

Environmental Management Plan

(Fifth Submittal)

Briland Residences and Marina (Formally Known as Harbour Island Marina) Harbour Island, The Bahamas



Prepared for:

4M Harbour Island, Ltd.
P.O. Box EL 27217
Harbour Island, The Bahamas

Prepared by:

Innovative Solutions Group
26 St. Albans Drive Cable Beach E.
Nassau, Bahamas CB 11492

For Submittal to:

The Ministry of the Environment and Housing
The Bahamas Environment, Science and Technology (BEST) Commission

July 2019



INNOVATIONS SOLUTIONS GROUP
ENVIRONMENTAL CONSULTANTS & PROFESSIONAL
ENGINEERS
WWW.SOLUTIONSGROUP.WEBS.COM

July 2019

Attn: The Director
Bahamas Environment Science and Technology Commission
P.O. Box N-
7132 Charlotte
House Nassau,
Bahamas

Dear
Sir/Madam,

Please find enclosed with this cover letter a copy of the revised Environmental Management Plan (EMP), for the Briland Residences and Marina (BR&M) development. As mentioned on July 25th in a brief meeting with the Director and Senior Officer of the Best Commission, the name "4M Harbour Island Marina" and "BR&M" are synonymous with each other. However the developer has decided to use "BR&M" to refer to the overall development. I have enclosed with this package a copy of the revised EMP, along with appropriate responses to the BEST Commission letters dated July 18, 2019 in Chapter 11.0.

We look forward to your response on the revised EMP document, and hope that we can move forward on the relevant project components that are currently still outstanding.

Should you have any questions regarding the submission, please do not hesitate to contact me at your earliest convenience.

Yours Respectfully


Franklyn Hall P.Eng., IEng

Principal (Innovative Solutions Group)

Mobile: 242-5565135 – Landline: 242-6770818

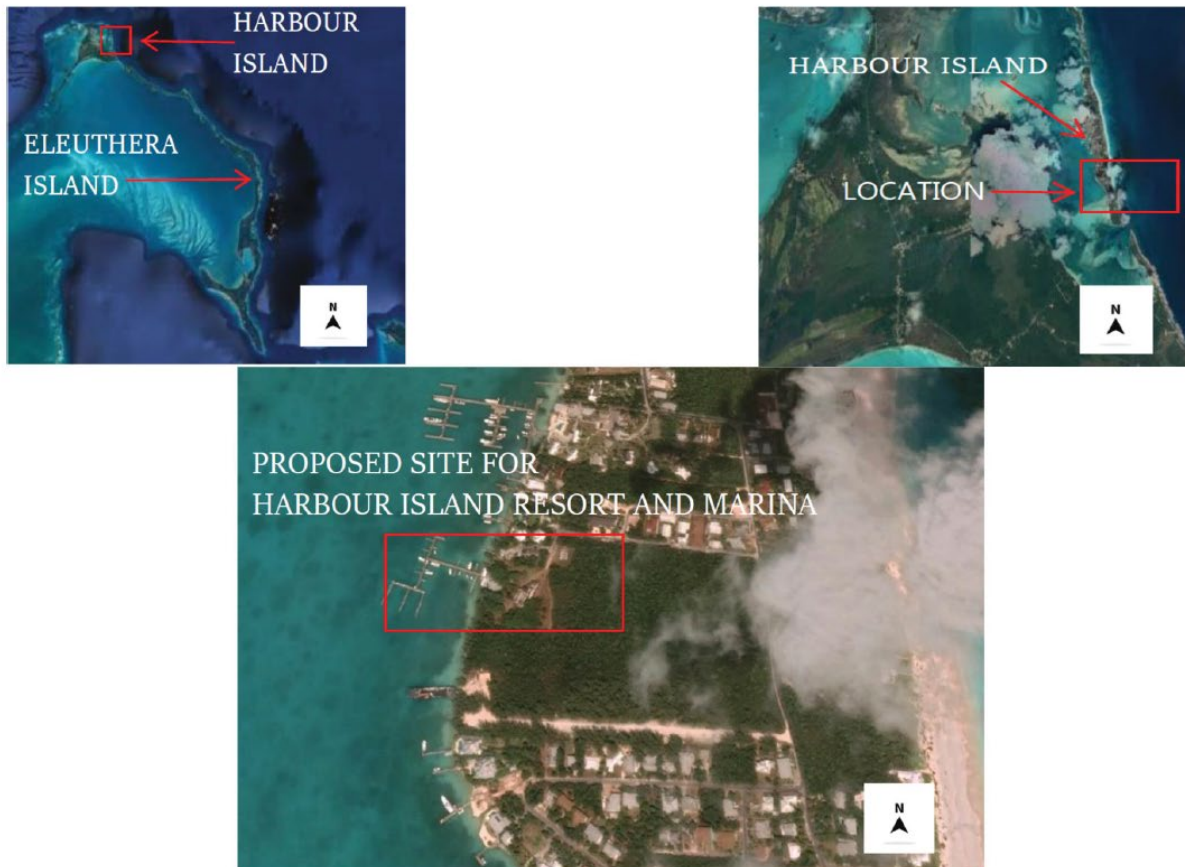
TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1
<hr/>	
1.0 MARINA STANDARDS / PROTOCOLS AND MANAGEMENT	MS-1
<hr/>	
2.0 DREDGING OVERVIEW	D-1
<hr/>	
3.0 GENERAL EXCAVATION AND FILL REQUIREMENTS	GE-1
<hr/>	
4.0 EXCAVATION AND FILL TURBIDITY	E-1
<hr/>	
5.0 RECLAIMED LAND / FILL	RL-1
<hr/>	
6.0 CORAL RELOCATION PLAN	CR-1
<hr/>	
7.0 4M HARBOUR ISLAND LOCAL TEAM AND RESPONSIBILITIES	HI-1
<hr/>	
8.0 WORK PLAN AND COST ESTIMATES	WP-1
<hr/>	
9.0 DEMOLITION PLAN	D-1
<hr/>	
10.0 SEABED LEASE	SL-1
<hr/>	
11.0 JULY 18, 2019 LETTER WITH RESPONSES	LR-1
<hr/>	
12.0 PROJECT SCHEDULE	PS-1
<hr/>	
APPENDIX A: TURBIDITY MANAGEMENT PLAN	
APPENDIX B: PROJECT PERMITS AND DOCUMENTS	
APPENDIX C: SPILL PREVENTION / HURRICANE AND EMERGENCY ACTION PLAN	
APPENDIX D: FERTILIZATION / PESTICIDE MANAGEMENT PLAN AND VECTOR CONTROL MANAGEMENT	
APPENDIX E: STORMWATER, INFRASTRUCTURE, DRAINAGE AND ROADWAYS MANAGEMENT	

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

4M Harbour Island Ltd has acquired 5.561 Acres (originally purchased with an additional 21.4 Acres recently purchased for a total of 21.4 Acres); a site located near the southern end of Harbour Island. The WGS approximate coordinates of the location is N 2,820,242 E 335,609 which is inclusive of a 39-slip marina for the proposed Briland Residences and Marina (BR&M). 4M Harbour Island Ltd. has a concept in its intent to beautify the natural ecosystem, preserving and restoring cultural heritage sites by sensitive sustainable approaches to further positively impacting the economy of beautiful Harbour Island and the main island of Eleuthera.



Marina Basin Excavation and Construction

This project proposes to excavate in designated areas of the seabed leased 11.924 acres site and construct a marina facility and residence villa sites. This facility is designed to accommodate a 39-slip marina and resort (BR&M). Dredging Operations Activity and Planned Mitigation Action is strategically planned for fill operational requirements during excavation, this process allows the conformity to procedures on all water quality standards. Turbidity control and monitoring program will be implemented before, during, and following the completion of all excavation and fill activities.

The intent of the Marina Operational Phase Standards set forth by 4M Harbour Island Ltd. is to address the environmental baseline or ecosystem that encompasses all socio-economic, cultural, existing physical-chemical, waste management strategies and pollution and biological (natural) components or all things related to the built environment.

These aspects are:

- Marina Management
- Emergency Response/Hurricane Preparedness
- Petroleum/Hazardous Spill Recovery
- Fuel Waste Management
- Boat Cleaning
- Biological Resources
- Solid Waste

A Mitigation Plan has been developed to minimize and mitigate impacts on stony corals growing on the existing marina structure and ironshore within the Project footprint.

Hurricane Preparedness Plan

The Operational team has an emergency action plan to respond to this type of potential natural adverse impact. Various scenarios of hurricanes, waves, water level setups, locally generated waves, and sea level rise as the entire archipelago sits in the Hurricane Belt of the Atlantic Ocean. Marine Environmental Assessment, tidal data and current flow speeds were incorporated into project design.

Coral Relocation Plan

The profile of the marine and terrestrial ecology which consists of stony corals growing on the existing marina structure and ironshore prepared by biologist within the Project footprint. As noted, coral colonization within the dredge area is minimal, approximately less than 1%, and limited to isolated colonies of Finger Coral. Prior to dredging operations, those corals identified to be in danger of being destroyed will be relocated.

Work Plan and Cost Estimates

The entire 4M Harbour Island Ltd team will be involved in evaluating the project. Suggested timelines have been recommended by the environmental project manager, to accommodate the projected timeline Gantt charts schedules shown in Work Plan from the mobilization date, dredging, infrastructure works and the demolition process. The technical, financial feasibility and the implementation plans are shown in Cost Estimate summary and basic facts.

Demolition Plan

Waste management and preservation will be carried out in the most efficient environmentally safe way as possible. Any old buildings on the site will first be assessed to see if it bears any archaeological significance, before developing a plan to demolish or alter the structure. Where necessary, demolition activity will involve the use of heavy-duty equipment and machinery to ensure that all debris are removed properly, and transported to the designated solid waste disposal site, in accordance with DEHS.

General Comments and Turbidity Monitoring Plan

4M Harbour Island Ltd. believes in quality, quantity assurance and transparency and will continue to engage the public and stakeholders of interest like Bahamian artisan shops, watersport entrepreneurs and overall local Harbour Islanders. For turbidity monitoring, see guidelines in **Appendix A**). Turbidity monitoring is expected to be done in accordance with the guidelines set forth in **Appendix A**, which complies with the environmental standards and guidelines of the Bahamas along with the recommendations of BEST.

EXECUTIVE SUMMARY

The 4M Harbour Island Ltd. team will continue ongoing communications with the following parties within their respective interests listed below:

- The Bahamas Environment Science and Technology Commission.
- Department of Physical Planning
- Lands and survey Department
- The Ministry of Public Works
- The Water and Sewerage Corporation
- Bahamas Power and Light (BPL)
- Cable Bahamas
- BTC
- The National Emergency Management Agency (NEMA)
- Bahamas National Trust
- Department of Agriculture and Marine Resources
- Port Control Department
- The Department of Environmental Health
- The Ministry of Tourism
- The Bahamas Investment Authority

1.0: MARINA STANDARDS / PROTOCOLS AND MANAGEMENT

MARINA STANDARDS / PROTOCOLS AND MANAGEMENT

1.1 Marina Basin Excavation and Construction Methodology

The purpose of the Environmental Management Plan (EMP) is to provide a concise and thorough summary of the environmental commitments and agreements achieved between the Developer and Government through the EIA process. This plan is written as a guideline for the practices that will continue to be applied to mitigate potential environmental impacts. The EMP will be kept onsite at all times and will be implemented and managed by the Environmental Manager (EM) and staff that will be engaged for the duration of the project. The contractors responsible for each aspect of project construction and operations will be required to review the document and comply with all environmental regulations and guidelines.

MARINA STANDARDS / PROTOCOLS AND MANAGEMENT

1.2 Marina Standards/Protocols and Management

The following standards have been adapted from the Florida Clean Marina Program and will be adopted and implemented by BR&M. These Best Management Practices (BMPs) provide management standards and protocols for the following aspects of marina operation:

- Marina Management
- Emergency Response
- Petroleum Spill Recovery
- Fuel Waste Management
- Boat Cleaning
- Biological Resources
- Solid waste

1.3 General Standards

1.3.1 Marina Management

Employees will be trained in the use of containment measures and will review emergency response plans and procedures with all marina staff at least twice annually. Local authorities will be invited to review emergency response procedures at the marina. The Marina Manager or Harbor Master will determine who will address boaters and contractors who are polluting. Staff will be encouraged to look for and immediately halt the following:

- Colored plumes in the water resulting from hull cleaning.
- Bilge water discharge with sheen.
- Uncontained sanding, painting, varnishing or cleaning.
- Maintenance debris being washed in the water.
- Sewage discharges in the marina.
- Use of environmentally harmful cleaning products.

In the event that a patron does not comply with marina environmental standards, the guest will be informed of the violation and provided an explanation to why the activity is harmful. If the problem persists, a written notice will be provided. The problem will then be remediated, the guest will be charged a fee, and he/she will be asked to leave the marina.

Standard marina management will also include the development of a staff training manual, maintenance of training records, distribution of marina rules and regulations to all slip/vessel owners and posted signs regarding Best Management Practices in the marina.

1.3.2 Emergency Response

In order to quickly and efficiently respond to an emergency situation, an emergency master file will be kept at BR&M. A master file will be compiled including a list of names of any and all emergency responders in the local area and kept in a file labeled "Emergency". Types of emergencies include fires, medical emergencies, hurricanes, petroleum and fuel spills, etc. The harbormaster and marina staff will be briefed on all fire safety issues, including evacuation plans, and appropriate signage will be posted where necessary.

MARINA STANDARDS / PROTOCOLS AND MANAGEMENT

Please see below for specific Emergency Response situations and protocols.

1.3.3 *Petroleum Spill Recovery Plan*

In order to quickly and efficiently respond to a spill, implementation of the following will be required at BR&M.

A Petroleum Spill Recovery Plan will be developed and kept in the master “Emergency File” of the marina. This plan will include the name and number of local agency responders. The marina will ensure that proper spill containment materials are kept onsite in the event of a spill such as:

- Absorbent pads to contain the largest potential spill based on vessel size and onsite storage containers.
- Containment booms that are at least 5 times the length of the longest vessel docked.
- Dispersing agents will be applied immediately onto the spill areas to break petroleum oil into small droplets to clear the oil from the surface of the water, making it less likely that the oil spill will reach the shoreline. The dispersant to be used is NOKOMIS 3-F4. The United States Environmental Protection Agency does not recommend the use of dispersing agents for gasoline or diesel spills.

The Harbor Master and staff will be familiarized on the location and use of the spill recovery equipment and procedures. Signage and pamphlets will be available that explain the harmful impacts of spills and list precautions that should be taken by marina guests. The marina will promote the use of fuel/air separators on air vent/overflow systems installed on inboard fuel tanks and vent/overflow collection devices. A petroleum recycle or disposal service will be established to remove used petroleum and petroleum related items from the marina on a regular basis as well as in emergencies. All petroleum and petroleum related materials will be stored in a covered area so that they are sheltered from the elements. In addition, all containers shall have secondary containment to protect from overflow and spills. Any fixed machinery that uses oil and gas shall be stored inside containment berms. Lastly, containers will be kept onsite to collect waste fuel products in the event of an emergency.

1.3.4 *Minor Boat cleaning (in water)*

BR&M will encourage the use of biodegradable spray cleaners that do not require rinsing. Customers will be encouraged to wash the boat hull above the waterline by hand with phosphate-free and biodegradable cleaning compounds. The marina will discourage the use of detergents containing ammonia, sodium hypochlorite, chlorinated solvents, petroleum distillates, or lye. Pressure washing for boat cleaning in or over the water will be prohibited. The use of soft towels or sponges to clean the underwater hull on a regular basis will be encouraged. In-water hull scraping and any abrasive process that occurs underwater that may remove anti-fouling paint from the hull will be avoided.

MARINA STANDARDS / PROTOCOLS AND MANAGEMENT

1.3.5 Biological Resources/Endangered Species

In order to preserve biological resources and limit impacts to endangered species, BR&M will implement the following standards. Boating activities will be restricted in order to avoid shallow waters that may be affected by propellers and hulls, thus reducing the risk of impacting any existing resources or endangered species. Signs, maps or charts showing the location of known shallow bottoms, speed zones, seagrass beds, or the occurrence of endangered species in the vicinity will be prominently displayed throughout the marina to all boaters. The marina will provide educational materials (i.e. pamphlets, brochures, etc.) to vessel operators that emphasize the damage to seagrass beds and other environmentally sensitive areas caused by propeller dredging and grounding.

1.3.6 Solid Waste

BR&M will ensure the cleanliness of the facility and surrounding area by implementing the following solid waste guidelines and regulations. The marina will provide convenient trash disposal and recycling facilities to marina patrons. Items that can be recycled will include: glass, aluminum, plastic trash, newspapers, batteries, oil, and monofilament line. All trash will be properly disposed of into trashcans and dumpsters with “wind/wildlife proof” covers for all receptacles. Signage will be installed identifying waste- disposal practices, and marina personnel will be trained in proper waste management storage and disposal procedures. Any invasive plant material observed will be properly disposed of in order to prevent introduction of any non-native resources.

Solid waste will be disposed of by hauling to North Eleuthera. The solid waste will be collected and transferred to the North Eleuthera Landfill via vessel from Harbour Island. The Project will work in coordination with the Department of Environmental Health Services and Physical Planning. At build out, the Project will produce approximately 1,850 pounds of solid waste per day.

1.3.7 Wastewater

All vessels desiring to pump out on-board wastewater (“blackwater”) shall utilize the marina vacuum pump out located at each individual slip. Direct discharges of wastewater into the ocean will be strictly prohibited as a condition of rental/lease of slip space and enforced by the Harbor Master and development staff. Wastewater vacuum pump out stations will be connected to the project’s wastewater treatment system so that all on-board sewage can be properly treated.

The sanitary sewer system includes the facilities for collection and conveyance of sewage. The proposed conceptual design implements a gravity flow and a grinder pump system, which will discharge into a STP (Sewage Treatment Plant). This STP will support the required demand of 35,546 GPD. Fifty percent of the treated effluent will be used as irrigation, and the remaining 50% will be discharged into a disposal well.

The conveyance system consists of 8” PVC SCH80 piping, as well as 3” HDPE (High Density Polyethylene) piping. The system’s piping will mainly be located underneath the proposed roadway and maintain a minimum of 3’ of cover. The proposed collector and trunk mains are laid out and sized for the eventual ultimate development, without regard to a phasing process.

MARINA STANDARDS / PROTOCOLS AND MANAGEMENT

1.4 Procedure for Reporting a Spill and/or Hazardous Material

Step 1: Anyone observing a spill (including the spiller) should report the spill immediately to the BR&M Manager. The manager or other staff must then immediately notify the contacts listed below:

- BR&M Manager
- Ministry of Transport and Aviation
 - Mr. Charles Dean, Oil Spill Response Committee Member and Coordinator
 - Tel: 242-394-0445/6

Step 2: When contact is made with the above individuals, report the following information as completely and accurately as possible:

- Location of Spill
- Source of Spill
- Time of Spill
- Volume of Spill
- Potential Hazard of Spill
- Has the spill been contained?
- Has the spill material reached a body of water?
- Responsible party's name, address, telephone, official to contact, etc.
- Weather conditions at the spill site

Step 3: If the spill report is not made by the BR&M Manager, the reporter will communicate the above information to him/her as soon as possible. From that point forward, the Marina Manager will coordinate all further activities in response to spill control.

1.5 Spill Containment and Cleanup

Upon discovering a spill, every effort will be made to contain the spill and stop it at its source (when this can be done without danger to the health and safety of those involved). Containment may involve blocking stormwater drains, building berms/dikes, deploying booms/absorbent materials and other barriers to prevent the spread of the pollutant, and other measures to minimize health and environmental damage.

Cleanup and removal of spill material and spill contaminated materials will be undertaken after consultation with appropriate governmental agencies to determine the best method(s) for removal. The Developer will contract with (or consult) a private company to conduct any cleanup of spills at BR&M. Disposal of the pollutant and/or pollutant- contaminated material will be in a manner and location as approved by the local Bahamian Environmental Authority.

1.6 Handling of Fuel and Hazardous Substances

1.6.1 General Protocols

MARINA STANDARDS / PROTOCOLS AND MANAGEMENT

The Developer will implement the following management practices (partially adapted from prescriptive guidelines for fueling and bulk storage suggested by the American Association of Port Authorities) to ensure that the risk for fuel/petroleum spillage at the marina facility is minimized in accordance with fueling and fuel offloading:

Maintenance Management Practices:

The marina will conduct monthly inspections of all tanks and equipment and conduct monthly leak detection tests on fuel systems including distribution lines and tanks. Marina staff will inspect hoses, coupling equipment, and overfill protection devices on a monthly basis. Detailed records of all inspection activities will be maintained.

Operational Management Practices:

The use of fuel equipment will be allowed only at designated fueling areas (i.e. the fuel/service dock). Marina staff will ensure the hoses are purged before uncoupling and will immediately switch off the fuel supply in the event of all extreme storm events (tropical storms and hurricanes). The marina will minimize or eliminate any other vessel movements within the marina basin when offloading fuel from the supply vessel and avoid the fueling of boats in hazardous wind/wave conditions. Lastly, under no circumstances will the marina allow the offloading of fuel from the supply vessel in hazardous wind/wave conditions.

Spill Response Management Practices:

BR&M will maintain adequate supplies of spill response equipment in accessible locations (pursuant to the boom deployment plan to be provided to BEST). Boom equipment will be maintained at the fueling dock itself that can be deployed immediately following a spill event. Spill response training will be provided to all personnel. Training will occur immediately after employment and thereafter on a biannual (i.e. happening twice per year) basis for long-term employees. In the event of a major spill within the marina basin (resulting from either fueling activities or offloading of fuel from the supply vessel), the marina will immediately deploy containment booms at the marina entrance. The marina will notify the appropriate local and/or national government agencies in the event of spills of petroleum-based products or other potential pollutants into surface waters.

