## **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:

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#### For Submittal to:

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



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 25<sup>th</sup> 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)

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**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



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 Habour Island Ltd. is to addresses 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.





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





#### 1.1 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.



#### 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.



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.





#### 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.



#### 1.4 Procedure for Reporting a Spill and/or Hazardous Material

<u>Step 1:</u> 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
  - o Mr. Charles Dean, Oil Spill Response Committee Member and Coordinator
  - o Tel: 242-394-0445/6

<u>Step 2:</u> 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

<u>Step 3:</u> 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



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

#### **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<br>Curtain  |  |
| Dredging Material Disposal               | Disposal site selection and preparation for avoidance of sea, near-sea, or adjacent site runoff scenarios. |  |





# 3.0: General Excavation & Fill Requirements

# 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 extend 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.





#### **EXCAVATION AND FILL TURBIDITY**

#### 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 asteroids). Impacts to these isolated coral colonies are frequently deemed negligible; however, prior to dredge operations, those individual coral colonies greater that are 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.





#### **CORAL RELOCATION PLAN**

#### 6.1.2 Coral Reef Check and Log Sheet

Figure 6.1.2 Coral Reef Check and Log Sheet

| Method                           | Reef Check   |
|----------------------------------|--|
| Categories                       | <ol> <li>Hard coral</li> <li>Soft coral</li> <li>Sponge</li> <li>Rock</li> <li>Recently killed coral</li> <li>Any accumulation of debris or;</li> <li>Silt</li> <li>Sand</li> <li>Rubble</li> <li>Other</li> </ol> |
| Transect length                  | 4 x 20 m separated by 5 m  |
| Survey depth                     | Shallow (2-6 m)<br>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 ARCINFO, 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.





#### 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:





- 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 Unites 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.





#### 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.





#### 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, FI. 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





#### CORAL RELOCATION PLAN

# 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 gama 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





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





#### **CORAL RELOCATION PLAN**

# 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





### CORAL RELOCATION PLAN

# 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  $0.2\mu g/L$  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





### **CORAL RELOCATION PLAN**

# 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 oversite, 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.
  - o 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





#### 8.1 Cost Estimate

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

|                | Implementation Budgets  **BASED ON BMC SCHEDULE OF VALUES   |        |   |  |  |  |  |  |  |  |
|----------------|---|--------|---|--|--|--|--|--|--|--|
|                |   |        |   |  |  |  |  |  |  |  |
| onstru         | iction Phase Budget (120 Days)  |        |   |  |  |  |  |  |  |  |
| ltem           | 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  | \$     | ₩0  |  |  |  |  |  |  |  |
| 5              | Spill Prevention, Precaution & Management   | \$     | -   |  |  |  |  |  |  |  |
| 6              | Environmental Consultants & Permitting  | \$     | -   |  |  |  |  |  |  |  |
|                | Construction Phase Budget (120 Days)  | \$     | 374,972.29                                    |  |  |  |  |  |  |  |
| larina         | Operations (Appual)   |        |   |  |  |  |  |  |  |  |
| larina<br>Item | Operations (Annual) Description   |        | Budget  |  |  |  |  |  |  |  |
|                |   | \$     | _   |  |  |  |  |  |  |  |
| ltem           | Description   | \$     | 2,500.00                                      |  |  |  |  |  |  |  |
| Item<br>1      | <b>Description</b> Employee Training - Containment Measures   |        | 2,500.00<br>5,000.00                          |  |  |  |  |  |  |  |
| 1<br>2         | Description Employee Training - Containment Measures Spill Prevention, Precaution & Management  | \$     | 2,500.00<br>5,000.00<br>1,000.00<br>60,000.00 |  |  |  |  |  |  |  |
| 1<br>2<br>3    | Description Employee Training - Containment Measures Spill Prevention, Precaution & Management Emergency Response File/Plan & Maintenance | \$     | 2,500.00<br>5,000.00<br>1,000.00              |  |  |  |  |  |  |  |

#### 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





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.* 





#### 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.* 





#### 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





#### Michael Johnson (Resume Continued)

#### 1990

HIGH SCHOOL, CENTRAL ELEUTHERA HIGH SCHOOL

Graduated with a 3.9 GPA

#### 1988

PRIMARY SCHOOL, EMMA E COPPER PRIMARY SCHOOL

Graduated with honors

### **CERTIFICATIONS & SKILLS**

- Single phase electrical license
- Electrical certification at College of the Bahamas
- Certification in Air Conditioning & Refrigeration
- Certified as a universal technician under the EPA of the United States
- 2005-2008 Elected town planning chairman for the central district of Eleuthera

### **ACTIVITIES**

- Spends time with family
- Boating activities
- Traveling





#### 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





Harbour Island Club and Marina

Phase 1 - Marina Construction and Initial Upland Improvements

Coastal Systems Devlopment

| Year   |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
|--|-----|-----|-----|-----|-----|----|------|-----|-----|------|------|-------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| Month  | Jul | Jul | Jul | Jul | Aug | Au | g Au | g A | g S | ep S | ep : | Sep : | ep | Oct | Oct | Oct | Oct | Det | 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  |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
| 17.00 Utilities Fuel   |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
| 18 . 00 Utilities - Electrical Distribution and Transformers |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
| 19 . 00   Utilities - Pedestals                              |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
| 814 M (2009) 05-250-9475-029                                 |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
| 20 . 00 Utilities - Potable Water                            |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
| 21 . 00 Utilities - Fire Protection                          |     |     |     |     |     |    |      |     |     |      |      |       |    |     |     |     |     |     |     |     |     |     |     |     |       |
| 22 . 00 Utilities - Sanitary Force Main                      |     |     |     |     |     |    |      |     |     |      |      |       |    | ĹŢ  |     |     |     |     |     |     |     |     |     |     |       |
| 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





