



**US Army Corps
of Engineers®**

**PORT OF ANCHORAGE INTERMODAL
EXPANSION PROJECT – OPTION 1
15% CONCEPT DESIGN
FOR
ALASKA DISTRICT, JOINT BASE ELMENDORF-
RICHARDSON, ALASKA**

Prepared for:

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EXECUTIVE SUMMARY

The purpose of this report is to inform the stakeholders of the cost and schedule risks and their resulting impacts on project cost and duration. The project is considering three options, developed to a 15% CONCEPT stage of design. The project includes Features 08 Roads, Railroads; 12 Navigation Ports & Harbors; 16 Bank Stabilization; and 19 Buildings, Grounds, & Utilities. The method used was a Cost and Schedule Risk Analysis as directed in W912PP-09-D-0016, Task Order ZJ03 3.a. COST ESTIMATE. The contingency results are shown in Table 1 with the relative confidence of cost under run. Recommended risk mitigation strategies are varied and summarized in Section 8 of this report.

Table 1. Executive Summary of Risk Analysis

Confidence Level	Value
60%	\$363,274,838
80%	\$376,982,054
100%	\$446,700,447

1. PURPOSE

The purpose of this report is to present the cost and schedule forecasts of the Port of Anchorage Intermodal Expansion Project – Option 1, 15% Concept design. The purpose for a Cost and Schedule Risk Analysis (CSRA) is to study elements related to cost and schedule to derive an outcome contingency calculation at the 80th percentile confidence level, for both cost and schedule, which are measured in terms of dollars and months, respectively.

2. BACKGROUND

This project, at the concept design state (15%), was requested by Alaska District U.S. Army Corps of Engineers (USACE) after CH2M HILL completed for review the study on the halted design and construction of the Port of Anchorage Intermodal Expansion Project. The project currently is considering three options, all of which have design developed to the Concept stage (15%). Each option is considered independently and an estimate and CSRA have been developed for each.

3. REPORT SCOPE

The scope of the risk analysis report is to calculate and present the cost and schedule contingencies at the 80 percent confidence level using the risk analysis processes as mandated by USACE Engineer Regulation (ER) 1110-2-1150, Engineering and Design for Civil Works, ER 1110-2-1302, Civil Works Cost Engineering, and Engineer Technical Letter 1110-2-573, Construction Cost Estimating Guide for Civil Works. The report presents the contingency results for both cost and schedule risks for all project features. The study and presentation can include or exclude consideration for operation and maintenance or life cycle costs, depending upon the program or decision document intended for funding.

3.1 Project Scope

The report includes the project technical scope, estimates, and schedules as developed and presented by CH2M HILL. Consequently, these documents serve as the basis for the risk analysis. In general, the construction scope consists of the following:

- 08 Roads, Railroads, and Bridges (15% Concept Design Stage)
- 12 Navigation Ports & Harbors (15% Concept Design Stage)
- 16 Bank Stabilization (15% Concept Design Stage)
- 19 Buildings, Grounds, & Utilities (15% Concept Design Stage)

3.2 USACE Risk Analysis Process

The risk analysis process followed the contract stipulations and the USACE Headquarters requirements as well as the guidance provided by the Cost Engineering Directory of Expertise for Civil Works (Cost Engineering DX). The risk analysis process reflected within the risk analysis report uses probabilistic cost and schedule risk analysis

methods within the framework of the Crystal Ball software. The risk analysis results are intended to serve several functions, one being the establishment of reasonable contingencies reflective of an 80 percent confidence level to accomplish the project work successfully within that established contingency amount. Furthermore, the scope of the report includes the identification and communication of important steps, logic, key assumptions, limitations, and decisions to help ensure that risk analysis results can be appropriately interpreted.

Risk analysis results are also intended to provide project leadership with contingency information for scheduling, budgeting, and project control purposes, as well as provide tools to support decision-making and risk management as the project progresses through planning and implementation. To fully recognize its benefits, cost and schedule risk analyses should be considered as an ongoing process conducted concurrent to, and iteratively with, other important project processes such as scope and execution plan development, resource planning, procurement planning, cost estimating, budgeting, and scheduling.

In addition to broadly defined risk analysis standards and recommended practices, the risk analysis is performed to meet the requirements and recommendations of the following documents and sources:

- W912PP-09-D-0016, Task Order ZJ03 3.a. COST ESTIMATE
- ER 1110-2-1150, Engineering and Design for Civil Works Projects
- ER 1110-2-1302, Civil Works Cost Engineering
- ETL 1110-2-573, Construction Cost Estimating Guide for Civil Works
- Cost and Schedule Risk Analysis Process guidance prepared by the USACE Cost Engineering DX

4. METHODOLOGY/PROCESS

The Project Delivery Team (PDT) was composed of members of Task 3 Concept Plan Charrette, as well as CH2M HILL personnel later executing the estimate and risk analysis.

The Cost Engineering DX guidance for cost and schedule risk analysis generally focuses on the 80-percent level of confidence (P80) for cost contingency calculation. It should be noted that use of P80 as a decision criteria is a risk adverse approach.

The risk analysis process uses *Monte Carlo* techniques to determine probabilities and contingency. The *Monte Carlo* techniques are facilitated computationally by a commercially available risk analysis software package (Crystal Ball) that is an add-in to Microsoft Excel. Cost estimates are packaged into an Excel format and used directly for cost risk analysis purposes. Because Crystal Ball is an Excel add-in, the schedules for each option are recreated in an Excel format from their native format. The level of detail recreated in the Excel-format schedule is sufficient for risk analysis purposes that reflect the established risk register, but generally less than that of the native format.

The primary steps, in functional terms, of the risk analysis process are described in the following subsections. Risk analysis results would be provided in Section 6.

4.1 Identify and Assess Risk Factors

Identifying the risk factors with the PDT is considered a qualitative process that results in establishing a risk register that serves as the document for the further study using the Crystal Ball risk software. Risk factors are events and conditions that may influence or drive uncertainty in project performance. They may be inherent characteristics or conditions of the project or external influences, events, or conditions such as weather or economic conditions. Risk factors may have either favorable or unfavorable impacts on project cost and schedule.

Checklists or historical databases of common risk factors are sometimes used to facilitate risk factor identification. However, key risk factors are often unique to a project and not readily derivable from historical information. Therefore, input from the entire PDT is obtained using creative processes such as brainstorming or other facilitated risk assessment meetings. In practice, a combination of professional judgment from the PDT and empirical data from similar projects is desirable and is considered.

Formal PDT meetings were held as a part of the design charrette for the purposes of identifying and assessing risk factors. The meetings held included capable and qualified representatives from multiple project team disciplines and functions:

- Project/program managers
- Environmental
- Civil, structural, geotechnical, and hydraulic design
- Cost and schedule engineers
- Key sponsors

Additionally, numerous conference calls and informal meetings are conducted throughout the risk analysis process on an as-needed basis to further facilitate risk factor identification, market analysis, and risk assessment.

4.2 Quantify Risk Factor Impacts

The quantitative impacts of risk factors on project plans are analyzed using a combination of professional judgment, empirical data, and analytical techniques. Risk factor impacts are quantified using probability distributions, because risk factors are entered into the Crystal Ball software in the form of probability density functions.

Similar to the identification and assessment process, risk factor quantification involves multiple project team disciplines and functions. However, the quantification process used herein relied more extensively on collaboration between cost engineering, designers, and risk analysis team members with lesser inputs from other functions and disciplines.

The following are PDT quantifying risk factor impacts:

- Maximum possible value for the risk factor
- Minimum possible value for the risk factor
- Most likely value (the statistical mode), if applicable
- Nature of the probability density function used to approximate risk factor uncertainty
- Mathematical correlations between risk factors
- Affected cost estimate and schedule elements

In this analysis, the risk discussions focused on the various project features as presented within the USACE Civil Works Work Breakdown Structure for cost accounting purposes. It was recognized that the various features carry differing degrees of risk as related to cost, schedule, design complexity, and design progress. The project features under study are presented in Table 2:

Table 2. Work Breakdown Structure by Feature

08	Roads, Railroads, and Bridges
12	Navigation Ports & Harbors
16	Bank Stabilization
20	Buildings, Grounds, & Utilities

The resulting product from the PDT discussions is captured within a risk register as presented in Section 6 for both cost and schedule risk concerns. Note that the risk register records the PDT's risk concerns, and potential impacts to the current cost and schedule estimates. The concerns should support the team's decisions related to event likelihood, impact, and the resulting risk levels for each risk event.

4.3 Analyze Cost Estimate and Schedule Contingency

Contingency is analyzed using the Crystal Ball software, an add-in to the Microsoft Excel format of the cost estimate and schedule. *Monte Carlo* simulations are performed by applying the risk factors (quantified as probability density functions) to the appropriate estimated cost and schedule elements identified by the PDT. Contingencies are calculated by applying only the moderate and high level risks identified for each option (i.e., low-level risks are typically not considered, but remain within the risk register to serve historical purposes as well as support follow-on risk studies as the project and risks evolve).

For the cost estimate, the contingency is calculated as the difference between the P80 cost forecast and the base cost estimate. For schedule contingency analysis, the option schedule contingency is calculated as the difference between the P80 option duration forecast and the base schedule duration. These contingencies are then used to

calculate the time value of money impact of project delays that are included in the presentation of total cost contingency in Section 6. The resulting time value of money, or added risk escalation, is then added into the contingency amount to reflect the USACE standard for presenting the “total project cost” for the fully funded project amount.

5. KEY ASSUMPTIONS

The following are key assumptions for the risk analysis identified by the PDT and risk analysts.

- Contract acquisition strategy assumed to be single prime contract DBB.
- Accuracy range of estimate is +30% to -15%.
- The contingency is determined after consideration of the project’s exposure to the studied risks. The recommended level of 80% should be carefully examined.
- All impact levels, those with high, moderate, or low risk level ratings, were studied and applied within the risk analysis.

6. RISK ANALYSIS RESULTS

6.1 Risk Register

The risk register reflects the results of risk factor identification and assessment, risk factor quantification, and contingency analysis (provided in Attachment A). A risk register can be an effective tool for managing identified risks throughout the project life cycle. As such, it is generally recommended that risk registers be updated as the designs, cost estimates, and schedule are further refined, especially on large projects with extended schedules. Recommended uses of the risk register going forward include:

- Documenting risk mitigation strategies pursued in response to the identified risks and their assessment in terms of probability and impact.
- Providing project sponsors, stakeholders, and leadership/management with a documented framework from which risk status can be reported in the context of project controls.
- Communicating risk management issues.
- Providing a mechanism for eliciting risk analysis feedback and project control input.
- Identifying risk transfer, elimination, or mitigation actions required for implementation of risk management plans.

6.2 Cost Risk Analysis – Base Cost Contingency Results

Cost risk as studied by the PDT and developed through the register and *Monte Carlo* processes is presented here. This section does not include cost escalation risk, which is studied separately and reported below in Section 6.4.

The sensitivity chart below reflects the areas of greatest concern, rated in order of criticality, and referenced to risks as shown in the risk register (and to the three-point estimate, see Attachment B for code references). Generally, the areas of high criticality are Market Conditions and Bidding Competition (PR-2), Poor construction quality/Hidden defects (CON-4), Historic Change Order Growth (CON-8), and Acts of God (PR-5).

Base Cost Sensitivity Chart

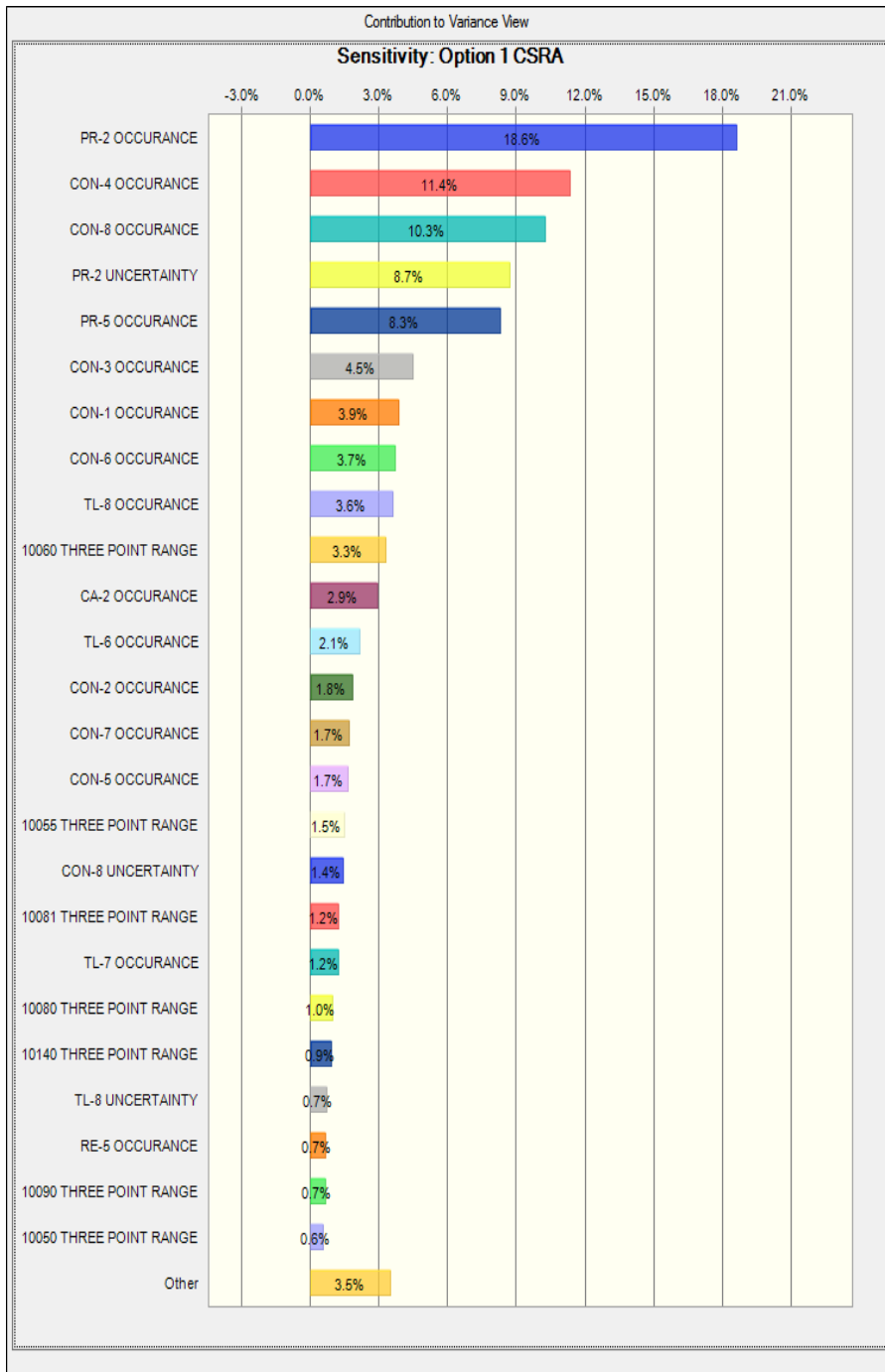
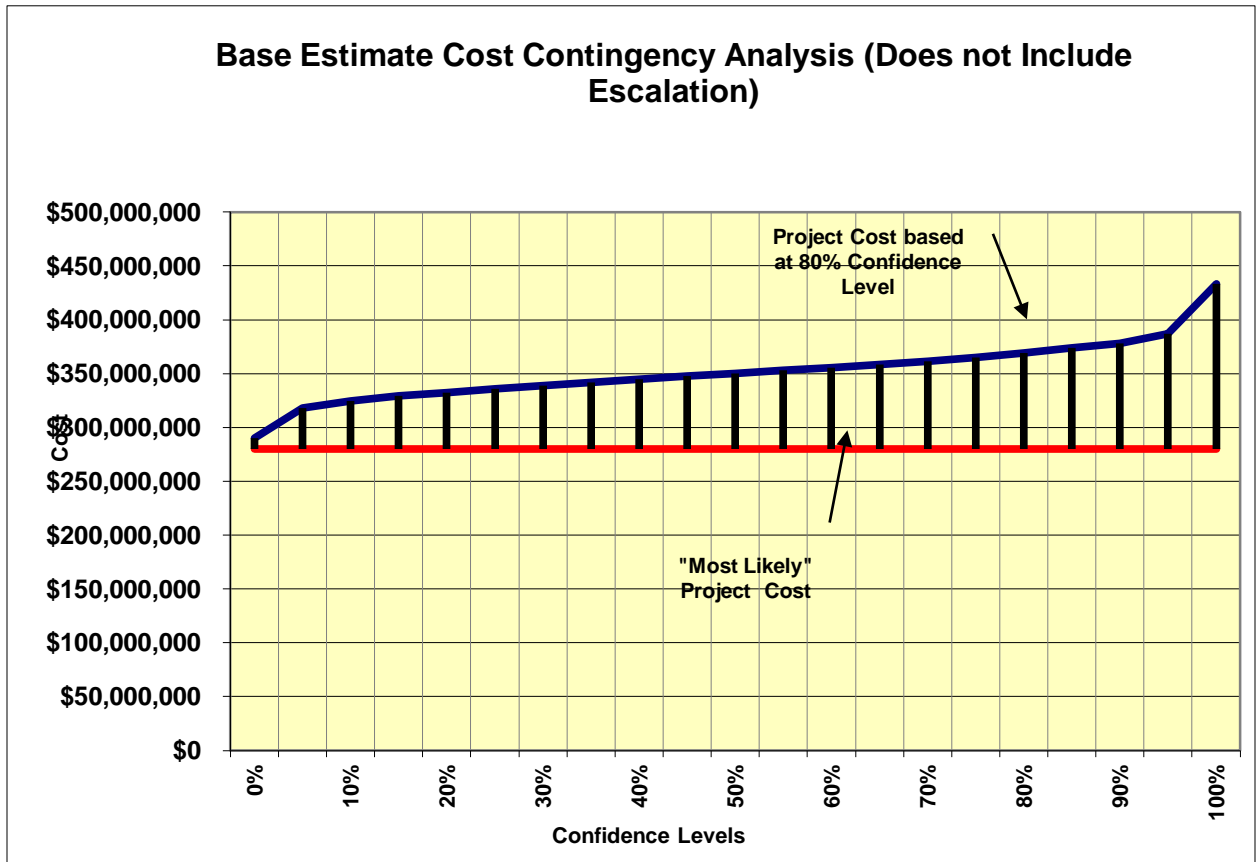


Table 3. Base Cost Confidence

Contingency Analysis

Most Likely Cost Estimate	\$280,082,839	
Confidence Level	Value	Contingency
0%	\$289,931,745	3.52%
5%	\$317,888,449	13.50%
10%	\$324,315,564	15.79%
15%	\$329,113,977	17.51%
20%	\$332,402,618	18.68%
25%	\$335,573,293	19.81%
30%	\$338,904,440	21.00%
35%	\$341,841,390	22.05%
40%	\$344,687,563	23.07%
45%	\$347,437,117	24.05%
50%	\$350,162,976	25.02%
55%	\$352,884,064	25.99%
60%	\$355,465,340	26.91%
65%	\$358,347,762	27.94%
70%	\$361,655,747	29.12%
75%	\$365,125,430	30.36%
80%	\$369,172,557	31.81%
85%	\$373,836,524	33.47%
90%	\$377,729,070	34.86%
95%	\$387,158,666	38.23%
100%	\$433,521,071	54.78%

Base Cost Confidence Chart



NOTE: These results reflect only those contingencies established from the cost risk analysis. For combined cost and schedule risk analysis, refer to Section 6.4.

