



COASTAL PROTECTION ENGINEERING
5301 N. FEDERAL HWY, SUITE 335
BOCA RATON, FL 33487
561-565-5100

February 11, 2022

Submitted Via Email

Robert Weber
Coastal Program Manager
Town of Palm Beach
951 Old Okeechobee Road
West Palm Beach, FL 33401

Re: Proposal for Reach 8 Beach Restoration Project Design and Permitting

Dear Rob:

This proposal is being provided at your request for Coastal Protection Engineering LLC (CPE) to support the Town of Palm Beach (Town) in preparing a Florida Department of Environmental Protection (FDEP) Joint Coastal Permit (JCP) application for the Reach 8 Beach Restoration Project. Additionally, CPE will provide support to continue the federal permitting process. The total cost for these services is an estimated, Not-To-Exceed amount of \$249,834.00 and will be performed in accordance with this proposal and the Professional Services Agreement (PSA) 2020-02 between the Town of Palm Beach and CPE dated May 22, 2020. A scope of services is provided in Exhibit A and the cost summary is provided in Exhibit B. The proposal from our subconsultant, APTIM Environmental & Infrastructure, LLC (APTIM) is provided in Exhibit C.

The compensation for services rendered under this proposal will be based on the Rate Schedule of the PSA as shown in Exhibit B. Although this proposal is detailed by separable items and estimated by specific staff and categories, it is anticipated that some work elements will exceed the estimate while others fall below the estimate to complete. Our full staff and sub-consultant will be available and used as needed to achieve the scope of services and to meet the Town's objectives and timelines within the task budget. Should the Town desire additional services beyond this scope, CPE will be available to discuss adjustments as appropriate.

Thank you for the opportunity to serve the Town of Palm Beach. If you have any questions, please feel free to contact me directly at 561-756-2535.

Sincerely,

A handwritten signature in blue ink, appearing to read "TP", with a long horizontal flourish extending to the right.

Thomas P. Pierro, P.E., D.CE
Principal Engineer
Coastal Protection Engineering LLC
Mobile: 561-756-2535
tpierro@coastalprotectioneng.com

cc: Tara Brenner, P.G., P.E., CPE
Stacy Buck, CPE



Exhibit A - Scope of Services

Task 1 – State and Federal Permitting

State Permitting

CPE will develop a Florida Department of Environmental Protection (FDEP) Joint Coastal Permit (JCP) application to request a 15-year multi-use permit that includes relevant aspects and features of the proposed Reach 8 Beach Restoration Project based on the Town's project evaluated in the Southern Palm Beach Island Comprehensive Shoreline Stabilization Project Environmental Impact Statement (EIS) and coordination to date. This includes coordination with State agencies, including FDEP and FWC, during the development and submittal of the permit application.

Federal Permitting

CPE will continue ongoing coordination with federal agencies to support the the U.S. Army Corps of Engineers (USACE) in the process towards issuance of the EIS Record of Decision (ROD). This includes coordination with, but not limited to, the USACE and National Marine Fisheries Services (NMFS). The USACE is currently coordinating Section 7 consultation under the Endangered Species Act with NMFS Protected Resources Division (NMFS-PRD) and consultation under the Magnuson-Stevens Fishery Conservation and Management Act with NMFS Habitat Conservation Division (NMFS-HCD). Coordination may include efforts such as responses to data requests, preparation of maps and plans, and participation in meetings and conference calls to discuss issues raised by the agencies.

The State and Federal Permitting task will include the following items:

Pre-Application Meeting

Prior to preparing the JCP application, CPE will request, prepare for, and attend a pre-application meeting with FDEP regulatory staff and representatives from Florida Fish and Wildlife Conservation Commission (FWC). The meeting(s) will be held virtually via webinar, but this proposal also includes the option to attend an in-person meeting with FDEP in Tallahassee if requested by the Town. The overall purpose of the pre-application meeting is to present the proposed project, obtain agency input and guidance and identify any additional data needs and concerns. Feedback received during the pre-application meeting will be used to refine the proposed field investigations, complete the design, and prepare and submit a thorough and complete JCP application.