1.7 Stormwater Run-off

Stormwater from the roads and buildings will be collected in drainage swales and conveyed to dry stormwater retention areas throughout the site. These areas will retain the stormwater and percolate into the ground. Areas with insufficient stormwater retention areas will discharge into the ocean via outfall control structures, which will provide water treatment (e.g. oil and debris separation) prior to discharge. The drainage design will also contain catch basins with corrugated HDPE (High Density Polyethylene) piping ranging from 12" to 18" in diameter. These structures will be used to connect detention areas to evenly distribute stormwater.

2.0: DREDGING OVERVIEW

2.1 Dredging Overview

The purpose of this EMP is to demonstrate that the requirements for a dredging permit have been fulfilled, to proceed with dredging activities so that full use of the BR&M is secured. The marine environmental assessment of the sea bottom reveals critical information about the substrate in the proposed dredging location for this Project (Section 3.1 in the Environmental Impact Assessment).

Dredging is typically disruptive and therefore, at times, a controversial issue of environmental concern for the Bahamas and other small island ecosystems. For this reason, and due to Bahamian statutes, the following environmental management plan will be in effect during all dredging activities to ensure operational quality and compliance. Strict adherence will be made to all local environmental regulations concerning environmental assessment, turbidity control, and dredging material disposal. **Table 2.1** outlines the management plan for dredging activities.

Table 2.1 Environment Management Plan for Dredging and Construction

Environment Management Plan for Dredging	
Dredging Operations Activity	Planned Mitigation Action
Turbidity Control	Turbidity Control through use of Turbidity Curtain
Dredging Material Disposal	Disposal site selection and preparation for avoidance of sea, near-sea, or adjacent site runoff scenarios.

3.0: GENERAL EXCAVATION AND FILL REQUIREMENTS

GENERAL EXCAVATION AND FILL REQUIREMENTS

3.1 General Excavation and Fill Requirements

Specific monitoring procedures recommended as a part of the excavation and fill operational requirements are summarized as follows:

- 1) During excavation operations, it is quite common to have turbidity due to the extraction of sub-surface aggregate material. However, in order to manage the level of turbidity, measures shall be taken to install the proper apparatus within the project dredging zone. This will include the installation of turbidity curtains to minimize plumes from the dredging activity, regular monitoring and collection of samples, to ensure the maximum turbidity levels are not exceeded and the water quality standards are maintained.
- 2) Fill material will be selected from the dredged marina area. Field investigations revealed that the dredge site was devoid of significant marine resources and determined that the fill was of beach quality and suitable for the creation of the marina breakwater. The breakwater is an important part of the project component, and the wave baffle that will be used to minimize the wave impact will require approximately 5,000 tons of boulder material. Similarly, 7,587 tons of boulders (aggregate material) will be required for the rock revetment, at the north face of the arrival island.
- 3) Brightly colored and reflective turbidity curtains will be installed around active excavation and fill sites in the marine and littoral zone in order to minimize adverse impacts to the benthic communities adjacent to the project site. Turbidity curtains will be required during all dredging, excavation and fill activities. The turbidity curtains will remain in place after construction until which point it is observed that the turbidity within the curtain has returned to levels similar to ambient conditions observed outside the construction area.
- 4) Turbidity measurements shall be conducted for the duration of excavation and fill operations according to the following specifications:
 - a. Suitable turbidity monitoring equipment and all related calibration fluids, receptacles, log sheets, etc. shall be obtained by the contractor and the testing process will be managed by the project's Environmental Manager (EM). This instrument is used in the field to analyze water samples on site for turbidity with reliable accuracy. Turbidity levels will be recorded in NTUs. The EM will be responsible for assuring the turbidity monitoring is followed according to proper protocols and will also work closely with the contractor to ensure that all of the standards are met. The EM will work along with the contractor during the turbidity monitoring exercise, to ensure that samples are taken in accordance with the guidelines set out in the EMP document and industry standards. Both the contractor and the EM shall maintain records of the daily turbidity monitoring logs and have them available for inspection by the Bahamian government throughout the duration of construction. It is understood that the responsibility of the project EM is to monitor, document, and submit all testing data to the appropriate agencies. See **Appendix A** for a sample of the turbidity monitoring plan and a complete overview of the Turbidity Management Plan.

GENERAL EXCAVATION AND FILL REQUIREMENTS

- b. Sample locations have been revised to reflect the following criteria: Background readings will be taken 500m upstream to test background levels, and Primary readings shall be taken within the 200m perimeter of the dredging activity. They shall be taken 50m, 75m, 100m, 150m and 200m respectively within the plume. The BEST Commission requires that readings be taken every 25m if the plume exceeds the 200m mark, until the final extent of the plume is reached. The project has also invested in an onsite turbidity unit so that at any given point and time, readings can also be taken by the EM and recorded in the daily log.
 - c. Three samples shall be obtained at both the background and compliance stations (6 total). One reading shall be taken prior to the commencement of work, four during the work period and one reading one hour after works have ceased.
 - d. Turbidity in NTUs shall be measured at both the background (control) and compliance (work) areas. See Turbidity Management Plan in **Appendix A** for map of sample location and water depth.
 - e. Compliance and background samples shall be collected at 2 feet from the surface of the water (See **Appendix A**).
 - f. Samples shall be analyzed immediately after collection.
 - g. A log shall be kept including date, time, location of sampling, a map/sketch of the location, water depth, sample depth, turbidity value, weather, wind, currents, and approximate tide. See the attached turbidity monitoring report form in **Appendix A**.
- 5) Turbidity in surrounding waters should be minimized to the greatest extent practicable to avoid impact to marine and benthic organisms. The immediate goal of the turbidity program is to eliminate any and all turbidity plumes from leaving active construction areas (and thereby impacting any surrounding corals or seagrass beds). To this end, the following turbidity compliance program will be implemented:
- a. All excavation and fill operations will immediately cease and the Bahamian Government (BEST Commission) will be informed via the project EM if a compliance sample readings exceed background readings by more than 29 NTUs, or compliance readings exceed 29 NTUs at any point, or within the 150m range, work will not recommence, and readings will be taken consistently until turbidity has returned to an acceptable level.
 - b. The contractor shall identify the cause of the increase and make reasonable attempts to further contain excessive turbidity. Excavation shall not recommence until measured turbidity readings have returned to acceptable levels.
- 6) **The EM assumes the overall responsibility for monitoring, documentation and submission of turbidity logs to the BEST Commission.** Monitoring and/or reporting frequencies may be reduced only with discretionary approval from the Bahamian Government (BEST Commission). Turbidity reports will be submitted to the BEST Commission on a weekly basis for analytical purposes.

4.0: EXCAVATION AND FILL TURBIDITY

EXCAVATION AND FILL TURBIDITY

4.1 Excavation and Fill Turbidity Control and Monitoring

A comprehensive turbidity control and monitoring program will be implemented before, during, and following the completion of all excavation and fill activities. Excavation and fill operations will be conducted in a manner to minimize turbidity and conform to all water quality standards as prescribed in Government Permits. Turbidity curtains will be installed around active excavation and fill sites, throughout the duration of the excavation and construction activities, in order to minimize adverse impacts to benthic communities adjacent to the Project site. The curtains will remain in place after construction has been completed, until which point it is observed that the turbidity within the curtain has returned to levels similar to ambient conditions observed outside of the construction area.

The immediate goal of the turbidity program is to eliminate any turbidity plumes from leaving the Project area. The following are recommendations made for the installation and maintenance of the turbidity curtains:

- 1) Suitable turbidity monitoring equipment and all related calibration fluids, receptacles, log sheets, etc. shall be obtained by the contractor. This equipment is used in the field to analyze water samples on site for turbidity with reliable accuracy. Turbidity levels will be recorded in Nephelometric Turbidity Units (NTU's). The EM shall keep daily turbidity monitoring logs and will ensure that the activities conducted by the Contractor is recorded on a daily basis and made available for inspection by the Bahamian government throughout the duration of construction.
- 2) Proposed turbidity curtains shall be selected by the excavation contractor, based upon their experience and the manufacturer's recommendations.
- 3) The entire perimeter of any proposed excavation shall be encapsulated by the approved curtain. Permanent gaps will not be allowed in the curtain for boat access. Temporary gaps will only be allowed if active excavation is not occurring. Please see the attached proposed turbidity curtain plan in **Appendix A**.
- 4) Where possible, curtain ends shall terminate on shore with at least 5 feet of curtain above the high water line, preferably with the ends tied off to rigid shore anchors (See **Appendix A**).
- 5) Installed turbidity curtains shall not be moved prior to the completion of excavation and shall be left in place for a minimum of 24 hours after stopping excavation prior to removal. This will ensure for the adequate settlement of residual suspended sediment.
- 6) Daily inspections of the curtain are recommended at least 3 times per day during active dredging works, and after work has ceased.
- 7) For use in an emergency, additional lengths of curtain and related hardware (anchors, ropes, fasteners, etc.) should be kept on site. See Turbidity Management Plan in **Appendix A** for turbidity control measures.

Turbidity measurements shall be conducted for the entire duration of the excavation and construction activities. The EM will be responsible for assuring that the turbidity monitoring is followed according to proper protocols.

4.2 Dredging Material Disposal

The Project proposes to deepen the waters of and adjacent to the marina to approximately - 12.5 feet MLW. In the process, the Project will excavate up to 7,200 cubic yards of mostly sandy sediment. Proposed designated disposal site for the fill material is within the proposed marina breakwater area, which is needed. No excavated material will be placed in the upland area of the project site.

5.0: RECLAIMED LAND / FILL

5.1 Reclaimed Lands Fill, Compaction, and Building Requirements

All structures to be sited on lands reclaimed from the seabed will be designed and constructed under the supervision of a professional engineer. The material to be utilized to fill the area of reclaimed lands will be placed and compacted in accordance with the following criteria:

- Site subgrade should be proof rolled and fill material should consist of inorganic sand or crushed limestone.
- Limestone fill should have a maximum particle size of 12 inches.

In the event that organic materials are encountered or the contractor cannot place material in accordance with the criteria specified above, the contractor may utilize deep foundations (i.e. piles anchored to the bedrock) to anchor structures in this zone. Should shallow foundations be deemed suitable by the geotechnical engineer, they shall bear 18-inches below exterior finished grade. Due to potential flood and storm surge impacts, structural engineers may determine that piles should be implemented on other structures, including those not sited on reclaimed lands.

Prior to any construction of permanent vertical structures in the reclaimed land area, the developer and/or contractor shall obtain all necessary regulatory approvals which will likely include: 1) Environmental approval of this EMP from the BEST Commission; 2) Acquisition of Crown Lands from Government Via Leasehold or Purchase; 3) Site Plan Approval from the Ministry of Works Department of Physical Planning; and 4) Building Permits from the Ministry of Works Building Control Section. See **Appendix B** for documents related to reclaimed land.

6.0: CORAL RELOCATION PLAN

6.1 Coral Relocation Plan

The following Coral Relocation Plan has been developed to minimize and mitigate impacts on stony corals growing on the existing marina structure and ironshore within the Project area. The use of adhesives for coral reef transplantation is the most documented methodology. Glue, epoxy, and cement works best on dome, lobate, and massive corals; which are the dominant coral structures within the Project Area according to the marine resource assessment. Existing coral colonization within the dredge area is minimal, approximately less than 1%, and limited to isolated colonies of Finger Coral (*Porites porites*), Lesser Starlet Coral (*Siderastrea radians*), Massive Starlet Coral (*Siderastrea siderea*), Golfball Coral (*Favia fragum*), and Mustard Hill Coral (*Porites asteroides*). Impacts to these isolated coral colonies are frequently deemed negligible; however, prior to dredge operations, those individual coral colonies greater than 10 cm in diameter will be relocated to appropriate locations. The location(s) that will host the transplanted corals shall be considered and chosen based on the key factors affecting corals; including light, water depth, substrate, turbulence, temperature, and water quality.

6.1.1 Coral Transplantation Methodology

Once located and inventoried, corals will be detached by divers (wearing gloves) using hammers and flat bladed chisels in the least invasive way possible. Once removed from their original substrate, the coral will be categorized in groups within submerged perforated plastic baskets for relocation on the same day to the recipient site(s). After a group of corals has been collected, the perforated baskets will be brought to the surface and transferred onto the boat, inserted into an aerated plastic bins filled with saltwater as well as covered with a damp towel to protect the corals from sunlight and excessive heating. The categorized corals will be immediately transported to the recipient location where biologists will remove the perforated plastic baskets with detached corals and swim the basket to the previously established relocation site for reattachment.

Divers tasked with coral transplantation typically use hydraulic cement or Portland cement supplemented with muddling plaster and sand. Cement will enter solution and generate a plume; therefore, divers will exercise caution to minimize deposition of cement residue around the work site. Epoxy is an alternative to cement, which is expensive, but works well for reattaching smaller, fragile corals. One method used to cement corals back on a reef starts with one to four liters of Portland type II mortar mix.

The mixed mortar or epoxy will be placed in a watertight container (plastic bag, a bowl with a sealed top, or a length of sealed PVC pipe). The diver will swim the cement to the work site or will be lowered to the bottom on a line. Both the recipient site and transplanted coral surface areas will be cleaned with a wire brush, and all or part of the mortar or epoxy is used to build a mound of cement on the recipient location's substrate. Then the coral, sponge or octocoral is inserted into the cement mound. If the area experiences currents and wave surge, soft dive weights or a sandbag will be placed around the base of the organisms to stabilize the transplant while the cement or epoxy hardens. Adding molding plaster to the cement during the mixing enhances the cement curing time (Caution is required, as the plaster is chemically reactive and causes the cement mixture to become hot). The mixer and diver will wear rubber gloves to protect their hands and prevent contaminating the mucus membranes surrounding the coral colonies. Commercial products such as the Water plug® Hydraulic Cement will also rapidly set. Cement will dissolve

CORAL RELOCATION PLAN

underwater, leaving grey silt on the sea floor. Placing soft dive weights around the base of the cemented organisms and fanning the area removes residue from the sea floor. Marine epoxy works well to reattach small to medium- sized organisms back on the reef platform. If epoxies are deemed preferable, Liquid Rock 500 epoxy and hardener will be dispensed from twin tubes placed in an applicator with a nozzle containing internal mixing spirals. If the organism is going to be transplanted on a vertical plane, a small hole will be drilled into the reef surface, the back of the coral, and a small brass or stainless rod will be fitted into the hole in the coral. Epoxy will then be applied to back of the coral and the rod. Both coral and rod will be placed on the reef surface with special care so that the rod is inserted into the holes. If any of the corals become fragmented during the removal and/or transfer process, the pieces of the colony will be transplanted close together to encourage tissue healing.

The location of the transplanted corals will be photo documented as well as geographically referenced with sub-foot GPS positioning technology. Additionally, compass bearings and distance from the marker stake to the location of each of the transplanted corals will be recorded so that the reattached corals can be relocated during future monitoring surveys.

6.1.2 Coral Reef Check and Log Sheet

Figure 6.1.2 Coral Reef Check and Log Sheet

Method	Reef Check
Categories	<ol style="list-style-type: none"> 1. Hard coral 2. Soft coral 3. Sponge 4. Rock 5. Recently killed coral 6. Any accumulation of debris or; <ol style="list-style-type: none"> a. Silt b. Sand c. Rubble d. Other
Transect length	4 x 20 m separated by 5 m
Survey depth	Shallow (2-6 m) Deep (6-12 m)
Point interval	➤ 10cm up to 50 cm
Number of points per transect	40
Total points used	160
Additional information collected	Additional photos taken (if possible) or video to study images of reef health
Other comments	Up to 3 full checks are done to detect any environmental changes along reef, for best coral health monitoring. Transects length of 4 X 20m

6.2 Marine Scientist to Relocate Corals

DREW CAMPBELL

President – Environmental & Marine Consulting Services, Inc.



Mr. Campbell's current role is President of EMCS. He is responsible for project development, project management, marketing, human resources, and information technology.

Mr. Campbell has over twenty (20) years of experience performing environmental projects throughout South Florida's marine and freshwater ecosystems. Eight (8) of these years were spent managing the Environmental Services Division of a prominent environmental engineering company in Miami-Dade County, where he managed a staff of 10 environmental professionals. He has experience performing research plan development and execution, project management, experimental design, permitting, legally mandated monitoring, and technical report manuscript writing and editing. He has participated in many research-oriented projects; specializing in those relating to marine monitoring and restoration, stormwater treatment, chemical treatment, best management practices, and wetland biogeochemistry in order to reach interim Everglades Forever Act's Phase II water quality goals, and the Long-term Water Quality Goals outlined in the SFWMD's Conceptual Plan (Long-Term Plan).

Mr. Campbell's experience also bridges to regulatory investigations of marine, wetland, and terrestrial environments. He has prepared numerous environmental assessments and biological inventories, providing environmental assessments and feasibility study documentation for the Comprehensive Everglades Restoration Project (CERP), water resources, water supply, and large-scale engineering projects.

Finally, he utilizes his 15 years of GIS experience using ARC/INFO, ARCVIEW and now ARCGIS, to construct geodatabases designed to support these multifaceted regional restoration efforts, regulatory investigations, and scientific research projects.

EXPERIENCE

2019

President & Lead Scientist, FLORIDA INLAND NAVIGATIONAL DISTRICT (FIND)

“Benthic Resources Mapping & Assessment” – EMCS performed Pre and Post Construction Monitoring for the dredging of 4 miles of Intracoastal Waterway Channel just South of the Port of Palm Beach, Florida. Benthic resources inventoried and mapped included seagrasses, corals and macroalgae. The total survey area encompassed 98 acres of submerged lands. GIS coverages of the pre-construction surveys were compared those generated during the post construction surveys to quantify construction related impacts to the benthic resources. Reports were submitted to the Client and distributed to Palm Beach County's Environmental Resources Management Department, Florida's Department of Environmental Protection, and the US Army Corps of Engineers.

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

2018

President & Lead Scientist, WALT DISNEY COMPANY (APPLIED TECHNOLOGY & MANAGEMENT, INC.)

“Benthic Resources Mapping & Assessments for Lighthouse Point, Eleuthera” – Lighthouse Point in Eleuthera, Bahamas is being evaluated as a potentially suitable Port for Disney Cruise ships. EMCS and ATM staff performed quantitative coral reef transects and benthic resources mapping within the 408-acre project area. Resources included corals, sponges, macroalgae and seagrasses. The data was used by the engineering team to design a 5000-foot-long pier and swimming areas that minimized environmental impacts. The report was submitted to the Bahamas Environment Science and Technology (BEST) Commission for their review and approval.

2019

President & Lead Scientist, BAHAMAS POWER AND LIGHT COMPANY LTD. (INNOVATIVE SOLUTIONS GROUP, LTD.)

“Benthic & Terrestrial Resources Surveys” – Bahamas Power and Light Company, Ltd. (BPL) plans to install three (3) 35kV core power cables in a 30-foot-wide trench below the seabed between Hope Town, on Elbow Cay, and Matt Lowes Cay in the Abacos. The Project is a part of BPL’s overall objective to improve service reliability throughout the Abacos. The length of the cable route is approximately 4 miles. Benthic surveys were performed along the entire cable route, which included an additional 10 feet on either side of the trench, resulting in a survey width of approximately 50 feet. In order to determine the suitability of the route (reflecting minimal effect to the marine environment), BPL contracted Innovative Solutions Group, Ltd. and EMCS to perform Benthic, Intertidal, Bathymetric, and Terrestrial Surveys for the Project. The Surveys are intended to show the diversity and density of benthos along the proposed route. These Surveys provided the following information:

1. Population density of aquatic species
2. Population diversity of aquatic species
3. Level of species activity and habitat sensitivity
4. Mapping of the underwater features
5. Identification of permanent structures on the seabed, such as rock outcroppings, reef formations, etc.
6. Water depth

More specifically, the scope of services provided under this contract included the following elements:

1. Benthic and Intertidal Surveys to identify and assess:
 - a. Hard substrate (potential coral habitat)
 - b. Coral reefs
 - c. Seagrass beds
 - d. Protected & endangered species
 - e. Essential fish habitat
 - f. Significant species within each habitat type
2. A Terrestrial Survey to document:

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

- a. The current conditions of flora and fauna at the landing site, and
- b. Potential marine turtle nesting areas
3. Route suitability recommendations proposed in terms of environmental impact, noting any outcroppings or physical impediments to cable placement
4. HD video and photo documentation of the project area

2017 – CURRENT

President & Lead Scientist, FLORIDA INSTITUTE OF TECHNOLOGY (USACE)

“Adaptive Dredge Management Protocols for the Expansion of Port Everglades” –

Performing in an advisory capacity to the US Army Corps of Engineers to establish adaptive dredge management protocols and transparency initiatives for the expansion of Port Everglades in Fort Lauderdale, FL. This project involves the removal of nearly 5 million cubic yards of sediment and rock to allow the Port to accommodate Post-Panamax cargo ships, while minimizing damage to the surrounding coral reef systems. Additionally, a transparency initiative is being constructed to facilitate public understanding and project acceptance.

2017

President & Lead Scientist, ST LUCIE COUNTY

“Seagrass and Benthic Resources Survey” – Performed two benthic resources surveys covering over more than 40 acres of the Indian River Lagoon to determine the species identification location, spatial extent, and density of seagrasses, macroalgae, and other submerged natural resources. All resources were catalogued and mapped using ARCGIS software. Spatial data was utilized for the design, planning and permitting of two proposed marinas.

2010 – 2018

President & Lead Scientist, LOBLOLLY PROPERTY OWNERS ASSOCIATION

“Mangrove Mitigation and Shoreline Stabilization Project” – Represented the Loblolly Property Owner’s Association during coordination with the Florida Department of Environmental Protection (FDEP) and the United States Army Corps of Engineers (USACE). This public/private partnering project incorporated installing a series of six (6) mangrove planters, along 650 feet of shoreline within the boundaries of the Jensen Beach to Jupiter Inlet Aquatic Preserve. Over 1,400 mangroves were planted as part of this project. EMCS partnered with Florida Oceanographic Society’s Staff and volunteers for the installation of oyster bags. These bags will provide favorable conditions for the recruitment of a healthy native oyster population within two years. The mitigation project will serve to armor the existing shoreline, restore the native mangrove habitat, and provide water quality and habitat benefits for fishes and invertebrates. EMCS was responsible for the project design, planning, permitting, construction management, and reporting.

