT COST:**

**\$646,708**

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: **Norfolk Harbor Navigation Improvements + 55ft**  
PROJECT NO: **P2 # 396150**  
LOCATION: **Norfolk, VA**

DISTRICT: **Norfolk District**

PREPARED: **11/16/2021**

POC: **CHIEF, COST ENGINEERING, XXX**

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST FUNDED (FULLY)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)	2022 1-Oct-21 Spent Thru: 1-Oct-21		TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
										(\$K)	(\$K)					
12	NAVIGATION PORTS & HARBORS	\$252,836	\$25,435	10.1%	\$278,271		\$252,836	\$25,435	\$278,271	\$68,609	\$346,879	4.4%	\$263,962	\$26,566	\$359,136	
02	RELOCATIONS	\$8,332	\$833	10.0%	\$9,165		\$8,332	\$833	\$9,165		\$9,165	2.7%	\$8,557	\$856	\$9,412	
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$261,168	\$26,268		\$287,436		\$261,168	\$26,268	\$287,436	\$68,609	\$356,045	4.4%	\$272,518	\$27,421	\$368,548	
01	LANDS AND DAMAGES															
30	PLANNING, ENGINEERING & DESIGN	\$19,179	\$1,918	10.0%	\$21,097	33.6%	\$19,179	\$9,005	\$28,185	\$12,174	\$40,358	-24.1%	\$19,459	\$1,946	\$33,579	
31	CONSTRUCTION MANAGEMENT	\$14,835	\$1,096	7.4%	\$15,932	2.4%	\$14,835	\$1,484	\$16,319	\$398	\$16,717	3.2%	\$15,305	\$1,531	\$17,234	
	<b>PROJECT COST TOTALS:</b>	\$295,183	\$29,282	10%	\$324,465		\$295,183	\$36,757	\$331,940	\$81,180	\$413,120	1.9%	\$307,283	\$30,898	\$419,361	

- \_\_\_\_\_ CHIEF, COST ENGINEERING, XXX
- \_\_\_\_\_ PROJECT MANAGER, XXX
- \_\_\_\_\_ CHIEF, REAL ESTATE, XXX
- \_\_\_\_\_ CHIEF, PLANNING, XXX
- \_\_\_\_\_ CHIEF, ENGINEERING, XXX
- \_\_\_\_\_ CHIEF, OPERATIONS, XXX
- \_\_\_\_\_ CHIEF, CONSTRUCTION, XXX
- \_\_\_\_\_ CHIEF, CONTRACTING, XXX
- \_\_\_\_\_ CHIEF, PM-PB, xxxx
- \_\_\_\_\_ CHIEF, DPM, XXX

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: **Norfolk Harbor Navigation Improvements**  
LOCATION: **Norfolk, VA**  
This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update  
TPCS NHC +55

DISTRICT: **Norfolk District**  
POC: **CHIEF, COST ENGINEERING, XXX**

PREPARED: **11/16/2021**

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b>		Estimate Price Level: 1-Oct-21		Program Year (Budget EC): 2022		Effective Price Level Date: 1-Oct-21						
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	RISK BASED		ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	ESC (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
				CNTG (%) E	TOTAL (\$K) F									
<b>Contract 1 - Atlantic Ocean Channel</b>														
<b>12</b>	NAVIGATION PORTS & HARBORS	\$46,178	\$4,618	10.0%	\$50,795		\$46,178	\$4,618	\$50,795	2024Q3	8.04%	\$49,890	\$4,989	\$54,879
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$46,178	\$4,618	10.0%	\$50,795		\$46,178	\$4,618	\$50,795			\$49,890	\$4,989	\$54,879
<b>01</b>	LANDS AND DAMAGES													
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$245	\$24	10.0%	\$269		\$245	\$24	\$269	2023Q3	3.8%	\$254	\$25	\$280
1.0%	Planning & Environmental Compliance	\$408	\$41	10.0%	\$449		\$408	\$41	\$449	2023Q3	3.8%	\$424	\$42	\$466
15.0%	Engineering & Design	\$2,531	\$253	10.0%	\$2,784		\$2,531	\$253	\$2,784	2023Q3	3.8%	\$2,626	\$263	\$2,889
1.0%	Reviews, ATRs, IEPRs, VE	\$204	\$20	10.0%	\$225		\$204	\$20	\$225	2023Q3	3.8%	\$212	\$21	\$233
1.0%	Life Cycle Updates (cost, schedule, risks)	\$204	\$20	10.0%	\$225		\$204	\$20	\$225	2023Q3	3.8%	\$212	\$21	\$233
1.0%	Contracting & Reprographics	\$82	\$8	10.0%	\$90		\$82	\$8	\$90	2024Q3	6.4%	\$87	\$9	\$96
3.0%	Engineering During Construction	\$122	\$12	10.0%	\$135		\$122	\$12	\$135	2024Q3	6.4%	\$130	\$13	\$143
2.0%	Planning During Construction	\$82	\$8	10.0%	\$90		\$82	\$8	\$90	2023Q3	3.8%	\$85	\$8	\$93
3.0%	Adaptive Management & Monitoring			10.0%										
1.0%	Project Operations	\$204	\$20	10.0%	\$225		\$204	\$20	\$225	2023Q3	3.8%	\$212	\$21	\$233
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,458	\$146	10.0%	\$1,604		\$1,458	\$146	\$1,604	2024Q3	6.4%	\$1,551	\$155	\$1,706
2.0%	Project Operation:	\$607	\$61	10.0%	\$668		\$607	\$61	\$668	2024Q3	6.4%	\$646	\$65	\$711
2.5%	Project Management	\$364	\$36	10.0%	\$401		\$364	\$36	\$401	2024Q3	6.4%	\$388	\$39	\$426
<b>CONTRACT COST TOTALS:</b>		\$52,689	\$5,269		\$57,958		\$52,689	\$5,269	\$57,958			\$56,715	\$5,672	\$62,387

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements  
LOCATION: Norfolk, VA

DISTRICT: Norfolk District  
POC: CHIEF, COST ENGINEERING, XXX

PREPARED: 11/16/2021

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b>		Estimate Price Level: 1-Oct-21		Program Year (Budget EC): 2022		Effective Price Level Date: 1-Oct-21						
Filename: 2021.11.15_Update - Combined NHC ERSB TPCS TPCS NHC +55														

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	RISK BASED		TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
			CNTG (\$K)	CNTG (%)										
<b>Awarded Contract #2 TSC-W with \$7.2M Mod.</b>														
12	NAVIGATION PORTS & HARBORS	\$17,217	\$1,722	10.0%	\$18,939		\$17,217	\$1,722	\$18,939	2022Q1		\$17,217	\$1,722	\$18,939
	#N/A													
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$17,217	\$1,722	10.0%	\$18,939		\$17,217	\$1,722	\$18,939			\$17,217	\$1,722	\$18,939
01	LANDS AND DAMAGES													
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management			10.0%										
1.0%	Planning & Environmental Compliance			10.0%										
15.0%	Engineering & Design			10.0%										
1.0%	Reviews, ATRs, IEPRs, VE			10.0%										
1.0%	Life Cycle Updates (cost, schedule, risks)			10.0%										
1.0%	Contracting & Reprographics	\$3	\$0	10.0%	\$3		\$3	\$0	\$3	2022Q3	1.2%	\$3	\$0	\$3
3.0%	Engineering During Construction			10.0%										
2.0%	Planning During Construction			10.0%										
3.0%	Adaptive Management & Monitoring			10.0%										
1.0%	Project Operations			10.0%										
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management			10.0%										
2.0%	Project Operation:			10.0%										
2.5%	Project Management			10.0%										
<b>CONTRACT COST TOTALS:</b>		\$17,220	\$1,722		\$18,942		\$17,220	\$1,722	\$18,942			\$17,220	\$1,722	\$18,942

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements  
LOCATION: Norfolk, VA

DISTRICT: Norfolk District  
POC: CHIEF, COST ENGINEERING, XXX

PREPARED: 11/16/2021

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b>		Estimate Price Level: 1-Oct-21		Program Year (Budget EC): 2022		Effective Price Level Date: 1-Oct-21						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	RISK BASED		TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
			CNTG (\$K)	CNTG (%)										

**Awarded Contract #3 Meeting Area #2 (MA2)**



\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

<b>12</b>	NAVIGATION PORTS & HARBORS	\$10,865	\$1,087	10.0%	\$11,952	\$10,865	\$1,087	\$11,952	2022Q1	\$10,865	\$1,087	\$11,952	
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$10,865	\$1,087	10.0%	\$11,952	\$10,865	\$1,087	\$11,952		\$10,865	\$1,087	\$11,952	
<b>01</b>	LANDS AND DAMAGES												
<b>30</b>	PLANNING, ENGINEERING & DESIGN												
2.5%	Project Management	\$91	\$9	10.0%	\$100	\$91	\$9	\$100	2022Q4	1.9%	\$93	\$9	\$102
1.0%	Planning & Environmental Compliance	\$151	\$15	10.0%	\$166	\$151	\$15	\$166	2022Q4	1.9%	\$154	\$15	\$170
15.0%	Engineering & Design	\$938	\$94	10.0%	\$1,032	\$938	\$94	\$1,032	2022Q4	1.9%	\$956	\$96	\$1,051
1.0%	Reviews, ATRs, IEPRs, VE	\$76	\$8	10.0%	\$83	\$76	\$8	\$83	2022Q4	1.9%	\$77	\$8	\$85
1.0%	Life Cycle Updates (cost, schedule, risks)	\$76	\$8	10.0%	\$83	\$76	\$8	\$83	2022Q4	1.9%	\$77	\$8	\$85
1.0%	Contracting & Reprographics	\$30	\$3	10.0%	\$33	\$30	\$3	\$33	2022Q2	0.6%	\$30	\$3	\$33
3.0%	Engineering During Construction	\$45	\$5	10.0%	\$50	\$45	\$5	\$50	2022Q2	0.6%	\$46	\$5	\$50
2.0%	Planning During Construction	\$30	\$3	10.0%	\$33	\$30	\$3	\$33	2022Q4	1.9%	\$31	\$3	\$34
3.0%	Adaptive Management & Monitoring			10.0%									
1.0%	Project Operations	\$76	\$8	10.0%	\$83	\$76	\$8	\$83	2022Q4	1.9%	\$77	\$8	\$85
<b>31</b>	CONSTRUCTION MANAGEMENT												
10.0%	Construction Management	\$550	\$55	10.0%	\$605	\$550	\$55	\$605	2022Q2	0.6%	\$553	\$55	\$609
2.0%	Project Operation:	\$229	\$23	10.0%	\$252	\$229	\$23	\$252	2022Q2	0.6%	\$231	\$23	\$254
2.5%	Project Management	\$137	\$14	10.0%	\$151	\$137	\$14	\$151	2022Q2	0.6%	\$138	\$14	\$152
<b>CONTRACT COST TOTALS:</b>		\$13,295	\$1,330		\$14,625	\$13,295	\$1,330	\$14,625		\$13,328	\$1,333	\$14,661	

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 11/16/2021

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b>		Estimate Price Level: 1-Oct-21		Program Year (Budget EC): 2022		Effective Price Level Date: 1-Oct-21						
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>P</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>
	<b>Contract #4 Inner Harbor Channels</b>													
<b>12</b>	NAVIGATION PORTS & HARBORS	\$63,030	\$6,303	10.0%	\$69,333		\$63,030	\$6,303	\$69,333	2023Q2	4.0%	\$65,539	\$6,554	\$72,093

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$63,030	\$6,303	10.0%	\$69,333	\$63,030	\$6,303	\$69,333		\$65,539	\$6,554	\$72,093	
<b>01</b>	LANDS AND DAMAGES			10.0%									
<b>30</b>	PLANNING, ENGINEERING & DESIGN												
2.5%	Project Management	\$176	\$18	10.0%	\$193	\$176	\$18	\$193	2022Q2	0.6%	\$177	\$18	\$195
1.0%	Planning & Environmental Compliance	\$293	\$29	10.0%	\$322	\$293	\$29	\$322	2022Q2	0.6%	\$295	\$29	\$324
15.0%	Engineering & Design	\$1,817	\$182	10.0%	\$1,999	\$1,817	\$182	\$1,999	2022Q2	0.6%	\$1,828	\$183	\$2,011
1.0%	Reviews, ATRs, IEPRs, VE	\$147	\$15	10.0%	\$161	\$147	\$15	\$161	2022Q2	0.6%	\$147	\$15	\$162
1.0%	Life Cycle Updates (cost, schedule, risks)	\$147	\$15	10.0%	\$161	\$147	\$15	\$161	2022Q2	0.6%	\$147	\$15	\$162
1.0%	Contracting & Reprographics	\$59	\$6	10.0%	\$64	\$59	\$6	\$64	2023Q2	3.1%	\$60	\$6	\$66
3.0%	Engineering During Construction	\$88	\$9	10.0%	\$97	\$88	\$9	\$97	2023Q2	3.1%	\$91	\$9	\$100
2.0%	Planning During Construction	\$59	\$6	10.0%	\$64	\$59	\$6	\$64	2022Q2	0.6%	\$59	\$6	\$65
3.0%	Adaptive Management & Monitoring			10.0%									
1.0%	Project Operations	\$147	\$15	10.0%	\$161	\$147	\$15	\$161	2022Q2	0.6%	\$147	\$15	\$162
<b>31</b>	CONSTRUCTION MANAGEMENT												
10.0%	Construction Management	\$558	\$56	10.0%	\$614	\$558	\$56	\$614	2023Q2	3.1%	\$575	\$58	\$633
2.0%	Project Operation:	\$233	\$23	10.0%	\$256	\$233	\$23	\$256	2023Q2	3.1%	\$240	\$24	\$264
2.5%	Project Management	\$140	\$14	10.0%	\$153	\$140	\$14	\$153	2023Q2	3.1%	\$144	\$14	\$158
<b>CONTRACT COST TOTALS:</b>		\$66,891	\$6,689		\$73,580	\$66,891	\$6,689	\$73,580			\$69,451	\$6,945	\$76,396