6.3 Schedule Risk Analysis - Schedule Contingency Results

The base schedule was estimated at 30 months, and assumed a construction start in April 2015. Risks were analyzed for schedule impact, and the resulting uncertainty is expressed below.

The sensitivity chart below reflects the areas of greatest concern, rated in order of criticality, and referenced to risks as shown in the risk register. Generally, the areas of high criticality are Unpredictable Funding (PPM-1), Lack of a Master Plan (D-01), and Acts of God (PR-5).

Schedule Sensitivity Chart:

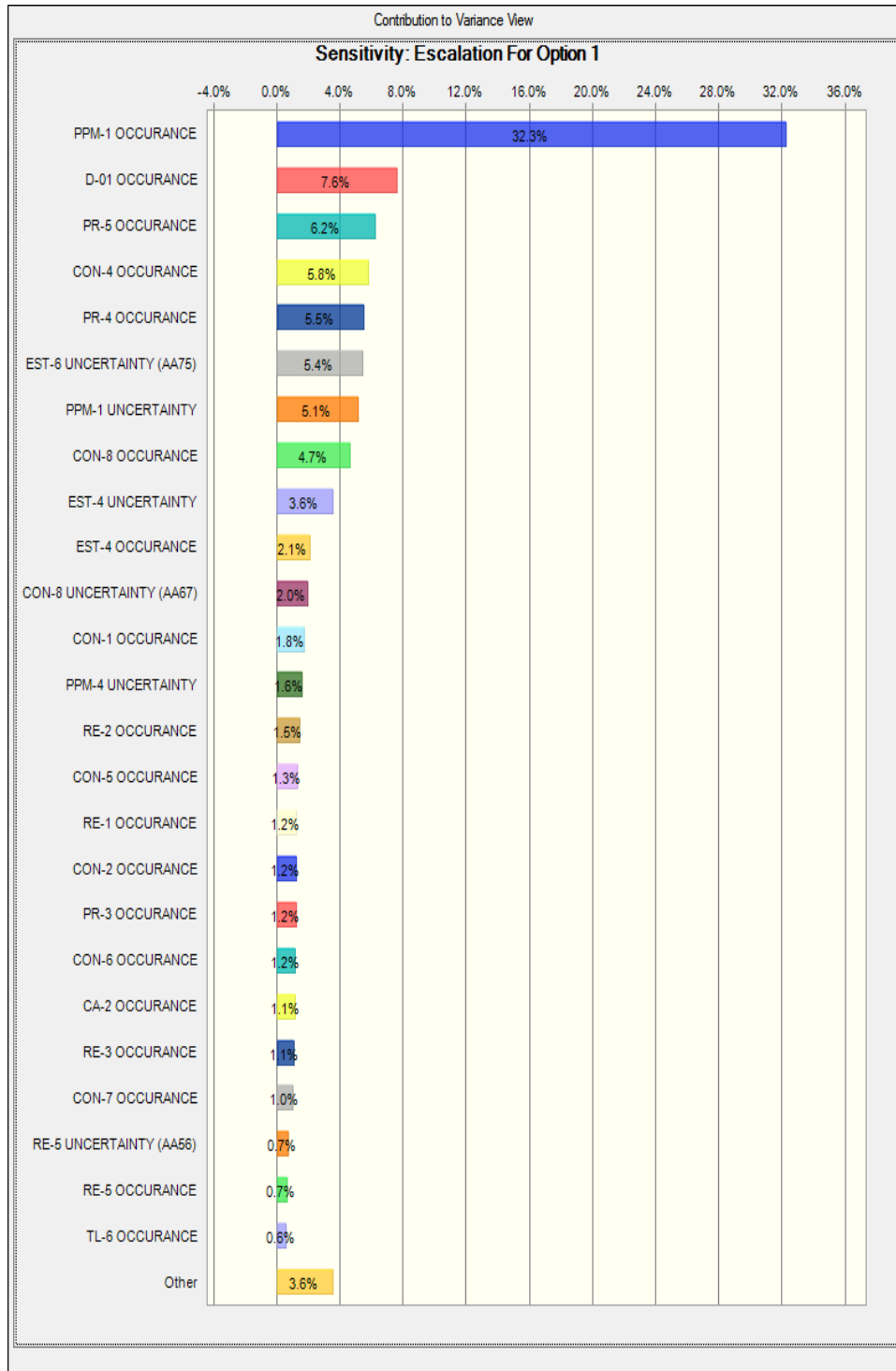
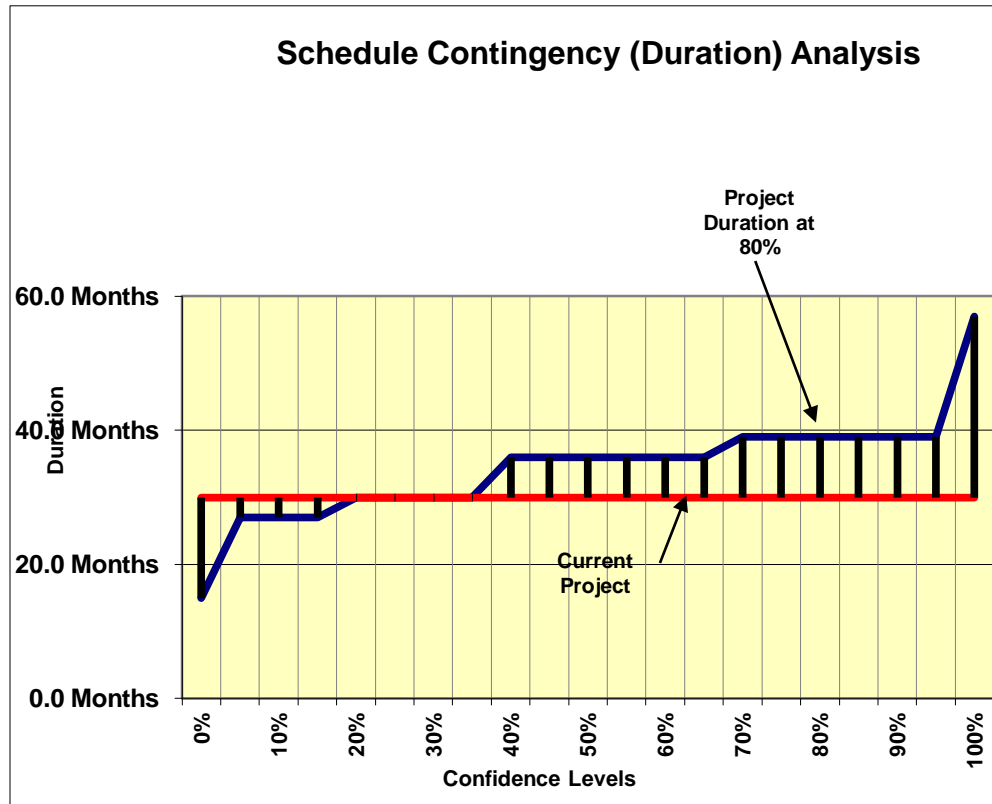


Table 4. Schedule Confidence

Contingency Analysis

Most Likely Schedule	30.0 Months	
Confidence Level	Value	Contingency
0%	15.0 Months	-50.00%
5%	27.0 Months	-10.00%
10%	27.0 Months	-10.00%
15%	27.0 Months	-10.00%
20%	30.0 Months	0.00%
25%	30.0 Months	0.00%
30%	30.0 Months	0.00%
35%	30.0 Months	0.00%
40%	36.0 Months	20.00%
45%	36.0 Months	20.00%
50%	36.0 Months	20.00%
55%	36.0 Months	20.00%
60%	36.0 Months	20.00%
65%	36.0 Months	20.00%
70%	39.0 Months	30.00%
75%	39.0 Months	30.00%
80%	39.0 Months	30.00%
85%	39.0 Months	30.00%
90%	39.0 Months	30.00%
95%	39.0 Months	30.00%
100%	57.0 Months	90.00%

Schedule Confidence Chart



NOTE: These results reflect only those contingencies established from the schedule risk analysis.

6.4 Combined Cost and Schedule Contingency Results

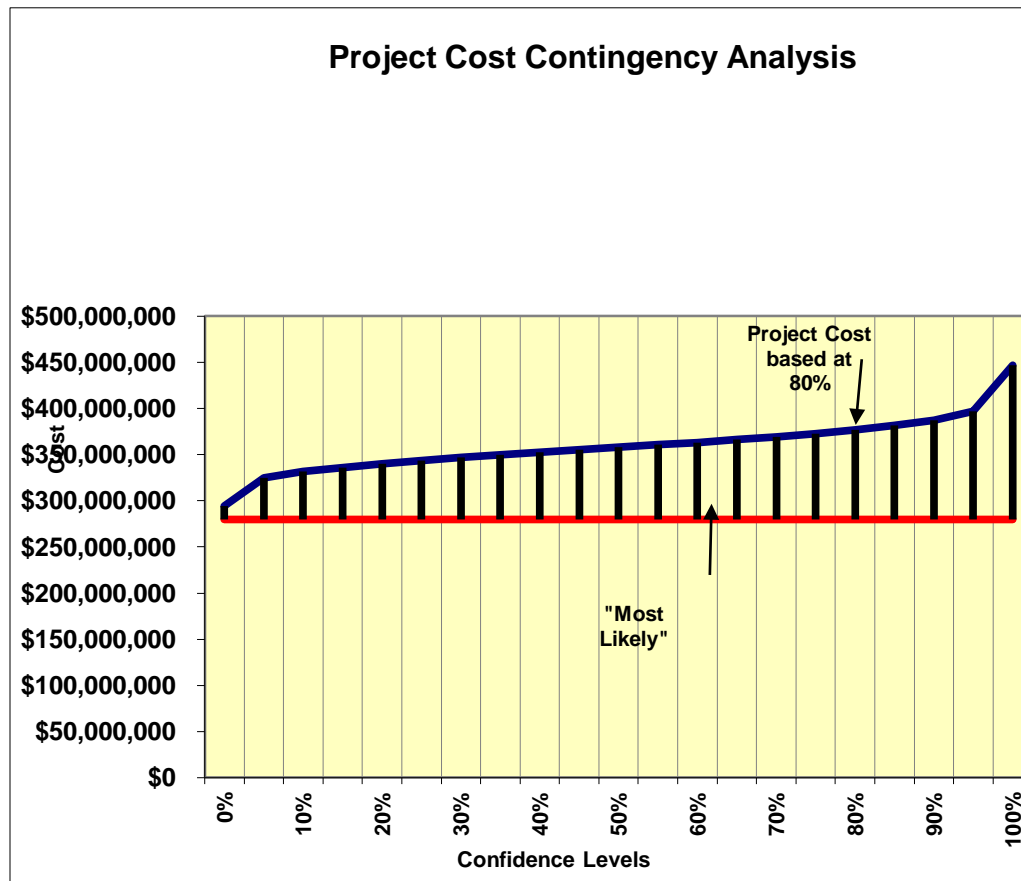
The cost risk analysis and schedule risk analysis contribute to a total project cost risk analysis. The schedule risk creates exposure to delays and risk of cost escalation. The purpose of analyzing schedule risk allows the project uncertainty to comprehend both the cost elements and their risks, but also how those costs are affected by the time element of the project and its associated risks. Presented here are the combine cost and schedule contingency results:

Table 5. Cost Confidence (Combined Cost and Schedule)

Contingency Analysis

Most Likely Cost Estimate	\$280,082,839	
Confidence Level	Value	Contingency
0%	\$294,477,887	5.14%
5%	\$325,037,021	16.05%
10%	\$331,464,136	18.35%
15%	\$336,262,549	20.06%
20%	\$340,212,115	21.47%
25%	\$343,382,790	22.60%
30%	\$346,713,938	23.79%
35%	\$349,650,888	24.84%
40%	\$352,497,060	25.85%
45%	\$355,246,614	26.84%
50%	\$357,972,473	27.81%
55%	\$360,693,561	28.78%
60%	\$363,274,838	29.70%
65%	\$366,157,259	30.73%
70%	\$369,465,245	31.91%
75%	\$372,934,928	33.15%
80%	\$376,982,054	34.60%
85%	\$381,646,021	36.26%
90%	\$387,526,528	38.36%
95%	\$396,956,124	41.73%
100%	\$446,700,447	59.49%

Combined Cost and Schedule Chart



7. MAJOR FINDINGS/OBSERVATIONS

CH2M HILL prepared an estimate as an input to the CSRA, which utilized contingencies typical for the project type and design stage, as well as those identified by the stakeholders as required. This estimate is considered a deterministic, point-value estimate, from which contingencies and escalation was removed in order to study the project's exposure to risk and their impacts on cost and schedule. The results find that these contingencies as used in the deterministic estimate are reasonable in providing a similar degree of confidence as resulted from the CSRA study. The benefits of the CSRA are the identification of risks for future mitigation and management effort, as well as to communicate the underlying contributors to project cost and schedule variance.

Table 6 presents project contingencies, which include base cost plus cost and schedule contingencies.

Table 6. Project Contingencies (Cost and Schedule Contingencies)

Confidence Level	Project Cost	Contingency (%)	Contingency (\$)
P0	\$294,477,887	5.14%	\$14,395,048
P10	\$331,464,136	18.35%	\$51,381,297
P20	\$340,212,115	21.47%	\$60,129,277
P30	\$346,713,938	23.79%	\$66,631,099
P40	\$352,497,060	25.85%	\$72,414,222
P50	\$357,972,473	27.81%	\$77,889,635
P60	\$363,274,838	29.70%	\$83,191,999
P70	\$369,465,245	31.91%	\$89,382,406
P80	\$376,982,054	34.60%	\$96,899,216
P90	\$387,526,528	38.36%	\$107,443,689
P100	\$446,700,447	59.49%	\$166,617,609

8. MITIGATION RECOMMENDATIONS

Risk mitigation recommendations and strategies are as tabulated in the following risk register entries.

Risk No.	Risk/Opportunity Event	Concerns	Risk Level	Responsibility (POC)	Recommended Mitigation
PPM-1	Political considerations and pressures can impact funding	Incremental and unpredictable funding	High	Project Sponsor(s)	Coordinate decisions and/or contract and construction events to minimize impact of political pressures.
PPM-4	Project planning and follow through	This is a concern for the design as well as the construction. Design related risk could become known and mitigated prior to construction. Construction risk can be negative or positive.	Low	Contracting	Have contractors discuss project delivery innovations and foreseeable planning difficulties during RFQ period.
CA-1	Misappropriation of risk to the contractor or owner	The contract type will shift risk to either party through performance or prescriptive specifications. Three major types of contracts should be considered: design-build, design-bid-build and general contractor/construction manager. Risk could be positive or negative.	Low	Contracting	Consider all contract types including recent innovations, as allowed by procurement constraints. Receive input from the construction community.
CA-2	Numerous separate contracts	Lack of coordination of multiple ongoing contracts, primarily the ongoing dredging contracts and the repair/construction contract can interfere or limit work.	Low	Contracting	Clearly delineate in the contract the method for contract coordination, and who has the right to occupy the work at various stages of construction and operation.
TL-1	Handling of groundwater/surface water from hill behind north extension (Safety)	Assumes a pile supported design	Low	Construction	Highlight this risk in ITB, specifications, Pre-bid meeting, Contract, schedule, and communicate to all controlling parties before and during construction. Secure contractor mitigation plan.
TL-6	Continuing port operations vs. construction phasing over extended time increments	Risk that some berths are unusable due to maneuvering or dredging requirements for extended times. Impact to construction progress and production because of complexities of sequencing.	Moderate	Operations	Coordinate with stakeholder to optimize operations and construction impacts
TL-7	Surveys outdated	Entire bathymetric survey is in dated, especially underneath Terminals 2 and 3, earthwork quantities for all options, and global stability for Option 5 at Terminals 2 and 3 are in question.	Moderate	Geotechnical/ Civil Design	Perform new surveys
TL-8	Excess/spoils disposition	Need to identify a location for excess material.	Moderate	Geotechnical/ Civil Design	Normally done as design progresses
D-01	Master plan	Lack of a current port master plan affects design. Requirements outside current application have not been fully analyzed, are only speculative, and not agreed on at all levels? Should time be spent on defining an undefined structure requirement or should focus be on a standard marine structure that meet current requirements (TOTE and Horizon Container Cargo terminal) or that could be easily customized to meet future requirements? Changing a design later in the process can have a major impact to budget and timeline and create problems of trust when seeking additional funding.	Low	Project Manager	Convene stakeholders to determine the ability and timeframe to develop a master plan.
D-08	Deferring TOTE terminal maintenance and planning because "we are moving the terminal"		Low	Operations	Examine ROI and other risks for optimal solution
D-09	Potential cost to TOTE for the expansion/development e.g. new gatehouse, shop, yard reconfiguration		Low	Operations	Include this cost after any design and logistics study is done to mitigate it

