ADDITIONAL SCOPE OF SERVICES FOR PORT EVERGLADES INLET SAND MANAGEMENT (RLI #022100-RB)

Amendment 9: PRE-CONSTRUCTION, CONSTRUCTION, & POST-CONSTRUCTION SERVICES

April 16, 2024

PREAMBLE: This Additional Scope of Services (A-7 Scope) provides for coastal engineering and biological services during the pre-construction, construction, and post-construction (years 0 through 5) timeframe for the Port Everglades Sand Bypass Project (Project). The principal elements of the Project will be constructed through four (4) independent construction contracts. The principal elements are dredging, jetty improvements, boulder mitigation, and rubble clearing mitigation. **Figure A** depicts the location of the Project and the task areas.

The A-7 Scope includes four (4) years of post-construction tasks associated with the reefs. A-7 Scope also includes tasks to support one maintenance dredging event of the sand trap. COUNTY anticipates the maintenance dredging event will occur 3 years after the initial construction of the sand trap.

Tables 1-4 summarize the tasks covered under A-7 Scope. A-7 Scope is divided into four parts. **Part I** details the coastal engineering services, including physical surveys, field observation, monitoring, and reporting, required for the initial construction of the Project. **Part II** details the biological services for the initial construction event and follows the August 2020 FDEP-approved Minimization, Mitigation, and Monitoring Plan. **Parts III** and **IV** include the coastal engineering and biological tasks that support one maintenance dredging and subsequent monitoring tasks that fall within the 5-year timeframe. CONSULTANT shall use qualified employees or subconsultants to perform the tasks described herein. The tasks reference the following permits: FDEP JCP #0289308-004-JC and U.S. Army Corps of Engineers (USACE) SAJ-2008-02034 SP-LCK.

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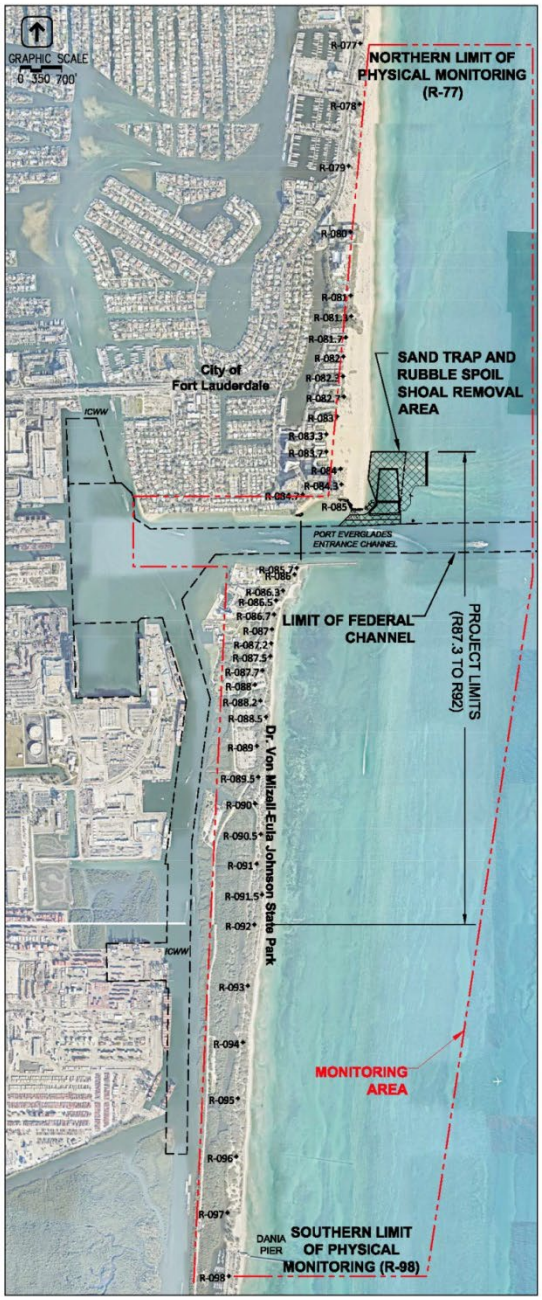

Figure A: Port Everglades Sand Bypass Project Location.

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Table 1: Tasks for Amendment 9, Part I.

PART I: ENGINEERING SERVICES	
Task No.	Task
1	Pre-Construction Physical Monitoring Survey
2	Construction Services - Sand Trap and Rubble Shoal Dredging / Jetty / Mitigation / Rubble Clearing
3	Contingency Construction Services (AW)
4	Water Quality Monitoring - Dredging (26 Weeks)
5	Water Quality Monitoring - Rubble Clearing (12 Weeks)
6	Water Quality Monitoring - Contingency (12 Weeks)
7	Permit Modification
8	Post-Construction Report
9	Physical Monitoring: Immediate Post-Construction
10	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (6-months)
11	Physical Monitoring: 1-Yr Post-Construction
12	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (18-months)
13	Physical Monitoring: 2-Yr Post-Construction
14	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (30-months)
15	Physical Monitoring: 3-Yr Post-Construction
16	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (42-months)
17	Physical Monitoring: 4-Yr Post-Construction
18	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (54-months)
19	Physical Monitoring: 5-Yr Post-Construction

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Exhibit "A-7"

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Table 2: Tasks for Amendment 9, Part II.

PART II: ENVIRONMENTAL SERVICES	
Task No.	Task
20	Non-Listed Species Relocation from Direct Impact Area (Corals, Conch, Urchins)
21	Contingency Non-Listed Coral Colony Removal and Relocation (AW)
22	Non-Listed Coral Relocation Monitoring: Immediate Post-Relocation Baseline (Time Zero) Survey
23	Non-Listed Coral Relocation Monitoring: Six-Month Post-Relocation Survey
24	Non-Listed Coral Relocation Monitoring: Year 1 Post-Relocation Survey
25	Non-Listed Coral Relocation Monitoring: Year 3 Post-Relocation Survey
26	Listed Coral Species (*Acropora Cervicornis*): Pre-Construction Survey
27	Listed Coral Species (*Acropora Cervicornis*) Colony Relocation
28	Contingency Listed Coral Colony Removal and Relocation (AW)
29	Contingency Listed Coral Fragment Removal and Relocation (AW)
30	Listed Coral Relocation Monitoring: Immediate Post-Relocation Baseline (Time Zero) And One Week Post-Relocation Survey of Colony Transplants and Reference Colonies
31	Listed Coral Relocation Monitoring: Three Month Post-Relocation Survey of Colony Transplants and Reference Colonies
32	Listed Coral Relocation Monitoring: Six-Month Post-Relocation Survey of Colony Transplants and Reference Colonies
33	Listed Coral Relocation Monitoring: One-Year Post-Relocation Survey of Colony Transplants and Reference Colonies
34	Coral Nursery Management
35	Outplanting of Acropora Cervicornis Colonies (AW)
36	Pre-Construction Baseline Survey of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone
37	Pre-Construction Survey of Listed Corals on Nearshore Hardbottom Within the Turbidity Mixing Zone
38	Pre-Construction Survey of Sedimentation at Listed Coral Sites Within the Turbidity Mixing Zone
39	Pre-Construction Seagrass Survey Within the Turbidity Mixing Zone
40	During-Construction Sedimentation Surveys of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone
41	Thirty (30) Day Contingency During-Construction Monitoring if Sand Trap Excavation Extends More Than 90 Days (AW)
42	Contingency During-Construction Monitoring Based on Sedimentation Triggers (AW)
43	Immediate Post-Construction Monitoring of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone
44	Immediate Post-Construction Survey of Seagrass Habitats Within the Turbidity Mixing Zone
45	Contingency Immediate Post-Construction Monitoring and Data Analyses Based on Sedimentation Impacts (AW)
46	Immediate Post-Construction Biological Monitoring Report - Nearshore Hardbottom
47	Immediate Post-Construction Surveys of Listed Coral Sites Within the Turbidity Mixing Zone
48	0.3-Acre Offshore Artificial Reef Mitigation Site Surveys
49	Mitigation Artificial Reef Construction Supervision
50	As-Built Immediate Post-Construction Surveys of the 0.3-Acre And 0.2-Acre Artificial Reef Coral Nurseries
51	During Construction Mitigation Surface Rubble Inspections
52	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 1 Post-Construction Benthic Habitat Map
53	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 2 Post-Construction Benthic Habitat Map
54	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 3 Post-Construction Benthic Habitat Map
55	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 5 Post-Construction Benthic Habitat Map (AW)
56	Contingency Aerial Photography for Mitigation Success Monitoring (AW) - Years 1, 2, 3, and 5
57	Baseline Coral Harvest/Relocation, Monitoring and Nursery Maintenance
58	Year 1 Coral Harvest/Relocation, Monitoring and Nursery Maintenance
59	Year 2 Coral Harvest/Relocation, Monitoring and Nursery Maintenance
60	Year 3 Coral Harvest/Relocation, Monitoring and Nursery Maintenance

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Table 3: Tasks for Amendment 9, Part III.

PART III: COASTAL ENGINEERING SERVICES	
Task No.	Task
61	Planning, Engineering, Design, and Permit Management (AW)
62	Geotechnical Investigation (Optional) (AW)
63	Final Design and Plans and Specifications (AW)
64	Bid Support (AW)
65	Construction Services (12 weeks) (AW)
66	Contingency Construction (4 Weeks) (AW)
67	Water Quality Monitoring (12 Weeks) (AW)
68	Sediment QA/QC Monitoring and Compliance (AW)
69	Post-Construction Report (AW)

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Table 4: Tasks for Amendment 9, Part IV.

PART IV: ENVIRONMENTAL SERVICES	
Task No.	Task
70	Permanent Monitoring Station Establishment and Baseline Hardbottom Monitoring- Sand Trap Maintenance Dredging Mixing Zone (AW)
71	Weekly During-Construction Hardbottom Surveys During the First Sand Trap Maintenance Dredging Event (12 Weeks) (AW)
72	Contingency During-Construction Sedimentation Triggered Monitoring During the First Sand Trap Maintenance Dredging Event (AW)
73	Immediate Post-Construction Hardbottom Monitoring in the Turbidity Mixing Zone- First Sand Trap Maintenance Dredging Event (AW)
74	Immediate Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)
75	Immediate Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)
76	Year 1 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)
77	Year 1 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)
78	Year 2 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)
79	Year 2 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)
80	Year 3 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)
81	Year 3 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)

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PART I: COASTAL ENGINEERING SERVICES - INITIAL SAND TRAP CONSTRUCTION

1. PRE-CONSTRUCTION MULTI-BEAM HYDROGRAPHIC SURVEY

1.1 **Multibeam Survey.** CONSULTANT shall conduct a pre-construction multibeam survey in accordance with the approved Physical Monitoring Plan. The survey will document the pre-construction condition of the sand trap and inlet channel. CONSULTANT shall provide all necessary materials and equipment to perform the required work activity. CONSULTANT shall also supply the supervisory, professional, and technical services personnel required to manage, document, and process all data associated with the acquisition and processing of the survey data.

Survey Deliverables. CONSULTANT shall provide COUNTY and FDEP with a digital copy of the following products:

(a) Survey report from the Florida licensed surveyor certifying to the FDEP that the survey meets the technical standards of Chapter 61G17-6, F.A.C.
(b) Copies of all checked, standard survey field books, computation and reduction files, and abstracted final positions.
(c) A quality control/quality assurance ("QA/QC") report detailing a QA/QC procedure and any findings, corrections, and results of that procedure
(d) ACSII file containing raw x, y, z data points.
(e) Digital copy of cross-section and plan view data plots.
(f) Complete federally compliant metadata file that includes the data collection methodology and processing procedures used in accordance with standards set forth by the Federal Geographic Data Committee. Metadata shall include all QA/QC procedures utilized to ensure the quality of the data and shall be delivered in digital format.
(g) Field books shall be scanned and pages amassed into a PDF document.
(h) Elevation data will be provided in North American Vertical Datum of 1988 (NAVD88) datum.

1.2 CONSULTANT shall use the multibeam survey data for comparison to the post-construction survey data and future project performance analyses.

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Deliverables. The deliverable includes an electronic memo summarizing the results of the survey per the Physical Monitoring Plan. CONSULTANT will submit the memo and data to COUNTY and FDEP.

2. CONSTRUCTION SERVICES

2.1 CONSTRUCTION CONTRACT ADMINISTRATION – SAND TRAP AND RUBBLE SHOAL DREDGING AND DISPOSAL (35 Weeks)

2.1.1 **Pre-construction Conference.** CONSULTANT shall meet with CONTRACT ADMINISTRATOR and dredging CONTRACTOR to review the Project Permits. CONSULTANT shall coordinate, prepare for, and attend a pre-construction conference to review the construction methodology and the specific conditions and monitoring requirements of the Permits. CONSULTANT shall invite CONTRACTOR, CONTRACTOR's subcontractors, FDEP and FWC staff, COUNTY's marine turtle permit holder, and other involved parties and stakeholders to the pre-construction conference. At the conference, CONSULTANT shall conduct a brief overview of the work and reiterate communications and reporting protocols for the duration of CONTRACTOR's mobilization, construction, and demobilization activities. The conference shall be held at least 7 days prior to the commencement date of construction. CONSULTANT shall coordinate with FDEP, USACE Regulatory and National Marine Fisheries Service (NMFS) at least 21 days prior to the intended commencement date for the dredging activities. A minimum ten (10) days advance written notification shall be provided to the parties advising of the date, time, location, and teleconference number of the pre-construction conference. After the pre-construction conference, CONSULTANT shall request a 'notice to proceed' from FDEP.

Deliverable: Deliverables include written notification of planned pre-construction meeting details, holding the pre-construction conference, meeting minutes, and the notice to proceed.

2.1.2 **Notice of Commencement.** At least fifteen (15) days before beginning dredging, CONSULTANT must provide notice to COUNTY that commencement notification should be sent to FDEP Beaches, Inlets and Ports Program, USACE Regulatory and NMFS. CONSULTANT shall confirm that notice was sent.

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Deliverable. Deliverables include one (1) electronic written notice.

2.1.3 **Notice of Deviations.** CONSULTANT shall notify COUNTY, FDEP Beaches, Inlets and Ports Program, and USACE Regulatory via email of any anticipated deviation from the FDEP and/or USACE Permits before implementing the deviation to enable FDEP, USACE and COUNTY determine if a modification of the Permit is required pursuant to Section 62B-49.008, F.A.C.

Deliverable. Deliverables include the one (1) electronic written notice.

2.1.4 **Notice of Non-Compliance.** CONSULTANT shall immediately notify COUNTY via email of any non-compliance with any condition or limitation specified in the Permits. Within 24 hours of the non-compliance notification, CONSULTANT shall transmit a written report to COUNTY detailing the non-compliance; identifying the cause of noncompliance; the period of noncompliance, including dates and times; and steps taken to remedy the non-compliance; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

Deliverable. Deliverables include the email notice and written report.

2.1.5 **Certification of Completion.** Within 60 days of completing the dredging authorized by the Permit, CONSULTANT shall submit to COUNTY a written statement of completion and certification by a registered professional engineer. The certification shall state that the dredging activities authorized by the Permits were performed in compliance with the plans and specifications approved in the Permits and all conditions of the Permits or shall describe any deviations from the plans and specifications and permit conditions. When the completed activity differs substantially from the permitted plans, any substantial deviations shall be noted and explained on two copies of as-built drawings.

Deliverable. Deliverables include the one (1) electronic copy of CONSULTANT's certification and one (1) electronic copy of the as-built drawings of any feature whose construction deviated from the permit permitted plans, specifications, or conditions.

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2.1.6 **Review of Contractor's Pre-Construction Submittals.** CONSULTANT obtain the following documents from CONTRACTOR:

- Daily Report
- Operations Plan
- Quality Control Plan
- Structure Inspection and Vibration Monitoring Plan and Qualifications
- Environmental Protection Plan
- Storm Contingency Plan
- Material Submittals
- Vessel Certification
- Accident Prevention Plan
- Dive Safety & Operations Plan

Upon receipt of the above-listed documents, CONSULTANT shall review the same and determine whether the documents meet permit requirement and/or industry standards. If the document does not meet these conditions, CONSULTANT shall return the documents to CONTRACTOR for edits consistent with CONSULTANT's comments. Once CONTRACTOR provides an acceptable document to CONSULTANT, CONSULTANT shall distribute the document to the COUNTY.

Deliverables. Deliverables shall include email correspondence that documents were reviewed and accepted.

2.1.7 **Review of Contractor's Requests for Payment.** CONSULTANT shall review CONTRACTOR progress and pay surveys, volume calculations, and pay requests for all work elements. CONSULTANT shall review the CONTRACTOR'S periodic payment invoices for accuracy of computation and completeness and make recommendations to COUNTY. CONSULTANT shall assist COUNTY in evaluating the periodic and final payments to the CONTRACTOR. CONSULTANT will review pay requests and make a recommendation to COUNTY regarding payment within five (5) days of receipt of the pay request. CONSULTANT shall assist COUNTY in assembling the documentation needed for State reimbursement or cost sharing.

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Deliverable. The deliverables include letters of recommendation for payment from CONSULTANT to COUNTY regarding CONTRACTOR's pay requests.

2.1.8 **Records Management.** CONSULTANT shall ensure that complete copies of all Permits, including all conditions, attachments, modifications, time extensions, and the approved the plans and specifications, are kept at the site of the permitted activity. CONSULTANT shall maintain detailed field logbooks and construction files (notebooks and file folders with copies of all documentation).

Deliverable. Upon completion of construction activities, CONSULTANT shall conduct final file management review and transfer to COUNTY one (1) copy of the files for archival of records at COUNTY'S request.

2.1.9 **Project Closeout.** Following notification by CONTRACTOR that dredge activities are complete and all payment quantities are approved and accepted by COUNTY, CONSULTANT shall conduct a final visual inspection of the work and staging areas and prepare a punch list of remaining equipment and material to be removed from the project site and the activities required for restoration of access and staging areas. CONSULTANT shall furnish the list to COUNTY and CONTRACTOR within fourteen (14) calendar days to ensure control of final clean up.

Deliverable. Deliverable is a punch list.

2.1.10 Following notice from CONTRACTOR that it completed final clean-up, CONSULTANT shall conduct a final inspection within seven (7) calendar days of notice of the staging areas. If CONTRACTOR'S equipment, construction fencing, supplies, and debris are completely removed and access and staging areas restored, then CONSULTANT shall forward a recommendation to COUNTY that it make the final payment to CONTRACTOR.

Deliverable. Deliverable is a recommendation for final payment.

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2.2 CONSTRUCTION OBSERVATIONS – SAND TRAP AND RUBBLE SHOAL DREDGING AND DISPOSAL (35 Weeks)

2.2.1 **Inspection.** CONSULTANT shall monitor daily progress of the work and track CONTRACTOR delays from mobilization through demobilization of the project site. The purpose of this monitoring is to ensure that work is compliant with the construction plans, contract documents, and permit authorizations granted for the dredging. CONSULTANT shall monitor the dredging contractor's daily activities through report and surveys provided by CONTRACTOR since all work will occur offshore. A full-time construction site representative is not required. CONSULTANT shall notify COUNTY as appropriate.

2.2.2 **On-Call & Periodic On-Site Representation.** CONSULTANT shall be available on an 'on-call' basis throughout the dredging period to address questions and required administrative matters.

2.2.3 CONSULTANT shall obtain and review the CONTRACTOR'S quality control reports (daily reports) from mobilization through demobilization from the project site.

CONSULTANT shall designate Project Engineer(s), who shall visit the site on a weekly basis, on average, throughout the period of construction. The Project Engineer shall serve as liaison between CONTRACTOR and COUNTY during all phases of construction. The Project Engineer shall be available to address questions concerning the plans and specifications and address other issues requiring coordination or liaison.

The Project Engineer shall attend, either in person or virtually, periodic progress meetings with CONTRACTOR as appropriate during construction. It is expected that a progress meeting will be held by CONTRACTOR at least weekly during the construction period.

CONSULTANT shall email a weekly report to COUNTY summarizing the progress of construction and compliance with the Permits and Contract, including but not limited the amount of work performed and by whom, problems encountered, method to correct problems, errors, omissions, deviations from Contract Documents, and weather conditions.

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Deliverable. Deliverables include on-site presence during construction, daily reports, documentation of construction operations (including appropriate photographs), and a weekly summary report of construction progress.

2.3 CONSTRUCTION CONTRACT ADMINISTRATION - JETTY (26 Weeks)

2.3.1 **Pre-construction Conference.** CONSULTANT shall meet with CONTRACT ADMINISTRATOR and jetty improvement CONTRACTOR to review the Project Permits for the jetty improvements prior to commencement of the activity authorized by the Permits. CONSULTANT shall coordinate, prepare for, and attend a pre-construction conference to review the construction methodology, and the specific conditions and monitoring requirements of the Permits. CONSULTANT shall invite jetty improvement CONTRACTOR, CONTRACTOR's subcontractors, FDEP and FWC staff, COUNTY's marine turtle permit holder, and other involved parties and stakeholders. At the conference, CONSULTANT shall conduct a brief overview of the jetty improvement work and reiterate communications and reporting protocols for the duration of CONTRACTOR's mobilization, construction, and demobilization activities. The conference shall be held at least 7 calendar days before construction begins. CONSULTANT shall coordinate with FDEP and USACE Regulatory at least 21 days prior to the intended commencement date for the onsite construction activities. A minimum ten (10) days advance written notification shall be provided to the parties advising of the date, time, location, and teleconference number of the pre-construction conference. After the conference, CONSULTANT shall request a 'notice to proceed' from FDEP.

Deliverable. Deliverables include written notification of planned pre-construction meeting details, and meeting minutes.

2.3.2 **Notice of Commencement.** At least fifteen (15) days before commencement, CONSULTANT must notify COUNTY to send a commencement notification to FDEP Beaches, Inlets and Ports Program, the USACE. CONSULTANT shall confirm that notice was sent.

Deliverable. Deliverables include one (1) electronic written notice.

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2.3.3 **Notice of Deviations.** CONSULTANT shall email COUNTY and FDEP Beaches, Inlets and Ports Program of any anticipated deviation from the FDEP permit prior to implementation so FDEP can determine if a permit modification is required.

Deliverable. Deliverables include the one (1) electronic written notice.

2.3.4 **Notice of Non-Compliance.** CONSULTANT shall immediately email COUNTY of any non-compliance with any permit condition or limitation. Within 24 hours of the non-compliance notification, CONSULTANT shall transmit a written report to COUNTY contain describing the non-compliance; the cause of noncompliance; the period of noncompliance, including dates and times; and steps taken to remedy the non-compliance; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

Deliverable. Deliverables include the email notice and written notice.

2.3.5 **Certification of Completion.** Within 60 days after completion of construction, CONSULTANT shall submit a written statement of completion and certification by a registered professional engineer to COUNTY. The certification shall state that the activities authorized by the permits were performed in compliance with the permitted plans and specifications and permit conditions or shall describe any deviations from the permitted plans, specifications, and conditions. When the completed activity differs substantially from the permitted plans, the substantial deviations shall be noted and explained on 'as-built' drawings.

Deliverable. Deliverables include the one (1) hard copy and one (1) electronic copy of CONSULTANT's certification and five (5) original copies of the as-built drawings, if necessary.

2.3.6 **Review of Contractor's Pre-Construction Submittals.** CONSULTANT shall obtain the following documents from CONTRACTOR:

- Daily Report
- Operations Plan
- Quality Control Plan

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- Structure Inspection and Vibration Monitoring Plan and Qualifications
- Environmental Protection Plan
- Storm Contingency Plan
- Material Submittals
- Vessel Certification
- Accident Prevention Plan
- Dive Safety & Operations Plan

Upon receipt of the above-listed documents, CONSULTANT shall review the same and determine whether the documents meet permit requirement and/or industry standards. If the document does not meet these conditions, CONSULTANT shall return the documents to CONTRACTOR for edits consistent with CONSULTANT's comments. Once CONTRACTOR provides an acceptable document to CONSULTANT, CONSULTANT shall distribute the document to the COUNTY.

Deliverables. Deliverables shall include email correspondence that documents were reviewed and accepted.

2.3.7 **Review of Contractor's Requests for Payment.** CONSULTANT shall review CONTRACTOR's progress and pay surveys, weigh tickets, volume calculations, and pay requests for all work elements. CONSULTANT shall review the CONTRACTOR's periodic payment invoices for accuracy of computation and completeness and make recommendations to COUNTY. CONSULTANT shall assist COUNTY in evaluating the periodic and final payments to the CONTRACTOR. CONSULTANT will review pay requests and make a recommendation to COUNTY regarding payment within 5 days of receipt of the pay request. CONSULTANT shall assist COUNTY in assembling the documentation needed for State reimbursement or cost sharing.

Deliverable. The deliverables include letters of recommendation from CONSULTANT to COUNTY regarding payment to CONTRACTOR.

2.3.8 **Records Management.** CONSULTANT shall ensure a complete copy of the permit, including conditions, attachments, modifications, time extensions, and the approved the plans and specifications, are kept at the permitted activity's work site. CONSULTANT shall maintain detailed field log books and construction files (notebooks and file folders with copies of all

documentation).

Deliverable. Upon completion of construction activities, CONSULTANT shall conduct final file management and transfer to COUNTY one (1) copy of the files for archival of records.

2.3.9 **Project Closeout.** Following notification by the CONTRACTOR that construction activities are complete and acceptance of all payment sections by the COUNTY, CONSULTANT shall conduct a final visual inspection of the work and staging areas and prepare a punch list of remaining equipment and material to be removed from the project sites and the activities required for restoration of access and staging areas. This list shall be furnished to COUNTY and CONTRACTOR to ensure control of final clean up.

Following notice from CONTRACTOR that final clean-up has been completed, CONSULTANT shall conduct a final inspection of the beach and staging areas. If CONTRACTOR'S equipment, construction fencing, supplies, and debris are completely removed and access and staging areas restored, CONSULTANT shall forward a recommendation to COUNTY make the final payment to CONTRACTOR.

Deliverable. Deliverables include a punch list and recommendation for final payment.

2.4 CONSTRUCTION OBSERVATIONS – JETTY (26 Weeks)

2.4.1 **Daily On-site Inspection.** CONSULTANT shall designate Site Representative(s) to be present at jetty construction work areas up to ten (10) hours per day, 6 days per week, for the duration of construction activities. The Site Representative(s) shall ensure that construction complies with the construction plans, contract documents, and permit authorizations granted for the work. The Site Representative shall monitor daily progress of the work and track CONTRACTOR delays through the duration of the project, mobilization through demobilization of the project site.

2.4.2 **On-Call & Periodic On-Site Representation.** CONSULTANT shall be on-call throughout the construction period to monitor construction activities and

be available to address questions and required administrative matters.

2.4.3 CONSULTANT, via the Site Representative(s), shall monitor daily progress of the work, track CONTRACTOR activities, and notify COUNTY as appropriate.

2.4.4 CONSULTANT shall obtain and review the CONTRACTOR's quality control reports (daily reports) through the duration of the project, from mobilization through demobilization of the project site.

2.4.5 CONSULTANT shall designate Project Engineer(s), who shall visit the site on a weekly basis throughout the construction period. The Project Engineer shall serve as liaison between CONTRACTOR and COUNTY during all construction phases. The Project Engineer shall be available to address questions concerning the plans, specifications, and other issues requiring coordination or liaison.

2.4.6 The Project Engineer(s) and Site Representative(s), as may be required, shall attend periodic progress meetings with the CONTRACTOR as appropriate during construction. COUNTY expects CONTRACTOR to hold weekly progress meetings during the construction period.

2.4.7 CONSULTANT shall email a weekly report to COUNTY, summarizing the progress of construction and compliance with the permits and Contract, including manpower, amount of work performed and by whom, equipment, problems encountered, method to correct problems, errors, omissions, deviations from Contract, and weather conditions.

Deliverable. Deliverables include on-site presence during construction, daily reports, documentation of construction operations (including photographs), and a weekly summary report of construction progress.

2.5 CONSTRUCTION CONTRACT ADMINISTRATION and SITE VISITS – MITIGATION REEF (4 WEEKS) (Authorization Withheld)

2.5.1 **Pre-construction Conference.** C CONSULTANT shall meet with CONTRACT ADMINISTRATOR and dredging CONTRACTOR to review the Project Permits. CONSULTANT shall coordinate, prepare for, and attend a pre-construction conference to review the construction methodology and the

specific conditions and monitoring requirements of the Permits. CONSULTANT shall invite CONTRACTOR, CONTRACTOR's subcontractors, FDEP and FWC staff, COUNTY's marine turtle permit holder, and other involved parties and stakeholders to the pre-construction conference. At the conference, CONSULTANT shall conduct a brief overview of the work and reiterate communications and reporting protocols for the duration of CONTRACTOR's mobilization, construction, and demobilization activities. The conference shall be held at least 7 days prior to the commencement date of construction. CONSULTANT shall coordinate with FDEP, USACE Regulatory and National Marine Fisheries Service (NMFS) at least 21 days prior to the intended commencement date for the dredging activities. A minimum ten (10) days advance written notification shall be provided to the parties advising of the date, time, location, and teleconference number of the pre-construction conference. After the pre-construction conference, CONSULTANT shall request a 'notice to proceed' from FDEP.

Deliverable. Deliverables include written notification of planned pre-construction meeting details, holding the pre-construction conference, meeting minutes, and the notice to proceed.

2.5.2 **Notice of Commencement.** At least fifteen (15) days before beginning dredging, CONSULTANT must provide notice to COUNTY that commencement notification should be sent to FDEP Beaches, Inlets and Ports Program, USACE Regulatory and NMFS. CONSULTANT shall confirm that notice was sent.

Deliverable. Deliverables include one (1) electronic written notice.

2.5.3 **Notice of Deviations.** CONSULTANT shall notify COUNTY, FDEP Beaches, Inlets and Ports Program, and USACE Regulatory via email of any anticipated deviation from the FDEP and/or USACE Permits before implementing the deviation to enable FDEP, USACE and COUNTY determine if a modification of the Permit is required pursuant to Section 62B-49.008, F.A.C.

Deliverable. Deliverables include the one (1) electronic written notice.

2.5.4 **Notice of Non-Compliance.** CONSULTANT shall immediately notify COUNTY via email of any non-compliance with any condition or limitation

specified in the Permits. Within 24 hours of the non-compliance notification, CONSULTANT shall transmit a written report to COUNTY detailing the non-compliance; identifying the cause of noncompliance; the period of noncompliance, including dates and times; and steps taken to remedy the non-compliance; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

Deliverable. Deliverables include the written notice.

2.5.5 **Certification of Completion.** Within 60 days of completing the dredging authorized by the Permit, CONSULTANT shall submit to COUNTY a written statement of completion and certification by a registered professional engineer. The certification shall state that the dredging activities authorized by the Permits were performed in compliance with the plans and specifications approved in the Permits and all conditions of the Permits or shall describe any deviations from the plans and specifications and permit conditions. When the completed activity differs substantially from the permitted plans, any substantial deviations shall be noted and explained on two copies of as-built drawings.

Deliverable. Deliverables include the one (1) electronic copy of CONSULTANT's certification and one (1) electronic copy of the as-built drawings of any feature whose construction deviated from the permit permitted plans, specifications, or conditions.

2.5.6 **Review of Contractor's Pre-Construction Submittals.** CONSULTANT obtain the following documents from CONTRACTOR:

- Daily Report
- Operations Plan
- Quality Control Plan
- Structure Inspection and Vibration Monitoring Plan and Qualifications
- Environmental Protection Plan
- Storm Contingency Plan
- Material Submittals
- Vessel Certification
- Accident Prevention Plan
- Dive Safety & Operations Plan

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Upon receipt of the above-listed documents, CONSULTANT shall review the same and determine whether the documents meet permit requirement and/or industry standards. If the document does not meet these conditions, CONSULTANT shall return the documents to CONTRACTOR for edits consistent with CONSULTANT's comments. Once CONTRACTOR provides an acceptable document to CONSULTANT, CONSULTANT shall distribute the document to the COUNTY.

