NEWBURYPORT HARBOR
PLUM ISLAND NORTH POINT
NEWBURYPORT, MASSACHUSETTS

§204 PROJECT
BENEFICIAL USE OF DREDGED MATERIALS

APPENDIX D
COST ENGINEERING

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Appendix D
Cost Engineering

1.0 SUMMARY

Three Construction Cost Estimates were prepared for this analysis, one for each of the plans listed below:

- Plan 1: Place Material at North Point Beach w/ Pipeline Dredge
- Plan 2: Place Material at North Point and Nearshore Sites w/ Hopper Dredge
- Plan 3: Place Material at Nearshore Sites w/ Hopper Dredge

Based on the Benefit-Cost Ratio (BCR) provided by the Economic Analysis (see Appendix E), Plan 1 was selected as the Recommended Plan for this project. The write-up which follows provides greater detail into the assumptions used to develop the Total Project Cost Estimate for this plan.

2.0 BACKGROUND

The Project Development Team (PDT) compared three separate plans for this study: the Section 204 (recommended) plan and two O&M plans. Each of these plans involve dredging the existing Federal Channel located near Newburyport and Salisbury, MA. Figure D-1 below provides a general layout of the channel.

The Federal Channel is comprised of a 9-foot channel located entirely within Newburyport Harbor and a 15-foot channel located at the mouth of the Merrimack River. Both channels are to be dredged for both the Section 204 plan and the base O&M plans. The difference between the Section 204 and the base O&M plans is in the disposal location of the dredged material. All the cost estimates are based on dredge quantities developed by the Civil Engineering and Survey Sections.

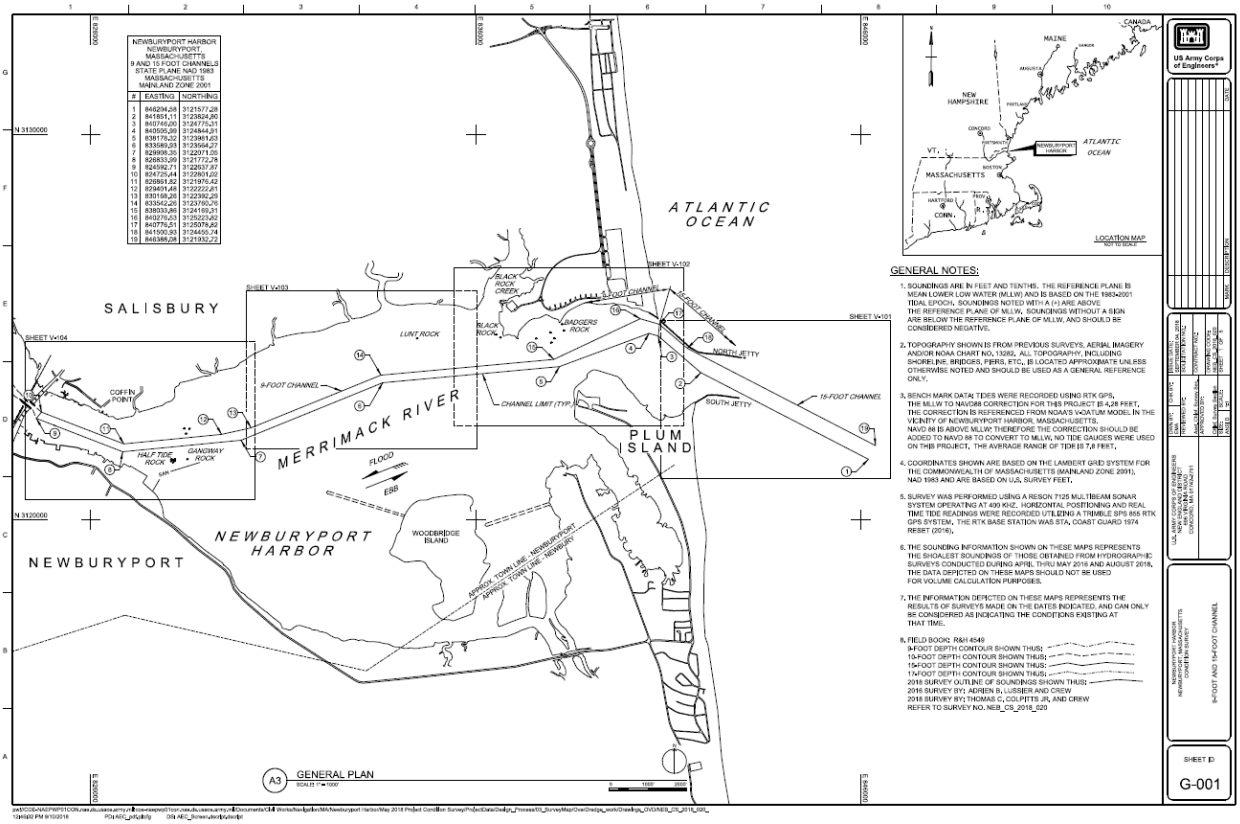

Figure D1. Layout of Federal Channel

3.0 RECOMMENDED PLAN: Place Material at North Point Beach w/Pipeline Dredge

The recommended plan is to dredge 220,000-cy out of the Federal Channel and place the material at North Point Beach using a pipeline dredge. It's assumed that hydraulic dredging equipment will be used throughout the project. The estimator selected a 16" cutterhead dredge for both the 9-foot and 15-foot channels. A 2018 navigation survey was used to determine the maximum pipeline lengths required to place material at the North Point Beach. For the beach construction work, the estimator included a 300-HP dozer and a 1.13-CY excavator to both manage and spread the slurry material exiting the pipeline. The estimate also includes the following assumptions:

- Contract will be awarded using an invitation-for-bid small business set-aside contracting vehicle. Contractor markups have been set to reflect the local small business environment (HOOH: 12%, Profit: 10%, Bond: 2%)
- All construction work will be performed by the prime contractor. No work is to be subcontracted.
- Prime contractor will mobilize from the New York City / New Jersey area.

4.0 PLAN 2: Place Material at North Point and Nearshore Sites w/Hopper Dredge

This O&M plan is to dredge 220,000-cy out of the Federal Channel using a hopper dredge. The material would be placed in three separate locations: 57,000-cy of the material would go to North Point Beach using a pump-out and the rest of the material would be split evenly between two nearshore disposal locations at Plum Island and Salisbury Beach. The estimator selected the "Generic Medium" sized hopper dredge for both the 9-ft and 15-ft channels; this dredge has a capacity of 3,800-cy. A 2018 navigation survey was used to determine the pipeline length for the pump-out system to North Point Beach; the estimator assumed a 16" pipeline would be used for this purpose. For the beach construction work, the estimator included a 300-HP dozer and a 1.13-CY excavator to both manage and spread the slurry material exiting the pipeline.

The 2018 survey shows that the nearshore locations are approximately equidistant from the river mouth. As such, only one CEDEP file was prepared for dredging the 9-ft and 15-ft channels with nearshore placement.

The estimate also includes the following assumptions:

- Contract will be awarded using an invitation-for-bid small business set-aside contracting vehicle. Contractor markups have been set to reflect the local small business environment (HOOH: 12%, Profit: 10%, Bond: 2%)
- All construction work will be performed by the prime contractor. No work is to be subcontracted.
- Prime contractor will mobilize from the Florida area.