#### Harbour Island Club and Marina

#### Phase 1 - Marina Construction and Initial Upland Improvements

#### **Coastal Systems Deviopment**

| Year   | _   |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
|--|-----|----|----|----|----|----|----|----------|----|----|----|--|----|----|----|----|----|----|----|----|----|----|----|--------------|---------------|
|  |     |    |    |    |    |    |    | _        |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
| Month  |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
| 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   |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
|  |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    | <del>-</del> | $\dashv$      |
| 08 : 00 Arrival Island   |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    | =  |    |    |    |    |    |    | _            |               |
| 09 : 00 Rock - Revetment                                       |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    | _            | $\vdash$      |
| 10 00 Dock - 1 0 - Wave Baffle                                 |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    | _  |    | _  |    |    |    |    |    | _            | <u>—</u>      |
| 11.00 Dock - 2.0 - West Dock                                   |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    | _            | ightharpoonup |
| 12 . 00 Dock - 3.0 - Central Dock                              |     |    |    |    |    |    |    |          |    |    |    |  | ,  |    |    | _  |    |    |    |    |    |    |    |              |               |
| 13 . 00 Dock 4.0 East Dock                                     |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
| 14 . 00   Dock - 5.0 - North Dock                              |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    | _  |    |    |    |    |    |    | _            | ightharpoonup |
| 15 . 00   Dock - 6.0 - Fuel Dock                               |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
| 16 . 00   Dock - 7.0 - Transient Dock                          |     |    |    | _  |    |    | _  |          |    |    |    | <del>                                     </del> |    |    |    |    |    |    |    |    |    |    |    |              |               |
| 17 . 00   Utilities - Fuel                                     |     |    |    |    |    |    |    |          |    |    |    | <del>                                     </del> |    |    |    |    |    |    |    |    |    |    |    |              |               |
| 18 . 00   Utilities - Electrical Distribution and Transformers |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    | -  |    |    |    |    |    |              |               |
| 19 . 00   Utilities - Pedestals                                |     |    |    |    |    |    |    | $\dashv$ |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
| 20 . 00   Utilities - Potable Water                            |     |    |    |    |    |    |    | =        |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
|  |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |
|  |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    | <u>—</u>     |               |
| 22 . 00 Utilities - Sanitary Force Main                        |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    | <u>—</u>     | $\sqsubseteq$ |
| 23 . 00 Upland - Demolition                                    |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    | _            | igsquare      |
| 24 . 00 Upland - Shoreline Stabilization - Bulkhead            |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    | <u> </u>     |               |
| 25 . 00 Upland - North Rock Revetment                          |     |    |    |    |    |    |    |          |    |    |    |  |    |    |    |    |    |    |    |    |    |    |    |              |               |

26 . 00 Upland - South Rock Revetment

27.00 De-Mobilization





Harbour Island Club and Marina

Phase 1 - Marina Construction and Initial Upland Improvements

**Coastal Systems Devlopment** 

|   | Year  | - 100 |    |     |                  | -111   | 95 gg          |                 | 200             |      |                 |     |     |     | 400000      | 075       | 1000000 |     | 44.77 |     |    |      | 100  |     | . , , , , , , , , , , , , , , , , , , , |                |                 |     |
|---|---|-------|----|-----|------------------|--|----------------|-----------------|-----------------|------|-----------------|-----|-----|-----|-------------|-----------|---------|-----|-------|-----|----|------|------|-----|---|----------------|-----------------|-----|
|   | Month   | Jw    | Ju | -J4 | <del>- J</del> ι | <del>                                     </del> | <del>" ^</del> | <del>yg ∧</del> | <del>µg ∕</del> | ug . | \ <del>ug</del> | Sep | Sep | Sop | Sep<br>ec D | Sop<br>ec | Oot     | Oot | Oot   | Oot | Ne | / No | V-Ne | V N | v D                                     | <del>∞ D</del> | <del>00 [</del> | 000 |
|   | Date  |       |    |     |                  | 29   |                |                 | 19              |      |                 |     |     |     | 30          | 07        | 14      |     | 28    | 04  | N  |      |      | 02  |   |                | 23              | 30  |
| 03 00                                   | Mobilization  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | Turbidity Control and Monitoring  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | Demotition of Existing Marina   |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | Dredging  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
| 07.00                                   |   |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | Arrival Island  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
| Print 2010 and all 2014 and             | Rock Revetment  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
| 0.0000000000000000000000000000000000000 | Dock - 1.0 - Wave Baffle  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | 1, 15 (500) 00 (1, 16) 1, 160 |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | Dock - 2.0 - West Dock  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | Dock - 3.0 - Central Dock   |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
| ****************                        | Dock - 4.0 - East Dock  |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | Dock - 5.0 - North Dock   |       |    |     |                  |  |                |                 |                 |      |                 |     |     |     |             |           |         |     |       |     |    |      |      |     |   |                |                 |     |
|   | 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.

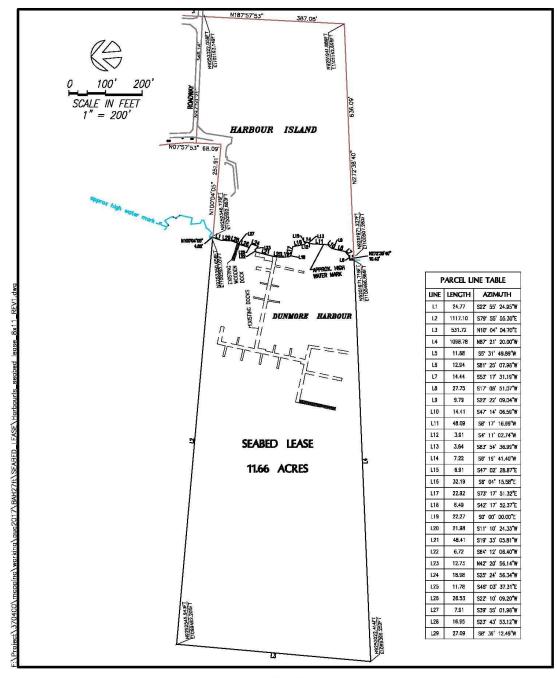




# 10.0: SEABED LEASE

#### 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.



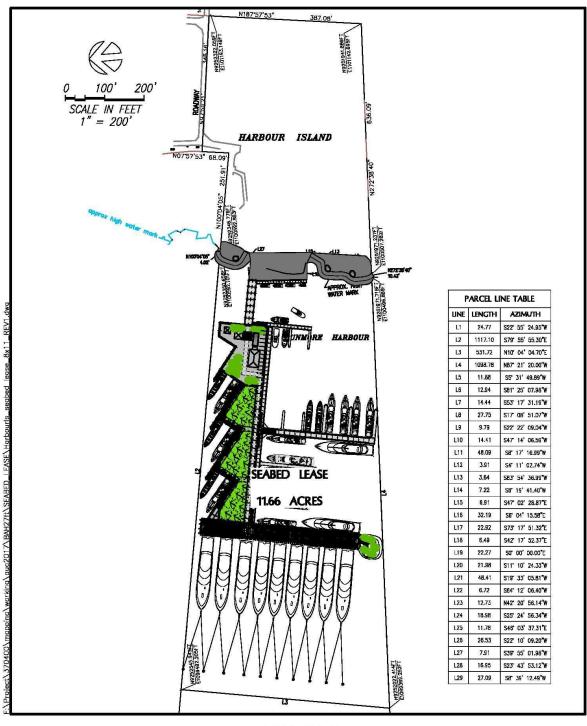
### FIGURE 6

HARBOUR ISLAND
PROPOSED SEABED LEASE WITH EXISTING MARINA
NOVEMBER 2017





## **SEABED LEASE**



# 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 ENIVIRONMENTAL 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 1<sup>st</sup> and 5<sup>th</sup> 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 1<sup>st</sup> and May 5<sup>th</sup> 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 1<sup>st</sup> and 5<sup>th</sup> 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

o 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.