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 11/16/2021

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b>		Estimate Price Level: 1-Oct-21		Program Year (Budget EC): 2022		Effective Price Level Date: 1-Oct-21						
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>P</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>
<b>Contract #5 Newport News, Anch F</b>														
<b>12</b>	NAVIGATION PORTS & HARBORS	\$20,661	\$2,066	10.0%	\$22,727		\$20,661	\$2,066	\$22,727	2023Q3	4.8%	\$21,650	\$2,165	\$23,815
<b>12</b>	NAVIGATION PORTS & HARBORS	\$8,885	\$1,040	11.7%	\$9,924		\$8,885	\$1,040	\$9,924	2025Q4	12.2%	\$9,973	\$1,167	\$11,140
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$29,546	\$3,106	10.5%	\$32,651		\$29,546	\$3,106	\$32,651			\$31,623	\$3,332	\$34,955
<b>01</b>	LANDS AND DAMAGES			10.0%										

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$126	\$13	10.0%	\$138	\$126	\$13	\$138	2022Q3	1.2%	\$127	\$13	\$140	
1.0%	Planning & Environmental Compliance	\$209	\$21	10.0%	\$230	\$209	\$21	\$230	2022Q3	1.2%	\$212	\$21	\$233	
15.0%	Engineering & Design	\$1,298	\$130	10.0%	\$1,427	\$1,298	\$130	\$1,427	2022Q3	1.2%	\$1,314	\$131	\$1,445	
1.0%	Reviews, ATRs, IEPRs, VE	\$105	\$10	10.0%	\$115	\$105	\$10	\$115	2022Q3	1.2%	\$106	\$11	\$117	
1.0%	Life Cycle Updates (cost, schedule, risks)	\$105	\$10	10.0%	\$115	\$105	\$10	\$115	2022Q3	1.2%	\$106	\$11	\$117	
1.0%	Contracting & Reprographics	\$42	\$4	10.0%	\$46	\$42	\$4	\$46	2023Q3	3.8%	\$43	\$4	\$48	
3.0%	Engineering During Construction	\$63	\$6	10.0%	\$69	\$63	\$6	\$69	2023Q3	3.8%	\$65	\$7	\$72	
2.0%	Planning During Construction	\$42	\$4	10.0%	\$46	\$42	\$4	\$46	2022Q3	1.2%	\$42	\$4	\$47	
3.0%	Adaptive Management & Monitoring			10.0%										
1.0%	Project Operations	\$105	\$10	10.0%	\$115	\$105	\$10	\$115	2022Q3	1.2%	\$106	\$11	\$117	
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,078	\$108	10.0%	\$1,185	\$1,078	\$108	\$1,185	2023Q3	3.8%	\$1,118	\$112	\$1,230	
2.0%	Project Operation:	\$449	\$45	10.0%	\$494	\$449	\$45	\$494	2023Q3	3.8%	\$466	\$47	\$513	
2.5%	Project Management	\$269	\$27	10.0%	\$296	\$269	\$27	\$296	2023Q3	3.8%	\$280	\$28	\$308	
<b>CONTRACT COST TOTALS:</b>		\$33,434	\$3,494		\$36,929	\$33,434	\$3,494	\$36,929			\$35,609	\$3,730	\$39,339	

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 11/16/2021

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

This Estimate reflects the scope and schedule in report;

TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b> Estimate Price Level: 1-Oct-21				Program Year (Budget EC): 2022 Effective Price Level Date: 1-Oct-21								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>P</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>
	<b>Contract #6 CBBT Cover</b>													
<b>02</b>	RELOCATIONS	\$8,332	\$833	10.0%	\$9,165		\$8,332	\$833	\$9,165	2022Q4	2.7%	\$8,557	\$856	\$9,412
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$8,332	\$833	10.0%	\$9,165		\$8,332	\$833	\$9,165			\$8,557	\$856	\$9,412
<b>01</b>	LANDS AND DAMAGES													
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$41	\$4	10.0%	\$45		\$41	\$4	\$45	2022Q2	0.6%	\$41	\$4	\$45
1.0%	Planning & Environmental Compliance	\$68	\$7	10.0%	\$75		\$68	\$7	\$75	2022Q2	0.6%	\$69	\$7	\$76
15.0%	Engineering & Design	\$423	\$42	10.0%	\$465		\$423	\$42	\$465	2022Q2	0.6%	\$426	\$43	\$468
1.0%	Reviews, ATRs, IEPRs, VE	\$34	\$3	10.0%	\$38		\$34	\$3	\$38	2022Q2	0.6%	\$34	\$3	\$38

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

1.0%	Life Cycle Updates (cost, schedule, risks)	\$34	\$3	10.0%	\$38	\$34	\$3	\$38	2022Q2	0.6%	\$34	\$3	\$38
1.0%	Contracting & Reprographics	\$14	\$1	10.0%	\$15	\$14	\$1	\$15	2022Q4	1.9%	\$14	\$1	\$15
3.0%	Engineering During Construction	\$20	\$2	10.0%	\$23	\$20	\$2	\$23	2022Q4	1.9%	\$21	\$2	\$23
2.0%	Planning During Construction	\$14	\$1	10.0%	\$15	\$14	\$1	\$15	2022Q2	0.6%	\$14	\$1	\$15
3.0%	Adaptive Management & Monitoring			10.0%									
1.0%	Project Operations	\$34	\$3	10.0%	\$38	\$34	\$3	\$38	2022Q2	0.6%	\$34	\$3	\$38
<b>31</b>	<b>CONSTRUCTION MANAGEMENT</b>												
10.0%	Construction Management	\$548	\$55	10.0%	\$603	\$548	\$55	\$603	2022Q4	1.9%	\$559	\$56	\$615
2.0%	Project Operation:	\$229	\$23	10.0%	\$251	\$229	\$23	\$251	2022Q4	1.9%	\$233	\$23	\$256
2.5%	Project Management	\$137	\$14	10.0%	\$151	\$137	\$14	\$151	2022Q4	1.9%	\$140	\$14	\$154
<b>CONTRACT COST TOTALS:</b>		\$9,929	\$993		\$10,921	\$9,929	\$993	\$10,921			\$10,175	\$1,017	\$11,192

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements  
LOCATION: Norfolk, VA

DISTRICT: Norfolk District  
POC: CHIEF, COST ENGINEERING, XXX

PREPARED: 11/16/2021

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b> Estimate Price Level: 1-Oct-21				Program Year (Budget EC): 2022 Effective Price Level Date: 1-Oct-21								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>12</b>	<b>Contract # Meeting Area #1 (MA1)</b> NAVIGATION PORTS & HARBORS	\$70,996	\$7,100	10.0%	\$78,096		\$70,996	\$7,100	\$78,096	2023Q2	4.0%	\$73,822	\$7,382	\$81,205
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$70,996	\$7,100	10.0%	\$78,096		\$70,996	\$7,100	\$78,096			\$73,822	\$7,382	\$81,205
<b>01</b>	LANDS AND DAMAGES													
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$158	\$16	10.0%	\$174		\$158	\$16	\$174	2022Q3	1.2%	\$160	\$16	\$176
1.0%	Planning & Environmental Compliance	\$264	\$26	10.0%	\$290		\$264	\$26	\$290	2022Q3	1.2%	\$267	\$27	\$294
15.0%	Engineering & Design	\$1,635	\$164	10.0%	\$1,799		\$1,635	\$164	\$1,799	2022Q3	1.2%	\$1,655	\$166	\$1,821
1.0%	Reviews, ATRs, IEPRs, VE	\$132	\$13	10.0%	\$145		\$132	\$13	\$145	2022Q3	1.2%	\$134	\$13	\$147
1.0%	Life Cycle Updates (cost, schedule, risks)	\$132	\$13	10.0%	\$145		\$132	\$13	\$145	2022Q3	1.2%	\$134	\$13	\$147
1.0%	Contracting & Reprographics	\$23	\$2	10.0%	\$25		\$23	\$2	\$25	2023Q2	3.1%	\$24	\$2	\$26
3.0%	Engineering During Construction	\$79	\$8	10.0%	\$87		\$79	\$8	\$87	2023Q2	3.1%	\$81	\$8	\$90
2.0%	Planning During Construction	\$53	\$5	10.0%	\$58		\$53	\$5	\$58	2022Q3	1.2%	\$54	\$5	\$59
3.0%	Adaptive Management & Monitoring			10.0%										
1.0%	Project Operations	\$132	\$13	10.0%	\$145		\$132	\$13	\$145	2022Q2	0.6%	\$133	\$13	\$146

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$2,323	\$232	10.0%	\$2,555	\$2,323	\$232	\$2,555	2023Q2	3.1%	\$2,396	\$240	\$2,635	
2.0%	Project Operation:	\$968	\$97	10.0%	\$1,065	\$968	\$97	\$1,065	2023Q2	3.1%	\$998	\$100	\$1,098	
2.5%	Project Management	\$581	\$58	10.0%	\$639	\$581	\$58	\$639	2023Q2	3.1%	\$599	\$60	\$659	
<b>CONTRACT COST TOTALS:</b>		\$77,476	\$7,748		\$85,224	\$77,476	\$7,748	\$85,224			\$80,457	\$8,046	\$88,503	

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements  
LOCATION: Norfolk, VA  
This Estimate reflects the scope and schedule in report;

TL008 Norfolk Harbor Navigation Improvements Project Cost Update

DISTRICT: Norfolk District  
POC: CHIEF, COST ENGINEERING, XXX

PREPARED: 11/16/2021

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>16-Nov-21</b>		Estimate Price Level: 1-Oct-21		Program Year (Budget EC): 2022		Effective Price Level Date: 1-Oct-21						
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	<b>Awarded Contract #2 TSC-E</b>													
<b>12</b>	NAVIGATION PORTS & HARBORS	\$15,005	\$1,500	10.0%	\$16,505		\$15,005	\$1,500	\$16,505	2022Q1		\$15,005	\$1,500	\$16,505
	#N/A													
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$15,005	\$1,500	10.0%	\$16,505		\$15,005	\$1,500	\$16,505			\$15,005	\$1,500	\$16,505
<b>01</b>	LANDS AND DAMAGES													
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$316	\$32	10.0%	\$348		\$316	\$32	\$348	2022Q1		\$316	\$32	\$348
1.0%	Planning & Environmental Compliance	\$527	\$53	10.0%	\$579		\$527	\$53	\$579	2022Q1		\$527	\$53	\$579
15.0%	Engineering & Design	\$3,266	\$327	10.0%	\$3,592		\$3,266	\$327	\$3,592	2022Q1		\$3,266	\$327	\$3,592
1.0%	Reviews, ATRs, IEPRs, VE	\$263	\$26	10.0%	\$290		\$263	\$26	\$290	2022Q1		\$263	\$26	\$290
1.0%	Life Cycle Updates (cost, schedule, risks)	\$263	\$26	10.0%	\$290		\$263	\$26	\$290	2022Q1		\$263	\$26	\$290
1.0%	Contracting & Reprographics	\$105	\$11	10.0%	\$116		\$105	\$11	\$116	2022Q4	1.9%	\$107	\$11	\$118
3.0%	Engineering During Construction	\$158	\$16	10.0%	\$174		\$158	\$16	\$174	2022Q4	1.9%	\$161	\$16	\$177
2.0%	Planning During Construction	\$105	\$11	10.0%	\$116		\$105	\$11	\$116	2022Q1		\$105	\$11	\$116
3.0%	Adaptive Management & Monitoring			10.0%										
1.0%	Project Operations	\$263	\$26	10.0%	\$290		\$263	\$26	\$290	2022Q1		\$263	\$26	\$290
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$2,386	\$239	10.0%	\$2,625		\$2,386	\$239	\$2,625	2022Q4	1.9%	\$2,431	\$243	\$2,674
2.0%	Project Operation:	\$994	\$99	10.0%	\$1,094		\$994	\$99	\$1,094	2022Q4	1.9%	\$1,013	\$101	\$1,114
2.5%	Project Management	\$597	\$60	10.0%	\$656		\$597	\$60	\$656	2022Q4	1.9%	\$608	\$61	\$669
<b>CONTRACT COST TOTALS:</b>		\$24,249	\$2,425		\$26,674		\$24,249	\$2,425	\$26,674			\$24,328	\$2,433	\$26,761