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

2012 – 2018

President & Lead Scientist, ENVIRONMENTAL SITE ASSESSMENTS

“Environmental Site Assessment Investigations” – Responsible for environmental data collection, photo-documentation, contamination risk analysis, wetland delineation, and reporting for the following sites within Palm Beach and Martin Counties:

- Flash Beach Grille – Hobe Sound, FL
- Covenant Fellowship Baptist Church – Stuart, FL
- Beeson Properties, Inc. (5 Properties) – West Palm Beach, FL
- Vilcap, Inc. – West Palm Beach, FL
- The Dunbar Center – Hobe Sound, FL
- Tropical Tree Farm – Hobe Sound, FL

2012 – 2018

President & Lead Scientist, MANGROVE TRIMMING, WETLANDS, DOCK & SHORELINE STABILIZATION PERMITTING (USACE, FDEP, SFWMD, AND COUNTY)

“Environmental Permitting” – Responsible for environmental data collection, photo-documentation, environmental impact analysis, and reporting for the following sites within Palm Beach, Martin and St. Lucie Counties:

- Private Homeowners in Joe’s Point – Stuart, FL
- Private Homeowner in Admiral’s Cove – Jupiter, FL
- Loblolly Property Owner’s Association – Hobe Sound, FL
- Private Homeowners; Loblolly Property Owner’s Association – Hobe Sound, FL
- Private Homeowners in Stuart, FL
- Private Homeowners in Port St. Lucie, FL
- Private Homeowners in Boca Raton, FL
- Expert Witness Testimony

2014 – 2018

President & Lead Scientist, GOPHER TORTOISE RELOCATIONS & PERMITTING

Responsible for environmental data collection, photo-documentation, GT relocation, permitting and reporting (FFWCC).

- Dickerson Construction
- Private Homeowners in Martin and St Lucie Counties
- Land Developers in Martin and St Lucie Counties

2013 – 2014

Vice President & Lead Scientist, CASHMAN DREDGING & MARINE CONTRACTING

“Bal Harbour Beach Renourishment Project, Benthic Resource Surveys” –

Performed benthic resource surveys to support dredging operations for beach renourishment along the Atlantic Coast of Bal Harbour, Florida. Over 70 transects were performed to identify marine resources requiring protection within a 245-acre work area. GPS data and a GIS database were used to generate accurate maps of resource and construction hazard locations. This data was uploaded into the navigation software for the ships conducting work in the area. Additional reporting was submitted to the Client and the County for review and archival purposes.

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

2011

Manager-Environmental Services, CITY OF CORAL GABLES, FL

“Coral Gables Waterway Dredging – Environmental Permitting Services” –

Performed all environmental assessment and permitting services for the dredging 1.3 miles of the Coral Gables Waterway. Tasks included staff safety training, biological assessment and inventory, USACE, FDEP, and DERM permit application preparation, RAI responses, agency coordination, client relations, and overall project management.

2010 – 2011

Manager-Environmental Services, CITY OF MIAMI, FL

“Wagner Creek Dredging Project – Environmental Permitting Services” –

Performed all environmental assessment and permitting services for the dredging of a 0.8 mile stretch of Wagner Creek. This project faced many difficult logistical challenges because the sediment being removed contained high levels of Dioxin. Tasks included staff safety training, biological assessment and inventory, USACE, FDEP, and DERM permit application preparation, RAI responses, agency coordination, client relations, and overall project management.

2007 – 2010

Manager-Environmental Services, CITY OF SUNNY ISLES

“**Environmental Permitting Services**” – Responsible for the environmental permitting of a fishing pier removal and replacement within coastal waters of the Atlantic Ocean. Permitting tasks included field investigations (biological assessments), pre-permit application meetings, advance notification, Joint Coastal Permit Application, DERM Class I Permit Application, Review Agency Coordination, RAI responses and mitigation planning.

2007 – 2010

Manager-Environmental Services, CITY OF SUNNY ISLES

“**Environmental Permitting Services**” – Responsible for the environmental permitting of a pedestrian and emergency vehicle bridge, observation deck and boardwalk, constructed over a canal on the west side of the City of Sunny Isles, FL. These tasks included field investigations, seagrass surveys, pre-permit application meetings, advance notification, ERP Permit Applications, DERM Class I Permit Application, Review Agency Coordination, RAI responses and mitigation planning.

2007 – 2011

Manager-Environmental Services, MIAMI-DADE WATER AND SEWER AUTHORITY

“Biscayne Bay Coastal Wetlands Baseline Assessment & Monitoring Plan” –

Performed a baseline data assessment for the Coastal Wetlands Reuse Demonstration Project to provide information needed to design, construct, and develop a monitoring plan for the project. This baseline assessment summarized existing datasets and identified data gaps that needed incorporation into the monitoring plan. This plan will drive all monitoring activity for the pilot scale phase of the demonstration project and will characterize an environmental baseline within the surrounding areas (Biscayne Bay

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

Coastal Wetlands and Biscayne Bay), so physical, chemical and biological responses to the Coastal Wetlands Reuse Demonstration Project can be assessed. Stakeholder participation and involvement was essential. Stakeholders included Biscayne and Everglades National Parks, Miami-Dade County DERM, US Fish and Wildlife Service, and Florida Department of Environmental Protection.

2006 – 2011

Manager-Environmental Services, SOUTH FLORIDA WATER MANAGEMENT DISTRICT

“Water Quality Monitoring and Assessment” – Responsible for managing all aspects of the project including work plan development, staffing, staff training and orientation, sampling, QA analysis & reporting, professional meetings, technical review and reporting. This project encompassed water quality sample collection at representative locations within the Everglades Stormwater Program (ESP) Basins, all six (6) Stormwater Treatment Areas (STAs), the Kissimmee River Basin, St. Lucie Tributaries, and Lake Okeechobee. These legally defensible datasets served to prioritize and evaluate the regulatory programs within upstream basin(s) required to achieve compliance with 40E-63, F.A.C., loading requirements and the EFA (Everglades Forever Act) phosphorus criteria for the EPA (Everglades Protection Area). Phosphorus speciation served to determine most effective Best management Practices and operational strategies for hot-spot locations. Deliverables consisted of weekly, monthly, bimonthly and quarterly sampling events at representative monitoring locations.

2010

Manager-Environmental Services, WEITZ & LUXEMBERG, P.C.

“The Acreage Cancer Cluster - Polonium 210 Investigations” – Managed the collection of over 35 sampling locations within the Acreage to determine if Polonium 210 was the cause of a cancer cluster within the Acreage, in Loxahatchee, Florida. Staff screened carbon filters using a radiometer, then sampled water before and after the water filtration systems at homes within this residential community. The sampling effort was to determine if radium was being retained by carbon filtration systems, being converted to Polonium 210, and emitting harmful radioactive gamma rays through the walls of adjacent homes, thus infecting their inhabitants. Performed safety training, QA/QC procedure training, client relations, stakeholder relations, data compilation, validation and reporting.

2005 – 2009

Senior Environmental Scientist & Project Manager, BROWARD COUNTY

“Shoreline Protection Project” – This project was designed to provide beach renourishment services to a 6.2-mile-long stretch of coastline along Broward County, Florida. The \$23.8 million project involved the placement of approximately 1.92 million cubic yards of sand on South Broward’s eroded beaches. The beach was widened, depending on the previous width, up to 200 feet.

Mr. Campbell was responsible for hiring and managing scientific divers to support hard bottom habitat data collection and analysis for the project. The divers performed coral reef biological data collection and monitoring services using Benthic Ecological

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

Assessment for Marginal Reefs (BEAMR), video capture and point count analysis methods. This data will provide the mitigation baseline and will be used to measure the impact of construction activities on the macroepibenthic flora and fauna, and the success of any mitigation during the post-construction project phase.

2007 – 2008

Manager-Environmental Services, SOUTH FLORIDA WATER MANAGEMENT DISTRICT

“Upper Kissimmee Basin Regional Water Supply Feasibility Study-Part 1” – This project evaluated the water quality in more than 7 major water bodies within the Upper Kissimmee Basin for their ability to be utilized as a potable water source. A 10-Year period of record was compared to Class I standards. Data gaps were identified, and a monitoring program was designed to satisfy the remaining information needs for the evaluation. Stakeholders included Florida’s Department of Environmental Protection and local representatives and utility companies.

2006 – 2007

Manager-Environmental Services, SOUTH FLORIDA WATER MANAGEMENT DISTRICT

“A State–Federal Collaborative Investigation of Sampling Methodologies for Monitoring Water Quality at Inflows to Everglades National Park” – Responsible for project management of the statistical, temporal, and spatial analysis of data from 10-time proportional autosamplers measuring inflows to Everglades National Park. The goal of the project was to evaluate sampling regime and recommend changes to increase the efficiency and robustness of the monitoring program.

2005 – 2007

Senior Environmental Scientist & Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT

“Conceptual Plan for Achieving Long-term Water Quality Goals: Stormwater Treatment Area and Downstream Field Support” – Responsible for managing all aspects of the project including work plan development, GIS mapping, staffing, staff training and orientation, sampling, data and statistical analysis, QA analysis reporting, professional meetings, technical review and reporting. The project is designed to analyze and interpret the performance within all the SFWMD’s STAs. Closed water budgets and phosphorus budgets are being calculated. An inventory of phosphorus storage compartments is being created. A stage/volume relationship is being generated for each cell of the STAs. The final goal of this project is to measure downstream impacts of adding clean water to previously impacted areas in terms of nutrient flux and nutrient front recession or reduced rate of expansion.

2004

Senior Environmental Scientist & Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT

“Evaluation of Full-Scale Stormwater Treatment Area Enhancements: Hydraulic Tracer Study for STA-1W, Cell 5” – Responsible for assisting with the formulation of

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

the work plan, the deployment of the lithium chloride tracer into the 22 inflow culverts of STA-1W, Cell 5b, programming and installing water quality sampling network to ensure the reliable sample collection of over 1,350 lithium tracer samples, training staff on the use, sample collection, and maintenance of the sampling system, performing a QC review of the final report, and attending meetings with the SFWMD for project coordination. STA-1W, Cell 5b is a full-scale stormwater treatment area with an effective treatment area of 2,293 ac. The project was intended to demonstrate and document the ability of a limerock berm to improve the hydraulic distribution within Cell 5b and to establish concentration and mass time series at each outflow culvert in order to characterize the inter-culvert variability of the tracer mass distribution at each culvert given a steady flow of 670cfs.

2004

Senior Environmental Scientist & Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT

“Baseline Tracer Study: STA-2, Cell3” – Responsible for assisting with the formulation of the work plan, the deployment of the lithium chloride tracer into the 5 inflow culverts of STA-2, Cell 3, programming and installing water quality sampling network to ensure the reliable sample collection of over 600 lithium tracer samples, training staff on the use, sample collection, and maintenance of the sampling system, performing a QC review of the final report, and attending meetings with the SFWMD for project coordination. This project employed the use of a lithium chloride tracer to provide baseline data for the assessment of a limerock berm installation on the hydraulic characteristics of Cell 3 (2,200 ac.).

2004

Senior Environmental Scientist & Project Manager, CITY OF MIAMI

“Margaret Pace Park Shoreline Stabilization” – Responsible for all aspects of organizing and conducting the Biological Resources Assessment of the project area for the purposes of identifying the location, density and relative health of sensitive natural resources (seagrasses). This project was located within the boundary of the Biscayne Bay Aquatic Preserve.

2003

Senior Environmental Scientist, FLORIDA DEPARTMENT OF TRANSPORTATION

“PD&E Documentation for Major FDOT Transportation Corridors in Dade, Broward, Palm Beach and Sumter County” – Prepared Project Development and Environment (PD&E) Study documentation elements for numerous Florida Department of Transportation projects. This documentation addressed many NEPA categories and included data collection and identification of possible environmental impacts to threatened and endangered species (Section 7 consultation), wetlands, cultural resources, air quality, noise levels, and contamination issues. ERP permits were also produced as a course of these investigations.

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

2002

Senior Environmental Scientist, RIVIERA BEACH CRA

“GIS Database Construction and Utilization Riviera Beach CRA” – Responsible for generating a GIS (ARC/GIS 8.1) database representing data collected from 18 quantitative seagrass transects established in Lake Worth Lagoon. This database also included a comprehensive and updated inventory of available federal, state, and county seagrass datasets. Additional data sets included LADS nearshore bathymetry data (Broward), marine and Intracoastal bathymetry and roughness, submerged lands ownership, Florida Inland Navigational District datasets and imagery, NWI wetlands, Broward County wetland and mitigation area data, local areas of particular concern, environmentally sensitive lands, contaminated sites, and Environmental Resource Permitting (ERP) permitting data.

2001 – 2002

Senior Environmental Scientist/Project Manager, AES OCEAN EXPRESS, BENTHIC RESOURCES

“Inventory and Baseline Data Formulation” – The AES project consisted of a new 53.62-mile interstate 26-inch natural gas pipeline extending through the Exclusive Economic Zone (EEZ) between the Port Everglades (Fort Lauderdale) and The Bahamas, to interconnect with the Florida Gas Transmission (FGT) system in Broward County, Florida. At the EEZ boundary, the Ocean Express pipeline was to connect with, and receive natural gas transported by, a 40-mile Bahamian-jurisdictional pipeline (owned by another AES affiliate) that extends to Ocean Cay, The Bahamas. Mr. Campbell led the scientific team responsible for performing the “Nearshore Survey of Marine Benthic Habitats” study. This study was the key element to the environmental permitting process. Of the 3 major companies attempting to bring natural gas pipelines through Port Everglades in 2002, AES received Federal, State and Local environmental permits for the installation before any other company.

The environmental objectives of this study were to:

1. Qualitatively and quantitatively characterize the marine benthic habitats within the project area;
2. Assist in the selection of a preferred pipeline route that minimized impact to the hard-bottom habitats; and,
3. Produce pre-construction biological baseline data sets, which were used for permitting, post-construction monitoring and calculating mitigation requirements.

The nearshore benthic survey was comprised of three components:

1. Marine reconnaissance survey;
2. Bio-video documentation and mapping; and,
3. Quantitative analysis of selected hard bottom and soft bottom habitats.

2002

Environmental Scientist & Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT'S ECOLOGICAL TECHNOLOGIES DIVISION

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

“Evaluation of Sequenced Vegetation Communities for Phosphorus Removal from Everglades Agricultural Area Stormwater” – Responsible for the experimental design and grant preparation for the Evaluation of Sequenced Vegetation Communities for Phosphorus Removal from Everglades Agricultural Area Stormwater Project. This project was to determine if sequenced vegetative treatment would enhance phosphorus removal from agricultural stormwater. The experimental design was based on two and three 1-acre cell configurations within the SFWMD Test Cells at STA-1W.

2001

Environmental Scientist & Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT'S ECOLOGICAL TECHNOLOGIES DIVISION

“STA-6 Nutrients Sediment Flux Experiment” – Responsible for establishing an 18-mesocosm biogeochemical experiment to measure the effect of a dried (dormant) periphyton mat on the soluble reactive phosphorus flux from reflooded STA-6 sediments. Maintained the lead role on experimental design, sampling regime, reporting and presenting its results.

2000

Environmental Scientist & Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT'S ECOLOGICAL TECHNOLOGIES DIVISION

“Dissolved Organic Phosphate Research Project” – Project manager for ultra-low level dissolved organic phosphate (DOP) research. The research was designed to identify the bioavailability of dissolved organic phosphate compounds in post BMP and post STA stormwater runoff and identify their chemical structure. New methods of analytical chemistry were needed to analyze for the DOP, resulting in the development of a method with a 0.2µg/L detection limit. The research was performed jointly by Florida State University and the Los Alamos High Magnetic Field Laboratory.

2000

Environmental Scientist & Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT'S ECOLOGICAL TECHNOLOGIES DIVISION

“Low Intensity Chemical Dosing, Phase II” – Responsible for performing the final evaluation for Low Intensity Chemical Dosing. This Advanced Treatment Technology was originally evaluated within Cell 2 of STA-1W and was then moved to the STA-1W Test Cells in order to better control environmental and chemical application conditions.

1999

Environmental Scientist & Assistant Project Manager, SOUTH FLORIDA WATER MANAGEMENT DISTRICT'S ECOLOGICAL TECHNOLOGIES DIVISION

“Chemical Treatment / Solids Separation Project” – Assisted with the experimental design for the Chemical Treatment / Solids Separation Project. This Advanced Treatment Technology used metal (iron and aluminum) salts routinely used in municipal water treatment facilities to remove phosphorus and organics from agricultural stormwater runoff. Responsibilities included performing bench-top testing to determine the chemicals to be used at the pilot scale, design of a portable laboratory to support the

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

project for its entire 2 years of operations, assisting in the optimization of operations at the pilot facility, assisting with the evaluation of chemical addition on over 36 water quality parameters, including nutrients, metals, organics, and physical parameters, assisting in evaluating this technology under the Standard of Comparison Guidelines, including biotoxicity analysis and effects on algal growth potential, technical review of all project documentation.

1996 – 2002

Senior Scientific Associate, SOUTH FLORIDA WATER MANAGEMENT DISTRICT'S ECOLOGICAL TECHNOLOGIES DIVISION

“STA Optimization Sampling and General Project Support” – Performed multiple support roles for the South Florida Water Management District's Ecologically Engineered Systems Research Division. Prepared field experiments and associated quality control, laboratory coordination, equipment procurement and management for the Everglades Nutrient Removal Project (ENR) and Advanced Treatment Technology Demonstration Projects. Coordinated fieldwork, sampling and data collection. Water, Soil, and Vegetation sampling was performed for nine research and monitoring projects at the ENR using SFWMD & FDEP approved techniques. GPS and GIS were utilized to verification of station locations for database and site map. ARCVIEW was used to generate maps for research teams. ARC/GIS Software and GPS was used to perform spatial data analysis and map generation. Tasks also included web site design and construction.

1995

Oceanographic Technician, UNIVERSITY OF MIAMI – ROSENSTIEL SCHOOL FOR MARINE AND ATMOSPHERIC SCIENCE

“Off Shore Nutrient Upwelling Dynamics” – Mr. Campbell participated in a NOAA and U.S. Navy funded project to evaluate sources of nutrient loading along South Florida coastline. He was responsible for the research and development, assembly, calibration, deployment, and maintenance of a rotating fleet of seven fully automated oceanographic profilers. Data from these units was used to generate three-dimensional maps of the ocean's circulatory patterns from the coast of Miami to Boca Raton.

EDUCATION

1997

GIS & REMOTE SENSING, FLORIDA INTERNATIONAL UNIVERSITY

1995

DEGREE – MARINE AFFAIRS, UNIVERSITY OF MIAMI, FL

- Marine Science, Environmental Law and Policy

PROFESSIONAL CERTIFICATIONS & AFFILIATIONS

- Save The Indian River Lagoon Estuary Now (STIRLEN) –Consulting Seagrass Expert*
- Environmental Permitting Summer School 2011

Drew Campbell (Resume Continued)
President – Environmental & Marine Consulting Services, Inc.

- AWRA, “The Effects of Climate Change on South Florida Ecosystems” 2011
- GEER – 2002, 2004, 2006, 2010*
- Project Management Professional Training
- SFWMD Project Management Training
- Treatment Wetland Short Course (Bill Kadlec & Bob Knight)
- Technical Writing Training
- Society for Ecological Restoration Conference*
- South Florida Restoration Science Conference*
- South Florida Biogeochemistry Conference
- American Water Resources Association
- Florida Association of Environmental Professionals*
- Hobe Sound Chamber of Commerce
- ARCGIS Certification
- Radioactive Isotope Safety Training (for in-vitro studies using P32)
- Lab Safety Training and Instruction
- Grasses and Sedges Identification Training
- US Coast Guard Boating Skills and Seamanship Certification
- Over 2400 hours of marine boat captaining
- Over 1800 hours of airboat piloting
- PADI Divemaster – Diving First Aid, CPR & O2 Administration
- PADI Rescue Diver
- NAUI Rescue Diver
- PADI Advanced Diver
- NASDS Open Water Diver
- R.S.M.A.S. Research Diving Certification
- SFWMD Certified Airboat Pilot
- Class D Driver's License
- SFWMD Defensive Driver Training
- 40-Hour HAZWOPER

* Presented at Conference

7.0: 4M HARBOUR ISLAND LOCAL TEAM AND RESPONSIBILITIES

4M HARBOUR ISLAND LOCAL TEAM AND RESPONSIBILITIES

7.1 Introduction of Local 4M Harbour Island Marina & Development Site Team

This section introduces the local 4M Harbour Island Marina and Development site team as **The Innovations Solutions Group**. Currently there are two full time staff members that are based on site, serving in the capacity of Site Manager and Field Technician respectively. Any changes or addition of personnel to the project will be updated accordingly in the company's files, and a record inserted into the EMP.

The Innovations Solutions Group will provide the environmental manager oversight, direction, and assume all responsibility for field operations and project efforts that would possibly result in any environmental risks during the dredging operations where the concern for turbidity impacts might exist. This effort is in addition to the normal and customary environmental manager duties during construction. Listed below are the names of the team members with their respective roles and responsibilities.