# **JULY 18, 2019 LETTER WITH RESPONSES**



# 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

o 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 5<sup>th</sup> 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 Chpter 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

- o <u>Executive Summary response</u> 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.
- <u>Dredging overview and General Excavation and fill requirements responses</u> 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.
- <u>Turbidity Measurement response</u> 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.
- <u>Coral relocation response</u> 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  $4^{th}$  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.
- <u>Demolition Plan response</u> please note that Appendix E does not contain a revised schedule. Appendix E is titled May 1 & 5<sup>th</sup> Letters and contains a series of drawings

This section (May 1 & 5<sup>th</sup> 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  $1^{st}~\&~5^{th}$  letters. Appendix E now refers to site storm water, drainage, Infrastructure and Roadways





# **JULY 18, 2019 LETTER WITH RESPONSES**



# THE BAHAMAS ENVIRONMENT, SCIENCE AND TECHNOLOGY COMMISSION

#### Ministry of the Environment and Housing

- Please note that Appendix C is tilted 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 5<sup>th</sup> 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 Habour 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 1<sup>st</sup> and May 5<sup>th</sup> 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

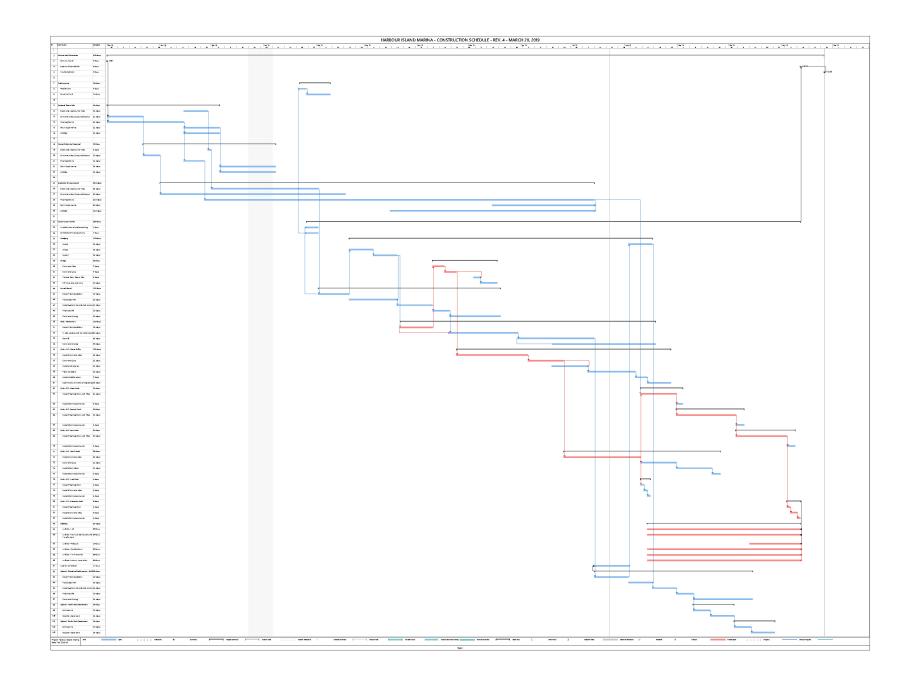
Cc: Ms. Janice Miller - Permanent Secretary, Ministry of the Environment & Housing

Mrs. Candia Ferguson - Director, Bahamas Investment Authority Mr. Charles Zonicle - Acting Director, Department of Physical Planning



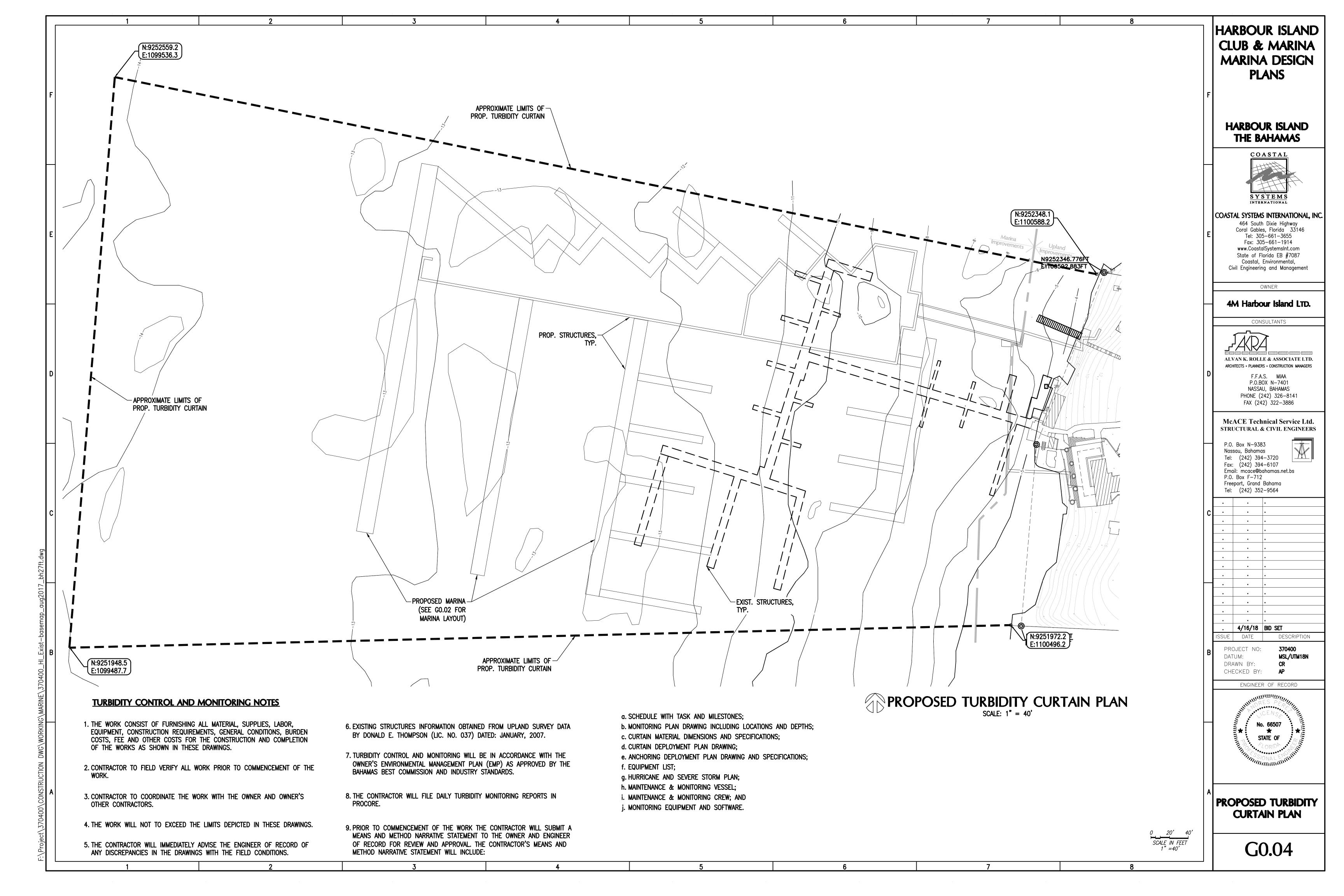


# 12.0: PROJECT SCHEDULE





# **APPENDIX A: TURBIDITY MANAGEMENT PLAN**





# TURBIDITY MANAGEMENT PLAN HABOUR ISLAND MARINA

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#### 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 curtained used must meet specifications for conditions experienced on site. Specifically, Type 2 curtains will be installed to manufactures 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.