5.0 PLAN 3: Place Material at Nearshore Sites w/ Hopper Dredge

This O&M plan is to dredge 220,000-cy out of the Federal Channel using a hopper dredge. The material would be split evenly between two nearshore disposal locations at Plum Island and Salisbury Beach. The estimator selected the "Generic Medium" sized hopper dredge for both the 9-ft and 15-ft channels; this dredge has a capacity of 3,800-cy. A 2018 navigation survey determined that both nearshore locations are approximately equidistant from the river mouth. As such, only one CEDEP file was prepared for dredging the 9-ft and 15-ft channels with nearshore placement. The estimate also includes the following assumptions:

- Contract will be awarded using an invitation-for-bid small business set-aside contracting vehicle. Contractor markups have been set to reflect the local small business environment (HOOH: 12%, Profit: 10%, Bond: 2%)
- All construction work will be performed by the prime contractor. No work is to be subcontracted.
- Prime contractor will mobilize from the Florida area.

6.0 SCHEDULE

The recommended plan is assumed to undergo the PED phase during FY21, in preparation for an FY22 award. As shown in the schedule provided in the attachments, the first month of the contract, assuming an NTP of October 1, 2021, would be devoted entirely to pre-construction submittal development. From there, it's assumed the contractor would use a full month to mobilize to the site and set up the pipeline. For the dredging and beach construction activities, the schedule assumes 49 working days along with 14 adverse weather days for a total of 63-days. Once complete, it's assumed the contractor would require 21-days to fully demobilize from the site. In total, the schedule estimates 143 working days to complete the project scope, from October 1, 2021 to February 21, 2022.

7.0 RISK ANALYSIS

The PDT prepared an Abbreviated Risk Analysis (ARA) in order to capture those risks which could potentially drive up the total project cost over the course the design and construction phases. Although the ARA did not identify any risks weighted with a 3 or 4, there were several 2's which are worth identifying. These are discussed in greater detail below:

- There is a risk that a differing site condition may arise if the contractor encounters cobbles or other hard materials while dredging the channel. Since the recommended plan incorporates the use of a pipeline dredge, any hard material encountered could necessitate bringing either a mechanical dredge or blasting equipment. This would cause delays to the construction schedule and would impact the mobilization costs for the additional equipment. However, the PDT finds this to be an unlikely scenario in light of the extensive sampling collected in the channel. Thus the risk was set to 2 for both the "Mobilization & Demobilization" and "Dredge Federal Channel" features of work.
- There is a risk that the equipment used to create the cost estimate is either improperly sized or will mobilize from a different location than what has been assumed. If the prime contractor chooses to use larger, more expensive equipment or mobilizes from a location beyond NYC, then it's possible that this would cause an increase in the construction contract costs. To mitigate this risk, the cost estimator used a combination of historical bid information and professional experience to select both the dredging and the beach construction equipment. Given that the estimator has successfully estimated other dredging contracts within the New England region, the PDT set this risk to 2 for each of the code 12 "Navigation Ports & Harbors" features of work.

The ARA assumed a "Moderate Risk" risk category for the project as the work is "typical" for pipeline dredging work. The resulting contingencies produced by the ARA are as follows:

- Total Construction Estimate: 20.87%
- Total Planning, Engineering, & Design: 18.40%
- Total Construction Management: 14.13%

These contingency percentages are utilized in the Total Project Cost Summary. No Lands and Damages are anticipated for this project.

8.0 TOTAL PROJECT COST SUMMARY (TPCS)

The Total Project Cost Summary (TPCS) summarizes the Construction Cost, Project First Cost, and the Total Project Cost or the Fully Funded Cost. The TPCS incorporates both the Construction Costs developed in MII and the contingencies developed in the ARA; from there, Planning, Engineering, & Design (PED) and Construction Management (S&A) are calculated as a percentage of the Construction Costs. The PED and S&A costs were reviewed by CENAE's Navigation Project Manager in order to ensure their accuracy based on similar projects completed in the District.

The TPCS form also applies escalation to the Construction, PED, and S&A costs. The escalation rates are based on the following assumptions:

- Mid-point of Design in Q3FY21
- Mid-point of Construction in Q1FY22

The Total Project Cost for the Construction, PED, and S&A phases is estimated to be $6,809,000. Since the more expensive O&M base plan is estimated at $6,312,000, only the remaining $497,000 is subject to a cost share of 65% Federal / 35% Non-Federal. There is also a $300,000 Feasibility Study which is to be completed using 100% Federal funding. Thus, the final split is $6,935,000 in Federal costs and $174,000 in Non-Federal costs.

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ATTACHMENTS

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

PROJECT: **Newburyport Harbor 204 North Point**
PROJECT NO: **474623**
LOCATION: **Newburyport, MA**

DISTRICT: **New England District** PREPARED: **6/25/2020**

POC: **CHIEF, COST ENGINEERING, Jeffrey Gaeta**

This Estimate reflects the scope and schedule in report;

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
Recommended Plan: Place Material at North Point Beach with Pipeline Dredge						Program Year (Budget EC): 2021 Effective Price Level Date: 1-Oct- 20									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	REMAINING COST ($K)	Spent Thru: 1-Oct-19 ($K)	TOTAL FIRST COST ($K)	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
12	NAVIGATION PORTS & HARBORS	$4,633	$967	21%	$5,600	3.0%	$4,771	$996	$5,767		$5,767	2.9%	$4,907	$1,024	$5,932
			-			-						-			
			-			-						-			
			-			-						-			
	CONSTRUCTION ESTIMATE TOTALS:	$4,633	$967		$5,600	3.0%	$4,771	$996	$5,767		$5,767	2.9%	$4,907	$1,024	$5,932
01	LANDS AND DAMAGES		-			-						-			
30	PLANNING, ENGINEERING & DESIGN	$510	$94	18%	$603	4.6%	$533	$98	$631		$631	2.6%	$547	$101	$647
31	CONSTRUCTION MANAGEMENT	$185	$26	14%	$211		$194	$27	$221		$221	4.0%	$202	$28	$230
	PROJECT COST TOTALS:	$5,328	$1,087	20%	$6,415		$5,498	$1,121	$6,619		**$6,619**	2.9%	$5,656	$1,153	$6,809

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_____ CHIEF, COST ENGINEERING, Jeffrey Gaeta

_____ PROJECT MANAGER, Dorothea Lundberg

_____ CHIEF, REAL ESTATE, Gaelen Daly

_____ CHIEF, PLANNING, John Kennelly

_____ CHIEF, ENGINEERING, David Margolis

_____ CHIEF, OPERATIONS, Eric Pederson

_____ CHIEF, CONSTRUCTION, Sean Dolan

_____ CHIEF, CONTRACTING, Sheila Winston-Vincuilla

_____ CHIEF, PM-PB, Janet Harrington

_____ CHIEF, DPM, Scott Acone

ESTIMATED TOTAL PROJECT COST:		**$6,809**
BASE PLAN TOTAL COST (PLAN 2):		$6,312
SHARED SECTION 204 COSTS:		$497
ESTIMATED FEDERAL COST:	**65%**	$323
ESTIMATED NON-FEDERAL COST:	**35%**	$174
22 - FEASIBILITY STUDY (CAP studies):		**$300**
ESTIMATED FEDERAL COST:	100%	$300
ESTIMATED NON-FEDERAL COST:		
ESTIMATED FEDERAL COST OF PROJECT		**$6,935**