1) Franklyn Hall – Environmental Manager (EM)

Responsibilities Include:

- Oversee/direct activities of team members and construction employees, to maintain environmental systems in accordance with the EMP.
- Ensure that daily operations are in compliance with local Bahamas environmental regulations.
- Train team members and all other workers on project site on environmental program and policies.
- Respond to concerns and queries regarding the project with respect to environmental issues and concerns.
- Responsible for supervision of EMP tasks including monitoring, documentation, and submission of turbidity logs.
- Submit weekly turbidity monitoring reports conducted daily, to the BEST Commission, relative to dredging and excavation activities during construction.
- Review and recommend improvements to existing environmental strategies.
- Investigate environmental incidents and develop action plans.
- Provide job training and assistance to team members when needed.
- Stay updated with environmental legislations and trends in the industry.
- Assist team in ensuring the site is safe, and correct protocols are followed in the EMP within 48hrs of an approaching hurricane or severe weather event.

2) Michael Johnson – Site Manager

Responsibilities Include:

- Coordination of all on-site activities.
- Verification of Contractor conformance with EMP.
- Identification and management of site related risks to: personnel and site conditions.
- Coordination with project and contractor environmental managers on required turbidity compliance and testing.
- Observation of construction activities for conformance to permitted documents.

4M HARBOUR ISLAND LOCAL TEAM AND RESPONSIBILITIES

- Maintain all records pertaining to labor, material, ordering supplies and cost and inventory of items for construction onsite.
- Ensure quality and standards are met.
- Attend all production meetings and schedule site meetings as necessary, to address any issues and coordinate any changes in activities.
- Responsible for ensuring site is safe before and after work activity, and securing site 48hrs in advance, in the event of an approaching hurricane, or severe weather event.

3) Aldon Davis – Field Technician

Responsibilities Include:

- Under the direction of the EM:
 - Provide full-time/dedicated efforts to observe/inspect all environmental risks and/or conditions.
 - Provide turbidity sampling support.
 - Manage all EMP related requirements.
- Assist Site Manager with the coordination of all site activities.
- Assist Site Manager with the identification and management of all site related risks to personnel and project site conditions.
- Assist with site safety, material inventory and securing site 48hrs in advance in the event of an approaching hurricane or severe weather event

8.0: WORK PLAN AND COST ESTIMATES

WORK PLAN AND COST ESTIMATES

8.1 Cost Estimate

Additionally, a detailed cost estimate is provided below for initial and reoccurring costs for administration, consultancy, operation, and maintenance.

Harbour Island Marina EMP Implementation Budgets		
**BASED ON BMC SCHEDULE OF VALUES		
Construction Phase Budget (120 Days)		
Item	Description	Budget
1	Turbidity Curtains	\$ 64,964.29
2	Turbidity Monitoring	\$ 26,785.20
3	Turbidity Maintenance	\$ 26,785.20
4	Dredging	\$ 256,437.60
3	Dredge Material Disposal	\$ -
4	Employee Training - Construction EMP	\$ -
5	Spill Prevention, Precaution & Management	\$ -
6	Environmental Consultants & Permitting	\$ -
Construction Phase Budget (120 Days)		\$ 374,972.29
Marina Operations (Annual)		
Item	Description	Budget
1	Employee Training - Containment Measures	\$ 2,500.00
2	Spill Prevention, Precaution & Management	\$ 5,000.00
3	Emergency Response File/Plan & Maintenance	\$ 1,000.00
4	Trash Disposal & Recycling Facilities	\$ 60,000.00
5	Monthly Inspections (Tanks, Equipment, Fuel Systems)	\$ 6,000.00
6	Environmental Consultants & Permitting	\$ 12,000.00
Construction Phase Budget (12 Months)		\$ 86,500.00

8.2 Work Plan

The following work plan has been developed to specify the proposed schedule for the Project. The goal of the BR&M (Project) marina redevelopment and expansion is to develop the existing marina into a world-class caliber destination on Harbour Island and throughout the Bahamas. The Project will increase high wealth tourism opportunities on Harbour Island by providing a luxury marina that can accommodate yachts of VIP visitors to the island. The newly renovated marina will have the ability to host up to 4000 linear feet of vessels, including mega yachts, and vessels ranging from 60-200 feet in length. In addition to a marina that can exclusively cater to large vessels, the proposed project will include construction of a small marine village.

Currently, during the construction phase, 4M Harbour Island has only two full time employees working on the project site. Each of these employees will be further trained by the Environmental Consultant of Record in the recognition of environmental concerns and also

WORK PLAN AND COST ESTIMATES

mitigation elements as indicated under the EMP. Additionally, these employees are authorized and trained to review the aspects under the EMP that are to be performed by the Contractors during the construction phase. While each Contractor is responsible for their compliance with the EMP, the BR&M employees are authorized to both halt any work or efforts not in compliance (red flags) with the EMP as well as notify the Environmental Manager should such an event occur.

Prior to beginning the operational phase, each employee will undergo an in-depth training program related to both workplace safety and environmental training as that relates to their roles and position within the project operations. Monitoring and formal process management will be provided by the Environmental Manager, particular emphasis will be placed during the early phases of operation to install a culture of compliance and management within the project team.

8.3 Project Team Resumes

SEE NEXT PAGE

8.3.1 Franklyn Hall – Environmental Manager

FRANKLYN HALL

Nationality: Bahamian franklynhall@hotmail.com

Contact: Cell: 242-5565135 Home: 242-6770818

Currently residing in the Bahamas, Mr. Hall is an innovative Professional Engineer and Environmental Expert, with field experience in project management, construction and development. Recent training over the years have been done in marine and coastal zone management and studying various environmental impacts due to development in these types of environments. A most recent project involved conducting a marine and terrestrial environmental survey for a newly proposed development in the North West Bahamas, in association with other international environmental consultants on the same project. In 2013, Mr. Hall was employed with Miya Bahamas in New Providence in the field operations to assess and supervise water infrastructure improvements, on an IDB sponsored project (Non-Revenue Water) In 2014, he conducted an independent study to look at how the government of the Bahamas can capitalize on investing in other forms of RE, such as solar (PV), and reduce their dependence on fossil fuel usage. This study focused primarily on most of the remote island locations where the distribution of electrical power is a major challenge. One of his major undertakings in the past was working on a development project on Winding Bay in Abaco Bahamas, for a Ritz Carlton owned project. Mr. Hall served in the capacity of Project Manager/Environment and Safety, and Manager of utilities respectively.

AREAS OF EXPERTISE

- Project Management, Horizontal Construction, Energy, Infrastructure and Utilities
- Environmental Management, Impact Assessment, Water Resource Management
- GIS/GPS Mapping/Coastal Zone and Marine Environmental Survey
- Subsurface Investigation and Analysis using Electrical Resistivity Method

EXPERIENCE

APRIL 2019 – CURRENT

ENVIRONMENTAL CONSULTANT, 4M – HARBOUR ISLAND MARINA

Project Environmental Manager and Environmental Consultant.

DECEMBER 2017 – 2019

PROJECT MANAGER, INDEPENDENT (ISG)

Management of operations for landscape design, plant identification, chemical application and irrigation control for commercial and residential facilities. *Location: Paradise Island, Bahamas.*

WORK PLAN AND COST ESTIMATES

Franklyn Hall (*Resume Continued*)

NOVEMBER 2018 – CURRENT

ENVIRONMENTAL CONSULTANT, INNOVATIVE SOLUTIONS GROUP

Responsible for EIA and EMP preparation, marine and terrestrial environmental surveys. *Location: West End, Grand Bahama.*

NOVEMBER 2018

ENVIRONMENTAL CONSULTANT, INNOVATIVE SOLUTIONS GROUP

Marine environmental survey of seabed, to locate endangered coral, and marine species, and map best location for installation of BPL HV feeder cable. *Location: Matt Lowe Cay - Abaco, Bahamas.*

AUGUST 2017 – DECEMBER 2017

ENVIRONMENTAL CONSULTANT, COASTAL SYSTEMS INTERNATIONAL

Responsible for preparation of EIA document and environmental site monitoring and report for all marine and terrestrial based activities, and control of EMP document. *Location: Harbour Island, Bahamas.*

JANUARY 2017 – APRIL 2017

ENVIRONMENTAL CONSULTANT, COASTAL SYSTEMS INTERNATIONAL

Responsible for environmental site monitoring and report for all marine and terrestrial based activities, and control of EMP document. *Location: South Cat Cay Development.*

MAY 2016 – OCTOBER 2016

ENVIRONMENTAL CONSULTANT, COASTAL SYSTEMS INTERNATIONAL

Responsible for designing and carrying out a Terrestrial Environmental Survey for the development of remote island in Southern Bahamas. Collection and processing of GPS data for native flora and fauna survey, and habitat mapping. *Location: Flamingo Cay, Bahamas.*

SEPTEMBER 2015 – CURRENT

ENVIRONMENTAL CONSULTANT AND POLICY ANALYST, BLUE ILLUSIONS LTD

Responsible for development and launching of Environmental Management Plan and development of policy for emergency preparedness and disaster. *Location: Nassau, Bahamas.*

JULY 2015 – SEPTEMBER 2015

LEAD ENVIRONMENTAL CONSULTANT, BLUE ILLUSIONS LTD

Assessment of marine mammal facility and conducting Environmental Impact Assessment study, for remote island with marine mammal-based activities. *Location: Nassau, Bahamas.*

JANUARY 2013 – OCTOBER 2015

SITE AND FIELD SUPERVISOR, MIYA BAHAMAS LTD

Management of all field related activities for rehabilitation and upgrades to water supply, for Non-Revenue water-based project. *Location: Nassau, Bahamas.*

WORK PLAN AND COST ESTIMATES

Franklyn Hall (*Resume Continued*)

DECEMBER 2010 – NOVEMBER 2012

MANAGER – UTILITIES/ENGINEER, ABACO CLUB – RITZ CARLTON

Managed water distribution operations, waste water treatment facilities, staff training of new personnel for utilities operations. Involved jointly with finance department in developing system for billing based on water consumption, for residential home owners. Managed OPEX budget for department's daily operation, logistics and supply of materials. Responsible for finding more efficient ways of utilizing energy systems for distribution of water, waste operations and power supply. *Location: Abaco, Bahamas.*

DECEMBER 2005 – NOVEMBER 2010

PROJECT MANAGER/ENGINEER (ENVIRONMENT/SAFETY), ABACO CLUB – RITZ CARLTON

Management of and installation all horizontal construction works, including water, sewer, electrical and communications. *Location: Abaco, Bahamas.*

JANUARY 2004 – NOVEMBER 2005

ASSISTANT PROJECT MANAGER, CONSOLIDATED WATER COMPANY LTD

Managed all horizontal construction, for development of 12.5 million/gal per day of reverse osmosis, salt water desalination plant. *Location: Nassau, Bahamas.*

EDUCATION

2000

MASTER OF ARTS, SOCIAL POLICY, UNIVERSITY OF YORK (UK)

1999

PG DIP, ENVIRONMENTAL ECONOMICS AND ENVIRONMENTAL MANAGEMENT, UNIVERSITY OF YORK (UK)

1996

BACHELOR OF SCIENCE, MECHANICAL ENGINEERING TECHNOLOGY, SAVANNAH STATE UNIVERSITY (SAVANNAH GA)

INSTITUTIONAL MEMBERSHIPS AND ACHIEVEMENTS

- Member of Society of Operation Engineers (SOOE) United Kingdom and registered Incorporated Engineer
- Member of Society of Professional Engineers (UK) and registered Professional Engineer
- Certified Environmental Professional (National Registry of Environmental Professionals). U.S.A.
- Listed Environmental Consultant with Bahamas Environmental Science and Technology Commission (BEST)
- Certificate – Principles for Reviewing Environmental Impact Assessments (IDB) 2019

8.3.2 Michael Johnson – Site Manager

MICHAEL JOHNSON

michaeljoh@hotmail.com 242-359.7212

Born and Raised in The Bahamas. Organized and resourceful with outstanding people skills. Honest and Loyal. Provides outstanding electrical work and customer service. Attention to detail. Time management.

EXPERIENCE

NOVEMBER 2017 – CURRENT

FIELD MANAGER, MICKYLE ENTERPRISES

During the construction of the new Briland Residences & Marina (BR&M) project I am acting as the Owner's local representative in the role of Field Manager. Responsibilities include all field related activities. As a member of the BR&M team, I am also responsible for monitoring the activities of the marina contractor including verification of compliance with the Environmental Management Plan and also coordinating the local needs of the project.

As a function of the environmental management program, my duties will include both monitoring of and responding to any environmental aspects concerning the marina construction.

2006 – CURRENT

LICENSED ELECTRICIAN, MICKYLE ENTERPRISES

As principal of Mickyle I am responsible for all functions of the company. Currently Mickyle is under contract with BR&M for the Field Manager role.

2000 – 2006

LICENSED ELECTRICIAN, FAMILY COMPANY

Worked in the family as a licensed electrician.

1993 – 1997

ELECTRICAL APPRENTICE, BAHAMAS GOVERNMENT & MINISTRY OF WORKS

Worked as an electrical apprentice.

1990 – 1993

ELECTRICAL ASSISTANT, FAMILY COMPANY

Worked in the family electrical and refrigeration company.

EDUCATION

1999 - 2000

ELECTRICAL TECHNICAL TRAINING, ITT TECH, JACKSONVILLE, FL

8.3.3 Aldon Davis – Field Technician

ALDON DAVIS

Harbour Island, Bahamas 242.470.8556

Born and raised in The Bahamas. Providing professional services while also friendly and outgoing. Organized and resourceful with outstanding people skills. Provides technical and associated customer service to boaters.

EXPERIENCE

APRIL 2017-CURRENT

FIELD ENGINEER, BRILAND RESIDENCES & MARINA

Maintain utilities and dock area, monitor and mitigate environmental concerns and maintain a clean and orderly environment. Provide turbidity sampling support under the direction of the Environmental Manager.

JULY 2003– APRIL 2017

DOCKMASTER, HARBOUR ISLAND MARINA

Direct, move, assist and securely moor vessels to dock, assist traffic along waterway, provide assistance to boaters, maintain utilities and dock area, monitor and mitigate environmental concerns and maintain a clean and orderly environment.

EDUCATION

2002

HIGH SCHOOL, HARBOUR ISLAND ALL AGE SCHOOL

SKILLS

- Captain License B1/B2
- Intermediate Certification in Marina Management
- Maintain and effect repairs of marine systems and docks including utilities and fueling systems

ACTIVITIES

- Boating activities
- Spending time with his daughter
- Reading bible

WORK PLAN AND COST ESTIMATES

Harbour Island Club and Marina
Phase 1 - Marina Construction and Initial Upland Improvements
Coastal Systems Development

		Year																											
		Month																											
		Jul	Jul	Jul	Jul	Aug	Aug	Aug	Aug	Sep	Sep	Sep	Sep	Oct	Oct	Oct	Oct	Oct	Nov	Nov	Nov	Nov	Dec	Dec	Dec				
		Date	09	16	23	30	06	13	20	27	03	10	17	24	01	08	15	22	29	05	12	19	26	03	10	17	24	31	
03 . 00	Mobilization																												
04 . 00	Turbidity Control and Monitoring																												
05 . 00	Demolition of Existing Marina																												
06 . 00	Dredging																												
07 . 00	Bridge																												
08 . 00	Arrival Island																												
09 . 00	Rock - Revetment																												
10 . 00	Dock - 1.0 - Wave Baffle																												
11 . 00	Dock - 2.0 - West Dock																												
12 . 00	Dock - 3.0 - Central Dock																												
13 . 00	Dock - 4.0 - East Dock																												
14 . 00	Dock - 5.0 - North Dock																												
15 . 00	Dock - 6.0 - Fuel Dock																												
16 . 00	Dock - 7.0 - Transient Dock																												
17 . 00	Utilities - Fuel																												
18 . 00	Utilities - Electrical Distribution and Transformers																												
19 . 00	Utilities - Pedestals																												
20 . 00	Utilities - Potable Water																												
21 . 00	Utilities - Fire Protection																												
22 . 00	Utilities - Sanitary Force Main																												
23 . 00	Upland - Demolition																												
24 . 00	Upland - Shoreline Stabilization - Bulkhead																												
25 . 00	Upland - North Rock Revetment																												
26 . 00	Upland - South Rock Revetment																												
27 . 00	De-Mobilization																												

WORK PLAN AND COST ESTIMATES

Harbour Island Club and Marina
Phase 1 - Marina Construction and Initial Upland Improvements
Coastal Systems Development

		Year																										
		Month																										
		Jan	Jan	Jan	Jan	Feb	Feb	Feb	Feb	Mar	Mar	Mar	Mar	Apr	Apr	Apr	Apr	Apr	May	May	May	May	Jun	Jun	Jun			
		Date	07	14	21	28	04	11	18	25	04	11	18	25	01	08	15	22	29	06	13	20	27	03	10	17	24	
03 . 00	Mobilization																											
04 . 00	Turbidity Control and Monitoring																											
05 . 00	Demolition of Existing Marina																											
06 . 00	Dredging																											
07 . 00	Bridge																											
08 . 00	Arrival Island																											
09 . 00	Rock - Revetment																											
10 . 00	Rock - 1.0 - Wave Baffle																											
11 . 00	Dock - 2.0 - West Dock																											
12 . 00	Dock - 3.0 - Central Dock																											
13 . 00	Dock - 4.0 - East Dock																											
14 . 00	Dock - 5.0 - North Dock																											
15 . 00	Dock - 6.0 - Fuel Dock																											
16 . 00	Dock - 7.0 - Transient Dock																											
17 . 00	Utilities - Fuel																											
18 . 00	Utilities - Electrical Distribution and Transformers																											
19 . 00	Utilities - Pedestals																											
20 . 00	Utilities - Potable Water																											
21 . 00	Utilities - Fire Protection																											
22 . 00	Utilities - Sanitary Force Main																											
23 . 00	Upland - Demolition																											
24 . 00	Upland - Shoreline Stabilization - Bulkhead																											
25 . 00	Upland - North Rock Revetment																											
26 . 00	Upland - South Rock Revetment																											
27 . 00	De-Mobilization																											

9.0: DEMOLITION PLAN

9.1 Demolition

The following demolition plan has been developed to minimize impacts to marine and upland resources.

The building on the property known locally as the “Haunted House” has been investigated further, and a letter was sent to the AMMC for research, to find out if this building bears any archaeological and historical significance to the Bahamas, and the island of Harbour Island. According to the records, this building is listed in the inventory of the national Register of Historic Resources of the AMMC. Based on this most recent finding, the developer will consult with the engineering team, and architectural consultants to see what the best method and approach is for retaining or restoring the structure. The building was constructed in the 1940’s and is currently deteriorating and the foundation has been destroyed by tree root invasion. The structure will have to be assessed properly given its current condition. Please see **Appendix B** for further details, and documents related to the status of the current building structure.

The dock has been removed using an excavator from a floating barge to manually remove the decking and stringers; piles were removed vertically. All debris associated with the dock removal will be transported to North Eleuthera and disposed of at the landfill. It is also noted that during this aspect of the operation, Best Management Practices will be strictly adhered to in order to minimize and mitigate impacts to nearby and adjacent properties. Screen fencing will be put in place during demolition operations, and a water truck will be used to water down the construction to minimize any excessive dust from construction debris. Traffic management will also be put in place to properly direct traffic flow, to avoid any congestion to nearby pedestrians, vehicular traffic and business operations. Operations will only be conducted during normal working hours (7am – 4pm) to avoid long periods of noise pollution to the community. No trees will be removed from adjacent or nearby property during this period.

9.2 Dredging

Dredging will be required to reach a depth of 12.5 Mean Low Water (MLW) within the marina. Displayed in the figure 4.1 below, three areas within the Project site will be dredge to reach -12.5 feet MLW: Area A will be dredged to -14 Mean Sea Level (previous reference to -14 MSL is equivalent to -12.5 MLW), area B will be dredged to -11 MSL (previous reference to -11 MSL is equivalent to -12.5 MLW), and area C will be dredged to -8 MSL (previous reference to -8 MSL is equivalent to -12.5 MLW). Mean Low Water is approximately 1.5 below Mean Sea Level. The areas that will not be dredged within the marina are already deep enough, having an approximate depth of -10 MSL and -12.5 MLW. Refer to **Appendix A** (Turbidity Management/Monitoring Plan) for a detailed dredging plan, for the development of the marina.

10.0: SEABED LEASE

10.1 Seabed Lease

The full extent of the proposed seabed lease is approximately 12 acres (522,720 square feet) and will run approximately 535 feet wide by 1,123 feet long. **Figure 6** and **Figure 7** below, show the approximate lease area with regards to the proposed marina structures.