### **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:**

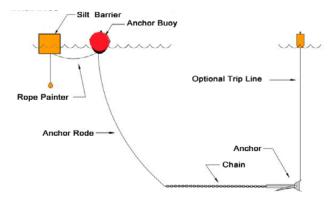
- Marker Lights
- Tow Bridles
- Navigation Buoys
- Wave Attenuators
- Oil Spill Kits
- Reefing Line for Skirt Adjustment







### 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 (+I 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., I 35lb., 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: I-888-703-9889 | Phone: (I+) 772-646-0597 | info@geiworks.com

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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.



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.















### 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.

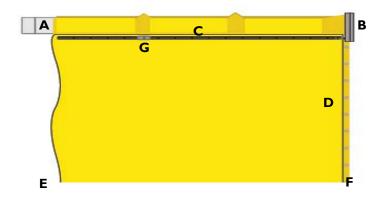
#### When should I use a Permeable Silt Curtain?

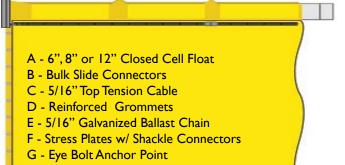
Permeable Type II Silt Barriers are most commonly used when they are either specified in a site project or when the curtain will be dealing with a significant amount of water pressure. Use of the bottom filter panel can help reduce pressure on the curtain by allowing water to continue to the flow through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





### **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 I2"                       |
| 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

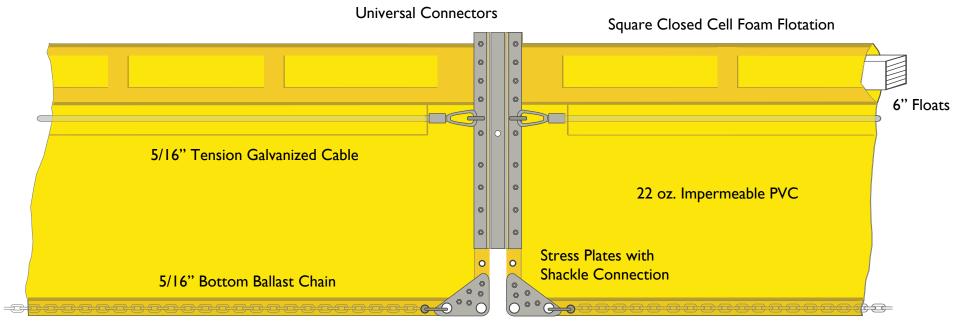
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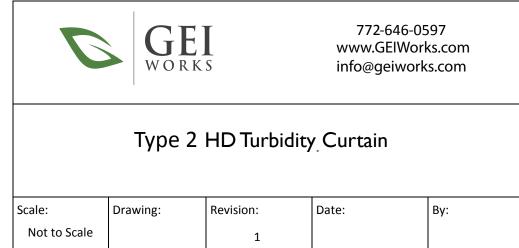
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Eye Bolt Anchor Point (every 50 feet)

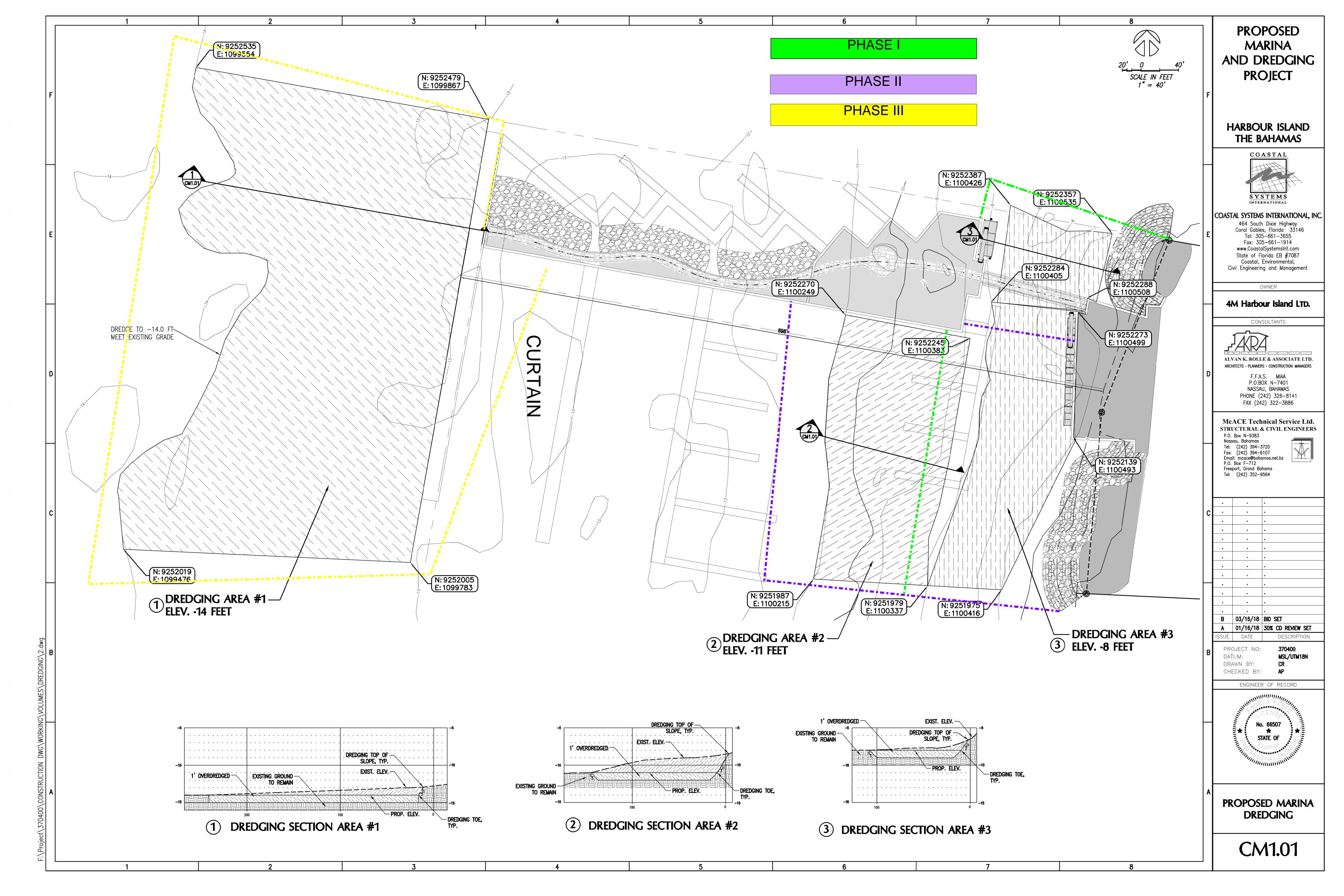


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Natural forces such as current, wind, waves, and location affect your product and may require engineering, additional anchoring, and customization.