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: **Norfolk Harbor Navigation Improvements + 50ft**  
 PROJECT NO: **P2 # 396150**  
 LOCATION: **Norfolk, VA**

DISTRICT: **Norfolk District**

PREPARED: **11/16/2021**

POC: **CHIEF, COST ENGINEERING, XXX**

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST FUNDED (FULLY)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)	Program Year (Budget EC):	2022	TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
										Effective Price Level Date:	1-Oct- 21					
										1-Oct-19						
<b>12</b>	NAVIGATION PORTS & HARBORS										\$40,673	\$40,673				\$40,673
<b>02</b>	RELOCATIONS															
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>					-					\$40,673	\$40,673	-			\$40,673
01	LANDS AND DAMAGES															
30	PLANNING, ENGINEERING & DESIGN															
31	CONSTRUCTION MANAGEMENT															
	<b>PROJECT COST TOTALS:</b>										\$40,673	\$40,673	-			\$40,673

- \_\_\_\_\_ CHIEF, COST ENGINEERING, XXX
- \_\_\_\_\_ PROJECT MANAGER, XXX
- \_\_\_\_\_ CHIEF, REAL ESTATE, XXX
- \_\_\_\_\_ CHIEF, PLANNING, XXX
- \_\_\_\_\_ CHIEF, ENGINEERING, XXX
- \_\_\_\_\_ CHIEF, OPERATIONS, XXX
- \_\_\_\_\_ CHIEF, CONSTRUCTION, XXX
- \_\_\_\_\_ CHIEF, CONTRACTING, XXX
- \_\_\_\_\_ CHIEF, PM-PB, xxxx
- \_\_\_\_\_ CHIEF, DPM, XXX

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: LPP - Elizabeth River and Southern Branch Navigation Improvements LPP  
PROJECT NO: P2 # 396150  
LOCATION: Norfolk, VA

DISTRICT: Norfolk District  
POC: CHIEF, COST ENGINEERING, xxx

PREPARED: 4/10/2020

This Estimate reflects the scope and schedule in report; ERSB Navigation Improvements

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19		TOTAL FIRST COST (\$K) K	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
										Spent Thru: 1-Oct-19 (\$K)						
12	NAVIGATION PORTS & HARBORS	\$129,687	\$19,194	14.8%	\$148,881	0.0%	\$129,687	\$19,194	\$148,881	\$0	\$148,881	\$148,881	13.3%	\$146,964	\$21,751	\$168,714
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$129,687	\$19,194		\$148,881	0.0%	\$129,687	\$19,194	\$148,881	\$0	\$148,881	\$148,881	13.3%	\$146,964	\$21,751	\$168,714
1	LANDS & DAMAGES	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
30	PLANNING, ENGINEERING & DESIGN	\$8,384	\$1,241	14.8%	\$9,625	0.0%	\$8,384	\$1,241	\$9,625	\$0	\$9,625	\$9,625	4.4%	\$8,755	\$1,296	\$10,051
31	CONSTRUCTION MANAGEMENT	\$5,899	\$873	14.8%	\$6,772	0.0%	\$5,899	\$873	\$6,772	\$0	\$6,772	\$6,772	16.8%	\$6,889	\$1,020	\$7,909
<b>PROJECT COST TOTALS:</b>		\$143,970	\$21,308	14.8%	\$165,278		\$143,970	\$21,308	\$165,278	\$0	\$165,278	\$165,278	12.9%	\$162,608	\$24,066	\$186,674

CHIEF, COST ENGINEERING, xxx

ESTIMATED TOTAL PROJECT COST: \$186,674

PROJECT MANAGER, xxx

CHIEF, REAL ESTATE, xxx

CHIEF, PLANNING, xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING, xxx

CHIEF, PM-PB, xxx

CHIEF, DPM, xxx

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: LPP - Elizabeth River and Southern Branch Navigation Improvements LPP  
LOCATION: Norfolk, VA  
Title: 2021 Update - Combined NHC ERSB TPCS  
TPCS ERSB

DISTRICT: Norfolk District  
POC: CHIEF, COST ENGINEERING, xxx

PREPARED: 4/10/2020



\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

This Estimate reflects the scope and schedule in report; ERSB Navigation Improvements

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared:		10-Apr-20	Program Year (Budget EC):		2020							
		Effective Price Level:		1-Oct-19	Effective Price Level Date:		1 OCT 19							
WBS NUMBER	Civil Works Feature & Sub-Feature Description	RISK BASED			TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
		COST (\$K)	CNTG (\$K)	CNTG (%)										
<b>CONTRACT 1 (Segment 1 - LPP)</b>														
<b>12</b>	NAVIGATION PORTS & HARBORS	\$39,525	\$5,850	14.8%	\$45,375	0.0%	\$39,525	\$5,850	\$45,375	2023Q3	11.0%	\$43,876	\$6,494	\$50,369
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	<b>\$39,525</b>	<b>\$5,850</b>	<b>14.8%</b>	<b>\$45,375</b>		<b>\$39,525</b>	<b>\$5,850</b>	<b>\$45,375</b>			<b>\$43,876</b>	<b>\$6,494</b>	<b>\$50,369</b>
<b>2</b>	RELOCATIONS	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$297	\$44	14.8%	\$341	0.0%	\$297	\$44	\$341	2021Q1	3.8%	\$308	\$46	\$354
1.0%	Planning & Environmental Compliance	\$495	\$73	14.8%	\$568	0.0%	\$495	\$73	\$568	2021Q1	3.8%	\$513	\$76	\$589
15.0%	Engineering & Design	\$3,066	\$454	14.8%	\$3,520	0.0%	\$3,066	\$454	\$3,520	2021Q1	3.8%	\$3,183	\$471	\$3,654
1.0%	Reviews, ATRs, IEPRs, VE	\$247	\$37	14.8%	\$284	0.0%	\$247	\$37	\$284	2021Q1	3.8%	\$257	\$38	\$295
1.0%	Life Cycle Updates (cost, schedule, risks)	\$247	\$37	14.8%	\$284	0.0%	\$247	\$37	\$284	2021Q1	3.8%	\$257	\$38	\$295
1.0%	Contracting & Reprographics	\$99	\$15	14.8%	\$114	0.0%	\$99	\$15	\$114	2021Q1	3.8%	\$103	\$15	\$118
3.0%	Engineering During Construction	\$148	\$22	14.8%	\$170	0.0%	\$148	\$22	\$170	2023Q3	14.1%	\$169	\$25	\$194
2.0%	Planning During Construction	\$99	\$15	14.8%	\$114	0.0%	\$99	\$15	\$114	2023Q3	14.1%	\$113	\$17	\$130
3.0%	Adaptive Management & Monitoring	\$0	\$0	14.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.0%	Project Operations	\$247	\$37	14.8%	\$284	0.0%	\$247	\$37	\$284	2021Q1	3.8%	\$257	\$38	\$295
<b>31</b>	CONSTRUCTION MANAGEMENT			5.7%										
10.0%	Construction Management	\$1,345	\$199	14.8%	\$1,545	0.0%	\$1,345	\$199	\$1,545	2023Q3	14.1%	\$1,535	\$227	\$1,762
2.0%	Project Operation:	\$561	\$83	14.8%	\$644	0.0%	\$561	\$83	\$644	2023Q3	14.1%	\$640	\$95	\$734
2.5%	Project Management	\$336	\$50	14.8%	\$386	0.0%	\$336	\$50	\$386	2023Q3	14.1%	\$384	\$57	\$441
	<b>CONTRACT COST TOTALS:</b>	<b>\$46,713</b>	<b>\$6,914</b>		<b>\$53,626</b>		<b>\$46,713</b>	<b>\$6,914</b>	<b>\$53,626</b>			<b>\$51,593</b>	<b>\$7,636</b>	<b>\$59,229</b>

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: LPP - Elizabeth River and Southern Branch Navigation Improvements LPP  
 LOCATION: Norfolk, VA  
 This Estimate reflects the scope and schedule in report; ERSB Navigation Improvements

DISTRICT: Norfolk District  
 POC: CHIEF, COST ENGINEERING, xxx

PREPARED: 4/10/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared:		10-Apr-20	Program Year (Budget EC):		2020							
		Effective Price Level:		1-Oct-19	Effective Price Level Date:		1 OCT 19							
Filename: 2021.11.15_Update - Combined NHC ERSB TPCS														
TPCS ERSB														

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>12</b>	<b>CONTRACT 2 (Segment 2 - LPP)</b>													
	NAVIGATION PORTS & HARBORS	\$90,162	\$13,344	14.8%	\$103,506	0.0%	\$90,162	\$13,344	\$103,506	2024Q3	14.3%	\$103,088	\$15,257	\$118,345
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$90,162	\$13,344	14.8%	\$103,506		\$90,162	\$13,344	\$103,506			\$103,088	\$15,257	\$118,345
<b>01</b>	LANDS AND DAMAGES	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$206	\$31	14.8%	\$237	0.0%	\$206	\$31	\$237	2021Q1	3.8%	\$214	\$32	\$246
1.0%	Planning & Environmental Compliance	\$344	\$51	14.8%	\$395	0.0%	\$344	\$51	\$395	2021Q1	3.8%	\$357	\$53	\$410
15.0%	Engineering & Design	\$2,132	\$316	14.8%	\$2,448	0.0%	\$2,132	\$316	\$2,448	2021Q1	3.8%	\$2,214	\$328	\$2,541
1.0%	Reviews, ATRs, IEPRs, VE	\$172	\$25	14.8%	\$197	0.0%	\$172	\$25	\$197	2021Q1	3.8%	\$179	\$26	\$205
1.0%	Life Cycle Updates (cost, schedule, risks)	\$172	\$25	14.8%	\$197	0.0%	\$172	\$25	\$197	2021Q1	3.8%	\$179	\$26	\$205
1.0%	Contracting & Reprographics	\$69	\$10	14.8%	\$79	0.0%	\$69	\$10	\$79	2021Q1	3.8%	\$71	\$11	\$82
3.0%	Engineering During Construction	\$103	\$15	14.8%	\$118	0.0%	\$103	\$15	\$118	2024Q3	18.4%	\$122	\$18	\$140
2.0%	Planning During Construction	\$69	\$10	14.8%	\$79	0.0%	\$69	\$10	\$79	2024Q3	18.4%	\$81	\$12	\$94
3.0%	Adaptive Management & Monitoring	\$0	\$0	14.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.0%	Project Operations	\$172	\$25	14.8%	\$197	0.0%	\$172	\$25	\$197	2021Q1	3.8%	\$179	\$26	\$205
<b>31</b>	CONSTRUCTION MANAGEMENT			4.1%										
10.0%	Construction Management	\$2,194	\$325	14.8%	\$2,519	0.0%	\$2,194	\$325	\$2,519	2024Q3	18.4%	\$2,598	\$385	\$2,983
2.0%	Project Operation:	\$914	\$135	14.8%	\$1,049	0.0%	\$914	\$135	\$1,049	2024Q3	18.4%	\$1,083	\$160	\$1,243
2.5%	Project Management	\$548	\$81	14.8%	\$630	0.0%	\$548	\$81	\$630	2024Q3	18.4%	\$650	\$96	\$746
	<b>CONTRACT COST TOTALS:</b>	\$97,257	\$14,394		\$111,651		\$97,257	\$14,394	\$111,651			\$111,014	\$16,430	\$127,444

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**COST ENGINEERING APPENDIX**

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**ATR CERTIFICATE FOR NORFOLK HARBOR  
GRR/EA**

# WALLA WALLA COST ENGINEERING MANDATORY CENTER OF EXPERTISE

## COST AGENCY TECHNICAL REVIEW CERTIFICATION STATEMENT

For Project No. 396150  
NAO – Norfolk Harbor Navigation Improvements, Virginia  
General Reevaluation Report

The Norfolk Harbor Navigation Improvements GRR, as presented by Norfolk District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of April 29, 2020, the Cost MCX certifies the estimated total project cost:

**TOTAL:**

FY20 Remaining Costs:	\$466,063,000 (Cost ATR Certified)
FY19 Spent Costs:	\$ 44,709,000 (From Programs & PM)
FY20 Project First Cost:	\$510,772,000 (Remaining plus Spent)
Fully Funded Costs:	\$555,109,000 including Spent Costs

**NORFOLK HARBOR +55ft:**

FY20 Remaining Costs:	\$300,786,000 (Cost ATR Certified)
FY19 Spent Costs:	\$ 4,035,000 (From Programs & PM)
FY20 Project First Cost:	\$304,821,000 (Remaining plus Spent)
Fully Funded Costs:	\$327,762,000 including Spent Costs

**NORFOLK HARBOR +50ft:**

Fully Funded Costs:	\$ 40,673,000 Spent Costs
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**ELIZABETH RIVER:**

FY20 Remaining Costs:	\$165,278,000 (Cost ATR Certified)
FY19 Spent Costs:	\$ 0 (From Programs & PM)
Fully Funded Costs:	\$186,674,000 including Spent Costs

Note: Cost ATR was devoted to remaining work. It did not review spent costs, which requires an audit process. It remains the responsibility of the District to correctly reflect these cost values and to implement effective project management controls and implementation procedures including risk management through the period of Federal participation.