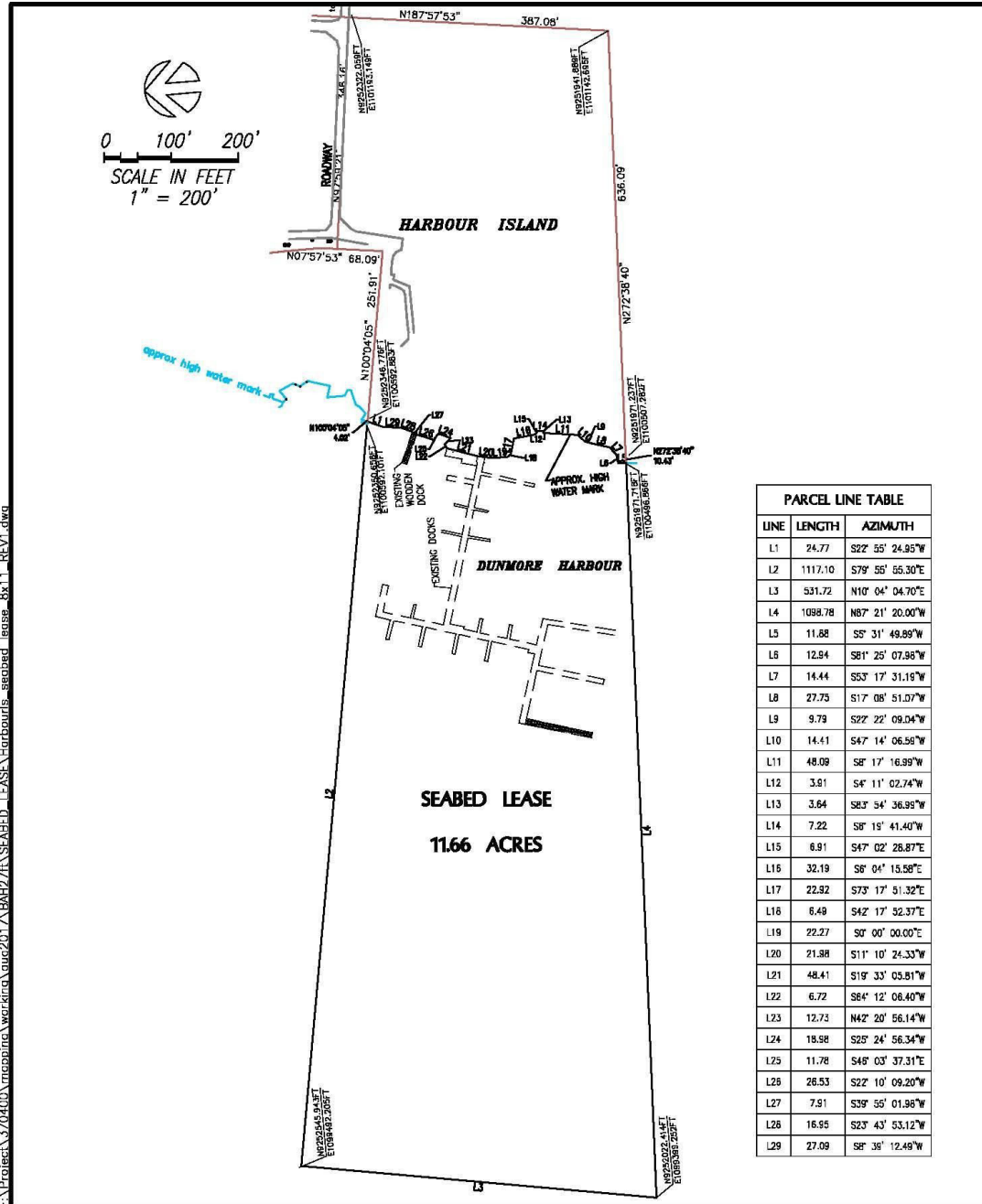


FIGURE 6
 HARBOUR ISLAND
 PROPOSED SEABED LEASE WITH EXISTING MARINA
 NOVEMBER 2017

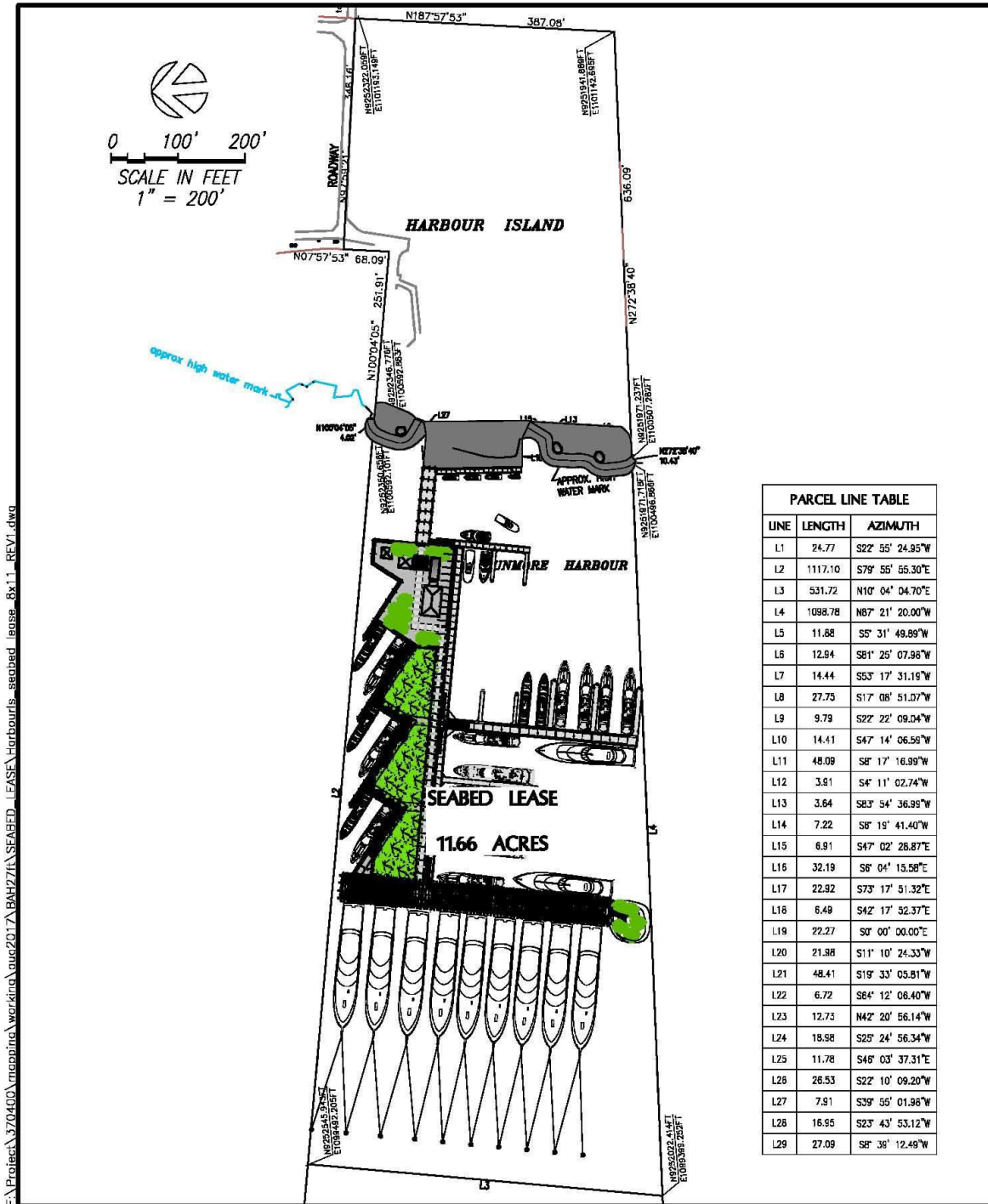


FIGURE 7
HARBOUR ISLAND
PROPOSED SEABED LEASE WITH PROPOSED MARINA
NOVEMBER 2017

11.0: JULY 18, 2019 LETTER WITH RESPONSES

JULY 18, 2019 LETTER WITH RESPONSES



THE BAHAMAS ENVIRONMENT, SCIENCE AND TECHNOLOGY COMMISSION Ministry of the Environment and Housing

July 18, 2019

SENT VIA EMAIL

Mr. Franklyn Hall
Environmental Manager
Innovations Solutions Group
P.O. Box CB-11492
New Providence

Dear Mr. Hall;

RE: 4M ENVIRONMENTAL MANAGEMENT PLAN REVIEW (4th SUBMITTAL)

With respect to the above submission made June 13, 2019, we have reviewed the document in relation to our May 1st and 5th letters. Please note our comments below:

- Comments in black indicates BEST comments
- Responses in red represents project's feedback

Executive Summary

- Please note that the document references a 40 slip marina however the approval letter from BIA dated January 18, 2017 indicates a 39 slip marina. Please advise.
Please see executive summary paragraph 1. Line 4 (total no. of slips is 39).

Marina standards / Protocols & Management

- 2.1.7 Waste water: - At the top of page 8 there is a reference to Appendices D, E, F and G which are supposed to refer to the Site Utilities Report. Please note that Appendix D is titled the Fertilization/ Pesticide Management Plan;
Please note this was a typing error and Appendix F and G does not exist. This line has been corrected and removed.
 - Appendix E is titled May 1st and May 5th Letters and references BEST communication to the environmental Consultant; and
 - There are no tabs for F or G and information associated with these references could not be found in the document.

As indicated above Appendix F and G has been removed from the document. May 1st and 5th letters have also been removed from table of contents and report, as this was a duplicate.

- **General Excavation & Fill Requirements-** Please address the conflicting information in Appendix A Turbidity Management Plan 4.4 Testing frequency Time which states that **"turbidity monitoring should be conducted once daily".** This is in conflict with the information in **General Excavation & Fill** required 1.1.2 4 (C) which indicated 6 total samples.

The chapter has been revised and reorganized and response to the above can be found in 3.1 - 4 (c) a total of 6 samples will be taken daily. This information is now consistent with section 4.4 in Appendix A

- 1.1.2 General Excavation & fill requirements (6):- indicates that the Contractor maintains the daily turbidity monitoring logs. In 4 (a) it is states that the EM will work along with the contractor and shall keep daily turbidity monitoring logs and have them available for inspection"

Please note that the Commission has no objections should the contractor also be required to keep a log of the turbidity. However, it should be clearly and consistently stated throughout the document if both are to maintain records. The Commission does require that the EM be ultimately responsible for the monitoring, documentation and submission of the turbidity logs to the Commission.



THE BAHAMAS ENVIRONMENT, SCIENCE AND TECHNOLOGY COMMISSION Ministry of the Environment and Housing

Both 1.1.2 (6) and 1.1.2 4(a) have been updated to 3.1 (6) and 4 (a) respectively, in General Excavation and Fill Requirements to indicate that both contractor and EM shall maintain logs. However, the EM shall be ultimately responsible for monitoring, documentation

- **Reclaimed Land /Fill 1.2:-** Please note the error in referencing the EIA in the final paragraph on this page. Prior to any construction.....the developer and/or contractor shall obtain all necessary approvals which will likely include: 1) Environmental Approval of **“this EIA”**....this should be EMP.

The above referenced has been corrected in this paragraph and chapter reorganized. See Chapter 5.0 paragraph 3 – line 3.

- Appendix B the first map insert has notes 1-5 cut off from the page. Please provide. Indicate where the notes are as indicated in map insert #2?

Map has been re-inserted in Appendix B with all notes included

- Further to Appendix B it is noted that various government communications/permits relative to the upland phased works known to the Commission as “Briland Residences” are included in this document. As indicated in our letter of May 5th should the developer intend on moving forward with this phase of the work and as no information was previously provided for this work, an Addendum to the EIA would be required and information governing its construction works would also need to be included in this EMP (as there is none). If the developer does not intend to proceed with the “Briland Residences” at this time it is requested that all such references to it be removed from this document. This EMP should only address the matters which are actively being pursued at this time as this is the document which will provide guidance to the contractor, EM and the general public as to what is to be expected on the property relative to environmental management actions associated with the approved works.

In regard to the use of the nomenclature describing the project in general, the Developer has chosen the name Briland Club and Residences to describe the entire project, including the original phase of 5.5 acres which specifically is the subject of this document as well as the subsequent phasing of single family homes, not currently the subject of this document. “Briland Club and Residences” is the proper name of the entire project and for the phase currently under consideration. Further to the Commission's comments, all communications/permits not deemed relevant has been removed from the document.

- **5.0 Environmental Project manager :-** It is unclear as to what the objective of this section is referencing as it has only Mr. Hall's CV and a Staff responsibilities section which speaks to identified roles in the event of a name storm approaching within 48 hours. Context is needed here. If Mr. Hall is to **assume the responsibilities of the fulltime EM** as indicated in the responses in Appendix B this section should contain introductory text which lets the reader know what the responsibilities of the EM are and indicate that Mr. Hall is the EM and provide the information on the two permanent employees and their intended roles if approved during the construction works. Clarity on the other positions is requested.

Chapter 5.0 has been reorganized and now pertains to “Reclaimed Land/Fill” The above information can now be found in Chapter Chapter 7.0 (7.1) and 8.0 (8.3.1 – 8.3.3). These speak to the roles and responsibilities of all employees and includes the CVs of all individuals As indicated in the chapter, Innovative Solutions Group, represented by Mr. Franklyn Hall will be responsible the environmental management of the project. This will also include training of staff to assume some designated tasks and assignments.

- **Work Plan and cost estimates:** - In this section it is stated that there are “only two” full time employees working on the project site. It is also stated that these individuals will be trained by the Environmental Consultant of Record to recognize issues of environmental concerns”. The CVs of these two individuals are required for review to determine the educational fitness for such a role. If there are no objections their CVs should be included in the document

Chapter 8.0 (8.3.1 – 8.3.3) been revised to include the CV's of all team members, including the two permanent staff members.



THE BAHAMAS ENVIRONMENT, SCIENCE AND TECHNOLOGY COMMISSION Ministry of the Environment and Housing

- **Demolition 7.1:-** As it relates to the “Haunted House” and its listing on the Register of Historic Resources no information on the current building structure can be found in Appendix B as indicated. Please advise

In this section there are two documents related to the “Haunted House”. The first is a historical piece of evidence referencing the ‘ Haunted House” in a written article. The second is a written communicated response to Mr. Alvin Rolle’s query regarding the building’s listing as a structure of archaeological significance to the Bahamas. These documents are listed in Appendix B of this report.

- **Seabed Lease 8.2:-** Please note there is no tab for an Appendix C and Appendix C is titled Spill Prevention/Hurricane And Emergency Action Plan. However, there are 2 figures contained in section 8.2. Please advise?

Appendix C as indicated is titled Spill Prevention/Hurricane and Emergency Action Plan. Chapter 10.0 SL-1 to SL-2 gives a brief narrative on the seabed lease, and Fig. 6 and Fig 7 are illustrative maps of the approximate 12 acres of seabed lease area.

BEST General Comments with responses:- May 1st 2019 letter

- Executive Summary response regarding Appendix B list of approve project components. Please see comments above.
Appendix B has been revised, and all documents, drawings and communication not included in the 5.6 acres of the proposed development has been removed for the purpose of this EMP document.
- Dredging overview and General Excavation and fill requirements responses – as there are several page “11s” please insert the specific chapter references for the page numbers to avoid confusion
The EMP document has been revised and references have been made to specific chapter and page numbers.
- Turbidity Measurement response – as there are several page “11 and 12” please insert the specific chapter references for the page numbers to avoid confusion.
Please see the above response. EMP document has been revised to reflect above referenced.
- Additionally, the response to paragraph “e” is missing the specific appendix reference.
The above referenced can be found in General Excavation and Fill Requirements 3.1. 4(e) “ Samples shall be collected at 2 feet from the surface of the water”
- All other items where the response directs the reader to a specific page number please indicate the chapter reference to avoid confusion as there are several pages which have the same number and we are unable to locate the required information.
- Coral relocation response indicates page 16-17 and Appendix B for the revised relocation methodology and CV – please indicate the chapter reference to avoid confusion as there are several pages which have the same number. Further Appendix B does not contain a methodology statement nor CVs.
Chapter 4.0 has been revised to Chapter 6.0 and includes the relevant information with respect to Coral Reef relocation Plan, in 6.1.1 Page CR-1. As indicated in the 4th submittal the BEST Commission has agreed to allow a joint site relocation visit to be done with the relevant government agency and the marine science specialist.
- Demolition Plan response please note that Appendix E does not contain a revised schedule. Appendix E is titled May 1 & 5th Letters and contains a series of drawings
This section (May 1 & 5th Letters” has been revised, and the revised schedule has been updated and found in Chapter 12, Page PS-1.
Appendix E has also been revised (added) and does not include May 1st & 5th letters. Appendix E now refers to site storm water, drainage, Infrastructure and Roadways



THE BAHAMAS ENVIRONMENT, SCIENCE AND TECHNOLOGY COMMISSION Ministry of the Environment and Housing

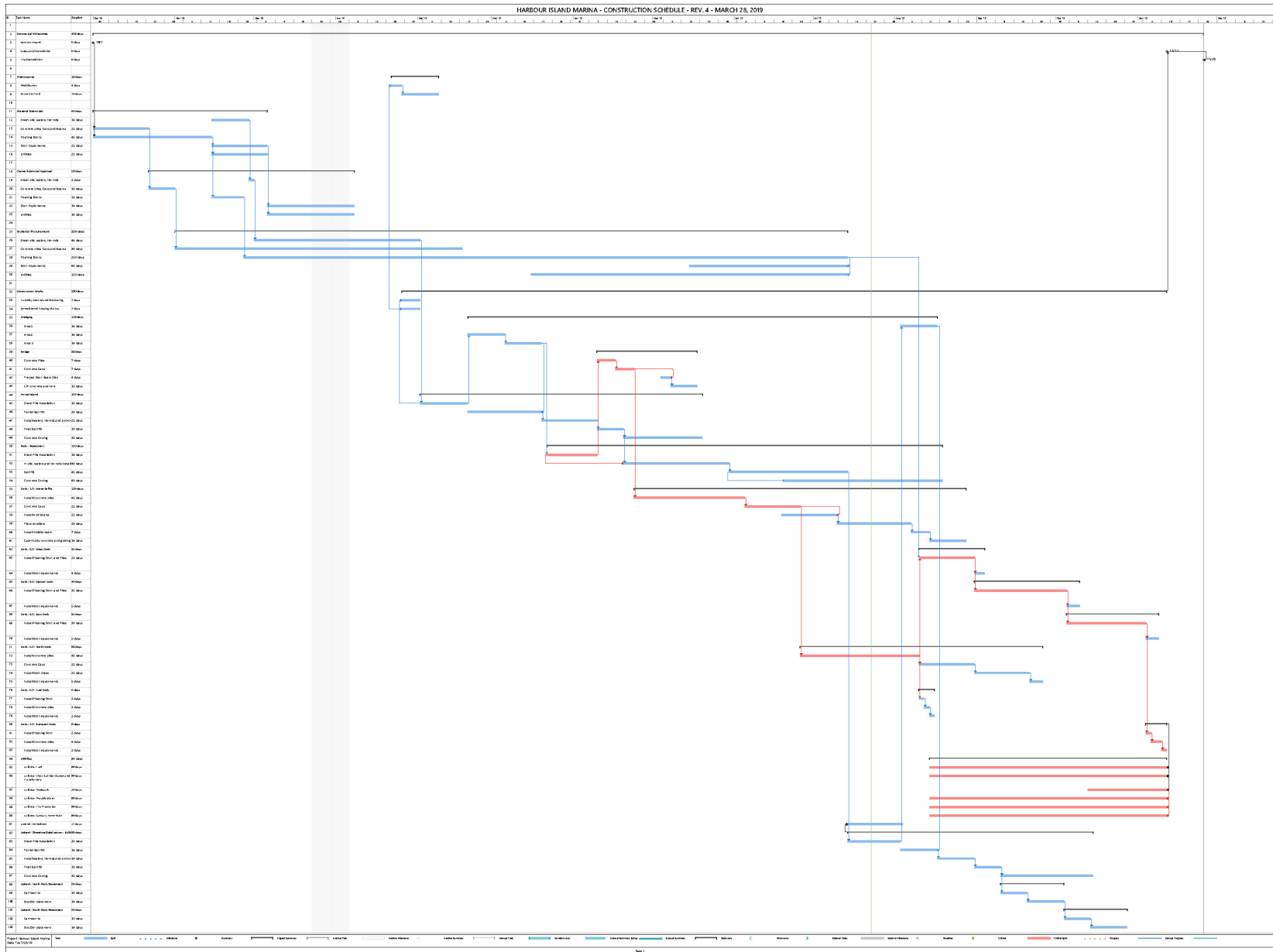
- Please note that Appendix C is titled Spill prevention/Hurricane and Emergency Action and it is not “tab”.
This has been revised and Appendix C is clearly tabbed for reference
- Please note that there is series of missed applied information regarding what is associated with Appendix E
As indicated above, Appendix E has been revised to address other relevant project components
- **May 5th Letter responses:**-Text need to be provide which indicates who the colored text represents
This has been revised to illustrate black (BEST Commission) and red (Project Response). Please see above
- **Appendix B. Project Permits & Documents:**-Please note that this section contains permits for which no information in this document is provided. Please see previous comments on page 1 under reclaimed land regarding same;
Please see above response. This has been revised and addressed accordingly
 - There are also maps with missing information and an aerial without a legends or title. Please advise
All maps have been revised and labels and legends/titles placed therein for reference to project
- **Appendix C. Spill Prevention Hurricane & Emergency Action Plan:**- As this project is based in Harbour Island it is not expedient that that the phone number for A&E at PMH in Nassau is listed as an Emergency Phone Numbers list, especially when it is not listed with the clear notation that it is a long distance call. All numbers which are not local should reference the (242) areas code so that the individual making the call would be aware. Further the local emergency numbers should be represented here as the primary agencies of contact i.e. the local clinic in Harbour Island, the island Administrator etc. Please reference the format used with the utilities company contacts as provided in this section.
The above comments have been note, and area code and contacts changed to reflect local district
- **Appendix E. May 1st and May 5th Letters:** - need to be revised as there are additional items in this sections which are not consistent with the title.
This has been revised and the entire document updated. As indicated above Appendix E has also been revised added) and now refers to drainage, infrastructure, utilities and roadways.

Sincerely;

Mrs. Rochelle W. Newbold
Director

Cc: Ms. Janice Miller - Permanent Secretary, Ministry of the Environment & Housing
Mrs. Candia Ferguson - Director, Bahamas Investment Authority
Mr. Charles Zonicle - Acting Director, Department of Physical Planning

12.0: PROJECT SCHEDULE



APPENDIX A: TURBIDITY MANAGEMENT PLAN



**TURBIDITY MANAGEMENT PLAN
HABOUR ISLAND MARINA**

Table of Contents

- 2.1 Background2
- 2.2 Turbidity Monitoring.....2
- 3.1 Turbidity Control.....2
- 3.2 Source Control Measures.....2
- 3.3 Containment2
- 3.4 Curtain Maintenance3
- 4.1 Turbidity Monitoring.....3
- 4.2 Monitoring Parameters.....3
- 4.3 Background Readings.....3
- 4.4 Testing Frequency (Time).....3
- 4.5 Test Locations3
- 4.6 Testing Method3
- 4.7 Daily Logs4
- 4.8 Hold Points4
- 5.1 Appendix5
- 5.2 Appendix 1: Turbidity Curtains Specifications5
- 5.3 Appendix 2: Turbidity Curtain Installation Maps6
- 5.4 Appendix 2: Sample Turbidity Monitoring Sheet7

1.1 Introduction

The following document was prepared to assist the Contractor with turbidity monitoring associated with activities that have the potential to generate turbidity.