5.3 Appendix 2: Turbidity Curtain Installation Maps



5.4 Appendix 3: Sample Turbidity Monitoring Form

### TURBIDITY MONITORING REPORT

| Sampler Name:                               |                   |                   |
|---|-------------------|-------------------|
| Date:                                       |                   |                   |
| Dredge Area Location (Descrip               | tion):            |                   |
|   |                   |                   |
| Parameter                                   | Background Sample | Compliance Sample |
| Samples to be taken within 200              |                   |                   |
| 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 <sup>st</sup> Reading [ ] | [ ]m              | [ ]m              |
| Turbidity (NTU) 2 <sup>nd</sup> Reading[ ]  | [ ]m              | [ ]m              |
| Turbidity (NTU) 3 <sup>rd</sup> Reading [ ] | [ ]m              | [ ]m              |
| Turbidity (NTU) 4 <sup>th</sup> Reading [ ] | [ ]m              | [ ]m              |
| Turbidity (NTU) 5 <sup>th</sup> Reading [ ] | [ ]m              | [ ]m              |
| Turbidity (NTU) 6 <sup>th</sup> 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



DATE OF APPLICATION

30-Nov-17

RECEIPT NO. 00046149

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

AREA
East

NO. OF DRAWINGS

116

O3982

DATE OF RECEIPT 11/29/2017

GOVERNMENT OF THE BAHAMA ISLANDS

| I/WE HEREBY APPLY FOR PERMISSION TO CARRY OUT THE DEVELOPMEN<br>THIS APPLICATION AND ON THE ATTACHED PLANS AND DRAWINGS  | IT DESCRIBED IN                 |   |   |  |            |
|--|---------------------------------|---|---|--|------------|
| AGENT<br>ALVAN K. ROLLE & ASSOCIATE LTD.   |                                 | (1) APPLICANT SURNAME 4M HARBOUR ISLANI                                     | D LTD.  |  |            |
| TELEPHONE<br>242-326-8141  |                                 | NAME  |   |  |            |
| EMAIL  |                                 | TELEPHONE<br>C/O 242-326-8141   |   |  |            |
| PROFESSION ARCHITECT ADDRESS   |                                 | EMAIL  ADDRESS  |   |  | 12         |
| P. O. BOX N-7401 (2) PARTICULARS OF APPLICANT'S INTEREST IN THE LAND OWNER IF OTHER, PLEASE SPECIFY:   | <del></del> 1                   | C/O P. O. BOX N-740 (3) ADDRESS AND LOCATION O ENABLE SITE TO BE READILY ID | F THE LAND TO BE DEVELOPED                          | O IN SUFFICIENT DETA   | IL TO      |
| IF PROSPECTIVE PURCHASER OR LESSEE WHETHER OWNER OR LESSON TO PROPOSED DEVELOPMENT   | HAS CONSENTED                   |   |   |  |            |
| YES NO   |                                 |   |   |  | <b>‡</b>   |
|  |                                 | Harbour Island,   |   |  |            |
| (4) DESCRIBE BRIEFLY THE PROPOSED DEVELOPMENT INCLUDING THE WHICH THE LAND AND/OR BUILDING ARE TO BE USED. IF THEY ARE TO MORE THAN ONE PURPOSE, GIVE DETAILS  | PURPOSE FOR BE USED FOR B.C W.C |   | , GIVE DETAILS                                      | DING(5) ARE NOW USI  | ED AND IF  |
| PROPOSED INFRASTRUCTURE  | \$                              |   |   |  |            |
| (6) GENERAL INFORMATION: MATERIALS FOR EXTERIOR FINISH OF THE  | BUILDING(S)                     | ESTIMATED CONSTRUCTION CO   | OST:  | n 211 - 1  | 10         |
| (A) WALLS N/A (B) ROOF N/A OCCUPANCY TYPE  | <b>\$</b>                       | 2.5M (C) ESTIMATE AREA IN SQUARE FEET                                       | (D) ESTIMATE FEE<br>\$100.00<br>DEPOSIT<br>\$100.00 | \$2,500,000  |            |
| TYPE: GROUP:   |                                 | FINAL AREA IN SQUARE FEET   | BALANCE FEE   | ACTUAL FEE   |            |
| Select Select  |                                 | 500   | -\$25.00  | \$75.00  |            |
| NO. OF UNITS:  |                                 |   | <sub>Total</sub> \$ <sup>(</sup>                    | 0.00   |            |
| (7) ARCHITECT/ DRAUGHTSMAN   |                                 | (8) SURVEYOR  | Total   |  |            |
| ŠÚRNAME  |                                 | SURNAME   |   |  |            |
| NAME   |                                 | NAME  |   |  |            |
| ADDRESS  | <u> </u>                        | ADDRESS   |   |  | *          |
| TELEPHONE  |                                 | TELEPHONE   |   | THE RESERVE OF THE PERSON OF T |            |
|  |                                 | (9) P.C.N.  |   |  |            |
| CONDITIONS SUBJECT TO WHICH THIS PERMIT IS ISSUED GENERAL: CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE BUILDING CODE, THE APPROVED DRAWINGS AND ANY OTHER CONDITHE PERMIT SHALL BE VALID FOR A PERIOD OF EIGHTEEN MONTHS F | ROM THE DATE OF IS              | SSUE GIVEN BELOW.   |   | E REQUIREMENTS OF T  | HE BAHAMAS |
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| DATE OF ISSUE 31 January, 2018   |                                 |   | FOR   | MINISTER   |            |

DATE OF APPLICATION

11/30/2017

RECEIPT NO.