Engineering Design

As the basis for the project design and permitting effort, CPE will utilize the template from the EIS compared to the most recent beach survey data available. Shoreline and volume changes will be updated to evaluate volume needs and distribution on the existing beach conditions. The proposed design may be slightly modified for existing conditions and will maintain focus on minimizing the potential for adverse impacts to the hardbottom resources nearshore of the project. A cross-shore equilibrium profile analysis of the proposed design will be conducted to evaluate the potential for hardbottom impacts.



The design will be based on the Town's preferred project template evaluated in the EIS will consider volume requirements, updated beach conditions, nearshore hardbottom, and other relevant factors of the proposed project. CPE will review existing data and the proposed template to update the design as appropriate, prepare the permit sketches, and assemble the application attachments. The permit sketches will include plan view and cross-sections of the beach fill template, available construction access(es) and staging areas, topographic and bathymetric survey data, identified regulatory restrictions, and known hardbottom areas. The permit sketches will be signed and sealed by a Professional Engineer registered in the State of Florida and provided with the application.

Artificial Reef Engineering and Design

Stability Analysis. CPE will perform a stability analysis of the proposed mitigative artificial reef based on the depths of water at the site. The submerged artificial reef will be subject to hydrodynamic forces associated with the ocean environment, which will be addressed in the analysis. The analysis will include an assessment of the required boulder size, need for anchoring, and foundation type (i.e. geotextile fabric, marine mattress, etc.) necessary to minimize wave-induced displacement, long-term settlement, and functionality as mitigation.

Design Drawings. CPE will prepare permit sketches with sufficient detail to support the environmental permit application. The proposed location will be identified, and the layout will consider nearby hardbottom and foundation requirements. Relevant coastal engineering factors including placement of the artificial reef in areas that may result in scouring or burial due to longshore and/or cross-shore sand movement will be considered. The drawings will include plan views, typical cross-sections, and preliminary material quantities as typically required to obtain environmental permits. Relevant exposed hardbottom and hydrographic survey data will be included in the drawings where appropriate. The artificial reef permit sketches will be signed and sealed by a Professional Engineer registered in the State of Florida and provided with the application.

Minimization, Mitigation & Monitoring Plan

CPE will develop a Minimization, Mitigation, & Monitoring Plan based on anticipated impacts to nearshore hardbottom resources. The plan will use means of calculating impacts and determining mitigation requirements based on previous coordination with USACE and FDEP. The plan will also detail the monitoring methodologies and reporting requirements for the nearshore hardbottom and mitigative artificial reef.

Agency Response and Coordination

Following submittal of the JCP application, CPE will continue coordination with State agencies, including FDEP and FWC, to respond to Requests for Additional Information (RAIs) during the permit review process. The FDEP has 90 days to review a permit application and either issue a Notice of Intent (NOI) to issue the permit or issue a RAI. FDEP RAI's may also include comments from the FWC, other State agencies and the general public.

If multiple RAIs are received, CPE will attempt to consolidate the agencies' RAIs into a single response. We will coordinate with the Town on the extent of the response and what the implication may be to



the permitting process and construction timeline. We will draft a RAI response and provide the Town an opportunity for review prior to submittal to the agencies. In cases where coordination and response efforts may exceed the level of effort estimated herein, CPE will contact the Town to discuss an approach and can develop a supplemental proposal if requested.

Task 2 – Field Investigations

CPE will conduct field investigations with the support of our subconsultant to collect the data needed to provide the agencies support for reasonable assurance determination regarding the conditions of the project site. These investigations will include a benthic survey of the nearshore hardbottom habitat, an ESA-listed coral species survey, a topographic and hydrographic survey along the fill area, establishment of an Erosion Control Line (ECL), a seismic survey of the artificial reef location, and an optional task to conduct sediment probes to refine the data collected during the seismic survey. These investigations are detailed in the following subtasks and may be refined based on guidance received during the pre-application meeting under Task 1.