Deliverables. Deliverables shall include email correspondence that documents were reviewed and accepted.

2.5.7 **Review of Contractor's Requests for Payment.** CONSULTANT shall review CONTRACTOR progress and pay surveys, volume calculations, and pay requests for all work elements. CONSULTANT shall review the CONTRACTOR'S periodic payment invoices for accuracy of computation and completeness and make recommendations to COUNTY. CONSULTANT shall assist COUNTY in evaluating the periodic and final payments to the CONTRACTOR. CONSULTANT will review pay requests and make a recommendation to COUNTY regarding payment within five (5) days of receipt of the pay request. CONSULTANT shall assist COUNTY in assembling the documentation needed for State reimbursement or cost sharing.

Deliverable. The deliverables include letters of recommendation for payment from CONSULTANT to COUNTY regarding CONTRACTOR's pay requests.

2.5.8 **Records Management.** CONSULTANT shall ensure that complete copies of all Permits, including all conditions, attachments, modifications, time extensions, and the approved the plans and specifications, are kept at the site of the permitted activity. CONSULTANT shall maintain detailed field logbooks and construction files (notebooks and file folders with copies of all documentation).

Deliverable. Upon completion of construction activities, CONSULTANT shall conduct final file management review and transfer to COUNTY one (1) copy of the files for archival of records at COUNTY'S request.

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2.5.9 **Project Closeout.** Following notification by CONTRACTOR that dredge activities are complete and all payment quantities are approved and accepted by COUNTY, CONSULTANT shall conduct a final visual inspection of the work and staging areas and prepare a punch list of remaining equipment and material to be removed from the project site and the activities required for restoration of access and staging areas. CONSULTANT shall furnish the list to COUNTY and CONTRACTOR within fourteen (14) calendar days to ensure control of final clean up

Deliverable. Deliverable is a punch list.

2.5.10 Following notice from CONTRACTOR that it completed final clean-up, CONSULTANT shall conduct a final inspection within seven (7) calendar days of notice of the staging areas. If CONTRACTOR'S equipment, construction fencing, supplies, and debris are completely removed and access and staging areas restored, then CONSULTANT shall forward a recommendation to COUNTY that it make the final payment to CONTRACTOR.

Deliverable. Deliverable is a recommendation for final payment.

2.5.11 **On-Call & Periodic On-Site Representation.** CONSULTANT shall be on-call throughout the construction period to monitor construction activities and be available to address questions and required administrative matters.

2.5.12 CONSULTANT, via the Site Representative(s), shall monitor daily progress of the work, track CONTRACTOR activities, and notify COUNTY as appropriate.

2.5.13 CONSULTANT shall obtain and review the CONTRACTOR's quality control reports (daily reports) through the duration of the project, from mobilization through demobilization of the project site.

2.5.14 CONSULTANT shall designate Project Engineer(s), who shall visit the site on a weekly basis throughout the construction period. The Project Engineer shall serve as liaison between CONTRACTOR and COUNTY during all construction phases. The Project Engineer shall be available to address questions concerning the plans, specifications, and other issues requiring coordination or liaison.

2.5.15 The Project Engineer(s) and Site Representative(s), as may be required, shall attend periodic progress meetings with the CONTRACTOR as appropriate during construction. COUNTY expects CONTRACTOR to hold weekly progress meetings during the construction period.

2.5.16 CONSULTANT shall email a weekly report to COUNTY, summarizing the progress of construction and compliance with the permits and Contract, including manpower, amount of work performed and by whom, equipment, problems encountered, method to correct problems, errors, omissions, deviations from Contract, and weather conditions.

Deliverable. Deliverable. Deliverables include on-site presence during construction, daily reports, documentation of construction operations (including photographs), and a weekly summary report of construction progress.

2.6 CONSTRUCTION CONTRACT ADMINISTRATION and SITE VISITS – RUBBLE CLEARING (12 WEEKS)

2.6.1 **Pre-construction Conference.** CONSULTANT shall meet with CONTRACT ADMINISTRATOR and dredging CONTRACTOR to review the Project Permits. CONSULTANT shall coordinate, prepare for, and attend a pre-construction conference to review the construction methodology and the specific conditions and monitoring requirements of the Permits. CONSULTANT shall invite CONTRACTOR, CONTRACTOR's subcontractors, FDEP and FWC staff, COUNTY's marine turtle permit holder, and other involved parties and stakeholders to the pre-construction conference. At the conference, CONSULTANT shall conduct a brief overview of the work and reiterate communications and reporting protocols for the duration of CONTRACTOR's mobilization, construction, and demobilization activities. The conference shall be held at least 7 days prior to the commencement date of construction. CONSULTANT shall coordinate with FDEP, USACE Regulatory and National Marine Fisheries Service (NMFS) at least 21 days prior to the intended commencement date for the dredging activities. A minimum ten (10) days advance written notification shall be provided to the parties advising of the date, time, location, and teleconference number of the pre-construction conference. After the pre-construction conference, CONSULTANT shall request a 'notice to proceed' from FDEP.

Deliverable. Deliverables include written notification of planned pre-construction meeting details, holding the pre-construction conference, meeting minutes, and the notice to proceed.

2.6.2 **Notice of Commencement.** At least fifteen (15) days before beginning dredging, CONSULTANT must provide notice to COUNTY that commencement notification should be sent to FDEP Beaches, Inlets and Ports Program, USACE Regulatory and NMFS. CONSULTANT shall confirm that notice was sent.

Deliverable. Deliverables include one (1) electronic written notice.

2.6.3 **Notice of Deviations.** CONSULTANT shall notify COUNTY, FDEP Beaches, Inlets and Ports Program, and USACE Regulatory via email of any anticipated deviation from the FDEP and/or USACE Permits before implementing the deviation to enable FDEP, USACE and COUNTY determine if a modification of the Permit is required pursuant to Section 62B-49.008, F.A.C.

Deliverable. Deliverables include one (1) electronic written notice.

2.6.4 **Notice of Non-Compliance.** CONSULTANT shall immediately notify COUNTY via email of any non-compliance with any condition or limitation specified in the Permits. Within 24 hours of the non-compliance notification, CONSULTANT shall transmit a written report to COUNTY detailing the non-compliance; identifying the cause of noncompliance; the period of noncompliance, including dates and times; and steps taken to remedy the non-compliance; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

Deliverable. Deliverables include the email notice and written report.

2.6.5 **Certification of Completion.** Within 60 days of completing the dredging authorized by the Permit, CONSULTANT shall submit to COUNTY a written statement of completion and certification by a registered professional engineer. The certification shall state that the dredging activities authorized by the Permits were performed in compliance with the plans

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and specifications approved in the Permits and all conditions of the Permits or shall describe any deviations from the plans and specifications and permit conditions. When the completed activity differs substantially from the permitted plans, any substantial deviations shall be noted and explained on two copies of as-built drawings.

Deliverable. Deliverables include the one (1) electronic copy of CONSULTANT's certification and one (1) electronic copy of the as-built drawings of any feature whose construction deviated from the permit permitted plans, specifications, or conditions.

2.6.6 **Review of Contractor's Pre-Construction Submittals.** CONSULTANT obtain the following documents from CONTRACTOR:

- Daily Report
- Operations Plan
- Quality Control Plan
- Structure Inspection and Vibration Monitoring Plan and Qualifications
- Environmental Protection Plan
- Storm Contingency Plan
- Material Submittals
- Vessel Certification
- Accident Prevention Plan
- Dive Safety & Operations Plan

Upon receipt of the above-listed documents, CONSULTANT shall review the same and determine whether the documents meet permit requirement and/or industry standards. If the document does not meet these conditions, CONSULTANT shall return the documents to CONTRACTOR for edits consistent with CONSULTANT's comments. Once CONTRACTOR provides an acceptable document to CONSULTANT, CONSULTANT shall distribute the document to the COUNTY.

Deliverables. Deliverables shall include email correspondence that documents were reviewed and accepted.

2.6.7 **Review of Contractor's Requests for Payment.** CONSULTANT shall review CONTRACTOR progress and pay surveys, volume calculations, and pay

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requests for all work elements. CONSULTANT shall review the CONTRACTOR'S periodic payment invoices for accuracy of computation and completeness and make recommendations to COUNTY. CONSULTANT shall assist COUNTY in evaluating the periodic and final payments to the CONTRACTOR. CONSULTANT will review pay requests and make a recommendation to COUNTY regarding payment within five (5) days of receipt of the pay request. CONSULTANT shall assist COUNTY in assembling the documentation needed for State reimbursement or cost sharing.

Deliverable. The deliverables include letters of recommendation for payment from CONSULTANT to COUNTY regarding CONTRACTOR's pay requests.

2.6.8 **Records Management.** CONSULTANT shall ensure that complete copies of all Permits, including all conditions, attachments, modifications, time extensions, and the approved the plans and specifications, are kept at the site of the permitted activity. CONSULTANT shall maintain detailed field logbooks and construction files (notebooks and file folders with copies of all documentation).

Deliverable. Upon completion of construction activities, CONSULTANT shall conduct final file management review and transfer to COUNTY one (1) copy of the files for archival of records at COUNTY'S request.

2.6.9 **Project Closeout.** Following notification by CONTRACTOR that dredge activities are complete and all payment quantities are approved and accepted by COUNTY, CONSULTANT shall conduct a final visual inspection of the work and staging areas and prepare a punch list of remaining equipment and material to be removed from the project site and the activities required for restoration of access and staging areas. CONSULTANT shall furnish the list to COUNTY and CONTRACTOR within fourteen (14) calendar days to ensure control of final clean up.

Deliverable. Deliverable is a punch list.

2.6.10 Following notice from CONTRACTOR that it completed final clean-up, CONSULTANT shall conduct a final inspection within seven (7) calendar days of notice of the staging areas. If CONTRACTOR'S equipment, construction fencing, supplies, and debris are completely removed and

access and staging areas restored, then CONSULTANT shall forward a recommendation to COUNTY that it make the final payment to CONTRACTOR..

Deliverable. Deliverable is a recommendation for final payment.

2.6.11 **On-Call & Periodic On-Site Representation.** CONSULTANT shall be on an on-call basis throughout the period of construction to monitor construction activities and be available to address questions and required administrative matters.

2.6.12 Through the Site Representatives, CONSULTANT shall monitor progress of the work, track the CONTRACTOR activities, and notify COUNTY as appropriate in accordance with issued permit authorizations.

2.6.13 CONSULTANT shall obtain and review the CONTRACTOR'S quality control reports (daily reports) through the duration of the project, from mobilization through demobilization from the project site.

2.6.14 CONSULTANT shall designate a representative, who shall visit the site on a regular basis, on average throughout the period of construction. The Project Engineer shall serve as liaison between the CONTRACTOR and COUNTY during all phases of construction. The Project Engineer shall be available to address questions concerning the plans and specifications and address other issues requiring coordination or liaison.

2.6.15 The Project Engineer and representative(s), as may be required, shall attend periodic progress meetings with the CONTRACTOR as appropriate during construction. It is expected that progress meetings will be held by the CONTRACTOR no less frequently than one weekly during the period of construction.

2.6.16 CONSULTANT shall submit a weekly report (via email) to COUNTY that summarizes the progress of construction and compliance with the permits and Contract, including, but not limited to: manpower, amount of work performed and by whom, equipment, problems encountered, methods to correct problems, errors, omissions, deviations from Contract Documents, and weather conditions.

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Deliverable. Deliverables include on-site presence during construction, daily reports, documentation of construction operations including photographs, and a weekly summary report of construction progress.

3. CONTINGENCY CONSTRUCTION SERVICES (Authorization Withheld)

This task provides for unanticipated professional services that may be required to assist COUNTY with completion of any of the project elements during the respective construction periods. COUNTY and CONSULTANT will negotiate the scope and budget for these contingency services on an as needed basis.

4. WATER QUALITY MONITORING – DREDGING (35 Weeks)

4.1 **Pre-Construction Submittals.** CONSULTANT shall prepare and submit to the COUNTY and FDEP the turbidity monitoring scope of work and turbidity monitor qualifications, as mandated in the FDEP Permit and Minimization, Mitigation and Monitoring Plan (Plan).

4.2 **Daily Monitoring.** CONSULTANT shall hire and manage a qualified third-party subconsultant to conduct daily water quality monitoring in accordance with FDEP Permit and Plan while dredging is occurring for the project. When dredging activities occur, CONSULTANT shall provide twenty-six (26) weeks of daily water quality monitoring services.

Weekly Report Submittals to FDEP. CONSULTANT shall submit weekly summary reports of water quality data and any water quality violations in accordance with the FDEP Permit.

Deliverables. Deliverables are electronic submittals to FDEP, including the turbidity monitor qualifications, the turbidity monitoring scope of work, daily reports and weekly summary reports.

5. WATER QUALITY MONITORING – RUBBLE CLEARING (12 weeks)

5.1 **Pre-Construction Submittals.** CONSULTANT shall prepare the turbidity monitoring scope of work and turbidity monitor qualifications and submit the same to the COUTNY and FDEP.

5.2 **Daily Monitoring.** This task shall provide water quality monitoring services in

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addition to those outlined in **Task 4.2**. CONSULTANT shall hire and manage a qualified third-party subconsultant to conduct daily water quality monitoring in accordance with FDEP Permit and Plan while dredging is occurring for the project. When dredging activities occur, CONSULTANT shall provide twelve (12) additional weeks of daily water quality monitoring services.

Weekly Report Submittals to FDEP. This task shall provide weekly water quality reporting in addition to those outlined in **Task 4.2**. This task provides for an additional twelve (12) weeks of water quality reporting services, if needed.

Deliverables. If needed, deliverables are electronic submittals to FDEP, including the turbidity monitor qualifications, the turbidity monitoring scope of work, daily reports and weekly summary reports.

6. CONTINGENCY WATER QUALITY MONITORING (20 weeks) (Authorization Withheld)

6.1 **Daily Monitoring.** This task shall provide water quality monitoring services in addition to those outlined in **Task 4.2**. CONSULTANT shall contract with and manage a qualified third-party subconsultant to provide up to twenty (20) additional weeks of daily water quality monitoring per FDEP permit and Plan, if needed.

6.2 **Weekly Report Submittals to FDEP.** This task shall provide weekly water quality reporting in addition to those outlined in **Task 4.2**. This task provides for an additional twenty (20) weeks of water quality reporting services, if needed.

7. PERMIT MODIFICATION (Authorization Withheld)

Should the project permits require modification to accommodate changes to the project site, work area, and/or construction contractor's proposed work plan, CONSULTANT prepare, submit, and work to facilitate review by FDEP and USACE one (1) permit modification application. The scope of the modification request will be developed through coordination with COUNTY, FDEP, and USACE.

Deliverables. Deliverables include signed and sealed permit drawings and an electronic copy of the formal request to FDEP and USACE.

8. POST-CONSTRUCTION REPORT

CONSULTANT shall prepare a post-construction report that addresses all aspects of the sand bypass project, as constructed. At a minimum, CONSULTANT must include

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documentation of CONTRACTOR productivity, construction and placement techniques, weather conditions during execution of the work, factors affecting CONTRACTOR's productivity, a summary of the bid results, elements of the total cost to construct, public interest issues occurring during the period of construction, and other factors potentially affecting future operation and performance of the sand bypass project. CONSULTANT shall assess, analyze, and summarize CONTRACTOR related data obtained from daily reports, project specific reporting submittals, internal reports, surveys, etc. If appropriate, the data should be formulated in a graphic format for visual interpretation by layman. Documentation of the as-built conditions of project features based upon both CONTRACTOR and CONSULTANT surveys must also be included.

Deliverable. Deliverables to COUNTY and FDEP are one (1) PDF copy of the report with appendices. The PDF copy of the report will be provided on electronic media (CD, thumb drive, ftp site, etc.) suitable for distribution.

9. PHYSICAL MONITORING: IMMEDIATE POST-CONSTRUCTION

FDEP Beaches, Inlets and Ports Program provided a set of technical specifications for the collection and submittal of coastal monitoring data (FDEP, 2001). CONSULTANT shall apply these technical specifications in the planning, collection, processing, and submittal of the monitoring data described herein. FDEP established additional guidelines for beach erosion control projects. The physical monitoring described herein meets or exceeds those requirements. The Physical Monitoring Plan includes:

1. Comprehensive surveys of the beach, inlet, and project improvements by a certified Hydrographic Surveyor and Professional Surveyor and Mapper;
2. Analysis of beach and inlet changes and development of a cumulative comparative database to evaluate sand bypass project performance and assist in planning future sand bypass events; and
3. A detailed Annual Report of Findings for consideration by COUNTY, state and federal agencies, and the general public.

9.1 **Beach Profile Survey.** CONSULTANT shall conduct an immediate post-construction beach profile survey per the approved Physical Monitoring Plan. CONSULTANT shall provide all necessary materials and equipment to perform the required work activity. CONSULTANT shall also supply the supervisory, professional, and technical services personnel required to manage, document, and process all data associated with the acquisition and processing of the survey data.

9.2 **Multibeam Survey.** CONSULTANT shall conduct a multibeam survey per the approved Physical Monitoring Plan. CONSULTANT shall provide all necessary

materials and equipment to perform the required work activity. CONSULTANT shall also supply the supervisory, professional, and technical services personnel required to manage, document, and process all data associated with the acquisition and processing of the survey data.

9.3 **Structure Survey.** CONSULTANT shall conduct an immediate post-construction survey of the north jetty extension, north jetty improvements, and interior groin per the approved Physical Monitoring Plan. CONSULTANT shall provide all necessary materials and equipment to perform the required work activity. CONSULTANT shall also supply the supervisory, professional, and technical services personnel required to manage, document, and process all data associated with the acquisition and processing of the survey data.

9.4 **Survey Deliverables.** Deliverables to COUNTY and FDEP are a digital copy of the following products:

(a) Survey report from the Florida licensed surveyor certifying to the Department that the survey meets the technical standards of Chapter 61G17-6, F.A.C.
(b) Copies of all checked, standard survey field books, computation and reduction files, and abstracted final positions.
(c) Monument Information Report (Given/Used/Found Report) with regard to monumentation that includes a list of provided, found, and used monuments and TBM identification, stamping, coordinates, elevations, and profile azimuths.
(d) A QA/QC report detailing the QA/QC procedure and any findings, corrections, and results of that procedure, including cross-sectional plots of each profile and plan view plot of the data with an approximate mean high water (MHW) contour.
(e) ACSII file containing raw x, y, z profile data points.
(f) ASCII files containing the profile data processed into the FDEP x, y, z format, if x, y, z data is collected, and the DEP distance and depth format. The FDEP format includes data and header records.
(g) ASCII file containing the monument identification, stamping, coordinates and elevations.
(h) Digital copy of cross-section and plan view data plots.
(i) Complete federally-compliant metadata file, including methodology of the data collection and processing procedures used in accordance with standards set forth by the Federal Geographic Data Committee. Metadata shall include all QA/QC procedures utilized to ensure the

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quality of the data and shall be delivered digitally on CD.

(j) Field books shall be scanned and pages amassed into a PDF document for digital submittal on CD.

(k) Data will be provided in NAVD88 datum.

9.5 **Analysis and Reporting.** Consistent with the approved Physical Monitoring Plan, CONSULTANT shall prepare an immediate post-project condition memo. The memo must document the immediate post-construction conditions and establish the comparative baseline for beach, sand trap, and inlet channel conditions and project performance conditions. The memo will include graphic presentations of conditions.

Deliverable. Deliverable to COUNTY and FDEP is one (1) PDF copy of the final memo provided on electronic media (CD, thumb drive, ftp site, etc.) suitable for distribution.

10. INTERMEDIATE POST-CONSTRUCTION MULTI-BEAM HYDROGRAPHIC SURVEY (6-months)

CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 1**. CONSULTANT shall conduct this task 6-months post-construction.

11. PHYSICAL MONITORING: 1-YR POST-CONSTRUCTION

FDEP's Beaches, Inlets and Ports Program provided a set of technical specifications for the collection and submittal of coastal monitoring data (FDEP, 2001). CONSULTANT shall apply these technical specifications in the planning, collection, processing, and submittal of the monitoring data described herein. FDEP established additional guidelines for beach erosion control projects. The physical monitoring described herein meets or exceeds those requirements. The Physical Monitoring Plan includes:

1. Comprehensive surveys of the beach, inlet, and project improvements by a certified Hydrographic Surveyor and Professional Surveyor and Mapper;
2. Analysis of beach and inlet changes and development of a cumulative comparative database to evaluate sand bypass project performance and assist in planning future sand bypass events; and
3. a detailed Annual Report of Findings for consideration by COUNTY, state and federal agencies, and the general public.

11.1 **Beach Profile Survey.** CONSULTANT shall conduct a beach profile survey per the approved Physical Monitoring Plan. CONSULTANT shall provide the necessary materials and equipment to perform this task. CONSULTANT shall also supply the supervisory, professional, and technical services personnel to manage, document,

and process all survey data.

11.2 **Multibeam Survey.** CONSULTANT shall conduct a multibeam survey per the approved Physical Monitoring Plan. CONSULTANT shall provide all necessary materials and equipment to perform this activity. CONSULTANT shall also supply the supervisory, professional, and technical services personnel required to manage, document, and process all survey data.

11.3 **Structure Survey.** CONSULTANT shall conduct an immediate post-construction survey of the north jetty extension, north jetty improvements, and interior groin per the approved Physical Monitoring Plan. CONSULTANT shall provide all necessary materials and equipment to perform the activity. CONSULTANT shall also supply the supervisory, professional, and technical services personnel required to manage, document, and process all survey data.

11.4 **Analysis and Reporting.** Consistent with the approved Physical Monitoring Plan, CONSULTANT shall prepare a detailed annual project monitoring report. The report shall summarize the annual and cumulative data and assess project performance. Recommendations for future management activities that may be required will be incorporated as necessary and appropriate at the time of the analysis. The report must include graphic presentations of temporal and cumulative changes of beach contours over time. Volumetric changes at each survey profile and throughout the limits of fill shall be computed and presented in tabular and graphic forms. Aerial photography provided by COUNTY will be utilized to further analyze shoreline changes. Analyses shall discuss shoreline change trends, sand trap and inlet channel shoal rates and patterns, and available sand capacity within the permit beach fill template south of the inlet where sand bypass material will be placed. CONSULTANT shall include a discussion of potential cause and effect relationships, storm impacts (if applicable), other littoral impacts, a local sediment budget for the area of interest, and changes to the nearshore edge location compared to observed beach change. Major report(s) of findings will be submitted annually 90 days after each annual monitoring survey.

Deliverable. Deliverables to COUNTY and FDEP are three (3) hardcopies and one (1) PDF copy of the annual report with appendices. The PDF copy of the report will be provided on electronic media (CD, thumb drive, ftp site, etc.) suitable for distribution.

12. INTERMEDIATE POST-CONSTRUCTION MULTI-BEAM HYDROGRAPHIC SURVEY (18-months)

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CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 1**. CONSULTANT shall conduct this task 18-months post-construction.

13. PHYSICAL MONITORING: 2-YEAR POST-CONSTRUCTION
CONSULTANT shall use the same methodology and provide the same deliverables as detailed in **Task 11**. CONSULTANT shall conduct this task two (2) years post-construction.

14. INTERMEDIATE POST-CONSTRUCTION MULTI-BEAM HYDROGRAPHIC SURVEY (30-months)
CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 1**. CONSULTANT shall conduct this task 18 months post-construction.

15. PHYSICAL MONITORING: 3-YEAR POST-CONSTRUCTION
CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 11**. CONSULTANT shall conduct this task three (3) years post-construction.

16. INTERMEDIATE POST-CONSTRUCTION MULTI-BEAM HYDROGRAPHIC SURVEY (42-months)
CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 1**. CONSULTANT shall conduct this task 18-months post-construction.

17. PHYSICAL MONITORING: 4-YEAR POST-CONSTRUCTION
CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 11**. CONSULTANT shall conduct this task four (4) years post-construction.

18. INTERMEDIATE POST-CONSTRUCTION MULTI-BEAM HYDROGRAPHIC SURVEY (54-months)
CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 1**. CONSULTANT shall conduct this task 54 months after construction of the sand trap and associated inlet improvements.

19. PHYSICAL MONITORING: 5-YEAR POST-CONSTRUCTION
CONSULTANT shall use the same methodology and provide the same deliverable as detailed in **Task 17.** CONSULTANT shall conduct this task five (5) years after construction of the sand trap and associated inlet improvements.

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April 16, 2024

PART II: ENVIRONMENTAL SERVICES - INITIAL SAND TRAP CONSTRUCTION

A. DIRECT IMPACT AREA - IMPACT AVOIDANCE/MINIMIZATION

All below tasks involving scleractinian coral and octocoral colony relocation include acquisition of a Special Activity License (SAL) from FWCC. All monitoring, reporting and notification tasks will be performed in accordance with the FDEP Permit, FDEP Minimization, Mitigation and Monitoring Plan, and National Marine Fisheries Service (NMFS) Biological Opinion (BO).

PRE-CONSTRUCTION CLEARANCE OF DIRECT IMPACT AREA AND CORAL TRANSPLANTATION MONITORING

20. **NON-LISTED SPECIES RELOCATION FROM DIRECT IMPACT AREA (corals, conch, urchins)**
FDEP Permit No. 0289308-004-JC Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 2.1

CONSULTANT shall survey the direct impact area and 10-m buffer area around the direct impact area to locate qualifying scleractinian coral and octocoral colonies for relocation (see Figure 1 below). Qualifying stony coral colonies have a maximum size (diameter) greater than or equal to 10 cm of live tissue and qualifying octocorals are 15 cm in height or greater. Colonies that exhibit obvious signs of disease or bleaching will not be harvested. Although colonies of the federally listed coral, *Acropora cervicornis*, were not observed in the direct impact area during any of the reconnaissance surveys, all healthy colonies of *A. cervicornis* or any other listed coral species present during the search and relocation effort of the direct impact area, regardless of size, shall be collected and relocated according to the requirements of Section 2.1.1.3.1 of the FDEP Minimization, Mitigation and Monitoring Plan (Plan, August 2020) and monitored according to the requirements of the NMFS BO.

All hardbottom habitats within the direct impact area and 10-m buffer (except for the Inlet Channel Wall) shall be included in the coral colony search and removal area. Within this area, CONSULTANT shall use 50-m diameter plots to define smaller, more manageable collection areas. Prior to field work, the project GIS database shall be used to overlay the 50-m diameter plots on the benthic habitat map to ensure the entire search area is covered. The center point for each plot shall be recorded and used to define each *in situ* collection site. A copy of the GIS database will be provided to COUNTY prior to in situ work. At each collection site, divers shall swim survey tapes 25 m out from the center point on north, east, south, and west compass headings to further subdivide each collection site into quadrants. A diver shall be assigned to each quadrant.

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During coral colony collection, individuals of queen conch (*Strombus gigas*) and long-spined sea urchins (*Diadema antillarum*) shall be collected at the 50-m diameter coral relocation plots. All collection and relocation activities shall be done in accordance with the requirements of Section 2.1.2 of the FDEP Plan. Mature queen conch shall be relocated to nearshore hardbottom offshore of (beyond) the permitted equilibrium toe of fill (ETOF) at Dr. Von D. Mizell-Eula Johnson State Park (Figures 2 and 3 of the Plan). Adult long-spined urchins shall be relocated to the *A. cervicornis* receiver sites (see Figures 7 and 8 of the NMFS BO or receiver sites for non-Acroporid scleractinian corals at the Broward County Segment III mitigation boulder reef (Figure 12 of the Plan). Long-spined urchins and queen conch shall be relocated to receiver areas on the day of collection.

For this task, the number of scleractinian corals greater than or equal to 10 cm of live tissue is estimated to be approximately 1,900 colonies (estimate based on 2007/2014 density data). The number of octocoral colonies greater than 15 cm in height is difficult to estimate because the baseline surveys did not use this size class. The expected number of octocoral colonies greater than 15 cm in height is 200 to 300. A relocation rate of 50 colonies/day has been used as the basis for development of the expected time required to perform all coral relocation.

For the total of approximately 2,100 to 2,200 scleractinian coral and octocoral colonies and expected numbers of queen conch/long-spined urchins, relocation should take approximately 45 days to complete. This relocation rate assumes that the receiver site is the Segment III mitigation artificial reef offshore of FDEP R-monuments R-101 to R-103 (Figure 12 of the FDEP Plan) or the Segment II mitigation artificial reef located offshore of R-48 to R-49 in Fort Lauderdale. A contingency task is included in **Task 21** below should the number of corals which require relocation exceed 2,100 colonies or the number of field days exceeds 45 days.

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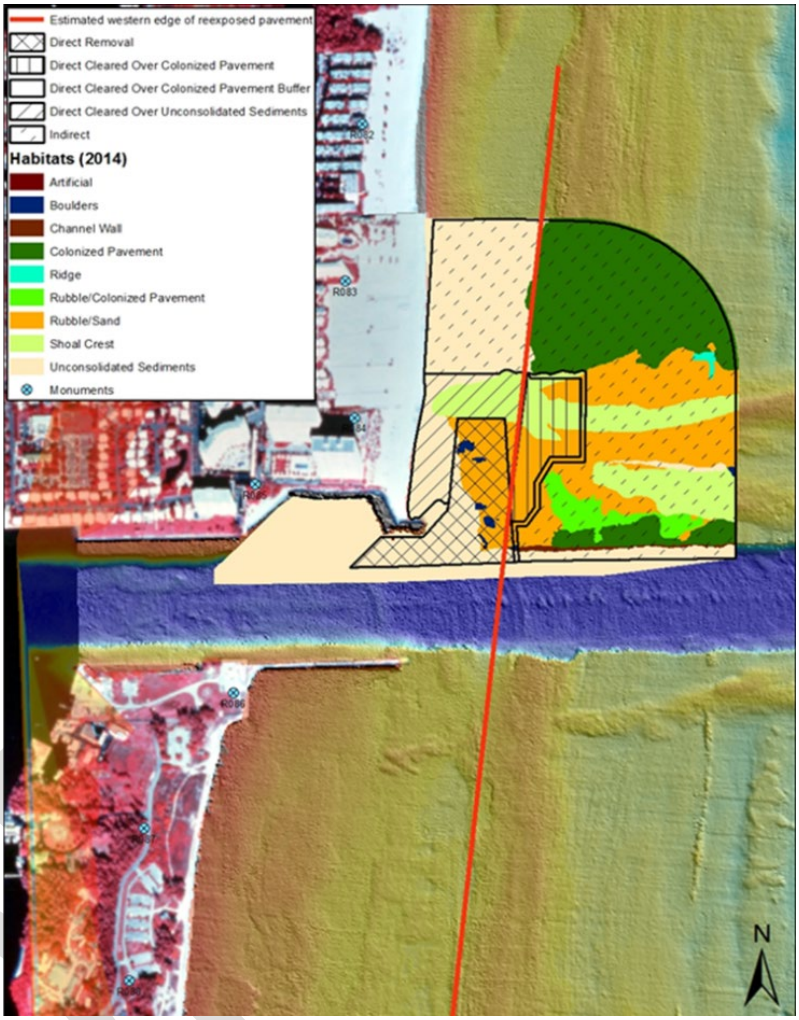

Figure 1. Benthic habitat map for the Port Everglades Sand Bypass Project showing the direct and indirect impact areas. The red line estimates the western edge of rubble/colonized pavement habitat following rubble clearing activities.

Deliverable. CONSULTANT shall conduct the relocation described above, email weekly brief work progress summaries to FDEP and COUNTY staff during relocation activities, and prepare a data summary documenting the relocation effort (number of colonies by species/size, number of relocated colonies on unconsolidated rubble, and number of relocated queen conch and long-spined urchins) with a map of the tagged boulders and GIS shape files of the receiver sites. The summary data files and maps/shape files shall be submitted to COUNTY, FDEP, and USACE within 60 days of completion of the field data collection.