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**Michael P. Jacobs, PE, CCE**  
**Chief, Cost Engineering MCX**  
**Walla Walla District**

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: **Norfolk Harbor Navigation Improvements**  
PROJECT NO: **P2 # 396150**  
LOCATION: **Norfolk, VA**

DISTRICT: **Norfolk District**

PREPARED: **5/1/2020**

POC: **CHIEF, COST ENGINEERING, XXX**

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)	Program Year (Budget EC): 2020		TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)	
										Effective Price Level Date:							Spent Thru:
										1-Oct-19	1-Oct-19						
12	NAVIGATION PORTS & HARBORS	\$374,241	\$40,023	\$0	\$414,263	\$ -	\$374,241	\$40,023	\$414,263	\$40,673	\$454,937	\$0	\$409,862	\$44,487	\$495,022		
02	RELOCATIONS	\$8,354	\$977	\$0	\$9,332	\$ -	\$8,354	\$977	\$9,332		\$9,332	\$0	\$8,573	\$1,003	\$9,576		
				-		-						-					
				-		-						-					
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$382,595	\$41,000		\$423,595		\$382,595	\$41,000	\$423,595	\$40,673	\$464,269	9.5%	\$418,435	\$45,490	\$504,598		
01	LANDS AND DAMAGES			-		-						-					
30	PLANNING, ENGINEERING & DESIGN	\$20,761	\$2,689	\$0	\$23,450	\$ -	\$20,761	\$2,689	\$23,450	\$4,035	\$27,485	\$0	\$22,217	\$2,871	\$29,123		
31	CONSTRUCTION MANAGEMENT	\$16,862	\$2,156	\$0	\$19,018	\$ -	\$16,862	\$2,156	\$19,018		\$19,018	\$0	\$18,956	\$2,431	\$21,388		
	<b>PROJECT COST TOTALS:</b>	\$420,219	\$45,845	11%	\$466,063		\$420,219	\$45,845	\$466,063	\$44,709	\$510,772	9.5%	\$459,608	\$50,792	\$555,109		

CHIEF, COST ENGINEERING, XXX

**ESTIMATED TOTAL PROJECT COST: \$555,109**

PROJECT MANAGER, XXX

CHIEF, REAL ESTATE, XXX

CHIEF, PLANNING, XXX

CHIEF, ENGINEERING, XXX

CHIEF, OPERATIONS, XXX

CHIEF, CONSTRUCTION, XXX

CHIEF, CONTRACTING, XXX

CHIEF, PM-PB, xxxx

CHIEF, DPM, XXX

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: **Norfolk Harbor Navigation Improvements + 55ft**  
 PROJECT NO: **P2 # 396150**  
 LOCATION: **Norfolk, VA**

DISTRICT: **Norfolk District**

PREPARED: **5/1/2020**

POC: **CHIEF, COST ENGINEERING, XXX**

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)	Program Year (Budget EC):	TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
										2020					
										1-Oct- 19					
										1-Oct-19					
12	NAVIGATION PORTS & HARBORS	\$244,554	\$20,829	8.5%	\$265,382		\$244,554	\$20,829	\$265,382		\$265,382	7.6%	\$262,898	\$22,736	\$285,635
02	RELOCATIONS	\$8,354	\$977	11.7%	\$9,332		\$8,354	\$977	\$9,332		\$9,332	2.6%	\$8,573	\$1,003	\$9,576
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$252,908	\$21,806		\$274,714		\$252,908	\$21,806	\$274,714		\$274,714	7.5%	\$271,471	\$23,739	\$295,210
01	LANDS AND DAMAGES														
30	PLANNING, ENGINEERING & DESIGN	\$12,377	\$1,448	11.7%	\$13,825		\$12,377	\$1,448	\$13,825		\$17,861	8.8%	\$13,462	\$1,575	\$19,072
31	CONSTRUCTION MANAGEMENT	\$10,963	\$1,283	11.7%	\$12,246		\$10,963	\$1,283	\$12,246		\$12,246	10.1%	\$12,068	\$1,412	\$13,479
	<b>PROJECT COST TOTALS:</b>	\$276,249	\$24,537	9%	\$300,786		\$276,249	\$24,537	\$300,786		\$4,035	7.6%	\$297,000	\$26,726	\$327,762

- \_\_\_\_\_ CHIEF, COST ENGINEERING, XXX
- \_\_\_\_\_ PROJECT MANAGER, XXX
- \_\_\_\_\_ CHIEF, REAL ESTATE, XXX
- \_\_\_\_\_ CHIEF, PLANNING, XXX
- \_\_\_\_\_ CHIEF, ENGINEERING, XXX
- \_\_\_\_\_ CHIEF, OPERATIONS, XXX
- \_\_\_\_\_ CHIEF, CONSTRUCTION, XXX
- \_\_\_\_\_ CHIEF, CONTRACTING, XXX
- \_\_\_\_\_ CHIEF, PM-PB, xxxx
- \_\_\_\_\_ CHIEF, DPM, XXX

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 5/1/2020

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>28-Feb-20</b> Estimate Price Level: 1-Oct-19				Program Year (Budget EC): 2020 Effective Price Level Date: 1-Oct-19								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>Contract 1 - Atlantic Ocean Channel</b>														
<b>12</b>	NAVIGATION PORTS & HARBORS	\$43,590	\$5,100	11.7%	\$48,690		\$43,590	\$5,100	\$48,690	2023Q3	11.01%	\$48,388	\$5,661	\$54,049
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$43,590	\$5,100	11.7%	\$48,690		\$43,590	\$5,100	\$48,690			\$48,388	\$5,661	\$54,049
<b>01</b>	LANDS AND DAMAGES													
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$245	\$29	11.7%	\$274		\$245	\$29	\$274	2022Q3	9.9%	\$269	\$31	\$301
1.0%	Planning & Environmental Compliance	\$408	\$48	11.7%	\$456		\$408	\$48	\$456	2022Q3	9.9%	\$449	\$52	\$501
15.0%	Engineering & Design	\$2,531	\$296	11.7%	\$2,827		\$2,531	\$296	\$2,827	2022Q3	9.9%	\$2,782	\$325	\$3,107
1.0%	Reviews, ATRs, IEPRs, VE	\$204	\$24	11.7%	\$228		\$204	\$24	\$228	2022Q3	9.9%	\$224	\$26	\$251
1.0%	Life Cycle Updates (cost, schedule, risks)	\$204	\$24	11.7%	\$228		\$204	\$24	\$228	2022Q3	9.9%	\$224	\$26	\$251
1.0%	Contracting & Reprographics	\$82	\$10	11.7%	\$91		\$82	\$10	\$91	2023Q3	14.1%	\$93	\$11	\$104
3.0%	Engineering During Construction	\$122	\$14	11.7%	\$137		\$122	\$14	\$137	2023Q3	14.1%	\$140	\$16	\$156
2.0%	Planning During Construction	\$82	\$10	11.7%	\$91		\$82	\$10	\$91	2022Q3	9.9%	\$90	\$10	\$100
3.0%	Adaptive Management & Monitoring			11.7%										
1.0%	Project Operations	\$204	\$24	11.7%	\$228		\$204	\$24	\$228	2022Q3	9.9%	\$224	\$26	\$251
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,458	\$171	11.7%	\$1,628		\$1,458	\$171	\$1,628	2023Q3	14.1%	\$1,663	\$195	\$1,858
2.0%	Project Operation:	\$607	\$71	11.7%	\$678		\$607	\$71	\$678	2023Q3	14.1%	\$693	\$81	\$774
2.5%	Project Management	\$364	\$43	11.7%	\$407		\$364	\$43	\$407	2023Q3	14.1%	\$416	\$49	\$464
<b>CONTRACT COST TOTALS:</b>		\$50,102	\$5,862		\$55,964		\$50,102	\$5,862	\$55,964			\$55,654	\$6,512	\$62,166

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 5/1/2020

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

This Estimate reflects the scope and schedule in report;

TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST Dollar Basis				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>28-Feb-20</b> Estimate Price Level: 1-Oct-19				Program Year (Budget EC): 2020 Effective Price Level Date: 1-Oct-19								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>Contract #2 TSC-E and TSC-W</b>														
12	NAVIGATION PORTS & HARBORS	\$20,116	\$2,354	11.7%	\$22,470		\$20,116	\$2,354	\$22,470	2022Q2	7.0%	\$21,518	\$2,518	\$24,036
12	NAVIGATION PORTS & HARBORS	\$78,626	\$1,415	1.8%	\$80,041		\$78,626	\$1,415	\$80,041	2021Q1	3.1%	\$81,040	\$1,459	\$82,498
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$98,742	\$3,769	3.8%	\$102,511		\$98,742	\$3,769	\$102,511			\$102,558	\$3,976	\$106,534
01	LANDS AND DAMAGES													
30	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$64	\$8	11.7%	\$72		\$64	\$8	\$72	2021Q3	5.8%	\$68	\$8	\$76
1.0%	Planning & Environmental Compliance	\$107	\$13	11.7%	\$120		\$107	\$13	\$120	2021Q3	5.8%	\$114	\$13	\$127
15.0%	Engineering & Design	\$665	\$78	11.7%	\$743		\$665	\$78	\$743	2021Q3	5.8%	\$704	\$82	\$786
1.0%	Reviews, ATRs, IEPRs, VE	\$54	\$6	11.7%	\$60		\$54	\$6	\$60	2021Q3	5.8%	\$57	\$7	\$63
1.0%	Life Cycle Updates (cost, schedule, risks)	\$54	\$6	11.7%	\$60		\$54	\$6	\$60	2021Q3	5.8%	\$57	\$7	\$63
1.0%	Contracting & Reprographics	\$24	\$3	11.7%	\$27		\$24	\$3	\$27	2021Q2	4.8%	\$25	\$3	\$28
3.0%	Engineering During Construction	\$32	\$4	11.7%	\$36		\$32	\$4	\$36	2021Q2	4.8%	\$34	\$4	\$38
2.0%	Planning During Construction	\$21	\$3	11.7%	\$24		\$21	\$3	\$24	2021Q3	5.8%	\$23	\$3	\$25
3.0%	Adaptive Management & Monitoring			11.7%										
1.0%	Project Operations	\$54	\$6	11.7%	\$60		\$54	\$6	\$60	2021Q3	5.8%	\$57	\$7	\$63
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$2,386	\$279	11.7%	\$2,666		\$2,386	\$279	\$2,666	2021Q2	4.8%	\$2,500	\$293	\$2,793
2.0%	Project Operation:	\$994	\$116	11.7%	\$1,111		\$994	\$116	\$1,111	2021Q2	4.8%	\$1,042	\$122	\$1,164
2.5%	Project Management	\$597	\$70	11.7%	\$666		\$597	\$70	\$666	2021Q2	4.8%	\$625	\$73	\$698
<b>CONTRACT COST TOTALS:</b>		\$103,795	\$4,360		\$108,155		\$103,795	\$4,360	\$108,155			\$107,862	\$4,597	\$112,459



\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 5/1/2020

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

This Estimate reflects the scope and schedule in report;

TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>28-Feb-20</b> Estimate Price Level: 1-Oct-19				Program Year (Budget EC): 2020 Effective Price Level Date: 1-Oct-19								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>	<u>J</u>	<u>P</u>	<u>L</u>	<u>M</u>	<u>N</u>	<u>O</u>
	<b>Contrat #3 Meeting Area #2 (MA2)</b>													
<b>12</b>	NAVIGATION PORTS & HARBORS	\$13,594	\$1,590	11.7%	\$15,184		\$13,594	\$1,590	\$15,184	2022Q3	7.8%	\$14,650	\$1,714	\$16,364
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$13,594	\$1,590	11.7%	\$15,184		\$13,594	\$1,590	\$15,184			\$14,650	\$1,714	\$16,364
<b>01</b>	LANDS AND DAMAGES													
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$91	\$11	11.7%	\$101		\$91	\$11	\$101	2021Q3	5.8%	\$96	\$11	\$107
1.0%	Planning & Environmental Compliance	\$151	\$18	11.7%	\$169		\$151	\$18	\$169	2021Q3	5.8%	\$160	\$19	\$179
15.0%	Engineering & Design	\$938	\$110	11.7%	\$1,048		\$938	\$110	\$1,048	2021Q3	5.8%	\$993	\$116	\$1,109
1.0%	Reviews, ATRs, IEPRs, VE	\$76	\$9	11.7%	\$85		\$76	\$9	\$85	2021Q3	5.8%	\$80	\$9	\$89
1.0%	Life Cycle Updates (cost, schedule, risks)	\$76	\$9	11.7%	\$85		\$76	\$9	\$85	2021Q3	5.8%	\$80	\$9	\$89
1.0%	Contracting & Reprographics	\$30	\$4	11.7%	\$34		\$30	\$4	\$34	2022Q3	9.9%	\$33	\$4	\$37
3.0%	Engineering During Construction	\$45	\$5	11.7%	\$51		\$45	\$5	\$51	2022Q3	9.9%	\$50	\$6	\$56
2.0%	Planning During Construction	\$30	\$4	11.7%	\$34		\$30	\$4	\$34	2021Q3	5.8%	\$32	\$4	\$36
3.0%	Adaptive Management & Monitoring			11.7%										
1.0%	Project Operations	\$76	\$9	11.7%	\$85		\$76	\$9	\$85	2021Q3	5.8%	\$80	\$9	\$89
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$550	\$64	11.7%	\$614		\$550	\$64	\$614	2022Q3	9.9%	\$604	\$71	\$675
2.0%	Project Operation:	\$229	\$27	11.7%	\$256		\$229	\$27	\$256	2022Q3	9.9%	\$252	\$29	\$281
2.5%	Project Management	\$137	\$16	11.7%	\$154		\$137	\$16	\$154	2022Q3	9.9%	\$151	\$18	\$169
<b>CONTRACT COST TOTALS:</b>		\$16,024	\$1,875		\$17,898		\$16,024	\$1,875	\$17,898			\$17,262	\$2,020	\$19,282

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 5/1/2020

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

This Estimate reflects the scope and schedule in report;

TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>28-Feb-20</b>		Estimate Price Level: 1-Oct-19		Program Year (Budget EC): 2020		Effective Price Level Date: 1-Oct-19						
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>P</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>
<b>Contract #4 Inner Harbor Channels</b>														
<b>12</b>	NAVIGATION PORTS & HARBORS	\$60,198	\$7,043	11.7%	\$67,242		\$60,198	\$7,043	\$67,242	2022Q2	7.0%	\$64,393	\$7,534	\$71,927
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$60,198	\$7,043	11.7%	\$67,242		\$60,198	\$7,043	\$67,242			\$64,393	\$7,534	\$71,927
<b>01</b>	LANDS AND DAMAGES			11.7%										
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$176	\$21	11.7%	\$196		\$176	\$21	\$196	2021Q2	4.8%	\$184	\$22	\$206
1.0%	Planning & Environmental Compliance	\$293	\$34	11.7%	\$327		\$293	\$34	\$327	2021Q2	4.8%	\$307	\$36	\$343
15.0%	Engineering & Design	\$1,817	\$213	11.7%	\$2,030		\$1,817	\$213	\$2,030	2021Q2	4.8%	\$1,904	\$223	\$2,127
1.0%	Reviews, ATRs, IEPRs, VE	\$147	\$17	11.7%	\$164		\$147	\$17	\$164	2021Q2	4.8%	\$154	\$18	\$172
1.0%	Life Cycle Updates (cost, schedule, risks)	\$147	\$17	11.7%	\$164		\$147	\$17	\$164	2021Q2	4.8%	\$154	\$18	\$172
1.0%	Contracting & Reprographics	\$59	\$7	11.7%	\$65		\$59	\$7	\$65	2022Q2	8.9%	\$64	\$7	\$71
3.0%	Engineering During Construction	\$88	\$10	11.7%	\$98		\$88	\$10	\$98	2022Q2	8.9%	\$96	\$11	\$107
2.0%	Planning During Construction	\$59	\$7	11.7%	\$65		\$59	\$7	\$65	2021Q2	4.8%	\$61	\$7	\$69
3.0%	Adaptive Management & Monitoring			11.7%										
1.0%	Project Operations	\$147	\$17	11.7%	\$164		\$147	\$17	\$164	2021Q2	4.8%	\$154	\$18	\$172
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$558	\$65	11.7%	\$623		\$558	\$65	\$623	2022Q2	8.9%	\$607	\$71	\$679
2.0%	Project Operation:	\$233	\$27	11.7%	\$260		\$233	\$27	\$260	2022Q2	8.9%	\$253	\$30	\$283
2.5%	Project Management	\$140	\$16	11.7%	\$156		\$140	\$16	\$156	2022Q2	8.9%	\$152	\$18	\$170
<b>CONTRACT COST TOTALS:</b>		\$64,059	\$7,495		\$71,554		\$64,059	\$7,495	\$71,554			\$68,483	\$8,012	\$76,495

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 5/1/2020

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

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TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>28-Feb-20</b> Estimate Price Level: 1-Oct-19				Program Year (Budget EC): 2020 Effective Price Level Date: 1-Oct-19								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>Contract #5 Newport News, Anch F</b>														
<b>12</b>	NAVIGATION PORTS & HARBORS	\$19,804	\$2,317	11.7%	\$22,121		\$19,804	\$2,317	\$22,121	2025Q1	16.0%	\$22,974	\$2,688	\$25,662
<b>12</b>	NAVIGATION PORTS & HARBORS	\$8,625	\$1,009	11.7%	\$9,634		\$8,625	\$1,009	\$9,634	2024Q4	15.2%	\$9,936	\$1,162	\$11,098
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$28,430	\$3,326	11.7%	\$31,756		\$28,430	\$3,326	\$31,756			\$32,910	\$3,850	\$36,760
<b>01</b>	LANDS AND DAMAGES			11.7%										
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$126	\$15	11.7%	\$140		\$126	\$15	\$140	2024Q2	17.3%	\$147	\$17	\$165
1.0%	Planning & Environmental Compliance	\$209	\$24	11.7%	\$234		\$209	\$24	\$234	2024Q2	17.3%	\$245	\$29	\$274
15.0%	Engineering & Design	\$1,298	\$152	11.7%	\$1,449		\$1,298	\$152	\$1,449	2024Q2	17.3%	\$1,522	\$178	\$1,700
1.0%	Reviews, ATRs, IEPRs, VE	\$105	\$12	11.7%	\$117		\$105	\$12	\$117	2024Q2	17.3%	\$123	\$14	\$137
1.0%	Life Cycle Updates (cost, schedule, risks)	\$105	\$12	11.7%	\$117		\$105	\$12	\$117	2024Q2	17.3%	\$123	\$14	\$137
1.0%	Contracting & Reprographics	\$42	\$5	11.7%	\$47		\$42	\$5	\$47	2025Q1	20.7%	\$51	\$6	\$56
3.0%	Engineering During Construction	\$63	\$7	11.7%	\$70		\$63	\$7	\$70	2025Q1	20.7%	\$76	\$9	\$85
2.0%	Planning During Construction	\$42	\$5	11.7%	\$47		\$42	\$5	\$47	2024Q2	17.3%	\$49	\$6	\$55
3.0%	Adaptive Management & Monitoring			11.7%										
1.0%	Project Operations	\$105	\$12	11.7%	\$117		\$105	\$12	\$117	2024Q2	17.3%	\$123	\$14	\$137
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$1,078	\$126	11.7%	\$1,204		\$1,078	\$126	\$1,204	2025Q1	20.7%	\$1,301	\$152	\$1,453
2.0%	Project Operation:	\$449	\$53	11.7%	\$502		\$449	\$53	\$502	2025Q1	20.7%	\$542	\$63	\$606
2.5%	Project Management	\$269	\$32	11.7%	\$301		\$269	\$32	\$301	2025Q1	20.7%	\$325	\$38	\$363
<b>CONTRACT COST TOTALS:</b>		\$32,318	\$3,781		\$36,099		\$32,318	\$3,781	\$36,099			\$37,537	\$4,392	\$41,928

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

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PROJECT: Norfolk Harbor Navigation Improvements

DISTRICT: Norfolk District

PREPARED: 5/1/2020

LOCATION: Norfolk, VA

POC: CHIEF, COST ENGINEERING, XXX

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TL008 Norfolk Harbor Navigation Improvements Project Cost Update

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>23-Mar-20</b> Estimate Price Level: 1-Oct-19				Program Year (Budget EC): 2020 Effective Price Level Date: 1-Oct-19								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
<b>Contract #6 CBBT Cover</b>														
<b>02</b>	RELOCATIONS	\$8,354	\$977	11.7%	\$9,332		\$8,354	\$977	\$9,332	2020Q4	2.6%	\$8,573	\$1,003	\$9,576
<b>CONSTRUCTION ESTIMATE TOTALS:</b>		\$8,354	\$977	11.7%	\$9,332		\$8,354	\$977	\$9,332			\$8,573	\$1,003	\$9,576
<b>01</b>	LANDS AND DAMAGES													
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$41	\$5	11.7%	\$46		\$41	\$5	\$46	2020Q2	0.9%	\$41	\$5	\$46
1.0%	Planning & Environmental Compliance	\$68	\$8	11.7%	\$76		\$68	\$8	\$76	2020Q2	0.9%	\$69	\$8	\$77
15.0%	Engineering & Design	\$423	\$50	11.7%	\$473		\$423	\$50	\$473	2020Q2	0.9%	\$427	\$50	\$477
1.0%	Reviews, ATRs, IEPRs, VE	\$34	\$4	11.7%	\$38		\$34	\$4	\$38	2020Q2	0.9%	\$34	\$4	\$38
1.0%	Life Cycle Updates (cost, schedule, risks)	\$34	\$4	11.7%	\$38		\$34	\$4	\$38	2020Q2	0.9%	\$34	\$4	\$38
1.0%	Contracting & Reprographics	\$14	\$2	11.7%	\$15		\$14	\$2	\$15	2020Q4	2.9%	\$14	\$2	\$16
3.0%	Engineering During Construction	\$20	\$2	11.7%	\$23		\$20	\$2	\$23	2020Q4	2.9%	\$21	\$2	\$24
2.0%	Planning During Construction	\$14	\$2	11.7%	\$15		\$14	\$2	\$15	2020Q2	0.9%	\$14	\$2	\$15
3.0%	Adaptive Management & Monitoring			11.7%										
1.0%	Project Operations	\$34	\$4	11.7%	\$38		\$34	\$4	\$38	2020Q2	0.9%	\$34	\$4	\$38
<b>31</b>	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$548	\$64	11.7%	\$613		\$548	\$64	\$613	2020Q4	2.9%	\$564	\$66	\$630
2.0%	Project Operation:	\$229	\$27	11.7%	\$255		\$229	\$27	\$255	2020Q4	2.9%	\$235	\$28	\$263
2.5%	Project Management	\$137	\$16	11.7%	\$153		\$137	\$16	\$153	2020Q4	2.9%	\$141	\$17	\$158
<b>CONTRACT COST TOTALS:</b>		\$9,951	\$1,164		\$11,115		\$9,951	\$1,164	\$11,115			\$10,202	\$1,194	\$11,396

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: **Norfolk Harbor Navigation Improvements + 50ft**  
 PROJECT NO: **P2 # 396150**  
 LOCATION: **Norfolk, VA**

DISTRICT: **Norfolk District**

PREPARED: **5/1/2020**

POC: **CHIEF, COST ENGINEERING, XXX**

This Estimate reflects the scope and schedule in report; TL008 Norfolk Harbor Navigation Improvements Project Cost Update

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)	Program Year (Budget EC):	TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
										2020					
											1-Oct- 19				
											1-Oct-19				
<b>12</b>	NAVIGATION PORTS & HARBORS										\$40,673		\$40,673		\$40,673
<b>02</b>	RELOCATIONS														
<b>CONSTRUCTION ESTIMATE TOTALS:</b>						-					\$40,673		\$40,673	-	\$40,673
01	LANDS AND DAMAGES														
30	PLANNING, ENGINEERING & DESIGN														
31	CONSTRUCTION MANAGEMENT														
<b>PROJECT COST TOTALS:</b>											\$40,673		\$40,673	-	\$40,673
		CHIEF, COST ENGINEERING, XXX													
		PROJECT MANAGER, XXX													
		CHIEF, REAL ESTATE, XXX													
		CHIEF, PLANNING, XXX													
		CHIEF, ENGINEERING, XXX													
		CHIEF, OPERATIONS, XXX													
		CHIEF, CONSTRUCTION, XXX													
		CHIEF, CONTRACTING, XXX													
		CHIEF, PM-PB, xxxx													
		CHIEF, DPM, XXX													

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

PROJECT: LPP - Elizabeth River and Southern Branch Navigation Improvements LPP  
 PROJECT NO: P2 # 396150  
 LOCATION: Norfolk, VA

DISTRICT: Norfolk District  
 POC: CHIEF, COST ENGINEERING, XXX

PREPARED: 4/10/2020

This Estimate reflects the scope and schedule in report; ERSB Navigation Improvements