Task 2A – Benthic Survey

A benthic investigation of the nearshore hardbottom resources in the Reach 8 project area will be conducted during Summer 2022. Eight (8) shore-perpendicular transects will be assessed and located in proximity to R-monuments between R-129 and R-136. If timing aligns, data from the three transects surveyed as part of the annual BMA monitoring in this area (R-132, R-133, and R-136) will be utilized. The length of each transect will depend on the width (west to east) of the hardbottom at the time of the survey. Transects will be assessed for characterization purposes only and will not be marked with permanent pins, but coordinates will be collected at the start and end of each transect. Sediment data will be collected using line-intercept and interval sediment depth measurements, and video documentation will also be collected for the length of each transect. Quadrats will be sampled along each transect using 0.5-m² quadrats spaced in a logarithmic placement on exposed hardbottom. Nearshore hardbottom edge mapping is not proposed in this scope; recent hardbottom delineations (in situ and/or aerial delineation) from the annual BMA monitoring will be used to supplement the transect data. It is anticipated that the effort to conduct the benthic survey will take up to three (3) field days.

The benthic data will be compiled and entered into an Access database. Raw data will be submitted in the form of scanned datasheets, excel spreadsheets with quadrat data, interval sediment depth measurements and line-intercept data, shapefiles of the transects surveyed, and video and photo documentation. A benthic characterization report will be prepared and provided to the Town and ultimately submitted to the regulatory agencies to support the permitting process. The report will include a map of the project area and adjacent hardbottom resources with the BMA hardbottom edge delineation and monitoring transects overlaid onto recent, clear aerial photographs.

Task 2B – ESA-Listed Coral Survey

In a RAI dated September 22, 2021, the USACE and NMFS Protected Resources Division (NMFS-PRD) requested that an Endangered Species Act (ESA) listed species survey be conducted within the Reach 8



project area. This survey will be conducted as per the NMFS recommended protocol for ESA-listed coral colony and *Acropora* critical habitat along the project area shoreline from R-129-210 to R-134+135. The survey area will include the nearshore hardbottom located within 500 feet of the equilibrium toe of fill (ETOF).

Based on historic hardbottom within the investigation area, it is anticipated that 30 sampling sites will be surveyed. Each 1-hectare sampling site will be surveyed by two marine biologists in a grid pattern to assess the entire site. Raw data will be submitted in the form of scanned datasheets, excel spreadsheets with coral data, and photographs. A listed coral survey report will be prepared and provided to the USACE to support ESA Section 7 consultation. The report will include a map of the project area and adjacent hardbottom resources with the survey results overlaid onto recent, clear aerial photographs.

Task 2C – Topographic/Bathymetric Survey

Topographic and bathymetric surveys of the proposed beach nourishment project area will be collected for the purpose of quantifying the volume in the beach, preparing the permit sketches, and preparing drawings for the permit application in accordance with Rule 62B-41.008(1)(a), Florida Administrative Code (F.A.C.).

The topographic and bathymetric survey drawings of the proposed project site will include profiles and a contour map that reflect the current conditions of the project area. The mean high water line, the seaward limit of vegetation, and all other existing structures located in the project area will be mapped and provided as part of the survey requirements. The drawings will meet the State's standards of practice as presented in 5J-17 F.A.C. and will be signed and sealed by the professional surveyor, duly registered pursuant to Chapter 472, Florida Statutes (F.S.), who performed the survey. Descriptions of the structures will also be provided as an attachment to the JCP application.

Beach profiles will be collected at 500' intervals per requirements including each FDEP R-monument within 1000' of the Reach 8 Beach Restoration project area, from R-129-210 to R-134+135. Profiles will extend to the depth of closure.