Filename: TPCS_CAP_North Pt Section 204_rev 8-17-20.xlsx
TPCS - P1 Beach Placement

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

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

PROJECT: Newburyport Harbor 204 North Point
LOCATION: Newburyport, MA
This Estimate reflects the scope and schedule in report;

DISTRICT: New England District
POC: CHIEF, COST ENGINEERING, Jeffrey Gaeta

PREPARED: 6/25/2020

Recommended Plan: Place Material at North Point Beach with Pipeline Dredge

Estimate Prepared: 25-Jun-20
Estimate Price Level: 1-Oct-19

Program Year (Budget EC): 2021
Effective Price Level Date: 1 -Oct-20

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
				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*
	PHASE 1 or CONTRACT 1													
12	NAVIGATION PORTS & HARBORS	$4,633	$967	20.9%	$5,600	3.0%	$4,771	$996	$5,767	2022Q1	2.9%	$4,907	$1,024	$5,932
	CONSTRUCTION ESTIMATE TOTALS:	$4,633	$967	20.9%	$5,600		$4,771	$996	$5,767			$4,907	$1,024	$5,932
01	LANDS AND DAMAGES													
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	$46	$9	18.4%	$55	4.6%	$48	$9	$57	2021Q3	2.1%	$49	$9	$59
1.0%	Planning & Environmental Compliance	$46	$9	18.4%	$55	4.6%	$48	$9	$57	2021Q3	2.1%	$49	$9	$59
3.0%	Engineering & Design	$139	$26	18.4%	$165	4.6%	$145	$27	$172	2021Q3	2.1%	$148	$27	$176
1.0%	Reviews, ATRs, IEPRs, VE	$46	$9	18.4%	$55	4.6%	$48	$9	$57	2021Q3	2.1%	$49	$9	$59
1.0%	Life Cycle Updates (cost, schedule, risks)	$46	$9	18.4%	$55	4.6%	$48	$9	$57	2021Q3	2.1%	$49	$9	$59
1.0%	Contracting & Reprographics	$46	$9	18.4%	$55	4.6%	$48	$9	$57	2022Q1	4.0%	$50	$9	$60
2.0%	Engineering During Construction	$93	$17	18.4%	$110	4.6%	$97	$18	$115	2022Q1	4.0%	$101	$19	$119
1.0%	Planning During Construction	$46	$9	18.4%	$55	4.6%	$48	$9	$57	2021Q3	2.1%	$49	$9	$59
	Adaptive Management & Monitoring			18.4%										
	Project Operations			18.4%										
31	CONSTRUCTION MANAGEMENT													
3.0%	Construction Management	$139	$20	14.1%	$159	4.6%	$145	$21	$166	2022Q1	4.0%	$151	$21	$173
	Project Operation:			14.1%										
1.0%	Project Management	$46	$7	14.1%	$53	4.6%	$48	$7	$55	2022Q1	4.0%	$50	$7	$58
	CONTRACT COST TOTALS:	$5,328	$1,087		$6,415		$5,498	$1,121	**$6,619**			$5,656	$1,153	**$6,809**

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

PROJECT: **Newburyport Harbor 204 North Point**
PROJECT NO: **474623**
LOCATION: **Newburyport, MA**

DISTRICT: **New England District** PREPARED: **6/25/2020**
POC: **CHIEF, COST ENGINEERING, Jeffrey Gaeta**

This Estimate reflects the scope and schedule in report;

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
Plan 2: Place Material at North Point and Nearshore Sites with Hopper Dredge						Program Year (Budget EC): 2021 Effective Price Level Date: 1-Oct- 20									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	REMAINING COST ($K)	Spent Thru: 1-Oct-19 ($K)	TOTAL FIRST COST ($K)	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
12	NAVIGATION PORTS & HARBORS	$4,265	$890	21%	$5,156	3.0%	$4,393	$917	$5,310		$5,310	2.9%	$4,518	$943	$5,461
			-			-						-			
			-			-						-			
			-			-						-			
	CONSTRUCTION ESTIMATE TOTALS:	$4,265	$890		$5,156	3.0%	$4,393	$917	$5,310		$5,310	2.9%	$4,518	$943	$5,461
01	LANDS AND DAMAGES		-			-						-			
30	PLANNING, ENGINEERING & DESIGN	$503	$93	18%	$596	4.6%	$526	$97	$623		$623	2.6%	$540	$99	$639
31	CONSTRUCTION MANAGEMENT	$171	$24	14%	$195	4.6%	$178	$25	$204		$204	4.0%	$186	$26	$212
	PROJECT COST TOTALS:	$4,939	$1,007	20%	$5,946		$5,098	$1,039	$6,137		**$6,137**	2.9%	$5,244	$1,068	$6,312

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_____	CHIEF, COST ENGINEERING, Jeffrey Gaeta
_____	PROJECT MANAGER, Dorothea Lundberg
_____	CHIEF, REAL ESTATE, Gaelen Daly
_____	CHIEF, PLANNING, John Kennelly
_____	CHIEF, ENGINEERING, David Margolis
_____	CHIEF, OPERATIONS, Eric Pederson
_____	CHIEF, CONSTRUCTION, Sean Dolan
_____	CHIEF, CONTRACTING, Sheila Winston-Vincuilla
_____	CHIEF, PM-PB, Janet Harrington
_____	CHIEF, DPM, Scott Acone

ESTIMATED TOTAL PROJECT COST:		**$6,312**
ESTIMATED FEDERAL COST:	100%	$6,312
ESTIMATED NON-FEDERAL COST:		
22 - FEASIBILITY STUDY (CAP studies):		
ESTIMATED FEDERAL COST:	100%	
ESTIMATED NON-FEDERAL COST:		
ESTIMATED FEDERAL COST OF PROJECT		**$6,312**

Filename: TPCS_CAP_North Pt Section 204_rev 8-17-20.xlsx
TPCS - P2 Beach & Nearshore

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

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

PROJECT: Newburyport Harbor 204 North Point
LOCATION: Newburyport, MA
This Estimate reflects the scope and schedule in report;