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21. CONTINGENCY NON-LISTED CORAL COLONY REMOVAL AND RELOCATION (AUTHORIZATION WITHHELD)

This task provides up to ten (10) additional field days for coral relocation activities should they be required. CONSULTANT shall use the methodology described in **Task 20** for this task.

NON-LISTED CORAL POST-RELOCATION MONITORING AND REPORTING SERVICES (*FDEP Permit Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 2.1.1.4.2 and 7.3)*

22. NON-LISTED CORAL RELOCATION MONITORING: IMMEDIATE POST-RELOCATION BASELINE (TIME ZERO) SURVEY

Once the subset of relocated colonies is established, CONSULTANT shall identify (species for scleractinian corals, genus for octocorals), measure (diameter for scleractinian corals, height for octocorals), record the colony condition, and photograph all colonies on each tagged boulder within one month of completion of relocation activities. CONSULTANT shall note percent bleaching, percent old and recent morality, presence of disease, obvious signs of predation, and sedimentation (accumulation) in its colony condition description. CONSULTANT shall also note whether a colony was relocated from rubble. If any ESA-listed colonies are relocated, monitoring of these colonies will be performed in conjunction with non-listed colony monitoring. CONULTANT shall create a Microsoft Access database with the above- described information

Deliverable. Deliverables include a Microsoft Access database and exported Excel spreadsheets with the transplanted colony information and a still photo library of the coral transplants. The Access database, spreadsheets, and field datasheets scanned to PDF shall be submitted to COUNTY, FDEP and USACE 30 days prior to sand trap construction activities commence and within 60 days of completing the baseline pre-construction survey. Data shall be submitted either on a portable hard drive or via an FTP site.

23. NON-LISTED CORAL RELOCATION MONITORING: SIX-MONTH POST-RELOCATION SURVEY

CONSULTANT shall conduct the six-month post-relocation survey of the coral transplants on tagged boulders, prepare a summary report of the status of transplanted colonies (by species and genus, respectively) and any changes in status from the baseline survey (i.e., estimation of survivorship), and update the Microsoft Access database, including the photo library, and spreadsheets. Monitoring methods shall follow the methods used in the baseline survey (**Task 22**) to document colony survival, health, and growth.

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Deliverable. Deliverables are a report summarizing the six-month post-relocation survey and comparing it to the baseline survey; an update to the Microsoft Access database, photo library, and exported Excel spreadsheets; and scanned field datasheets. The Access database and exported Excel datasheets, scanned field datasheets in PDF format and still photo library shall be submitted to COUNTY, FDEP and USACE within 60 days of survey completion. The summary report shall be submitted within 90 days of completion of the six-month relocation survey. Data shall be submitted either on a portable hard drive or via an FTP site.

24. NON-LISTED CORAL RELOCATION MONITORING: YEAR 1 POST-RELOCATION SURVEY

CONSULTANT shall conduct the Year 1 post-relocation survey of coral transplants on the tagged boulders. Monitoring methods shall follow the methods used in the baseline survey (**Task 22**) to document colony survival, health, and growth. A report shall be prepared which summarizes colony survivorship and provides survival, condition, and tissue mortality data in tabular and graphical form. The Year 1 report shall also describe any changes in status in comparison to the baseline and 6-month post-relocation surveys.

Deliverable. Deliverables are an update the Microsoft Access database and photo library for the Year 1 post-relocation survey and a Year 1 Summary report. The draft Year 1 summary report shall be submitted to COUNTY for review within 60 days following survey completion. The scanned field datasheets to PDF, Access database and exported Excel spreadsheets, and still photo library from the Year 1 post-relocation survey shall be submitted in digital format to COUNTY, FDEP and USACE within 60 days, and the summary report shall be submitted within 90 days of completion of the Year 1 post-relocation survey. Data shall be submitted either on a portable hard drive or via an FTP site.

25. NON-LISTED CORAL RELOCATION MONITORING: YEAR 3 POST-RELOCATION SURVEY

CONSULTANT shall conduct the Year 3 post-relocation survey of coral transplants on the tagged boulders. Monitoring methods shall follow the methods used in the baseline survey (**Task 22**) to document colony survival, health, and growth. A report shall be prepared which summarizes colony survivorship and provides survival, condition, and tissue mortality data in tabular and graphical form. The Year 3 report shall also describe any changes in status in comparison to the baseline and post-relocation surveys

Deliverable. Deliverables are an update the Microsoft Access database and photo library for the Year 3 post-relocation survey and a Year 3 Summary Report. The draft Year 3 summary report shall be submitted to COUNTY for review within 60 days following survey

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completion. The scanned field datasheets to PDF, Access database and exported Excel spreadsheets, and still photo library from the Year 3 post-relocation survey shall be submitted in digital format to COUNTY, FDEP and USACE within 60 days, and the Year 3 summary report shall be submitted within 90 days of completion of the Year 3 post-relocation survey. Data shall be submitted either on a portable hard drive or via an FTP site.

B. INDIRECT IMPACT AREA- IMPACT AVOIDANCE/MINIMIZATION

All below tasks involving scleractinian coral and octocoral colony relocation include acquisition of a Special Activity License (SAL) from FWCC. All monitoring, reporting, and notification tasks will be performed in accordance with the FDEP Permit, FDEP Minimization, Mitigation and Monitoring Plan, and NMFS BO.

PRE-CONSTRUCTION CLEARANCE OF INDIRECT IMPACT AREA *(FDEP Permit Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 2.2; NMFS BO Sections 10 and 11, Appendix A and B)*

26. LISTED CORAL SPECIES (*ACROPORA CERVICORNIS*): PRE-CONSTRUCTION SURVEY

CONSULTANT shall conduct a listed coral survey at five sites inside the turbidity mixing zone where *Acropora cervicornis* was documented during pre-construction surveys (sites 1, 2, 4, 33 and 34; see Figure 13 of the Plan) within 30 days prior to construction. The survey shall follow NMFS recommended protocol for listed coral species (NMFS BO, 2020) to document colony abundance, size, and condition. This method shall be applied to all seven federally listed coral species; however, only *A. cervicornis* has been found at the natural hardbottom sites during surveys of the project area since 2007. Each of the five sites is 1 hectare (100 m x 100 m) and is centered around the 2014/2017 listed coral survey sites as presented in Figure 13 of the BMP. CONSULTNT shall prepare an Excel spreadsheet with the survey results colony abundance by site/size. This spreadsheet shall be used to develop the final relocation and fragmentation plan pursuant to the NMFS BO and FDEP Plan.

Deliverable. Deliverable is an Excel spreadsheet submitted to COUNTY, FDEP, USACE, and NMFS within 30 days of survey completion.

27. LISTED CORAL SPECIES (*ACROPORA CERVICORNIS*) COLONY/FRAGMENT RELOCATION

CONSULTANT shall relocate all *A. cervicornis* colonies greater than or equal to 5 cm in maximum dimension from Sites 1 and 4 (see Figure 13 of the Plan). As noted above in

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Task 20, any ESA-listed species colonies observed within the indirect impact area shall be relocated, regardless of size. Transplantation receiver sites are natural nearshore hardbottom in Fort Lauderdale located between FDEP profile monuments R-73 and R-75 and/or R-80 and R-81.5 (see Figures 7 and 8 of the NMFS BO). Surveys conducted in March 2021 suggest that the number of *A. cervicornis* colonies to be relocated from Sites 1 and 4 is approximately 3,400. Given the length of time that has passed since the March 2021 survey, this task assumes that the sites will support a minimum number of 2,400 corals at the time of relocation. Contingency tasks have been included in the event that **Task 26** documents up to 3,400 colonies of *A. cervicornis* (see **Tasks 28** and **29**). Colony collection shall adhere to the coral relocation protocol described in the NMFS BO. Colonies which exhibit obvious signs of disease or bleaching will not be removed for relocation.

Prior to relocation of *A. cervicornis* colonies from Sites 1 and 4, CONSULTANT shall collect 5-cm fragments from all *A. cervicornis* colonies at Sites 1, 2, 4, 33 and 34, and place the fragments into the permitted coral nursery in Broward County in compliance with Terms and Conditions of the NMFS BO. Approximately 100 colonies are expected at Sites 2, 33, and 34. Fragments shall be collected from the axial tip of healthy branches using hand tools. Fragment collection shall adhere to the coral relocation protocol described in the NMFS BO. Any fragments larger than 5 cm shall be relocated according to relocation protocols and fragments less than or equal to 5 cm shall be relocated to the nursery.

Prior to fragment collection, CONSULTANT shall construct and deploy a sufficient number of PVC trees in the permitted Broward County coral nursery based on expected collection of 2,500 fragments from all five sites. The floating PVC trees are used to suspend fragments on lines or frames and are attached to the seafloor bottom with anchors and suspended using subsurface floats.

Relocated colonies of *A. cervicornis* from Sites 1 and 4 shall be attached to the natural substratum following the requirements of the NMFS BO. *Acropora cervicornis* colonies to be monitored shall be transplanted into circular plots, 7 m in diameter each. Each plot shall have 10 to 15 colonies, and plots shall be separated by 10 to 20 m. Individual spacing between transplanted colonies shall not exceed 0.75 m.

This task provides for the construction and installation of PVC trees, collection and relocation of 2,500 fragments of *A. cervicornis* from Sites 1, 2, 4, 33 and 34 into the nursery, attachment of 2,500 fragments to the PVC trees in the permitted nursery, and collection and relocation of up to 2,400 colonies of *A. cervicornis* from Sites 1 and 4 to plots on natural nearshore hardbottom north of the project area (Figures 7 and 8 of the NMFS BO). A relocation rate of 200 fragments/day to the nursery has been estimated

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which equates to relocation of 2,400 fragments in approximately 12 field days. An estimated collection and relocation rate of *A. cervicornis* colonies to natural reef areas of 100 colonies per day will result in the relocation of 2,400 colonies in approximately 24 field days. Two contingency tasks are included in this scope of work (**Tasks 28** and **29**) should there be up to 3,500 fragments or colonies to be relocated as suggested by the March 2021 survey or should the number of field days required to relocate fragments exceed 12 and/or colony relocation exceed 24 field days. CONSULTANT shall prepare a summry table that documents the number of relocated colonies by size, number of fragments attached at the nursery, and maps that show the harvest and receiver location of the relocated colonies.

Deliverable. Deliverables are the coral relocation described above and summary table documenting the number of relocated colonies by size, number of fragments attached at the nursery, and maps showing the harvest and receiver location of the relocated colonies. Coordinates and GIS shape files of the center of colony receiver plots and trees in the nursery shall be provided to COUNTY, USACE and NMFS within 30 days following completion of relocation activities.

28. CONTINGENCY LISTED CORAL COLONY REMOVAL AND RELOCATION (AUTHORIZATION WITHHELD)

This task provides for up to an additional ten (10) field days of *A. cervicornis* relocation activities from Sites 1 and 4 if the number of colonies for relocation is approximately 3,400 as suggested by the March 2021 survey. The methodology described in **Task 27** above shall be used for this task.

29. CONTINGENCY LISTED CORAL FRAGMENT REMOVAL AND RELOCATION AND FRAGMENT OUTPLANTING FROM NURSERY (AUTHORIZATION WITHHELD)

This task provides for an additional fifteen (15) field days of *A. cervicornis* fragment collection and relocation from sites 1, 2, 4, 33 and 34 to the nursery if the number of fragments is approximately 3,500 as indicated by the March 2021 survey or if the number of fragments to be outplanted from the nursery exceeds 1,400 (see **Task 35**). The methodology as described in **Task 27** above shall be implemented for this task.

30. LISTED CORAL RELOCATION MONITORING: IMMEDIATE POST-RELOCATION BASELINE (TIME ZERO) AND ONE WEEK POST-RELOCATION SURVEY OF COLONY TRANSPLANTS AND REFERENCE COLONIES

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CONSULTANT shall collect demographic information for the subset of corals to be monitored immediately following transplantation (time zero) and conduct a post-relocation survey within the first week following transplantation according to the requirements of Appendix A of the NMFS BO. According to the power analysis required by the BO, a maximum of 500 relocated colonies of *A. cervicornis* and 250 reference colonies of *A. cervicornis* shall be monitored during each event. Colony demographic data shall be recorded for transplanted and reference colonies. Colonies shall be photo documented with a scale in the photographs. GPS locations of the center of reference monitoring plots shall be recorded.

The one-week post-transplantation monitoring report shall document attachment status (secure, loose, or missing). Any colonies that are not firmly attached to the bottom shall be re-attached to the bottom. The one-week survey shall observe and record presence, survivorship, and condition (disease, necrosis, fouling, sediment coverage).

Following the initial (time zero) and one-week post-relocation survey, CONSULTANT shall prepare a single summary report that documents the *A. cervicornis* relocation effort, identifies the location and status of the tagged plots with relocated corals, and presents the monitoring data from both surveys. The report shall include a table with tag number, location, water depth, maximum length, number of branch tips, and percent mortality (in 10% increments) for each of the transplants. GIS shape files of the monitoring plots shall be provided. The report shall also include photographs of the transplants and reference colonies. Comparisons shall be made between the reference sites and the relocation monitoring sites.

Deliverable. Deliverables are the single summary report documenting the *A. cervicornis* relocation effort, the location and status of the tagged plots with relocated corals, and the monitoring data from both surveys; GIS shape files of the monitoring plots; and photographs of the transplants and reference colonies. The report and associated data shall be submitted in digital format to COUNTY, FDEP, USACE, and NMFS within 30 days of completion of the one-week post-relocation survey.

31. LISTED CORAL RELOCATION MONITORING: THREE MONTH POST-RELOCATION SURVEY OF COLONY TRANSPLANTS AND REFERENCE COLONIES

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CONSULTANT shall conduct the three-month post-relocation survey according to the requirements of Appendix A of the NMFS BO as summarized above under **Task 30**. The three-month survey shall document presence, survivorship, and condition (disease, necrosis, fouling, sediment coverage). Any colonies that are not firmly attached to the bottom at the time of the survey shall be re-attached to the bottom. The three-month survey shall observe and record for presence, survivorship, and condition (disease, necrosis, fouling, sediment coverage). CONSULTANT shall prepare a summary report that documents survivorship and the status of the tagged plots with relocated corals. The report shall include a table with tag number, location, water depth, maximum length, number of branch tips, and percent mortality (in 10% increments) for each of the transplant monitoring plots. The report shall also include photographs of the transplants and reference colonies. Comparisons shall be made between the reference and relocation monitoring sites.

Deliverable. Deliverables are the 3-month post-relocation survey and summary report of the survey results The report and associated data shall be submitted in digital format to COUNTY, FDEP, USACE, and NMFS within 30 days of completion of the three-month post-relocation survey.

32. LISTED CORAL RELOCATION MONITORING: SIX-MONTH POST-RELOCATION SURVEY OF COLONY TRANSPLANTS AND REFERENCE COLONIES

CONSULTANT shall conduct the six-month post-relocation survey according to the requirements of Appendix A of the NMFS BO as summarized above under **Task 30** Any colonies that are not firmly attached to the bottom at the time of the survey shall be re-attached to the bottom. The six-month survey shall observe and record for presence, survivorship, and condition (disease, necrosis, fouling, sediment coverage). CONSULTANT shall prepare a summary report that documents survivorship and status of the tagged monitoring plots with relocated corals. The report shall include a table with tag number, location, water depth, maximum length, number of branch tips, and percent mortality (in 10% increments) for each transplantation plot. The report shall also include photographs of the transplants and reference colonies. Comparisons shall be made between reference and relocation monitoring sites.

Deliverable. Deliverables are the 6-month post relocation survey, summary report, and associated data which must be submitted in digital format to COUNTY, FDEP, USACE, and NMFS within 30 days of completion of the six-month post-relocation survey.

33. LISTED CORAL RELOCATION MONITORING: ONE-YEAR POST-RELOCATION SURVEY OF COLONY TRANSPLANTS AND REFERENCE COLONIES

CONSULTANT shall conduct the one-year post-relocation survey according to the requirements of Appendix A of the NMFS BO. The following tasks shall be conducted for the transplants on each tagged boulder and reference colonies: Colony demographic data shall be recorded as outlined in the Appendix A of the BO, and transplanted and reference colonies shall be photo documented with a scale in the photographs. CONSULTANT shall prepare a summary report that documents survivorship and status of the relocated corals. The report shall include a table with tag numbers, locations, and water depth for each of the transplantation plots. The report shall also include the maximum length, number of branch tips, and percent mortality (in 10% increments) of the colonies monitored in each plot. The report shall also include representative photographs of the transplants and reference colonies. The final one-year survey shall record and compare presence, survivorship, and condition (e.g., disease, necrosis, fouling, sediment coverage) among all post-transplantation monitoring events. Comparisons shall be made between reference and relocation monitoring sites.

Deliverable. Deliverables are the one-year post-relocation survey and summary report. The report and associated data shall be submitted in digital format to COUNTY, FDEP, USACE, and NMFS within 30 days of completion of the one-year post-relocation survey.

34. CORAL NURSERY MANAGEMENT

CONSULTANT shall manage the nursery trees which hold the *A. cervicornis* fragments for 18 months for potential relocation for mitigation. Management includes monthly observations of the trees and the replacement of materials (lines, buoys, etc.) as needed and reattachment of fragments that may have become dislodged from the trees.

Deliverable. Deliverables are the monthly logs of nursery maintenance events for the 18-month management period. These logs shall document major storm events which affect the nursery. The logs shall be submitted via email at 6-month intervals to COUNTY, FDEP, USACE, and NMFS.

35. OUTPLANTING OF ACROPORA CERVICORNIS COLONIES (AUTHORIZATION WITHHELD)

Should the one-year post-relocation monitoring report indicate that 1) less than 85% of the transplanted colonies survive (survival means no net loss of tissue), 2) the results of the sedimentation monitoring at Sites 2, 33, or 34 indicate partial or total mortality during the immediate post-construction survey of the sand trap, or 3) the results of coral monitoring at Sites 2, 33, or 34 indicate mortality during the immediate post-construction survey (see Section E- **Task 47**), CONSULTANT shall conduct outplanting of colonies from the nursery at a ratio of 1:1 (relocation survivorship or sedimentation) or a ratio of 1:1.15 (coral monitoring), following the requirements of the NMFS BO (Appendices A and B).

Outplanting for restoration shall occur at: 1) sites 1 and 4 if post-construction sediment surveys indicate that suitable habitat for *A. cervicornis* remains; 2) at Sites 2, 33 or 34 if suitable habitat remains, or 3) at one of the natural hardbottom *A. cervicornis* relocation sites if all other sites within the project area are not suitable at one-year post-construction. If required, restoration through outplanting shall be completed within two years. Any corals remaining in the nursery after COUNTY's outplanting mitigation requirements have been met shall remain in the NSU nursery and shall be available to NSU for future restoration activities.

The total amount billed under this task will be based on the number of days required to meet the 1:1 or the 1:1.15 outplanting mitigation requirement with a maximum number of 1,400 fragments to be outplanted from the nursery. If the number of fragments to be outplanted exceeds 1,400, additional outplanting will be conducted under Contingency **Task 29**. This task also includes two monitoring events of at least 20% of the transplanted fragments as typically required by the FWCC Special Activity License (SAL) for coral relocation. CONSULTANT shall provide an Excel spreadsheet with the total number of outplanted colonies at each receiver site, maps and GIS shape files of the locations of the outplant receiver sites, and representative photographs of the outplanted colonies during the initial event

Deliverable. Deliverables are the outplanting, an Excel spreadsheet documenting the total number of outplanted colonies at each receiver site, maps and GIS shape files of the locations of the outplant receiver sites, and representative photographs of the outplanted colonies during the initial event. The colony demographic data from the two post-transplant monitoring events shall be submitted in digital format to COUNTY, FWCC, USACE, and NMFS within 30 days following completion of the second monitoring event. Data shall be submitted in Microsoft Excel format via email or an FTP site.

C. INDIRECT IMPACT AREA - PRE-CONSTRUCTION STATION INSTALLATION AND MONITORING (*FDEP Permit Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 3.1; NMFS Biological Opinion Appendix B and C)*

All monitoring, reporting and notification tasks will be performed in accordance with the FDEP Permit, FDEP Minimization, Mitigation and Monitoring Plan, and NMFS BO.
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36. PRE-CONSTRUCTION BASELINE SURVEY OF NEARSHORE HARDBOTTOM WITHIN/ ADJACENT TO THE TURBIDITY MIXING ZONE

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36.1 Transect / Station Installation

CONSULTANT shall install 13 permanent monitoring stations within the turbidity mixing zone immediately prior to sand trap construction and conduct the baseline biological monitoring survey of these stations (see Figure 2 below). All transect installation and monitoring shall be conducted in accordance with the FDEP Plan (Section 3.1.1.1).

A single, permanent transect shall be established at each of the 13 monitoring stations. Permanent transects shall be of two lengths: 50 m long or 150 m long. The 150-m transects shall only be established at the two northernmost monitoring stations (Stations 1 and 38); 50-m transects shall be established at all other stations (see Figure 2 below). Transect orientations are station specific and shall be oriented as shown in Figure 2 and Table 1 of the Plan. Permanent markers shall be installed at the transects according to the FDEP Plan.

Three (3) transects shall be established in areas adjacent to the turbidity mixing zone: Stations 23 and 24 of COUNTY's nearshore hardbottom monitoring program and at the *Acropora cervicornis* monitoring station (see Figure 2 below). The pre-construction survey of the permanent transects at these stations shall consist of 1-m interval sediment depth measurements, high-definition digital still images along both sides of the three transects, and qualitative video transects.

Stations 23 and 24 currently consist of 70-m permanent cross-shore transects. An additional 100-m shore-parallel permanent transect shall installed at both stations (see Figure 2 below). At Station 23, the additional 100-m transect shall start (zero [0] meter mark) at the midpoint (meter mark 35) of the existing 70-m transect. The transect shall extend 100 m to the south, towards the turbidity mixing zone. At Station 24, the additional 100-m shore-parallel transect shall start (zero [0] meter mark) at meter mark 25 of the existing 70-m cross-shore transect and shall extend 100 m to the north, towards the northern edge of the mixing zone. Permanent markers at these three transects shall be installed at the locations specified in the FDEP Plan.

Two (2) permanent transects, one cross-shore and one shore-parallel, shall be established at the Broward County Segment II Nourishment Project *A. cervicornis* monitoring station indicated by the red star in Figure 2 below. The cross-shore transect line shall be 50 m in length, and the shore-parallel shall be 100 m in

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length. The north-south transect shall extend 100 m to the south. Permanent markers at these two transects shall be installed at the locations specified in the FDEP Plan.

36.2 Pre-Construction Baseline Survey

The full length of each permanent transect shall be surveyed during the pre-construction (baseline) monitoring event. The pre-construction survey at the permanent transects shall consist of interval sediment depth measurements, quantitative photo surveys, scleractinian and octocoral belt transect surveys, and qualitative video transect surveys according to the protocol outlined in the FDEP Plan.

A 50 m long by 1 m wide belt transect shall be surveyed for scleractinian coral and octocoral abundance at each of the 11 permanent 50-m stations during the pre-construction survey. The permanent transect at each monitoring station shall form one side of the belt transect. For the two stations with a 150-m transect (stations 1 and 38), only the 0–50 m transect shall be surveyed.

The pre-construction survey of the permanent transects at Stations 23 and 24 and the *A. cervicornis* monitoring station shall consist of 1-m interval sediment depth measurements, high-definition digital still images along both sides of the three transects, and qualitative video transects.

Quantitative still image analysis shall be performed at the 11 50-m permanent stations and first 50-m of the two 150-m transects within the turbidity mixing zone using a point count method described in the Plan.

Deliverable. Pre-construction data shall be entered into a Microsoft Access database for data management and QA-QC review, and individual datasets shall be exported to Microsoft Excel workbooks. All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable. At least 30 days prior to the commencement of sand trap excavation and within 60 days of completion of the pre-construction monitoring, CONSULTANT shall submit all raw pre-construction (baseline) data, including the still photo transect images and digital video transects, to COUNTY and FDEP in electronic format. Data shall be submitted on a single portable hard drive or via a FTP site.

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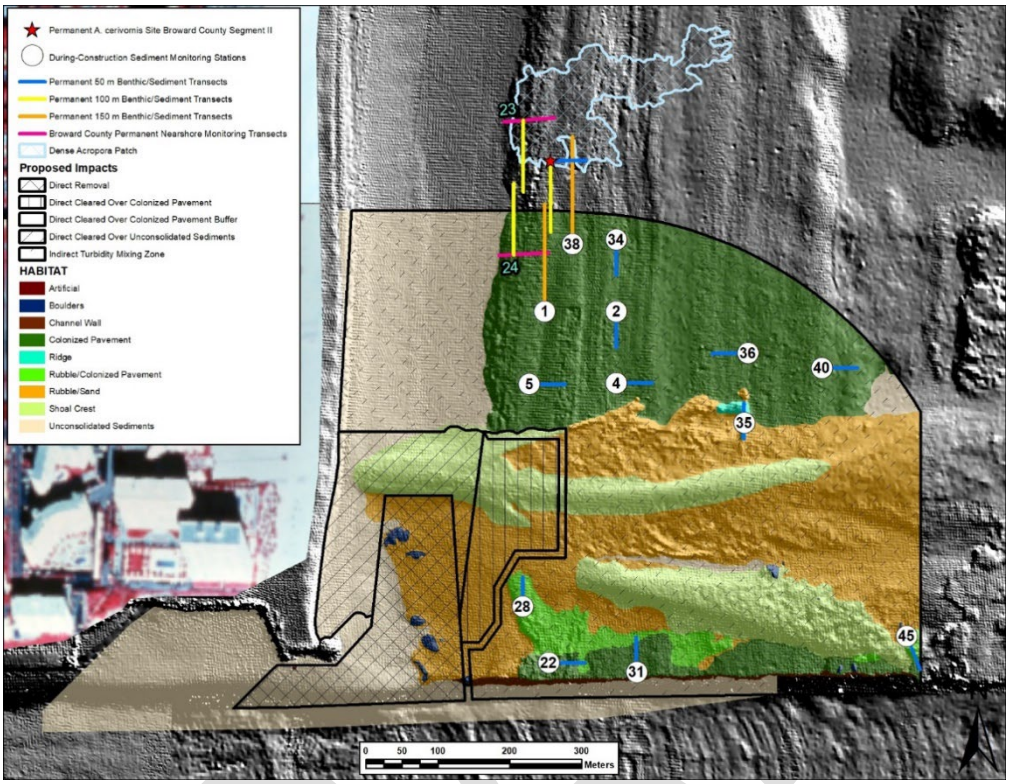

Figure 2. Permanent monitoring stations within and adjacent to the turbidity mixing zone for the Port Everglades Sand Bypass Project. Station numbers in white circles are within the turbidity mixing zone. The pink, 70 m long, west-east oriented transects at Stations 23 and 24 are also monitored in conjunction with Broward County's nearshore hardbottom monitoring program. The red star indicates the location of an *Acropora cervicornis* monitoring station that was monitored in conjunction with the Broward County Segment II nourishment project.

37. PRE-CONSTRUCTION SURVEY OF LISTED CORALS ON NEARSHORE HARDBOTTOM WITHIN THE TURBIDITY MIXING ZONE

CONSULTANT shall tag and conduct the pre-construction monitoring of 10% of the *A. cervicornis* colonies at Sites 2, 33, and 34 (approximately 20 colonies) within the turbidity mixing zone. All three sites are 100 m by 100 m. The survey shall be conducted in accordance with the requirements in Appendix B of the NMFS BO. The following information shall be recorded for all tagged colonies during the pre-construction survey: species; dimensions (diameter or longer dimension in units); percentage live tissue and recent percent mortality in 10% increments; still photography; sediment cover; and GPS coordinates (or similar means of accurately locating) each tagged colony.

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Deliverable. Deliverables are a site map with locations of the tagged colonies and pre-construction survey data entered into Microsoft Excel for data management and QA-QC review. All field datasheets shall be reviewed and scanned to digital format and submitted to COUNTY, FDEP, USACE, and NMFS within 60 days of survey completion.

38. PRE-CONSTRUCTION SURVEY OF SEDIMENTATION AT LISTED CORAL SITES WITHIN THE TURBIDITY MIXING ZONE

CONSULTANT shall conduct pre-construction sediment monitoring at Sites 1, 2, 4, 33, and 34 within the turbidity mixing zone. Sediment surveys shall be conducted no more than sixty (60) days prior to construction of the sand trap in accordance with the conditions of Appendix C of the NMFS BO. A grid pattern comprised of 100 x 100 m survey sites shall be superimposed over coral hardbottom areas within the five sites. Four permanent transects shall be established at each site, and each site shall be divided into four quadrants. A 50-m permanent transect shall be placed on coral hardbottom within each quadrant and shall cover as much hardbottom as possible (large sand areas shall be avoided). Transects shall be placed so that the survey areas do not overlap and are not directly adjacent to each other. Permanent markers shall be placed at the 0-m and 50-m marks of the transects, and GPS coordinates shall be recorded at these transect ends.

Deliverable. Deliverables are a site map and GIS shape file depicting the locations of the permanent transects and display coral critical habitat essential feature within project areas (benthic habitat layer). Pre-construction sediment monitoring data shall be entered into Microsoft Excel for data management and QA/QC review. The map, shapefile, all field datasheets scanned to PDF, and Excel worksheets shall be submitted to COUNTY, FDEP, USACE, and NMFS within 60 days of survey completion.

39. PRE-CONSTRUCTION SEAGRASS SURVEY WITHIN THE TURBIDITY MIXING ZONE

CONSULTANT shall conduct a pre-construction survey of seagrass beds comprised of *Halophila decipiens* along the north side of Port Everglades Inlet within the turbidity mixing zone. The edge (boundary) of each seagrass bed shall be mapped (delineated) immediately prior to the commencement of sand trap excavation. During the edge mapping survey, divers shall swim around the full extent of each seagrass bed while towing a buoy equipped with a GNSS receiver which wirelessly transmits corrected positions to a radio on the survey vessel. The receiving radio is interfaced with ArcPad or HYPACK navigation software on the survey vessel.

Deliverable. CONSULTANT shall prepare and submit a site map showing seagrass beds during the pre-construction survey and a GIS shape file of seagrass bed locations shall be to COUNTY, FDEP, and USACE at least 30 days prior to the commencement of sand trap

excavation and within 60 days of completion of the pre-construction seagrass monitoring event. The monitoring data shall be presented in the immediate post-construction monitoring report (see **Task 46**).

D. INDIRECT IMPACT AREA - DURING-CONSTRUCTION TURBIDITY MIXING ZONE MONITORING (*FDEP Permit Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 3.1)*

All monitoring, reporting and notification tasks will be performed in accordance with the FDEP Permit, FDEP Minimization, Mitigation and Monitoring Plan, and NMFS BO.

40. DURING-CONSTRUCTION SEDIMENTATION SURVEYS OF NEARSHORE HARDBOTTOM WITHIN/ADJACENT TO THE TURBIDITY MIXING ZONE

CONSULTANT shall conduct weekly surveys at the 13 permanent stations during dredging operations. All monitoring shall be conducted in accordance with the FDEP Plan. It is expected that weekly surveys will require two field days/week to complete due to the number of stations required to be surveyed.

The full length of the eleven (11) permanent 50-m transects shall be surveyed during each weekly during-construction survey. However, unless during-construction monitoring indicates sedimentation impacts (see **Task 42)**, only the first 50 m of stations 1 and 38 (the two 150-m transects) shall be surveyed during each weekly during-construction survey. The weekly during-construction surveys shall consist of interval sediment depth measurements at 1-m intervals along each transect inclusive of sand patches. Three (3) sediment depth measurements shall be taken at each 1-m interval - one measurement on the center of the line, one 0.5 m to the left of the line, and another 0.5 m to the right of the line. For each measurement, a stainless-steel ruler graduated in millimeters (measuring at least 30 cm in length) shall be pressed through the sediment until the ruler reaches the surface of hard substratum or is totally immersed in sand. Depth measurements will be recorded to the nearest half centimeter (*e.g.*, 0 cm, 0.5 cm, 1 cm, 1.5 cm, etc.). Measurements greater than 30 cm shall be recorded as greater than 30 cm.