00046149 DATE OF RECEIPT

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

AREA East NO. OF DRAWINGS 116 03982

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| OVERNMENT | OF | THE | BAHAMA | ISLANDS |  |
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| <u>FHall</u>  |
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| COMMENTS:   |
| INFRASTRUCTURE APPROVED   |
|   |
| PLUMBING INSPECTION SECTION: INSPECTOR:   |
| <u>WSmith</u>   |
| 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   |

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

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GOVERNMENT OF THE BAHAMA ISLANDS

| I/WE HEREBY APPLY FOR PERMISSION TO CARRY OUT THE DEVELOPME<br>THIS APPLICATION AND ON THE ATTACHED PLANS AND DRAWINGS  | ENT DESCRIBED IN   |  |   |                                 |
|---|--|--|---|---------------------------------|
| ALVEN K. ROLLE & ASSOC CO LTD   |  | (1) APPLICANT SURNAME<br>4M HARBOUR ISLAN                  | ID -MARINA                                |                                 |
| TELEPHONE 326-8141  |  | NAME<br>4M HARBOUR ISLAN                                   | ID -MARINA                                |                                 |
| EMAIL   |  | TELEPHONE<br>326-8141                                      |   |                                 |
| PROFESSION ARCHITECT ADDRESS  | *  | EMAIL  ADDRESS P. O. BOX N-7401                            |   | æ<br>T                          |
| (2) PARTICULARS OF APPLICANT'S INTEREST IN THE LAND OWNER IF OTHER, PLEASE SPECIFY:   |  | (3) ADDRESS AND LOCATION (<br>ENABLE SITE TO BE READILY II | OF THE LAND TO BE DEVEL<br>DENTIFIED<br>  | OPED IN SUFFICIENT DETAIL TO    |
| IF PROSPECTIVE PURCHASER OR LESSEE WHETHER OWNER OR LESSO TO PROPOSED DEVELOPMENT   | N HAS CONSENTED  | HARBOUR ISLA   | .ND                                       |                                 |
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| (6) GENERAL INFORMATION: MATERIALS FOR EXTERIOR FINISH OF TH  | E BUILDING(S)  | ESTIMATED CONSTRUCTION CO                                  | DST:                                      |                                 |
| (A) WALLS  (B) ROOF   | #*<br>***  | 4.5M (C) ESTIMATE AREA IN SQUARE FEET 76000                | (D) ESTIMATE FEE<br>\$2,850.00<br>DEPOSIT | ESTIMATED VALUE                 |
| OCCUPANCY TYPE  |  |  | \$2,850.00                                | Ψ4.501                          |
| TYPE: GROUP: III Select   |  | FINAL AREA IN SQUARE FEET<br>76000 SQ FT                   | \$8,550.00                                | \$11,400.00                     |
| NO. OF UNITS:   |  |  |   |                                 |
|   |  | .A.  | Total                                     | \$8,550.00                      |
| (7) ARCHITECT/ DRAUGHTSMAN<br>SURNAME   |  | (8) SURVEYOR<br>SURNAME                                    |   |                                 |
| NAME  |  | NAME   |   |                                 |
| ADDRESS   | *  | ADDRESS  |   | .sts                            |
| TELEPHONE   | afo.   | TELEPHONE  |   | ₩.                              |
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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 MINIS

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

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GOVERNMENT OF THE BAHAMA ISLANDS

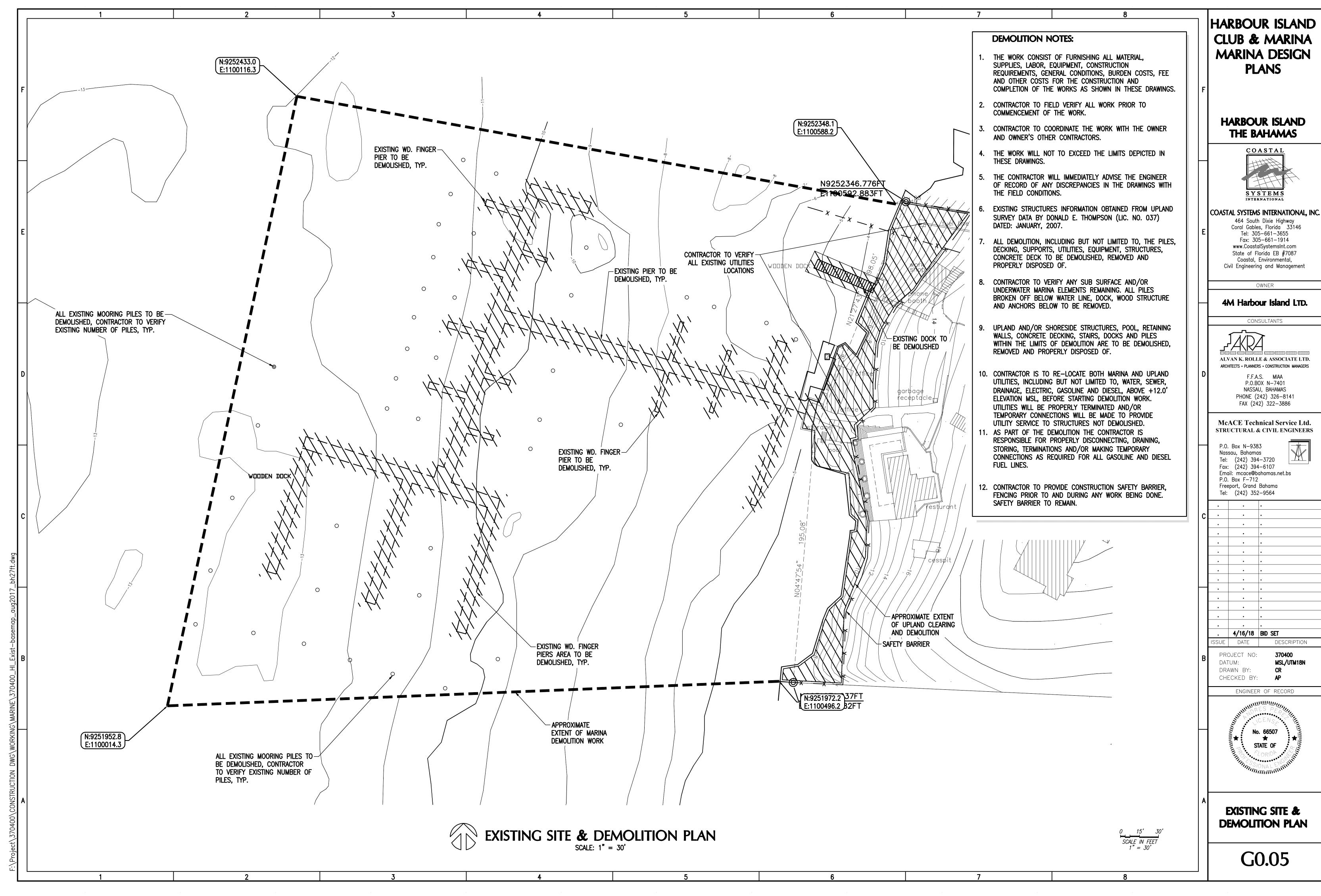
ISLAND Eleuthera

| BUILDING INSPECTION SECTION:   |
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| CONDITIONS: FULL APPROVED INSPECTORS:  |
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| VOLATILE INSPECTION SECTION: INSPECTOR:  |
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| CONDITIONS:  |
| TAPPROVED  |
| 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:  |
| <u>LCunningham</u>   |
| 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   |

· . .