DISTRICT: New England District
POC: CHIEF, COST ENGINEERING, Jeffrey Gaeta

PREPARED: 6/25/2020

Plan 2: Place Material at North Point and Nearshore Sites with Hopper Dredge

Estimate Prepared: **25-Jun-20**
Estimate Price Level: 1-Oct-19

Program Year (Budget EC): 2021
Effective Price Level Date: 1 -Oct-20

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
				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*
	PHASE 1 or CONTRACT 1													
12	NAVIGATION PORTS & HARBORS	$4,265	$890	20.9%	$5,156	3.0%	$4,393	$917	$5,310	2022Q1	2.9%	$4,518	$943	$5,461
	CONSTRUCTION ESTIMATE TOTALS:	$4,265	$890	20.9%	$5,156		$4,393	$917	$5,310			$4,518	$943	$5,461
01	LANDS AND DAMAGES													
30	PLANNING, ENGINEERING & DESIGN*													
1.0%	Project Management	$51	$9	18.4%	$61	4.6%	$54	$10	$63	2021Q3	2.1%	$55	$10	$65
1.0%	Planning & Environmental Compliance	$43	$8	18.4%	$51	4.6%	$45	$8	$53	2021Q3	2.1%	$46	$8	$54
3.0%	Engineering & Design	$154	$28	18.4%	$182	4.6%	$161	$30	$190	2021Q3	2.1%	$164	$30	$194
1.0%	Reviews, ATRs, IEPRs, VE	$43	$8	18.4%	$51	4.6%	$45	$8	$53	2021Q3	2.1%	$46	$8	$54
1.0%	Life Cycle Updates (cost, schedule, risks)	$43	$8	18.4%	$51	4.6%	$45	$8	$53	2021Q3	2.1%	$46	$8	$54
1.0%	Contracting & Reprographics	$43	$8	18.4%	$51	4.6%	$45	$8	$53	2022Q1	4.0%	$46	$9	$55
2.0%	Engineering During Construction	$85	$16	18.4%	$101	4.6%	$89	$16	$106	2022Q1	4.0%	$93	$17	$110
1.0%	Planning During Construction	$43	$8	18.4%	$51	4.6%	$45	$8	$53	2021Q3	2.1%	$46	$8	$54
	Adaptive Management & Monitoring			18.4%										
	Project Operations			18.4%										
31	CONSTRUCTION MANAGEMENT*													
3.0%	Construction Management	$128	$18	14.1%	$146	4.6%	$134	$19	$153	2022Q1	4.0%	$139	$20	$159
	Project Operation:			14.1%										
1.0%	Project Management	$43	$6	14.1%	$49	4.6%	$45	$6	$51	2022Q1	4.0%	$46	$7	$53
	CONTRACT COST TOTALS:	$4,939	$1,007		$5,946		$5,098	$1,039	**$6,137**			$5,244	$1,068	**$6,312**

Filename: TPCS_CAP_North Pt Section 204_rev 8-17-20.xlsx
TPCS - P2 Beach & Nearshore

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

PROJECT: **Newburyport Harbor 204 North Point**
PROJECT NO: **474623**
LOCATION: **Newburyport, MA**

DISTRICT: **New England District**
PREPARED: **6/25/2020**
POC: **CHIEF, COST ENGINEERING, Jeffrey Gaeta**

This Estimate reflects the scope and schedule in report;

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
Plan 3: Place Material at Near-Shore Sites using Hopper Dredge						Program Year (Budget EC): 2021 Effective Price Level Date: 1-Oct- 20									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	REMAINING COST ($K)	Spent Thru: 1-Oct-19 ($K)	TOTAL FIRST COST ($K)	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
12	NAVIGATION PORTS & HARBORS	$3,020	$630	21%	$3,650	3.0%	$3,110	$649	$3,759		$3,759	2.9%	$3,199	$668	$3,866
			-			-						-			
			-			-						-			
			-			-						-			
	CONSTRUCTION ESTIMATE TOTALS:	$3,020	$630		$3,650	3.0%	$3,110	$649	$3,759		$3,759	2.9%	$3,199	$668	$3,866
01	LANDS AND DAMAGES		-			-						-			
30	PLANNING, ENGINEERING & DESIGN	$495	$91	18%	$586	4.6%	$518	$95	$613		$613	2.6%	$531	$98	$629
31	CONSTRUCTION MANAGEMENT	$169	$24	14%	$193	4.6%	$177	$25	$202		$202	4.0%	$184	$26	$210
	PROJECT COST TOTALS:	$3,684	$745	20%	$4,430		$3,805	$769	$4,574		**$4,574**	2.9%	$3,914	$791	$4,706

_____ CHIEF, COST ENGINEERING, Jeffrey Gaeta

_____ PROJECT MANAGER, Dorothea Lundberg

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_____ CHIEF, CONSTRUCTION, Sean Dolan

_____ CHIEF, CONTRACTING, Sheila Winston-Vincuilla

_____ CHIEF, PM-PB, Janet Harrington

_____ CHIEF, DPM, Scott Acone

ESTIMATED TOTAL PROJECT COST:		**$4,706**
ESTIMATED FEDERAL COST:	100%	$4,706
ESTIMATED NON-FEDERAL COST:		
22 - FEASIBILITY STUDY (CAP studies):		
ESTIMATED FEDERAL COST:	100%	
ESTIMATED NON-FEDERAL COST:		
ESTIMATED FEDERAL COST OF PROJECT		**$4,706**

Filename: TPCS_CAP_North Pt Section 204_rev 8-17-20.xlsx
TPCS - P3 All Nearshore

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

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

PROJECT: Newburyport Harbor 204 North Point
LOCATION: Newburyport, MA
This Estimate reflects the scope and schedule in report;

DISTRICT: New England District
POC: CHIEF, COST ENGINEERING, Jeffrey Gaeta

PREPARED: 6/25/2020

Plan 3: Place Material at Near-Shore Sites using Hopper Dredge

Estimate Prepared: 6-May-16
Estimate Price Level: 1-Oct-19

Program Year (Budget EC): 2021
Effective Price Level Date: 1 -Oct-20

		WBS Structure	ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
					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*
		PHASE 1 or CONTRACT 1													
12		NAVIGATION PORTS & HARBORS	$3,020	$630	20.9%	$3,650	3.0%	$3,110	$649	$3,759	2022Q1	2.9%	$3,199	$668	$3,866
		CONSTRUCTION ESTIMATE TOTALS:	$3,020	$630	20.9%	$3,650		$3,110	$649	$3,759			$3,199	$668	$3,866
01		LANDS AND DAMAGES													
30		PLANNING, ENGINEERING & DESIGN													
1.0%		Project Management	$45	$8	18.4%	$54	4.6%	$47	$9	$56	2021Q3	2.1%	$48	$9	$57
1.0%		Planning & Environmental Compliance	$45	$8	18.4%	$54	4.6%	$47	$9	$56	2021Q3	2.1%	$48	$9	$57
3.0%		Engineering & Design	$136	$25	18.4%	$161	4.6%	$142	$26	$168	2021Q3	2.1%	$145	$27	$172
1.0%		Reviews, ATRs, IEPRs, VE	$45	$8	18.4%	$54	4.6%	$47	$9	$56	2021Q3	2.1%	$48	$9	$57
1.0%		Life Cycle Updates (cost, schedule, risks)	$45	$8	18.4%	$54	4.6%	$47	$9	$56	2021Q3	2.1%	$48	$9	$57
1.0%		Contracting & Reprographics	$45	$8	18.4%	$54	4.6%	$47	$9	$56	2022Q1	4.0%	$49	$9	$58
2.0%		Engineering During Construction	$91	$17	18.4%	$107	4.6%	$95	$17	$112	2022Q1	4.0%	$99	$18	$117
1.0%		Planning During Construction	$42	$8	18.4%	$50	4.6%	$44	$8	$52	2021Q3	2.1%	$45	$8	$53
		Adaptive Management & Monitoring			18.4%										
		Project Operations			18.4%										
31		CONSTRUCTION MANAGEMENT													
3.0%		Construction Management	$127	$18	14.1%	$145	4.6%	$133	$19	$151	2022Q1	4.0%	$138	$19	$157
		Project Operation:			14.1%										
1.0%		Project Management	$42	$6	14.1%	$48	4.6%	$44	$6	$50	2022Q1	4.0%	$46	$6	$52
		CONTRACT COST TOTALS:	$3,684	$745		$4,430		$3,805	$769	**$4,574**			$3,914	$791	**$4,706**