This task assumes that dredging extends up to thirty five (35) weeks with a maximum of thirty-five (35) weekly during-construction sedimentation surveys.

Deliverable. Deliverables are the submittal of weekly raw sedimentation monitoring data to COUNTY and FDEP in electronic format within 7 days of completion of each weekly survey. Data shall be submitted in Microsoft Excel format via email or an FTP site. The final during-construction sediment monitoring dataset shall be provided within 7 days of

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completion of sand trap excavation end with a digital copy of the scanned field datasheets (PDF file) on a portable hard drive or via an FTP site.

41. TWENTY (20) WEEK CONTINGENCY DURING-CONSTRUCTION MONITORING IF SAND TRAP EXCAVATION EXTENDS UP TO 55 WEEKS (AUTHORIZATION WITHHELD)

This task provides up to an additional seventeen (17) weeks of during-construction sedimentation monitoring surveys if dredging extends beyond the initial thirty-five (35) weeks. Surveys under this task shall be billed at a weekly rate up to the maximum of twenty (20) weeks.

42. CONTINGENCY DURING-CONSTRUCTION MONITORING BASED ON SEDIMENTATION TRIGGERS (AUTHORIZATION WITHHELD)

If during-construction weekly sediment depth measurements document sedimentation impacts, CONSULTANT shall perform additional monitoring where the impact was documented (location/type of monitoring station where impact was documented). The FDEP Plan defines sedimentation impact as an increase in mean sediment depth of 1 cm or more above mean baseline sediment depth. CONSULTANT shall notify COUNTY, FDEP, and USACE as soon as possible as to which trigger was tripped pursuant to the requirements of the FDEP Plan.

42.1 During-Construction Sedimentation Triggered Monitoring at 50-m Transects

If during-construction weekly sediment depth measurements at any of the 50-m transects at the permanent stations indicate sedimentation impacts, CONSULTANT shall add qualitative video transects to the weekly during-construction monitoring of the affected transect(s). The additional video transect survey shall be implemented during the next weekly during-construction survey after sedimentation impacts are documented. Sediment triggered protocol shall remain in effect until: 1) the immediate post-construction survey is conducted; or 2) weekly sediment depth data at whichever station(s) have been affected have returned to or are lower than the mean sediment depth recorded during the baseline survey.

This task assumes that qualitative video surveys at five (5) or more of the 13 50-m transects during dredging of the sand trap. The cost is based upon an increase in cost per weekly event to conduct the additional video transects for a maximum of 20 (20) weekly during-construction surveys. If four or fewer stations trigger qualitative video surveys, there is no additional cost to the field surveys since it is

assumed that the additional video surveys can be completed within the same two-day weekly survey period.

42.2 During-Construction Sedimentation Triggered Monitoring at 150-m Transects

If during-construction weekly sediment depth measurements at stations 1 and/or 38 indicate sedimentation impacts along the 0 to 50-m segment of the transect, CONSULTANT shall add the entire 150 m of each transect to the weekly sedimentation survey protocol. Interval sediment depth measurements and qualitative video surveys shall be collected along the full 150-m of the transect(s) during the next weekly during-construction survey after sedimentation impacts are documented. Sediment triggered protocol changes shall remain in effect until either the immediate post-construction survey is conducted or weekly sediment depth data at whichever station(s) are affected document a return of mean sediment depth along the full 150-m length of the transect to that or below the mean depth recorded along the first 50 m of the transect during the baseline survey.

This task is based upon an additional weekly cost to conduct the additional monitoring at the two 150-m transects for a maximum of 20 weekly during-construction surveys.

42.3 During-Construction Sedimentation Triggered Monitoring at Stations Adjacent to the Turbidity Mixing Zone (Stations 23, 24 and *A. cervicornis* station)

CONSULTANT shall add the permanent transects at Stations 23, 24 and the *A. cervicornis* station to the weekly during-construction monitoring surveys if sedimentation impacts are recorded during weekly construction monitoring surveys of the distal portion of the transects (50 to 150 m) at stations 1 and/or 38. Weekly during-construction monitoring shall include interval sediment depth measurements and qualitative video surveys along the full lengths of all three transects and shall commence during the survey immediately following detection of sedimentation impacts. Weekly during-construction monitoring for all three stations (23, 24 and the *A. cervicornis* monitoring station) shall remain in effect if during-construction mean sediment depth along any transect indicates sedimentation impacts.

Weekly during-construction monitoring of all transects at three stations shall be terminated if no sedimentation impacts are documented along any of the six (6) transects and weekly during-construction sediment depth data collected along the

distal portions (50 to 150 m) of both transects at stations 1 and 38 indicate that mean sediment depth has returned to levels at or below the baseline survey. If weekly monitoring is terminated at the three stations due to abatement of sedimentation impacts, but subsequent weekly monitoring documents new impacts along the 50 to 150 m segments of transects at stations 1 and/or 38, weekly during-construction monitoring at all three stations (23, 24, and the *A. cervicornis* station) shall be reinitiated.

If no sedimentation impacts are detected at station 1 and/or 38 during the weekly construction sedimentation survey, these three stations shall not be monitored during or after construction, and the pre-construction data and still images from these stations shall not be analyzed.

This task is based upon an additional weekly cost to conduct the additional monitoring at the three stations for a maximum of 20 weekly during-construction surveys.

42.4 During-Construction Sedimentation Triggered Monitoring from Additional Turbidity Samples Collected over Hardbottom Habitats in the Turbidity Mixing Zone

The FDEP Plan requires a Turbidity Monitoring GIS database for the project and additional turbidity samples are required on consolidated pavement and ridge habitats in the turbidity mixing zone during sand trap excavation (See **Task 4**). If the densest portion of the plume extends within a 10-m radius of the same location on consolidated hardbottom for three (3) consecutive days and the turbidity level at the location exceeds 10 NTUs at each reading, CONSULTANT shall inspect the benthic community at the location of the elevated turbidity reading on the following day or as soon as conditions allow for safe dive operations. If the location of elevated turbidity is within 50 m of a permanent monitoring site, that site shall be inspected at the time of the next weekly monitoring event at the permanent site. If weekly monitoring has already occurred that week at the permanent site, the next weekly during-construction monitoring event shall be advanced such that it occurs within 24 to 48 hours of the turbidity exceedance.

If the turbidity exceedance is located at a discrete location away from existing permanent monitoring sites, a temporary 20 m long by 1 m wide belt transect shall be surveyed at the location of elevated turbidity levels. A permanent transect shall be installed at this location if sediment deposition resulting in the partial or total

burial of hardbottom biota is observed. Permanent markers shall be installed at the start, end, and middle [10- m mark] of the transect.

Following installation of a permanent transect due to excessive turbidity, the area of impact shall be mapped and quantified. Digital still images shall be taken to document the current condition of benthos. Impacted sites shall be added to the list of permanent monitoring sites that are monitored weekly during the remainder of construction.

This task is based upon an additional per event cost to conduct the additional monitoring at the temporary transect, install a permanent transect, and quantify the sedimentation impact area. A maximum of twelve (12) events/exceedances with permanent transect installation are included in the cost for this task.

42.5 During-Construction Turbidity and Sedimentation Triggered Monitoring in Seagrass Beds

The FDEP Plan requires collection of weekly turbidity samples within seagrass beds located on the north side of Port Everglades Inlet channel within the turbidity mixing zone. If a turbidity reading at the seagrass beds exceeds 6 NTUs above background, CONSULTANT shall visually inspect the seagrass beds within 48 hours of the elevated reading or as soon as conditions allow for safe dive operations.

Seagrass beds shall be assessed by divers swimming an east-west transect through the extent of each bed. Seagrasses shall be inspected for signs of obvious sediment accumulation on above-ground biomass and partial/complete burial of patches due to sediment deposition. Seagrass bed edge mapping shall also be conducted following the mapping methods followed during the pre-construction survey (**Task 39**).

If no adverse effects to seagrasses are discovered after three (3), separate during-construction surveys (visual inspections and mapping efforts) following the occurrence of an exceedance of 6 NTU above background, then during-construction seagrass monitoring will be discontinued. Future during-construction seagrass monitoring shall only be required if weekly turbidity monitoring values at the seagrass beds indicate turbidity levels exceed state water quality standards of 29 NTUs above background.

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This task is based upon six (6) during-construction seagrass bed inspections following exceedances of 6 NTUs above background with no adverse effects to seagrasses discovered during the inspections.

42.6 During-Construction Sedimentation Impacts Discovered in Seagrass Beds

If during-construction impacts are discovered in seagrass beds under **Task 42.5** above, CONSULTANT shall identify and map the extent of sedimentation impact at the location and add the location to the list of permanent sites that are monitored weekly for sedimentation during construction. The site shall be visited weekly during construction to determine the permanence of the impact (i.e., success or failure of impacts to recede). Once triggered, the requirement for weekly during-construction (and immediate post-construction) monitoring of an impact site shall remain in effect until the immediate post-construction survey or weekly during-construction monitoring indicates impacts are no longer present.

This task is based on six (6) documented sedimentation impact events in seagrass beds, which include mapping and quantifying the extent of the impact.

Deliverable. If any of the triggers listed under this task are exceeded, the additional data shall be included in the weekly sedimentation monitoring data submittals described under **Task 40** above, and the data will be presented and evaluated in the immediate post-construction report.

E. INDIRECT IMPACT AREA - IMMEDIATE POST-CONSTRUCTION TURBIDITY MIXING ZONE MONITORING (*FDEP Permit Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 3.1; NMFS Biological Opinion Appendix B and C)*

All monitoring, reporting and notification tasks will be performed in accordance with the FDEP Permit, FDEP Minimization, Mitigation and Monitoring Plan, and NMFS BO.

43. IMMEDIATE POST-CONSTRUCTION MONITORING OF NEARSHORE HARDBOTTOM WITHIN/ADJACENT TO THE TURBIDITY MIXING ZONE

CONSULTANT shall conduct the immediate post-construction biological monitoring survey of the 13 permanent stations within or adjacent to the turbidity mixing zone within one (1) week following sand trap excavation. All monitoring shall be conducted in accordance with the FDEP Plan. The immediate post-construction survey at the permanent transects shall consist of interval sediment depth measurements at 1-m intervals; quantitative photo surveys, and scleractinian coral and octocoral belt transect

surveys. All three metrics shall be evaluated following the requirements of the pre-construction survey described under **Task 36**.

This task assumes that qualitative video transect surveys were triggered by sedimentation impacts at four or fewer stations during weekly construction surveys. Therefore, qualitative video transects shall be conducted at a maximum of four stations according to the protocol of the pre-construction video transect survey (see **Task 36)**. This task also assumes that monitoring of the distal portion of transects at stations 1 and 3 (two 150-m transects) was not triggered during construction so that only the first 50 m of stations 1 and 38 shall be surveyed during immediate post-construction.

Quantitative image analysis of the still photographs at the 13 permanent stations during the immediate post-construction survey shall be conducted using the point count method described for the pre-construction survey under **Task 36**. A unique set of 25 random points shall be applied to each image. Functional group cover shall be assessed at each of the 25 points on every image to quantitative assess benthic functional group cover.

Deliverable. Immediate post-construction data shall be entered into a Microsoft Access database for data management and QA/QC review, and individual datasets shall be exported to Microsoft Excel workbooks for submittal to COUNTY and FDEP. All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable.

CONSULTANT shall submit all raw immediate post-construction data to COUNTY and FDEP in electronic format within 60 days of completion of the immediate post-construction survey. Data shall be submitted on a single portable hard drive or via an FTP site. The monitoring data shall be evaluated in the final immediate post-construction report (see **Task 46**).

44. IMMEDIATE POST-CONSTRUCTION SURVEY OF SEAGRASS HABITATS WITHIN THE TURBIDITY MIXING ZONE

CONSULTANT shall conduct an immediate post-construction survey of the seagrass beds mapped during the pre-construction survey along the north side of Port Everglades Inlet within the turbidity mixing zone. The edge of each seagrass bed shall be mapped within 30 days following completion of dredging activities. During the edge mapping survey, divers shall swim around the full extent of each seagrass bed while towing a buoy equipped with a GNSS receiver which wirelessly transmits corrected positions to a radio on the survey vessel. The receiving radio must be interfaced with ArcPad or HYPACK navigation software on the survey vessel.

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If during-construction impacts were discovered in seagrass beds as described under **Task 42.6**, CONSULTANT shall conduct a final post-construction inspection to determine the permanence of the impact (i.e., success or failure of impacts to recede) and identify and quantify the extent of the permanent sediment impact.

Deliverable. A site map showing seagrass beds during the pre-construction and immediate post-construction surveys and a GIS shape file of seagrass bed locations during the immediate post-construction survey shall be prepared and submitted to COUNTY, FDEP, and USACE with the post-construction data deliverable described in **Task 43** above. The monitoring data shall be evaluated in the final immediate post-construction report (see **Task 46**).

45. CONTINGENCY IMMEDIATE POST-CONSTRUCTION MONITORING AND DATA ANALYSES BASED ON SEDIMENTATION IMPACTS (AUTHORIZATION WITHHELD)

45.1 Sedimentation triggered monitoring at 50-m and 150-m transects

At the stations where sedimentation levels triggered the need for qualitative video transects during weekly construction surveys (minimum of five (5) of the 50-m permanent stations) and these stations have not recovered to baseline conditions by the end of the sand trap dredging, or sedimentation was recorded along the entire 150-m length of the transects at stations 1 and/or 38, CONSULTANT shall conduct additional qualitative video transects at the affected transects and/or conduct a sediment depth interval survey along the entire length of the two 150-m transects. This work shall be performed during the immediate post-construction survey. The immediate post-construction video transect and sediment depth interval surveys shall be conducted according to the pre-construction survey protocol described in **Task 36**.

45.2 Sedimentation triggered monitoring at stations adjacent to the turbidity mixing zone (Stations 23, 24 and *A. cervicornis* station)

If no sedimentation impacts are detected at station 1 and/or 38 during the weekly construction sedimentation surveys (**Task 40**), Stations 23 and 24 and the *A. cervicornis* monitoring station will not be monitored during the immediate-post-construction survey, and the pre-construction data and still images from these stations will not be analyzed.

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If during-construction sedimentation monitoring triggers extension of either station 1 or 38 during weekly surveys, and during-construction mean sediment depth measurements indicate sedimentation impacts along the distal, 100-m segment of the transect (from meter 50 to meter 150), CONSULTANT shall conduct immediate post-construction monitoring at the transects at Stations 23 and 24 and the *A. cervicornis monitoring* station. The immediate post-construction survey shall consist of sediment depth interval measurements, quantitative still images, and qualitative video transects as conducted during the pre-construction survey under **Task 36**.

45.3 Sedimentation triggered monitoring from additional turbidity samples collected over consolidated hardbottom habitats in the turbidity mixing zone

If additional 20-m permanent transects were installed during the weekly during-construction surveys in areas of new sedimentation impact away from the permanent monitoring stations, and sedimentation impacts did not abate/recede during weekly sedimentation surveys, CONSULTANT shall conduct an immediate post-construction assessment at these transects. The area(s) of impact shall be mapped, and the final impact(s) shall be quantified and presented in the final immediate post-construction report (see **Task 46**).

Deliverable. Field data and point count data files/still images collected as part of this task shall be added to the immediate post-construction data submittal described under **Task 3** above and the data shall be presented and evaluated in the final immediate post-construction report (see **Task 46**).

45.4 Sedimentation triggered video transect point count analyses

The qualitative video transect surveys serve as archival data for further resolution if quadrat and sediment data at specific permanent stations suggest project-related sedimentation impacts. If mandated by the FDEP Plan, CONSULTANT shall conduct quantitative image analysis of the qualitative video transects at the stations of concern. Quantitative image analysis of frame-grabbed still images of the video transect shall be conducted using the point count method described for the pre-construction survey under **Task 36**. A unique set of 25 random points shall be applied to each image. Functional group cover shall be assessed at each of the 25 points on every still image to quantitative assess benthic functional group and sediment cover. This task assumes that quantitative image analysis is required for a maximum of three (3) permanent stations during pre/post construction surveys.

Deliverable. Frame-grabbed still images from all video transects subject to quantitative image analysis shall be submitted to COUNTY and FDEP with the associated Point Count files and data summaries/output in Excel spreadsheets within 60 days after survey completion.

46. IMMEDIATE POST-CONSTRUCTION BIOLOGICAL MONITORING REPORT-NEARSHORE HARDBOTTOM

CONSULTANT shall prepare the final immediate post-construction report for submittal to COUNTY, FDEP, USACE and NMFS that clearly describes methods used in field monitoring and data analyses and presents all permit-required data in tables, figures, and maps. The report shall compare the pre-construction and post-construction survey results and describe, compare, and contrast conditions observed during weekly during-construction surveys in the evaluation of unanticipated project impacts. If project-related impacts are suggested by the monitoring data, the report shall evaluate these effects and determine the severity of impacts.

Deliverable. A draft report shall be submitted to COUNTY within 60 days following survey completion. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the immediate post-construction survey.

47. IMMEDIATE POST-CONSTRUCTION SURVEYS OF LISTED CORAL SITES WITHIN THE TURBIDITY MIXING ZONE

47.1 LISTED CORAL MONITORING

CONSULTANT shall conduct immediate post-construction monitoring of the tagged *A. cervicornis* colonies at Sites 2, 33, and 34 (approximately 20 colonies based on May 2021 data) within the turbidity mixing zone. The survey shall be conducted in accordance with the NMFS BO within thirty (30) days of completion of dredging activities. The following information shall be recorded for all tagged colonies during the post-construction survey: species, dimensions (diameter or longer dimension in units), percentage live tissue and recent percent mortality in 10% increments, still photographs, sediment cover, and GPS coordinates (or similar means of accurately locating) each tagged colony.

47.2 SEDIMENTATION MONITORING AT LISTED CORAL SITES

CONSULTANT shall conduct immediate post-construction sediment monitoring at Sites 1, 2, 4, 33, and 34 within the turbidity mixing zone. Sediment data shall be

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collected within sixty (60) days of completion of sand trap dredging activities in accordance with the conditions of the NMFS BO. The immediate post-construction survey shall follow the same protocol as the pre-construction survey at the permanent transects described under **Task 38**. Sediment depth, sediment characterization, and habitat characterization shall be recorded at 1-m intervals along the 50-m permanent transects according to the sediment monitoring requirements of the NMFS BO. Sediment depth measurements shall be recorded to the nearest millimeter using a ruler that is at least 30 cm in length. Measurements greater than 30 cm shall be recorded as "> 30 cm." At each point along the transects where sediment depth is taken, the habitat shall be recorded as: 1) coral hardbottom; 2) sand patch; or 3) sand channel. Characterization of sediments shall also be recorded at each interval sediment depth location. Characterization categories shall include sand (S), sand with fines (SF), fines with sand (FS), and fines (F).

Deliverable. Post-construction coral and sediment data shall be entered into Microsoft Excel for data management and QA/QC review. CONSULTANT shall prepare an immediate post-construction report that compares the post-construction coral and sediment surveys to the results of the pre-construction survey to describe, compare, and contrast the conditions observed and determine if unanticipated project impacts have occurred. CONSULTANT and COUNTY will meet to discuss results of the draft final report prior to submittal. If impacts were documented, the report shall describe all project-related impacts and the severity of impacts, including quantifying the total loss or damage to ESA-listed corals.

All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable and immediate post-construction report to COUNTY, FDEP, and USACE within sixty (60) days of survey completion.

F. MITIGATION ARTIFICIAL REEF SURVEYS (*FDEP Permit Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 4.2)*

The FDEP Plan requires construction of 0.5 net acres of artificial reef to serve as coral nursery habitat as mitigation for direct impacts to rubble-dominated coral communities during sand trap construction. Two limestone boulder artificial reefs are required to provide transplantation receiver sites: a 0.30-acre reef located approximately one mile offshore of R-65 in Fort Lauderdale and a 0.20-acre nearshore artificial reef. The permitted 0.20-acre reef site is being relocated to the north of the sand bypass project area through a minor modification to project permits. Permitting and site surveys for the

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new 0.20-acre nearshore reef have been authorized under a separate task order with COUNTY. All monitoring, reporting and notification tasks will be performed in accordance with the FDEP Permit, FDEP Minimization, Mitigation and Monitoring Plan, and NMFS BO.

48. 0.3-ACRE OFFSHORE ARTIFICIAL REEF MITIGATION SITE SURVEYS

CONSULTANT shall conduct a survey of the permitted offshore artificial reef site to identify the 0.30-acre footprint required for boulder placement within the larger permitted site (Figure 3 below). Divers shall visually inspect the sea floor within the reef placement area and verify that there is no exposed hardbottom within 50 feet of the artificial reef footprint. Any exposed hardbottom within the permitted offshore site shall be identified and its location(s) shall be recorded by divers. The locations of reef edges in closest proximity to the 0.3-acre placement area shall be delineated with DPGS, and the coordinates of the four corners of the 0.3-acre placement area shall be recorded. All mapping and positioning shall be conducted by divers towing a buoy equipped with a SP60 GNSS receiver.

Deliverable. CONSULTANT shall provide ArcGIS shape files of any hardbottom features located within/adjacent to the permitted offshore artificial reef placement area and the final artificial reef footprint within the permitted artificial reef placement site. A map of the final 0.3-acre boulder placement area shall be provided in PDF and GIS shapefile format within thirty (30) days of survey completion.

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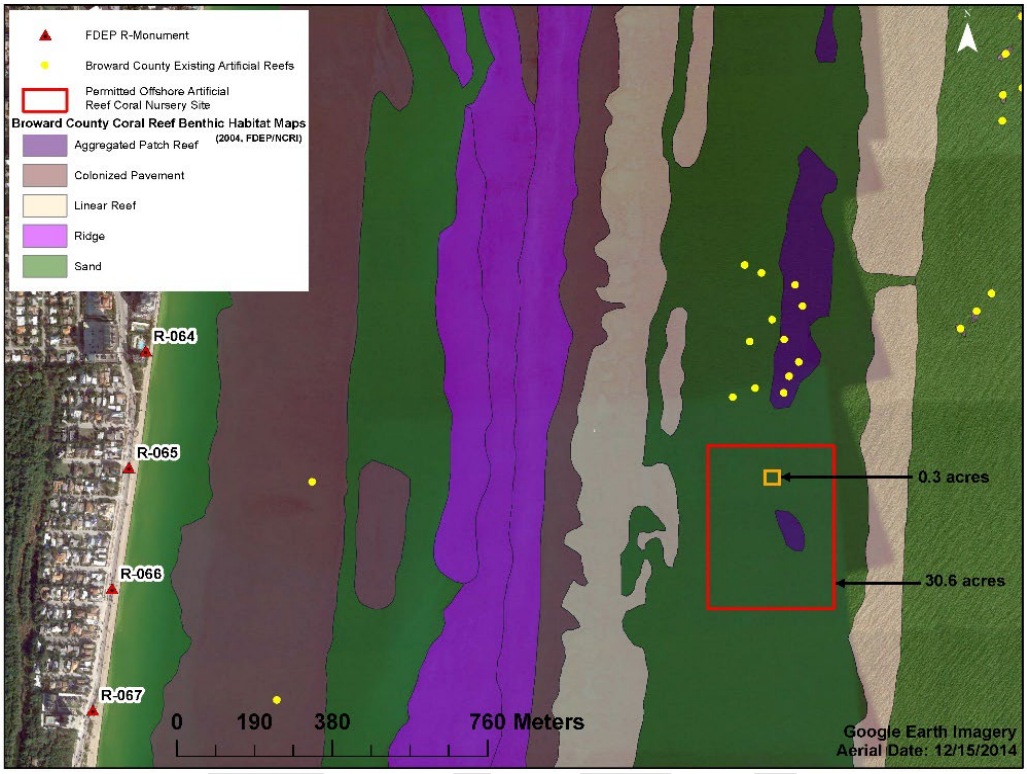

Figure 3. Permitted offshore artificial reef site showing the smaller 0.3-acre coral nursery area.

49. MITIGATION ARTIFICIAL REEF CONSTRUCTION SUPERVISION (Authorization Withheld)

CONSULTANT shall conduct a single immediate pre-construction inspection of each mitigation reef placement area immediately following selection of mooring locations at each site by the Contractor, up to six (6) weekly inspections during construction of both mitigation artificial reefs, and a single immediate post-construction inspection prior to Contractor demobilization (total of 8 inspections) to ensure that both mitigation artificial reefs are constructed in compliance with FDEP and USACE permit conditions and construction plans and specifications. To ensure that the mitigation reefs will meet the net acreage success requirements of the project permits and FDEP Plan, divers shall survey two (2) 10-m long temporary random transects for line-intercept sand/boulder cover within the newly constructed reef during each weekly inspection. Line-intercept data for sand and boulder cover shall be collected along the temporary transects to determine the percent cover of boulders within each reef section. CONSULTANT shall report the data will be reported to COUNTY, summarize diver observations, and provide the line-intercept transect data for percent boulder/sand cover and representative

photographs of the constructed reefs. These reports shall note any potential issues with permit compliance and provide recommendations as needed to ensure that net mitigation acreages shall be met.

Deliverable. CONSULTANT shall submit weekly line-intercept transect reports to COUNTY within 24 hours of completion of each inspection. This task shall be billed based on the number of weekly inspections conducted during construction and the immediate pre- and post-construction inspections.

50. AS-BUILT IMMEDIATE POST-CONSTRUCTION SURVEYS OF THE 0.3-ACRE AND 0.2-ACRE ARTIFICIAL REEF CORAL NURSERIES

CONSULTANT shall delineate the boundaries of the 0.30-acre offshore and 0.20-acre nearshore limestone boulder artificial reefs within six months following completion of reef construction as required by the FDEP Plan. Mapping methods shall be consistent with the requirements of the FDEP Plan. Divers shall swim the full extent of the boulder reef edge at each site while towing a buoy equipped with a SP60 GNSS receiver. The SP60 GNSS receiver transmits corrected positions to an XDL Rover 2 on the survey vessel. These positions are then transmitted to an Algiz 8X handheld tablet running ArcMap via Bluetooth technology.

CONSULTANT shall establish and survey seven 10-m long temporary, random transects on the offshore boulder reef and five 10-m long temporary transects on the nearshore boulder reef during the as-built survey. The locations and headings of the transect endpoints shall be randomly generated in ArcGIS prior to survey commencement. Line-intercept data for boulder cover shall be collected along all temporary transects. These data will be used to calculate the overall percentage of bottom occupied by boulders at each reef site to verify that the required net acreages of 0.3 and 0.2 acres of boulder have been constructed.

Deliverable. CONSULTANT shall provide ArcGIS shape files of the diver transect locations and Excel files with the raw and summary data from the line intercept transects and overall percent cover/area covered by boulders at each site. CONSULTANT shall submit final shape files of the 0.3-acre and 0.2-acre artificial reefs within 30 days of survey completion with a map showing their locations net acreages.

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G. RE-EXPOSURE OF RUBBLE/CONSOLIDATED HARDBOTTOM MITIGATION (*FDEP Permit Condition No. 27; FDEP Minimization, Mitigation and Monitoring Plan Section 4.1)*

51. DURING CONSTRUCTION MITIGATION SURFACE RUBBLE INSPECTIONS

CONSULTANT shall conduct a verification survey of the 7.3-acre rubble removal area when CONTRACTOR believes that rubble removal work is roughly 50% complete. Scientific divers will sample 300 randomly placed, one-meter square quadrats over the 7.3-acre excavation area for mean areal percent cover of unconsolidated rubble and unconsolidated sediment depth over underlying consolidated hardbottom substrate. CONSULTANT shall conduct a final verification survey according to the methods of the 50% completion survey when the CONTRACTOR believes that the rubble removal work is 100% complete. This task also includes one (1) contingency verification survey to be performed if the work is not deemed complete following the completion of the second verification dive.

Deliverable. CONSULTANT shall prepare and submit an Excel spreadsheet with the quadrat data and field datasheets as a PDF within three (3) day of survey completion.

52. MITIGATION SUCCESS MONITORING- CREATION OF RUBBLE/COLONIZED PAVEMENT FROM CLEARING/RUBBLE REMOVAL- YEAR 1 POST-CONSTRUCTION BENTHIC HABITAT MAP

Removal of approximately 16.2 acres of unconsolidated rubble during project dredging is expected to re-expose approximately 7.3 acres of consolidated substrate that COUNTY believes is suitable for subsequent coral colonization. The re-exposed hardbottom habitat is expected to function as rubble/consolidated pavement habitat following trap excavation since it will not be possible to remove all unconsolidated rubble. The FDEP Plan requires annual post-construction monitoring at Years 1, 2, 3, and 5 (if necessary) to document the success of this mitigation measure and verify overall acreage and ecological functions of the re-exposed substrate.

CONSULTANT shall update the extent of rubble/consolidated pavement in the 7.3-acre mitigation area (cleared rubble area) in the 2015 pre-construction benthic habitat map (NSU, 2015) to the Year 1 post-construction condition using ArcGIS desk-top analysis and diver mapping/ reconnaissance surveys of habitat borders.

CONSULTANT shall obtain high-resolution, geo-rectified aerial photography, and/or satellite imagery that captures the Year 1 post-construction condition from archival

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sources. If there are no adequate archival remote sensing datasets available at the time of the Year 1 post-construction survey, CONSULTANT shall obtain aerial photography as described under **Task 56** below. CONSULTANT shall compare the 2015 pre-construction benthic habitat polygons in ArcGIS to the Year 1 post-construction imagery, and draw new polygon edges in GIS as necessary to update the map. Habitats that appear distinct from the 2015 pre-construction benthic habitat map shall be modified in ArcGIS and then refined based on qualitative field reconnaissance surveys and field mapping of habitat borders. Analysis shall focus on the borders between habitat types in the study area (shoal crest, rubble/sand, colonized pavement, rubble/consolidated pavement, and unconsolidated sediments.

CONSULTANT shall conduct field reconnaissance surveys to qualitatively validate the distinct habitats drawn during in ArcGIS and aid in determining habitat boundaries for map refinement. Divers shall note obvious habitat transitions while swimming predetermined courses spanning multiple habitats. Habitat borders shall be mapped by divers towing a buoy equipped with a GNSS receiver which wirelessly transmits corrected positions to a radio on the survey vessel. The receiving radio must be interfaced with ArcPad software on the survey vessel.

Deliverable. CONSULTANT shall provide COUNTY with an updated habitat map in ArcGIS and calculate acreage of re-exposed rubble/colonized pavement habitat within the 7.3-acre mitigation area. CONSULTANT shall prepare a summary report to accompany the Year 1 post-construction habitat map. CONSULTANT and COUNTY will hold a meeting to discuss results of the Draft final report prior to submittal. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days completion of the Year 1 post-construction survey.

53. MITIGATION SUCCESS MONITORING- CREATION OF RUBBLE/COLONIZED PAVEMENT FROM CLEARING/RUBBLE REMOVAL- YEAR 2 POST-CONSTRUCTION BENTHIC HABITAT MAP

CONSULTANT shall update the extent of rubble/consolidated pavement in the 7.3-acre mitigation area (cleared rubble area) in the Year 1 post-construction habitat map to the Year 2 post-construction condition using ArcGIS desk-top analysis and diver mapping/reconnaissance surveys of habitat borders.

CONSULTANT shall obtain high-resolution, geo-rectified aerial photography, and/or satellite imagery that captures the Year 2 post-construction condition from archival sources. If there are no adequate archival remote sensing datasets available at the time of the Year 2 post-construction survey, aerial photography shall be obtained as described

under **Task 56** below. The 2015 pre-construction and Year 1 post-construction benthic habitat polygons shall be compared in ArcGIS to the Year 2 post-construction imagery and new polygon edges shall be drawn in GIS as necessary to update the map. Habitats that appear distinct from the Year 1 post-construction benthic habitat map shall first be modified in ArcGIS and then refined based on qualitative field reconnaissance surveys and field mapping of habitat borders. Analysis shall focus on the borders between habitat types in the study area (shoal crest, rubble/sand, colonized pavement, rubble/ consolidated pavement, and unconsolidated sediments.