Risk No.	Risk/Opportunity Event	Concerns	Risk Level	Responsibility (POC)	Recommended Mitigation
RE-1	Permits in place	Risk of having a negative impact on the existing 404 Permit because it is already in place for the North Extension assuming the design and construction methodology did not change	Low	Environmental	Examine process for expediting permit if assumptions change from existing
RE-2	Permit modifications	High risk of having permit modifications (negative impact) later that may cost time and money due to whether or not the existing North Extension is the best plan	Low	Environmental	Examine process for expediting permit if assumptions change from existing
RE-3	Permit exposure	Completing North Extension prior to using a systems approach to determine present and future purpose and need: High risk of having future permit modifications or new permit requirements if North Extension does not meet the Port's present and future goals	Low	Environmental	Examine process for expediting permit if assumptions change from existing
RE-4	Excluding/including appropriate natural resource agency folks in the process early and often	Low risk of having negative environmental and regulatory issues late in the project. High risk of having successful "buy-in" (positive impact) upfront from agency folks and thus reducing project time and thus cost	Low	Environmental	Ensure buy-in/inclusion is pursued
RE-5	Beluga whale listing as a threatened and endangered species reduces the amount of work that can be performed during the day.	Stop and go operations also reduce productivity. Possible solutions include reducing the number of piles required in the new POA design, or increasing the construction duration. Any increases to construction duration will likely increase construction costs as well.	Moderate	Environmental	Design solutions as are warranted by ROI, assume risk.
CON-1	The construction should be allowed on both the ocean and land side of the new dock system.	Over restrictive site limitations	Low	Construction	Verify and communicate the site limitations, consider all effect of such a limitation before making same required.
CON-2	Weather	Severe weather can affect the ability to perform work on the project site. Typically, weather delay risks are shared by both the owner and contractor. The contractor generally receives time but no additional compensation. Severe weather days should be anticipated in the schedule	Moderate	Contracting	Consider that any onerous risk transferred to the contractor comes at a premium, and the determination of that premium is influenced by other circumstances such as market demand and overall state of the economy
CON-3	Availability of experienced contractors/ subcontractors and labor force in Anchorage. Selection of the repair and construction method can increase or decrease work force/ contractor availability (i.e. pile/tussle supported docks vs. OCSP® system).		Low	Contracting	This can be addressed with an RFQ process that results in a bid go or no-go
CON-4	Poor construction quality/hidden defects	Weak or lack of QA/QC can result in rework, additional costs, and extended durations. The selection of repair and construction method will also increase/decrease risk that work was performed correctly. For example, surface structures have a higher degree of assurance that the work was installed as designed verses piles driven below the ground surface have lower degree of assurance that work was installed as designed	Moderate	Project Manager	Use QA/QC best practices, examine others that were successful on other port projects

Risk No.	Risk/Opportunity Event	Concerns	Risk Level	Responsibility (POC)	Recommended Mitigation
CON-5	Material availability a. Local availability b. Material only available outside the region c. Special requirements after fabrication (galvanization) d. Material inspections	Changes in design will likely require use of material not locally available. What are manufacturers' schedules of availability to manufacture? Where will material inspections be performed for acceptance? What are the planned and alternative methods of shipping to Anchorage? Are there unique dimension requirements? What is the impact when an unseen circumstances or event occurs?	Moderate	Cost Engineering	Perform an analysis of impact of material availability when specifying material sources.
CON-6	Potential for vessel schedule disruptions during construction	Some alternatives may have higher likelihood of occurring	Moderate	Operations	Coordinate these with operations in order to minimize
CON-7	Access and security issues	Changes in security protocols, impact of access requirements on available labor force, daily production, and morale	Moderate	Contracting	Consider what options the port has to make the project attractive to contractors and workers, and communicate those options in the ITB, contract, pre-bid, etc.
CON-8	Historical change order growth	Need to study market behavior for region and project type for historical changes - Walla Walla for reference	High	Cost Engineering	Investigate contractors during RFQ for propensity for change order growth. Consider contract type alternatives that minimize the exposure to both owner and contractor.
CON-9	Diesel fuel volatility	\$6M marine + \$2M civil	Low	Cost Engineering	Maintain awareness of fuel pricing at bid time. Consider master agreement with suppliers. To provide min max at an agreed price
EST-4	Project cost exceeds available budget	What if the minimal design exceeds construction budget?	High	Project Sponsor(s)	Create separable construction packages
EST-5	Estimate quality related to lesser designed features	The use of parametric area based estimates for the civil backlands scope has inherent variability. Especially, utilities are perhaps the least designed at this stage, and are subject to variations. The wharf decking design is the marine side least designed component, along with bulkhead flat sheet piles	High	Cost Engineering	This can be mitigated normally through design progress. An assessment of exposure to estimate accuracy can be included in future estimate preparations
EST-6	Estimate confidence in large and critical quantities	Dredging quantities are historically variable.	Low	Cost Engineering	This can be mitigated normally through design progress. An assessment of exposure to estimate accuracy can be included in future estimate preparations
EST-7	Estimate include waste / drop off quantities	Estimate and design both include these, however, some uncertainty as to the location for disposal exists	Low	Cost Engineering	This can be mitigated normally through design progress. An assessment of exposure to estimate accuracy can be included in future estimate preparations
PR-2	Market conditions and bidding competition	The base estimate is assuming 10% indirect costs and 20% overhead and profit markup structure, which favors a low demand market. Should there be little supply due to increased demand, the contractors are expected to add overhead and profit, up to 15% more than in the estimate	High	Contracting	Remain cognizant of the supply and demand for various contractor capabilities related to the project features. Select a contract type that leverages the market supply and demand forecast for the bid period.

Risk No.	Risk/Opportunity Event	Concerns	Risk Level	Responsibility (POC)	Recommended Mitigation
PR-3	Labor disruptions	This is covered previously, but there is some related risk to the contractor that could affect schedule, and thus his escalation exposure	Low	Construction	Require labor resource identification, contingency plan and forecast from contractors during RFP period. Maintain contact with labor organizations. Consider low cost amenities that will attract skilled and qualified labor and supervision.
PR-4	Acts of God (seismic events: volcanic activity, earthquakes, tsunamis; or severe weather: freezing, flooding or hurricane)	Weather (snow, freezing - subarctic related) impacts on production - estimate does not include "act of God" level impacts	Low	Contracting	Refer to insurance and contracting general terms and conditions
PR-5	Acts of God (seismic events: volcanic activity, earthquakes, tsunamis; or severe weather: freezing, flooding or hurricane)	Seismic (earthquakes) impacts on production, labor availability, materials delivery, placed work damages - estimate does not include "act of God" level impacts	Low	Contracting	Refer to insurance and contracting general terms and conditions

ITB = invitation to bid

POC = point of contact

QA/QC = quality control/quality assurance

RFQ = request for quote

ROI = return on investment

TOTE = Totem Ocean Trailer Express, Inc.

ATTACHMENT A
DETAILED RISK REGISTER

Risk No	Risk/Opportunity Event	Concerns	Project Cost				Project Schedule				Variance Distribution	Correlation to Other(s)	Responsibility/POC	Affected Project Component
			Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)				
CA-1	Misappropriation of risk to the contractor or owner.	The contract type will shift risk to either party through performance or prescriptive specifications. Three major types of contracts should be considered: design-build, design-bid-build and General Contractor/Construction Manager (GC/CM). Risk could be pos or neg	Very Unlikely	Marginal	LOW	\$10M	Very Unlikely	Negligible	LOW	none	Triangular		Contracting	Project Cost
CA-2	Numerous separate contracts	Lack of coordination of multiple ongoing contracts, primarily the on-going dredging contracts and the repair/construction contract can interfere or limit work.	Very Unlikely	Significant	LOW	\$25M	Very Unlikely	Marginal	LOW	3 mo	Triangular		Contracting	Project Cost & Schedule
	TECHNICAL RISKS													
TL-1	Handling of groundwater/surface water from hill behind north extension. (Safety)	Assumes a pile supported design	Very Unlikely	Negligible	LOW	\$1M	Very Unlikely	Negligible	LOW	none	Triangular		Construction	Project Cost
TL-2	Port configuration that shoals in during the winter months when dredging cannot occur. (interrupting vessel operations in terms of time and money)	Positioning vessels	Unlikely	Significant	MODERATE		Unlikely		0					
TL-3	Port layout that hampers current vessels to maneuver, dock, and moor with the current tugs.	(Higher horsepower tugs needed or ice sweeping vessels off dock and aground)	Unlikely	Significant	MODERATE		Unlikely		0					
TL-4	Focusing on the North dock completion rather than the entire port system as a whole.	(risk building the wrong project for today that may be incompatible with future needs)	Unlikely	Marginal	LOW		Unlikely		0					
TL-5	Port configuration that cannot be dredged with existing hopper equipment.	(Operations money is getting tighter and the potential could exist to not be able to fully dredge)	Very Unlikely	Significant	LOW		Very Unlikely		0					

Risk No	Risk/Opportunity Event	Concerns	Project Cost				Project Schedule				Variance Distribution	Correlation to Other(s)	Responsibility/POC	Affected Project Component
			Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)				
TL-6	Continuing port operations vs. construction phasing over extended time increments.	(Risk that some berths are unusable due to maneuvering or dredging requirements for extended times.) Impact to construction progress and production due to complexities of sequencing	Likely	Marginal	MODERATE	\$10M	Likely	Marginal	MODERATE	2 mo	Triangular		Operations	Project Cost & Schedule
TL-7	Surveys outdated	Entire bathymetric survey is in dated, especially underneath terminals #2 and #3, earthwork quantities for all options, and global stability for option 5 at terminals #2 and #3 are in question	Likely	Marginal	MODERATE	\$10M	Likely	Negligible	LOW	1 mo	Triangular		Geotechnical/Civil Design	Project Cost & Schedule
TL-8	Excess/spoils disposition	Need to identify a location for excess material.	Likely	Marginal	MODERATE	\$15M	Likely	Negligible	LOW	1 mo	Triangular		Geotechnical/Civil Design	Project Cost & Schedule
	DESIGN RISKS													
D-01	Master plan	Lack of a current Port Master Plan affects design. Requirements outside current application have not been fully analyzed, are only speculative, and not agreed on at all levels? Should time be spent on defining an undefined structure requirement or should focus be on a standard marine structure that meet current requirements (TOTE and Horizon) or that can be easily customized to meet future requirements? Changing a design later in the process can have a major impact to budget and timeline and create problems of trust when seeking additional funding.	Very Unlikely	Marginal	LOW	\$10M	Very Unlikely	Critical	LOW	1 year	Triangular		Project Manager	Project Cost & Schedule
D-02	b. Fail to ID requirements		Very Unlikely	Marginal	LOW		Very Unlikely		0					
D-03	c. Time to develop 100% design		Very Unlikely	Marginal	LOW		Very Unlikely		0					
D-04	d. Impact to cost from changes		Very Unlikely	Marginal	LOW		Very Unlikely		0					

Risk No	Risk/Opportunity Event	Concerns	Project Cost				Project Schedule				Variance Distribution	Correlation to Other(s)	Responsibility/POC	Affected Project Component
			Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)				
D-05	e- Location and structure impact to Safe Navigation	What is the new structures impact to Safe Navigation and mooring?	Very-Unlikely	Marginal	LOW		Very-Unlikely		0					
D-06	f- Impact from loss of acreage-	Effects on operation with loss of acreage?-	Very-Unlikely	Significant	LOW		Very-Unlikely		0					
D-07	Continuing silting issues at the stern of Tote vessels								0					
D-08	Deferring Tote terminal maintenance and planning because "we are moving the terminal"		Unlikely	Marginal	LOW	\$1M	Unlikely	Negligible	LOW	none	Triangular		Operations	Project Cost
D-09	Potential cost to Tote for the expansion/development e.g. new gatehouse, shop, yard reconfiguration		Unlikely	Marginal	LOW	\$1M	Unlikely	Negligible	LOW	none	Triangular		Operations	Project Cost
	REGULATORY AND ENVIRONMENTAL RISKS								0					
RE-1	Permits in place	Risk of having a negative impact on the existing 404 permit because it is already in place for the North Extension assuming the design and construction methodology did not change	Unlikely	Marginal	LOW	escalation related	Unlikely	Marginal	LOW	3 mo	Triangular		Environmental	Project Cost & Schedule
RE-2	Permit mods	High risk of having permit mods (negative impact) later that may cost time and money due to whether or not the existing North Extension is the best plan	Unlikely	Marginal	LOW	escalation related	Unlikely	Marginal	LOW	3 mo	Triangular		Environmental	Project Cost & Schedule

Risk No	Risk/Opportunity Event	Concerns	Project Cost				Project Schedule				Variance Distribution	Correlation to Other(s)	Responsibility/POC	Affected Project Component
			Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)				
RE-3	Permit exposure	Completing North Extension prior to using a systems approach to determine present and future purpose and need: High risk of having future permit modifications or new permit requirements if North Extension does not meet the Port's present and future goals	Unlikely	Marginal	LOW	escalation related	Unlikely	Marginal	LOW	3 mo	Triangular		Environmental	Project Cost & Schedule
RE-4	Excluding/Including appropriate natural resource agency folks in the process early and often:	Low risk of having environmental and regulatory issues that are negative late in the project. High risk of having successful "buy-in" (positive impact) upfront from agency folks and thus reducing project time and thus cost	Very Unlikely	Significant	LOW	escalation related	Very Unlikely	Marginal	LOW	-3 to +1 mo	Triangular		Environmental	Project Cost & Schedule
RE-5	Beluga whale listing as a Threatened and Endangered species reduces the amount of work that can be performed during the day.	Stop and go operations also reduces productivity. Possible solutions include reducing the number of piles required in the new POA design, or increasing the construction duration. Any increases to construction duration will likely increase construction costs as well.	Very Likely	Marginal	MODERATE	\$10M	Very Likely	Marginal	MODERATE	3 mo	Triangular		Environmental	Project Cost & Schedule
RE-6	NEPA permits a. 404 (exp 31AUG2014 minimal quantities remain) b. LOA c. What new permits will a new structure require d. DOE e. ADEC requirements	Many of the permits expire in the near future. What new requirements will a new or hybrid structure entail? Will a new EA be required? Can the process be streamlined? How much time and effort will be required for submission and review? Impact to construction of not having permits in place?	Likely	Marginal	MODERATE				0					

Risk No	Risk/Opportunity Event	Concerns	Project Cost				Project Schedule				Variance Distribution	Correlation to Other(s)	Responsibility/POC	Affected Project Component
			Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)				
RE-7	Endangered species- (beluga whales)- a. Impact to in-water work- i. Low tide ii. Harassment and takes- b. Monitoring- i. Contractor ii. Scientific iii. Cost associated-	Loss of 8 hours of in-water work daily around low times. Meeting whale harassment and having minimal takes- Monitoring requirement both from contractor and scientific by permit and the cost associated-	Likely	Marginal	MODERATE				0					
	CONSTRUCTION RISKS								0					
CON-1	The construction should be allowed on both the ocean and land side of the new dock system.	Over restrictive site limitations	Very Unlikely	Significant	LOW	\$20M	Very Unlikely	Significant	LOW	6 MO	Triangular		Construction	Project Cost & Schedule
CON-2	Weather	Severe weather can affect the ability to perform work on the project site. Typically, weather delay risks are shared by both the owner and contractor. The contractor generally receives time but no additional compensation. Severe weather days should be anticipated in the schedule	Likely	Marginal	MODERATE	\$10m	Likely	Marginal	MODERATE	3 mo	Triangular		Contracting	Project Cost & Schedule
CON-3	Availability of experienced contractors/subcontractors and labor force in Anchorage. Selection of the repair and construction method can increase or decrease work force/contractor availability (i.e. pile/tussle supported docks vs. OCSP dock system).		Very Unlikely	Significant	LOW	\$25m	Very Unlikely	Negligible	LOW	none	Triangular		Contracting	Project Cost

Risk No	Risk/Opportunity Event	Concerns	Project Cost				Project Schedule				Variance Distribution	Correlation to Other(s)	Responsibility/POC	Affected Project Component
			Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)				
FL-8	Potential negative risk to structures and appurtenances by ice flows and large tide cycle range		Unlikely	Marginal	LOW									
FL-9	Potential negative risk associated with existing condition of existing structures and utilities		Unlikely	Marginal	LOW			0						
Programmatic Risks (External Risk Items are those that are generated, caused, or controlled exclusively outside the PDT's sphere of influence.)														
PR-1	Public trust a. Incremental funding b. Budget challenge	The history of the project has created a problem with public trust that has caused the budget to be funded incrementally. How can these challenges be overcome to attain funding needed? Impact of incremental funding has to be addressed so that public is fully aware of impacts i.e. increasing cost and delay in completion.	Likely	Significant	HIGH			0						
PR-2	Market conditions and bidding competition	The base estimate is assuming a 10% indirects and 20% OH&P markup structure, which favors a low demand market. Should there be little supply due to increased demand, the contractors are expected to add overhead and profit, up to 15% more than in the estimate	Likely	Critical	HIGH	0 to 15% more	Likely	Negligible	LOW	none	Triangular		Contracting	Project Cost
PR-3	Labor disruptions	This is covered in XX above, but there is some related risk to the contractor that could affect schedule, and thus his escalation exposure	Unlikely	Marginal	LOW	based on esc	Unlikely	Marginal	LOW	3 mo	Triangular		Construction	Project Cost & Schedule
PR-4	Acts of God (seismic events: volcanic activity, earthquakes, tsunamis; or severe weather: freezing, flooding or hurricane)	Weather (snow, freezing - subarctic related) impacts on production - estimate does not include "act of God" level impacts	Unlikely	Marginal	LOW	\$3M	Unlikely	Significant	MODERATE	6 mo	Triangular		Contracting	Project Cost & Schedule

Risk No	Risk/Opportunity Event	Concerns	Project Cost				Project Schedule				Variance Distribution	Correlation to Other(s)	Responsibility/POC	Affected Project Component
			Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)				
PR-5	Acts of God (seismic events: volcanic activity, earthquakes, tsunamis; or severe weather: freezing, flooding or hurricane)	Seismic (earthquakes) impacts on production, labor availability, materials delivery, placed work damages - estimate does not include "act of God" level impacts	Very Unlikely	Critical	LOW	\$50M	Very Unlikely	Critical	LOW	1 yr	Triangular		Contracting	Project Cost & Schedule

*Likelihood, Impact, and Risk Level to be verified through market research and analysis (conducted by cost engineer).