B of B was



CLUB & MARINA MARINA DESIGN

### 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, MSc. (Arch); B. Arch (Hons.)
Historic Preservation Architect/Consultant;
Antiquities, Monuments, & Museum Corporation, Nassau, The Bahamas
Registered Architect (The Bahamas) # 038
Telephone: (242) 397-6850

# **An Historical Tale**

In 1941 Europe was at war and many wealthy Americans who owned villas in the south of France, Italy and Spain began to wonder if they would ever see them in one piece again. Many decided that a villa in a less troubled part of the world was the answer, and so a large number of "Mansions" were constructed throughout the Bahamas and Caribbean. At least one such villa is here on Harbour Island—that is Runaway Hill and it is just possible that our very own "Haunted House" may well be in this category also.

one at each end of the west facing porch. downstairs consisted of a dining room, a common wide verandahs. One enjoyed a "His and Hers" bedrooms, each with In the front of the top floor were two ensuite apartment in the upper rear of the building maid. The couple occupied the small brought with them a French butler and Mrs. Stewart were of English descent and when he had the house built. Colonel And Colonel Stewart, it is believed, was a World Colonel Glen Stewart and Mrs. Stewart. lounge, a library/study and two day rooms. view of the harbour, the other, the sea. The War I veteran. He was about 60 years old The house was constructed in 1941 for

The roof was of wooden cedar shingles and had concealed gutters to gather rainwater which was collected in two large cisterns under each porch. Each contained more than 37,000 gallons. In those days there was no well field on Eleuthera. What rainfall you could collect was all the water you had.

In a small single story building at one side of the enclosed courtyard there was a generator room with two 12KW Gensets and a laundry. Here the water for the entire building was heated both by electricity and, believe it or not, by a solar heating panel. The building now houses our gift shop which is open Monday through Saturday.

There were no guest accommodations in the main house, but several cottages and a dock were constructed at the harbours edge about where the airstrip now stands.

The architect was a Mr. Fox from Nassau, and the contractor of record is believed to be a Mr. Ralph Higgs, also a Nassuavian. Much local labor and local materials were used including the floors of hand quarried coral stone from Eleuthera.

Mrs. Pearle, (Frank "Art Gallery/Willies Tavern" Mather's Mother) was employed by the Stewarts as the cook. She has an interesting memory of them that has remained with her throughout the years. When recently she visited the property for the first time in over 40 years she said "You know..., the Master (Colonel Stewart) never touched his chair when he sat down. The butler with his white gloves pulled the chair our for him and pushed it in again". Ah, gracious times!

For all the effort that he must have put into creating the house, Colonel Stewart was destined to enjoy the house for only 3 years. In 1944 he left for a medical check-up fully expecting to return, however he was hospitalized and never did return to the Island. This we believe gave rise to the first of a number of "myths" about the property and its owners. This one we shall call the "Marie Celeste" myth. As the story goes he left the house with the table set for dinner and just disappeared—Poof!

The Stewarts retained the property until the early 50's. Believing his end was near, he wanted to tidy up his estate. He sold the property to two families from New Jersey, Col. Wright and Edward Van Vooren. At this stage we should point out that the "property" consisted of some 80 acres ranging from harbour to ocean. The property ran all the way from the Romora Bay Club to the cannons at the very Southern tip of the Island.

The Wright and Van Vooren families continued to use the house as a vacation home for a number of years.

mas Out Island Airways, later to become and the forerunner of the dock as you see it division. Over the next four years his toil ter's Brother, Geoffrey Brown was given the was formed. Lester and Dr. Paul owned the property and the "Harbour Island Club" With a group of Norwegians they acquired historian), negotiated to buy the property. late Dr. Paul Albury, (the noted Bahamian In 1958/59, Lester Brown of Nassau and the structed. Bahamasair, and the airstrip was contoday. A tract of land was leased to Baharesulted in the Triana Shores subdivision task of creating a marina and housing sub-20% each, and the Norwegians, 60%. Les-

The 1,400 foot airstrip became the principle means of access to the Island, replacing the amphibious aircraft which landed in the Harbour and came ashore on the ramp next to Valentine's Yacht Club. A special Briten Norman Islander aircraft was used. It must have been quite an adventure just to get here!

the destiny of our enterprise, giving rise to yet another myth. An Open Day was held unsold portion of Triana Shores. Here afternoon the sale of most, but not all, of the ers. This event could be described as "a freshments were served by the six bartendwith boats decorating the dock. Ample rehere, didn't like it, and never returned. sent for his bride and she spent half an hour Greek bought the house as a wedding prearises myth number two. Supposedly the cluded was the house, the airstrip and the property was negotiated for \$1,000,000. In-George Lavanos. During the course of the the guests was a young Greek millionaire, host of Big Spenders from all over". One of 1964 saw an event that was to further shape



Your Ref:

Owr Ref:

Fort Department
Prince George Dock
P.O. Box N-8175
Phone: (242) 322-8832
Fax: (242) 322-5545
Nassau, Bahamas

23rd February, 2018

POR/6/1

Alvan K. Rolle President Alvan K. Rolle & Associates P. O. Box N-7401 Nassau, Bahamas

Dear Sir,

### 20/17 HARBOUR ISLAND MARINA (4M HARBOUR ISLAND) MARINA – HARBOUR ISLAND, ELEUTHERA

With reference to your application on the above captioned.

Please be advised that your request for construction of a Marina is hereby approved, by the Minister of Transport & Local Government and was subsequently agreed to by the Minister of The Environment & Housing. Approval is subject to The Best Commission's letter dated 11<sup>th</sup> December, 2017 and environmental safeguards (i.e. best management practices) being carried out (i.e. turbidity control, silt curtains, etc).

Further be informed that you may now procure the necessary permits for commencement of this project, as work should begin within six months from the date of this letter.

Yours sincerely

Captain Cyril Roker Acting Port Controller

CR/bt

### BAHAMAS INVESTMENT AUTHORITY

CECIL WALLACE WHITFIELD CENTRE, CABLE BEACH
P. O. Box CB - 10980
NASSAU, N.P., THE BAHAMAS
TEL: (242) 327-5826-9; FAX: (242) 327-5806

OPM/PRJ/Eleuthera/08

28th November, 2018

Mr. L. Ryan Pinder Attorney-at-Law GrahamThompson P. O. Box N-272 Nassau, N.P. The Bahamas Via Facsimile No.: 362-4810

Dear Mr. Pinder,

### 4M Harbour Island Ltd. - Seabed Lease Agreement

With reference to our letter dated 6<sup>th</sup> October, 2017, I am directed to forward for your record, Crown Lease No. 1145, M.P. No. 2891/VI dated 15<sup>th</sup> November 2018, between the Minister Responsible for Lands and Surveys and 4M Harbour Island Ltd. regarding 11.924 acres or thereabouts of a lot of seabed at Harbour Island, Eleuthera.