Field reconnaissance surveys shall be performed to qualitatively validate the distinct habitats drawn during in ArcGIS and to aid in determining habitat boundaries for map refinement. Divers shall note obvious habitat transitions while swimming predetermined courses spanning multiple habitats. Habitat borders shall be mapped by divers towing a buoy equipped with a GNSS receiver which wirelessly transmits corrected positions to a radio on the survey vessel. The receiving radio must be interfaced with ArcPad software on the survey vessel.

Deliverable. CONSULTANT shall provide an updated habitat map in ArcGIS and calculate acreage of re-exposed rubble/colonized pavement habitat within the project area. A summary report shall be prepared to accompany the Year 2 post-construction habitat map. CONSULTANT and COUNTY will meet to discuss the draft final report prior to submittal. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the Year 2 post-construction survey.

54. MITIGATION SUCCESS MONITORING- CREATION OF RUBBLE/COLONIZED PAVEMENT FROM CLEARING/RUBBLE REMOVAL- YEAR 3 POST-CONSTRUCTION BENTHIC HABITAT MAP

CONSULTANT shall update the entire 2015 pre-construction benthic habitat map (NSU, 2015) to the Year 3 post-construction condition using ArcGIS desk-top analysis, diver mapping/reconnaissance surveys of habitat borders, and permanent transect data.

CONSULTANT shall obtain high-resolution, geo-rectified aerial photography, and/or satellite imagery that captures the Year 3 post-construction condition from archival sources. If there are no adequate archival remote sensing datasets available at the time of the Year 3 post-construction survey, aerial photography shall be obtained as described under **Task 56** below. The 2015 Pre-construction, Year 1, and Year 2 post-construction benthic habitat polygons shall be compared in ArcGIS to the Year 3 post-construction imagery and new polygon edges shall be drawn in GIS as necessary to update the map. Habitats that appear distinct from previous benthic habitat maps shall be modified in

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ArcGIS and then refined based on qualitative field reconnaissance surveys and field mapping of habitat borders. Analysis shall focus on the borders between habitat types in the study area (shoal crest, rubble/sand, colonized pavement, rubble/ consolidated pavement, and unconsolidated sediments.

CONSULTANT shall perform field reconnaissance surveys to qualitatively validate the distinct habitats drawn during in ArcGIS and aid in determining habitat boundaries for map refinement. Divers shall note obvious habitat transitions while swimming predetermined courses spanning multiple habitats. Habitat borders shall be mapped by divers towing a buoy equipped with a GNSS receiver which wirelessly transmits corrected positions to a radio on the survey vessel. The receiving radio must be interfaced with ArcPad software on the survey vessel.

Sixteen (16) permanent monitoring sites shall be installed on re-exposed rubble/colonized pavement habitat and reference rubble/colonized pavement habitat during the Year 3 post-construction survey. Comparison of survey results between these two areas (re- exposed habitat vs. reference rubble/consolidated pavement habitat) shall be used to determine whether the re-exposed rubble/consolidated pavement habitat is providing functions similar to the existing reference habitat. Eight (8) of the sites shall be established within the re-exposed rubble/colonized pavement habitat. Another eight (8) sites shall be established within rubble/colonized pavement habitat as serve as the reference community habitat. Due to the limited acreage of reference community habitat, the eight (8) rubble/colonized pavement habitat sites may be located in the turbidity mixing zone permitted for sand trap excavation and/or sand trap maintenance dredging events. The site locations shall be determined in consultation with FDEP staff prior to the Year 3 post-construction monitoring event. Locations shall be based on post-project habitat conditions and FDEP staff assessment.

CONSULTANT shall establish three (3) parallel 20-m long transects spaced 10 m apart at each monitoring site during the Year 3 post-construction survey. Permanent markers (pins, iron rods, etc.) shall be installed at the start, middle (10-m mark), and end of each transect line at each site. GPS coordinates for each permanent transect shall be recorded.

Transect monitoring shall consist of quantitative photo surveys with functional group cover analysis and quadrat/belt transect surveys. High-definition digital still photographs of a quality sufficient to allow for post-collection analysis shall be taken along each of the three (3) 20-m transects at each site. A diver shall photograph the full length of one (1) side of each transect; the side on which photographs are taken shall be recorded so that

the survey may be repeated during the Year 5 post-construction if necessary. All photographs shall be taken from a constant distance of 40 cm above the bottom.

A quadrat/belt transect survey shall be conducted to document scleractinian coral species richness, colony size, density, and condition (presence of disease, bleaching, and Cliona spp.), and octocoral density and colony size at each site. For each monitoring event, 0.75 m² quadrats (0. 75 m wide by 1 m long) shall be sampled along both sides of the middle 20-m transect at each site (N=20 quadrats per side). Sampling shall result in a total survey area of 30 m² (0.75 m + 0.75 m wide X 20 m long) per site. Every scleractinian coral colony within each quadrat shall be identified to species and size (maximum colony dimension) shall be measured to the nearest centimeter. Each octocoral within each quadrat shall be identified to genus, and its height shall be measured and assigned to one of the following four size classes: <5 cm, 5-25 cm, 25-50 cm, and >50 cm.

Deliverable. CONSULTANT shall update the entire 2015 Pre-construction benthic habitat map (NSU, 2015) to the Year 3 post-construction condition using ArcGIS desk-top analysis, diver mapping/reconnaissance surveys, and permanent transect data. An updated habitat map in ArcGIS shall be prepared and the acreage of re-exposed rubble/colonized pavement habitat within the project area shall be calculated and reported.

The FDEP Plan shall be updated to include the coordinates of the sixteen (16) permanent monitoring sites. A map of the sites shall be prepared and submitted to COUNTY, FDEP and USACE. The raw data and still photo libraries from the Year 3 post-construction survey shall be submitted in digital format to FDEP and County within 45 days of completion of the Year 3 post-construction survey. CONSULTANT shall prepare a summary report to accompany the Year 3 post-construction habitat map. The Year 3 report shall provide a mitigation success analysis to determine if the acreage of rubble/consolidated pavement in the cleared impact area is at least 6.6 acres (90% of the predicted 7.3 acres of exposure) and major functional groups in the exposed rubble/colonized pavement area are at least 75% similar to the rubble/colonized pavement reference sites. If mitigation success is achieved, no monitoring shall be required at Year 5 post-construction.

CONSULTANT and COUNTY will meet to discuss the draft final report prior to submittal. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the Year 3 post-construction survey.

55. MITIGATION SUCCESS MONITORING- CREATION OF RUBBLE/COLONIZED PAVEMENT FROM CLEARING/RUBBLE REMOVAL- YEAR 5 POST-CONSTRUCTION BENTHIC HABITAT MAP (AUTHORIZATION WITHHELD)

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If mitigation success is not achieved at Year 3 post-construction (**Task 54**), CONSULTANT shall update the entire 2015 pre-construction benthic habitat map (NSU, 2015) to the Year 5 post-construction condition using ArcGIS desk-top analysis, diver mapping/reconnaissance surveys of habitat borders, and permanent transect data.

CONSULTANT shall obtain high-resolution, geo-rectified aerial photography, and/or satellite imagery which captures the Year 3 post-construction condition shall be obtained from archival sources. If there are no adequate archival remote sensing datasets available at the time of the Year 5 post-construction survey, aerial photography shall be obtained as described under **Task 56** below. The 2015 Pre-construction and Year 3 post-construction benthic habitat polygons shall be compared in ArcGIS to the Year 5 post-construction imagery, and new polygon edges shall be drawn in GIS as necessary to update the map. Habitats which appear distinct from the previously mapped benthic habitats shall be modified in ArcGIS and then refined based on qualitative field reconnaissance surveys and field mapping of habitat borders. Analysis shall focus on the borders between habitat types in the study area (shoal crest, rubble/sand, colonized pavement, rubble/ consolidated pavement, and unconsolidated sediments.

Field reconnaissance surveys shall be performed to qualitatively validate the distinct habitats drawn during in ArcGIS and to aid in determining habitat boundaries for map refinement. Divers shall note obvious habitat transitions while swimming predetermined courses spanning multiple habitats. Habitat borders shall be mapped by divers towing a buoy equipped with a GNSS receiver which wirelessly transmits corrected positions to a radio on the survey vessel. The receiving radio is interfaced with ArcPad software on the survey vessel.

The sixteen (16) monitoring sites installed during the Year 3 post-construction survey shall be surveyed during the Year 5 post-construction survey. Comparison of survey results between these reference and re-exposed habitats shall be used to determine whether the re-exposed rubble/consolidated pavement habitat is providing functions similar to the existing reference habitat.

Transect monitoring shall consist of quantitative photo surveys with functional group cover analysis and quadrat/belt transect surveys. High-definition digital still photographs of a quality sufficient to allow for post-collection analysis shall be taken along each of the three (3) 20-m transects at each site. A diver shall photograph the full length of one (1) side of each transect; the side on which photographs are taken shall be recorded so that

the survey may be repeated during the Year 5 post-construction if necessary. All photographs shall be taken from a constant distance of 40 cm above the bottom.

A quadrat/belt transect survey shall be conducted to document scleractinian coral species richness, colony size, density, and condition (presence of disease, bleaching, and Cliona spp.), and octocoral density and colony size at each site. For each monitoring event, 0.75 m² quadrats (0. 75 m wide by 1 m long) shall be sampled along both sides of the middle 20-m transect at each site (N=20 quadrats per side). Sampling shall result in a total survey area of 30 m² (0.75 m + 0.75 m wide X 20 m long) per site. Every scleractinian coral colony within each quadrat shall be identified to species, and its size (maximum colony dimension) shall be measured to the nearest centimeter. Each octocoral within each quadrat shall be identified to genus, and its height shall be measured and assigned to one of the following four size classes: <5 cm, 5-25 cm, 25-50 cm, and >50 cm.

Deliverable. CONSULTANT shall update the 2015 Pre-construction benthic habitat map (NSU, 2015) to the Year 5 post-construction condition using ArcGIS desk-top analysis, diver mapping/reconnaissance surveys, and permanent transect data and prepare an updated habitat map in ArcGIS. CONSULTANT shall calculate and report the acreage of re-exposed rubble/colonized pavement habitat within the project area.

The raw data and still photo libraries from the Year 5 post-construction survey shall be submitted in digital format to FDEP and County within 45 days of completion of the Year 5 post-construction survey. A summary report shall be prepared to accompany the Year 5 post-construction habitat map. The Year 5 report shall provide a mitigation success analysis to determine if the acreage of rubble/consolidated pavement in the cleared impact area is at least 6.6 acres (90% of the predicted 7.3 acres of exposure) and major functional groups in the exposed rubble/colonized pavement area are at least 75% similar to the rubble/colonized pavement reference sites.

CONSULTANT and COUNTY will meet to discuss the draft final report prior to submittal. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completing the Year 5 post-construction survey.

56. CONTINGENCY AERIAL PHOTOGRAPHY FOR MITIGATION SUCCESS MONITORING (AUTHORIZATION WITHHELD) – YEARS 1, 2, 3, and 5

CONSULTANT shall acquire updated, controlled digital color aerial photography at negative scales of 1”=500’. The photography shall be used to update annual project area habitat maps at Years 1 through 3 (and Year 5 if mitigation success is not achieved at Year

3) if there is no existing archival imagery for these years. The coverage area is the shorelines north of the inlet, the sand trap location, and the rubble pile. CONSULTANT shall attempt to meet clear water, low tide, and low wave conditions during the flights. Since the proposed flight lines are in the Ft. Lauderdale Airport air space, some compromises in project specifications may be necessary. The work products shall be rectified and digital. The photo base shall be utilized in development of annual benthic habitat maps.

Deliverable. CONSULTANT shall provide georeferenced, tiff format, digital aerial photography products with the projected coordinate system and datum used to geo-reference each image and standard compliant metadata.

H. CORAL NURSERY MITIGATION – RELOCATING CORALS OF OPPORTUNITY AND MANAGING CORAL NURSERY REEFS (*FDEP Permit Condition No .32; FDEP Minimization, Mitigation and Monitoring Plan Section 4.3)*

Annual collection and relocation of corals of opportunity to the mitigation boulder reefs is required as a component of the coral nursery mitigation program. The FDEP Plan requires relocation of at least 3,000 corals of opportunity within ten years of construction of the coral nursery artificial reefs. A-7 Scope covers the first four years of coral collection and transplantation to the coral nursery artificial reefs and is based on relocating 1,000 colonies (average of 250 colonies/year) over this four-year period. Survival, health, and reproductive status of a subset of coral colonies in each cohort transplanted to each coral nursery boulder reef shall be tracked over time (Time zero, Year 1, and Year 3 post-transplantation).

57. BASELINE CORAL HARVEST/RELOCATION, MONITORING AND NURSERY MAINTANENCE

57.1 Baseline Coral Harvest/Relocation- Cohort 1

CONSULTANT shall plan for and harvest approximately 250 corals of opportunity and relocate these colonies to the coral nursery artificial reefs (Cohort 1). Coral transplantation protocol shall follow the specifications in the FDEP Plan. Corals of opportunity shall be transplanted to boulders at their respective mitigation reef nursery sites. Each boulder to which colonies are transplanted will be tagged so that cohorts of transplants (colonies collected during the same year) can be identified. All corals on an individual boulder shall be of the same cohort.

57.2 Monitoring the Survival and Health of Relocated Corals of Opportunity- Baseline

Survey Cohort 1 (Time Zero)

CONSULTANT shall conduct the baseline (Time Zero) survey of Cohort 1 on the coral nursery boulder reefs. For monitoring the survival and health of colonies, the number of tagged boulders for each cohort will represent a minimum of 25% of colonies within the cohort. During the Time Zero survey of Cohort 1, divers shall identify colonies to species, measure live tissue (maximum diameter), and record colony condition according to the Plan requirements.

57.3 Monitoring the Reproductive Status of Relocated Corals of Opportunity- Baseline Survey Cohort 1 (Time Zero)

CONSULTANT shall document the reproductive status of 10% of Cohort 1 colonies (different from the subset monitored for health and survival under **Task 57.2**) through histological analysis at the time of collection (baseline) according to the protocol outlined in the FDEP Plan.

Deliverables. Within 60 days of completing collection of the Cohort 1 colonies and the Time Zero monitoring event, CONSULTANT will submit all raw data on coral condition, size, species, survival, and health directly and concurrently (simultaneously) to FDEP, USACE, and COUNTY in electronic format. Data shall be submitted either on a portable hard drive or via an FTP site.

58. YEAR 1 CORAL HARVEST/RELOCATION, MONITORING AND NURSERY MAINTANENCE

58.1 Coral Harvest/Relocation- Cohort 2

CONSULTANT, through a qualified employee or subconsultant, shall plan for, harvest, and relocate approximately 250 corals of opportunity (Cohort 2) to the coral nursery artificial reefs. Coral transplantation protocol shall follow the specifications in the FDEP Plan. Corals of opportunity shall be transplanted to boulders at their respective mitigation reef nursery sites. Each boulder to which colonies are transplanted will be tagged so that cohorts of transplants (colonies collected during the same year) can be identified. All corals on an individual boulder shall be of the same cohort.

58.2 Monitoring the Survival and Health of Relocated Corals of Opportunity- Baseline Survey (Time Zero) for Cohort 2

CONSULTANT shall conduct the baseline (Time Zero) survey of Cohort 2 of transplanted corals. For monitoring the survival and health of colonies, the number of tagged boulders for each cohort will represent a minimum of 25% of colonies within the cohort. Divers shall identify colonies to species, measure live tissue (maximum diameter), and record colony condition according to the Plan requirements.

58.3 Monitoring the Reproductive Status of Relocated Corals of Opportunity- Baseline Survey Cohort 2 (Time Zero)

CONSULTANT shall document the reproductive status of 10% of the Cohort 2 colonies (different from the subset monitored for health and survival under **Task 58.2**) through histological analysis at the time of collection (baseline) according to the protocol in the FDEP Plan.

58.4 Monitoring the Survival and Health of Relocated Corals of Opportunity- Year 1 Post-Transplantation Survey for Cohort 1

CONSULTANT shall conduct the Year 1 post-transplantation survey of Cohort 1. Monitoring methods shall follow the protocol in the FDEP Plan.

58.5 Tracking the Recruitment of Scleractinian Corals to the Nursery Boulder Reefs- Year 1 Post-Transplantation Survey for Cohort 1

Recruitment (sexual) of scleractinian corals to the mitigation reef shall be assessed during the Year 1 post-transplantation survey of Cohort 1. The area within 25 cm of all relocated colonies on tagged boulders shall be searched and all coral recruits (non-transplanted colonies greater than 2 cm in maximum dimension) shall be recorded and identified to the lowest taxonomic level possible (to species, if possible).

58.6 Cleaning the Surfaces of Nursery Boulder Reefs

CONSULTANT shall conduct annual cleaning of the nursery boulder reefs to reduce the overgrowth of turf and macroalgae on reef boulders. The cleaning event shall be conducted two weeks prior to the August/September spawning event during the Year 1 post-transplantation survey of Cohort 1. Divers shall use wire brushes to remove turf and macroalgae from 25 cm diameter areas around each transplanted coral colony at each boulder reef.

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58.7 Active Management of Coral Nursery Boulder Reefs

CONSULTANT shall conduct an annual collection and relocation of long-spined sea urchins (*Diadema antillarum*) during the Year 1 post-transplantation survey of Cohort 1. Urchins shall be collected from the rubble habitats at the spoil shoal during collection of corals of opportunity. Relocation shall occur in summer months prior to annual coral spawning events.

Deliverables. Within 60 days of completing collection of the Cohort 2 colonies, the Time Zero monitoring event of Cohort 2, and the Year 1 post-transplantation survey of Cohort 1, CONSULTANT will submit all raw data on coral condition, size, species, survival and health to FDEP, USACE, and COUNTY in electronic format. Data shall be submitted on a portable hard drive or via an FTP site. CONSULTANT shall prepare a final report. CONSULTANT and COUNTY will meet to discuss results of a draft of the final report prior to submittal. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 60 days of completion of the Year 1 post-transplantation survey of Cohort 1 and Time Zero survey of Cohort 2.

59. YEAR 2 CORAL HARVEST/RELOCATION, MONITORING AND NURSERY MAINTENANCE

59.1 Coral Harvest/Relocation- Cohort 3

CONSULTANT shall plan for, harvest, and relocate approximately 250 corals of opportunity (Cohort 3) to the coral nursery artificial reefs. Coral transplantation protocol shall follow the specifications in the FDEP Plan. Corals of opportunity shall be transplanted to boulders at their respective mitigation reef nursery sites. Each boulder to which colonies are transplanted will be tagged so that cohorts of transplants (colonies collected during the same year) can be identified. All corals on an individual boulder shall be of the same cohort.

59.2 Monitoring the Survival and Health of Relocated Corals of Opportunity- Baseline Survey (Time Zero) for Cohort 3

CONSULTANT shall conduct the baseline (Time Zero) survey of Cohort 3 on the coral nursery boulder reefs. the number of tagged boulders for each cohort will represent a minimum of 25% of colonies within the cohort. During the survey, divers shall identify colonies to species, measure live tissue (maximum diameter), and record colony condition according to the Plan requirements.

59.3 Monitoring the Reproductive Status of Relocated Corals of Opportunity-

Baseline Survey Cohort 3 (Time Zero)

CONSULTANT shall document the reproductive status of 10% of the Cohort 3 colonies (different from the subset monitored for health and survival under **Task 59.2**) through histological analysis at the time of collection (baseline) according to the protocol in the FDEP Plan.

59.4 Monitoring the Survival and Health of Relocated Corals of Opportunity- Year 1 Post-Transplantation Survey for Cohort 2

CONSULTANT shall conduct the Year 1 post-transplantation survey of Cohort 2 on the coral nursery boulder reefs. Monitoring methods shall follow the protocol in the FDEP Plan.

59.5 Tracking the Recruitment of Scleractinian Corals to the Nursery Boulder Reefs- Year 1 Post-Transplantation Survey for Cohort 2

Recruitment (sexual) of scleractinian corals to the mitigation reef shall be assessed during the Year 1 post-transplantation survey of Cohort 2. The area within 25 cm of all relocated colonies on tagged boulders shall be searched and all coral recruits (non-transplanted colonies greater than 2 cm in maximum dimension) shall be recorded and identified to the lowest taxonomic level possible (to species, if possible).

59.6 Cleaning the Surfaces of Nursery Boulder Reefs

CONSULTANT shall conduct annual cleaning of the nursery boulder reefs to reduce the overgrowth of turf and macroalgae on reef boulders. The cleaning event shall be conducted two weeks prior to the August/September spawning event during the Time Zero survey of Cohort 3/Year 1 post-transplantation survey of Cohort 2. Divers shall use wire brushes to remove turf and macroalgae from 25 cm diameter areas around each transplanted coral colony at each boulder reef.

59.7 Active Management of Coral Nursery Boulder Reefs

CONSULTANT shall conduct an annual collection and relocation of long-spined sea urchins (*Diadema antillarum*) during the Year 1 post-transplantation survey of Cohort 2. Urchins shall be collected from the rubble habitats at the spoil shoal during collection of corals of opportunity. Relocation shall occur in summer months prior to annual coral spawning events.

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Deliverables. Within 60 days of the Cohort 3 completing collection and the Time Zero monitoring event and the Cohort 2 Year 1 post-transplantation survey, CONSULTANT will submit all raw data on coral condition, size, species, survival and health to FDEP, USACE, and COUNTY in electronic format. Data shall be submitted on a portable hard drive or via an FTP site. CONSULTANT shall prepare a report. CONSULTANT and COUNTY will meet to discuss a draft of the final report prior to submittal. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the Cohort 2 Year 1 cohort transplantation and Cohort 3 time zero surveys.

60. YEAR 3 CORAL HARVEST/RELOCATION, MONITORING AND NURSERY MAINTANENCE

60.1 Coral Harvest/Relocation- Cohort 4

CONSULTANT shall plan for, harvest, and relocate approximately 250 corals of opportunity (Cohort 4) and to the coral nursery artificial reefs. Coral transplantation protocol shall follow the specifications in the FDEP Plan. Corals of opportunity shall be transplanted to boulders at their respective mitigation reef nursery sites. Each boulder to which colonies are transplanted will be tagged so that cohorts of transplants (colonies collected during the same year) can be identified. All corals on an individual boulder shall be of the same cohort.

60.2 Monitoring the Survival and Health of Relocated Corals of Opportunity- Baseline Survey Cohort 4 (Time Zero)

CONSULTANT shall conduct the baseline (Time Zero) survey of Cohort 4 on the coral nursery boulder reefs. IThe number of tagged boulders for each cohort will represent a minimum of 25% of colonies within the cohort. During the Time Zero survey, divers shall identify colonies to species, measure live tissue (maximum diameter), and record colony condition according to the Plan requirements.

60.3 Monitoring the Reproductive Status of Relocated Corals of Opportunity- Baseline Survey Cohort 4 (Time Zero) and Year 3 Post-Transplantation Survey of Cohort 1

CONSULTANT shall document the reproductive status of 10% of the Cohort 4 colonies (different from the subset monitored for health and survival under **Task 58.2**) and 10% of the Cohort 1 colonies (Year 3 post-transplantation) through histological analysis at the time of collection (baseline) according to the protocol outlined in the Plan.

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60.4 Monitoring the Survival and Health of Relocated Corals of Opportunity- Year 3 Post-Transplantation Survey of Cohort 1 and Year 1 Post-Transplantation Survey of Cohort 3

CONSULTANT shall conduct the Year 1 post-transplantation survey of Cohort 3 and Year 3 post-transplantation survey of Cohort 1 on the coral nursery boulder reefs. Monitoring methods shall follow the protocol in the FDEP Plan.

60.5 Tracking the Recruitment of Scleractinian Corals to the Nursery Boulder Reefs- Year 3 Post-Transplantation Survey of Cohort 1/Year 1 Post-Transplantation Survey of Cohort 3.

Recruitment (sexual) of scleractinian corals to the mitigation reef shall be assessed during the Year 1 post-transplantation survey of Cohort 3. The area within 25 cm of all relocated colonies on tagged boulders shall be searched and all coral recruits (non-transplanted colonies greater than 2 cm in maximum dimension) shall be recorded and identified to the lowest taxonomic level possible (to species, if possible).

60.6 Cleaning the Surfaces of Nursery Boulder Reefs

CONSULTANT shall conduct annual cleaning of the nursery boulder reefs to reduce the overgrowth of turf and macroalgae on reef boulders. The cleaning event shall be conducted two weeks prior to the August/September spawning event during the Year 1 post-transplantation survey of Cohort 3/Year 3 post-transplantation survey of Cohort 1. Divers shall use wire brushes to remove turf and macroalgae from 25 cm diameter areas around each transplanted coral colony at each boulder reef.

60.7 Active Management of Coral Nursery Boulder Reefs.

CONSULTANT shall conduct an annual collection and relocation of long-spined sea urchins (*Diadema antillarum*) during the Year 1 post-transplantation survey of Cohort 3/Year 3 post-transplantation survey of Cohort 1. Urchins shall be collected from the rubble habitats at the spoil shoal during collection of corals of opportunity. Relocation shall occur in summer months prior to annual coral spawning events.

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Deliverables. Within 60 days of completing the Cohort 4 collection and Time Zero monitoring event, Year 1 post-transplantation survey of the Cohort 3, and Year 3 post-transplantation survey of Cohort 1, CONSULTANT will submit all raw data on coral condition, size, species, survival and health to FDEP, USACE, and COUNTY in electronic format. Data shall be submitted on a portable hard drive or via an FTP site. CONSULTANT shall write a final report. CONSULTANT and COUNTY will meet to discuss a draft of the final report prior to submittal. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the Year 1 cohort transplantation and time zero survey.

PART III: COASTAL ENGINEERING SERVICES – FIRST SAND BYPASS EVENT

61. PLANNING, ENGINEERING, DESIGN, and PERMIT MANAGEMENT (AUTHORIZATION WITHHELD)

61.1 **Engineering-Level Design.** CONSULTANT shall utilize the most recent physical monitoring surveys to prepare an engineering-level design. CONSULTANT will estimate the volume of material available in the sand trap and develop the planned location(s) and volume(s) of beach fill placement.

Deliverable. CONSULTANT shall provide a summary memo of findings.

61.2 **Pre-construction Submittals.** CONSULTANT shall prepare and submit pre-construction submittals as required by the FDEP and USACE permits.

Deliverable. Deliverables will include an electronic copy of the submittals to the FDEP and USACE.

62. GEOTECHNICAL INVESTIGATION (AUTHORIZATION WITHHELD)

62.1 **Data Collection.** CONSULTANT shall collect ten (10) Vibracores within the sand trap to characterize the sediment. The Vibracores will be collected in a manner that the expected sand deposit and anticipated dredge horizon for the first sand bypass event will be represented.

62.2 **Laboratory Testing and Analysis.** CONSULTANT shall photograph the vibracores and classify Ithe sediment layers. Representative sediment samples will be analyzed for Munsell color, carbonate content, and grain size.

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Deliverable. Deliverables are photographs of the vibracores, core logs, a field data collection report, laboratory results, and a summary memo of the findings.

63. FINAL DESIGN and PLANS and SPECIFICATIONS (AUTHORIZATION WITHHELD)

63.1 **Construction Plans.** CONSULTANT shall prepare construction plans for the first maintenance dredging of the sand trap. Construction plans shall include project aerials, bathymetric charts, applicable geotechnical data, survey monumentation, and other relevant information.

63.2 CONSULTANT shall prepare elements of the Project Manual that include the Bid Schedule, the Technical Specifications, and the Environmental Protection Requirements.

Deliverables. CONSULTANT shall provide COUNTY with reproducible electronic (PDF) files of the final plans and project manual. CONSULTANT shall provide up to three (3) revisions of the plans and specifications as may be required by COUNTY, state, and federal reviews.

64. BID SUPPORT (AUTHORIZATION WITHHELD)

64.1 CONSULTANT shall assist COUNTY in conducting one (1) pre-bid conference, at which CONSULTANT shall be available to answer technical and engineering questions.

64.2 CONSULTANT shall provide timely responses to prospective bidders by using written addenda. CONSULTANT shall prepare and distribute as necessary addenda approved by COUNTY.

64.3 Within seven (7) days of bid opening, CONSULTANT shall provide COUNTY an evaluation of the bids for technical completeness and a written recommendation to COUNTY with respect to award of the contract. The non-technical portion of the bid submittals shall be evaluated by COUNTY.

Deliverables. Deliverables include a PDF pre-bid presentation, electronic written responses to bidders, and a recommendation memo to COUNTY.

65. CONSTRUCTION SERVICES (AUTHORIZATION WITHHELD)

65.1 CONSTRUCTION CONTRACT ADMINISTRATION (12 Weeks)

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65.1.1 **Pre-construction Conference.** CONSULTANT and CONTRACT ADMINISTRATOR shall review the Project Permits with the CONTRACTOR prior to commencement of the activity authorized by the Permits. CONSULTANT shall coordinate, prepare for, and attend a pre-construction conference to review the construction methodology, and the specific conditions and monitoring requirements of the Permits with the CONTRACTOR, the CONTRACTOR'S subcontractors, FDEP and FWC staff, COUNTY's marine turtle permit holder, and other involved parties and stakeholders. CONSULTANT shall conduct a brief overview of the project and shall reiterate communications and reporting protocols for the duration of CONTRACTOR mobilization, construction, and demobilization activities. The conference shall be held at least 7 days prior to the commencement date of construction. CONSULTANT shall coordinate with the agencies at least 21 days prior to the intended commencement date. A minimum 7 days advance written notification shall be provided to the parties advising of the date, time, location, and teleconference number of the pre-construction conference. CONSULTANT shall subsequently seek a notice-to-proceed from FDEP which has been withheld pending completion of the pre-construction conference.

Deliverable: Deliverables include written notification of planned pre-construction meeting details, and meeting minutes.

65.1.2 **Notice of Commencement.** At least forty-eight (48) hours prior to commencement of beach and groin activity authorized by the state and federal permits, CONSULTANT shall submit to COUNTY, FDEP Beaches, Inlets and Ports Program, the USACE, and the appropriate District office of FDEP, a written notice (via email) of commencement of construction indicating the actual start date and the expected completion date and an affirmative statement that COUNTY and the CONTRACTOR, if one is to be used, have read the general and specific conditions of the permit and understand them.

Deliverable. Deliverables include one (1) electronic written notice.

65.1.3 **Notice of Deviations.** CONSULTANT shall notify COUNTY and FDEP Beaches, Inlets and Ports Program in writing (via email) of any anticipated deviation from FDEP permit prior to implementation so that FDEP can determine whether a modification of the permit is required pursuant to

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Rule 62B-49.008, F.A.C.

Deliverable. Deliverables are one (1) electronic written notice.

65.1.4 **Notice of Non-Compliance.** CONSULTANT shall notify immediately (via email) COUNTY of any non-compliance with any condition or limitation specified in the permits. The written report shall contain a description of and cause of noncompliance; and the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance. All notices of non-compliance from CONSULTANT will be reported to COUNTY, who will report to the State and Federal agencies, as appropriate.

Deliverable. Deliverables include the written notice.

65.1.5 **Certification of Completion.** Within 60 days after completion of construction authorized by the Permit, CONSULTANT shall submit to COUNTY for submission to the FDEP Beaches, Inlets and Ports Program and the USACE a written statement of completion and certification by a registered professional engineer. This certification shall state that the activities authorized by the permits have been performed in compliance with the plans and specifications approved as a part of the permits, and all conditions of the permits; or shall describe any deviations from the plans and specifications, and all conditions of the permits. When the completed activity differs substantially from the permitted plans, any substantial deviations shall be noted and explained on two copies of as-built drawings.

Deliverable. Deliverables include the one (1) hard copy and one (1) electronic copy of CONSULTANT'S certification and five (5) original copies of the as-built drawings, if necessary.