1. Risk/Opportunity identified with reference to the Risk Identification Checklist and through deliberation and study of the PDT.
2. Discussions and Concerns elaborates on Risk/Opportunity Events and includes any assumptions or findings (should contain information pertinent to eventual study and analysis of event's impact to project).
3. Likelihood is a measure of the probability of the event occurring -- **Very Unlikely, Unlikely, Moderately Likely, Likely, Very Likely**. The likelihood of the event will be the same for both Cost and Schedule, regardless of impact.
4. Impact is a measure of the event's effect on project objectives with relation to scope, cost, and/or schedule -- **Negligible, Marginal, Significant, Critical, or Crisis**. Impacts on Project Cost may vary in severity from impacts on Project Schedule.
5. Risk Level is the resultant of Likelihood and Impact **Low, Moderate, or High**. Refer to the matrix located at top of page.
6. Variance Distribution refers to the behavior of the individual risk item with respect to its potential effects on Project Cost and Schedule. For example, an item with clearly defined parameters and a solid most likely scenario would probably follow a triangular or normal distribution. An risk item for which the PDT has little data or probability of modeling with respect to effects on cost or schedule (i.e. "anyone's guess") would probably follow a uniform or discrete uniform distribution.
7. The responsibility or POC is the entity responsible as the Subject Matter Expert (SME) for action, monitoring, or information on the PDT for the identified risk or opportunity.
8. Correlation recognizes those risk events that may be related to one another. Care should be given to ensure the risks are handled correctly without a "double counting."
9. Affected Project Component identifies the specific item of the project to which the risk directly or strongly correlates.
10. Project Implications identifies whether or not the risk item affects project cost, project schedule, or both. The PDT is responsible for conducting studies for both Project Cost and for Project Schedule.
11. Results of the risk identification process are studied and further developed by the Cost Engineer, then analyzed through the Monte Carlo Analysis Method for Cost (Contingency) and Schedule (Escalation) Growth.

ATTACHMENT B
COST ESTIMATE (INPUT TO CSRA)

Cost Estimate

**Port of Anchorage
Intermodal Expansion Project
15% Concept Plans – Option 1
Contract No. W912PP-09-D-0016
Task Order ZJ03**

Prepared for

Alaska District U.S. Army Corps of Engineers

February 26, 2013

CH2MHILL®

2020 SW 4th Avenue
3rd Floor
Portland, Oregon 97201

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Tables

1	Overall Costs
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Cost Estimate

1. Executive Summary

The construction cost for the project is described herein and in Table 1.

TABLE 1
Overall Costs

Accuracy Range per ASTM E2516 – 11, Standard Classification for Cost Estimate Classification System, see Section 2.5

Description	Amount	Rounded
Option 1 estimate	\$366,847,382	\$365,000,000
Hi range + 30%	\$476,901,594	\$475,000,000
Lo range – 15%	\$311,820,275	\$310,000,000

ASTM = American Society for Testing and Materials (formerly, now ASTM International)

The executive summary provides an overview of the Cost Estimate. Reliance on this information is advised to be in consideration of the full context of this report.

2. Estimate Information

2.1 Purpose of Estimate

The purpose of this Cost Estimate is to establish an engineer's opinion of probable cost for design documents at 15% concept design, suitable for further development using U.S. Army Corps of Engineers (USACE) Cost and Schedule Risk Analysis (CSRA) Guidance (17 May 2009) to calculate total project costs.

2.2 Client

The client is the Alaska District USACE.

2.3 Project Location and General Scope

The project is located on the Knik Arm, within the Municipality of Anchorage, Alaska, approximately 1 mile north of downtown Anchorage. The general scope of the work for Option 1 is to demolish an existing sheet pile wall, construct a new wharf, trestle and sheet pile wall, complete with associated excavation, grading, paving, drainage, stevedore facilities, and utilities.

2.4 Date and Preparation

The estimate was prepared January - February 2013, by CH2M HILL team members as listed:

- Jorge Abisambra/WPB (marine work)
- Robert Wells/PDX, (civil "*" scope) phone 503-872-4622 x24622
- Joe Taylor/ANC (civil quantities)
- John O'Reilly/SAC (quality assurance and quality control)

The estimate was requested by Doug Playter/SEA for project number 462130.

2.5 Estimate Classification and Methodology

This cost estimate prepared is considered a Budget Level or Class 4 estimate per American Society for Testing and Materials (ASTM) E2516-11. It is considered accurate to +30% to -15%, based upon a design deliverable (15% Concept Plans).

The estimating effort did decompose the scope to a sufficient level to support a thorough analysis of all major cost elements at the work package level, for purposes of performing risk analysis and identifying those critical items which might be expected to create cost variances of +0.5% in the bottom line estimate.

The individual scope items inclusions under Section 3.b.vi of the Task Order preceded by an asterisk were estimated by parametric estimating techniques. The estimated costs for these asterisked items were developed using the 11 April 2012 Port of Anchorage (POA) Intermodal Expansion Project Budgetary Cost Estimate Report and calculated as "blended costs" per unit of measure. Additionally, the estimated costs for the Marine Terminal Buildings (complete structures, including foundation, structure, shell, interior finishes, and all utilities) and Corrosion Protection were calculated by the same parametric technique.

This estimate was developed, as required by USACE CSRA Guidance (17 May 2009), as an input to the CSRA. The CSRA is a separate document prepared concurrently with this estimate.

The estimate is appended to this report as Appendix A.

3. Basis of Estimate

3.1 Basis Documents

The estimate is based on 15% drawings for Option 1, developed by CH2M HILL, dated February 2013. Additionally, the estimate used portions of the POA Intermodal Expansion Project Budgetary Cost Estimate Report estimate prepared 11 April 2012, as directed, for parametric cost estimating.

3.2 Key Assumptions

- Project is to be offered to bidders on a lowest responsive basis, in time to allow construction progress to begin April 2015.
- Permitting and regulatory agencies to have issued all permits, modifications, and amendments, so as not to impede the construction start and progress in any way.
- Project is to be fully funded prior to the start of construction.

3.3 Project Delivery Schedule and Method

It is assumed that the environmental, permitting, and design phase will continue to early 2015, with a bid and award date that supports an April 2015 construction start. The scheduled duration for Option 1 is 30 months, ending late 2017. The assumed delivery method is a single prime contract with the Municipality of Anchorage, Alaska.

3.4 Labor, Materials, Subcontracts and Other Direct Costs

3.4.1 Labor

Labor rates used are based on 2013 prevailing wage rates adjusted for Anchorage, Alaska, as well as those used in the POA Intermodal Expansion Project Budgetary Cost Estimate Report estimate prepared 11 April 2012, adjust for inflation by 1.28%.

3.4.2 Materials

Materials pricing is based on recent and historical vendor quotations, as well as pricing used in the POA Intermodal Expansion Project Budgetary Cost Estimate Report estimate prepared 11 April 2012, adjusted for inflation by 1.28%.

3.4.3 Subcontracts

It is assumed that the Prime Contractor may employ various specialty subcontractors, such as electrical, telecom, utility, and earthwork subcontractors.

3.4.4 Long Lead Items

Galvanized steel sheet and cylinder piling, fender materials assumed to be 5 months lead-time.

3.4.5 Owner Supplied

Steel sheet pile in quantities assumed to supply majority of bulkhead sheet pile materials.

3.4.6 Allowances

Landscaping allowance for restoration of disturbed areas, \$150,000 subcontractor price.

3.5 Markups, Taxes and Other Indirect Costs

Detail on markups used, taxes included, contingencies, owner costs, or any other cost additions.

• General requirements/site indirect costs	10%
• Taxes on material and equipment	0%
• Prime Overhead, Profit	20%
• Bond	1%
• Contingency	20%
• PM, CM and Design (Owner's Costs)	18%
• Owner's Contingency (Reserve)	8.5%

3.6 Market Conditions

Market conditions adjustments were not considered for this project; it remains market neutral. An adjustment is unwarranted because of market condition volatility and because the project will be executed in the future.

3.7 Escalation Costs

Escalation is based on USACE EM 1110-2-1304 (31 March 2012), Table A-1, Quarterly Cost Index by CWBS Feature Code. Feature codes relevant to this project are:

- 08 Roads, Railroads, and Bridges (Cherry Hill Road, Rail extension)
- 12 Navigation Ports & Harbors (Wharf and bulkhead, including dredging and demo)
- 16 Bank Stabilization (Slope protection)
- 19 Buildings, Grounds, & Utilities (Landside work)

Escalation costs are estimated in two parts: The first part is to escalate the project costs prepared in February 2013 dollars to the assumed bid date of April 2015; the second part is the escalation of costs through the duration of the project, the mid-point of which is assumed to be mid 2014. The severing of escalation will allow the project to input into CSRA, removing only the escalation for the project duration, which then will be modeled per the CSRA guidance. The use of costs, as directed, from the POA Intermodal Expansion Project Budgetary Cost Estimate Report, dated 11 April 2012, required the addition of 1.28% escalation to bring it current to the year and month of estimate, February 2013.

3.8 Detailed Scope, Clarifications, Inclusions and Exclusions

3.8.1 Civil Scope

Option 1 does not propose any new improvements to the wharves or trestles at Terminals 2 and 3. As such, this option excludes Horizon Container Cargo terminal enhancement.

At the north extension, a new pile-supported Wet Barge Berth and new roll-on/roll-off (RO/RO) Berth are proposed, as well as a new sheet pile bulkhead. Approximately 31 acres of new paved upland area would be provided.

The integrity and function of the existing Dry Barge Berth would be maintained but removal of the existing OCSP® structure, mass excavation of existing embankment, and construction dredging would be required. The remaining slopes would be protected with a layer of armor stone.

3.8.2 Demolition of Existing Infrastructure and Mass Excavation

Option 1 would require moderate demolition of existing infrastructure and mass excavation.

At the north extension portion of the project, the OCSP® system including tail walls would be demolished from the existing Dry Barge Berth south. The portions of traditional Z-pile walls previously installed at the north extension would also be removed. The OCSP® system installed for the Dry Barge Berth would remain in place.

Mass excavation of previously constructed embankment and construction dredging would be required. Salvage of existing armor stone would also be included. The existing Dry Barge Berth would be maintained in approximately its existing condition but some regrading at the interface between the Dry Barge Berth and new upland area would be required.

3.8.3 Civil Elements to be Constructed

Option 1 would include the following specific civil design elements:

- Water service and fire suppression lines
- Sanitary sewer lines
- Storm drain piping and inlets
- Electrical, communication, and security lines
- Cherry Hill Haul Road realignment and new rail spur
- Paved upland area
- Landscaped areas
- Site grading and drainage

3.8.4 Structural Scope

The major structural components of Option 1 would consist of two pile-supported wharves, six access trestles, and a cellular steel sheet pile bulkhead. Other ancillary structural components to support port operations would include heavy-duty fenders, mooring bollards, quick release hooks along the wharf face, and a stevedore building. The pile-supported wharves would provide a total of 1,800 linear feet of new dock face and two new berths: (1) a barge berth to support containerized, break bulk, or bulk cargo operations, and (2) a RO/RO Berth to support containerized RO/RO operations.

3.8.5 Slope Protection

All new embankment slopes would be covered by a 6-foot-thick layer of armor rock and riprap, a mitigation measure to prevent piping conditions at the slope surface.

3.8.6 Corrosion Protection

Corrosion Protection System for Pile-Supported Wharf

The steel casing in the top part of the hybrid piles would be sacrificial. The presence of the steel casing would delay the onset of corrosion in the reinforced concrete core. A corrosion allowance is built into the design of the hollow steel pipe pile that would form the lower part of the hybrid pile. All-steel reinforcing bar used in the pile-supported wharf and trestle, including deck, piles, and pile caps, would be epoxy coated to increase corrosion resistance. High-performance concrete water/cement ratio and air entrainment admixture would be in accordance with American Concrete Institute 201.2R *Guide to Durable Concrete* to establish a dense, low-permeability concrete.

Corrosion Protection System for Sheet Pile Bulkhead

All existing sheet piles in the POA stockpile were specified to be hot-dip galvanized with a minimum zinc thickness of 6 to 12 mils. Galvanization would be the sole corrosion protection element for sheet piles exposed to the atmospheric and splash zones. An impressed-current cathodic protection system would protect structural components of the sheet pile bulkheads that would be submerged in or in contact with soil. Cathodic protection

anodes would be installed on the seaward side of sheet piling for protection of seaside surfaces, and additional anodes would be installed in drilled holes landside to protect surfaces exposed to soil and mud.

Corrosion Protection System for Fender Piles

A galvanic anode cathodic protection system would protect the portions of the fender piles that would be submerged in or in contact with soil. Based on the estimated surface area per fender pile, approximately 2,000 pounds of aluminum anode would be required for a 20-year service life. Eight or nine aluminum anodes could be fabricated into "bracelet" anodes that could be fastened or welded to the fender pile.

3.8.7 Exclusions

- Hazardous materials handling and disposal
- Natural gas utilities

3.9 Cost Resources

The following cost resources were used in the development of the cost estimate.

- 11 April 2012 POA Intermodal Expansion Project Budgetary Cost Estimate Report
- Vendor quotes on equipment and materials
- Estimator judgment

Appendix A
Cost Estimate Summary and Detail Reports

ESTIMATE RECAP - BID QUANTITIES

	DIRECT	INDIRECT	TOTAL	% OF TOTAL
Labor	8,190,204.49		8,190,204.49	4.374%
Burden	4,426,800.21		4,426,800.21	2.364%
Lab+Bur	12,617,004.70		12,617,004.70	6.738%
Perm Matl	61,132,325.36		61,132,325.36	32.645%
Const Exp	318,010.90		318,010.90	0.170%
Equipment	21,771,807.91		21,771,807.91	11.626%
Subs	64,782,006.93		64,782,006.93	34.594%
Other	26,641,078.43		26,641,078.43	14.227%
Total Costs:	187,262,234.23		187,262,234.23	100.000%
% of Total	100.000%	0.000%	100.000%	

Escalation on:	Labor	Burden	Perm Matl	Const Matl	Co Eqp	Rented Eqp
	0	0	0	0	0	0
	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
	Eq Op Exp	Sub	Misc1	Misc2	Misc3	Total Escalation
	0	0	0	0	0	0
	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

* Data Below here is dependent on the Summary Process. *
 The Summary Process was last run 02/26/2013 at 8:29 PM

Markup on Resource Costs	35,202,256.42	18.7984%
MARKUP TOTALS ==>>	35,202,256.42	18.7984%
<i>Cost Addons</i>		
Escalation to February 2015 3.4700 % of Cost, Mkup, & Prev	7,846,813.54	4.1903%
Escalation to Proj Midpoint 2.0500 % of Cost, Mkup, & Prev	4,796,585.26	2.5614%
Contingency 20.0000 % of Cost, Mkup, & Prev Addons	47,755,270.77	25.5018%
PM, CM, Design 18.0000 % of Cost, Mkup, & Prev Addons	51,575,692.43	27.5420%
Owner's Contingency 8.5000 % of Cost, Mkup, & Prev Addon	28,739,121.95	15.3470%
Bond from Summary Table	3,668,464.38	1.9590%
MARKUP, ADDON & BOND TOTALS ==>>	179,584,204.75	95.8999%
COST + MARKUP ----->	\$366,846,438.98	(% of costs)
	(On Takeoff Quantity)	

There * ARE NOT * closing accounts for this bid.

Rounding difference:	943.19	-Effect on Bid- Adjusted
Unbalancing difference:		
From Cut&Add Sheet-costs:		(on Bid Quantity)
From Cut&Add Sheet-markup:		(on Bid Quantity)
Pass Through Adjustments:		None

02/26/2013
 13-008-1
 *** Bob Wells

20:30
 POA 15% CONCEPT OPTION 1

BID TOTALS

<u>Biditem</u>	<u>Description</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Bid Total</u>
10040	Construction Staging	1.000	LS	1,710,877.64	1,710,877.64
10050	Demolition	1.000	LS	23,078,216.31	23,078,216.31
10055	Dredging	938,000.000	CY	52.57	49,310,660.00
10060	Piling	88,172.000	FT	1,088.43	95,969,049.96
10080	Sheet Pile Bulkhead	2,200.000	LF	9,660.88	21,253,936.00
10081	Credit Sheetpile Materials on site	1.000	LS	-18,086,297.52	-18,086,297.5
10090	Concrete Deck Superstructure	149,750.000	SF	197.86	29,629,535.00
10100	Abutments	6.000	EA	293,795.02	1,762,770.12
10120	Fendering	1.000	LS	4,641,979.20	4,641,979.20
10140	Slope Protection	160,000.000	CY	191.68	30,668,800.00

***Subtotal Marine Work \$239,939,526.71

GENERAL CONSTRUCTION

10150	Surface Pavements	1.000	LS	45,518,984.70	45,518,984.70
10160	Traffic Control Parking	1.000	LS	731,885.94	731,885.94
10170	Surface water control	1.000	LS	2,067,798.24	2,067,798.24
10180	Potable Water Utilities	1.000	LS	4,947,008.02	4,947,008.02
10190	Fire Suppression Utilities	1.000	LS	4,947,008.02	4,947,008.02
10200	Sanitary Sewer Utilities	1.000	LS	704,567.53	704,567.53
10210	Electrical Power Utilities	1.000	LS	18,099,336.17	18,099,336.17
10230	Telecommunications Utilities	1.000	LS	6,428,494.77	6,428,494.77
10240	Railroad Spur	1.000	LS	13,328,244.27	13,328,244.27
10250	Surface Restoration/Landscaping	1.000	LS	293,849.78	293,849.78
10260	Marine Terminal Buildings incl Crane Maint	1.000	LS	2,845,968.39	2,845,968.39
10270	Corrosion Control	1.000	LS	16,778,822.29	16,778,822.29
10280	Cherry Hill Road Upgrades	1.000	LS	1,612,428.17	1,612,428.17
10290	Other	1.000	LS	8,603,459.16	8,603,459.16

***Subtotal General Construction \$126,907,855.45

Bid Total =====> \$366,847,382.16

**Notes:
 Items in italics are Non-Additive.

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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PARENT ITEM = 10040 CLIENT# = 01-12
Description = Construction Staging Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

Listing of Sub-Biditems of Parent Item 10040:

PARENT ITEM = 10042 CLIENT# = 03-12
Description = Mobilization and Demobilization Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

Listing of Sub-Biditems of Parent Item 10042:

BID ITEM = 10043 CLIENT# = 03-12 Land Item SCHEDULE: 1 100
Description = Mobilization Unit = LS Takeoff Quan: 1.000 Engr Quan: 0.000

219000 Misc Hauling/Trucking **Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

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5TRKFB Trucking - Flat Bed 20.00 HR 100.000 2,000 2,000

540000 Temporary Construction Fence **Quan: 750.00 LF Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****

31CHAINFENCE Temporary Chainlinkfence 750.00 LF 12.000 9,000 9,000

890005 Pile Crew Mobilization **Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

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Mobilization from Tacoma Washington