The purpose of the plan is to:

1. **Control** the amount of turbidity generated by activities
2. **Contain** turbidity generated by activities
3. **Document** potential turbidity within and outside the prescribed mixing zone beyond the area of turbidity generating activity.

This plan was prepared based on guidelines set out in the Environmental Management Plan (EMP) and takes into consideration the specific unique conditions of the site.

2.1 Background

2.2 Turbidity Monitoring

Turbidity is a measure of the degree to which the water loses its transparency due to the presence of suspended particulates. The more total suspended solids in the water, the higher the turbidity. Turbidity is measured using a turbidity meter and is generally reported in nephelometric turbidity units (NTUs). This measurement usually provides a strong correlation with the concentration of total suspended particles in the water that affect clarity. As The Bahamas does not have legislation mandating acceptable turbidity levels associated with construction, this Project will follow the Florida Department of Environmental Protection's (FDEP) turbidity criteria of 29 NTU.

3.1 Turbidity Control

3.2 Source Control Measures

The first effort will be to limit the amount of turbidity generated due to the activity as far as possible. Every effort should be made to conduct works during favourable weather conditions. The Contractor should monitor weather conditions and the turbidity generating activity should temporarily cease if weather conditions are unfavourable; resulting in turbidity levels that are at or near the established threshold.

3.3 Containment

Turbidity curtains will be installed for containment. The type of turbidity curtain used must meet specifications for conditions experienced on site. Specifically, Type 2 curtains will be installed to manufacturer's specification (See Appendix 1). Anchors have been provided with the curtain assemblage but additional concrete blocks will be used to anchor curtain corners to ensure stability.

Dredging will be conducted in three (3) phases to ensure effective containment (See Appendix 2: Turbidity Curtain Installation Maps). The Project will excavate approximately 7,200 cubic yards of mostly sandy sediment that will be immediately placed within the sheet piles to fill in the Arrival Island.

3.4 Curtain Maintenance

Curtains are to be inspected prior to daily works for the following:

- Noticeable areas where the curtain is not successfully securing the containment area.
- Sufficient turbidity control performance.
- Anchors that have become dislodged or loose. Depending on load, installation, and weather events, repositioning or re-tensioning anchors may be periodically required.
- Curtain skirt bases that have become buried in sediment or debris. To function properly, turbidity curtain should be approximately 1 foot above the bottom at all times.
- Marine growth or accumulated debris on connectors, buoys, mooring lines, or tidal compensators. Clean if necessary.
- Damage or tears to the sediment curtain itself.
- Signs that the weather is changing. Turbidity Curtain should not be left during hurricane events.

4.1 Turbidity Monitoring

4.2 Monitoring Parameters

- The establish threshold indicated in the EMP is 29 NTU in accordance with the Florida Department of Environmental Protection's (FDEP) turbidity criteria.
- A 250m mixing zone originating from activity location will be utilized as per the EMP.

4.3 Background Readings

Background and compliance measurements were taken to identify baseline turbidity levels. Background readings were taken 200m from the coast to ensure that the baseline data covered all areas that might be affected by turbidity. Readings were recorded at 0.9NTU.

4.4 Testing Frequency (Time)

- Three samples shall be obtained at both the background and compliance stations (6 total). One reading shall be taken prior to the commencement of work, four during the work period and one reading one hour after work has ceased.
- Measurements should be conducted during the active working operations
- Monitoring should be conducted for the duration of the turbidity generating activity

4.5 Test Locations

- 500 meters upstream to test background turbidity levels
- 200-meter downstream of construction activity that is generating the turbidity

It should be noted that these locations will change based on wind direction.

4.6 Testing Method

- The turbidity meter should be calibrated at the beginning of each sampling session.
- Samples should be taken at the densest part of the turbidity plume.
- Samples should be taken two feet from the surface of the water.

4.7 Daily Logs

Daily monitoring logs (See Appendix 2: Sample Turbidity Monitoring Sheet) should be kept and should include the following information for each sample:

- 1) Date and time of day of sampling
- 2) Weather conditions
- 3) Tidal stage and direction of flow
- 4) Wind direction and magnitude
- 5) Latitude / Longitude coordinates of each sampling location
- 6) A description of any factors influencing the turbidity generating activity at the time of the monitoring
- 7) Final measurements

4.8 Hold Points

- If test results are near prescribed levels operations/ methodology will be modified as needed.
- If test results exceed prescribed levels, activities generating turbidity will temporarily cease.

5.1 Appendix

5.2 Appendix 1: Turbidity Curtains Specifications



Anchoring Kits

Security and Stability for Curtains & Booms

Anchoring Kits produce the important and necessary means of securing curtains and booms depending on your specific project conditions and requirements.



GEI
WORKS

Anchoring Kits

Security and Stability for Curtains & Booms

Anchor Kits are a requirement for any floating barrier being used the water. This includes Type 1, Type 2 and Type 3 Turbidity Curtains, Open Water Oil Booms, River Debris Booms, Mats, Signs and more. Without proper anchoring, your boom or barrier WILL fail. Correct Mooring will ensure product performance and longevity. Feel free to contact a GEI Works specialist for anchoring recommendations at 772.646.0597

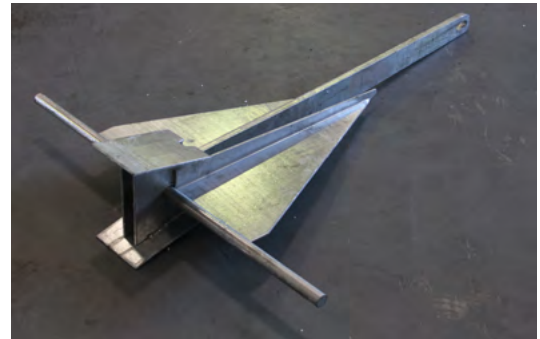
Kits Include

- Anchors
- Painter Rope
- Chain
- Buoys
- Optional Trip Line Buoys

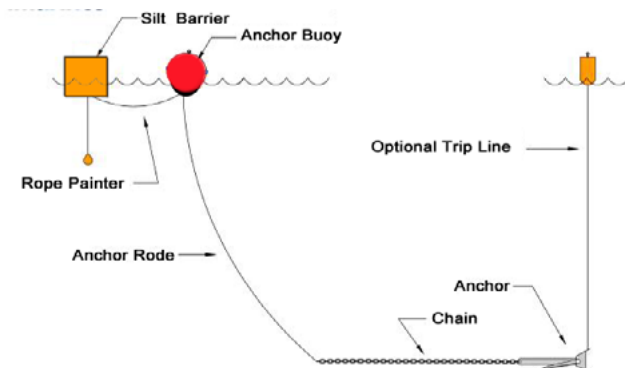
Accessories are an important component to the installation of any silt curtain or barrier in order to ensure safe navigation, compliance and improved performance

Accessories:

- Marker Lights
- Tow Bridles
- Navigation Buoys
- Wave Attenuators
- Oil Spill Kits
- Reefing Line for Skirt Adjustment



The Importance of Anchoring



Anchoring and anchor kits are one of the most important accessories for sites dealing with moving currents, waves, tides or other site factors. Having the right anchor pattern, installation design and anchors can significantly influence, reduce and redistribute loads placed on your barrier. Contact our technical team (+1 772.646.0597) for more information regarding anchor placement and use.

Anchoring Kits

Security and Stability for Curtains & Booms



Ground Anchor KIT

Recommended for use with a variety of Silt Curtains, Turbidity Curtains and Boom products.

Kit Part	Description
Anchor	Ground Anchor Style
Webbing	Sized to suit
Shackle	5/16"
Buoy	15" Orange Buoy
Installation Driver & Rod	Sold Separately - Not included in Kit



Fluke Anchor KIT

Recommended for use with a variety of Silt Curtains, Turbidity Curtains and Boom products.

Kit Part	Description
Anchor	22lb., 40lb., or 65lb. - Fluke Style
Rope	60' of 1/2" Twisted Nylon
Chain	8' of 3/8" Leader Chain
Buoy	Inflatable 86.4" Circumference
Painter Liner	6' of 1/2" Twisted Nylon (40lb. and 65lb. anchors only)
Hold Power	22lb./1600 40lb./2000 65lb./3000



Pyramid Anchor Kit

Designed to penetrate the bottom and prevent dragging.

Kit Part	Description
Anchor	35lb., 135lb., or 300lb.
Rope	1/2" Twisted Nylon
Chain	Galvanized Steel. Suitable for conditions
Buoy	Inflatable. Suitable for conditions
Shackle	7/16, 5/8, or 7/8 Galvanized
Hold Power	10x Anchor weight for average conditions

Anchoring kits and accessories should be chosen carefully according to site conditions including (but not limited to) soil, topography, water flow rate, etc. Please consult with a GEI Works specialists for recommendations. 772-646-0597

GEI Works is dedicated to developing innovative anchoring and turbidity curtain solutions that provide superior performance and achieve the desired results for our customers. We work closely with our client team to design a deployment layout that takes into consideration all of your project requirements including water conditions, project progress, budget and water quality goals.

Our goal is to work with our clients to develop the best solution for their specific project and help them come in under budget and on time.

For more complete information on GEI Works products and solutions, visit us on the Web at www.geiworks.com.

Toll Free: 1-888-703-9889 | Phone: (1+) 772-646-0597 | info@geiworks.com

© 2015 GEI Works
All rights reserved
GEI Works terms and conditions apply.

All photos are representatives only. Actual Product may differ than featured.

Materials and specifications are subject to change without notice. Featured products in photos may include additional equipment or accessories. See your GEI Works Dealer for available options.

GEI Works, Mars, Taurus, Triton, Kraken, Orion, Vulcan and geiworks.com, their respective logos, product identity used herein, are trademarks of GEI Works and may not be used without permission.



GEI
WORKS



Triton Type II HD Silt and Turbidity Barrier



Triton Type 2 HD Silt Curtains are designed for silt and turbidity control in areas with moving water, currents, waves or tides. These barriers surround projects and help to contain materials until they have enough time to settle.



GEI
WORKS

Triton Type II HD

Silt and Turbidity Barrier

Constructed using robust and reliable components, these barriers actively work to contain silt, turbidity and displaced particles around your site. Type 2 HD curtains are typically recommended for use in water locations with waves up to two feet (2'), moderate wind, and currents up to 1 knot.

Applications:

- Dredging Projects
- Dock Repair, Demolition and Maintenance
- Boat Ramp Creation
- Pile Driving
- Shoreline Construction
- Rip Rap Installation
- Remediation Projects

Accessories are an important component to the installation of any silt curtain or barrier in order to maximize effectiveness.

Turbidity Curtain Accessories:

- Anchor Kits
- Buoys
- Marker Lights
- Tow Bridles

Importance of Anchoring:

Anchoring and anchor kits are one of the most important accessories for sites dealing with moving currents, waves, tides or other site factors. Having the right anchor pattern, installation design and anchors can significantly influence, reduce and redistribute loads placed on your barrier. Contact our technical team (+1 772.646.0597) for more information regarding anchor placement and use.



Triton Type II HD Silt and Turbidity Barrier



How a Turbidity Curtain Works:

The main function of a silt screen or turbidity barrier is to control the dispersion of suspended silt and to improve settling times (Stokes Law). During a construction project, silt and other materials often become suspended in the water area. Curtains are placed within the water to create a confined zone of contained materials. Contained areas allow marine contractors to stay within Federal and State Clean Water Act and NPDES Phase II regulations. In turn, this helps sites to avoid fines and allows projects to be completed on time.

Please note, turbidity curtains are designed to act as a temporary area that increases the amount of time solids have to settle back down to the bottom of the area. They will not act as dams or walls.

Product Considerations:

Knowing these elements can help determine the right anchoring strategy, curtain model and deployment method.

Turbidity Curtains and Salt Water

When using the Type II HD Barrier in salt water areas, consideration should be given to the tension cables and connectors. The following component adjustments are recommended for any location with salt water; Stainless Steel Cable and Zinc Anode Connectors upgrade, Stainless Steel Chain upgrade, or a combined Cable/Chain upgrade.

For short term projects, galvanized components can be used for a period of up to 12 months.

Fabric Considerations

Alternative fabrics are also available for extended deployment in areas with high pH levels, high temperatures, low temperatures or in areas where chemicals are present.

When should I use a Permeable Silt Curtain?

Permeable Type II Silt Barriers are most commonly used when they are either specified in a site project or when the curtain will be dealing with a significant amount of water pressure. Use of the bottom filter panel can help reduce pressure on the curtain by allowing water to continue to flow through the curtain.

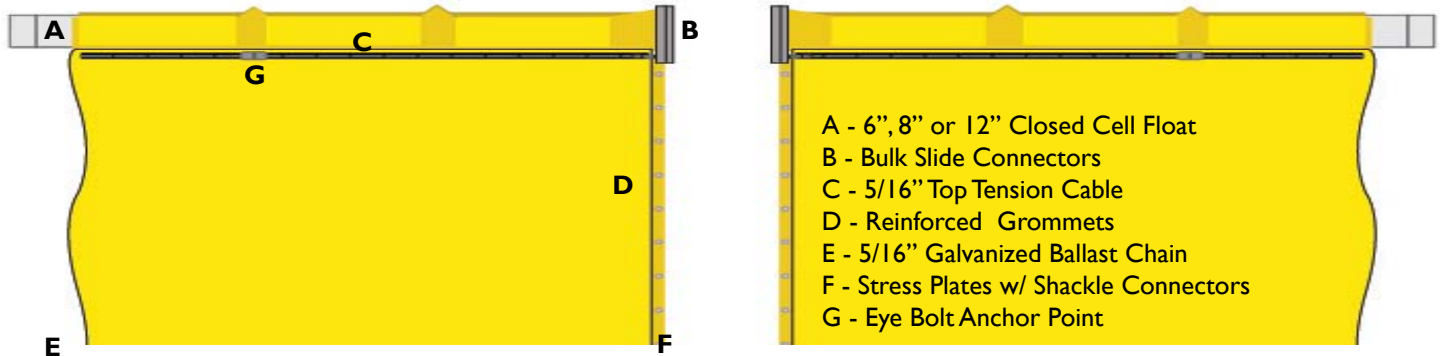
Water Conditions, Factors and Considerations

Consideration of site and water conditions is an important step for any location looking to control silt in a moving water body. Due to the current and waves in these areas, additional pressure is placed on the barrier during use. In order to accommodate and contain silt in these conditions, it is important to consider the following:

- Water Velocity
- Waves (height, frequency)
- Wind Speed and Direction
- Tides
- Soil Type (contaminated?)
- Project Duration

Triton Type II HD

Silt and Turbidity Barrier



SPECIFICATIONS

Length	50' or 100'
Depth	5' (3' - 100' available on request)
Fabric	22 oz. PVC
Flotation	Square Foam Filled Flotation
Flotation Size	6", 8" or 12"
Tension Cable	5/16" Tension Cable Below Float
Bottom Ballast Chain	5/16" Galvanized Chain
Section Connectors	Bulk Slide Connectors
Color	Yellow
Anchor Points	Every 50'

GEI Works is dedicated to developing innovative turbidity curtain solutions that provide superior performance and achieve the desired results for our customers. We work closely with our client team to design a deployment layout that takes into consideration all of your project requirements including water conditions, project progress, budget and water quality goals.

Our goal is to work with our clients to develop the best solution for their specific project and help them come in under budget and on time.

For more complete information on GEI Works products and solutions, visit us on the Web at www.geiworks.com.

Phone: (1+) 772-646-0597 | info@geiworks.com

© 2015 GEI Works
 All rights reserved
 GEI Works terms and conditions apply.

All photos are representatives only. Actual Product may differ than featured.

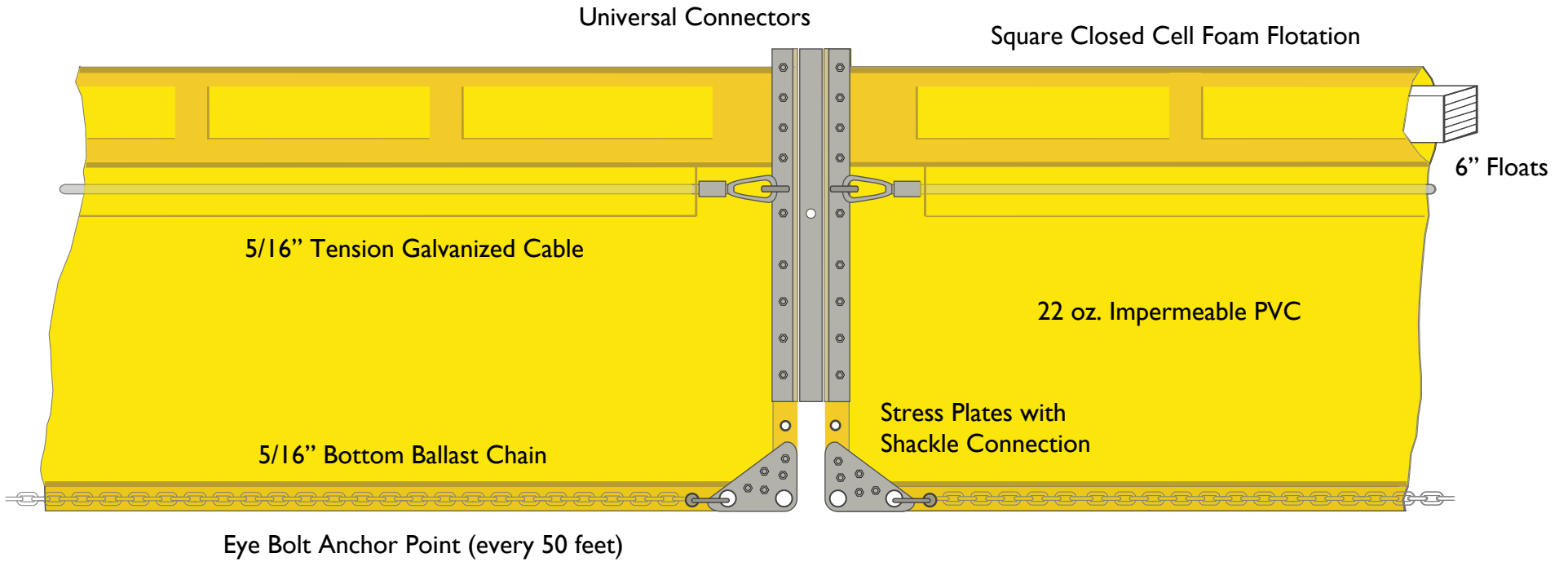
Materials and specifications are subject to change without notice. Featured products in photos may include additional equipment or accessories. See your GEI Works Dealer for available options.

GEI Works, Mars, Taurus, Triton, Kraken, Orion, Helios, Centaur, Hydrostar and geiworks.com, their respective logos, product identity used herein, are trademarks of GEI Works and may not be used without permission.



GEI
WORKS

635-2017-02-01



GEI
WORKS

772-646-0597
www.GEIWorks.com
info@geiworks.com

Type 2 HD Turbidity Curtain

Drawing is for illustrative purposes only. Not to scale.
Copyright © GEI Works 2018
Natural forces such as current, wind, waves, and location affect your product and may require engineering, additional anchoring, and customization.