65.1.6 **Review of Contractor's Pre-Construction Submittals.** CONSULTANT shall comment on and coordinate the acceptance and distribution of the following submittals required by the CONTRACTOR:

- Daily Report
- Operations Plan
- Quality Control Plan
- Structure Inspection and Vibration Monitoring and Control Plan

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- Environmental Protection Plan
- Storm Contingency Plan
- Vessel Certification
- Accident Prevention Plan

Deliverables. Deliverables shall include email correspondence that documents were reviewed and accepted.

65.1.7 **Review of Contractor's Requests for Payment.** CONSULTANT shall review CONTRACTOR progress and pay surveys, weigh tickets, volume calculations, and pay requests for all work elements. CONSULTANT shall review for accuracy of computation and completeness, the CONTRACTOR'S periodic payment invoices and will make recommendations to COUNTY. CONSULTANT shall assist COUNTY in evaluating the periodic and final payments to the CONTRACTOR. CONSULTANT will review pay requests and make a recommendation to COUNTY regarding payment within 5 days of receipt of the pay request. CONSULTANT shall assist COUNTY in assembling the documentation needed for State reimbursement or cost sharing.

Deliverable. The deliverables include letters of recommendation from CONSULTANT to COUNTY regarding payment to the CONTRACTOR.

65.1.8 **Records Management.** CONSULTANT shall ensure that a copy of the permit, complete with all conditions, attachments, modifications, and time extensions, and the approved the plans and specifications shall be kept at the work site of the permitted activity. CONSULTANT shall maintain detailed field log books and construction files (notebooks and file folders with copies of all documentation).

Deliverable. Upon completion of construction activities, CONSULTANT shall conduct final file management and transfer to COUNTY one (1) copy of the files for archival of records.

65.1.9 **Project Closeout.** Following notification by the CONTRACTOR that construction activities are complete and all payment sections have been approved and accepted by COUNTY, CONSULTANT shall conduct a final visual inspection of the work and staging areas and prepare a punch list of remaining equipment and material to be removed from the project sites

and the activities required for restoration of access and staging areas. This list shall be furnished to COUNTY and CONTRACTOR to ensure control of final clean up.

65.1.10 Following notice from the CONTRACTOR that final clean-up has been completed, CONSULTANT shall conduct a final inspection of the beach and staging areas. If the CONTRACTOR'S equipment, construction fencing, supplies, and debris are completely removed, and access and staging areas restored, then CONSULTANT shall forward a recommendation to COUNTY that final payment be made to the CONTRACTOR.

Deliverable. Deliverables include a punch list and recommendation for final payment.

65.2 CONSTRUCTION OBSERVATIONS (12 Weeks)

65.2.1 **Daily On-site Inspection.** CONSULTANT shall designate Site Representatives to be present at the beach fill sites, access corridors or staging areas up to ten (10) hours per day for the duration of construction activities. Observations will be conducted to ensure that construction is in compliance with the construction plans, contract documents, and permit authorizations granted for the work. The Site Representative will monitor daily progress of the work and track CONTRACTOR delays through the duration of the project, from mobilization through demobilization from the83rojectt site.

65.2.2 **On-Call & Periodic On-Site Representation.** CONSULTANT shall be 'on-call' basis throughout the period of construction to monitor construction activities and address questions and required administrative matters.

65.2.3 Through the Site Representatives, CONSULTANT shall monitor daily progress of the work, track the CONTRACTOR activities, and notify COUNTY as appropriate.

65.2.4 CONSULTANT shall obtain and review the CONTRACTOR'S quality control reports (daily reports) through the duration of the project, from mobilization through demobilization from the project site.

65.2.5 CONSULTANT shall designate Project Engineer(s), who shall visit the site

on weekly throughout the period of construction. The Project Engineer(s) shall serve as liaison between the CONTRACTOR and COUNTY during all phases of construction. The Project Engineer(s) shall be available to address questions concerning the plans and specifications and address other issues requiring coordination or liaison.

65.2.6 The Project Engineer(s) and Site Representative(s) shall attend periodic progress meetings with the CONTRACTOR as appropriate during construction. It is expected that progress meetings will be held by the CONTRACTOR no less frequently than one weekly during the period of construction.

65.2.7 CONSULTANT shall email a weekly report to COUNTY that summarizes the progress of construction and compliance with the permits and Contract, including manpower, amount of work performed and by whom, equipment, problems encountered, method to correct problems, errors, omissions, deviations from Contract Documents, and weather conditions.

Deliverable. Deliverables include on-site presence during construction, daily reports, documentation of construction operations (including photographs), and a weekly summary report of construction progress.

66. CONTINGENCY CONSTRUCTION SERVICES (Authorization Withheld)

66.1 CONSTRUCTION CONTRACT ADMINISTRATION (4 Weeks)

This task provides beach fill services in addition to those outlined in **Task 65.1**. CONSULTANT shall provide four (4) additional weeks (7-day weeks) of construction contract administration services, if needed.

66.2 CONSTRUCTION OBSERVATION (4 Weeks)

This task shall provide beach fill services in addition to those outlined in **Task 65.2**. CONSULTANT shall provide four (4) additional weeks (7-day weeks) of construction observation services, if needed.

67. WATER QUALITY MONITORING (12 Weeks) (AUTHORIZATION WITHHELD)

67.1 **Pre-Construction Submittals.** CONSULTANT shall prepare and submit the turbidity

monitoring scope of work and turbidity monitor qualifications consistent with the FDEP Permit.

67.2 **Daily Monitoring.** CONSULTANT conduct daily water quality monitoring as required by FDEP Permit while dredging is occurring for the project. When dredging activities occurring, CONSULTANT shall be prepared to provide this service seven (7) days a week. This task provides for eight (8) weeks of water quality monitoring services.

67.3 **Weekly Report Submittals to FDEP.** CONSULTANT shall submit weekly summary reports of water quality data and any water quality violations as required by the FDEP Permit.

Deliverables: Deliverables include electronic submittals to FDEP, including the turbidity monitor qualifications, the turbidity monitoring scope of work, daily reports, and weekly summary reports.

68. SEDIMENT QA/QC MONITORING and COMPLIANCE (AUTHORIZATION WITHHELD)

For sand placed along the beach, CONSULTANT shall collect representative sand samples approximately 500-ft alongshore intervals within the fill area. A grain-size distribution curve will be formulated for each sample using the applicable ASTM standards. CONSULTANT shall evaluate the samples for compliance with the Sediment QA/QC Plan and prepare a report for submittal to FDEP.

Deliverables. Deliverables are an engineering memo summarizing findings from the sampling and laboratory work. A statistical report and distribution curve for each sample tested will also be prepared and included with the engineering memo.

69. POST-CONSTRUCTION REPORT (AUTHORIZATION WITHHELD)

CONSULTANT shall prepare a post-construction report which addresses all aspects of the sand bypass project, as constructed. Items of interest include documentation of CONTRACTOR productivity, construction and placement techniques, weather conditions during execution of the work, and factors affecting the CONTRACTOR'S productivity. Additionally, the report will summarize the bid results, elements of the total cost to construct, public interest issues occurring during the period of construction, and other factors potentially affecting future operation and performance of the sand bypass project. CONSULTANT shall assess, analyze, and summarize CONTRACTOR related data obtained

from daily reports, project specific reporting submittals, internal reports, surveys, etc. If appropriate, such databases will be formulated in a graphic format for visual interpretation by the layman. Documentation of the as-built conditions of project features based upon both CONTRACTOR and CONSULTANT surveys will be included.

Deliverable. Deliverables to COUNTY and FDEP are one (1) PDF copy of the report with appendices. The PDF copy of the report will be provided on electronic media (CD, thumb drive, ftp site, etc.) suitable for distribution.

PART IV: ENVIRONMENTAL SERVICES – FIRST SAND BYPASS EVENT

(*FDEP Permit Condition No. 27b; FDEP Minimization, Mitigation and Monitoring Plan Section 3.2)*

70. PERMANENT MONITORING STATION ESTABLISHMENT AND BASELINE HARDBOTTOM MONITORING- SAND TRAP MAINTENANCE DREDGING MIXING ZONE (AUTHORIZATION WITHHELD)

CONSULTANT shall install six (6) permanent monitoring stations in the colonized pavement and rubble/colonized payment habitats within the 150-m turbidity mixing zone around the sand trap. The locations of the six permanent stations will be determined in consultation with FDEP (Section 3.2.1).

CONSULTANT shall establish a single 50-m long transect at each monitoring station and install permanent markers (pins, iron rods, etc.) at the start, end, and middle (25-m mark) of each transect. The pre-construction baseline survey of the six stations shall consist of interval sediment depth measurements, quantitative still photography with functional group analysis using a point count method, belt transects for stony coral and octocoral density by species, and digital video transects. All field survey activities shall be performed in accordance with the FDEP Plan.

Deliverable. Pre-construction data shall be entered into a Microsoft Access database for data management and QA/QC review. Individual datasets shall be exported to Microsoft Excel workbooks. All field datasheets shall be reviewed and scanned to PDF format for submittal with the raw data deliverable. At least 30 days prior the commencement of sand trap excavation and within 60 days of completion of the pre-construction monitoring, CONSULTANT shall submit all raw pre-construction (baseline) data, including the still photo transect images and digital video transects, point count raw and summary data, GIS shape files of the six (6) permanent monitoring stations, and a map which shows the locations of the six monitoring stations and benthic habitats. The data shall be submitted

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to COUNTY and FDEP in electronic format on a single portable hard drive or via an FTP site.

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71. WEEKLY DURING-CONSTRUCTION SEDIMENT SURVEYS DURING THE FIRST SAND TRAP MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

CONSULTANT shall conduct weekly surveys at the six (6) permanent stations during maintenance dredging operations. All field monitoring tasks shall be conducted in accordance with the FDEP Plan. COUNTY expects that weekly surveys will require one day/week to complete.

The weekly during-construction surveys shall consist of interval sediment depth measurements at 1-m intervals along each transect inclusive of sand patches. Three (3) sediment depth measurements shall be taken at each 1-m interval: one measurement on the center of the line, one 0.5 m to the left of the line, and another 0.5 m to the right of the line. Depth measurements will be recorded to the nearest half centimeter (*e.g.*, 0 cm, 0.5 cm, 1 cm, 1.5 cm, etc.), and measurements greater than 30 cm shall be recorded as greater than 30 cm.

This task assumes that maintenance dredging extends up a maximum of ten (10) weeks; therefore, a maximum of ten (10) field days during construction is required.

Deliverable. CONSULTANT shall submit the weekly raw sedimentation monitoring data directly and concurrently to COUNTY and FDEP in electronic format within 5 days of completion of each weekly survey. Data shall be submitted in Microsoft Excel format via email or uploaded to an FTP site. The final during-construction sediment monitoring dataset shall be provided within 5 days of completion of the first maintenance dredging event with a digital copy of the scanned field datasheets (PDF file) on a portable hard drive or via an FTP site.

72. CONTINGENCY DURING-CONSTRUCTION SEDIMENTATION TRIGGERED MONITORING DURING THE FIRST SAND TRAP MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

If during-construction weekly sediment depth measurements at any of the six (6) permanent stations indicate sedimentation impacts, CONSULTANT shall include digital video transect monitoring. The FDEP Plan defines sedimentation impact as an increase in mean sediment depth of 1 cm or more above mean baseline sediment depth. Qualitative video surveys shall be implemented during the next weekly during-construction survey at the affected transect(s). The digital video transect protocol changes shall remain in effect until either the post-construction survey is conducted, or weekly sediment depth data at the affected transect(s) indicate that impacts have receded (defined as the return of mean

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sediment depth to or below the mean sediment depth recorded during the pre-construction baseline survey).

This task assumes that qualitative video transect surveys have been added at three (3) or more permanent stations. The cost is based upon an increase in cost per weekly event to conduct the additional video transects for a maximum of nine (9) weekly during-construction surveys. If qualitative video transects surveys are triggered at only one (1) or two (2) permanent stations, there is no additional cost to the field surveys since it is assumed that the additional video surveys can be completed within the same day.

Deliverable. CONSULTANT shall notify COUNTY, FDEP, and the USACE as soon as possible if the video transect monitoring requirement is triggered and provide summaries in the weekly sedimentation monitoring data submittals of the affected station(s). The digital video transects shall be submitted to COUNTY and FDEP in electronic format (USB flash drive or uploaded to a FTP site) within five (5) days of completion of each weekly survey.

73. IMMEDIATE POST-CONSTRUCTION HARDBOTTOM MONITORING IN THE TURBIDITY MIXING ZONE- FIRST SAND TRAP MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

CONSULTANT shall conduct the immediate post-construction biological monitoring survey of the six (6) permanent stations within the 150-m turbidity mixing zone following the first maintenance dredging event as required by permit. All monitoring shall be conducted in accordance with the FDEP Plan and follow the same metrics as the pre-construction baseline survey (**Task 70**). The immediate post-construction survey at the permanent stations shall consist of interval sediment depth measurements at 1-m intervals, quantitative photo surveys, scleractinian and octocoral belt transect surveys, and digital video transects.

Deliverable. The immediate post-construction monitoring data shall be entered into a Microsoft Access database for data management and QA-QC review, and individual datasets shall be exported to Microsoft Excel workbooks. All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable.

Within 60 days of completion of the immediate post-construction monitoring event for the first maintenance dredging of the sand trap, CONSULTANT shall submit all monitoring data, including the still photo transect images and digital video transects and point count raw and summary data, to COUNTY and FDEP in electronic format (a single portable hard drive or via a FTP site).

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FIRST MAINTENANCE DREDGING–OF SAND TRAP - BEACH FILL PLACEMENT MONITORING- R-86 TO R-92 (AUTHORIZATION WITHHELD) (*FDEP Permit Condition No. 29; FDEP Minimization, Mitigation and Monitoring Plan Section 5.0)*

Sand dredged from maintenance dredging of the sand trap will be placed in the template for the Broward County Segment III Beach Nourishment Project at Dr. Von D. Mizell- Eula Johnson State Park (Park) between R-86 and R-92. The permitted Equilibrium Toe of Fill (ETOF) for the Port Everglades Sand Bypassing project is the same as the ETOF permitted for the Broward County Segment III Beach Nourishment Project (FDEP Permit No. 0163435-015-JC, expiration November 9, 2035). The Biological Monitoring Plan (BMP) for the Segment III Project in the Park is intended to be identical to the FDEP Plan for the Sand Bypass Project.

Thirteen permanent, 150-m shore-perpendicular transects were installed between R-86 and R-93 in the Park in September 2020. Seven (7) of the transects (BT1-BT7) are full biological transects while six (6) transects (ST1 – ST6) are sediment-only transects (Figure 5). Transect BT7 is located approximately 1,000 ft. downdrift of the beach fill area, just north of R-93. The pre-construction (baseline) survey of the Park transects was conducted in September 2020. This survey shall serve as the pre-construction baseline survey for the Sand Bypass Project; a separate pre-construction survey for the Sand Bypass Project is not required. Post-construction nearshore hardbottom monitoring in the Park shall be conducted under either the Segment III BMP requirements or the Sand Bypass Project Plan requirements; monitoring shall not be duplicated. A-7 Scope includes the initial post-construction survey required within six months of the initial fill placement in the Park and three years of annual post-construction hardbottom monitoring surveys of the beach fill placement area (Years 1 through 3 post-construction) in event that these surveys are not already being conducted for compliance with the Segment III Beach Nourishment Project BMP.

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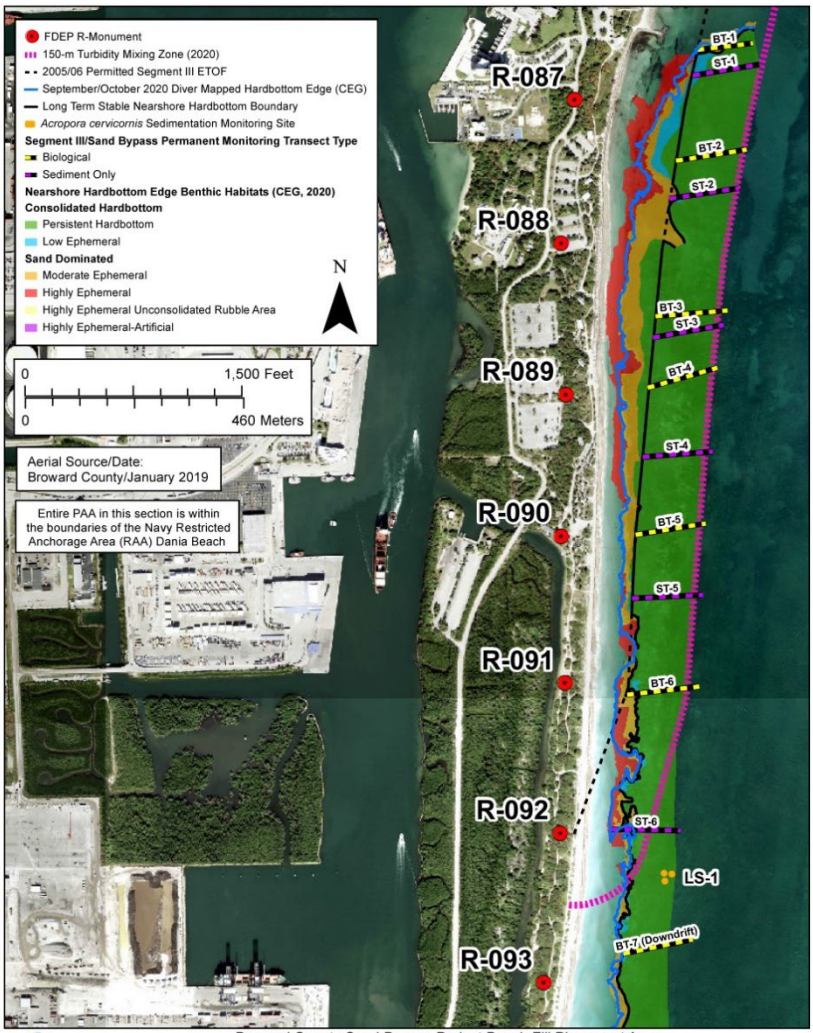

Figure 5 Permanent monitoring transects for beach fill placement within the Park.

74. IMMEDIATE POST-CONSTRUCTION HARDBOTTOM MONITORING – BEACH FILL PLACEMENT FOLLOWING THE FIRST MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

CONSULTANT shall conduct the immediate post-construction hardbottom monitoring at the beach fill placement area at the Park in according to the requirements of the FDEP Plan. The immediate post-construction hardbottom monitoring survey shall include diver mapping of the nearshore hardbottom edge between R-86 and R-92 following FDEP standards, benthic monitoring of the permanent quadrats at the six (6) biological

monitoring transects, digital video transects and sediment depth/line intercept monitoring at all thirteen (13) permanent transects, and monitoring of the permanent *Acropora cervicornis* station located downdrift of the fill area. All data collection shall be consistent with the baseline survey conducted in September/October 2020.

Deliverable. The immediate post-construction data shall be entered into a Microsoft Access database for data management and QA/QC review, and individual datasets shall be exported to Microsoft Excel workbooks. All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable within 45 days of completion of the immediate post-construction monitoring event. CONSULTANT shall submit all monitoring data, including GIS shape files of the transects and diver-mapped hardbottom edge, still photo images, and digital video transects to COUNTY and FDEP in electronic format (a single portable hard drive or a FTP site).

75. IMMEDIATE POST-CONSTRUCTION BIOLOGICAL MONITORING REPORT - FIRST SAND TRAP MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

CONSULTANT shall prepare the immediate post-construction report for submittal to COUNTY, FDEP, and USACE, describing the field monitoring methods and data analyses and presenting all permit-required data in tables, figures, and maps. The report shall compare the pre-construction and immediate post-construction survey results at the sand trap and describe, compare, and contrast conditions observed during the weekly during-construction sedimentation surveys at the sand trap with the baseline and immediate post-construction surveys. The report shall also compare the pre-construction and immediate post-construction surveys at the beach fill placement area in the evaluation of unanticipated project impacts if potential impacts are not being evaluated in the post-construction monitoring reports for the Segment III project for the same monitoring period. If project-related impacts are suggested in the monitoring data, the report shall evaluate these effects and determine the severity of impacts.

Deliverable. A draft report shall be provided to COUNTY for review within 60 days of completion of the immediate post-construction survey. The final report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the immediate post-construction survey.

76. YEAR 1 POST-CONSTRUCTION HARDBOTTOM MONITORING – BEACH FILL PLACEMENT FOLLOWING THE FIRST MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

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CONSULTANT shall conduct the Year 1 post-construction hardbottom monitoring at the beach fill placement area at the Park according to the requirements of the FDEP Plan. The Year 1 post-construction hardbottom monitoring survey shall include diver mapping of the nearshore hardbottom edge between R-86 and R-92 following FDEP standards, benthic monitoring of the permanent quadrats at the six (6) biological monitoring transects, digital video transects and sediment depth/line intercept monitoring at all twelve (12) permanent transects, and monitoring of the permanent *Acropora cervicornis* station located downdrift of the fill area. All data collection shall be consistent with the baseline survey conducted in September/October 2020.

Deliverable. The Year 1 post-construction data shall be entered into the Microsoft Access project database for data management and QA/QC review. Individual datasets shall be exported to Microsoft Excel workbooks. All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable within 45 days of completion of the Year 1 post-construction monitoring event. CONSULTANT shall submit all monitoring data, including GIS shape files of the transects and diver-mapped hardbottom edge, still photo images and digital video transects, to COUNTY and FDEP in electronic format (a single portable hard drive or a FTP site).

77. YEAR 1 POST-CONSTRUCTION BIOLOGICAL MONITORING REPORT - FIRST SAND TRAP MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

CONSULTANT shall prepare the Year 1 post-construction report for submittal to COUNTY, FDEP, and USACE. The report will clearly describe the methods used in field monitoring and data analyses and present all permit-required data in tables, figures, and maps. The report shall compare the pre-construction baseline and Year 1 post-construction survey results at the beach fill placement area in the evaluation of unanticipated project impacts. The report will evaluate any project-related impacts suggested in the monitoring data and determine their severity.

Deliverable. CONSULTANT shall provide a draft report to COUNTY for review within 60 days of completion of the immediate post-construction survey. The report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the Year 1 post-construction survey.

78. YEAR 2 POST-CONSTRUCTION HARDBOTTOM MONITORING – BEACH FILL PLACEMENT FOLLOWING THE FIRST MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

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ADDITIONAL SCOPE OF SERVICES FOR PORT EVERGLADES INLET SAND MANAGEMENT (RLI #022100-RB)

Amendment 9: PRE-CONSTRUCTION, CONSTRUCTION, & POST-CONSTRUCTION SERVICES

CONSULTANT shall conduct the Year 2 post-construction hardbottom monitoring at the Park's beach fill placement area in accordance with the FDEP Plan. The Year 2 post-construction hardbottom monitoring survey shall include diver mapping of the nearshore hardbottom edge between R-86 and R-92 following FDEP standards, benthic monitoring of the permanent quadrats at the six (6) biological monitoring transects, digital video transects and sediment depth/line intercept monitoring at the twelve (12) permanent transects, and monitoring of the permanent *Acropora cervicornis* station located downdrift of the fill area. All data collection shall be consistent with the baseline survey conducted in September/October 2020.

Deliverable. CONSULTANT shall enter the Year 2 post-construction data shall into the Microsoft Access project database for data management and QA/QC review. Individual datasets shall be exported to Microsoft Excel workbooks. All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable within 45 days of completion of the Year 2 post-construction monitoring event. CONSULTANT shall submit all monitoring data, including GIS shape files of the transects and diver-mapped hardbottom edge, still photo images and digital video transects, to COUNTY and FDEP in electronic format (a single portable hard drive or via a FTP site).

79. YEAR 2 POST-CONSTRUCTION BIOLOGICAL MONITORING REPORT - FIRST SAND TRAP MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

CONSULTANT shall prepare the Year 2 post-construction report for submittal to COUNTY, FDEP, and USACE. The report must clearly describe the field monitoring methods and data analyses and present all permit-required data in tables, figures, and maps. The report shall compare the pre-construction baseline and Year 2 post-construction survey results at the beach fill placement area in the evaluation of unanticipated project impacts. The report will evaluate any project-related impacts are suggested in the monitoring data and determine their severity.

Deliverable. CONSULTANT shall provide a draft report to COUNTY for review within 60 days of completion of the immediate post-construction survey. The report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the Year 2 post-construction survey.

80. YEAR 3 POST-CONSTRUCTION HARDBOTTOM MONITORING – BEACH FILL PLACEMENT FOLLOWING THE FIRST MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

DRAFT

ADDITIONAL SCOPE OF SERVICES FOR PORT EVERGLADES INLET SAND MANAGEMENT (RLI #022100-RB)

Amendment 9: PRE-CONSTRUCTION, CONSTRUCTION, & POST-CONSTRUCTION SERVICES

CONSULTANT shall conduct the Year 3 post-construction hardbottom monitoring at the Park's beach fill placement area in accordance with the FDEP Plan. The Year 3 post-construction hardbottom monitoring survey shall include diver mapping of the nearshore hardbottom edge between R-86 and R-92 following FDEP standards, benthic monitoring of the permanent quadrats at the six (6) biological monitoring transects, digital video transects and sediment depth/line intercept monitoring at the twelve (12) permanent transects, and monitoring of the permanent *Acropora cervicornis* station located downdrift of the fill area. All data collection shall be consistent with the baseline survey conducted in September/October 2020.

Deliverable. CONSULTANT shall enter the Year 3 post-construction data into the Microsoft Access project database. Individual datasets shall be exported to Microsoft Excel workbooks. All field datasheets shall be reviewed and scanned to digital format for submittal with the raw data deliverable within 45 days of completion of the Year 3 post-construction monitoring event. CONSULTANT shall submit all monitoring data, including GIS shape files of the transects and diver-mapped hardbottom edge, still photo images and digital video transects, to COUNTY and FDEP in electronic format (a single portable hard drive or via a FTP site).

81. YEAR 3 POST-CONSTRUCTION BIOLOGICAL MONITORING REPORT - FIRST SAND TRAP MAINTENANCE DREDGING EVENT (AUTHORIZATION WITHHELD)

CONSULTANT shall prepare the Year 3 post-construction report for submittal to COUNTY, FDEP, and USACE. The Year 3 post-construction report is the final monitoring report for the first maintenance dredging event. The report must clearly describe the field monitoring methods and data analyses and include all permit-required data in tables, figures, and maps. The report shall compare the pre-construction baseline and Year 3 post-construction survey results at the beach fill placement area in the evaluation of unanticipated project impacts. The report will evaluate any short-term or longer-term project-related impacts that are suggested in the cumulative monitoring data, and determine their severity.

Deliverable. CONSULTANT shall provide a draft report to COUNTY for review within 60 days of completion of the immediate post-construction survey. The report shall be provided in digital (PDF) format to COUNTY, FDEP, and USACE within 90 days of completion of the Year 3 post-construction survey.

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Port Everglades Inlet Sand Management
RLI #022100-RB
(Amendment 9)

TOTAL COST SUMMARY

Task (Note: Authorization Withheld Tasks are indicated with an "(AW)")		Olsen	Direct Costs	Subconsultants	Total
I - Engineering (Initial Construction and Post-Project Physical Monitoring)					
I - Engr	SubTotal (Authorized)	$ 1,477,141	$ 141,600	$ 1,837,098	$ 3,455,839
I - Engr	SubTotal (AW)	$ 542,900	$ -	$ 502,500	$ 1,045,400
	subtotal	**$ 2,020,041**	**$ 141,600**	**$ 2,339,598**	**$ 4,501,239**
II - Environmental (Initial Construction and Post-Project Monitoring)					
II - Env	SubTotal (Authorized)	$ 180,962	$ 5,600	$ 2,052,690	$ 2,239,252
II - Env	SubTotal (AW)	$ 64,314	$ -	$ 1,101,417	$ 1,165,731
	subtotal	**$ 245,276**	**$ 5,600**	**$ 3,154,107**	**$ 3,404,983**
III - Engineering (First Bypass Event)					
III - Engr	SubTotal (Authorized)	$ -	$ -	$ -	$ -
III - Engr	SubTotal (AW)	$ 705,436.00	$ 66,584.00	$ 616,900.00	$ 1,388,920
		$ 705,436.00	**$ 66,584.00**	**$ 616,900.00**	**$ 1,388,920**
IV - Environmental (First Bypass Event)					
IV - Env	SubTotal (Authorized)	$ -	$ -	$ -	$ -
IV - Env	SubTotal (AW)	$ 54,238	$ -	$ 649,352	$ 703,590
	subtotal	**$ 54,238**	**$ -**	**$ 649,352**	**$ 703,590**
Total					
SubTotal (Authorized)		$ 1,658,103	$ 147,200	$ 3,889,788	$ 5,695,091
SubTotal (Authorization Withheld)		$ 1,366,888	$ 66,584	$ 2,870,169	$ 4,303,641
	Total	**$ 3,024,991**	**$ 213,784**	**$ 6,759,957**	**$ 9,998,732**

Port Everglades Inlet Sand Management
RLI #022100-RB
(Amendment 9)

TOTAL COST SUMMARY
I - Engineering

OLSEN ASSOCIATES, INC.					
Task (Note: Authorization Withheld Tasks are indicated with an "(AW)")		Labor	Direct Costs	Subs	Total
Pre-Construction					
1.0	Pre-Construction Physical Monitoring Survey	$ 9,494.00	$ -	$ 25,000.00	$ 34,494.00
Construction					
2.0	Construction Services				
2.1	Construction Contract Adminstration - Dredging	$ 236,090.00	$ -	$ -	$ 236,090.00
2.2	Construction Observation - Dredging	$ 179,270.00	$ 56,000.00	$ -	$ 235,270.00
2.3	Construction Contract Adminstration - Jetty	$ 138,248.00	$ -	$ -	$ 138,248.00
2.4	Construction Observation - Jetty	$ 130,344.00	$ 41,600.00	$ 234,000.00	$ 405,944.00
2.5	Construction Contract Adminstration and Site Visits - Mitigation	$ 39,532.00	$ 6,400.00	$	$ 45,932.00
2.7	Construction Contract Adminstration and Site Visits - Rubble Clearing	$ 78,084.00	$ 19,200.00	$	$ 97,284.00
3.0	Contingency Construction Services (AW) (Allowance)	$ 500,000.00	$ -	$ -	$ 500,000.00
4.0	Water Quality Monitoring - Dredging	$ 51,695.00	$ -	$ 857,500.00	$ 909,195.00
5.0	Water Quality Monitoring - Rubble Clearing	$ 17,724.00	$ -	$ 294,000.00	$ 311,724.00
6.0	Contingency Water Quality Monitoring (AW)	$ 30,360.00	$ -	$ 490,000.00	$ 520,360.00
7.0	Permit Modification (AW)	$ 12,540.00	$ -	$ 12,500.00	$ 25,040.00
Post-Construction					
8.0	Post-Construction Report	$ 85,996.00	$ -	$ -	$ 85,996.00
9.0	Physical Monitoring: Immediate Post-Construction	$ 53,410.00	$ 2,400.00	$ 53,000.00	$ 108,810.00
10.0	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (6-months)	$ 9,992.00	$ -	$ 22,500.00	$ 32,492.00
11.0	Physical Monitoring: 1-Yr Post-Construction	$ 75,240.00	$ 3,200.00	$ 53,000.00	$ 131,440.00
12.0	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (18-months)	$ 10,496.00	$ -	$ 22,500.00	$ 32,996.00
13.0	Physical Monitoring: 2-Year Post-Construction	$ 79,296.00	$ 3,200.00	$ 53,000.00	$ 135,496.00
14.0	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (30-months)	$ 10,804.00	$ -	$ 22,500.00	$ 33,304.00
15.0	Physical Monitoring: 3-Year Post-Construction	$ 81,496.00	$ 3,200.00	$ 53,000.00	$ 137,696.00
16.0	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (42-months)	$ 11,114.00	$ -	$ 22,500.00	$ 33,614.00
17.0	Physical Monitoring: 4-Year Post-Construction	$ 83,696.00	$ 3,200.00	$ 53,000.00	$ 139,896.00
18.0	Intermediate Multibeam Survey of Sand Trap and Inlet Channel (54-months)	$ 11,424.00	$ -	$ 22,500.00	$ 33,924.00
19.0	Physical Monitoring: 5-Year Post-Construction	$ 83,696.00	$ 3,200.00	$ 49,098.00	$ 135,994.00
SubTotal (Authorized)		$ 1,477,141.00	$ 141,600.00	$ 1,837,098.00	$ 3,455,839.00
SubTotal (AW)		$ 542,900.00	$ -	$ 502,500.00	$ 1,045,400.00
Total		$ 2,020,041.00	$ 141,600.00	$ 2,339,598.00	$ 4,501,239.00