Task 2D – Establishment of an Erosion Control Line (ECL)

A mean high water (MHW) survey will be conducted in accordance with standards set by FDEP, Division of State Lands, Bureau of Survey and Mapping. Surveys will be submitted to the State for approval and recording. Survey deliverables will consist of four (4) 22" X 34" survey maps signed and sealed by a registered Florida Surveyor and Mapper compliant with requirements Chapter 161 F.S. Coordination will be conducted as necessary with the Division of State Land's for review and submission of the survey drawings. An electronic version of the ECL legal description and AutoCAD format files will also be delivered.

CPE will prepare and attend the required workshop and hearing. It is assumed that the Town will be responsible for preparation or delivery of the required public notice of the ECL public hearing or recording in the official records.



Task 2E – Seismic Survey for Artificial Reef Siting

A geophysical and hydrographic survey will be conducted with the goal of identifying a suitable artificial reef site in the nearshore habitat offshore of the Town. Comprehensive survey services will be provided including field data collection using our subconsultant's equipment and personnel, data processing, interpretation, analysis, and composition of a final letter report of findings, including an isopach showing the thickness of unconsolidated material over rock. Ground-truthing (jet probes) of the remote-sensing data collected is not included within this proposal, but sediment probes are included as an optional task under Task 2F.

The survey plan will consist of a one-half day mobilization of equipment and personnel, one full day of survey operations, and one-half day demobilization of equipment and personnel. We will work with the Town to determine the survey area. Once determined, 30-meter spaced survey lines will be collected over the survey area for adequate coverage to delineate locations suitable for artificial reef placement. It is expected that 30 nautical miles of line coverage can be collected in the two-day survey, equating to between 300 and 500 acres (depending on survey area size and shape). We will work with the Town to refine the potential survey area to target an appropriately sized area to achieve the estimated coverage. Additionally, we will carefully target a weather window to ensure optimal survey production and allow for accessing shallow waters nearshore.

CPE's subconsultant will review and process and interpret the seismic sub-bottom data to determine overburden thickness of unconsolidated material above the limestone/consolidate rock for placement of an artificial reef. In addition, our subconsultant will map and delineate any other anomalous features identified in the seismic data. Bathymetry data will be processed and edited in accordance with National Geodetic Standards, requirements for a U.S. Army Corps of Engineers Class II Hydrographic Survey. An ASCII file with the processed x/y/z bathymetry data will be generated and submitted to the Town.

A letter report of findings detailing field acquisition, data processing, interpretation, analysis and processed isopach (unconsolidated sediment thickness) maps of the surveyed area, signed and sealed by a Professional Geologist licensed in the State of Florida. This will include electronic CADD files (AutoCAD (.dwg) format) depicting profiles and isopach plots, GIS shapefiles and ASCII x/y/z and x, y (delta) z data files.

Task 2F – Optional: Sediment Probes for Artificial Reef Siting

Sediment probes will be conducted, if required, to verify sediment thickness above hard substrate as derived by the sub-bottom profiler. Divers will conduct measurements using a manual probe in areas requiring ground-truthing and verification. During the sediment probe data collection, divers will manually drive the sediment probes (iron rods) through the unconsolidated overburden (sand) until they encounter the subsurface bedrock. Once bedrock has been encountered, the depth of the rod into the subsurface will be recorded. Results of sediment probes will be summarized in tabular and graphic format, including probe number, area, position, penetration depth, top of hard layers encountered, and visual observations. One day of field work is included in this task.



Task 3 – Meetings and Presentations

This task is intended to support the Town of Palm Beach with both scheduled and impromptu meetings or presentations that may arise relating to the design and permitting of the Reach 8 project. This may include but not limited to responding to Town staff and Council requests, preparation of memorandums, assembling and analyzing existing documents and information, preparing for and/or participating in conference calls, site visits, meetings and/or presentations, planning, and coordination with other local, state, and federal entities as requested.