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Program Year (Budget EC): 2020 Effective Price Level Date: 1 OCT 19		TOTAL FIRST COST (\$K) K	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
										Spent Thru: 1-Oct-19 (\$K)						
12	NAVIGATION PORTS & HARBORS	\$129,687	\$19,194	14.8%	\$148,881	0.0%	\$129,687	\$19,194	\$148,881	\$0	\$148,881	13.3%	\$146,964	\$21,751	\$168,714	
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
	#N/A	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$129,687	\$19,194		\$148,881	0.0%	\$129,687	\$19,194	\$148,881	\$0	\$148,881	13.3%	\$146,964	\$21,751	\$168,714	
1	LANDS & DAMAGES	\$0	\$0 -		\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0	
30	PLANNING, ENGINEERING & DESIGN	\$8,384	\$1,241	14.8%	\$9,625	0.0%	\$8,384	\$1,241	\$9,625	\$0	\$9,625	4.4%	\$8,755	\$1,296	\$10,051	
31	CONSTRUCTION MANAGEMENT	\$5,899	\$873	14.8%	\$6,772	0.0%	\$5,899	\$873	\$6,772	\$0	\$6,772	16.8%	\$6,889	\$1,020	\$7,909	
<b>PROJECT COST TOTALS:</b>		\$143,970	\$21,308	14.8%	\$165,278		\$143,970	\$21,308	\$165,278	\$0	\$165,278	12.9%	\$162,608	\$24,066	\$186,674	

CHIEF, COST ENGINEERING, xxx

**ESTIMATED TOTAL PROJECT COST: \$186,674**

PROJECT MANAGER, xxx

CHIEF, REAL ESTATE, xxx

CHIEF, PLANNING, xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING,xxx

CHIEF, PM-PB, xxxx

CHIEF, DPM, xxx

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: LPP - Elizabeth River and Southern Branch Navigation Improvements LPP  
 LOCATION: Norfolk, VA  
 This Estimate reflects the scope and schedule in report; ERSB Navigation Improvements

DISTRICT: Norfolk District  
 POC: CHIEF, COST ENGINEERING, xxx

PREPARED: 4/10/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: <b>10-Apr-20</b>		Program Year (Budget EC): 2020		Effective Price Level: 1-Oct-19		Effective Price Level Date: 1 OCT 19						
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>P</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>
<b>12</b>	<b>CONTRACT 1 (Segment 1 - LPP)</b>													
	NAVIGATION PORTS & HARBORS	\$39,525	\$5,850	14.8%	\$45,375	0.0%	\$39,525	\$5,850	\$45,375	2023Q3	11.0%	\$43,876	\$6,494	\$50,369
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$39,525	\$5,850	14.8%	\$45,375		\$39,525	\$5,850	\$45,375			\$43,876	\$6,494	\$50,369
<b>2</b>	RELOCATIONS	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$297	\$44	14.8%	\$341	0.0%	\$297	\$44	\$341	2021Q1	3.8%	\$308	\$46	\$354
1.0%	Planning & Environmental Compliance	\$495	\$73	14.8%	\$568	0.0%	\$495	\$73	\$568	2021Q1	3.8%	\$513	\$76	\$589
15.0%	Engineering & Design	\$3,066	\$454	14.8%	\$3,520	0.0%	\$3,066	\$454	\$3,520	2021Q1	3.8%	\$3,183	\$471	\$3,654
1.0%	Reviews, ATRs, IEPRs, VE	\$247	\$37	14.8%	\$284	0.0%	\$247	\$37	\$284	2021Q1	3.8%	\$257	\$38	\$295
1.0%	Life Cycle Updates (cost, schedule, risks)	\$247	\$37	14.8%	\$284	0.0%	\$247	\$37	\$284	2021Q1	3.8%	\$257	\$38	\$295
1.0%	Contracting & Reprographics	\$99	\$15	14.8%	\$114	0.0%	\$99	\$15	\$114	2021Q1	3.8%	\$103	\$15	\$118
3.0%	Engineering During Construction	\$148	\$22	14.8%	\$170	0.0%	\$148	\$22	\$170	2023Q3	14.1%	\$169	\$25	\$194
2.0%	Planning During Construction	\$99	\$15	14.8%	\$114	0.0%	\$99	\$15	\$114	2023Q3	14.1%	\$113	\$17	\$130
3.0%	Adaptive Management & Monitoring	\$0	\$0	14.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.0%	Project Operations	\$247	\$37	14.8%	\$284	0.0%	\$247	\$37	\$284	2021Q1	3.8%	\$257	\$38	\$295
<b>31</b>	CONSTRUCTION MANAGEMENT			5.7%										
10.0%	Construction Management	\$1,345	\$199	14.8%	\$1,545	0.0%	\$1,345	\$199	\$1,545	2023Q3	14.1%	\$1,535	\$227	\$1,762
2.0%	Project Operation:	\$561	\$83	14.8%	\$644	0.0%	\$561	\$83	\$644	2023Q3	14.1%	\$640	\$95	\$734
2.5%	Project Management	\$336	\$50	14.8%	\$386	0.0%	\$336	\$50	\$386	2023Q3	14.1%	\$384	\$57	\$441
	<b>CONTRACT COST TOTALS:</b>	\$46,713	\$6,914		\$53,626		\$46,713	\$6,914	\$53,626			\$51,593	\$7,636	\$59,229

\*\*\*\* TOTAL PROJECT COST SUMMARY \*\*\*\*

\*\*\*\* CONTRACT COST SUMMARY \*\*\*\*

PROJECT: LPP - Elizabeth River and Southern Branch Navigation Improvements LPP  
 LOCATION: Norfolk, VA  
 This Estimate reflects the scope and schedule in report; ERSB Navigation Improvements

DISTRICT: Norfolk District  
 POC: CHIEF, COST ENGINEERING, xxx

PREPARED: 4/10/2020

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	Estimate Prepared: Effective Price Level:		10-Apr-20 1-Oct-19	Program Year (Budget EC): Effective Price Level Date:		2020 1 OCT 19		Mid-Point Date P	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O	
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	ESC (%) G	COST (\$K) H	CNTG (\$K) I						TOTAL (\$K) J
<b>12</b>	<b>CONTRACT 2 (Segment 2 - LPP)</b> NAVIGATION PORTS & HARBORS	\$90,162	\$13,344	14.8%	\$103,506	0.0%	\$90,162	\$13,344	\$103,506	2024Q3	14.3%	\$103,088	\$15,257	\$118,345
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	#N/A	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	<b>CONSTRUCTION ESTIMATE TOTALS:</b>	\$90,162	\$13,344	14.8%	\$103,506		\$90,162	\$13,344	\$103,506			\$103,088	\$15,257	\$118,345
<b>01</b>	LANDS AND DAMAGES	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
<b>30</b>	PLANNING, ENGINEERING & DESIGN													
2.5%	Project Management	\$206	\$31	14.8%	\$237	0.0%	\$206	\$31	\$237	2021Q1	3.8%	\$214	\$32	\$246
1.0%	Planning & Environmental Compliance	\$344	\$51	14.8%	\$395	0.0%	\$344	\$51	\$395	2021Q1	3.8%	\$357	\$53	\$410
15.0%	Engineering & Design	\$2,132	\$316	14.8%	\$2,448	0.0%	\$2,132	\$316	\$2,448	2021Q1	3.8%	\$2,214	\$328	\$2,541
1.0%	Reviews, ATRs, IEPRs, VE	\$172	\$25	14.8%	\$197	0.0%	\$172	\$25	\$197	2021Q1	3.8%	\$179	\$26	\$205
1.0%	Life Cycle Updates (cost, schedule, risks)	\$172	\$25	14.8%	\$197	0.0%	\$172	\$25	\$197	2021Q1	3.8%	\$179	\$26	\$205
1.0%	Contracting & Reprographics	\$69	\$10	14.8%	\$79	0.0%	\$69	\$10	\$79	2021Q1	3.8%	\$71	\$11	\$82
3.0%	Engineering During Construction	\$103	\$15	14.8%	\$118	0.0%	\$103	\$15	\$118	2024Q3	18.4%	\$122	\$18	\$140
2.0%	Planning During Construction	\$69	\$10	14.8%	\$79	0.0%	\$69	\$10	\$79	2024Q3	18.4%	\$81	\$12	\$94
3.0%	Adaptive Management & Monitoring	\$0	\$0	14.8%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
1.0%	Project Operations	\$172	\$25	14.8%	\$197	0.0%	\$172	\$25	\$197	2021Q1	3.8%	\$179	\$26	\$205
<b>31</b>	CONSTRUCTION MANAGEMENT			4.1%										
10.0%	Construction Management	\$2,194	\$325	14.8%	\$2,519	0.0%	\$2,194	\$325	\$2,519	2024Q3	18.4%	\$2,598	\$385	\$2,983
2.0%	Project Operation:	\$914	\$135	14.8%	\$1,049	0.0%	\$914	\$135	\$1,049	2024Q3	18.4%	\$1,083	\$160	\$1,243
2.5%	Project Management	\$548	\$81	14.8%	\$630	0.0%	\$548	\$81	\$630	2024Q3	18.4%	\$650	\$96	\$746
	<b>CONTRACT COST TOTALS:</b>	\$97,257	\$14,394		\$111,651		\$97,257	\$14,394	\$111,651			\$111,014	\$16,430	\$127,444



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## **COST ENGINEERING APPENDIX**

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### **NORFOLK HARBOR COST RE- CERTIFICATION**

Moffatt & Nichol  
Project NHC: Norfolk Harbor Channels: Cost Recertification  
Norfolk Harbor Channels: Cost Recertification  
Norfolk Harbor Channels: Cost Recertification

Estimated by Sean Jessup  
Designed by Moffatt & Nichol  
Prepared by Sean Jessup  
Preparation Date 3/10/2020  
Effective Date of Pricing 10/1/2019  
Estimated Construction Time 2,500 Days

Cost Recertification for the channel deepening of Norfolk Harbor

Labor ID: EQ ID:

Currency in US dollars

TRACES MII Version 4.2

Description	UOM	Quantity	ContractCost	Contingency	ProjectCost
Project Owner Summary			276,248,656	0	276,248,656
			<i>254,311,021.50</i>		<i>254,311,021.50</i>
NHC - Segment 1	EA	1.0	254,311,021	0	254,311,021
			<i>8,354,467.30</i>		<i>8,354,467.30</i>
02 Relocations	EA	1.0	8,354,467	0	8,354,467
			<i>8,354,467.30</i>		<i>8,354,467.30</i>
CBBT Cover	EA	1.0	8,354,467	0	8,354,467
			<i>42.19</i>	<i>0.00%</i>	<i>42.19</i>
Clamshell Dredge of Upper Layer of Sand Cover (Note: Based on CEDEP estimate.)	CY	24,800.0	1,046,312	0	1,046,312
			<i>56.28</i>	<i>0.00%</i>	<i>56.28</i>
Clamshell Dredge of Lower Layer of Sand Cover (Note: Based on CEDEP estimate.)	CY	30,000.0	1,688,400	0	1,688,400
USR Clamshell Dredge Mob/ Demob (Note: Based on CEDEP estimate.)	LS	1.0	1,071,449	0	1,071,449
			<i>108.61</i>	<i>0.00%</i>	<i>108.61</i>
USR Rock Transported to CBBT (Note: 4000 hp Tug boat with 3000 ton barge with 4-man crew. Round trip takes 20 hours.)	TON	31,500.0	3,421,078	0	3,421,078
			<i>24.67</i>	<i>0.00%</i>	<i>24.67</i>
USR Rock Placement	TON	31,500.0	777,228	0	777,228
USR Rock Mob / Demob	LS	1.0	350,000	0	350,000
			<i>224,749,356.03</i>		<i>224,749,356.03</i>
12 Navigation Ports & Harbors	EA	1.0	224,749,356	0	224,749,356
			<i>43,590,220.86</i>		<i>43,590,220.86</i>
AOC	EA	1.0	43,590,221	0	43,590,221
			<i>2,006,522.00</i>	<i>0.00%</i>	<i>2,006,522.00</i>
USR Atlantic Ocean Channel - Mob & Demob (Note: Estimated cost from recent bids. Includes all contractor Markups. Assumes 2 mobilizations required.)	EA	2.0	4,013,044	0	4,013,044
			<i>5.98</i>	<i>0.00%</i>	<i>5.98</i>
USR Atlantic Ocean Channel Dredging (Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 59'. Maximum Pay Depth of 60')	CY	6,618,257.0	39,577,177	0	39,577,177
			<i>20,116,293.36</i>		<i>20,116,293.36</i>
TSC - East	EA	1.0	20,116,293	0	20,116,293
USR Thimble Shoal Channel - East of CBBT - Mob & Demob	LS	1.0	2,006,552	0	2,006,552