TOTAL COST SUMMARY
II - Environmental

OLSEN ASSOCIATES, INC.						
	Task (Note: Authorization Withheld Tasks are indicated with an "(AW)")	Labor	Direct Costs	Subs	Total	
	Pre-Construction					
20.0	Non-Listed Species Relocation from Direct Impact Area (Corals, Conch, Urchins)	$ 10,956.00	$ -	$ 192,016.00	$ 202,972.00	CEG and IDC
21.0	Contingency Non-Listed Coral Colony Removal and Relocation (AW)	$ 3,426.00	$ -	$ 41,860.00	$ 45,286.00	CEG and IDC
22.0	Non-Listed Coral Relocation Monitoring: Immediate Post-Relocation Baseline (Time Zero) Survey	$ 2,932.00	$ -	$ 20,308.00	$ 23,240.00	CEG
23.0	Non-Listed Coral Relocation Monitoring: Six-Month Post-Relocation Survey	$ 2,932.00	$ -	$ 20,308.00	$ 23,240.00	CEG
24.0	Non-Listed Coral Relocation Monitoring: Year 1 Post-Relocation Survey	$ 2,932.00	$ -	$ 20,308.00	$ 23,240.00	CEG
25.0	Non-Listed Coral Relocation Monitoring: Year 3 Post-Relocation Survey	$ 2,932.00	$ -	$ 20,298.00	$ 23,230.00	CEG
26.0	Listed Coral Species (*Acropora Cervicornis*): Pre-Construction Survey	$ 2,932.00	$ -	$ 22,612.00	$ 25,544.00	CEG
27.0	Listed Coral Species (*Acropora Cervicornis*) Colony Relocation	$ 9,384.00	$ -	$ 229,924.00	$ 239,308.00	CEG
28.0	Contingency Listed Coral Colony Removal and Relocation (AW)	$ 3,920.00	$ -	$ 45,000.00	$ 48,920.00	NSU
29.0	Contingency Listed Coral Fragment Removal and Relocation (AW)	$ 3,920.00	$ -	$ 67,500.00	$ 71,420.00	NSU
30.0	Listed Coral Relocation Monitoring: Immediate Post-Relocation Baseline (Time Zero) And One Week Post-Relocation Survey of Colony Transplants and Reference Colonies	$ 2,424.00	$ -	$ 37,760.00	$ 40,184.00	NSU & CEG
31.0	Listed Coral Relocation Monitoring: Three Month Post-Relocation Survey of Colony Transplants and Reference Colonies	$ 2,424.00	$ -	$ 26,290.00	$ 28,714.00	NSU & CEG
32.0	Listed Coral Relocation Monitoring: Six-Month Post-Relocation Survey of Colony Transplants and Reference Colonies	$ 2,424.00	$ -	$ 26,290.00	$ 28,714.00	NSU & CEG
33.0	Listed Coral Relocation Monitoring: One-Year Post-Relocation Survey of Colony Transplants and Reference Colonies	$ 2,932.00	$ -	$ 30,656.00	$ 33,588.00	NSU & CEG
34.0	Coral Nursery Management	$ 2,554.00	$ -	$ 41,500.00	$ 44,054.00	NSU
35.0	Outplanting of Acropora Cervicornis Colonies (AW)	$ 4,120.00	$ -	$ 55,374.00	$ 59,494.00	NSU
36.0	Pre-Construction Baseline Survey of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone	$ 4,120.00	$ -	$ 123,232.00	$ 127,352.00	CEG (Task 36.1); CEG/NSU Task 36,2
37.0	Pre-Construction Survey of Listed Corals on Nearshore Hardbottom Within the Turbidity Mixing Zone	$ 4,120.00	$ -	$ 13,000.00	$ 17,120.00	NSU
38.0	Pre-Construction Survey of Sedimentation at Listed Coral Sites Within the Turbidity Mixing Zone	$ 4,120.00	$ -	$ 13,000.00	$ 17,120.00	NSU
39.0	Pre-Construction Seagrass Survey Within the Turbidity Mixing Zone	$ 1,974.00	$ -	$ 14,128.00	$ 16,102.00	CEG
40.0	During-Construction Sedimentation Surveys of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone (Max 35 weeks)	$ 21,588.00	$ -	$ 355,659.00	$ 377,247.00	CEG
41.0	Twenty (20) Week Contingency During-Construction Monitoring if Sand Trap Excavation Extends Beyond 35 Weeks (AW)	$ 15,048.00	$ -	$ 208,148.00	$ 223,196.00	CEG
42.0	Contingency During-Construction Monitoring Based on Sedimentation Triggers (20 Weeks Assumed) (AW)	$ 19,676.00	$ -	$ 444,683.00	$ 464,359.00	CEG- Tasks 42.1-42.6
43.0	Immediate Post-Construction Monitoring of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone	$ 5,108.00	$ -	$ 80,681.00	$ 85,789.00	CEG & NSU
44.0	Immediate Post-Construction Survey of Seagrass Habitats Within the Turbidity Mixing Zone	$ 2,060.00	$ -	$ 14,128.00	$ 16,188.00	CEG
45.0	Contingency Immediate Post-Construction Monitoring and Data Analyses Based on Sedimentation Impacts (AW)	$ 5,108.00	$ -	$ 113,017.00	$ 118,125.00	CEG & NSU (Task 45.1)
46.0	Immediate Post-Construction Biological Monitoring Report - Nearshore Hardbottom	$ 6,124.00	$ -	$ 45,064.00	$ 51,188.00	CEG
47.0	Immediate Post-Construction Surveys of Listed Coral Sites Within the Turbidity Mixing Zone	$ 3,556.00	$ -	$ 38,760.00	$ 42,316.00	NSU (Task 47.1)
48.0	0.3-Acre Offshore Artificial Reef Mitigation Site Surveys	$ 3,062.00	$ -	$ 25,082.00	$ 28,144.00	CEG
49.0	Mitigation Artificial Reef Construction Supervision	$ 16,452.00	$ 2,400.00	$ 49,132.00	$ 67,984.00	CEG
50.0	As-Built Immediate Post-Construction Surveys of the 0.3-Acre And 0.2-Acre Artificial Reef Coral Nurseries	$ 3,248.00	$ -	$ 15,346.00	$ 18,594.00	CEG
51.0	During Construction Mitigation Surface Rubble Inspections	$ 13,524.00	$ 3,200.00	$ 35,506.00	$ 52,230.00	CEG
52.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 1 Post-Construction Benthic Habitat Map	$ 5,196.00	$ -	$ 33,896.00	$ 39,092.00	CEG & NSU
53.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 2 Post-Construction Benthic Habitat Map	$ 5,196.00	$ -	$ 33,896.00	$ 39,092.00	CEG & NSU
54.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 3 Post-Construction Benthic Habitat Map	$ 5,196.00	$ -	$ 119,199.00	$ 124,395.00	CEG & NSU
55.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 5 Post-Construction Benthic Habitat Map (AW)	$ 5,196.00	$ -	$ 106,027.00	$ 111,223.00	CEG & NSU
56.0	Contingency Aerial Photography for Mitigation Success Monitoring (AW) - Years 1, 2, 3, and 5	$ 3,900.00	$ -	$ 19,808.00	$ 23,708.00	CEG
57.0	Baseline Coral Harvest/Relocation, Monitoring and Nursery Maintenance	$ 7,140.00	$ -	$ 66,676.00	$ 73,816.00	CEG & NSU (Task 57.1)
58.0	Year 1 Coral Harvest/Relocation, Monitoring and Nursery Maintenance	$ 7,140.00	$ -	$ 92,793.00	$ 99,933.00	CEG & NSU (Task 58.1)
59.0	Year 2 Coral Harvest/Relocation, Monitoring and Nursery Maintenance	$ 7,140.00	$ -	$ 92,468.00	$ 99,608.00	CEG & NSU (Task 59.1)
60.0	Year 3 Coral Harvest/Relocation, Monitoring and Nursery Maintenance	$ 7,140.00	$ -	$ 102,774.00	$ 109,914.00	CEG & NSU (Task 60.1)
SubTotal (Authorized)		$ 180,962.00	$ 5,600.00	$ 2,052,690.00	$ 2,239,252.00	
SubTotal (AW)		$ 64,314.00	$ -	$ 1,101,417.00	$ 1,165,731.00	
Total		$ 245,276.00	$ 5,600.00	$ 3,154,107.00	$ 3,404,983.00	

Port Everglades Inlet Sand Management
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(Amendment 9)

TOTAL COST SUMMARY
III - Engineering

OLSEN ASSOCIATES, INC.					
Task (Note: Authorization Withheld Tasks are indicated with an "(AW)")		Labor	Direct Costs	Subs	Total
First Bypass Event					
61.0	Planning, Engineering, Design, and Permit Management (AW)	$ 63,404.00	$ 3,200.00	$ -	$ 66,604.00
62.0	Geotechnical Investigation (Optional) (AW)	$ 33,264.00	$ 2,700.00	$ 100,000.00	$ 135,964.00
63.0	Final Design and Plans and Specifications (AW)	$ 85,656.00	$ 3,200.00	$ -	$ 88,856.00
64.0	Bid Support (AW)	$ 55,208.00	$ 3,200.00	$ -	$ 58,408.00
65.0	Construction Services (AW)				
65.1	*Construction Contract Adminstration (12 Weeks)*	*$ 128,776.00*	*$ 3,500.00*	*$ -*	*$ 132,276.00*
65.2	*Construction Observation (12 Weeks)*	*$ 139,856.00*	*$ 24,000.00*	*$ 79,800.00*	*$ 243,656.00*
66.0	Contingency Construction Services (AW)				
66.1	*Construction Contract Adminstration (4 Weeks)*	*$ 21,280.00*	*$ -*	*$ -*	*$ 21,280.00*
66.2	*Construction Observation (4 Weeks)*	*$ 35,536.00*	*$ 8,000.00*	*$ 26,600.00*	*$ 70,136.00*
67.0	Water Quality Monitoring (12 Weeks) (AW)	$ 44,352.00	$ 14,784.00	$ 392,000.00	$ 451,136.00
68.0	Sediment QA/QC Monitoring and Compliance (AW)	$ 19,844.00	$ 4,000.00	$ 18,500.00	$ 42,344.00
69.0	Post-Construction Report (AW)	$ 78,260.00	$ -	$ -	$ 78,260.00
SubTotal (Authorized)		$ -	$ -	$ -	$ -
SubTotal (AW)		$ 705,436.00	$ 66,584.00	$ 616,900.00	$ 1,388,920.00
Total		$ 705,436.00	$ 66,584.00	$ 616,900.00	$ 1,388,920.00

Port Everglades Inlet Sand Management
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TOTAL COST SUMMARY
IV - Environmental

	OLSEN ASSOCIATES, INC.					
	Task **(Note: Authorization Withheld Tasks are indicated with an "(AW)")**	Labor	Direct Costs	Subs	Total	
	Pre-Construction					
70.0	Permanent Monitoring Station Establishment and Baseline Hardbottom Monitoring- Sand Trap Maintenance Dredging Mixing Zone (AW)	$ 2,670.00	$ -	$ 49,018.00	$ 51,688.00	CEG
71.0	Weekly During-Construction Hardbottom Surveys During the First Sand Trap Maintenance Dredging Event (12 Weeks) (AW)	$ 8,048.00	$ -	$ 84,450.00	$ 92,498.00	CEG
72.0	Contingency During-Construction Sedimentation Triggered Monitoring During the First Sand Trap Maintenance Dredging Event (AW)	$ 4,352.00	$ -	$ 49,476.00	$ 53,828.00	CEG
73.0	Immediate Post-Construction Hardbottom Monitoring in the Turbidity Mixing Zone- First Sand Trap Maintenance Dredging Event (AW)	$ 4,352.00	$ -	$ 50,904.00	$ 55,256.00	CEG
74.0	Immediate Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)	$ 4,352.00	$ -	$ 69,444.00	$ 73,796.00	CEG
75.0	Immediate Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)	$ 4,352.00	$ -	$ 38,216.00	$ 42,568.00	CEG
76.0	Year 1 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)	$	$ -	$ 69,444.00	$ 73,796.00	CEG
77.0	Year 1 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)	$ 4,352.00 4,352.00	$	$ 31,240.00	$ 35,592.00	CEG
78.0	Year 2 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)	$	$ -	$ 69,444.00	$ 73,796.00	CEG
79.0	Year 2 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)	$ 4,352.00 4,352.00	$	$ 31,840.00	$ 36,192.00	CEG
80.0	Year 3 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)	$	$ - -	$ 69,444.00	$ 73,796.00	CEG
81.0	Year 3 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)	$ 4,352.00 4,352.00	$	$ 36,432.00	$ 40,784.00	CEG
SubTotal (Authorized)		$ -	$ - -	$ -	$ -	
SubTotal (AW)		$ 54,238.00	$ -	$ 649,352.00	$ 703,590.00	
Total		$ 54,238.00	$ - -	$ 649,352.00	$ 703,590.00	

TASK 1.0: LABOR and EXPENSE BREAKDOWN

Task 1.0 - Pre-Construction Physical Monitoring Survey

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						4	4	16	$ 240.00	$ 3,840	TRAVEL		Topo-Hydro Surveyor	$ 25,000	
Senior Engineer								2	2	$ 177.00	$ 354	PER DIEM				
Coastal Engineer III							24	8	32	$ 124.00	$ 3,968	REPRODUCTION				
Coastal Engineer II									0	$ 119.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 107.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 93.00	$ 744	POSTAGE				
Adminstrative Assistant	2						4		6	$ 98.00	$ 588					
												MISC				
SUBTOTAL DIRECT LABOR											$ 9,494	subtotal	$ -	subtotal	$ 25,000	$ 34,494

TASK 2.0: LABOR and EXPENSE BREAKDOWN

Task 2.1 Construction Contract Adminstration - Dredging

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	PRE-CON COORD	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	70	40	0	0	0	140	70	70	390	$ 247.00	$ 96,330	TRAVEL				
Senior Engineer	0	0	0	0	0	70	70	140	$ 280	$ 182.00	$ 50,960	PER DIEM				
Coastal Engineer III	0	0	0	0	0	0	0	0	$ 0	127.00	$ -					
Coastal Engineer II	0	40	0	0	0	280	140	140	600	$ 122.00	$ 73,200					
Coastal Engineer I	0	0	0	0	0	0	0	0	0	110.00	$ -					
CADD Technician/Designer	0	0	0	0	0	0	0	0	0	95.00	$ -					
Adminstrative Assistant	70	16	0	0	0	0	70	0	156	$ 100.00	$ 15,600					
												MISC				
SUBTOTAL DIRECT LABOR											$ 236,090	subtotal	$ -	subtotal	$ -	$ 236,090

Task 2.2 Construction Observation - Dredging

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	START UP PERIOD	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	70	0	0	420	0	0	0	0	490	$ 247.00	$ 121,030	TRAVEL	$ 28,000			
Senior Engineer	0	0	0	0	0	0	0	0	$ 0	182.00	$ -	PER DIEM	$ 28,000			
Coastal Engineer III	0	0	0	0	0	0	0	0	$	127.00	$ -					
Coastal Engineer II	0	0	0	420	0	0	0	0	420	$ 122.00	$ 51,240					
Coastal Engineer I	0	0	0	0	0	0	0	0	0	110.00	$ -					
CADD Technician/Designer	0	0	0	0	0	0	0	0	0	95.00	$ -					
Adminstrative Assistant	70	0	0	0	0	0	0	0	70	$ 100.00	$ 7,000					
												MISC				
SUBTOTAL DIRECT LABOR											$ 179,270	subtotal	$ 56,000	subtotal	$ -	$ 235,270

Task 2.3 Construction Contract Adminstration - Jetty

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	PRE-CON COORD	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	52	40	0	0	0	52	52	52	248	$ 247.00	$ 61,256	TRAVEL				
Senior Engineer	0	0	0	0	0	52	52	52	$ 156	$ 182.00	$ 28,392	PER DIEM				
Coastal Engineer III	0	0	0	0	0	0	0	0	$ 0	127.00	$ -					
Coastal Engineer II	0	40	0	0	0	104	104	52	300	$ 122.00	$ 36,600					
Coastal Engineer I	0	0	0	0	0	0	0	0	0	110.00	$ -					
CADD Technician/Designer	0	0	0	0	0	0	0	0	0	95.00	$ -					
Adminstrative Assistant	52	16	0	0	0	0	52	0	120	$ 100.00	$ 12,000					
												MISC				
SUBTOTAL DIRECT LABOR											$ 138,248	subtotal	$ -	subtotal	$ -	$ 138,248

Task 2.4 Construction Observation - Jetty

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	START UP PERIOD	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	52	0	40	260	0	0	0	0	352	$ 247.00	$ 86,944	TRAVEL	$ 20,800	Field Services	$ 234,000	
Senior Engineer	0	0	0	0	0	0	0	0	$ 0	182.00	$ -	PER DIEM	$ 20,800			
Coastal Engineer III	0	0	0	0	0	0	0	0	$ 0	127.00	$ -					
Coastal Engineer II	0	0	40	260	0	0	0	0	300	$ 122.00	$ 36,600					
Coastal Engineer I	0	0	0	0	0	0	0	0	0	110.00	$ -					
CADD Technician/Designer	0	0	0	0	0	0	0	0	0	95.00	$ -					
Adminstrative Assistant	52	0	16	0	0	0	0	0	68	$ 100.00	$ 6,800					
SUBTOTAL DIRECT LABOR											$ 130,344	subtotal	$ 41,600	subtotal	$ 234,000	$ 405,944

Task 2.5 Construction Contract Adminstration and Site Visits - Mitigation

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	START UP PERIOD	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16	0	40	16	0	12	0	8	92	$ 247.00	$ 22,724	TRAVEL	$ 3,200			
Senior Engineer	0	0	0	16	0	4	0	8	$ 28	$ 182.00	$ 5,096	PER DIEM	$ 3,200			
Coastal Engineer III	0	0	0	0	0	0	0	8	$ 8	127.00	$ 1,016					
Coastal Engineer II	0	0	40	0	0	12	16	0	68	$ 122.00	$ 8,296					
Coastal Engineer I	0	0	0	0	0	0	0	0	0	110.00	$ -					
CADD Technician/Designer	0	0	0	0	0	0	0	0	0	95.00	$ -					
Adminstrative Assistant	8	0	16	0	0	0	0	0	24	$ 100.00	$ 2,400					
SUBTOTAL DIRECT LABOR											$ 39,532	subtotal	$ 6,400	subtotal	$ -	$ 45,932

Task 2.7 Construction Contract Adminstration and Site Visits - Rubble Clearing

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	PRE-CON COORD	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	48	0	24	48	0	36	0	24	180	$ 247.00	$ 44,460	TRAVEL	$ 9,600			
Senior Engineer	0	0	0	48	0	12	0	24	84	$ 182.00	$ 15,288	PER DIEM	$ 9,600			
Coastal Engineer III	0	0	0	0	0	0	0	24	$ 24	$ 127.00	$ 3,048					
Coastal Engineer II	0	0	0	0	0	36	48	0	84	$ 122.00	$ 10,248					
Coastal Engineer I	0	0	24	0	0	0	0	0	24	$ 110.00	$ 2,640					
CADD Technician/Designer	0	0	0	0	0	0	0	0	0	95.00	$ -					
Adminstrative Assistant	24	0	0	0	0	0	0	0	24	$ 100.00	$ 2,400					
SUBTOTAL DIRECT LABOR											$ 78,084	subtotal	$ 19,200	subtotal	$ -	$ 97,284

TASK 3.0: LABOR and EXPENSE BREAKDOWN

Task 3.1	Contingency Construction Services (AW) (Allowance)															
	DIRECT LABOR											Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	PRE-CON COORD	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal									0	$ 247.00	$ -	TRAVEL				
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -					
Coastal Engineer II									0	$ 122.00	$ -					
Coastal Engineer I									0	$ 110.00	$ -					
CADD Technician/Designer									0	$ 95.00	$ -					
Adminstrative Assistant									0	$ 100.00	$ -					
SUBTOTAL DIRECT LABOR											$ 500,000	subtotal		subtotal	$ -	$ 500,000

TASK 4.0: LABOR and EXPENSE BREAKDOWN

Task 4.0 - Water Quality Monitoring - Dredging

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	70							70	140	$ 240.00	$ 33,600	TRAVEL		Water Quality Monitor	$ 857,500	
Senior Engineer									0	$ 177.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 124.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 119.00	$ -	LD TEL/FAX				
Coastal Engineer I								105	105	$ 107.00	$ 11,235	FED EX				
CADD Technician/Designer									0	$ 93.00	$ -	POSTAGE				
Adminstrative Assistant	70								70	$ 98.00	$ 6,860					
												MISC				
SUBTOTAL DIRECT LABOR											$ 51,695	subtotal	$ -	subtotal	$ 857,500	$ 909,195

TASK 5.0: LABOR and EXPENSE BREAKDOWN

Task 5.0	Water Quality Monitoring - Rubble Clearing															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	24							24	48	$ 240.00	$ 11,520	TRAVEL		Water Quality Monitor	$ 294,000	
Senior Engineer									0	$ 177.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 124.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 119.00	$ -	LD TEL/FAX				
Coastal Engineer I								36	36	$ 107.00	$ 3,852	FED EX				
CADD Technician/Designer									0	$ 93.00	$ -	POSTAGE				
Adminstrative Assistant	24								24	$ 98.00	$ 2,352					
												MISC				
SUBTOTAL DIRECT LABOR											$ 17,724	subtotal	$ -	subtotal	$ 294,000.00	$ 311,724

TASK 6.0: LABOR and EXPENSE BREAKDOWN

Task 6.0	Contingency Water Quality Monitoring (AW)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	40							40	80	$ 247.00	$ 19,760	TRAVEL		Water Quality Monitor	$ 490,000	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I								60	60	$ 110.00	$ 6,600	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	40								40	$ 100.00	$ 4,000					
												MISC				
SUBTOTAL DIRECT LABOR											$ 30,360	subtotal	$ -	subtotal	$ 490,000	$ 520,360

TASK 7.0: LABOR and EXPENSE BREAKDOWN

Task 7.0	Permit Modification (AW)																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16						8	4	28	$ 247.00	$ 6,916	TRAVEL		CEG	$ 12,500	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III							32		32	$ 127.00	$ 4,064	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 95.00	$ 760	POSTAGE				
Adminstrative Assistant	8								8	$ 100.00	$ 800					
												MISC				
SUBTOTAL DIRECT LABOR											$ 12,540	subtotal	$ -	subtotal	$ 12,500	$ 25,040

TASK 8.0: LABOR and EXPENSE BREAKDOWN

Task 8.0	Post-Construction Report																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16						24	12	52	$ 247.00	$ 12,844	TRAVEL				
Senior Engineer			60				80		140	$ 182.00	$ 25,480	PER DIEM				
Coastal Engineer III							8		8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II			60				88		148	$ 122.00	$ 18,056	LD TEL/FAX				
Coastal Engineer I			40						40	$ 110.00	$ 4,400	FED EX				
CADD Technician/Designer							120		120	$ 95.00	$ 11,400	POSTAGE				
Adminstrative Assistant	8						120		128	$ 100.00	$ 12,800					
												MISC				
SUBTOTAL DIRECT LABOR											$ 85,996	subtotal	$ -	subtotal	$ -	$ 85,996

TASK 9.0: LABOR and EXPENSE BREAKDOWN

Task 9.0	Physical Monitoring: Immediate Post-Construction															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16		16		20		16	16	84	$ 247.00	$ 20,748	TRAVEL	$ 1,500	Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer			32					16	48	$ 182.00	$ 8,736	PER DIEM	$ 900	Topo-Hydro Surveyor (Profiles)	$ 30,500	
Coastal Engineer III			16		10		32		58	$ 127.00	$ 7,366	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I			40				40		80	$ 110.00	$ 8,800	FED EX				
CADD Technician/Designer			16				32		48	$ 95.00	$ 4,560	POSTAGE				
Adminstrative Assistant	8						24		32	$ 100.00	$ 3,200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 53,410	subtotal	$ 2,400	subtotal	$ 53,000	$ 108,810

TASK 10.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						4	4	16	$ 254.00	$ 4,064	TRAVEL		Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer								2	2	$ 187.00	$ 374	PER DIEM				
Coastal Engineer III							24	8	32	$ 130.00	$ 4,160	REPRODUCTION				
Coastal Engineer II									0	$ 125.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 113.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 97.00	$ 776	POSTAGE				
Adminstrative Assistant	2						4		6	$ 103.00	$ 618					
												MISC				
SUBTOTAL DIRECT LABOR											$ 9,992	subtotal	$ -	subtotal	$ 22,500	$ 32,492

TASK 11.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	24				20		16	24	84	$ 261.00	$ 21,924	TRAVEL	$ 2,000	Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer			32					16	48	$ 192.00	$ 9,216	PER DIEM	$ 1,200	Topo-Hydro Surveyor (Profiles)	$ 30,500	
Coastal Engineer III			40		20		40	24	124	$ 133.00	$ 16,492	REPRODUCTION				
Coastal Engineer II									0	$ 128.00	$ -	LD TEL/FAX				
Coastal Engineer I			60				100		160	$ 116.00	$ 18,560	FED EX				
CADD Technician/Designer							40		40	$ 99.00	$ 3,960	POSTAGE				
Adminstrative Assistant	16						32		48	$ 106.00	$ 5,088					
												MISC				
SUBTOTAL DIRECT LABOR											$ 75,240	subtotal	$ 3,200	subtotal	$ 53,000	$ 131,440

TASK 12.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						4	4	16	$ 268.00	$ 4,288	TRAVEL		Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer								2	2	$ 197.00	$ 394	PER DIEM				
Coastal Engineer III							24	8	32	$ 136.00	$ 4,352	REPRODUCTION				
Coastal Engineer II									0	$ 131.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 119.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 101.00	$ 808	POSTAGE				
Adminstrative Assistant	2						4		6	$ 109.00	$ 654					
												MISC				
SUBTOTAL DIRECT LABOR											$ 10,496	subtotal	$ -	subtotal	$ 22,500	$ 32,996

TASK 13.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	24				20		16	24	84	$ 276.00	$ 23,184	TRAVEL	$ 2,000	Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer			32					16	48	$ 202.00	$ 9,696	PER DIEM	$ 1,200	Topo-Hydro Surveyor (Profiles)	$ 30,500	
Coastal Engineer III			40		20		40	24	124	$ 140.00	$ 17,360	REPRODUCTION				
Coastal Engineer II									0	$ 134.00	$ -	LD TEL/FAX				
Coastal Engineer I			60				100		160	$ 122.00	$ 19,520	FED EX				
CADD Technician/Designer							40		40	$ 104.00	$ 4,160	POSTAGE				
Adminstrative Assistant	16						32		48	$ 112.00	$ 5,376					
												MISC				
SUBTOTAL DIRECT LABOR											$ 79,296	subtotal	$ 3,200	subtotal	$ 53,000	$ 135,496

TASK 14.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						4	4	16	$ 276.00	$ 4,416	TRAVEL		Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer								2	2	$ 202.00	$ 404	PER DIEM				
Coastal Engineer III							24	8	32	$ 140.00	$ 4,480	REPRODUCTION				
Coastal Engineer II									0	$ 134.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 122.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 104.00	$ 832	POSTAGE				
Adminstrative Assistant	2						4		6	$ 112.00	$ 672					
												MISC				
SUBTOTAL DIRECT LABOR											$ 10,804	subtotal	$ -	subtotal	$ 22,500	$ 33,304

TASK 15.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	24				20		16	24	84	$ 284.00	$ 23,856	TRAVEL	$ 2,000	Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer			32					16	48	$ 208.00	$ 9,984	PER DIEM	$ 1,200	Topo-Hydro Surveyor (Profiles)	$ 30,500	
Coastal Engineer III			40		20		40	24	124	$ 144.00	$ 17,856	REPRODUCTION				
Coastal Engineer II									0	$ 138.00	$ -	LD TEL/FAX				
Coastal Engineer I			60				100		160	$ 125.00	$ 20,000	FED EX				
CADD Technician/Designer							40		40	$ 107.00	$ 4,280	POSTAGE				
Adminstrative Assistant	16						32		48	$ 115.00	$ 5,520					
												MISC				
SUBTOTAL DIRECT LABOR											$ 81,496	subtotal	$ 3,200	subtotal	$ 53,000	$ 137,696

TASK 16.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						4	4	16	$ 284.00	$ 4,544	TRAVEL		Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer								2	2	$ 208.00	$ 416	PER DIEM				
Coastal Engineer III							24	8	32	$ 144.00	$ 4,608	REPRODUCTION				
Coastal Engineer II									0	$ 138.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 125.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 107.00	$ 856	POSTAGE				
Adminstrative Assistant	2						4		6	$ 115.00	$ 690					
												MISC				
SUBTOTAL DIRECT LABOR											$ 11,114	subtotal	$ -	subtotal	$ 22,500	$ 33,614

TASK 17.0: LABOR and EXPENSE BREAKDOWN

Task 17.0	Physical Monitoring: 4-Year Post-Construction																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	24				20		16	24	84	$ 292.00	$ 24,528	TRAVEL	$ 2,000	Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer			32					16	48	$ 214.00	$ 10,272	PER DIEM	$ 1,200	Topo-Hydro Surveyor (Profiles)	$ 30,500	
Coastal Engineer III			40		20		40	24	124	$ 148.00	$ 18,352	REPRODUCTION				
Coastal Engineer II									0	$ 142.00	$ -	LD TEL/FAX				
Coastal Engineer I			60				100		160	$ 128.00	$ 20,480	FED EX				
CADD Technician/Designer							40		40	$ 110.00	$ 4,400	POSTAGE				
Adminstrative Assistant	16						32		48	$ 118.00	$ 5,664					
												MISC				
SUBTOTAL DIRECT LABOR											$ 83,696	subtotal	$ 3,200	subtotal	$ 53,000	$ 139,896

TASK 18.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						4	4	16	$ 292.00	$ 4,672	TRAVEL		Topo-Hydro Surveyor (MB)	$ 22,500	
Senior Engineer								2	2	$ 214.00	$ 428	PER DIEM				
Coastal Engineer III							24	8	32	$ 148.00	$ 4,736	REPRODUCTION				
Coastal Engineer II									0	$ 142.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 128.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 110.00	$ 880	POSTAGE				
Adminstrative Assistant	2						4		6	$ 118.00	$ 708					
												MISC				
SUBTOTAL DIRECT LABOR											$ 11,424	subtotal	$ -	subtotal	$ 22,500	$ 33,924

TASK 19.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	24				20		16	24	84	$ 292.00	$ 24,528	TRAVEL	$ 2,000	Topo-Hydro Surveyor (MB)	$ 20,986	
Senior Engineer			32					16	48	$ 214.00	$ 10,272	PER DIEM	$ 1,200	Topo-Hydro Surveyor (Profiles)	$ 28,112	
Coastal Engineer III			40		20		40	24	124	$ 148.00	$ 18,352	REPRODUCTION				
Coastal Engineer II									0	$ 142.00	$ -	LD TEL/FAX				
Coastal Engineer I			60				100		160	$ 128.00	$ 20,480	FED EX				
CADD Technician/Designer							40		40	$ 110.00	$ 4,400	POSTAGE				
Adminstrative Assistant	16						32		48	$ 118.00	$ 5,664					
												MISC				
SUBTOTAL DIRECT LABOR											$ 83,696	subtotal	$ 3,200	subtotal	$ 49,098	$ 135,994