EXHIBIT B

TOWN OF PALM BEACH, FLORIDA

FEE SCHEDULE FOR

Reach 8 Beach Restoration Design and Permitting

Prepared By

Coastal Protection Engineering LLC



February 11, 2022

EXHIBIT B

TOWN OF PALM BEACH, FLORIDA

Reach 8 Beach Restoration Design and Permitting

FEE ESTIMATE

Tasks	Labor				Direct		Subconsultants	
	Principal Engineer (Hours)	Senior Marine Biologist (Hours)	Coastal Engineer (Hours)	CAD/ GIS Operator (Hours)	Travel (Direct Cost)*	SCUBA Diving (per diver per day)	Aptim Environmental & Infrastructure, LLC (APTIM) (Sub-Consultant)*	
Task 1. State and Federal Permitting								
State and Federal Permitting	60	192	128	82			\$2,000.00	
Task 2. Field Investigations								
2A. Benthic Survey		140				6	\$12,551.82	
2B. Coral Survey		172				8	\$16,141.82	
2C. Topographic/Bathymetric Survey		4					\$17,563.64	
2D. Establishment of ECL	24	8	8				\$18,886.36	
2E. Seismic Survey for Artificial Reef Site		10					\$17,472.73	
2F. Optional: Sediment Probes		4					\$3,527.27	
Task 3. Meetings and Presentations								
Meetings and Presentations	40	40	24	8	2000		\$0.00	
*Estimated cost to be billed per actual cost.								
	Total =	124	570	160	90	2000	14	\$88,143.64
	Rate =	\$279.00	\$153.00	\$123.00	\$95.00	1.00	\$60.00	1.10
	Cost =	\$34,596.00	\$87,210.00	\$19,680.00	\$8,550.00	\$2,000.00	\$840.00	\$96,958.00
LABOR COST =		\$150,036.00						
DIRECT EXPENSE COST =		\$2,840.00						
SUB-CONSULTANT COST =		\$96,958.00						
TOTAL PROJECT COST =		\$249,834.00						
Coastal Protection Engineering LLC								

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Aptim Environmental & Infrastructure, LLC
6401 Congress Ave, Suite 140
Boca Raton, FL 33487
Tel: +1 561 391 8102
Fax: +1 561 391 9116
www.aptim.com

February 11, 2022

Stacy Buck
Senior Marine Biologist
Coastal Protection Engineering LLC
5301 N. Federal Hwy, Suite 335
Boca Raton, FL 33487

Subject: Proposal for Permitting and Survey Services for the Town of Palm Beach Reach 8 Beach Restoration Project Permitting

Dear Stacy:

This proposal is in response to Coastal Protection Engineering's (CPE) request for Aptim Environmental & Infrastructure, LLC (APTIM) to provide professional services in support of the Reach 8 Beach Restoration Project Permitting for the Town of Palm Beach (ToPB). Thank you for the opportunity to provide these services.

Scope of Work

The scope of services outlined below will include supporting CPE in the permitting effort and providing field investigations for the Reach 8 Beach and Restoration Project.

Task 1 – Permitting

An APTIM GIS Analyst will assist CPE in the analysis and development of maps of the project area and final GIS deliverables.

Task 2A – Benthic Survey

An APTIM Captain and a Marine Biologist will participate in the benthic survey will provide the monitoring equipment listed in Exhibit A. An APTIM Marine Biologist will also assist with the preparation of data deliverables, data analysis and report production.

Task 2B – ESA-Listed Coral Survey

An APTIM Captain and a Marine Biologist will participate in the ESA-listed coral survey and will provide the monitoring equipment listed in Exhibit A. An APTIM Marine Biologist will also assist with the preparation of data deliverables, data analysis and report production.

Task 2C – Topographic/Bathymetric Survey

APTIM will collect topographic and bathymetric surveys of the proposed beach nourishment project area for the purpose of quantifying the volume in the beach, preparing the permit sketches, and preparing drawings for the permit application in accordance with Rule 62B-41.008(1)(a), Florida Administrative Code (F.A.C.).