Filename: TPCS_CAP_North Pt Section 204_rev 8-17-20.xlsx
TPCS - P3 All Nearshore

Abbreviated Risk Analysis

Project (less than $40M): **North Point Section 204 Beach Renourishment Study** **Alternative: Plan 1: Place Material at North Point**

Project Development Stage/Alternative: **Feasibility (Recommended Plan)**

Risk Category: **Moderate Risk: Typical Project Construction Type** **Meeting Date: 6/25/2020**

Total Estimated Construction Contract Cost = $ 4,632,790

	CWWBS	Feature of Work	Estimated Cost		% Contingency	$ Contingency	Total
	01 LANDS AND DAMAGES	Real Estate	$ -		0%	$ -	$ -
1	12 02 HARBORS	**Mobilization & Demobilization**	$ 1,358,638		22%	$ 302,061	$ 1,660,699
2	12 02 HARBORS	**Dredge Federal Channel**	$ 1,546,735		24%	$ 374,417	$ 1,921,152
3	12 02 HARBORS	**Place Material at North Point Beach**	$ 1,131,907		18%	$ 206,138	$ 1,338,045
4					0%	$ -	$ -
5					0%	$ -	$ -
6					0%	$ -	$ -
7					0%	$ -	$ -
8					0%	$ -	$ -
9					0%	$ -	$ -
10					0%	$ -	$ -
11					0%	$ -	$ -
12	All Other	**Remaining Construction Items**	$ 595,510	*14.8%*	14%	$ 84,130	$ 679,640
13	30 PLANNING, ENGINEERING, AND DESIGN	**Planning, Engineering, & Design**	$ 509,607		18%	$ 93,781	$ 603,388
14	31 CONSTRUCTION MANAGEMENT	**Construction Management**	$ 185,312		14%	$ 26,180	$ 211,491
XX	FIXED DOLLAR RISK ADD (EQUALLY DISPERSED TO ALL, MUST INCLUDE JUSTIFICATION SEE BELOW)					$ -	

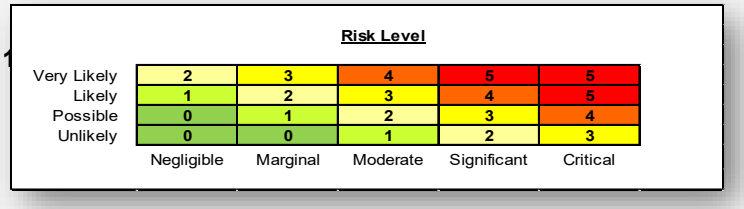
Totals					
Real Estate	$ -	0%	$ -	$ -	
Total Construction Estimate	$ 4,632,790	20.87%	$ 966,747	$ 5,599,537	
Total Planning, Engineering & Design	$ 509,607	18.40%	$ 93,781	$ 603,388	
Total Construction Management	$ 185,312	14.13%	$ 26,180	$ 211,491	
Total Excluding Real Estate	**$ 5,327,709**	**20.40%**	**$ 1,086,707**	**$ 6,414,416**	
		Base	**50%**	**80%**	
Confidence Level Range Estimate ($000's)		$5,328k	$5,980k	$6,414k	

* 50% based on base is at 5% CL.

Fixed Dollar Risk Add: (Allows for additional risk to be added to the risk analsyis. Must include justification. Does not allocate to Real Estate.	

North Point Section 204 Beach Renourishment Study Plan 1

Feasibility (Recommended Plan)
Abbreviated Risk Analysis
Meeting Date: 25-Jun-20



Risk Register

Risk Element	Feature of Work	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Impact	Likelihood	Risk Level
Project Management & Scope Growth				**Maximum Project Growth**		**75%**
PS-1	Mobilization & Demobilization	The customer may request material to be placed at a different location than North Point.	Over the history of this project, there have been multiple locations proposed for beach placement. While a location change is unlikely to happen, if it did, it would have a moderate impact on the hydraulic dredging costs since it would likely increase the amount of pipe required to be mobilized to the project site.	Moderate	Unlikely	1
PS-2	Dredge Federal Channel	The customer may request material to be placed at a different location than North Point.	Over the history of this project, there have been multiple locations proposed for beach placement. While a location change is unlikely to happen, if it did, it would have a moderate impact on the hydraulic dredging costs since it would likely increase the amount of pipe required to complete the job.	Moderate	Unlikely	1
PS-3	Place Material at North Point Beach	The customer may request material to be placed at a different location than North Point.	Over the history of this project, there have been multiple locations proposed for beach placement. However, it is unlikely to result in a change to the beach construction costs as the quantity of beach construction would remain the same.	Negligible	Unlikely	0
PS-12	Remaining Construction Items	The customer may request material to be placed at a different location than North Point.	Over the history of this project, there have been multiple locations proposed for beach placement. However, it is unlikely to result in a change to the oversight costs as the period of performance would remain the same.	Negligible	Unlikely	0
PS-13	Planning, Engineering, & Design	The customer may request material to be placed at a different location than North Point.	Over the history of this project, there have been multiple locations proposed for beach placement. While a location change is unlikely to happen, if it did, it would have a moderate impact on the PED phase costs.	Moderate	Unlikely	1
PS-14	Construction Management	The customer may request material to be placed at a different location than North Point.	Over the history of this project, there have been multiple locations proposed for beach placement. However, it is unlikely to result in a change to the USACE oversight costs as the period of performance would remain the same.	Negligible	Unlikely	0
Acquisition Strategy				**Maximum Project Growth**		**30%**
AS-1	Mobilization & Demobilization	The solicitation may be procured using a small business set aside.	Using a small business set-aside is likely to result in higher contractor markups. The MII estimate accounts for this risk by including 12% for HOOH, 10% for Profit, and 2% for Bond. As such, this risk is expect to have a negligible cost impact, although an impact is still possible.	Negligible	Possible	0
AS-2	Dredge Federal Channel	The solicitation may be procured using a small business set aside.	Using a small business set-aside is likely to result in higher contractor markups. The MII estimate accounts for this risk by including 12% for HOOH, 10% for Profit, and 2% for Bond. As such, this risk is expect to have a negligible cost impact, although an impact is still possible.	Negligible	Possible	0