Scale:

Not to Scale

Drawing:

Revision:

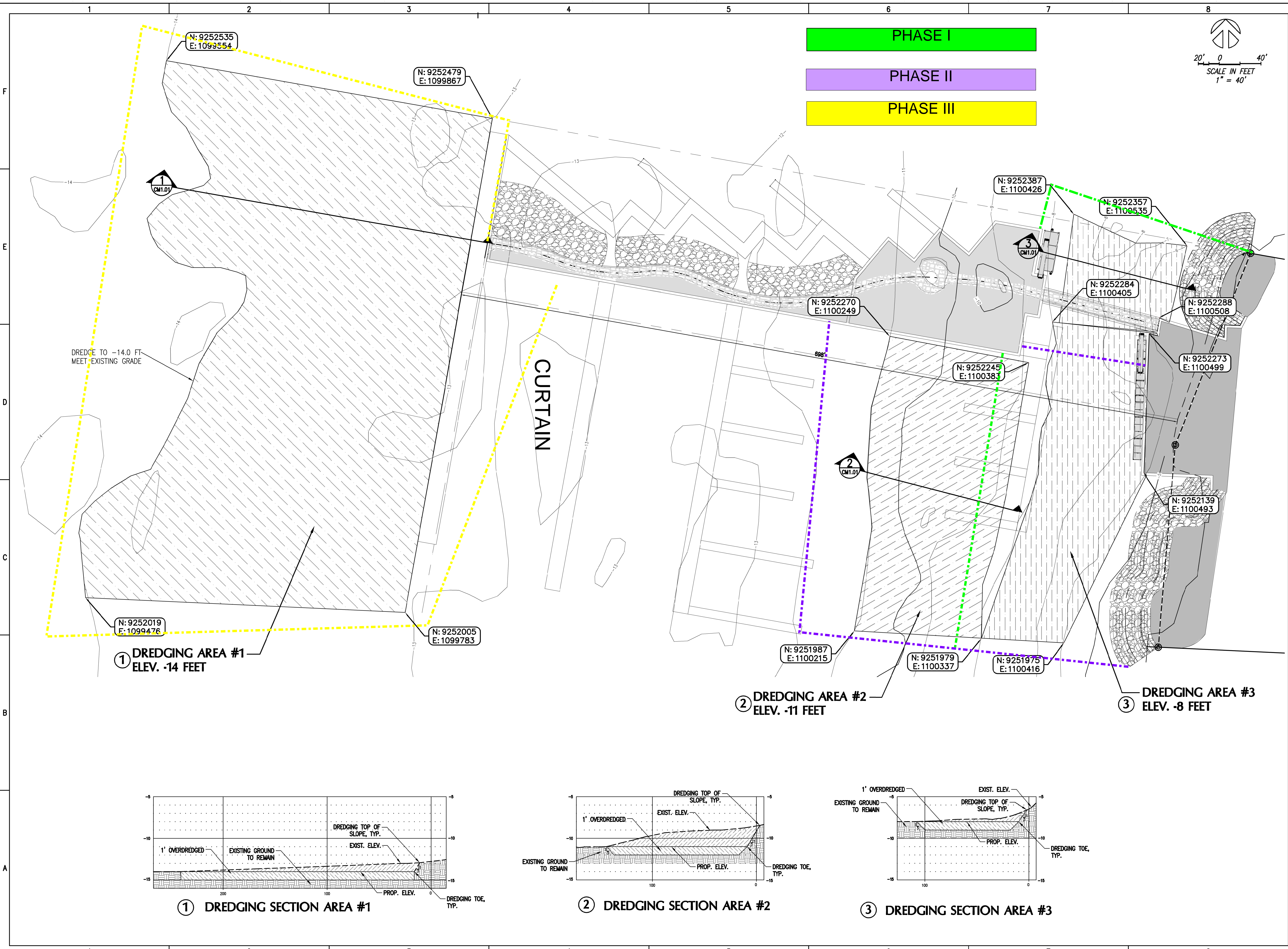
1

Date:

By:

5.3 Appendix 2: Turbidity Curtain Installation Maps

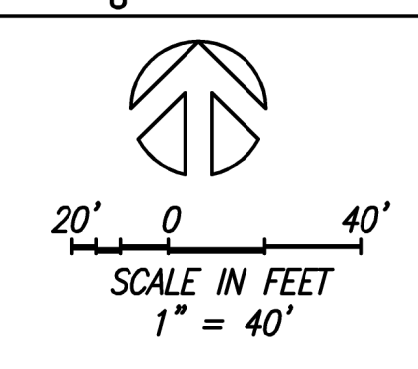
F:\Project\370400\CONSTRUCTION DWG\WORKING VOLUMES\DREDGING\2.dwg



PHASE I

PHASE II

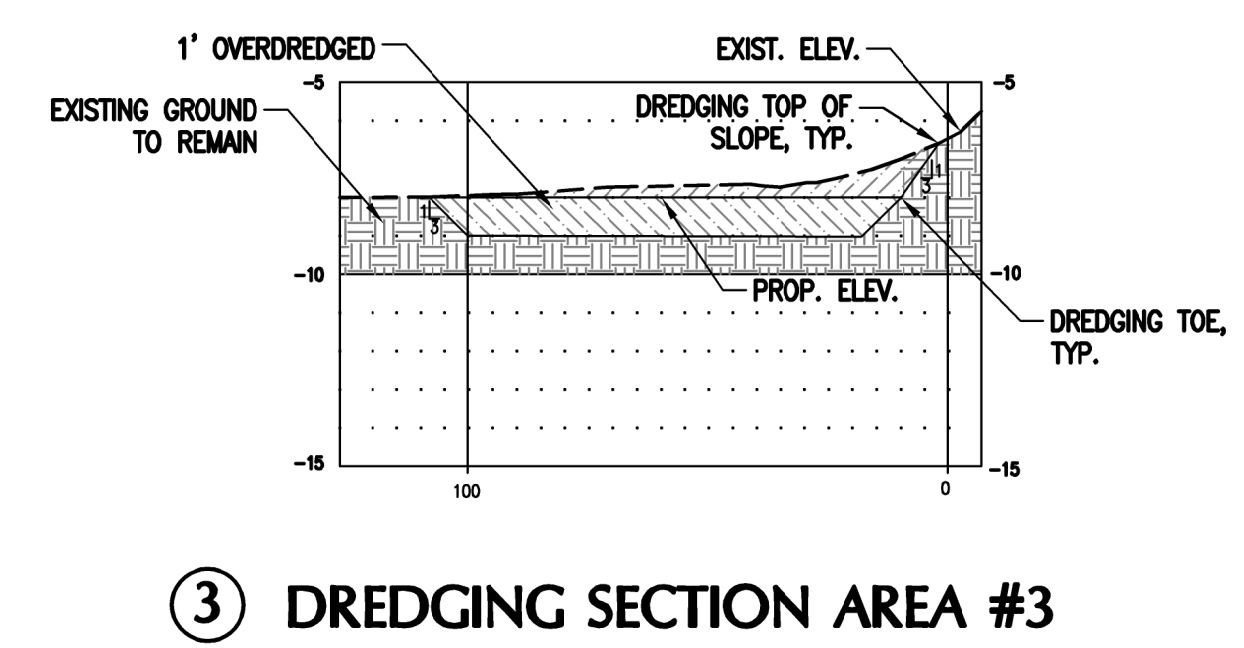
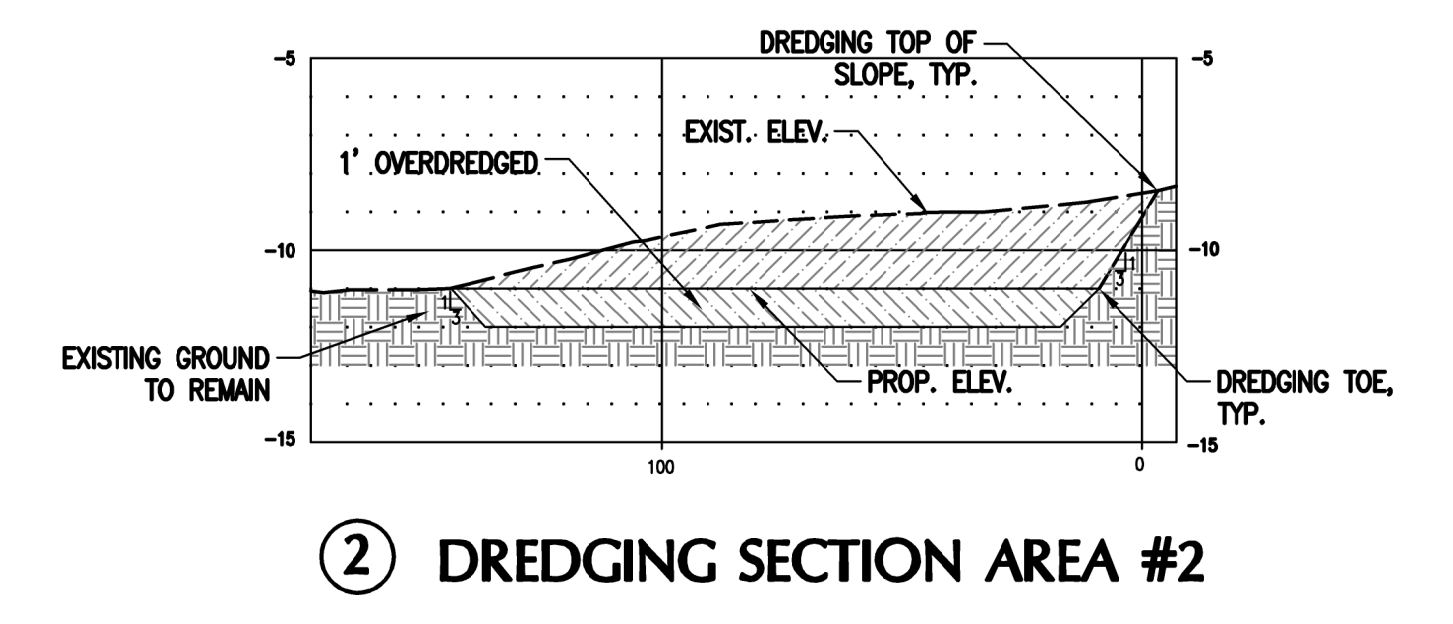
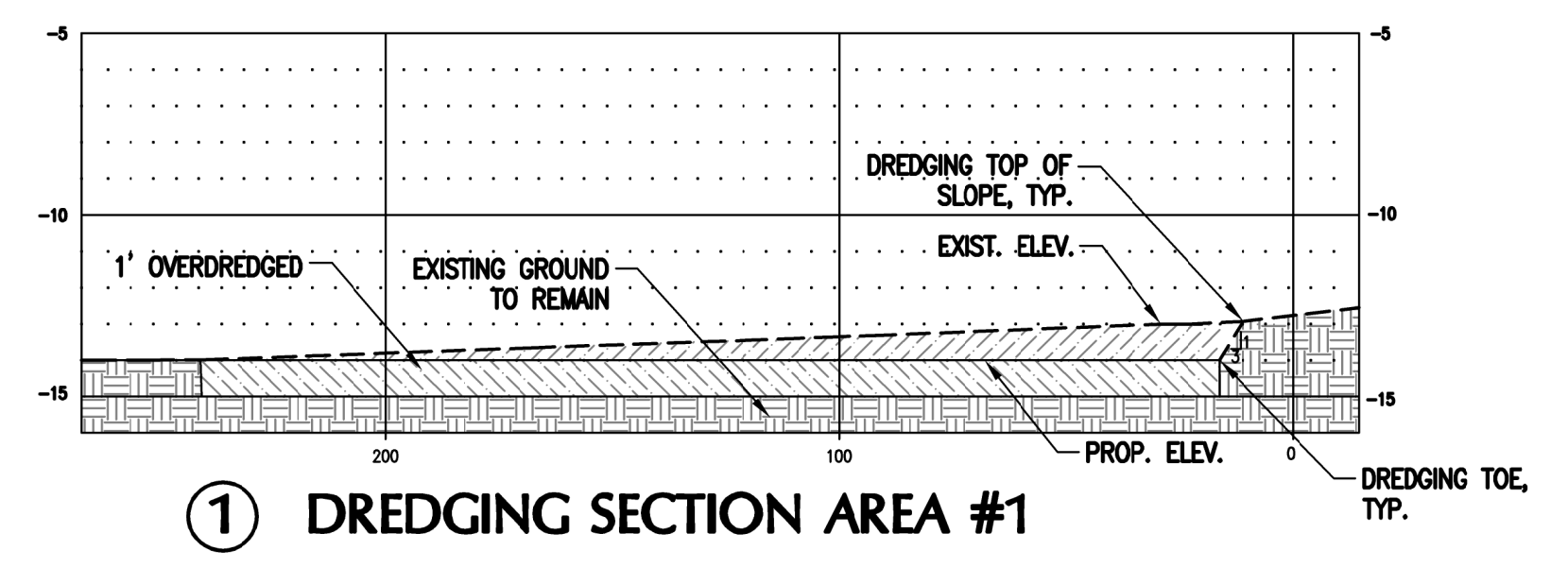
PHASE III



① DREDGING AREA #1
ELEV. -14 FEET

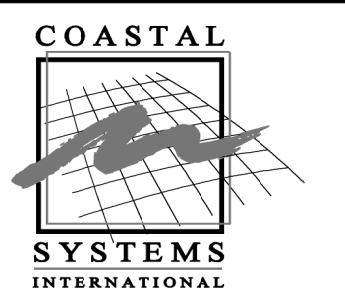
② DREDGING AREA #2
ELEV. -11 FEET

③ DREDGING AREA #3
ELEV. -8 FEET



PROPOSED MARINA AND DREDGING PROJECT

HARBOUR ISLAND THE BAHAMAS



COASTAL SYSTEMS INTERNATIONAL, INC.
464 South Dixie Highway
Coral Gables, Florida 33146
Tel: 305-661-3655
Fax: 305-661-1914
www.CoastalSystemsInt.com
State of Florida EB #7087
Coastal, Environmental,
Civil Engineering and Management

OWNER

4M Harbour Island LTD.

CONSULTANTS

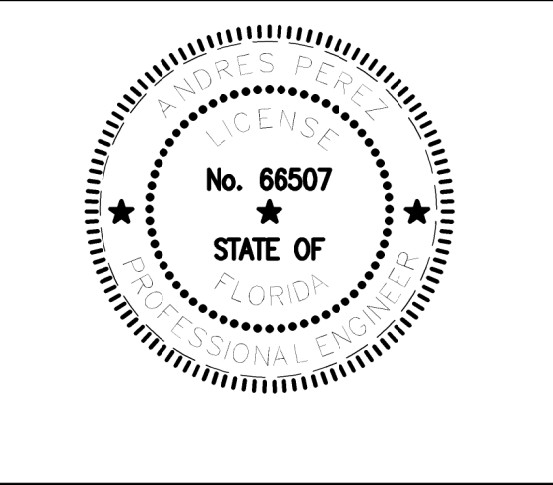
JARA
ALVAN K. ROLLE & ASSOCIATE LTD.
ARCHITECTS - PLANNERS - CONSTRUCTION MANAGERS
F.F.A.S. MIAA
P.O. BOX N-7401
NASSAU, BAHAMAS
PHONE (242) 326-8141
FAX (242) 322-3886

McACE Technical Service Ltd.
STRUCTURAL & CIVIL ENGINEERS
P.O. Box N-9383
Nassau, Bahamas
Tel: (242) 394-3720
Fax: (242) 394-6107
Email: mcace@bahamas.net.bs
P.O. Box F-712
Freetown, Grand Bahama
Tel: (242) 352-9564

ISSUE	DATE	DESCRIPTION
B	03/16/18	BID SET
A	01/16/18	30% CD REVIEW SET

PROJECT NO: 370400
DATUM: MSL/UTM18N
DRAWN BY: CR
CHECKED BY: AP

ENGINEER OF RECORD



PROPOSED MARINA DREDGING

CM1.01

5.4 Appendix 3: Sample Turbidity Monitoring Form

TURBIDITY MONITORING REPORT

Sampler Name: _____

Date: _____

Dredge Area Location (Description): _____

Parameter	Background Sample	Compliance Sample
Samples to be taken within 200m of the works at regular intervals (50, 75, 150, 200)m		
Location (Station ID)		
Weather		
Conditions(e.g. Clear, Rainy, Cloudy)		
Air Temperature (°F)		
Wind Speed (mph)		
Wind Direction		
Sea Conditions		
Tidal Stage (e.g. high, low, incoming, outgoing, slack,)		
Wave Height (ft)		
Turbidity (Sample taken 2ft below surface)		
Time at sample Analysis		
Instrument Calibration (Date)		
Turbidity (NTU) 1 st Reading []	[]m	[]m
Turbidity (NTU) 2 nd Reading []	[]m	[]m
Turbidity (NTU) 3 rd Reading []	[]m	[]m
Turbidity (NTU) 4 th Reading []	[]m	[]m
Turbidity (NTU) 5 th Reading []	[]m	[]m
Turbidity (NTU) 6 th Reading []	[]m	[]m

If the readings taken at background and compliance are greater than 29 NTUs the EM shall notify the Government Agency immediately, and all dredging shall cease. The EM shall ensure that corrective action is taken by the Contractor and samples are taken at regular intervals until the turbidity has returned to acceptable levels.

APPENDIX B: PROJECT PERMITS AND DOCUMENTS

Acquapazza Wine Bar & Ristorante

A and A Hidden Treasures

LEGEND

DESIGN CRITERIA

NOTES

SITE DATA SUCH AS TIDE LEVELS, BATHYMETRY, SHORE ELEVATION, SOIL STUDY, WIND SPEED AND WAVE HEIGHT TO BE CONFIRMED UPON FINAL DESIGN.

ALL DIMENSIONS ARE BETWEEN DOCK ALUMINUM EXTRUSIONS ONLY AND DO NOT TAKE INTO ACCOUNT THE FENDER WIDTHS UNLESS OTHERWISE NOTED.

A h	INITIAL ISSUE	O.C.	19/05/17		
No.	Description	By	Appro.	For	Inst.
		YAMMOO	YAMMOO	YAMMOO	YAMMOO

PROPRIETARY INFORMATION
 This drawing and all the information thereon are exclusive property of MAADI MANUFACTURING INC.; they are strictly confidential and they must not be made public or copied. This drawing is transmitted for consultation only and must be returned upon request to MAADI MANUFACTURING INC.; it may only be used for purpose of executing the work for which it was conceived.

TECHNO' MARINE
 Advanced Docking Solutions

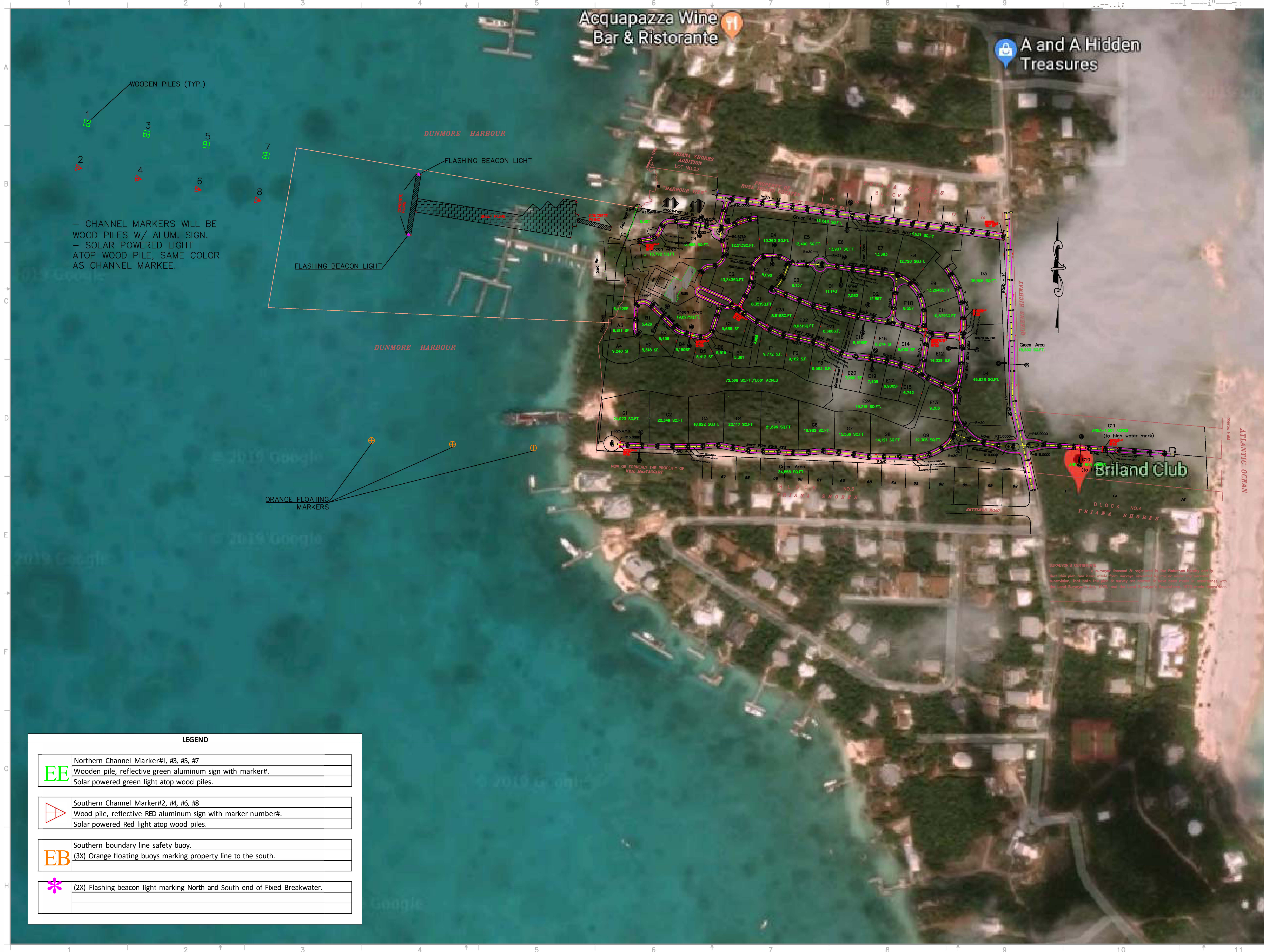
Project
BRILAND CLUB AND MARINA
 NORTH ELEUTHERA
 THE BAHAMAS

Title
CHANNEL ENTRANCE

No. de Contrat	D1382	G@rant de projet	O.S.
Contract no.		Project manager	

Traç@ le	19/05/17	Dessiné par	O.C.
Printed		Drawn by	

Dessin de		No. de dessin	D1382-MS02	Rev.	00
Ref. drawing		Drawing no		Rev	



WOODEN PILES (TYP.)

1 2 3 4 5 6 7 8

— CHANNEL MARKERS WILL BE WOOD PILES W/ ALUM. SIGN.
 — SOLAR POWERED LIGHT ATOP WOOD PILE, SAME COLOR AS CHANNEL MARKEE.

FLASHING BEACON LIGHT

FLASHING BEACON LIGHT

ORANGE FLOATING MARKERS

LEGEND

EE	Northern Channel Marker#1, #3, #5, #7 Wooden pile, reflective green aluminum sign with marker#. Solar powered green light atop wood piles.
EB	Southern Channel Marker#2, #4, #6, #8 Wood pile, reflective RED aluminum sign with marker number#. Solar powered Red light atop wood piles.
EB	Southern boundary line safety buoy. (3X) Orange floating buoys marking property line to the south.
*	(2X) Flashing beacon light marking North and South end of Fixed Breakwater.

BUILDING PERMIT

DATE OF APPLICATION
30-Nov-17

RECEIPT NO.
00046149

DATE OF RECEIPT
11/29/2017

THE BUILDINGS REGULATIONS ACT
THE TOWN PLANNING ACT 1961
AND THE PRIVATE ROADS AND SUBDIVISIONS ACT 1961

GOVERNMENT OF THE BAHAMA ISLANDS

AREA
East
NO. OF DRAWINGS
116
03982

I/WE HEREBY APPLY FOR PERMISSION TO CARRY OUT THE DEVELOPMENT DESCRIBED IN THIS APPLICATION AND ON THE ATTACHED PLANS AND DRAWINGS

AGENT
ALVAN K. ROLLE & ASSOCIATE LTD.