The topographic and bathymetric survey drawings of the proposed project site will include profiles and a contour map that reflect the current conditions of the project area. The mean high water line, the seaward limit of vegetation, and all other existing structures located in the project area will be mapped and provided as part of the survey requirements. The drawings will meet the State's standards of practice as presented in 5J-17 F.A.C. and will be signed and sealed by the professional surveyor, duly registered pursuant to Chapter 472, Florida Statutes (F.S.), who performed the survey. Descriptions of the structures will also be provided as an attachment to the JCP application.

Beach profiles will be collected at 500' intervals per requirements including each FDEP R-monument within 1000' of the Reach 8 Beach Restoration project area, from R-129-210 to R-134+135. Profiles will extend to the depth of closure.

Task 2D – Establishment of an Erosion Control Line (ECL)

A mean high water (MHW) survey will be conducted in accordance with standards set by FDEP, Division of State Lands, Bureau of Survey and Mapping. Surveys will be submitted to the State for approval and recording. Survey deliverables will consist of four (4) 22" X 34" survey maps signed and sealed by a registered Florida Surveyor and Mapper compliant with requirements Chapter 161 F.S. APTIM will coordinate as necessary with the Division of State Land's for review and submission of the survey drawings. An electronic version of the ECL legal description and AutoCAD format files will also be delivered.

APTIM will prepare for and attend the required workshop and hearing. It is assumed that the ToPB will be responsible for preparation or delivery of the required public notice of the ECL public hearing or recording in the official records.

Task 2E – Seismic Survey for Artificial Reef Siting

APTIM will conduct a geophysical and hydrographic survey with the goal of investigating the potential for development of an artificial reef site in the nearshore habitat offshore of the ToPB. APTIM will provide comprehensive survey services including field data collection using APTIM equipment and personnel, data processing, interpretation, analysis, and composition of a final letter report of findings, including an isopach showing the thickness of unconsolidated material over rock. Groundtruthing (jet probes) of the remotely-sensed data is not included within this proposal.

APTIM's survey plan will consist of a one half day mobilization of equipment and personnel, one full day of survey operations, and one half day demobilization of equipment and personnel. APTIM will work with the ToPB to determine the survey area. Once determined, APTIM will collect 30-meter spaced survey lines over the survey area for adequate coverage to delineate locations suitable for artificial reef placement. It is expected that APTIM will be able to cover 30 nautical miles of line coverage in the two-day survey, equating to between 300 and 500 acres (depending on survey area size and shape). APTIM will work with the ToPB to refine the potential survey area to target an appropriately sized area to achieve the estimated coverage. APTIM will carefully target a weather window to ensure optimal survey production and allow for accessing shallow waters nearshore.

APTIM will review and process and interpret the seismic sub-bottom data to determine overburden thickness of unconsolidated material above the limestone/consolidate rock for placement of an artificial reef. In addition,

APTIM will map and delineate any other anomalous features identified in the seismic data. Bathymetry data will be processed and edited in accordance with National Geodetic Standards, requirements for a U.S. Army Corps of Engineers Class II Hydrographic Survey. An ASCII file with the processed x/y/z bathymetry data will be generated and submitted to the ToPB.

A letter report of findings detailing field acquisition, data processing, interpretation, analysis and processed isopach (unconsolidated sediment thickness) maps of the surveyed area, signed and sealed by a Professional Geologist licensed in the State of Florida. This will include electronic CADD files (AutoCAD (.dwg) format) depicting profiles and isopach plots, GIS shapefiles and ASCII x/y/z and x,y (delta) z data files.

Task 2F – Optional Sediment Probes for Artificial Reef Siting

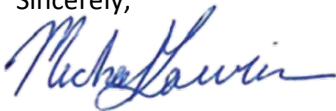
APTIM will conduct sediment probes, if required, to verify sediment thickness as derived by the sub-bottom profiler. APTIM divers will conduct measurements using a manual probe in areas requiring groundtruthing and verification. One day additional day of field work is included in this task.