Description	UOM	Quantity	ContractCost	Contingency	ProjectCost
(Note: Estimated cost from recent bids. Includes all contractor Markups.)					
USR Thimble Shoal Channel - East of CBBT Dredging	CY	1,977,046.0	18,109,741	0	18,109,741
(Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 56 feet. Max pay depth of 57 feet.)					
TSC - West	EA	1.0	78,625,500	0	78,625,500
USR Thimble Shoal Channel - West of CBBT Dredging & Mobilization Under Contract)	LS	1.0	78,625,500	0	78,625,500
(Note: Price from Weeks Marine Bid Currently Under Contract.)					
TSC - MA#2	EA	1.0	13,593,625	0	13,593,625
USR Thimble Shoal Channel - MA #2 - Mob & Demob	LS	1.0	2,006,552	0	2,006,552
(Note: Estimated cost from recent bids. Includes all contractor Markups.)					
USR Thimble Shoal Channel - MA #2 Dredging	CY	1,428,739.0	11,587,073	0	11,587,073
(Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 56 feet. Max pay depth of 57 feet.)					
SP to LB	EA	1.0	60,198,404	0	60,198,404
USR Sewells Point to Lamberts Bend Dredging	CY	6,941,078.0	57,333,304	0	57,333,304
(Note: Unit Price from CEDEP. Includes all contractor Markups. Required depth of 55 feet plus 1 ft of advanced maintenance. 1 additional ft of pay overdepth allowed in all reaches.)					
USR Sewells Point to Lamberts Bend - Mob & Demob	LS	1.0	2,865,100	0	2,865,100
(Note: Unit Price from CEDEP. Includes all contractor Markups.)					
Anchorage F	EA	1.0	8,625,312	0	8,625,312
USR Anchorage F - Mob & Demob	LS	1.0	1,383,558	0	1,383,558
(Note: Mobilization and Demobilization assumed to be \$2,767,116 based on CEDEP for one hydraulic dredge mobilization. Cost is split evenly between Anchorage F and Channel to Newport News, as both areas are expected to be dredged in one contract.)					
USR Anchorage F Dredging	CY	1,311,912.0	7,241,754	0	7,241,754
(Note: Unit Price from CEDEP. Includes all contractor Markups. Assumes expanded diameter of anchorage to 3,620 feet. Dredged to a nominal depth of 51 feet. Required Depth of 51 Feet. Maximum pay depth of 52 feet.)					
30 Planning, Engineering, & Design	EA	1.0	11,141,798	0	11,141,798
USR CBBT Cover - PED	LS	1.0	682,500	0	682,500

Description	UOM	Quantity	ContractCost	Contingency	ProjectCost
USR AOC - Planning, Engineering, and Design (Note: Based on Separate Estimate)	LS	1.0	4,082,082	0	4,082,082
USR TSC East - Planning, Engineering, and Design (Note: Based on Separate Estimate)	LS	1.0	1,073,019	0	1,073,019
USR TSC West - Planning, Engineering, and Design (Note: Design completed. \$4.035 million entered in TPCS as already spent. Remaining money for PED related issues during construction.)	LS	1.0	2,549	0	2,549
USR TSC MA#2 - Planning, Engineering, and Design (Note: Based on Separate Estimate)	LS	1.0	1,513,391	0	1,513,391
USR SP to LB - Planning, Engineering, and Design (Note: Based on Separate Estimate)	LS	1.0	2,930,947	0	2,930,947
USR Anchorage F - Planning, Engineering, and Design (Note: Based on Separate Estimate)	LS	1.0	857,311	0	857,311
<b>31 Construction Management</b>	EA	1.0	<i>10,065,400.00</i> <b>10,065,400</b>	<b>0</b>	<i>10,065,400.00</i> <b>10,065,400</b>
USR CBBT Cover - Construction Management	LS	1.0	914,000	0	914,000
USR AOC - Construction Management (Note: Based on Separate Estimate)	LS	1.0	2,429,600	0	2,429,600
USR TSC East - Construction Management (Note: Based on Separate Estimate)	LS	1.0	810,260	0	810,260
USR TSC West - Construction Management (Note: Based on Separate Estimate)	LS	1.0	3,166,940	0	3,166,940
USR TSC MA#2 - Construction Management (Note: Based on Separate Estimate)	LS	1.0	916,600	0	916,600
USR SP to LB - Construction Management (Note: Based on Separate Estimate)	LS	1.0	930,000	0	930,000
USR Anchorage F - Construction Management (Note: Based on Separate Estimate)	LS	1.0	898,000	0	898,000
<b>NHC - Segment 2</b>	EA	1.0	<i>21,937,634.76</i> <b>21,937,635</b>	<b>0</b>	<i>21,937,634.76</i> <b>21,937,635</b>
<b>12 Navigation Ports &amp; Harbors</b>	EA	1.0	<i>19,804,199.36</i> <b>19,804,199</b>	<b>0</b>	<i>19,804,199.36</i> <b>19,804,199</b>

Description	UOM	Quantity	ContractCost	Contingency	ProjectCost
			<i>19,804,199.36</i>		<i>19,804,199.36</i>
<b>CNN</b>	EA	1.0	<b>19,804,199</b>	<b>0</b>	<b>19,804,199</b>
USR Channel to Newport News - Mob & Demob	LS	1.0	1,383,558	0	1,383,558
(Note: Mobilization and Demobilization assumed to be \$2,767,116 based on CEDEP for one hydraulic dredge mobilization. Cost is split evenly between Anchorage F and Channel to Newport News, as both areas are expected to be dredged in one contract.)					
			<i>8.36</i>	<i>0.00%</i>	<i>8.36</i>
USR Channel to Newport News Dredging	CY	2,203,426.0	18,420,641	0	18,420,641
(Note: Unit Price from CEDEP. Includes all contractor Markups. Required depth of 55 feet. Max pay depth of 56 feet.)					
			<i>1,235,435.40</i>		<i>1,235,435.40</i>
30 Planning Engineering & Design	EA	1.0	<b>1,235,435</b>	<b>0</b>	<b>1,235,435</b>
USR CNN - Planning, Engineering, and Design	LS	1.0	1,235,435	0	1,235,435
(Note: Based on Separate Estimate)					
			<i>898,000.00</i>		<i>898,000.00</i>
31 Construction Management	EA	1.0	<b>898,000</b>	<b>0</b>	<b>898,000</b>
USR CNN - Construction Management	LS	1.0	898,000	0	898,000
(Note: Based on Separate Estimate)					

Description	Quantity	UOM	LaborCost	EQCost	MatlCost	BareCost	DirectCost
Project Direct Summary			150,844	613,163	2,520,000	253,396,722	253,582,635
			<i>150,844.05</i>	<i>613,163.22</i>	<i>2,520,000.00</i>	<i>253,396,722.47</i>	<i>253,582,635.38</i>
NHC - Segment 1	1.0	EA	150,844	613,163	2,520,000	253,396,722	253,582,635
			<i>150,844.05</i>	<i>613,163.22</i>	<i>2,520,000.00</i>	<i>7,440,168.27</i>	<i>7,626,081.18</i>
02 Relocations	1.0	EA	150,844	613,163	2,520,000	7,440,168	7,626,081
			<i>150,844.05</i>	<i>613,163.22</i>	<i>2,520,000.00</i>	<i>7,440,168.27</i>	<i>7,626,081.18</i>
CBBT Cover	1.0	EA	150,844	613,163	2,520,000	7,440,168	7,626,081
			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>42.19</i>	<i>42.19</i>
Clamshell Dredge of Upper Layer of Sand Cover (Note: Based on CEDEP estimate.)	24,800.0	CY	0	0	0	1,046,312	1,046,312
			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>56.28</i>	<i>56.28</i>
Clamshell Dredge of Lower Layer of Sand Cover (Note: Based on CEDEP estimate.)	30,000.0	CY	0	0	0	1,688,400	1,688,400
USR Clamshell Dredge Mob/ Demob (Note: Based on CEDEP estimate.)	1.0	LS	0	0	0	1,071,449	1,071,449
			<i>0.94</i>	<i>3.80</i>	<i>80.00</i>	<i>84.75</i>	<i>89.76</i>
USR Rock Transported to CBBT (Note: 4000 hp Tug boat with 3000 ton barge with 4-man crew. Round trip takes 20 hours.)	31,500.0	TON	29,669	119,807	2,520,000	2,669,476	2,827,537
			<i>3.85</i>	<i>15.66</i>	<i>0.00</i>	<i>19.51</i>	<i>20.39</i>
USR Rock Placement	31,500.0	TON	121,175	493,356	0	614,531	642,383
USR Rock Mob / Demob	1.0	LS	0	0	0	350,000	350,000
			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>224,749,356.03</i>	<i>224,749,356.03</i>
12 Navigation Ports & Harbors	1.0	EA	0	0	0	224,749,356	224,749,356
			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>43,590,220.86</i>	<i>43,590,220.86</i>
AOC	1.0	EA	0	0	0	43,590,221	43,590,221
			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>2,006,522.00</i>	<i>2,006,522.00</i>
USR Atlantic Ocean Channel - Mob & Demob (Note: Estimated cost from recent bids. Includes all contractor Markups. Assumes 2 mobilizations required.)	2.0	EA	0	0	0	4,013,044	4,013,044
			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>5.98</i>	<i>5.98</i>
USR Atlantic Ocean Channel Dredging (Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 59'. Maximum Pay Depth of 60')	6,618,257.0	CY	0	0	0	39,577,177	39,577,177
			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>20,116,293.36</i>	<i>20,116,293.36</i>
TSC - East	1.0	EA	0	0	0	20,116,293	20,116,293
USR Thimble Shoal Channel - East of CBBT - Mob & Demob	1.0	LS	0	0	0	2,006,552	2,006,552

Description	Quantity	UOM	LaborCost	EQCost	MatlCost	BareCost	DirectCost
(Note: Estimated cost from recent bids. Includes all contractor Markups.)							
USR Thimble Shoal Channel - East of CBBT Dredging	1,977,046.0	CY	0.00 0	0.00 0	0.00 0	9.16 18,109,741	9.16 18,109,741
(Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 56 feet. Max pay depth of 57 feet.)							
TSC - West	1.0	EA	0.00 0	0.00 0	0.00 0	78,625,500.00 78,625,500	78,625,500.00 78,625,500
USR Thimble Shoal Channel - West of CBBT Dredging & Mobilization Under Contract)	1.0	LS	0	0	0	78,625,500	78,625,500
(Note: Price from Weeks Marine Bid Currently Under Contract.)							
TSC - MA#2	1.0	EA	0.00 0	0.00 0	0.00 0	13,593,625.29 13,593,625	13,593,625.29 13,593,625
USR Thimble Shoal Channel - MA #2 - Mob & Demob	1.0	LS	0	0	0	2,006,552	2,006,552
(Note: Estimated cost from recent bids. Includes all contractor Markups.)							
USR Thimble Shoal Channel - MA #2 Dredging	1,428,739.0	CY	0.00 0	0.00 0	0.00 0	8.11 11,587,073	8.11 11,587,073
(Note: Unit Price from CEDEP. Includes all contractor Markups. Nominal Depth of 55 feet. Required Depth of 56 feet. Max pay depth of 57 feet.)							
SP to LB	1.0	EA	0.00 0	0.00 0	0.00 0	60,198,404.28 60,198,404	60,198,404.28 60,198,404
USR Sewells Point to Lamberts Bend Dredging	6,941,078.0	CY	0.00 0	0.00 0	0.00 0	8.26 57,333,304	8.26 57,333,304
(Note: Unit Price from CEDEP. Includes all contractor Markups. Required depth of 55 feet plus 1 ft of advanced maintenance. 1 additional ft of pay overdepth allowed in all reaches.)							
USR Sewells Point to Lamberts Bend - Mob & Demob	1.0	LS	0	0	0	2,865,100	2,865,100
(Note: Unit Price from CEDEP. Includes all contractor Markups.)							
Anchorage F	1.0	EA	0.00 0	0.00 0	0.00 0	8,625,312.24 8,625,312	8,625,312.24 8,625,312
USR Anchorage F - Mob & Demob	1.0	LS	0	0	0	1,383,558	1,383,558
(Note: Mobilization and Demobilization assumed to be \$2,767,116 based on CEDEP for one hydraulic dredge mobilization. Cost is split evenly between Anchorage F and Channel to Newport News, as both areas are expected to be dredged in one contract.)							
USR Anchorage F Dredging	1,311,912.0	CY	0.00 0	0.00 0	0.00 0	5.52 7,241,754	5.52 7,241,754
(Note: Unit Price from CEDEP. Includes all contractor Markups. Assumes expanded diameter of anchorage to 3,620 feet. Dredged to a nominal depth of 51 feet. Required Depth of 51 Feet. Maximum pay depth of 52 feet.)							
30 Planning, Engineering, & Design	1.0	EA	0.00 0	0.00 0	0.00 0	11,141,798.17 11,141,798	11,141,798.17 11,141,798