Activity Resource	Desc	Quantity	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
<u>MARPIL</u>	Marine Piling & Demo Crew	20.00	CH	Prod: 2.0000 S	Lab Pcs: 6.00			Eqp Pcs: 17.00		
3WELD	Weld Supplies (1 man-Stick	2.00	DA	70.000			140			140
8211050	Fuel, Oil, Grease 50g/d	2.00	DA	200.000				400		400
8CRANEC200	Crane Manitowoc 777 20	1.00	20.00	HR 163.361				3,267		3,267
8DRILLR	***DRILLS - ROCK***	1.00	20.00	HR 17.500				350		350
8MAC-A-10	Compressor 185 CFM	1.00	20.00	HR 3.000				60		60
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00	20.00	HR 10.000				200		200
8MBS-Z-14	Spud Barge M-120x45'	1.00	20.00	HR 17.500				350		350
8MBT-Z-12	Tug Push Boat 200 HP	1.00	20.00	HR 20.000				400		400
8MBW-Z-2	18' Aluminum Boat & O/	1.00	20.00	HR 3.000				60		60
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	20.00	HR 5.000				100		100
8MDH-A-7	DELMAG D19 HAMMER	1.00	20.00	HR 10.000				200		200
8MFD-A-1	FAIRLEADS	1.00	20.00	HR 0.100				2		2
8MGN-Z-11	Generator 10 KW	1.00	20.00	HR 3.000				60		60
8MLT-A-1	Light Tower, Genie	1.00	20.00	HR 3.500				70		70
8MPE-A-11	Extractor Pile	1.00	20.00	HR 5.000				100		100
8MVP-A-11	FORD F150 SUPERC 10	1.00	20.00	HR 6.500				130		130
8MWH-A-1	WINCH 3-DRUM RB-90	1.00	20.00	HR 10.000				200		200
8MWM-C-1	Welder Diesel 400 AMP	1.00	20.00	HR 2.500				50		50
8PILE26	Vibro Hammer 150 TN	1.00	20.00	HR 45.492				910		910
9100000	Substance 5 workers	2.00	DA	500.000			1,000			1,000
M105	Foreman - General Marine	1.00	20.00	MH 35.720	1,251					1,251
M165	M-Piledriver	1.00	20.00	MH 34.950	1,240					1,240
M170	M-Welder	1.00	20.00	MH 32.000	1,155					1,155
M190	M-Skilled Laborer	1.00	20.00	MH 29.250	1,008					1,008
M195	M-Laborer	1.00	20.00	MH 27.520	958					958
OPCR100	Op Eng 1A- Crane 100-200	1.00	20.00	MH 33.480	1,051					1,051
\$14,712.91	120.0000 MH/LS	120.00	MH	[4244.24]	6,664		1,140	6,909		14,713

890006 Carpenter Crew Mob **Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Ment Contract	Total
BID ITEM = 10043 CLIENT# = 03-12 Land Item SCHEDULE: 1 100									
Description = Mobilization Unit = LS Takeoff Quan: 1.000 Engr Quan: 0.000									
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****									
<u>MARWOO</u>	Marine Carpenters Crew		20.00 CH	Prod:	2.0000 S	Lab Pcs:	10.00	Eqp Pcs:	16.00
8211050	Fuel, Oil, Grease 50g/d	2.00	DA	200.000			400		400
8CRANEC100	Crane Manitowoc 222B 1	1.00	20.00 HR	106.961			2,139		2,139
8MAC-A-17	Atlas Copco 185 CFM Ai	1.00	20.00 HR	3.000			60		60
8MBC-Z-1	Barge Carpenter 12'X40	1.00	20.00 HR	6.500			130		130
8MBC-Z-2	Barge Carpenter 12'X40	1.00	20.00 HR	6.500			130		130
8MBS-Z-9	Spud Barge M-80x28'	1.00	20.00 HR	10.000			200		200
8MBW-Z-2	18' Aluminum Boat & O/	1.00	20.00 HR	3.000			60		60
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	20.00 HR	5.000			100		100
8MCN-A-13	Container Steel 20'	1.00	20.00 HR	0.100			2		2
8MFW-A-1	Work Float	1.00	20.00 HR	2.000			40		40
8MFW-A-2	Work Float	1.00	20.00 HR	2.000			40		40
8MGN-Z-17	Generator 8 KW	1.00	20.00 HR	2.000			40		40
8MGN-Z-18	Generator 8 KW	1.00	20.00 HR	2.000			40		40
8MLT-A-2	Light Tower, Genie	1.00	20.00 HR	3.500			70		70
8MVP-A-2	FORD F150 SUPERC 2	1.00	20.00 HR	6.500			130		130
8WELD400	Welder 400 AMP	2.00	40.00 HR	2.044			82		82
M100	Foreman - Carpenter	1.00	20.00 MH	34.720	1,222				1,222
M170	M-Welder	1.00	20.00 MH	32.000	1,155				1,155
M173	M-Lead Carpenter	1.00	20.00 MH	28.250	1,046				1,046
M175	M-Carpenter	3.00	60.00 MH	27.520	3,076				3,076
M180	M-Carpenter Helper	3.00	60.00 MH	27.520	2,875				2,875
OPCR100	Op Eng 1A- Crane 100-200	1.00	20.00 MH	33.480	1,051				1,051
\$14,088.62	200.0000 MH/LS	200.00	MH	[6458.54]	10,426		3,663		14,089

960015 Rigging Supplies Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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31RIGGING	Rigging Supplies	1.00	LS	15,000.000			15,000		15,000
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=====> **Item Totals: 10043 - Mobilization**

\$54,801.53	320.0000 MH/LS	320.00	MH	[10702.78]	17,089		27,140	10,572	54,802
54,801.530	1 LS				17,089.49		27,140.00	10,572.04	54,801.53

BID ITEM = 10044 CLIENT# = 03-12 Land Item SCHEDULE: 1 100

Description = Transportation Unit = LS Takeoff Quan: 1.000 Engr Quan: 0.000

219000 Misc Hauling/Trucking Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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5TRKFB	Trucking - Flat Bed	80.00	HR	100.000			8,000		8,000
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890007 Marine Tugs Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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rental tugging services to and from Tacoma, Washington State.
Distance Tacoma to Anchorage: 1,472 N Miles
at 4.5 knots, 1,472/4.5= 327 hours ==> 13.62 days say 14 days
14 days in and 14 days back 2 days on stand by = 30 days
then tug needs to go back and do it all over again for demobilization
so, say 60 days

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Ment Contract	Total
BID ITEM = 10044 CLIENT# = 03-12 Land Item SCHEDULE: 1 100									
Description =	Transportation		Unit =	LS	Takeoff	Quan:	1.000	Engr Quan:	0.000
5TUGSERVICE	Tug Rental	60.00	DA	6,500.000			390,000		390,000
8211060	==> Fuel, Oil, Grease 1400	60.00	DA	5,810.000				348,600	348,600
\$738,600.00				[]			390,000	348,600	738,600
=====> Item Totals: 10044 - Transportation									
\$746,600.00				[]			398,000	348,600	746,600
746,600.000		1 LS					398,000.00	348,600.00	746,600.00

BID ITEM = 10046 CLIENT# = 03-12 Land Item SCHEDULE: 1 100									
Description =	Demobilization		Unit =	LS	Takeoff	Quan:	1.000	Engr Quan:	0.000

115000 Remove Fence (Chain Link) Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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<u>LAB4</u>	Foreman + 3 Laborers		30.00	CH	Prod:	3.0000 S	Lab Pcs:	4.00	Eqp Pcs:	1.00
8TRKPU70	Leased 4x2, 3/4 Ton Ga	1.00	30.00	HR		8.476		254		254
LFORMN	Laborer-Foreman	1.00	30.00	MH		29.250	1,321			1,321
LPWR	Laborer-Power Tools	3.00	90.00	MH		28.020	3,827			3,827
\$5,402.41	120.0000 MH/LS		120.00	MH	[3739.23]	5,148		254		5,402

890010 Subcontractor Pile Crew Demobilization Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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<u>MARPI</u>	Marine Piling & Demo Crew		20.00	CH	Prod:	2.0000 S	Lab Pcs:	6.00	Eqp Pcs:	17.00
3WELD	Weld Supplies (1 man-Stick	2.00	DA			70.000		140		140
8211050	Fuel, Oil, Grease 50g/d		2.00	DA		200.000				400
8CRANEC200	Crane Manitowoc 777 20	1.00	20.00	HR		163.361		3,267		3,267
8DRILLR	***DRILLS - ROCK***	1.00	20.00	HR		17.500		350		350
8MAC-A-10	Compressor 185 CFM	1.00	20.00	HR		3.000		60		60
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00	20.00	HR		10.000		200		200
8MBS-Z-14	Spud Barge M-120x45'	1.00	20.00	HR		17.500		350		350
8MBT-Z-12	Tug Push Boat 200 HP	1.00	20.00	HR		20.000		400		400
8MBW-Z-2	18' Aluminum Boat & O/	1.00	20.00	HR		3.000		60		60
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	20.00	HR		5.000		100		100
8MDH-A-7	DELMAG D19 HAMMER	1.00	20.00	HR		10.000		200		200
8MFD-A-1	FAIRLEADS	1.00	20.00	HR		0.100		2		2
8MGN-Z-11	Generator 10 KW	1.00	20.00	HR		3.000		60		60
8MLT-A-1	Light Tower, Genie	1.00	20.00	HR		3.500		70		70
8MPE-A-11	Extractor Pile	1.00	20.00	HR		5.000		100		100
8MVP-A-11	FORD F150 SUPERC 10	1.00	20.00	HR		6.500		130		130
8MWH-A-1	WINCH 3-DRUM RB-90	1.00	20.00	HR		10.000		200		200
8MWM-C-1	Welder Diesel 400 AMP	1.00	20.00	HR		2.500		50		50
8PILE26	Vibro Hammer 150 TN	1.00	20.00	HR		45.492		910		910
9100000	Subsistance 5 workers		2.00	DA		500.000		1,000		1,000
M105	Foreman - General Marine	1.00	20.00	MH		35.720	1,251			1,251
M165	M-Piledriver	1.00	20.00	MH		34.950	1,240			1,240
M170	M-Welder	1.00	20.00	MH		32.000	1,155			1,155
M190	M-Skilled Laborer	1.00	20.00	MH		29.250	1,008			1,008
M195	M-Laborer	1.00	20.00	MH		27.520	958			958
OPCR100	Op Eng 1A- Crane 100-200	1.00	20.00	MH		33.480	1,051			1,051
\$14,712.91	120.0000 MH/LS		120.00	MH	[4244.24]	6,664		1,140	6,909	14,713

890011 Subcontractor Carpenter Crew Demob Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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<u>MARWOO</u>	Marine Carpenters Crew		20.00	CH	Prod:	2.0000 S	Lab Pcs:	10.00	Eqp Pcs:	16.00
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Direct Cost Report

Activity Resource	Desc	Pcs	Quantity Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10046			CLIENT# = 03-12	Land Item	SCHEDULE: 1 100					
Description =	Demobilization		Unit =	LS	Takeoff Quan:		1.000	Engr Quan:		0.000
8211050	Fuel, Oil, Grease 50g/d		2.00 DA	200.000				400		400
8CRANEC100	Crane Manitowoc 222B 1	1.00	20.00 HR	106.961				2,139		2,139
8MAC-A-17	Atlas Copco 185 CFM Ai	1.00	20.00 HR	3.000				60		60
8MBC-Z-1	Barge Carpenter 12'X40	1.00	20.00 HR	6.500				130		130
8MBC-Z-2	Barge Carpenter 12'X40	1.00	20.00 HR	6.500				130		130
8MBS-Z-9	Spud Barge M-80x28'	1.00	20.00 HR	10.000				200		200
8MBW-Z-2	18' Aluminum Boat & O/	1.00	20.00 HR	3.000				60		60
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	20.00 HR	5.000				100		100
8MCN-A-13	Container Steel 20'	1.00	20.00 HR	0.100				2		2
8MFW-A-1	Work Float	1.00	20.00 HR	2.000				40		40
8MFW-A-2	Work Float	1.00	20.00 HR	2.000				40		40
8MGN-Z-17	Generator 8 KW	1.00	20.00 HR	2.000				40		40
8MGN-Z-18	Generator 8 KW	1.00	20.00 HR	2.000				40		40
8MLT-A-2	Light Tower, Genie	1.00	20.00 HR	3.500				70		70
8MVP-A-2	FORD F150 SUPERC 2	1.00	20.00 HR	6.500				130		130
8WELD400	Welder 400 AMP	2.00	40.00 HR	2.044				82		82
M100	Foreman - Carpenter	1.00	20.00 MH	34.720	1,222					1,222
M170	M-Welder	1.00	20.00 MH	32.000	1,155					1,155
M173	M-Lead Carpenter	1.00	20.00 MH	28.250	1,046					1,046
M175	M-Carpenter	3.00	60.00 MH	27.520	3,076					3,076
M180	M-Carpenter Helper	3.00	60.00 MH	27.520	2,875					2,875
OPCR100	Op Eng 1A- Crane 100-200	1.00	20.00 MH	33.480	1,051					1,051
\$14,088.62	200.0000 MH/LS		200.00 MH	[6458.54]	10,426			3,663		14,089
=====> Item Totals: 10046 - Demobilization										
\$34,203.94	440.0000 MH/LS		440.00 MH	[14442.01]	22,238		1,140	10,826		34,204
34,203.940	1 LS				22,237.62		1,140.00	10,826.32		34,203.94

Total of Above Sub-Biditems

=====> Item Totals: 10042 - Mobilization and Demobilization										
\$835,605.47	760.0000 MH/LS		760.00 MH	[25144.79]	39,327		426,280	369,998		835,605
835,605.470	1 LS				39,327.11		426,280.00	369,998.36		835,605.47

BID ITEM = 10047			CLIENT# = 03-12	Land Item	SCHEDULE: 1 100					
Description =	Environmental Protection & Turbidity Bar		Unit =	FT	Takeoff Quan:		664.000	Engr Quan:		0.000

430000 Silt Fence - Install **Quan: 1,000.00 LF Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

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<u>LAB3</u>	Foreman + 2 Laborers		10.00 CH	Prod: 100.0000 UH	Lab Pcs: 3.00	Eqp Pcs: 1.00
31ECSF	Silt Fence	1,000.00 LF		1.000	1,000	1,000
8TRKPU70	Leased 4x2, 3/4 Ton Ga	1.00	10.00 HR	8.476		85
LFORMN	Laborer-Foreman	1.00	10.00 MH	29.250	440	440
LPWR	Laborer-Power Tools	2.00	20.00 MH	28.020	850	850
\$2,375.55	0.0300 MH/LF		30.00 MH	[0.938]	1,291	1,000
						85
						2,376

432000 Turbidity Barrier **Quan: 1,000.00 LF Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

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<u>MARPIL</u>	Marine Piling & Demo Crew		10.00 CH	Prod: 1.0000 S	Lab Pcs: 6.00	Eqp Pcs: 17.00
3TRUBIDITYBA	Turbidity Barrier	1,000.00 LF		14.000	14,000	14,000

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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BID ITEM = 10050 CLIENT# = 01-12 Marine Item SCHEDULE: 1 100
 Description = Demolition Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000
 =====
 Salvage Armor Rock: 10,100 CY
 Armor Rock: 131,600 CY
 Total to install: 141,700 CY

205025 Excavation Marine Quan: 734,000.00 CY Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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 INCLUDES 10,100 CY OF SALVAGED

MARLAN	Demolition Crew on land	2,451.57	CH	Prod: 245.1575 S	Lab Pcs: 19.00	Eqp Pcs: 13.00	
8211050	Fuel, Oil, Grease 50g/d	245.16	DA	200.000	49,032	49,032	
8BHLD480	BHL Cat 450E 1.75CY	8.00	19,612.60	HR 45.473	891,844	891,844	
8CRANEC100	Crane Manitowoc 222B 1	1.00	2,451.58	HR 106.961	262,223	262,223	
8TRKPU10	Pickup 4x2 3/4 Ton Gas	4.00	9,806.30	HR 7.044	69,076	69,076	
9100010	Substance 10 workers	245.16	DA	1,000.000	245,160	245,160	
M105	Foreman - General Marine	1.00	2,451.58	MH 35.720	153,335	153,335	
M150	M-Operator, Crane	1.00	2,451.58	MH 33.480	146,797	146,797	
M195	M-Laborer	8.00	19,612.60	MH 27.520	939,765	939,765	
OPCR100	Op Eng 1A- Crane 100-200	1.00	2,451.58	MH 33.480	128,884	128,884	
OPEXC3	Op Eng 3- Backhoe to 3Y	8.00	19,612.60	MH 32.390	1,004,847	1,004,847	
\$3,890,963.19	0.0634 MH/CY	46,579.94	MH	[2.138] 2,373,628	245,160	1,272,175	3,890,963

205030 Excavation to Stockpile Marine Quan: 734,000.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 ***** includes 10,100 cy riprap + 734,000 cy excavation

5TRKCY	Trucking - CY	734,000.00	CY	8.000	5,872,000	5,872,000
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500510 Removal of Open Cell Sheets Marine Quan: 15,300.00 FT Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****

MARPI	Marine Piling & Demo Crew	2,550.00	CH	Prod: 255.0000 S	Lab Pcs: 6.00	Eqp Pcs: 17.00
3WELD	Weld Supplies (1 man-Stick	255.00	DA	70.000	17,850	17,850
8211050	Fuel, Oil, Grease 50g/d	255.00	DA	200.000	51,000	51,000
8CRANEC200	Crane Manitowoc 777 20	1.00	2,550.00	HR 163.361	416,571	416,571
8DRILLR	***DRILLS - ROCK***	1.00	2,550.00	HR 17.500	44,625	44,625
8MAC-A-10	Compressor 185 CFM	1.00	2,550.00	HR 3.000	7,650	7,650
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00	2,550.00	HR 10.000	25,500	25,500
8MBS-Z-14	Spud Barge M-120x45'	1.00	2,550.00	HR 17.500	44,625	44,625
8MBT-Z-12	Tug Push Boat 200 HP	1.00	2,550.00	HR 20.000	51,000	51,000
8MBW-Z-2	18' Aluminum Boat & O/	1.00	2,550.00	HR 3.000	7,650	7,650
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	2,550.00	HR 5.000	12,750	12,750
8MDH-A-7	DELMAG D19 HAMMER	1.00	2,550.00	HR 10.000	25,500	25,500
8MFD-A-1	FAIRLEADS	1.00	2,550.00	HR 0.100	255	255
8MGN-Z-11	Generator 10 KW	1.00	2,550.00	HR 3.000	7,650	7,650
8MLT-A-1	Light Tower, Genie	1.00	2,550.00	HR 3.500	8,925	8,925
8MPE-A-11	Extractor Pile	1.00	2,550.00	HR 5.000	12,750	12,750
8MVP-A-11	FORD F150 SUPERC 10	1.00	2,550.00	HR 6.500	16,575	16,575
8MWH-A-1	WINCH 3-DRUM RB-90	1.00	2,550.00	HR 10.000	25,500	25,500
8MWM-C-1	Welder Diesel 400 AMP	1.00	2,550.00	HR 2.500	6,375	6,375
8PILE26	Vibro Hammer 150 TN	1.00	2,550.00	HR 45.492	116,005	116,005
9100000	Substance 5 workers	255.00	DA	500.000	127,500	127,500
M105	Foreman - General Marine	1.00	2,550.00	MH 35.720	159,491	159,491
M165	M-Piledriver	1.00	2,550.00	MH 34.950	158,107	158,107
M170	M-Welder	1.00	2,550.00	MH 32.000	147,237	147,237
M190	M-Skilled Laborer	1.00	2,550.00	MH 29.250	128,561	128,561
M195	M-Laborer	1.00	2,550.00	MH 27.520	122,187	122,187
OPCR100	Op Eng 1A- Crane 100-200	1.00	2,550.00	MH 33.480	134,058	134,058