TASK 20.0: LABOR and EXPENSE BREAKDOWN

LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST
Principal	8					20			28	$ 247.00	$ 6,916
Senior Engineer						20			20	$ 182.00	$ 3,640
Coastal Engineer III									0	$ 127.00	$ -
Coastal Engineer II									0	$ 122.00	$ -
Coastal Engineer I									0	$ 110.00	$ -
CADD Technician/Designer									0	$ 95.00	$ -
Adminstrative Assistant	4								4	$ 100.00	$ 400
SUBTOTAL DIRECT LABOR											$ 10,956

Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
ITEM	TOTAL	SERVICE	COST	
TRAVEL		CEG and IDC	$ 192,016	
PER DIEM				
REPRODUCTION				
LD TEL/FAX				
FED EX				
POSTAGE				
MISC				
subtotal	$ -	subtotal	$ 192,016	$ 202,972

TASK 21.0: LABOR and EXPENSE BREAKDOWN

Task 21.0	**Contingency Non-Listed Coral Colony Removal and Relocation (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					4			6	$ 247.00	$ 1,482	TRAVEL		CEG and IDC	$ 41,860	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 3,426	subtotal	$ -	subtotal	$ 41,860	$ 45,286

TASK 22.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		CEG	$ 20,308	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,932	subtotal	$ -	subtotal	$ 20,308	$ 23,240

TASK 23.0: LABOR and EXPENSE BREAKDOWN

Task 23.0	**Non-Listed Coral Relocation Monitoring: Six-Month Post-Relocation Survey**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		CEG	$ 20,308	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,932	subtotal	$ -	subtotal	$ 20,308	$ 23,240

TASK 24.0: LABOR and EXPENSE BREAKDOWN

Task 24.0	**Non-Listed Coral Relocation Monitoring: Year 1 Post-Relocation Survey**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		CEG	$ 20,308	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,932	subtotal	$ -	subtotal	$ 20,308	$ 23,240

TASK 25.0: LABOR and EXPENSE BREAKDOWN

Task 25.0	**Non-Listed Coral Relocation Monitoring: Year 3 Post-Relocation Survey**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		CEG	$ 20,298	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,932	subtotal	$ -	subtotal	$ 20,298	$ 23,230

TASK 26.0: LABOR and EXPENSE BREAKDOWN

Task 26.0	**Listed Coral Species (Acropora Cervicornis): Pre-Construction Survey**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		CEG	$ 22,612	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,932	subtotal	$ -	subtotal	$ 22,612	$ 25,544

TASK 27.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					12			16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 229,924	
Senior Engineer						12			12	$ 182.00	$ 2,184	PER DIEM				
Coastal Engineer III						24			24	$ 127.00	$ 3,048	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 9,384	subtotal	$ -	subtotal	$ 229,924	$ 239,308

TASK 28.0: LABOR and EXPENSE BREAKDOWN

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					4			8	$ 247.00	$ 1,976	TRAVEL		NSU	$ 45,000	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 3,920	subtotal	$ -	subtotal	$ 45,000	$ 48,920

TASK 29.0: LABOR and EXPENSE BREAKDOWN

Task 29.0	**Contingency Listed Coral Fragment Removal and Relocation (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					4			8	$ 247.00	$ 1,976	TRAVEL		NSU	$ 67,500	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 3,920	subtotal	$ -	subtotal	$ 67,500	$ 71,420

TASK 30.0: LABOR and EXPENSE BREAKDOWN

Task 30.0	**Listed Coral Relocation Monitoring: Immediate Post-Relocation Baseline (Time Zero) And One Week Post-Relocation Survey of Colony Transplants and Reference Colonies**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		NSU & CEG	$ 37,760	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						4			4	$ 127.00	$ 508	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,424	subtotal	$ -	subtotal	$ 37,760	$ 40,184

TASK 31.0: LABOR and EXPENSE BREAKDOWN

Task 31.0	**Listed Coral Relocation Monitoring: Three Month Post-Relocation Survey of Colony Transplants and Reference Colonies**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		NSU & CEG	$ 26,290	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						4			4	$ 127.00	$ 508	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,424	subtotal	$ -	subtotal	$ 26,290	$ 28,714

TASK 32.0: LABOR and EXPENSE BREAKDOWN

Task 32.0	**Listed Coral Relocation Monitoring: Six-Month Post-Relocation Survey of Colony Transplants and Reference Colonies**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		NSU & CEG	$ 26,290	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						4			4	$ 127.00	$ 508	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,424	subtotal	$ -	subtotal	$ 26,290	$ 28,714

TASK 33.0: LABOR and EXPENSE BREAKDOWN

Task 33.0	Listed Coral Relocation Monitoring: One-Year Post-Relocation Survey of Colony Transplants and Reference Colonies																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		NSU & CEG	$ 30,656	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,932	subtotal	$ -	subtotal	$ 30,656	$ 33,588

TASK 34.0: LABOR and EXPENSE BREAKDOWN

Task 34.0	**Coral Nursery Management**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					2			6	$ 247.00	$ 1,482	TRAVEL		NSU	$ 41,500	
Senior Engineer						2			2	$ 182.00	$ 364	PER DIEM				
Coastal Engineer III						4			4	$ 127.00	$ 508	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,554	subtotal	$ -	subtotal	$ 41,500	$ 44,054

TASK 35.0: LABOR and EXPENSE BREAKDOWN

Task 35.0	**Outplanting of Acropora Cervicornis Colonies (AW)**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8								8	$ 247.00	$ 1,976	TRAVEL		NSU	$ 55,374	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,120	subtotal	$ -	subtotal	$ 55,374	$ 59,494

TASK 36.0: LABOR and EXPENSE BREAKDOWN

Task 36.0	Pre-Construction Baseline Survey of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8								8	$ 247.00	$ 1,976	TRAVEL		CEG (Task 36.1); CEG/NSU Task 36.2	$ 30,118	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM		CEG & NSU (Task 36.2)	$ 93,114	
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,120	subtotal	$ -	subtotal	$ 123,232	$ 127,352

TASK 37.0: LABOR and EXPENSE BREAKDOWN

Task 37.0	Pre-Construction Survey of Listed Corals on Nearshore Hardbottom Within the Turbidity Mixing Zone																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8								8	$ 247.00	$ 1,976	TRAVEL		NSU	$ 13,000	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,120	subtotal	$ -	subtotal	$ 13,000	$ 17,120

TASK 38.0: LABOR and EXPENSE BREAKDOWN

Task 38.0	**Pre-Construction Survey of Sedimentation at Listed Coral Sites Within the Turbidity Mixing Zone**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8								8	$ 247.00	$ 1,976	TRAVEL		NSU	$ 13,000	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,120	subtotal	$ -	subtotal	$ 13,000	$ 17,120

TASK 39.0: LABOR and EXPENSE BREAKDOWN

Task 39.0	**Pre-Construction Seagrass Survey Within the Turbidity Mixing Zone**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2								2	$ 247.00	$ 494	TRAVEL		CEG	$ 14,128	
Senior Engineer						2			2	$ 182.00	$ 364	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	1								1	$ 100.00	$ 100					
												MISC				
SUBTOTAL DIRECT LABOR											$ 1,974	subtotal	$ -	subtotal	$ 14,128	$ 16,102

TASK 40.0: LABOR and EXPENSE BREAKDOWN

Task 40.0	During-Construction Sedimentation Surveys of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone (Max 35 weeks)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8					16			24	$ 247.00	$ 5,928	TRAVEL		CEG	$ 355,659	
Senior Engineer						35			35	$ 182.00	$ 6,370	PER DIEM				
Coastal Engineer III						70			70	$ 127.00	$ 8,890	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 21,588	subtotal	$ -	subtotal	$ 355,659	$ 377,247

TASK 41.0: LABOR and EXPENSE BREAKDOWN

Task 41.0	Twenty (20) Week Contingency During-Construction Monitoring if Sand Trap Excavation Extends Beyond 35 Weeks (AW)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					20			24	$ 247.00	$ 5,928	TRAVEL		CEG	$ 208,148	
Senior Engineer						20			20	$ 182.00	$ 3,640	PER DIEM				
Coastal Engineer III						40			40	$ 127.00	$ 5,080	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 15,048	subtotal	$ -	subtotal	$ 208,148	$ 223,196

TASK 42.0: LABOR and EXPENSE BREAKDOWN

Task 42.0	**Contingency During-Construction Monitoring Based on Sedimentation Triggers (20 Weeks Assumed) (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8					20			28	$ 247.00	$ 6,916	TRAVEL		CEG (Task 42.1)	$ 104,312	
Senior Engineer						40			40	$ 182.00	$ 7,280	PER DIEM		CEG (Task 42.2)	$ 93,272	
Coastal Engineer III						40			40	$ 127.00	$ 5,080	REPRODUCTION		CEG (Task 42.3)	$ 93,272	
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX		CEG (Task 42.4)	$ 70,798	
Coastal Engineer I									0	$ 110.00	$ -	FED EX		CEG (Task 42.5)	$ 34,834	
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE		CEG (Task 42.6)	$ 48,195	
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 19,676	subtotal	$ -	subtotal	$ 444,683	$ 464,359

TASK 43.0: LABOR and EXPENSE BREAKDOWN

Task 43.0	**Immediate Post-Construction Monitoring of Nearshore Hardbottom Within / Adjacent to the Turbidity Mixing Zone**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU	$ 80,681	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 5,108	subtotal	$ -	subtotal	$ 80,681	$ 85,789

TASK 44.0: LABOR and EXPENSE BREAKDOWN

Task 44.0	**Immediate Post-Construction Survey of Seagrass Habitats Within the Turbidity Mixing Zone**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	2					2			4	$ 247.00	$ 988	TRAVEL		CEG	$ 14,128	
Senior Engineer						2			2	$ 182.00	$ 364	PER DIEM				
Coastal Engineer III						4			4	$ 127.00	$ 508	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,060	subtotal	$ -	subtotal	$ 14,128	$ 16,188

TASK 45.0: LABOR and EXPENSE BREAKDOWN

Task 45.0	**Contingency Immediate Post-Construction Monitoring and Data Analyses Based on Sedimentation Impacts (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU (Task 45.1)	$ 25,632	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM		CEG & NSU (Task 45.2)	$ 19,269	
Coastal Engineer III						8			8	$ 127.00	$ 1,016	REPRODUCTION		CEG & NSU (Task 45.3)	$ 14,442	
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX		CEG & NSU (Task 45.4)	$ 53,674	
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 5,108	subtotal	$ -	subtotal	$ 113,017	$ 118,125

TASK 46.0: LABOR and EXPENSE BREAKDOWN

Task 46.0	**Immediate Post-Construction Biological Monitoring Report - Nearshore Hardbottom**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG	$ 45,064	
Senior Engineer								4	4	$ 182.00	$ 728	PER DIEM				
Coastal Engineer III								16	16	$ 127.00	$ 2,032	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 6,124	subtotal	$ -	subtotal	$ 45,064	$ 51,188

TASK 47.0: LABOR and EXPENSE BREAKDOWN

Task 47.0	**Immediate Post-Construction Surveys of Listed Coral Sites Within the Turbidity Mixing Zone**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					4			8	$ 247.00	$ 1,976	TRAVEL		NSU (Task 47.1)	$ 25,760	
Senior Engineer								2	2	$ 182.00	$ 364	PER DIEM		NSU (Task 47.2)	$ 13,000	
Coastal Engineer III								8	8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 3,556	subtotal	$ -	subtotal	$ 38,760	$ 42,316

TASK 48.0: LABOR and EXPENSE BREAKDOWN

Task 48.0	**0.3-Acre Offshore Artificial Reef Mitigation Site Surveys**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					2			6	$ 247.00	$ 1,482	TRAVEL		CEG	$ 25,082	
Senior Engineer						2			2	$ 182.00	$ 364	PER DIEM				
Coastal Engineer III								8	8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 3,062	subtotal	$ -	subtotal	$ 25,082	$ 28,144

TASK 49.0: LABOR and EXPENSE BREAKDOWN

Task 49.0 **Mitigation Artificial Reef Construction Supervision**

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16					4		8	28	$ 247.00	$ 6,916	TRAVEL	$ 1,500	CEG	$ 49,132	
Senior Engineer						4			4	$ 182.00	$ 728	PER DIEM	$ 900			
Coastal Engineer III					20			24	44	$ 127.00	$ 5,588	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I					10			12	22	$ 110.00	$ 2,420	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	8								8	$ 100.00	$ 800					
												MISC				
SUBTOTAL DIRECT LABOR											$ 16,452	subtotal	$ 2,400	subtotal	$ 49,132	$ 67,984

TASK 50.0: LABOR and EXPENSE BREAKDOWN

Task 50.0	As-Built Immediate Post-Construction Surveys of the 0.3-Acre And 0.2-Acre Artificial Reef Coral Nurseries															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					4			8	$ 247.00	$ 1,976	TRAVEL		CEG	$ 15,346	
Senior Engineer								2	2	$ 182.00	$ 364	PER DIEM				
Coastal Engineer III								4	4	$ 127.00	$ 508	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 3,248	subtotal	$ -	subtotal	$ 15,346	$ 18,594

TASK 51.0: LABOR and EXPENSE BREAKDOWN

Task 51.0	**During Construction Mitigation Surface Rubble Inspections**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8			20				8	36	$ 247.00	$ 8,892	TRAVEL	$ 2,000	CEG	$ 35,506	
Senior Engineer									0	$ 182.00	$ -	PER DIEM	$ 1,200			
Coastal Engineer III								16	16	$ 127.00	$ 2,032	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I				20					20	$ 110.00	$ 2,200	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 13,524	subtotal	$ 3,200	subtotal	$ 35,506	$ 52,230

TASK 52.0: LABOR and EXPENSE BREAKDOWN

Task 52.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 1 Post-Construction Benthic Habitat Map															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL	$ -	CEG & NSU	$ 33,896	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III						8		8	16	$ 127.00	$ 2,032	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 5,196	subtotal	$ -	subtotal	$ 33,896	$ 39,092

TASK 53.0: LABOR and EXPENSE BREAKDOWN

Task 53.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 2 Post-Construction Benthic Habitat Map															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU	$ 33,896	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III						8		8	16	$ 127.00	$ 2,032	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 5,196	subtotal	$ -	subtotal	$ 33,896	$ 39,092

TASK 54.0: LABOR and EXPENSE BREAKDOWN

Task 54.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 3 Post-Construction Benthic Habitat Map															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU	$ 119,199	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III						8		8	16	$ 127.00	$ 2,032	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 5,196	subtotal	$ -	subtotal	$ 119,199	$ 124,395

TASK 55.0: LABOR and EXPENSE BREAKDOWN

Task 55.0	Mitigation Success Monitoring - Creation of Rubble / Colonized Pavement from Clearing/Rubble Removal- Year 5 Post-Construction Benthic Habitat Map (AW)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU	$ 106,027	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III						8		8	16	$ 127.00	$ 2,032	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 5,196	subtotal	$ -	subtotal	$ 106,027	$ 111,223

TASK 56.0: LABOR and EXPENSE BREAKDOWN

Task 56.0	**Contingency Aerial Photography for Mitigation Success Monitoring (AW) - Years 1, 2, 3, and 5**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					4			8	$ 247.00	$ 1,976	TRAVEL		CEG	$ 19,808	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III						4		8	12	$ 127.00	$ 1,524	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 3,900	subtotal	$ -	subtotal	$ 19,808	$ 23,708

TASK 57.0: LABOR and EXPENSE BREAKDOWN

Task 57.0	**Baseline Coral Harvest/Relocation, Monitoring and Nursery Maintenance**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU (Task 57.1)	$ 37,204	
Senior Engineer								4	4	$ 182.00	$ 728	PER DIEM		CEG & NSU (Task 57.2)	$ 26,472	
Coastal Engineer III						8		16	24	$ 127.00	$ 3,048	REPRODUCTION		CEG & NSU (Task 57.3)	$ 3,000	
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 7,140	subtotal	$ -	subtotal	$ 66,676	$ 73,816

TASK 58.0: LABOR and EXPENSE BREAKDOWN

Task 58.0	**Year 1 Coral Harvest/Relocation, Monitoring and Nursery Maintenance**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU (Task 58.1)	$ 37,204	
Senior Engineer								4	4	$ 182.00	$ 728	PER DIEM		CEG & NSU (Task 58.2)	$ 30,322	
Coastal Engineer III						8		16	24	$ 127.00	$ 3,048	REPRODUCTION		CEG & NSU (Task 58.3)	$ 3,000	
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX		CEG & NSU (Task 58.4)	$ 17,316	
Coastal Engineer I									0	$ 110.00	$ -	FED EX		CEG & NSU (Task 58.5)	$ 1,617	
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE		CEG & NSU (Task 58.6)	$ 1,667	
Adminstrative Assistant	4								4	$ 100.00	$ 400			CEG & NSU (Task 58.7)	$ 1,667	
												MISC				
SUBTOTAL DIRECT LABOR											$ 7,140	subtotal	$ -	subtotal	$ 92,793	$ 99,933

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TASK 59.0: LABOR and EXPENSE BREAKDOWN

Task 59.0	**Year 2 Coral Harvest/Relocation, Monitoring and Nursery Maintenance**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU (Task 59.1)	$ 37,204	
Senior Engineer								4	4	$ 182.00	$ 728	PER DIEM		CEG & NSU (Task 59.2)	$ 30,322	
Coastal Engineer III						8		16	24	$ 127.00	$ 3,048	REPRODUCTION		CEG & NSU (Task 59.3)	$ 3,000	
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX		CEG & NSU (Task 59.4)	$ 16,991	
Coastal Engineer I									0	$ 110.00	$ -	FED EX		CEG & NSU (Task 59.5)	$ 1,617	
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE		CEG & NSU (Task 59.6)	$ 1,667	
Adminstrative Assistant	4								4	$ 100.00	$ 400			CEG & NSU (Task 59.7)	$ 1,667	
												MISC				
SUBTOTAL DIRECT LABOR											$ 7,140	subtotal	$ -	subtotal	$ 92,468	$ 99,608

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TASK 59.0: LABOR and EXPENSE BREAKDOWN

	$ 1,860.20
	$ 1,516.10
	$ 150.00
	$ 849.55
	$ 80.85
	$ 83.35
	$ 83.35
	$ 4,623.40

TASK 60.0: LABOR and EXPENSE BREAKDOWN

Task 60.0	**Year 3 Coral Harvest/Relocation, Monitoring and Nursery Maintenance**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	4					8			12	$ 247.00	$ 2,964	TRAVEL		CEG & NSU (Task 60.1)	$ 37,204	
Senior Engineer								4	4	$ 182.00	$ 728	PER DIEM		CEG & NSU (Task 60.2)	$ 30,222	
Coastal Engineer III						8		16	24	$ 127.00	$ 3,048	REPRODUCTION		CEG & NSU (Task 60.3)	$ 5,000	
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX		CEG & NSU (Task 60.4)	$ 20,286	
Coastal Engineer I									0	$ 110.00	$ -	FED EX		CEG & NSU (Task 60.5)	$ 6,728	
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE		CEG & NSU (Task 60.6)	$ 1,667	
Adminstrative Assistant	4								4	$ 100.00	$ 400			CEG & NSU (Task 60.7)	$ 1,667	
												MISC				
SUBTOTAL DIRECT LABOR											$ 7,140	subtotal	$ -	subtotal	$ 102,774	$ 109,914

TASK 61.0: LABOR and EXPENSE BREAKDOWN

Task 61.0	**Planning, Engineering, Design, and Permit Management (AW)**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16	40			20		16	16	108	$ 247.00	$ 26,676	TRAVEL	$ 2,000			
Senior Engineer		40					24		64	$ 182.00	$ 11,648	PER DIEM	$ 1,200			
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II		120			20		40		180	$ 122.00	$ 21,960	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer							16		16	$ 95.00	$ 1,520	POSTAGE				
Adminstrative Assistant	8						8		16	$ 100.00	$ 1,600					
												MISC				
SUBTOTAL DIRECT LABOR											$ 63,404	subtotal	$ 3,200	subtotal	$ -	$ 66,604

TASK 62.0: LABOR and EXPENSE BREAKDOWN

Task 62.0	**Geotechnical Investigation (Optional) (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						8	32	48	$ 247.00	$ 11,856	TRAVEL	$ 1,500	Vibracores/Geotech	$ 100,000	
Senior Engineer		8						8	16	$ 182.00	$ 2,912	PER DIEM	$ 1,200			
Coastal Engineer III		8					40		48	$ 127.00	$ 6,096	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I		24			32		32		88	$ 110.00	$ 9,680	FED EX				
CADD Technician/Designer							16		16	$ 95.00	$ 1,520	POSTAGE				
Adminstrative Assistant	4						8		12	$ 100.00	$ 1,200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 33,264	subtotal	$ 2,700	subtotal	$ 100,000	$ 135,964

TASK 63.0: LABOR and EXPENSE BREAKDOWN

Task 63.0 **Final Design and Plans and Specifications (AW)**

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16						80	16	112	$ 247.00	$ 27,664	TRAVEL	$ 2,000			
Senior Engineer		16		20			120		156	$ 182.00	$ 28,392	PER DIEM	$ 1,200			
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II		40		20			120		180	$ 122.00	$ 21,960	LD TEL/FAX				
Coastal Engineer I		40					8		48	$ 110.00	$ 5,280	FED EX				
CADD Technician/Designer							8		8	$ 95.00	$ 760	POSTAGE				
Adminstrative Assistant	8						8		16	$ 100.00	$ 1,600					
												MISC				
SUBTOTAL DIRECT LABOR											$ 85,656	subtotal	$ 3,200	subtotal	$ -	$ 88,856

TASK 64.0: LABOR and EXPENSE BREAKDOWN

Task 64.0	**Bid Support (AW)**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	32			20		60	24		136	$ 247.00	$ 33,592	TRAVEL	$ 2,000			
Senior Engineer						24	16		40	$ 182.00	$ 7,280	PER DIEM	$ 1,200			
Coastal Engineer III							8		8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II				20					20	$ 122.00	$ 2,440	LD TEL/FAX				
Coastal Engineer I						32	24		56	$ 110.00	$ 6,160	FED EX				
CADD Technician/Designer							16		16	$ 95.00	$ 1,520	POSTAGE				
Adminstrative Assistant	16						16		32	$ 100.00	$ 3,200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 55,208	subtotal	$ 3,200	subtotal	$ -	$ 58,408

TASK 65.0: LABOR and EXPENSE BREAKDOWN

Task 65.1 **Construction Contract Adminstration (12 Weeks)**

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	PRE-CON COORD	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	48	40	0	0	0	0	0	48	136	$ 247.00	$ 33,592	TRAVEL	$ 2,000			
Senior Engineer	0	80	48	0	0	24	0	48	200	$ 182.00	$ 36,400	PER DIEM	$ 1,500			
Coastal Engineer III	0	0	0	0	0	0	0	96	96	$ 127.00	$ 12,192	REPRODUCTION				
Coastal Engineer II	0	40	0	0	0	192	24	0	256	$ 122.00	$ 31,232	LD TEL/FAX				
Coastal Engineer I	0	0	96	0	0	0	0	0	96	$ 110.00	$ 10,560	FED EX				
CADD Technician/Designer	0	0	0	0	0	0	0	0	0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	48	0	0	0	0	0	0	0	48	$ 100.00	$ 4,800					
												MISC				
SUBTOTAL DIRECT LABOR											$ 128,776	subtotal	$ 3,500	subtotal	$ -	$ 132,276

Task 65.2 **Construction Observation (12 Weeks)**

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	START UP PERIOD	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	48	0	40	96	0	48	0	48	280	$ 247.00	$ 69,160	TRAVEL	$ 15,000	Field Services	$ 79,800	
Senior Engineer	0	0	40	48	0	24	24	48	184	$ 182.00	$ 33,488	PER DIEM	$ 9,000			
Coastal Engineer III	0	0	0	0	0	0	0	0	0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II	0	0	40	96	0	0	48	0	184	$ 122.00	$ 22,448	LD TEL/FAX				
Coastal Engineer I	0	0	0	0	0	48	0	0	48	$ 110.00	$ 5,280	FED EX				
CADD Technician/Designer	0	0	0	0	0	0	24	0	24	$ 95.00	$ 2,280	POSTAGE				
Adminstrative Assistant	48	0	0	0	0	0	24	0	72	$ 100.00	$ 7,200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 139,856	subtotal	$ 24,000	subtotal	$ 79,800	$ 243,656

TASK 66.0: LABOR and EXPENSE BREAKDOWN

Task 66.1 **Construction Contract Adminstration (4 Weeks)**

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16							16	32	$ 247.00	$ 7,904	TRAVEL				
Senior Engineer			16			8		16	40	$ 182.00	$ 7,280	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II							8		8	$ 122.00	$ 976	LD TEL/FAX				
Coastal Engineer I			32						32	$ 110.00	$ 3,520	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	16								16	$ 100.00	$ 1,600					
												MISC				
SUBTOTAL DIRECT LABOR											$ 21,280	subtotal	$ -	subtotal	$ -	$ 21,280

Task 66.2 **Construction Observation (4 Weeks)**

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16			32		8		16	72	$ 247.00	$ 17,784	TRAVEL	$ 5,000	Field Services	$ 26,600	
Senior Engineer				16		8	8	16	48	$ 182.00	$ 8,736	PER DIEM	$ 3,000			
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II				32			16		48	$ 122.00	$ 5,856	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer							8		8	$ 95.00	$ 760	POSTAGE				
Adminstrative Assistant	16						8		24	$ 100.00	$ 2,400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 35,536	subtotal	$ 8,000	subtotal	$ 26,600	$ 70,136

TASK 67.0: LABOR and EXPENSE BREAKDOWN

Task 67.0	**Water Quality Monitoring (12 Weeks) (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	48							48	96	$ 247.00	$ 23,712	TRAVEL		Water quality monitor	$ 294,000	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I								144	144	$ 110.00	$ 15,840	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	48								48	$ 100.00	$ 4,800					
												Contingency (4 add weeks)	$ 14,784	Contingency (4 add weeks)	$ 98,000	
SUBTOTAL DIRECT LABOR											$ 44,352	subtotal	$ 14,784	subtotal	$ 392,000	$ 451,136

TASK 68.0: LABOR and EXPENSE BREAKDOWN

Task 68.0	**Sediment QA/QC Monitoring and Compliance (AW)**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8						4	8	20	$ 247.00	$ 4,940	TRAVEL	$ 2,500	Geotech	$ 18,500	
Senior Engineer				16					16	$ 182.00	$ 2,912	PER DIEM	$ 1,500			
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II			16	24			32	4	76	$ 122.00	$ 9,272	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer							16		16	$ 95.00	$ 1,520	POSTAGE				
Adminstrative Assistant	4						8		12	$ 100.00	$ 1,200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 19,844	subtotal	$ 4,000	subtotal	$ 18,500	$ 42,344

TASK 69.0: LABOR and EXPENSE BREAKDOWN

Task 69.0 **Post-Construction Report (AW)**

DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16						24	12	52	$ 247.00	$ 12,844	TRAVEL				
Senior Engineer			60				40		100	$ 182.00	$ 18,200	PER DIEM				
Coastal Engineer III							8		8	$ 127.00	$ 1,016	REPRODUCTION				
Coastal Engineer II			60				40		100	$ 122.00	$ 12,200	LD TEL/FAX				
Coastal Engineer I			40				120		160	$ 110.00	$ 17,600	FED EX				
CADD Technician/Designer							80		80	$ 95.00	$ 7,600	POSTAGE				
Adminstrative Assistant	8						80		88	$ 100.00	$ 8,800					
												MISC				
SUBTOTAL DIRECT LABOR											$ 78,260	subtotal	$ -	subtotal	$ -	$ 78,260

TASK 70.0: LABOR and EXPENSE BREAKDOWN

Task 70.0	**Permanent Monitoring Station Establishment and Baseline Hardbottom Monitoring- Sand Trap Maintenance Dredging Mixing Zone (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	8							2	10	$ 247.00	$ 2,470	TRAVEL		CEG	$ 49,018	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	2								2	$ 100.00	$ 200					
												MISC				
SUBTOTAL DIRECT LABOR											$ 2,670	subtotal	$ -	subtotal	$ 49,018	$ 51,688

TASK 71.0: LABOR and EXPENSE BREAKDOWN

Task 71.0	**Weekly During-Construction Hardbottom Surveys During the First Sand Trap Maintenance Dredging Event (12 Weeks) (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	24								24	$ 247.00	$ 5,928	TRAVEL		CEG	$ 84,450	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I						12			12	$ 110.00	$ 1,320	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	8								8	$ 100.00	$ 800					
												MISC				
SUBTOTAL DIRECT LABOR											$ 8,048	subtotal	$ -	subtotal	$ 84,450	$ 92,498

TASK 72.0: LABOR and EXPENSE BREAKDOWN

Task 72.0	**Contingency During-Construction Sedimentation Triggered Monitoring During the First Sand Trap Maintenance Dredging Event (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 49,476	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 49,476	$ 53,828

TASK 73.0: LABOR and EXPENSE BREAKDOWN

Task 73.0	**Immediate Post-Construction Hardbottom Monitoring in the Turbidity Mixing Zone- First Sand Trap Maintenance Dredging Event (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 50,904	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 50,904	$ 55,256

TASK 74.0: LABOR and EXPENSE BREAKDOWN

Task 74.0	**Immediate Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 69,444	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 69,444	$ 73,796

TASK 75.0: LABOR and EXPENSE BREAKDOWN

Task 75.0	**Immediate Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 38,216	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 38,216	$ 42,568

TASK 76.0: LABOR and EXPENSE BREAKDOWN

Task 76.0	Year 1 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 69,444	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 69,444	$ 73,796

TASK 77.0: LABOR and EXPENSE BREAKDOWN

Task 77.0	Year 1 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 31,240	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 31,240	$ 35,592

TASK 78.0: LABOR and EXPENSE BREAKDOWN

Task 78.0	Year 2 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 69,444	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 69,444	$ 73,796

TASK 79.0: LABOR and EXPENSE BREAKDOWN

Task 79.0	**Year 2 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)**																
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 31,840	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 31,840	$ 36,192

TASK 80.0: LABOR and EXPENSE BREAKDOWN

Task 80.0	**Year 3 Post-Construction Hardbottom Monitoring – Beach Fill Placement Following the First Maintenance Dredging Event (AW)**															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 69,444	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 69,444	$ 73,796

TASK 81.0: LABOR and EXPENSE BREAKDOWN

Task 81.0	Year 3 Post-Construction Biological Monitoring Report - First Sand Trap Maintenance Dredging Event (AW)															
DIRECT LABOR												Direct Costs		OUTSIDE SVS/SUB-CONTRACTORS		TOTAL
LABOR CATEGORY	ADMIN/ MGMT	ENGR/ DESIGN	ANALYSIS/ MODELING	FIELD WORK	TRAVEL	LIASON	REPORT PREP	QA/QC	TOTAL HOURS	RATE	COST	ITEM	TOTAL	SERVICE	COST	
Principal	16								16	$ 247.00	$ 3,952	TRAVEL		CEG	$ 36,432	
Senior Engineer									0	$ 182.00	$ -	PER DIEM				
Coastal Engineer III									0	$ 127.00	$ -	REPRODUCTION				
Coastal Engineer II									0	$ 122.00	$ -	LD TEL/FAX				
Coastal Engineer I									0	$ 110.00	$ -	FED EX				
CADD Technician/Designer									0	$ 95.00	$ -	POSTAGE				
Adminstrative Assistant	4								4	$ 100.00	$ 400					
												MISC				
SUBTOTAL DIRECT LABOR											$ 4,352	subtotal	$ -	subtotal	$ 36,432	$ 40,784