(1) APPLICANT SURNAME
4M HARBOUR ISLAND LTD.

TELEPHONE
242-326-8141

NAME

EMAIL

TELEPHONE
c/o 242-326-8141

PROFESSION
ARCHITECT

EMAIL

ADDRESS
P. O. BOX N-7401

ADDRESS
c/o P. O. BOX N-7401

(2) PARTICULARS OF APPLICANT'S INTEREST IN THE LAND
OWNER
IF OTHER, PLEASE SPECIFY:

(3) ADDRESS AND LOCATION OF THE LAND TO BE DEVELOPED IN SUFFICIENT DETAIL TO ENABLE SITE TO BE READILY IDENTIFIED

IF PROSPECTIVE PURCHASER OR LESSEE WHETHER OWNER OR LESSON HAS CONSENTED TO PROPOSED DEVELOPMENT

YES NO

Harbour Island, North Eleuthera, Bahamas

(4) DESCRIBE BRIEFLY THE PROPOSED DEVELOPMENT INCLUDING THE PURPOSE FOR WHICH THE LAND AND/OR BUILDING ARE TO BE USED. IF THEY ARE TO BE USED FOR MORE THAN ONE PURPOSE, GIVE DETAILS

(5) STATE THE PURPOSE FOR WHICH THE LAND AND/OR BUILDING(S) ARE NOW USED AND IF FOR MORE THAN ONE PURPOSE, GIVE DETAILS

EXISTING BUILDINGS TO BE DEMOLISH

B.C.
 W.C.

PROPOSED INFRASTRUCTURE

(6) GENERAL INFORMATION: MATERIALS FOR EXTERIOR FINISH OF THE BUILDING(S)

ESTIMATED CONSTRUCTION COST:

(A) WALLS

N/A

2.5M

(B) ROOF

N/A

(C) ESTIMATE AREA IN SQUARE FEET

(D) ESTIMATE FEE

ESTIMATED VALUE

\$100.00

DEPOSIT

\$2,500,000.00

\$100.00

OCCUPANCY TYPE

TYPE:

GROUP:

FINAL AREA IN SQUARE FEET

BALANCE FEE

ACTUAL FEE

Select...

Select...

500

-\$25.00

\$75.00

NO. OF UNITS:

Total \$0.00

(7) ARCHITECT/ DRAUGHTSMAN SURNAME

(8) SURVEYOR SURNAME

NAME

NAME

ADDRESS

ADDRESS

TELEPHONE

TELEPHONE

(9) P.C.N.

CONDITIONS SUBJECT TO WHICH THIS PERMIT IS ISSUED
GENERAL: CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATION ACT 1971, THE RULES MADE THEREUNDER, THE REQUIREMENTS OF THE BAHAMAS BUILDING CODE, THE APPROVED DRAWINGS AND ANY OTHER CONDITIONS SPECIFIED HEREUNDER.
THE PERMIT SHALL BE VALID FOR A PERIOD OF EIGHTEEN MONTHS FROM THE DATE OF ISSUE GIVEN BELOW.

BUILDING PERMIT TO BE POSTED AT COMMENCEMENT OF CONSTRUCTION

THE REASON(S) FOR THE IMPOSITION OF THE CONDITION(S) SPECIFIED ABOVE IS/ARE

TO COMPLY WITH THE REGULATIONS OF THE MINISTRY OF WORKS

DATE OF ISSUE

31 January, 2018


FOR MINISTER

BUILDING PERMIT

DATE OF APPLICATION
11/30/2017

RECEIPT NO.
00046149

DATE OF RECEIPT
11/29/2017

THE BUILDINGS REGULATIONS ACT
THE TOWN PLANNING ACT 1961
AND THE PRIVATE ROADS AND SUBDIVISIONS ACT 1961

GOVERNMENT OF THE BAHAMA ISLANDS

AREA East
NO. OF DRAWINGS 116
03982
ISLAND Eleuthera

BUILDING INSPECTION SECTION:

CONDITIONS:

INSPECTORS:
FHall

DATE:
1/31/2018 12:00:00 AM

COMMENTS:
INFRASTRUCTURE APPROVED

PLUMBING INSPECTION SECTION:

INSPECTOR:
WSmith

DATE:
1/31/2018 12:00:00 AM

COMMENTS:
PROFESSIONAL STAMP REQUIRED FOR WATER SUPPLY & PLUMBING DRAWINGS

CONDITIONS:

APPROVED

NO PLUMBING INSPECTIONS WILL BE CARRIED OUT UNTIL A COMPLETE SET OF PLUMBING DRAWINGS HAVE BEEN APPROVED

THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED AND SHALL BE SUBMITTED:

PLUMBING FLOOR PLAN

SANITARY RISER DIAGRAM

DETAILS OF PRIVATE WATER SYSTEM

BUILDING PERMIT

DATE OF APPLICATION
30-Nov-17

RECEIPT NO.
00046148

DATE OF RECEIPT
11/29/2017

THE BUILDINGS REGULATIONS ACT
THE TOWN PLANNING ACT 1961
AND THE PRIVATE ROADS AND SUBDIVISIONS ACT 1961

AREA
NO. OF DRAWINGS 88
03983

GOVERNMENT OF THE BAHAMA ISLANDS

I/WE HEREBY APPLY FOR PERMISSION TO CARRY OUT THE DEVELOPMENT DESCRIBED IN THIS APPLICATION AND ON THE ATTACHED PLANS AND DRAWINGS

AGENT
ALVEN K. ROLLE & ASSOC CO LTD

(1) APPLICANT SURNAME
4M HARBOUR ISLAND -MARINA

TELEPHONE
326-8141

NAME
4M HARBOUR ISLAND -MARINA

EMAIL

TELEPHONE
326-8141

PROFESSION
ARCHITECT

EMAIL

ADDRESS

ADDRESS
P. O. BOX N-7401

(2) PARTICULARS OF APPLICANT'S INTEREST IN THE LAND
OWNER
IF OTHER, PLEASE SPECIFY:

(3) ADDRESS AND LOCATION OF THE LAND TO BE DEVELOPED IN SUFFICIENT DETAIL TO ENABLE SITE TO BE READILY IDENTIFIED

IF PROSPECTIVE PURCHASER OR LESSEE WHETHER OWNER OR LESSON HAS CONSENTED TO PROPOSED DEVELOPMENT

YES NO

HARBOUR ISLAND

HARBOUR ISLAND

ELEUTHERA

(4) DESCRIBE BRIEFLY THE PROPOSED DEVELOPMENT INCLUDING THE PURPOSE FOR WHICH THE LAND AND/OR BUILDING ARE TO BE USED. IF THEY ARE TO BE USED FOR MORE THAN ONE PURPOSE, GIVE DETAILS

(5) STATE THE PURPOSE FOR WHICH THE LAND AND/OR BUILDING(S) ARE NOW USED AND IF FOR MORE THAN ONE PURPOSE, GIVE DETAILS

B.C.
 W.C.

EXISTING MARINA TO BE DEMOLISH

MARINA

(6) GENERAL INFORMATION: MATERIALS FOR EXTERIOR FINISH OF THE BUILDING(S)
(A) WALLS

ESTIMATED CONSTRUCTION COST:

4.5M

(B) ROOF

(C) ESTIMATE AREA IN SQUARE FEET
76000

(D) ESTIMATE FEE

\$2,850.00

ESTIMATED VALUE

OCCUPANCY TYPE

DEPOSIT

\$4.5M

TYPE:

GROUP:

FINAL AREA IN SQUARE FEET

BALANCE FEE

ACTUAL FEE

III

Select...

76000 SQ FT

\$8,550.00

\$11,400.00

NO. OF UNITS:

1

Total \$8,550.00

(7) ARCHITECT/ DRAUGHTSMAN SURNAME

(8) SURVEYOR SURNAME

NAME

NAME

ADDRESS

ADDRESS

TELEPHONE

TELEPHONE

(9) P.C.N.

CONDITIONS SUBJECT TO WHICH THIS PERMIT IS ISSUED

GENERAL: CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATION ACT 1971, THE RULES MADE THEREUNDER, THE REQUIREMENTS OF THE BAHAMAS BUILDING CODE, THE APPROVED DRAWINGS AND ANY OTHER CONDITIONS SPECIFIED HEREUNDER.
THE PERMIT SHALL BE VALID FOR A PERIOD OF EIGHTEEN MONTHS FROM THE DATE OF ISSUE GIVEN BELOW.

**STRUCTURALLY APPROVED SUBJECT TO SHOP DRAWINGS FOR FLOATING DOCK
BUILDING PERMIT TO BE POSTED AT COMMENCEMENT OF CONSTRUCTION**

THE REASON(S) FOR THE IMPOSITION OF THE CONDITION(S) SPECIFIED ABOVE IS/ARE

TO COMPLY WITH THE RULES AND REGULATIONS OF THE MINISTRY OF WORKS

DATE OF ISSUE

06 September, 2018


FOR MINISTER

BUILDING PERMIT

DATE OF APPLICATION
11/30/2017

RECEIPT NO.
00046148

DATE OF RECEIPT
11/29/2017

THE BUILDINGS REGULATIONS ACT
THE TOWN PLANNING ACT 1961
AND THE PRIVATE ROADS AND SUBDIVISIONS ACT 1961

GOVERNMENT OF THE BAHAMA ISLANDS

AREA
NO. OF DRAWINGS 88
03983

ISLAND
Eleuthera

BUILDING INSPECTION SECTION:

CONDITIONS:
FULL APPROVED

INSPECTORS:
GTurner

DATE:
9/6/2018 12:00:00 AM

COMMENTS:

VOLATILE INSPECTION SECTION:

INSPECTOR:
TMcKenzie

DATE:
5/3/2018 12:00:00 AM

COMMENTS:

CONDITIONS:

APPROVED

ADDITIONAL INFORMATION SHALL BE PROVIDED TO SHOW METHOD OF SUPPLYING GAS TO STOVES FROM STORAGE AREAS SHOULD LPG STOVES BE USED

ADDITIONAL INFORMATION SHALL BE PROVIDED:

A GARAGE LICENSE APPLICATION SHOULD BE SUBMITTED AND APPROVED BEFORE ANY PAINT & BODY OR MECHANICAL REPAIR WORK IS OUT

MECHANICAL REPAIR BUILDING SHOULD CONFORM TO N.F.P.A. 88

BODY & PAINT REPAIR BUILDING SHOULD CONFORM TO N.F.P.A. 33

SITE PLAN SHOWING EXACT MEASUREMENT POSITION OF TANKS FROM BUILDING-& BOUNDARY LINE

TANK SUPPORT DETAIL

PIPING FLOOR PLAN WITH ISOMETRIC RISER DIAGRAM SHOWING PIPE DISTANCE & TOTAL B.T.U. LOAD OF APPLIANCES

100 LBS A/G CYLINDERS SHALL BE INSTALLED TO THE FOLLOWING REQUIREMENTS

MINIMUM OF 5FT AWAY FROM EXTERIOR SOURCE OF IGNITION

MINIMUM OF 3FT AWAY FROM ANY BUILDING OPENING

LPG LINES THAT SHOULD BE ROUTED IN THE FLOOR SLAB SHALL BE INSTALLED IN A PIPE SLEEVE MINIMUM SIZE 1"

PERMISSION IS REQUIRED TO USE LARGER TANK THAN WHAT IS MENTIONED ABOVE

FOLLOWING ADDITIONAL INFORMATION IS REQUIRED AND SHALL BE SUBMITTED BEFORE COMMENCING GASOLINE, DIESEL OR LPG WORKS

SITE PLAN SHOWING EXACT POSITION

TANK SUPPORT DETAILS

PIPING DETAIL/FLOOR PLANE

RISER DIAGRAM

DISPENSER DETAILS

ELECTRICAL INSPECTION SECTION:

INSPECTOR:

L.Cunningham

DATE:

3/5/2018 12:00:00 AM

COMMENTS:

CONDITIONS:

APPROVED

NO ELECTRICAL INSPECTIONS WILL BE CARRIED OUT UNTIL A COMPLETE SET OF ELECTRICAL DRAWINGS HAVE BEEN APPROVED

PLEASE ENSURE THAT POOL GROUND WIRE IS INSPECTED BY THE MINISTRY OF WORKS ELECTRICAL INSPECTION SECTION BEFORE POOL IS GUNITED

THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED AND SHALL BE BEFORE COMMENCING ELECTRICAL WORKS:

SERVICE RISER DIAGRAM

ELECTRICAL FLOOR DIAGRAM

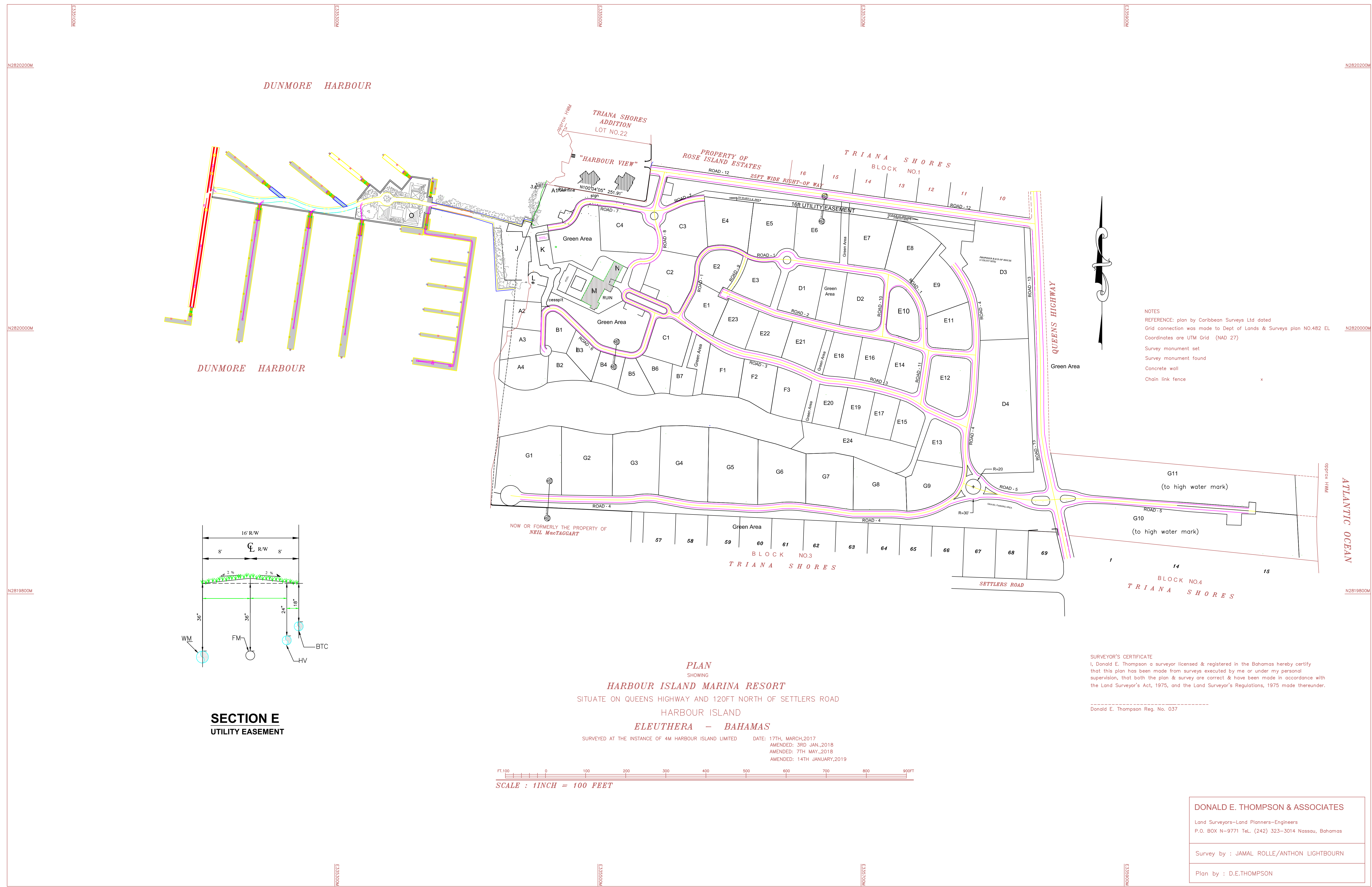
PANEL SCHEDULE (S)

ELECTRICAL LEGEND

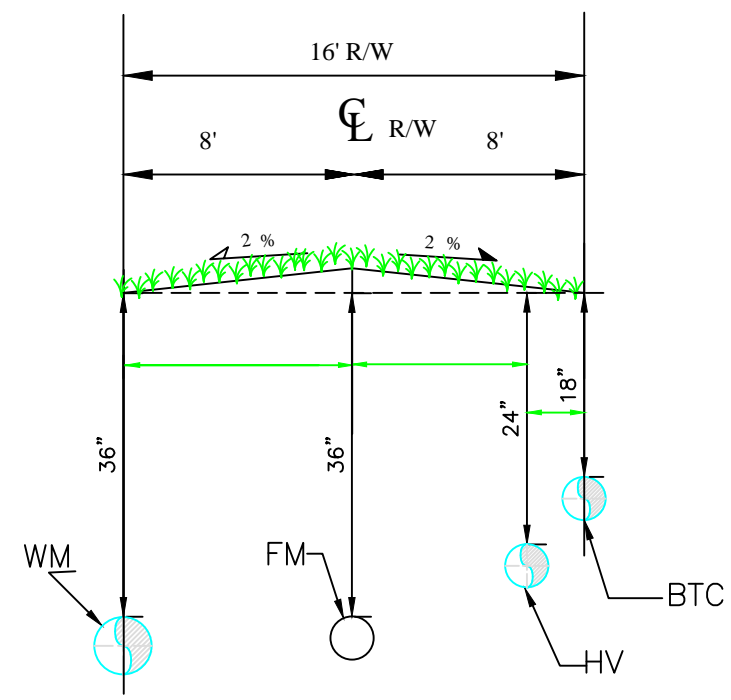
TELEPHONE RISER DIAGRAM

TELEVISION RISER DIAGRAM

FIRE ALARM RISER & FLOOR PLANS



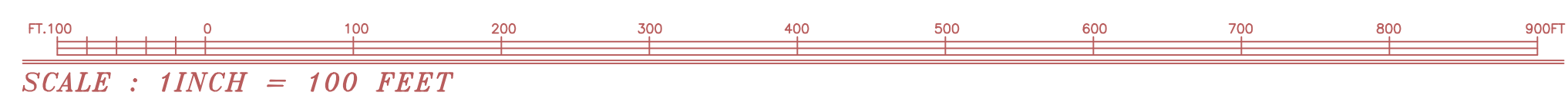
NOTES
 REFERENCE: plan by Caribbean Surveys Ltd dated
 Grid connection was made to Dept of Lands & Surveys plan NO.482 EL
 Coordinates are UTM Grid (NAD 27)
 Survey monument set
 Survey monument found
 Concrete wall
 Chain link fence



SECTION E
UTILITY EASEMENT

PLAN
 SHOWING
HARBOUR ISLAND MARINA RESORT
 SITUATE ON QUEENS HIGHWAY AND 120FT NORTH OF SETTLERS ROAD
 HARBOUR ISLAND
ELEUTHERA - BAHAMAS

SURVEYED AT THE INSTANCE OF 4M HARBOUR ISLAND LIMITED DATE: 17TH, MARCH, 2017
 AMENDED: 3RD JAN., 2018
 AMENDED: 7TH MAY, 2018
 AMENDED: 14TH JANUARY, 2019



SURVEYOR'S CERTIFICATE
 I, Donald E. Thompson a surveyor licensed & registered in the Bahamas hereby certify that this plan has been made from surveys executed by me or under my personal supervision, that both the plan & survey are correct & have been made in accordance with the Land Surveyor's Act, 1975, and the Land Surveyor's Regulations, 1975 made thereunder.
 Donald E. Thompson Reg. No. 037

DONALD E. THOMPSON & ASSOCIATES
 Land Surveyors—Land Planners—Engineers
 P.O. BOX N-9771 Tel. (242) 323-3014 Nassau, Bahamas
 Survey by : JAMAL ROLLE/ANTHON LIGHTBOURN
 Plan by : D.E.THOMPSON

RE: 4M Harbour Island Marina & Resort (Harbour Island Eleuthera)

Alicia Oxley <aoxley@ammcbahamas.com>

Mon 6/3/2019 12:26 PM

- You;
- 'Alvan Rolle';
- 'Alvan Rolle';
- 'Michael Wiener';
- kouttenstubbs@ammc.bahamas.com;
- aflowers@ammcbahamas.com;
- lsmall@ammcbahamas.com

Historic Register Preliminary Form Individual Property rev October 2018.pdf

327 KB

MOF-Exemption-Application-Form.pdf

200 KB

3 attachments (1 MB)

Download all

Save all to OneDrive

Good morning Mr. Rolle

Kindly note that the building known as 'The Haunted House' situated on Harbour Island is listed in the Inventory of the National Register of Historic Resources of the AMMC. Attached FYI is a history of the structure. It is hoped that as part of the proposed development that the structure is retained to be used and/or adaptively re-used as part of the development.

Also note that along with the Ministry of Finance that the structure only would be eligible for Tax Exemptions for Duty Free (for materials to restore to the original) as well as Real Property Tax – Form attached.

Also attached for completion by the Owner/Agent is a Form to be returned to the AMMC for the updated information. Because the structure is already listed in the Inventory, application can be made to the Ministry of Finance and a copy of the application also be sent to the AMMC for verification of application.

It is hoped that this information answers the queries of all the other emails received with regard to this historic property.

Regards

Ms. Alicia C. A. Oxley, M.Sc. (Arch); B. Arch (Hons.)

Historic Preservation Architect/Consultant;

Antiquities, Monuments, & Museum Corporation, Nassau, The Bahamas

Registered Architect (The Bahamas) # 038

Telephone: (242) 397-6850