AS-3	Place Material at North Point Beach	The solicitation may be procured using a small business set aside.	Using a small business set-aside is likely to result in higher contractor markups. The MII estimate accounts for this risk by including 12% for HOOH, 10% for Profit, and 2% for Bond. As such, this risk is expect to have a negligible cost impact, although an impact is still possible.	Negligible	Possible	0
AS-12	Remaining Construction Items	The solicitation may be procured using a small business set aside.	Using a small business set-aside is likely to result in higher contractor markups. The MII estimate accounts for this risk by including 12% for HOOH, 10% for Profit, and 2% for Bond. As such, this risk is expect to have a negligible cost impact, although an impact is still possible.	Negligible	Possible	0
AS-13	Planning, Engineering, & Design	The solicitation may be procured using a small business set aside.	Professional experience indicates that, even if we were to set this project aside, USACE would likely include a DRC in the contract which requires the KTR to demonstrate they have the correct equipment and have performed similar work in the past. Development of the DRC would require only a minor amount of PDT development.	Negligible	Possible	0
AS-14	Construction Management	The solicitation may be procured using a small business set aside.	If USACE uses a small business set aside, it will have a negligible impact on USACE's oversight costs.	Negligible	Possible	0
Construction Elements				**Maximum Project Growth**		**25%**
CE-1	Mobilization & Demobilization	The KTR may encounter cobbles or other hard material while dredging the Federal channel.	USACE has collected a thorough set of geotechnical samples in the areas where the channel is to be built, which indicate that the material is primarily sand. In the unlikely case that hard material is encountered and required to be removed, this would require mobilizing new equipment to the site. This would cause a significant cost growth to the project.	Significant	Unlikely	2
CE-2	Dredge Federal Channel	The KTR may encounter cobbles or other hard material while dredging the Federal channel.	USACE has collected a thorough set of geotechnical samples in the areas where the channel is to be built, which indicate that the material is primarily sand. In the unlikely case that hard material is encountered, this would require a significant effort to either remove or work around said material.	Significant	Unlikely	2
CE-3	Place Material at North Point Beach	The KTR may encounter cobbles or other hard material while dredging the Federal channel.	USACE has collected a thorough set of geotechnical samples in the areas where the channel is to be built, which indicate that the material is primarily sand. In the unlikely case that hard material is encountered, there would be no impact on the beach construction since the hard material is not suitable for placement in this area.	Negligible	Unlikely	0
CE-12	Remaining Construction Items	The KTR may encounter cobbles or other hard material while dredging the Federal channel.	USACE has collected a thorough set of geotechnical samples in the areas where the channel is to be built, which indicate that the material is primarily sand. In the unlikely case that hard material is encountered, this would require a contract modification, increasing the administrative costs for the KTR to manage and oversee the contract.	Marginal	Unlikely	0
CE-13	Planning, Engineering, & Design	The KTR may encounter cobbles or other hard material while dredging the Federal channel.	USACE has collected a thorough set of geotechnical samples in the areas where the channel is to be built, which indicate that the material is primarily sand. In the unlikely case that hard material is encountered, this would require a contract modification, which may involve USACE conducting additional surveys to verify the presence of hard material.	Moderate	Unlikely	1

CE-14	Construction Management	The KTR may encounter cobbles or other hard material while dredging the Federal channel.	USACE has collected a thorough set of geotechnical samples in the areas where the channel is to be built, which indicate that the material is primarily sand. In the unlikely case that hard material is encountered, this would require a contract modification; however, USACE oversight costs are not likely to change since S&A costs are determined prior to contract award.	Negligible	Unlikely	0
Specialty Construction or Fabrication				**Maximum Project Growth**		**65%**
SC-1	Mobilization & Demobilization	KTR may not be able to procure the proper dredging equipment to complete this work.	This alternative requires the use of readily-available hydraulic dredging equipment to place material at North Point and standard construction equipment to construct the beach (a dozer and excavator). As such, the impact of any specialty equipment is negligible and unlikely.	Negligible	Unlikely	0
SC-2	Dredge Federal Channel	KTR may not be able to procure the proper dredging equipment to complete this work.	This alternative requires the use of readily-available hydraulic dredging equipment to place material at North Point. As such, the impact of any specialty equipment is negligible and unlikely.	Negligible	Unlikely	0
SC-3	Place Material at North Point Beach	KTR may not be able to procure the proper beach construction equipment to complete this work.	This alternative requires the use of standard construction equipment to construct the beach (a dozer and excavator). As such, the impact of any specialty equipment is negligible and unlikely.	Negligible	Unlikely	0
SC-12	Remaining Construction Items	The PDT does not have specific concerns with regard to this Feature of Work.	n/a	Negligible	Unlikely	0
SC-13	Planning, Engineering, & Design	The PDT does not have specific concerns with regard to this Feature of Work.	n/a	Negligible	Unlikely	0
SC-14	Construction Management	The PDT does not have specific concerns with regard to this Feature of Work.	n/a	Negligible	Unlikely	0
Technical Design & Quantities				**Maximum Project Growth**		**30%**
T-1	Mobilization & Demobilization	The design is based on a 2018 dredge survey and there could be additional material to dredge in the Federal channel than what is being assumed.	Any additional material in the channel is not likely to change the size of the equipment necessary to complete this job. Thus the cost impact is negligible and unlikely.	Negligible	Unlikely	0
T-2	Dredge Federal Channel	The design is based on a 2018 dredge survey and there could be additional material to dredge in the Federal channel than what is being assumed.	The PDT does not anticipate a large amount of additional material in the channel as the survey was recently completed in 2018. As such, the cost impacts any additional material are only expected to be marginal and possible.	Marginal	Possible	1
T-3	Place Material at North Point Beach	The design is based on a 2018 dredge survey and there could be additional material to place on the beach from the Federal channel than what is being assumed.	The PDT does not anticipate a large amount of additional material in the channel as the survey was recently completed in 2018. As such, the cost impacts any additional material are only expected to be marginal and possible.	Marginal	Possible	1
T-12	Remaining Construction Items	The design is based on a 2018 dredge survey and there could be additional material to dredge in the Federal channel than what is being assumed.	Any additional material in the channel is not likely to change the amount of KTR oversight required since the project is based on a recent survey and any quantity increases are expected to be marginal.	Negligible	Unlikely	0
T-13	Planning, Engineering, & Design	The design is based on a 2018 dredge survey and there could be additional material to dredge in the Federal channel than what is being assumed.	The PDT does not anticipate completing an additional survey before contract award. As such, additional material will have no impact on the PED phase costs.	Negligible	Unlikely	0
T-14	Construction Management	The design is based on a 2018 dredge survey and there could be additional material to dredge in the Federal channel than what is being assumed.	Any additional material in the channel is not likely to change the amount of USACE oversight required since the project is based on a recent survey and any quantity increases are expected to be marginal.	Negligible	Unlikely	0
Cost Estimate Assumptions				**Maximum Project Growth**		**35%**