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10050										
Description =	Demolition									
\$1,875,896.60	1.0000 MH/FT	15,300.00 MH		[35.369]	849,641		145,350	880,905		1,875,897

500530 Removal of Rip Rap Marine Quan: 10,100.00 CY Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 ***** trucking included in excavatiuon to stockpile

Item	Description	Quantity	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
<u>MARLAN</u>	Demolition Crew on land	89.32	CH					19.00		13.00
8211050	Fuel, Oil, Grease 50g/d	8.93	DA	200.000				1,786		1,786
8BHL480	BHL Cat 450E 1.75CY	8.00	HR	45.473				32,493		32,493
8CRANEC100	Crane Manitowoc 222B 1	1.00	HR	106.961				9,554		9,554
8TRKPU10	Pickup 4x2 3/4 Ton Gas	4.00	HR	7.044				2,517		2,517
9100010	Substance 10 workers		DA	1,000.000				8,930		8,930
M105	Foreman - General Marine	1.00	MH	35.720	5,587					5,587
M150	M-Operator, Crane	1.00	MH	33.480	5,348					5,348
M195	M-Laborer	8.00	MH	27.520	34,239					34,239
OPCR100	Op Eng 1A- Crane 100-200	1.00	MH	33.480	4,696					4,696
OPEXC3	Op Eng 3- Backhoe to 3Y	8.00	MH	32.390	36,610					36,610
\$141,759.63	0.1680 MH/CY	1,697.08 MH		[5.661]	86,480			8,930	46,350	141,760

=====> **Item Totals: 10050 - Demolition**

\$11,780,619.42	63,577.0200 MH/LS	63,577.02 MH		[2167710.36]	3,309,750		6,271,440	2,199,429		11,780,619
11,780,619.420	1 LS				3,309,750.03		6,271,440.00	2,199,429.39		11,780,619.42

BID ITEM = 10055										
Description =	Dredging									

640000 Mechanical Dredging Quan: 938,000.00 CY Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5H *****

Item	Description	Quantity	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
<u>DREDGE</u>	Marine Piling & Demo Crew	4,709.14	CH					12.00		36.00
3WELD	Weld Supplies (1 man-Stick	1,177.29	DA	70.000				82,410		82,410
8211060	Fuel, Oil, Grease 1400g/d	588.64	DA	5,810.000				3,419,998		3,419,998
8CRANEC200	Crane Manitowoc 777 20	2.00	HR	9,418.29	163.361			1,538,581		1,538,581
8DRILLR	***DRILLS - ROCK***	2.00	HR	17.500				164,820		164,820
8MAC-A-10	Compressor 185 CFM	2.00	HR	9,418.29	3.000			28,255		28,255
8MBM-Z-2	M.Barge2110 GRT OB-80-	2.00	HR	9,418.29	10.000			94,183		94,183
8MBS-Z-10	Scow Barge	4.00	HR	18,836.57	227.000			4,275,901		4,275,901
8MBS-Z-14	Spud Barge M-120x45'	2.00	HR	9,418.29	17.500			164,820		164,820
8MBT-Z-12	Tug Push Boat 200 HP	2.00	HR	9,418.29	20.000			188,366		188,366
8MBW-Z-2	18' Aluminum Boat & O/	2.00	HR	9,418.29	3.000			28,255		28,255
8MCE-A-40	Bucket Clamshell 3 CYD	2.00	HR	9,418.29	5.000			47,091		47,091
8MDH-A-7	DELMAG D19 HAMMER	2.00	HR	9,418.29	10.000			94,183		94,183
8MFD-A-1	FAIRLEADS	2.00	HR	9,418.29	0.100			942		942
8MGN-Z-11	Generator 10 KW	2.00	HR	9,418.29	3.000			28,255		28,255
8MLT-A-1	Light Tower, Genie	2.00	HR	9,418.29	3.500			32,964		32,964
8MPE-A-11	Extractor Pile	2.00	HR	9,418.29	5.000			47,091		47,091
8MVP-A-11	FORD F150 SUPERC 10	2.00	HR	9,418.29	6.500			61,219		61,219
8MWH-A-1	WINCH 3-DRUM RB-90	2.00	HR	9,418.29	10.000			94,183		94,183
8MWM-C-1	Welder Diesel 400 AMP	2.00	HR	9,418.29	2.500			23,546		23,546
9100010	Substance 10 workers		DA	1,000.000				588,640		588,640
M105	Foreman - General Marine	2.00	MH	9,418.29	35.720	589,071				589,071
M165	M-Piledriver	2.00	MH	9,418.29	34.950	583,960				583,960
M170	M-Welder	2.00	MH	9,418.29	32.000	543,812				543,812
M190	M-Skilled Laborer	2.00	MH	9,418.29	29.250	474,835				474,835
M195	M-Laborer	2.00	MH	9,418.29	27.520	451,291				451,291
OPCR100	Op Eng 1A- Crane 100-200	2.00	MH	9,418.29	33.480	495,138				495,138
\$14,141,809.61	0.0602 MH/CY	56,509.74 MH		[2.131]	3,138,106			671,050	10,332,654	14,141,810

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Ment Contract	Total
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BID ITEM = 10055 CLIENT# = 01-12 Land Item SCHEDULE: 1 100
Description = Dredging Unit = CY Takeoff Quan: 938,000.000 Engr Quan: 938,000.000

640010 Spoils Disposal **Quan: 938,000.00 CY Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5H *****

Item	Description	Quantity	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Ment Contract	Total
DDISPO	Dredge Disposal	4,709.14	CH						
8211060	Fuel, Oil, Grease 1400g/d	588.64	DA	5,810.000			3,419,998		3,419,998
8CRANEC100	Crane Manitowoc 222B 1	1.00	HR	106.961			503,694		503,694
8DOZER	Bulldozer	2.00	HR	50.000			470,915		470,915
8EXCAV-Z-1	Excavator	2.00	HR	45.000			423,823		423,823
8MAC-A-17	Atlas Copco 185 CFM Ai	1.00	HR	3.000			14,127		14,127
8MBS-Z-14	Spud Barge M-120x45'	1.00	HR	17.500			82,410		82,410
8MBT-Z-12	Tug Push Boat 200 HP	1.00	HR	20.000			94,183		94,183
8MBW-Z-2	18' Aluminum Boat & O/	1.00	HR	3.000			14,127		14,127
8MCN-A-13	Container Steel 20'	1.00	HR	0.100			471		471
8MGN-Z-11	Generator 10 KW	1.00	HR	3.000			14,127		14,127
8MLT-A-1	Light Tower, Genie	1.00	HR	3.500			16,482		16,482
8MWM-C-1	Welder Diesel 400 AMP	1.00	HR	2.500			11,773		11,773
8PMP-Z-1	Slurry Pump	2.00	HR	150.000			1,412,744		1,412,744
9100000	Subsistance 5 workers	588.64	DA	500.000			294,320		294,320
M105	Foreman - General Marine	1.00	MH	35.720	294,535				294,535
M170	M-Welder	1.00	MH	32.000	271,906				271,906
M195	M-Laborer	3.00	MH	27.520	676,936				676,936
OPCR100	Op Eng 1A- Crane 100-200	1.00	MH	33.480	247,569				247,569
OPEXC3	Op Eng 3- Backhoe to 3Y	4.00	MH	32.390	965,087				965,087
\$9,229,226.51	0.0502 MH/CY	47,091.42	MH	[1.73]	2,456,032		294,320	6,478,875	9,229,227

905 MOBILIZATION-DEMobilIZATION **Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

5MOBE	Dredging Mob and Demob	1.00	LS	1,800,000.000			1,800,000		1,800,000
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=====> **Item Totals: 10055 - Dredging**

\$25,171,036.12	0.1104 MH/CY	103,601.16	MH	[3.861]	5,594,138		2,765,370	16,811,528	25,171,036
26.835	938000 CY				5.96		2.95	17.92	26.83

BID ITEM = 10060 CLIENT# = 01-12 Marine Item SCHEDULE: 1 100
Description = Piling Unit = FT Takeoff Quan: 88,172.000 Engr Quan: 88,172.000

303000 Supply Pipe Piles **Marine** **Quan: 88,172.00 FT Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

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2PP48INCH	48 In Diam Pipe Pile	88,172.00	LF	430.000			37,913,960		37,913,960
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303010 Pile Painting & Wrapping **Marine** **Quan: 1.04 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP**

Option 1
48 " O 1 " Thick Steel Pipe Pile

Outside Diameter = 48 in
Wall Thickness = 1.000 in

Tip Elevation	Top Elevation	Length (ft)	Quantity	Total Length (ft)	Unit Weight (lb/ft)	Weight (lb)
84,968.00	1	84,968.00	502.43	42,690,472.2	21,345.2	

Coating

Tip Elevation	Top Elevation	Length (ft)	Quantity	Diameter	Coating(SF)
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Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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BID ITEM = 10060 CLIENT# = 01-12 Marine Item SCHEDULE: 1 100
 Description = Piling Unit = FT Takeoff Quan: 88,172.000 Engr Quan: 88,172.000
 116.55 486 48 711,827.9
 2PP48COATING Pipe Pile Shop Coating 740,300.96 SF 4.000 2,961,204 2,961,204

303022 Set Pile Template Marine Quan: 1.04 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****
 31PILETEMPLA Pipe Pile Template 1.04 LS 60,000.000 62,400 62,400

303035 Piling - Pipe Marine Quan: 504.33 EA Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Pipe Qty Piles Pile Length Total Length Concrete Fill Volume Concrete (CF) Rebar (Ft)

A1 18 178 3,204.00 85.00 19,226.6 25,632
 A19 17 178 3,026.00 85.00 18,158.4 24,208
 A36 55 178 9,790.00 85.00 58,747.9 78,320
 B1 18 178 3,204.00 85.00 19,226.6 25,632
 B19 17 178 3,026.00 85.00 18,158.4 24,208
 B36 55 173 9,515.00 85.00 58,747.9 78,320
 C1 18 173 3,114.00 85.00 19,226.6 25,632
 C19 17 173 2,941.00 85.00 18,158.4 24,208
 C36 55 173 9,515.00 85.00 58,747.9 78,320
 D1 18 168 3,024.00 85.00 19,226.6 25,632
 D19 17 168 2,856.00 85.00 18,158.4 24,208
 D36 55 173 9,515.00 85.00 58,747.9 78,320
 E10 2 188 376.00 85.00 2,136.3 2,848
 E25 2 198 396.00 85.00 2,136.3 2,848
 E40 12 198 2,376.00 85.00 12,817.7 17,088
 F10 2 183 366.00 85.00 2,136.3 2,848
 F25 2 193 386.00 85.00 2,136.3 2,848
 F40 12 193 2,316.00 85.00 12,817.7 17,088
 G10 2 178 356.00 85.00 2,136.3 2,848
 G25 2 188 376.00 85.00 2,136.3 2,848
 G40 8 188 1,504.00 85.00 8,545.2 11,392
 H10 2 173 346.00 85.00 2,136.3 2,848
 H25 8 183 1,464.00 85.00 8,545.2 11,392
 H40 2 183 366.00 85.00 2,136.3 2,848
 I10 2 168 336.00 85.00 2,136.3 2,848
 I25 2 178 356.00 85.00 2,136.3 2,848
 I40 8 178 1,424.00 85.00 8,545.2 11,392
 J10 2 163 326.00 85.00 2,136.3 2,848
 J25 2 178 356.00 85.00 2,136.3 2,848
 J40 8 178 1,424.00 85.00 8,545.2 11,392
 K10 2 158 316.00 85.00 2,136.3 2,848
 K25 2 173 346.00 85.00 2,136.3 2,848
 K40 8 173 1,384.00 85.00 8,545.2 11,392
 L10 2 158 316.00 85.00 2,136.3 2,848
 L25 2 173 346.00 85.00 2,136.3 2,848
 L40 8 168 1,344.00 85.00 8,545.2 11,392
 M10 2 148 296.00 85.00 2,136.3 2,848
 M25 2 158 316.00 85.00 2,136.3 2,848
 M40 8 163 1,304.00 85.00 8,545.2 11,392
 N10 2 133 266.00 85.00 2,136.3 2,848
 N25 2 143 286.00 85.00 2,136.3 2,848
 N40 8 178 1,424.00 85.00 8,545.2 11,392
 O40 8 173 1,384.00 85.00 8,545.2 11,392
 P40 8 158 1,264.00 85.00 8,545.2 11,392
 486 173.5 84,968.00 519,118.0 cf 692,064 ft
 Average 174.8 19,226.6 cy

MARPIL	Marine Piling & Demo Crew	1,260.79	CH	Prod: 126.0794 S	Lab Pcs: 6.00	Eqp Pcs: 17.00
3WELD	Weld Supplies (1 man-Stick)	126.08	DA	70.000	8,826	8,826
8211050	Fuel, Oil, Grease 50g/d	126.08	DA	200.000	25,216	25,216
8CRANEC200	Crane Manitowoc 777 20	1.00	HR	163.361	205,964	205,964
8DRILLR	***DRILLS - ROCK***	1.00	HR	17.500	22,064	22,064

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Contract	Total
BID ITEM = 10060									
Description =	Piling								
		CLIENT# = 01-12	Marine Item	SCHEDULE: 1 100					
			Unit =	FT	Takeoff	Quan:	88,172.000	Engr Quan:	88,172.000
8MAC-A-10	Compressor 185 CFM	1.00	1,260.79 HR	3.000			3,782		3,782
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00	1,260.79 HR	10.000			12,608		12,608
8MBS-Z-14	Spud Barge M-120x45'	1.00	1,260.79 HR	17.500			22,064		22,064
8MBT-Z-12	Tug Push Boat 200 HP	1.00	1,260.79 HR	20.000			25,216		25,216
8MBW-Z-2	18' Aluminum Boat & O/	1.00	1,260.79 HR	3.000			3,782		3,782
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	1,260.79 HR	5.000			6,304		6,304
8MDH-A-7	DELMAG D19 HAMMER	1.00	1,260.79 HR	10.000			12,608		12,608
8MFD-A-1	FAIRLEADS	1.00	1,260.79 HR	0.100			126		126
8MGN-Z-11	Generator 10 KW	1.00	1,260.79 HR	3.000			3,782		3,782
8MLT-A-1	Light Tower, Genie	1.00	1,260.79 HR	3.500			4,413		4,413
8MPE-A-11	Extractor Pile	1.00	1,260.79 HR	5.000			6,304		6,304
8MVP-A-11	FORD F150 SUPERC 10	1.00	1,260.79 HR	6.500			8,195		8,195
8MWH-A-1	WINCH 3-DRUM RB-90	1.00	1,260.79 HR	10.000			12,608		12,608
8MWM-C-1	Welder Diesel 400 AMP	1.00	1,260.79 HR	2.500			3,152		3,152
8PILE26	Vibro Hammer 150 TN	1.00	1,260.79 HR	45.492			57,356		57,356
9100000	Substance 5 workers		126.08 DA	500.000			63,040		63,040
M105	Foreman - General Marine	1.00	1,260.79 MH	35.720	78,857				78,857
M165	M-Piledriver	1.00	1,260.79 MH	34.950	78,172				78,172
M170	M-Welder	1.00	1,260.79 MH	32.000	72,798				72,798
M190	M-Skilled Laborer	1.00	1,260.79 MH	29.250	63,564				63,564
M195	M-Laborer	1.00	1,260.79 MH	27.520	60,413				60,413
OPCR100	Op Eng 1A- Crane 100-200	1.00	1,260.79 MH	33.480	66,282				66,282
\$927,495.50	14.9995 MH/EA		7,564.74 MH	[530.515]	420,086		71,866	435,544	927,496

303040 Piling - Concrete Filling Marine Quan: 1.04 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****

MARWOO	Marine Carpenters Crew		1,252.36 CH	Prod:	125.2363 S	Lab Pcs:	10.00	Eqp Pcs:	16.00
8211050	Fuel, Oil, Grease 50g/d		125.24 DA	200.000			25,048		25,048
8CRANEC100	Crane Manitowoc 222B 1	1.00	1,252.36 HR	106.961			133,954		133,954
8MAC-A-17	Atlas Copco 185 CFM Ai	1.00	1,252.36 HR	3.000			3,757		3,757
8MBC-Z-1	Barge Carpenter 12'X40	1.00	1,252.36 HR	6.500			8,140		8,140
8MBC-Z-2	Barge Carpenter 12'X40	1.00	1,252.36 HR	6.500			8,140		8,140
8MBS-Z-9	Spud Barge M-80x28'	1.00	1,252.36 HR	10.000			12,524		12,524
8MBW-Z-2	18' Aluminum Boat & O/	1.00	1,252.36 HR	3.000			3,757		3,757
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	1,252.36 HR	5.000			6,262		6,262
8MCN-A-13	Container Steel 20'	1.00	1,252.36 HR	0.100			125		125
8MFW-A-1	Work Float	1.00	1,252.36 HR	2.000			2,505		2,505
8MFW-A-2	Work Float	1.00	1,252.36 HR	2.000			2,505		2,505
8MGN-Z-17	Generator 8 KW	1.00	1,252.36 HR	2.000			2,505		2,505
8MGN-Z-18	Generator 8 KW	1.00	1,252.36 HR	2.000			2,505		2,505
8MLT-A-2	Light Tower, Genie	1.00	1,252.36 HR	3.500			4,383		4,383
8MVP-A-2	FORD F150 SUPERC 2	1.00	1,252.36 HR	6.500			8,140		8,140
8WELD400	Welder 400 AMP	2.00	2,504.73 HR	2.044			5,120		5,120
M100	Foreman - Carpenter	1.00	1,252.36 MH	34.720	76,520				76,520
M170	M-Welder	1.00	1,252.36 MH	32.000	72,311				72,311
M173	M-Lead Carpenter	1.00	1,252.36 MH	28.250	65,525				65,525
M175	M-Carpenter	3.00	3,757.09 MH	27.520	192,612				192,612
M180	M-Carpenter Helper	3.00	3,757.09 MH	27.520	180,026				180,026
OPCR100	Op Eng 1A- Crane 100-200	1.00	1,252.36 MH	33.480	65,839				65,839
\$882,202.95	12,041.9423 MH/LS		12,523.62 MH	[388866.788]	652,834		229,369		882,203