Description	Quantity	UOM	LaborCost	EQCost	MatlCost	BareCost	DirectCost
USR CBBT Cover - PED	1.0	LS	0	0	0	682,500	682,500
USR AOC - Planning, Engineering, and Design (Note: Based on Separate Estimate)	1.0	LS	0	0	0	4,082,082	4,082,082
USR TSC East - Planning, Engineering, and Design (Note: Based on Separate Estimate)	1.0	LS	0	0	0	1,073,019	1,073,019
USR TSC West - Planning, Engineering, and Design (Note: Design completed. \$4.035 million entered in TPCS as already spent. Remaining money for PED related issues during construction.)	1.0	LS	0	0	0	2,549	2,549
USR TSC MA#2 - Planning, Engineering, and Design (Note: Based on Separate Estimate)	1.0	LS	0	0	0	1,513,391	1,513,391
USR SP to LB - Planning, Engineering, and Design (Note: Based on Separate Estimate)	1.0	LS	0	0	0	2,930,947	2,930,947
USR Anchorage F - Planning, Engineering, and Design (Note: Based on Separate Estimate)	1.0	LS	0	0	0	857,311	857,311
<b>31 Construction Management</b>			<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>10,065,400.00</i>	<i>10,065,400.00</i>
USR CBBT Cover - Construction Management	1.0	EA	0	0	0	10,065,400	10,065,400
USR AOC - Construction Management (Note: Based on Separate Estimate)	1.0	LS	0	0	0	914,000	914,000
USR TSC East - Construction Management (Note: Based on Separate Estimate)	1.0	LS	0	0	0	2,429,600	2,429,600
USR TSC West - Construction Management (Note: Based on Separate Estimate)	1.0	LS	0	0	0	810,260	810,260
USR TSC MA#2 - Construction Management (Note: Based on Separate Estimate)	1.0	LS	0	0	0	3,166,940	3,166,940
USR SP to LB - Construction Management (Note: Based on Separate Estimate)	1.0	LS	0	0	0	916,600	916,600
USR Anchorage F - Construction Management (Note: Based on Separate Estimate)	1.0	LS	0	0	0	930,000	930,000
USR Anchorage F - Construction Management (Note: Based on Separate Estimate)	1.0	LS	0	0	0	898,000	898,000

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## **COST ENGINEERING APPENDIX**

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### **MEETING AREA 1 COST UPDATE**

08/27/2021

Technical Letter # 014

Revision	Date	By	Reviewed By	Comment
0	8/27/2021	S. Jessup, J. Gage	I. Brotman	

**Subject: Norfolk Harbor Navigation Improvements Meeting Area #1 Cost Update**

**Introduction / Purpose:**

This technical letter documents the project cost update for the Norfolk Harbor Navigation Improvements Meeting Area #1 segment to support a meeting area validation study effort. Meeting Area #1 is a proposed widened segment of the Thimble Shoal Channel located between the Hampton Roads Bridge-Tunnel (HRBT) and the Chesapeake Bay Bridge-Tunnel (CBBT) (Figure 1).

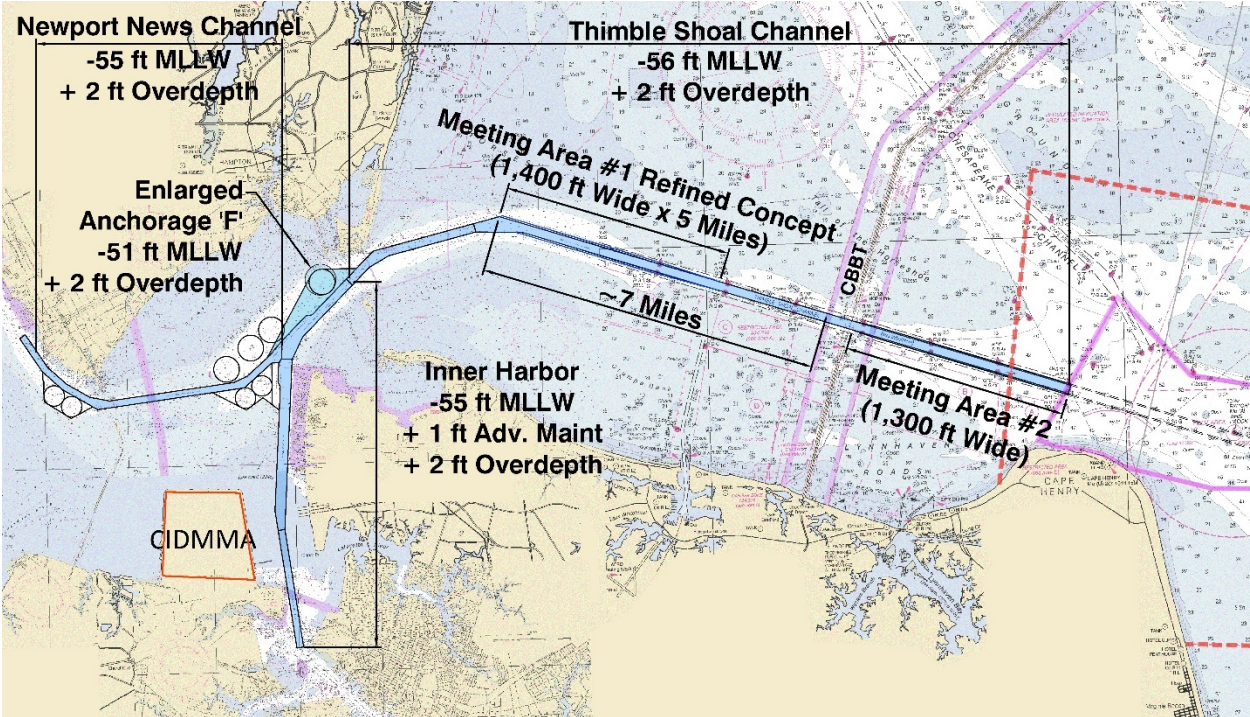


Figure 1 – Meeting Area #1 Location

Meeting Area #1 was evaluated and documented in the General Re-evaluation Report (GRR), but was not justified for inclusion into the National Economic Development (NED) project based on the fleet forecast used for the study and resultant benefits vs. project costs.

Since completion of the GRR, ocean carriers have more rapidly transitioned to the ultra large container vessels (ULVC) than the forecast predicted, warranting a re-assessment of the benefits and costs associated with this project element for possible inclusion into the NED project. Local stakeholders continue to advocate for its construction.

**Project Description:**

Business rules within the Norfolk Harbor maritime community currently establish one way vessel traffic when ultra large container vessels or bulk carriers are transiting the Norfolk Harbor channels. Meeting Area #1 widens Thimble Shoal Channel up to 200 ft on each side of the channel to provide a 1,400 ft wide segment to accommodate two-way ULCV and bulk carrier traffic, thereby lessening the impact of the traffic restrictions on other commercial and military operations.

The environmental assessment performed in conjunction with the GRR evaluated a full length Meeting Area #1 (~7 miles). In seeking to find a concept that provided a more attractive benefit to cost ratio, shorter alternatives were explored but for the fleet forecast used in the GRR, an alternative with sufficiently attractive benefits vs costs could not be identified. The most attractive alternative to provide the Virginia Pilots with a functional meeting area was a 5 mile long meeting area. Due to the shallow waters on either side of Thimble Shoal Channel, a 1,400 ft width was requested to minimize adverse hydrodynamic effects experienced by large vessels as they approach the edge of a dredged channel (referred to as “bank effects”). This configuration (Figure 2) was confirmed by the Virginia Pilots using ship simulators in 2018 as part of a broader design validation performed during the initial phase of Preconstruction Engineering and Design (PED).

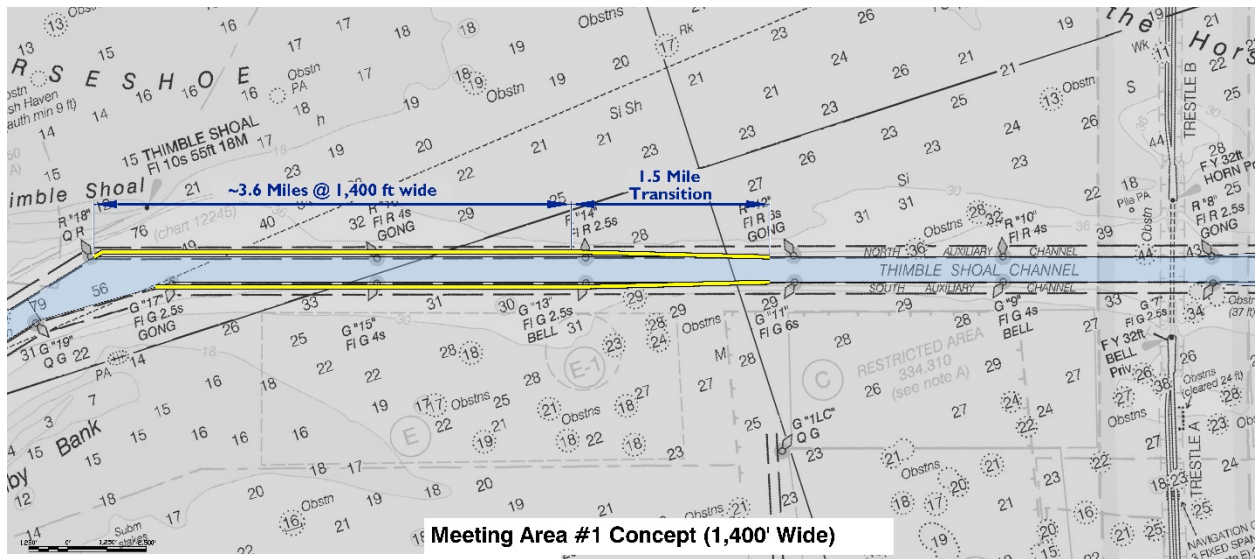


Figure 2 – Meeting Area #1 Concept

Studies and analyses performed in support of the GRR established a recommended depth for Thimble Shoal Channel of -56 ft MLLW to accommodate the design container vessel and bulk carrier, and their associated under-keel clearance needs.

The proposed portion of Thimble Shoal Channel for Meeting Area #1 was deepened to -56 ft MLLW in 2020 as the first segment of the Norfolk Harbor Navigation Improvements, but retained the 1,000 ft width consistent with the NED project definition. Construction of Meeting Area #1 would therefore be limited to widening the existing channel on each side by 200 ft to the -56 ft MLLW required depth. The dredge prism also provides for 3H:1V channel sideslopes based on slope stability analyses and existing channel conditions.

Consistent with deepening of the main channel, 1 ft of paid overdepth would also be permitted, with an additional 1 ft of non-pay overdepth anticipated for estimating total dredge volume.

**Project Data:**

The following dredge volumes were estimated based on the after-dredge surveys of the deepened channel performed from March 2020 to June 2021 for widening the channel 200 ft on each side to a required depth of -56 ft plus 1 ft of pay overdepth and 1 ft of non-pay overdepth:

Volume to required depth:	4,227,546 CY
Additional 1 ft pay overdepth:	362,011 CY
<u>Additional 1 ft non-pay overdepth:</u>	<u>368,228 CY</u>
<b>Total Volume</b>	<b>4,957,785 CY (4,589,557 CY Pay Vol)</b>

Sediment samples for this segment (and experience from the deepening of the main channel) indicate the material is predominantly silts (~55%) and clays (~30%) and fine sands (~15%). Beneficial use opportunities for this type of material could not be identified. Regionally there is a preference for sandier material to support dike construction at CIDMMA and beach nourishment efforts.

Offshore placement will be at the Dam Neck Ocean Disposal Site (DNODS), resulting in a one-way haul distance of approximately 25 miles. The project area is subject to Northern Right Whale protocols that limit transit speeds to less than 10 kts.

For the dredging, a single generic large hopper dredge was assumed (7,600 CY volume; 4,500 CY effective capacity based on site conditions). Equipment, fuel, and other rates reflect currently available data.

Mobilization/Demobilization and turtle trawling rates reflect recent project bid results. Turtle trawling is only necessary if the project experiences a specified number of takes, but 60 days is a typical bid amount for a project of this duration.

Refer to attached estimating worksheets for additional assumptions on the project.

### **Cost Update:**

The project is estimated to take approximately 18 months to complete, which will require at least two mobilizations due to the 2.5-month seasonal dredge restriction imposed on hopper dredges.

PED and construction management costs were developed during the GRR and re-certified for FY20. Project experience with other segments suggests they are sufficiently conservative.

An 11.70% contingency is provided for both design and construction-related efforts based on the cost-risk analysis performed during the GRR and subsequent cost re-certification.

Estimated breakdown of project costs are as follows:

4,589,557 CY @ \$13.80/CY =	\$63,335,887
2 mob/demob events @ \$2,263,925 each =	\$ 4,527,850
Turtle trawling 60 days @ \$6,000.00/Day	\$ 360,000
<hr/>	
Construction Subtotal	\$68,223,737
Construction Contingency (11.70%)	\$ 7,982,177
<hr/>	
<b>Construction Total</b>	<b>\$76,205,914</b>
Preconstruction Engineering and Design	\$ 2,637,141
Construction Management	\$ 3,871,600
PED/CM Contingency (11.70%)	\$ 761,522
<hr/>	
<b>Project Total</b>	<b>\$83,476,177</b>

Costs are presented in FY21 dollars.

**Attachments:**

MII Cost Summary  
Dredge Cost Estimating Worksheets

**List of Preparers**

Sean Jessup, P.E.  
Jonathan Gage, P.E.