EST-1	Mobilization & Demobilization	The Mobilization & Demobilization distances used in the CEDEP file may not be sufficient to capture the winning contractor's costs for this feature of work.	The estimate assumes that the winning KTR mobilizes from New York, roughly 400-miles away from the project location. This represents a reasonable assumption based on historical experience. However, it's possible that a KTR could mobilize from further away or take longer to install the pipeline. This risk could have a moderate impact on cost growth and the PDT determined its likelihood to be possible.	Moderate	Possible	2
EST-2	Dredge Federal Channel	The cost estimate might not include the correct assumptions in the CEDEP files to estimate the hydraulic dredging.	The cost estimate to dredge the Federal channel is built using similar assumptions and NAE Cost Estimating SOPs that have been used to award previous USACE hydraulic dredging contracts. That said, this estimator tends to underestimate dredging contracts. Thus, the possibility for cost growth is possible for this item.	Moderate	Possible	2
EST-3	Place Material at North Point Beach	The cost estimate might not have sufficient labor and equipment costs to capture the work required to construct the beach.	The cost estimate to construct the beach is built using the same historical crew size that have been used to award previous USACE hydraulic dredging contracts. That said, this estimator tends to underestimate dredging contracts. Thus, the possibility for cost growth is possible for this item.	Moderate	Possible	2
EST-12	Remaining Construction Items	The cost estimate might not have sufficient oversigth costs to capture the work required meet contract general conditions requirements.	The oversight costs were based on historical contract requirements for KTR oversight. There may be additional requirements for this contract, which come to light during the PED phase. As such, the cost growth is possible, but would only be marginal.	Marginal	Possible	1
EST-13	Planning, Engineering, & Design	PED phase costs may be too low since they are based on percentages rather than detailed cost estimates from PDT members.	The FS report is to be reviewed in-house by experienced section chiefs, so, while it is possible that the budget is too low, the impacts are mitigated by this layer of review.	Marginal	Possible	1
EST-14	Construction Management	Construction Management phase costs may be too low since they are based on percentages rather than detailed cost estimates from PDT members.	The FS report is to be reviewed in-house by experienced section chiefs, so, while it is possible that the budget is too low, the impacts are mitigated by this layer of review.	Marginal	Possible	1
External Project Risks				**Maximum Project Growth**		**40%**
EX-1	Mobilization & Demobilization	The project schedule may be delayed during the PED phase, thereby impacting the midpoint of construction.	If the project schedule slides during the PED phase, there may be a corresponding slide during the construction phase which pushes back the midpoint of construction. Such a risk is expected to have a marginal impact, since only the escalation of the project costs are affected. The PDT determined that this risk has a "possible" likelihood.	Marginal	Possible	1
EX-2	Dredge Federal Channel	The project schedule may be delayed during the PED phase, thereby impacting the midpoint of construction.	If the project schedule slides during the PED phase, there may be a corresponding slide during the construction phase which pushes back the midpoint of construction. Such a risk is expected to have a marginal impact, since only the escalation of the project costs are affected. The PDT determined that this risk has a "possible" likelihood.	Marginal	Possible	1
EX-3	Place Material at North Point Beach	The project schedule may be delayed during the PED phase, thereby impacting the midpoint of construction.	If the project schedule slides during the PED phase, there may be a corresponding slide during the construction phase which pushes back the midpoint of construction. Such a risk is expected to have a marginal impact, since only the escalation of the project costs are affected. The PDT determined that this risk has a "possible" likelihood.	Marginal	Possible	1
EX-12	Remaining Construction Items	The project schedule may be delayed during the PED phase, thereby impacting the midpoint of construction.	If the project schedule slides during the PED phase, there may be a corresponding slide during the construction phase which pushes back the midpoint of construction. Such a risk is expected to have a marginal impact, since only the escalation of the project costs are affected. The PDT determined that this risk has a "possible" likelihood.	Marginal	Possible	1

EX-13	Planning, Engineering, & Design	Workload constraints may delay the design schedule.	The team members assigned to the PED phase will have competing interests with other, higher-priority projects, which may delay the design schedule. This, in turn, could result in a delayed award, thereby pushing back the midpoint of construction for all features of work, including the PED phase. This would have a marginal impact on costs and the likelihood is deemed "possible".	Marginal	Possible	**1**
EX-14	Construction Management	The project schedule may be delayed during the PED phase, thereby impacting the midpoint of construction.	If the project schedule slides during the PED phase, there may be a corresponding slide during the construction phase which pushes back the midpoint of construction. Such a risk is expected to have a marginal impact, since only the escalation of the project costs are affected. The PDT determined that this risk has a "possible" likelihood.	Marginal	Possible	**1**

North Point Section 204 Beach Renourishment Study Plan 1: Place Material at North Point
Feasibility (Recommended Plan)
Abbreviated Risk Analysis

Risk Evaluation

WBS	Potential Risk Areas	Project Management & Scope Growth	Acquisition Strategy	Construction Elements	Specialty Construction or Fabrication	Technical Design & Quantities	Cost Estimate Assumptions	External Project Risks	Cost in Thousands
01 LANDS AND DAMAGES	**Real Estate**								$0
12 02 HARBORS	**Mobilization & Demobilization**	**1**	**0**	**2**	**0**	**0**	**2**	**1**	$1,359
12 02 HARBORS	Dredge Federal Channel	**1**	**0**	**2**	**0**	**1**	**2**	**1**	$1,547
12 02 HARBORS	Place Material at North Point Beach	**0**	**0**	**0**	**0**	**1**	**2**	**1**	$1,132
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
0	**0**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$0
All Other	Remaining Construction Items	**0**	**0**	**0**	**0**	**0**	**1**	**1**	$596
30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design	**1**	**0**	**1**	**0**	**0**	**1**	**1**	$510
31 CONSTRUCTION MANAGEMENT	Construction Management	**0**	**0**	**0**	**0**	**0**	**1**	**1**	$185
									$5,328
Risk		$ 81	$ 266	$ 381	$ -	$ 53	$ 194	$ 111	**$1,087**
Fixed Dollar Risk Allocation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$0**
	Risk	$ 81	$ 266	$ 381	$ -	$ 53	$ 194	$ 111	**$1,087**
								Total	**$6,414**

This estimate is for the Section 204 project at North Point on Plum Island. The baseline proposal is to take dredged material to 2 different offshore disposal sites, depositing half the dredged material in each. The alternative proposal is to use the dredged material to rebuild the North Point Beach with land-based equipment.

Escalation taken from Q1FY16 to Q1FY20 for Material and Subcontract RSM cost items.For Equipment items, used Q1FY18 to Q1FY20. CEDEP items and labor rates are current and are thus not escalated in MII. The remainder of the escalation was completed in TPCS spreadsheet. Midpoint of construction assumed in Q1FY22. Assumed KTR works two, 12-hr shifts per day. All work is assumed to be self-performed by the Prime KTR.