303042 Concrete Supply Marine Quan: 15,738.00 CY Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Pipe Qty	Piles	Pile Length	Total Length	Concrete Fill Volume	Concrete (CF)	Rebar (Ft)
A1 18	178	3,204.00	85.00	19,226.6	25,632	
A19 17	178	3,026.00	85.00	18,158.4	24,208	
A36 55	178	9,790.00	85.00	58,747.9	78,320	

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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BID ITEM = 10060		CLIENT# = 01-12	Marine Item	SCHEDULE: 1	100					
Description = Piling			Unit =	FT	Takeoff	Quan:	88,172.000	Engr Quan:	88,172.000	
B1 18 178	3,204.00	85.00	19,226.6	25,632						
B19 17 178	3,026.00	85.00	18,158.4	24,208						
B36 55 173	9,515.00	85.00	58,747.9	78,320						
C1 18 173	3,114.00	85.00	19,226.6	25,632						
C19 17 173	2,941.00	85.00	18,158.4	24,208						
C36 55 173	9,515.00	85.00	58,747.9	78,320						
D1 18 168	3,024.00	85.00	19,226.6	25,632						
D19 17 168	2,856.00	85.00	18,158.4	24,208						
D36 55 173	9,515.00	85.00	58,747.9	78,320						
E10 2 188	376.00	85.00	2,136.3	2,848						
E25 2 198	396.00	85.00	2,136.3	2,848						
E40 12 198	2,376.00	85.00	12,817.7	17,088						
F10 2 183	366.00	85.00	2,136.3	2,848						
F25 2 193	386.00	85.00	2,136.3	2,848						
F40 12 193	2,316.00	85.00	12,817.7	17,088						
G10 2 178	356.00	85.00	2,136.3	2,848						
G25 2 188	376.00	85.00	2,136.3	2,848						
G40 8 188	1,504.00	85.00	8,545.2	11,392						
H10 2 173	346.00	85.00	2,136.3	2,848						
H25 8 183	1,464.00	85.00	8,545.2	11,392						
H40 2 183	366.00	85.00	2,136.3	2,848						
I10 2 168	336.00	85.00	2,136.3	2,848						
I25 2 178	356.00	85.00	2,136.3	2,848						
I40 8 178	1,424.00	85.00	8,545.2	11,392						
J10 2 163	326.00	85.00	2,136.3	2,848						
J25 2 178	356.00	85.00	2,136.3	2,848						
J40 8 178	1,424.00	85.00	8,545.2	11,392						
K10 2 158	316.00	85.00	2,136.3	2,848						
K25 2 173	346.00	85.00	2,136.3	2,848						
K40 8 173	1,384.00	85.00	8,545.2	11,392						
L10 2 158	316.00	85.00	2,136.3	2,848						
L25 2 173	346.00	85.00	2,136.3	2,848						
L40 8 168	1,344.00	85.00	8,545.2	11,392						
M10 2 148	296.00	85.00	2,136.3	2,848						
M25 2 158	316.00	85.00	2,136.3	2,848						
M40 8 163	1,304.00	85.00	8,545.2	11,392						
N10 2 133	266.00	85.00	2,136.3	2,848						
N25 2 143	286.00	85.00	2,136.3	2,848						
N40 8 178	1,424.00	85.00	8,545.2	11,392						
O40 8 173	1,384.00	85.00	8,545.2	11,392						
P40 8 158	1,264.00	85.00	8,545.2	11,392						
486 173.5	84,968.00	519,118.0	cf 692,064							
Average	174.8	19,226.6	cy							
2CR14	5000 PSI Concrete	1.10	17,311.79	CY	105.000	1,817,738				1,817,738

303043 Concrete Pumping Marine Quan: 1.04 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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5CONCP36M	Concrete Concrete Pump 36	626.16	HR	125.000		78,270			78,270
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303045 Piling - Rebar Marine Quan: 4,349,090.53 LB Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Option 1 ==>48" Pipe Pile Area II
PIECES SIZE WEIGHT LENGTH POUNDS TONS UNIT EXT.
INST. EA. PRICE PRICE

1 #8	2.670	1,426,984	3,810,048	1905.02	0.65	\$2,476,531.08	hook dowels @ 5'		
		3,810,048	1905.02						
		10%	4,191,053						
		SUBTOTAL:	\$2,476,531.08						
		TAX 6.5%:	\$160,974.52						
		TOTAL:	\$2,637,505.60	8%	\$211,000.45				
2RR02	Gr 60 Rebar	1.10	4,783,999.59	LB	0.480	2,296,320			2,296,320
2RR10	Rebar Supports		4,783,999.59	LB	0.050	239,200			239,200

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10060		CLIENT# = 01-12	Marine Item	SCHEDULE: 1 100						
Description =	Piling		Unit =	FT	Takeoff	Quan:	88,172.000	Engr	Quan:	88,172.000
2RS16	Coupler T-25 (#8)	16.00	8,069.22 EA	13.000		104,900				104,900
5REBAR	Rebar Sub	4,349,090.53	LB	0.280			1,217,745			1,217,745
\$3,858,164.99				[]		2,640,420	1,217,745			3,858,165
304000	Pile Splices - Pipe pile		Marine	Quan: 499.85 EA	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
5SPICES	Welding Subcontractor	749.75	EA	650.000			487,338			487,338
=====	Item Totals: 10060 - Piling									
\$48,988,772.73	0.2278 MH/FT	20,088.36	MH	[7.621]	1,072,920	45,333,321	1,917,618	664,913		48,988,773
555.605	88172 FT				12.17	514.15	21.75	7.54		555.60

BID ITEM = 10080		CLIENT# = 01-12	Marine Item	SCHEDULE: 1 100						
Description =	Sheet Pile Bulkhead		Unit =	LF	Takeoff	Quan:	2,200.000	Engr	Quan:	2,200.000
301000	Supply Open Cell Flat Sheets		Marine	Quan: 7,414,501.00 LB	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
2FSZ	STEEL SHEET PILE	7,414,501.00	LB	0.950		7,043,776				7,043,776
2SSPGALVANIZ	Galvanization of SSP	7,414,501.00	LB	0.350		2,595,075				2,595,075
\$9,638,851.30				[]		9,638,851				9,638,851

301015	Sheeting Template		Marine	Quan: 1.00 LS	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
31SHEETEMPLA	Open Cell Template	1.00	LS	85,000.000			85,000			85,000

301020	Drive Sheeting Bulkhead		Marine	Quan: 2,200.00 LF	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
<u>MARPIL</u>	Marine Piling & Demo Crew		1,530.00	CH	Prod: 153.0000 S	Lab Pcs:	6.00	Eqp Pcs:	17.00	
3WELD	Weld Supplies (1 man-Stick	153.00	DA	70.000		10,710				10,710
8211050	Fuel, Oil, Grease 50g/d	153.00	DA	200.000			30,600			30,600
8CRANEC200	Crane Manitowoc 777 20	1.00	1,530.00	HR	163.361		249,942			249,942
8DRILLR	***DRILLS - ROCK***	1.00	1,530.00	HR	17.500		26,775			26,775
8MAC-A-10	Compressor 185 CFM	1.00	1,530.00	HR	3.000		4,590			4,590
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00	1,530.00	HR	10.000		15,300			15,300
8MBS-Z-14	Spud Barge M-120x45'	1.00	1,530.00	HR	17.500		26,775			26,775
8MBT-Z-12	Tug Push Boat 200 HP	1.00	1,530.00	HR	20.000		30,600			30,600
8MBW-Z-2	18' Aluminum Boat & O/	1.00	1,530.00	HR	3.000		4,590			4,590
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	1,530.00	HR	5.000		7,650			7,650
8MDH-A-7	DELMAG D19 HAMMER	1.00	1,530.00	HR	10.000		15,300			15,300
8MFD-A-1	FAIRLEADS	1.00	1,530.00	HR	0.100		153			153
8MGN-Z-11	Generator 10 KW	1.00	1,530.00	HR	3.000		4,590			4,590
8MLT-A-1	Light Tower, Genie	1.00	1,530.00	HR	3.500		5,355			5,355
8MPE-A-11	Extractor Pile	1.00	1,530.00	HR	5.000		7,650			7,650
8MVP-A-11	FORD F150 SUPERC 10	1.00	1,530.00	HR	6.500		9,945			9,945
8MWH-A-1	WINCH 3-DRUM RB-90	1.00	1,530.00	HR	10.000		15,300			15,300
8MWM-C-1	Welder Diesel 400 AMP	1.00	1,530.00	HR	2.500		3,825			3,825
8PILE26	Vibro Hammer 150 TN	1.00	1,530.00	HR	45.492		69,603			69,603
9100000	Substance 5 workers		153.00	DA	500.000		76,500			76,500
M105	Foreman - General Marine	1.00	1,530.00	MH	35.720	95,694				95,694
M165	M-Piledriver	1.00	1,530.00	MH	34.950	94,864				94,864
M170	M-Welder	1.00	1,530.00	MH	32.000	88,342				88,342
M190	M-Skilled Laborer	1.00	1,530.00	MH	29.250	77,137				77,137

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10080										
	CLIENT# = 01-12									
Description =	Sheet Pile Bulkhead		Marine Item	SCHEDULE: 1	100					
			Unit = LF	Takeoff	Quan:	2,200.000		Engr	Quan:	2,200.000
M195	M-Laborer	1.00	1,530.00 MH	27.520	73,312					73,312
OPCR100	Op Eng 1A- Crane 100-200	1.00	1,530.00 MH	33.480	80,435					80,435
\$1,125,537.95	4.1727 MH/LF		9,180.00 MH	[147.584]	509,785		87,210	528,543		1,125,538
=====> Item Totals: 10080 - Sheet Pile Bulkhead										
\$10,849,389.25	4.1727 MH/LF		9,180.00 MH	[147.584]	509,785	9,638,851	172,210	528,543		10,849,389
4,931.541	2200 LF				231.72	4,381.30	78.28	240.25		4,931.54

BID ITEM = 10081										
	CLIENT# = 01-12									
Description =	Credit Sheetpile Materials on site		Marine Item	SCHEDULE: 1	100					
			Unit = LS	Takeoff	Quan:	1.000		Engr	Quan:	1.000
301000 Supply Open Cell Flat Sheets Marine Quan: 7,101,861.70 LB Hrs/Shft: 10.00 Cal: 510 WC: CCISP										
ANCHORAGE EXISTING SHEET PILES										
Unused PS 27.5 PS 31										
Total LF 26,040.00 116,453.00										
Unit weight 45.10 50.90										
Total weight 1,174,404.00 5,927,457.70 7,101,861.70 Lbs										
2FSZ	STEEL SHEET PILE		-7,101,861.70 LB	0.950		-6,746,769				-6,746,769
2SSPGALVANIZ	Galvanization of SSP		-7,101,861.70 LB	0.350		-2,485,652				-2,485,652
\$-9,232,420.22				[]		-9,232,420				-9,232,420
=====> Item Totals: 10081 - Credit Sheetpile Materials on site										
\$-9,232,420.22				[]		-9,232,420				-9,232,420
-9,232,420.219	1 LS					-9,232,420.21				-9,232,420.21

BID ITEM = 10090										
	CLIENT# = 01-12									
Description =	Concrete Deck Superstructure		Marine Item	SCHEDULE: 1	100					
			Unit = SF	Takeoff	Quan:	149,750.000		Engr	Quan:	149,750.000
322005 Final Deck Product Marine Quan: 149,750.00 SF Hrs/Shft: 10.00 Cal: 510 WC: CCISP										
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
52SUPERSTRUC	Concrete Superstructure		149,750.00 SF		101.000		15,124,750			15,124,750
=====> Item Totals: 10090 - Concrete Deck Superstructure										
\$15,124,750.00				[]		15,124,750				15,124,750
101.000	149750 SF					101.00				101.00

BID ITEM = 10100										
	CLIENT# = 01-12									
Description =	Abutments		Marine Item	SCHEDULE: 1	100					
			Unit = EA	Takeoff	Quan:	6.000		Engr	Quan:	6.000
303000 Supply Pipe Piles Marine Quan: 1,058.40 FT Hrs/Shft: 10.00 Cal: 510 WC: CCISP										
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
2PP48INCH	48 In Diam Pipe Pile		1,058.40 LF		430.000		455,112			455,112
303010 Pipe Painting & Wrapping Marine Quan: 8,866.86 SF Hrs/Shft: 10.00 Cal: 510 WC: CCISP										
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
2PP48COATING	Pipe Pile Shop Coating		8,866.86 SF		4.000		35,467			35,467

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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BID ITEM = 10100 CLIENT# = 01-12 Marine Item SCHEDULE: 1 100
Description = Abutments Unit = EA Takeoff Quan: 6.000 Engr Quan: 6.000

303022 Set Pile Template Marine Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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31PILETEMPLA	Pipe Pile Template	1.00	LS	6,000.000		6,000			6,000
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303035 Piling - Pipe Marine Quan: 6.00 EA Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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<u>MARPIL</u>	Marine Piling & Demo Crew	15.00	CH	Prod:	1.5000 S	Lab Pcs:	6.00	Eqp Pcs:	17.00
3WELD	Weld Supplies (1 man-Stick	1.50	DA	70.000		105			105
8211050	Fuel, Oil, Grease 50g/d	1.50	DA	200.000			300		300
8CRANEC200	Crane Manitowoc 777 20	1.00	15.00	HR	163.361		2,450		2,450
8DRILLR	***DRILLS - ROCK***	1.00	15.00	HR	17.500		263		263
8MAC-A-10	Compressor 185 CFM	1.00	15.00	HR	3.000		45		45
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00	15.00	HR	10.000		150		150
8MBS-Z-14	Spud Barge M-120x45'	1.00	15.00	HR	17.500		263		263
8MBT-Z-12	Tug Push Boat 200 HP	1.00	15.00	HR	20.000		300		300
8MBW-Z-2	18' Aluminum Boat & O/	1.00	15.00	HR	3.000		45		45
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	15.00	HR	5.000		75		75
8MDH-A-7	DELMAG D19 HAMMER	1.00	15.00	HR	10.000		150		150
8MFD-A-1	FAIRLEADS	1.00	15.00	HR	0.100		2		2
8MGN-Z-11	Generator 10 KW	1.00	15.00	HR	3.000		45		45
8MLT-A-1	Light Tower, Genie	1.00	15.00	HR	3.500		53		53
8MPE-A-11	Extractor Pile	1.00	15.00	HR	5.000		75		75
8MVP-A-11	FORD F150 SUPERC 10	1.00	15.00	HR	6.500		98		98
8MWH-A-1	WINCH 3-DRUM RB-90	1.00	15.00	HR	10.000		150		150
8MWM-C-1	Welder Diesel 400 AMP	1.00	15.00	HR	2.500		38		38
8PILE26	Vibro Hammer 150 TN	1.00	15.00	HR	45.492		682		682
9100000	Subsistance 5 workers	1.50	DA	500.000		750			750
M105	Foreman - General Marine	1.00	15.00	MH	35.720	938			938
M165	M-Piledriver	1.00	15.00	MH	34.950	930			930
M170	M-Welder	1.00	15.00	MH	32.000	866			866
M190	M-Skilled Laborer	1.00	15.00	MH	29.250	756			756
M195	M-Laborer	1.00	15.00	MH	27.520	719			719
OPCR100	Op Eng 1A- Crane 100-200	1.00	15.00	MH	33.480	789			789
\$11,034.68	15.0000 MH/EA	90.00	MH	[530.532]	4,998		855	5,182	11,035

303040 Piling - Concrete Filling Marine Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

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<u>MARWOO</u>	Marine Carpenters Crew	15.00	CH	Prod:	1.5000 S	Lab Pcs:	10.00	Eqp Pcs:	16.00
8211050	Fuel, Oil, Grease 50g/d	1.50	DA	200.000			300		300
8CRANEC100	Crane Manitowoc 222B 1	1.00	15.00	HR	106.961		1,604		1,604
8MAC-A-17	Atlas Copco 185 CFM Ai	1.00	15.00	HR	3.000		45		45
8MBC-Z-1	Barge Carpenter 12'X40	1.00	15.00	HR	6.500		98		98
8MBC-Z-2	Barge Carpenter 12'X40	1.00	15.00	HR	6.500		98		98
8MBS-Z-9	Spud Barge M-80x28'	1.00	15.00	HR	10.000		150		150
8MBW-Z-2	18' Aluminum Boat & O/	1.00	15.00	HR	3.000		45		45
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	15.00	HR	5.000		75		75
8MCN-A-13	Container Steel 20'	1.00	15.00	HR	0.100		2		2
8MFW-A-1	Work Float	1.00	15.00	HR	2.000		30		30
8MFW-A-2	Work Float	1.00	15.00	HR	2.000		30		30
8MGN-Z-17	Generator 8 KW	1.00	15.00	HR	2.000		30		30
8MGN-Z-18	Generator 8 KW	1.00	15.00	HR	2.000		30		30
8MLT-A-2	Light Tower, Genie	1.00	15.00	HR	3.500		53		53
8MVP-A-2	FORD F150 SUPERC 2	1.00	15.00	HR	6.500		98		98
8WELD400	Welder 400 AMP	2.00	30.00	HR	2.044		61		61
M100	Foreman - Carpenter	1.00	15.00	MH	34.720	917			917