Schedule and Summary

APTIM proposes to provide these services as detailed in Exhibit A on a time and materials basis for an estimated Not-To-Exceed amount of \$88,143.64 to be billed in accordance with this proposal and the terms and conditions of the Master Services Agreement between APTIM and CPE dated January 9, 2020. Please issue a Purchase Order or Notice to Proceed in the name of our licensed contracting entity, Aptim Environmental & Infrastructure, LLC. The billing rates for services rendered under this proposal will be based on the schedule of hourly billing rates of the MSA, discounted by 10% per rate negotiation between APTIM and CPE. Although this proposal is detailed by separable items and estimated by specific staff and categories, it is anticipated that some work elements will exceed the estimate while others fall below the estimate to complete.

Thank you for the opportunity to provide these services and please do not hesitate to call if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Michael Lowiec".

Michael Lowiec, PSM
Program Manager
Aptim Environmental & Infrastructure, LLC

cc: Katy Brown, APTIM
Nicole S. Sharp, PE, APTIM
Debra Neese, APTIM



EXHIBIT A
FEE SCHEDULE



TOWN OF PALM BEACH, FLORIDA
 REACH 8 BEACH RESTORATION PROJECT PERMITTING
 PREPARED BY: APTIM ENVIRONMETNAL & INFRASTRUCTURE, LLC

Tasks	Labor												Equipment								Direct			
	Senior Project Manager (Hours)	Coastal Engineer III (Hours)	Professional Surveyor & Mapper (Hours)	Surveyor (Hours)	Survey Technician (Hours)	Boat Captain (Hours)	Marine Biologist II (Hours)	Professional Geologist (Hours)	Geologist III (Hours)	Geologist II (Hours)	CAD Operator (Hours)	GIS Operator (Hours)	Survey Boat (24 ft. Privateer) (Days)	Trimble Differential GPS (Days)	Digital Camera (Days)	X-STAR CHIRP 512i Seismic Profiler System (Days)	Odom Hydrotrack Sounder (Days)	Heave, Pitch, Roll Compensator (Days)	Trimble RTK GPS (Days)	SCUBA Tanks (Nitrox) (Total No.)	Sonar Wizard Map Seismic Data Processing Package (Days)	Hypack / DredgePack Navigation System (Days)	Equipment and Insurance (per diver per day)	
Task 1. Permitting												20												
Task 2. Field Investigation																								
2A. Benthic Survey						39	52					4	3	3	3					36		3	3	
2B. ESA-Listed Coral Survey						52	64					4	4	4	4					48		4	4	
2C. Topographic/Bathymetric Survey			24	36	64	16					36	1				1	1	2				1		
2D. Establishment of ECL	8	16	60	40							40								1					
2E. Seismic Survey								8	16	88	16	4	2	2		2					2	2		
2F. Optional Sediment Probes					12	12	16					4												
*Estimated cost to be billed per actual cost.	Total = 8	16	84	76	76	119	132	8	16	88	92	36	10	9	7	2	1	1	3	84	2	10	7	
	Rate = \$ 213.64	\$136.36	\$118.18	\$86.36	\$72.73	\$72.73	\$86.36	\$118.18	\$118.18	\$86.36	\$100.00	\$100.00	\$718.18	\$377.27	\$9.09	\$1,045.45	\$150.00	\$195.45	\$450.00	\$17.27	\$140.91	\$236.36	\$60.00	
	Cost = \$1,709.09	\$2,181.82	\$9,927.27	\$6,563.64	\$5,527.27	\$8,654.55	\$11,400.00	\$945.45	\$1,890.91	\$7,600.00	\$9,200.00	\$3,600.00	\$7,181.82	\$3,395.45	\$63.64	\$2,090.91	\$150.00	\$195.45	\$1,350.00	\$1,450.91	\$281.82	\$2,363.64	\$420.00	
	LABOR COST = \$69,200.00																							
	EQUIPMENT COST = \$18,523.64																							
	DIRECT EXPENSE COST = \$420.00																							
	TOTAL PROJECT COST = \$88,143.64																							

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