Prime KTR Markups

JOOH: 3%

HOOH: 12%

Profit: 10%

Bond: 2%

Estimated by

Designed by

Prepared by Jeremiah Masey

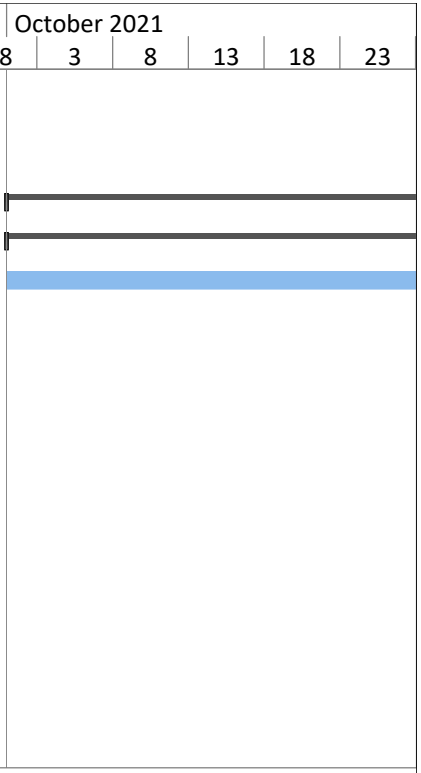
Preparation Date 6/25/2020

Effective Date of Pricing 6/25/2020

Estimated Construction Time 120 Days

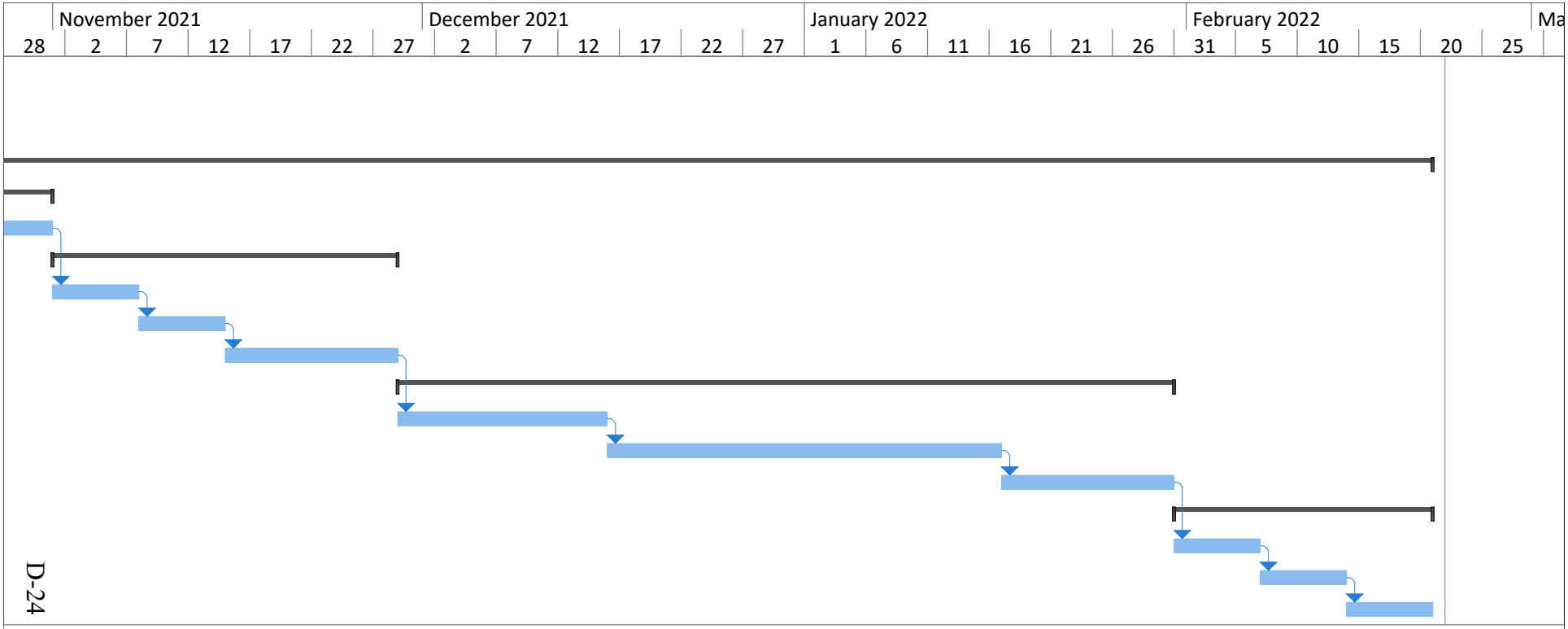
Description	Quantity	UOM	DirectCost	SubCMU	PrimeCMU	Escalation	Contingency	ProjectCost
1.1 Recommended Plan: Place Material at North Point Beach w/ Pipeline Dredge	**1**	**EA**	**3,579,270**	**0**	**1,053,520**	**0**	**0**	**4,632,790**
1.1.1 General Conditions	**4**	**MO**	**460,088**	**0**	**135,422**	**0**	**0**	**595,509**
1.1.2 Mobilization / Demobilization	**1**	**LS**	**1,049,677**	**0**	**308,961**	**0**	**0**	**1,358,638**
1.1.3 Dredging w/ Beach Disposal	**220,000**	**CY**	**2,069,506**	**0**	**609,137**	**0**	**0**	**2,678,643**
1.2 Plan 2: Place Material at North Point and Nearshore Sites w/ Hopper Dredge	**1**	**EA**	**3,295,398**	**0**	**969,965**	**0**	**0**	**4,265,362**
1.2.1 General Conditions	**3**	**MO**	**356,716**	**0**	**104,995**	**0**	**0**	**461,711**
1.2.2 Mobilization / Demobilization	**1**	**LS**	**1,035,278**	**0**	**304,723**	**0**	**0**	**1,340,001**
1.2.3 Hopper Dredging w/ Nearshore Disposal	**163**	**CY**	**967,630**	**0**	**284,811**	**0**	**0**	**1,252,441**
1.2.4 Dredging w/ Beach Disposal	**57,000**	**CY**	**935,774**	**0**	**275,435**	**0**	**0**	**1,211,209**
1.3 Plan 3: Place Material at Nearshore Sites w/ Hopper Dredge	**1**	**EA**	**2,333,144**	**0**	**686,736**	**0**	**0**	**3,019,880**
1.3.1 General Conditions	**2**	**MO**	**254,183**	**0**	**74,816**	**0**	**0**	**329,000**
1.3.2 Mobilization / Demobilization	**1**	**LS**	**807,521**	**0**	**237,685**	**0**	**0**	**1,045,205**
1.3.3 Dredging w/ Nearshore Disposal	**220,000**	**CY**	**1,271,440**	**0**	**374,235**	**0**	**0**	**1,645,675**

ID	Task Mode	Task Name	Duration	Start	Finish
1		Recommended Plan: Place Material at North Point Beach with Pipeline Dredge			
2					
3		**Draft Construction Schedule**	**143 days**	**Fri 10/1/21**	**Mon 2/21/22**
4		**Pre-Construction Activities**	**31 days**	**Fri 10/1/21**	**Mon 11/1/21**
5		Pre-Con Submittals	31 days	Fri 10/1/21	Mon 11/1/21
6		**Mobilization**	**28 days**	**Mon 11/1/21**	**Mon 11/29/21**
7		Prepare for Mobilization	7 days	Mon 11/1/21	Mon 11/8/21
8		Mobilize to Site	7 days	Mon 11/8/21	Mon 11/15/21
9		Setup Pipeline	14 days	Mon 11/15/21	Mon 11/29/21
10		**Dredging**	**63 days**	**Mon 11/29/21**	**Mon 1/31/22**
11		Dredge 9-ft Channel & Construct Beach	17 days	Mon 11/29/21	Thu 12/16/21
12		Dredge 15-ft Channel & Construct Beac	32 days	Thu 12/16/21	Mon 1/17/22
13		Adverse Weather Days	14 days	Mon 1/17/22	Mon 1/31/22
14		**Demobilization**	**21 days**	**Mon 1/31/22**	**Mon 2/21/22**
15		Break Down Pipeline	7 days	Mon 1/31/22	Mon 2/7/22
16		Demobilize	7 days	Mon 2/7/22	Mon 2/14/22
17		Prepare Pipeline for Storage	7 days	Mon 2/14/22	Mon 2/21/22



Project: North Point Section 204
Date: Fri 8/21/20

Task	Inactive Task	Start-only	
Split	Inactive Milestone	Finish-only	
Milestone	Inactive Summary	Deadline	
Summary	Manual Task	Progress	
Project Summary	Duration-only	Manual Progress	
External Tasks	Manual Summary Rollup		
External Milestone	Manual Summary		



Project: North
Point Section 204
Date: Fri 8/21/20

Task		Inactive Task		Start-only	
Split		Inactive Milestone		Finish-only	
Milestone		Inactive Summary		Deadline	
Summary		Manual Task		Progress	
Project Summary		Duration-only		Manual Progress	
External Tasks		Manual Summary Rollup			
External Milestone		Manual Summary			