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10100										
Description =		CLIENT# = 01-12		Marine Item	SCHEDULE: 1 100					
		Abutments		Unit =	EA	Takeoff Quan:	6.000	Engr Quan:		6.000
M170	M-Welder	1.00	15.00 MH	32.000		866				866
M173	M-Lead Carpenter	1.00	15.00 MH	28.250		785				785
M175	M-Carpenter	3.00	45.00 MH	27.520		2,307				2,307
M180	M-Carpenter Helper	3.00	45.00 MH	27.520		2,156				2,156
OPCR100	Op Eng 1A- Crane 100-200	1.00	15.00 MH	33.480		789				789
\$10,566.48	150.0000 MH/LS		150.00 MH	[4843.91]		7,819		2,747		10,566
303042	Concrete Supply		Marine	Quan: 219.75 CY	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
2CR14	5000 PSI Concrete	1.10	241.71 CY	105.000		25,380				25,380
303043	Concrete Pumping		Marine	Quan: 1.00 LS	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
5CONCP36M	Concrete Concrete Pump 36		7.50 HR	125.000			938			938
303045	Piling - Rebar		Marine	Quan: 1.00 LS	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
2RR02	Gr 60 Rebar	1.10	23,347.50 LB	0.480		11,207				11,207
2RR10	Rebar Supports		23,347.50 LB	0.050		1,167				1,167
2RS16	Coupler T-25 (#8)	16.00	96.00 EA	13.000		1,248				1,248
5REBAR	Rebar Sub		21,224.01 LB	0.280			5,943			5,943
\$19,564.90				[]		13,622	5,943			19,565
304000	Pile Splices - Pipe pile		Marine	Quan: 6.00 EA	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
5SPICES	Welding Subcontractor		24.00 EA	650.000			15,600			15,600
322910	Concrete Cap Dolphins			Quan: 6.00 EA	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****										
<u>MARPIL</u>	Marine Piling & Demo Crew		360.00 CH	Prod: 36.0000 S		Lab Pcs: 6.00		Eqp Pcs: 17.00		
2CR14	5000 PSI Concrete	1.10	250.80 CY	105.000		26,334				26,334
2RR02	Gr 60 Rebar	1.05	38,162.25 LB	0.480		18,318				18,318
3WELD	Weld Supplies (1 man-Stick		36.00 DA	70.000			2,520			2,520
5REBAR	Rebar Sub		38,162.01 LB	0.280			10,685			10,685
8211050	Fuel, Oil, Grease 50g/d		36.00 DA	200.000				7,200		7,200
8CRANEC200	Crane Manitowoc 777 20	1.00	360.00 HR	163.361				58,810		58,810
8DRILLR	***DRILLS - ROCK***	1.00	360.00 HR	17.500				6,300		6,300
8MAC-A-10	Compressor 185 CFM	1.00	360.00 HR	3.000				1,080		1,080
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00	360.00 HR	10.000				3,600		3,600
8MBS-Z-14	Spud Barge M-120x45'	1.00	360.00 HR	17.500				6,300		6,300
8MBT-Z-12	Tug Push Boat 200 HP	1.00	360.00 HR	20.000				7,200		7,200
8MBW-Z-2	18' Aluminum Boat & O/	1.00	360.00 HR	3.000				1,080		1,080
8MCE-A-40	Bucket Clamshell 3 CYD	1.00	360.00 HR	5.000				1,800		1,800
8MDH-A-7	DELMAG D19 HAMMER	1.00	360.00 HR	10.000				3,600		3,600
8MFD-A-1	FAIRLEADS	1.00	360.00 HR	0.100				36		36
8MGN-Z-11	Generator 10 KW	1.00	360.00 HR	3.000				1,080		1,080
8MLT-A-1	Light Tower, Genie	1.00	360.00 HR	3.500				1,260		1,260
8MPE-A-11	Extractor Pile	1.00	360.00 HR	5.000				1,800		1,800
8MVP-A-11	FORD F150 SUPERC 10	1.00	360.00 HR	6.500				2,340		2,340
8MWH-A-1	WINCH 3-DRUM RB-90	1.00	360.00 HR	10.000				3,600		3,600
8MWM-C-1	Welder Diesel 400 AMP	1.00	360.00 HR	2.500				900		900
8PILE26	Vibro Hammer 150 TN	1.00	360.00 HR	45.492				16,377		16,377
9100000	Substance 5 workers		36.00 DA	500.000			18,000			18,000
M105	Foreman - General Marine	1.00	360.00 MH	35.720		22,516				22,516

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10100		CLIENT# = 01-12	Marine Item	SCHEDULE: 1 100						
Description =	Abutments		Unit =	EA	Takeoff	Quan:	6.000	Engr	Quan:	6.000
M165	M-Piledriver	1.00	360.00 MH	34.950	22,321					22,321
M170	M-Welder	1.00	360.00 MH	32.000	20,786					20,786
M190	M-Skilled Laborer	1.00	360.00 MH	29.250	18,150					18,150
M195	M-Laborer	1.00	360.00 MH	27.520	17,250					17,250
OPCR100	Op Eng 1A- Crane 100-200	1.00	360.00 MH	33.480	18,926					18,926
\$320,169.70	360.0000 MH/EA	2,160.00 MH		[12732.72]	119,949	44,652	31,205	124,363		320,170
=====> Item Totals: 10100 - Abutments										
\$899,832.25	400.0000 MH/EA	2,400.00 MH		[14070.57]	132,767	574,233	60,541	132,292		899,832
149,972.042	6 EA				22,127.76	95,705.51	10,090.10	22,048.68		149,972.04

BID ITEM = 10120		CLIENT# = 01-12	Marine Item	SCHEDULE: 1 100						
Description =	Fendering		Unit =	LS	Takeoff	Quan:	1.000	Engr	Quan:	1.000

620010 Fendering and bollard System Marine Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5H *****

24 fenders @ \$58,333.00= \$1,399,992.00
48 cylindrical fenders @ \$5,499= \$263,952.00
3 pneumatic fenders @ \$24,182.00= \$72,546
Total: = \$1,736,490.00

2BOLLARD	Bollards	24.00 EA	22,700.000	544,800				544,800		
2FENDER	Fender system	1.00 LS	1,736,490.000	1,736,490				1,736,490		
\$2,281,290.00			[]	2,281,290				2,281,290		

620020 Install Fenders and Bollards Marine Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5 *****
***** Copied and adjusted from Y:\TBG-ENGI\EST\13-008-5H *****

MARPIL	Marine Piling & Demo Crew	120.00 CH	Prod:	12.0000 S	Lab Pcs:	6.00	Eqp Pcs:	17.00
3WELD	Weld Supplies (1 man-Stick	12.00 DA	70.000		840			840
8211050	Fuel, Oil, Grease 50g/d	12.00 DA	200.000			2,400		2,400
8CRANEC200	Crane Manitowoc 777 20	1.00 120.00 HR	163.361			19,603		19,603
8DRILLR	***DRILLS - ROCK***	1.00 120.00 HR	17.500			2,100		2,100
8MAC-A-10	Compressor 185 CFM	1.00 120.00 HR	3.000			360		360
8MBM-Z-2	M.Barge2110 GRT OB-80-	1.00 120.00 HR	10.000			1,200		1,200
8MBS-Z-14	Spud Barge M-120x45'	1.00 120.00 HR	17.500			2,100		2,100
8MBT-Z-12	Tug Push Boat 200 HP	1.00 120.00 HR	20.000			2,400		2,400
8MBW-Z-2	18' Aluminum Boat & O/	1.00 120.00 HR	3.000			360		360
8MCE-A-40	Bucket Clamshell 3 CYD	1.00 120.00 HR	5.000			600		600
8MDH-A-7	DELMAG D19 HAMMER	1.00 120.00 HR	10.000			1,200		1,200
8MFD-A-1	FAIRLEADS	1.00 120.00 HR	0.100			12		12
8MGN-Z-11	Generator 10 KW	1.00 120.00 HR	3.000			360		360
8MLT-A-1	Light Tower, Genie	1.00 120.00 HR	3.500			420		420
8MPE-A-11	Extractor Pile	1.00 120.00 HR	5.000			600		600
8MVP-A-11	FORD F150 SUPERC 10	1.00 120.00 HR	6.500			780		780
8MWH-A-1	WINCH 3-DRUM RB-90	1.00 120.00 HR	10.000			1,200		1,200
8MWM-C-1	Welder Diesel 400 AMP	1.00 120.00 HR	2.500			300		300
8PILE26	Vibro Hammer 150 TN	1.00 120.00 HR	45.492			5,459		5,459
9100000	Substance 5 workers	12.00 DA	500.000		6,000			6,000
M105	Foreman - General Marine	1.00 120.00 MH	35.720	7,505				7,505
M165	M-Piledriver	1.00 120.00 MH	34.950	7,440				7,440
M170	M-Welder	1.00 120.00 MH	32.000	6,929				6,929
M190	M-Skilled Laborer	1.00 120.00 MH	29.250	6,050				6,050
M195	M-Laborer	1.00 120.00 MH	27.520	5,750				5,750

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
BID ITEM = 10120		CLIENT# = 01-12	Marine Item	SCHEDULE: 1	100					
Description =	Fendering		Unit =	LS	Takeoff	Quan:	1.000	Engr	Quan:	1.000
OPCR100	Op Eng 1A- Crane 100-200	1.00	120.00	MH	33.480	6,309				6,309
\$88,277.49	720.0000 MH/LS	720.00	MH	[25465.44]	39,983		6,840	41,454		88,277
=====> Item Totals: 10120 - Fendering										
\$2,369,567.49	720.0000 MH/LS	720.00	MH	[25465.44]	39,983	2,281,290	6,840	41,454		2,369,567
2,369,567.490	1 LS				39,983.13	2,281,290.00	6,840.00	41,454.36		2,369,567.49

BID ITEM = 10140		CLIENT# = 01-12	Marine Item	SCHEDULE: 1	100					
Description =	Slope Protection		Unit =	CY	Takeoff	Quan:	160,000.000	Engr	Quan:	160,000.000
203900	Supply Armor Rock		Quan:	160,000.00	CY	Hrs/Shft:	10.00	Cal:	510	WC: CCISP

per plan C-8 supply armor rock: 131,600 CY
 2ARMOR Armor Stone 208,950.83 TN 60.000 12,537,050 12,537,050

209900	Install Slope Protection		Marine	Quan:	172,279.64	CY	Hrs/Shft:	10.00	Cal:	510	WC: CCISP
<u>MARLAN</u>	Demolition Crew on land		1,964.74	CH	Prod:	196.4742	S	Lab Pcs:	19.00	Eqp Pcs:	13.00
8211050	Fuel, Oil, Grease 50g/d		196.47	DA	200.000			39,294		39,294	
8BHL480	BHL Cat 450E 1.75CY	8.00	15,717.93	HR	45.473			714,741		714,741	
8CRANEC100	Crane Manitowoc 222B 1	1.00	1,964.74	HR	106.961			210,151		210,151	
8TRKPU10	Pickup 4x2 3/4 Ton Gas	4.00	7,858.97	HR	7.044			55,359		55,359	
9100010	Substance 10 workers		196.47	DA	1,000.000			196,470		196,470	
M105	Foreman - General Marine	1.00	1,964.74	MH	35.720	122,885				122,885	
M150	M-Operator, Crane	1.00	1,964.74	MH	33.480	117,646				117,646	
M195	M-Laborer	8.00	15,717.93	MH	27.520	753,147				753,147	
OPCR100	Op Eng 1A- Crane 100-200	1.00	1,964.74	MH	33.480	103,290				103,290	
OPEXC3	Op Eng 3- Backhoe to 3Y	8.00	15,717.93	MH	32.390	805,304				805,304	
\$3,118,286.91	0.2166 MH/CY	37,330.08	MH	[7.301]	1,902,272			196,470	1,019,544	3,118,287	
=====> Item Totals: 10140 - Slope Protection											
\$15,655,336.71	0.2333 MH/CY	37,330.08	MH	[7.861]	1,902,272	12,537,050		196,470	1,019,544	15,655,337	
97.846	160000 CY				11.89	78.36		1.23	6.37	97.85	

BID ITEM = 10150		CLIENT# = 01-19	Land Item	SCHEDULE: 1	100					
Description =	Surface Pavements		Unit =	LS	Takeoff	Quan:	1.000	Engr	Quan:	1.000
23	ASPHALT PAVING		Quan:	1.00	LS	Hrs/Shft:	10.00	Cal:	510	WC: CCISP

This is the parametric cost from ICRC estimate site prep, earthwork and paving, per SY
 4SUB Subcontract 150,041.00 SY 154.863 23,235,844 23,235,844

BID ITEM = 10160		CLIENT# = 01-19	Land Item	SCHEDULE: 1	100					
Description =	Traffic Control Parking		Unit =	LS	Takeoff	Quan:	1.000	Engr	Quan:	1.000
5	TRAFFIC CONTROL/ACCESS		Quan:	150,041.00	SY	Hrs/Shft:	10.00	Cal:	510	WC: CCISP

This is the parametric cost from ICRC estimate for striping and signage, per SY
 4SUB Subcontract 150,041.00 SY 2.490 373,602 373,602

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Matl/Exp	Equip Ment	Sub-Contract	Total
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BID ITEM = 10170 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
 Description = Surface water control Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

40 DRAINAGE Quan: 150,041.00 SY Hrs/Shft: 10.00 Cal: 510 WC: CCISP

This is the parametric cost from ICRC estimate for lump sum surface drainage, costed per SY
 4SUB Subcontract 150,041.00 SY 7.035 1,055,538 1,055,538

BID ITEM = 10180 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
 Description = Potable Water Utilities Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

411 WATER MAINS Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Potable water as lump sum from ICRC estimate
 4SUB Subcontract 1.00 LS 2,525,274.000 2,525,274 2,525,274

BID ITEM = 10190 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
 Description = Fire Suppression Utilities Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

411 WATER MAINS Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Estimating Fire suppression water as Potable water lump sum from ICRC estimate (assumes the ICRC estimate only had Potable water).
 4SUB Subcontract 1.00 LS 2,525,274.000 2,525,274 2,525,274

BID ITEM = 10200 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
 Description = Sanitary Sewer Utilities Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

412 SANITARY SEWER Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

San Sewer as lump sum from ICRC estimate
 4SUB Subcontract 1.00 LS 359,657.000 359,657 359,657

BID ITEM = 10210 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
 Description = Electrical Power Utilities Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

419 ELEC. UTILITIES Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Electrical Utilities as lump sum from ICRC estimate
 4SUB Subcontract 1.00 LS 9,239,076.000 9,239,076 9,239,076

BID ITEM = 10230 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
 Description = Telecommunications Utilities Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

419 TEL/COM. UTILITIES Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Telecomm utilities cost taken as lump sum from ICRC estimate
 4SUB Subcontract 1.00 LS 3,281,521.000 3,281,521 3,281,521

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Perm Labor	Constr Material	Equip Matl/Exp	Sub-Ment Contract	Total
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BID ITEM = 10240 CLIENT# = 01-08 Land Item SCHEDULE: 1 100
Description = Railroad Spur Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

3 RAIL SPUR Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Rail and appurtenances taken as lump sum from ICRC estimate
4SUB Subcontract 1.00 LS 6,803,601.000 6,803,601 6,803,601

BID ITEM = 10250 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
Description = Surface Restoration/Landscaping Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

209000 Restorations Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

No restoration was identified in ICRC estimate. Assuming a nominal amount for landscape and plants.
4SUB Subcontract 1.00 LS 150,000.000 150,000 150,000

BID ITEM = 10260 CLIENT# = 01-19 Land Item SCHEDULE: 1 100
Description = Marine Terminal Buildings incl Crane Mai Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

89 Tote Marine and AWWU Meeting Buildings Quan: 1.00 EA Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Parametric cost taken as lump sum from ICRC estimate - used for stevedore facilities
4SUB Subcontract 1.00 EA 1,452,767.000 1,452,767 1,452,767

BID ITEM = 10270 CLIENT# = 01-12 Land Item SCHEDULE: 1 100
Description = Corrosion Control Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

859 CATHODIC PROTECTION Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Updated numbers from Jerry Duppong/SEA based on current structural (replaces ICRC estimate)
4SUB Subcontract 1.00 LS 8,565,000.000 8,565,000 8,565,000

BID ITEM = 10280 CLIENT# = 01-08 Land Item SCHEDULE: 1 100
Description = Cherry Hill Road Upgrades Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

2 EARTHWORK/BASE/PAVING Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

Road upgrade cost from ICRC estimate
4SUB Subcontract 1.00 LS 823,088.000 823,088 823,088

BID ITEM = 10290 CLIENT# = 01-12 Land Item SCHEDULE: 1 100
Description = Other Unit = LS Takeoff Quan: 1.000 Engr Quan: 1.000

89 MARINE MAMMAL MONITORING Quan: 1.00 LS Hrs/Shft: 10.00 Cal: 510 WC: CCISP

4SUB Subcontract 1.00 LS 3,624,482.000 3,624,482 3,624,482

Direct Cost Report

Activity Resource	Desc	Quantity Pcs	Unit	Unit Cost	Labor	Perm Material	Constr Matl/Exp	Equip Ment	Sub-Contract	Total	
BID ITEM = 10290											
Description = Other		CLIENT# = 01-12	Land Item Unit =	SCHEDULE: 1	100						
				LS	Takeoff Quan:		1.000	Engr Quan:		1.000	
890000	KABATA WORK			Quan: 1.00	LS	Hrs/Shft: 10.00	Cal: 510	WC: CCISP			
4SUB	Subcontract	1.00	LS	767,282.000				767,282		767,282	
=====> Item Totals: 10290 - Other											
\$4,391,764.00				[]				4,391,764		4,391,764	
4,391,764.000				1 LS				4,391,764.00		4,391,764.00	
<hr/>											
\$187,262,233.66		*** Report Totals ***		238,013.29	MH	12,617,005	61,132,325	26,959,089	21,771,807	64,782,007	187,262,234

>>> indicates Non Additive Activity
 -----Report Notes:-----
 The estimate was prepared with TAKEOFF Quantities.
 This report shows TAKEOFF Quantities with the resources.

Bid Date: Owner: Engineering Firm:
 Estimator-In-Charge:

JOB NOTES

Estimate created on: 03/12/2008 by User#: 0 -
 Source used: C:\HEAVYBID\BIN\BLANK\BLANK.zip (a backup) from 04/20/2006 4:40:12 PM

*****Estimate created on: 03/20/2008 by User#: 0 -
 Source used: R:\CURRENT DEVELOPMENT\HEAVYBID\INSTALLS\CURRENT INSTALL SOURCE\BACKUPS\BLANK.zip (a backup)
 from 03/18/2008 11:43:18 AM

*****Estimate created on: 03/21/2008 by User#: 0 -
 Source used: C:\HEAVYBID\BACKUPS\BLANK.zip (a backup) from 03/20/2008 8:40:26 AM

*****Estimate created on: 01/24/2013 by User#: 609 - Bob Wells
 Source estimate used: Y:\TBG-ENGI\EST\ESTMAST

*****Estimate created on: 02/07/2013 by User#: 609 - Bob Wells
 Source estimate used: Y:\TBG-ENGI\EST\13-008

* on units of MH indicate average labor unit cost was used rather than base rate.
 [] in the Unit Cost Column = Labor Unit Cost Without Labor Burdens
 In equipment resources, rent % and EOE % not = 100% are represented as XXX%YYY where XXX=Rent% and YYY=EOE%
 -----Calendar Codes-----
 510 5 days @ 10hrs/day