Yours sincerely,

Carol U. Young

For Director of Investments



# COMMONWEALTH OF THE BAHAMAS LOCAL GOVERNMENT DISTRICT

NORTH ELEUTHERA

CROWN LEASE NO.1 | 45 M.P. NO. 2891/VI

THIS LEASE made the Stay of Novembro in the year of our Lord Two Thousand and Eighteen BETWEEN THE MINISTER RESPONSIBLE FOR LANDS AND SURVEYS acting in the name of and on behalf of Her Majesty Queen Elizabeth the Second in right of Her Commonwealth of The Bahamas (hereinafter called "the Lessor" which expression shall where the context so admits include his successors in office and assigns) of the ONE PART and 4M HARBOUR ISLAND LTD. a Company incorporated under the Laws of the Commonwealth of The Bahamas having its registered office situate at the offices of Graham Thompson & Co. in the City of Nassau in the Island of New Providence one of the Islands of the said Commonwealth (hereinafter called "the Lessee" which expression shall where the context so admits include its successors and assigns) of the other part WITNESSETH as follows:

In consideration of the rent hereinafter reserved and of the covenants and conditions hereinafter contained and on the part of the Lessee to be paid performed and observed the Lessor hereby demises unto the Lessee ALL THAT certain piece parcel or lot of the sea bed containing by admeasurement Eleven and Nine Hundred and Twenty Four Thousandths (11.924) Acres or thereabouts situate in Harbour Island on the Island of Eleuthera another one of the Islands of the said Commonwealth as shown on MP File No. 2891/VI on record in the Department of Lands and Surveys. ABUTTING AND BOUNDING towards the NORTH by the Sea and running thereon for a total distance of Eleven Hundred and Forty (1140.00') feet, towards the EAST along the high water mark by the land said to be the property of Rose Estates, towards the SOUTH by the Sea and running thereon for a total distance of Eleven Hundred (1123.00') feet, towards the WEST by the Sea and running thereon for a total distance of Five Hundred and Thirty-four and Eighty-five hundredths (534.85') feet or however else the same

may abut and bound which said piece parcel or lot of land (hereinafter called the "the Demised Premises") is more particularly delineated and shown colored pink on the plan of the area hereto annexed and marked. TO HOLD the same unto the Lessee from the day of day of in the year of our Lord Two Thousand and Eighteen for a term of Twenty-one (21) Years (hereinafter called "the said Term") and paying therefore during the said Term a yearly rent of Eleven Thousand, Nine Hundred and Twenty-Four Dollars (\$11,924.00) in the currency of the said Commonwealth of The Bahamas (hereinafter called "the said Currency") payable each year on the anniversary of the commencement date of the said Term.

- The Lessee for itself and its assigns and to the intent that the obligations herein contained may continue throughout the said Term hereby created HEREBY COVENANTS with the Lessor as follows;-
  - (a) to pay the rent hereby reserved to the Director of Lands and Surveys at his office in Nassau, New Providence at the times and in the manner aforesaid and to bear, pay and discharge all electrical water, gas, cable and telephone rates and any other utility rates imposed charged upon the Demised Premises upon the owner or occupier in respect thereof;
  - (b) to use the Demised Premises for the purpose of constructing and operating a marina;
    - Premises or any part thereof without obtaining the prior written consent of the Lessor (such consent not to be unreasonably withheld in the case of a respectable and responsible person) and where permission is granted the Lessor reserves the right to levy a reasonable fee in respect thereof **PROVIDED ALWAYS** that no such permission shall in any way relieve the Lessee from responsibility for non-fulfilment of any conditions of this Lease or non-compliance therewith;

- (d) permit the Lessor or his servants or agents or anyone authorized by him in that behalf with or without workmen and others at all reasonable times to enter upon the Demised Premises to view the same for any purpose whatsoever;
- (e) to use the Demised Premises in a proper and tenant like manner to the satisfaction of the relevant Governmental Authorities for the maintenance of docking facilities and not to construct any piers or jetties without first obtaining the approval frrom the relevant Government Authorities;
- (f) to obtain wherever necessary the prior approval of the Minister Responsible for Public Works and the Minister Responsible for Health, or any other relevant Governmental Agencies, for the erection of any building or other structures on the Demised Premises and for the effecting of any additions, alterations, and repairs to any existing or future buildings;
- (g) to keep the Demised Premises and any buildings, out buildings structures and conveniences thereon in a proper and sanitary condition at all times and to satisfaction of the relevant Government Authorities;
- (h) to practice such health measures under the advice of the Minister Responsible for Health and the Minister Responsible for Public Works for the prevention, control and elimination of disease;
- (i) throughout the said Term the Lessee shall effect a policy of public liability insurance with a reputable insurance company or agency and to the satisfaction of the Lessor and naming the Lessor as an insured party thereto relative to any buildings or jetties, inter alia, comprising the Demised Premises from time to time in an amount at least to the extent of the replacement value thereof, and shall

- pay all premiums in respect thereof whenever the same shall become due; and provide proof of the validity of such insurance to the Lessor annually;
- (j) Not to make any changes in the risks covered by the said policy of insurance without the prior written consent of the Lessor and to produce to the Lessor on demand written confirmation from the insurers that they have agreed to waive all rights of subrogation against the Lessor;
- (k) to be responsible for the care and maintenance of such concrete pillars iron stakes and/or other survey marks of whatsoever nature as may be placed at the corners of or along the boundaries of the Demised Premises for the purpose of marking the boundaries thereof;
- to practice and use the strictest safety measures as may be required during the said term of the lease;
- (m) to use the Demised Premises so as not to cause any nuisance or annoyance to neighboring owners or occupiers;
- (n) to abate any nuisance arising on or emanating from the Demised

  Premises immediately upon being required so to do either by the

  Lessor or other person acting under the authority or by the

  appropriate Governmental Authorities;
- (o) and to indemnify and hold harmless the Lessor against and from all actions claims suits and demands whatsoever to which the Lessor may be or become liable arising out of any use to which the Demised Premises might be put;
- (p) to pay the cost of surveying the Demised Premises whenever necessary and the costs of and incidental to the drafting of this Lease;

- (q) at the determination of the said Term (or sooner determination) to yield up to the Lessor the Demised Premises together with all improvements thereto apart from any building or jetties erected by the Lessee on the said Demised Premises;
- (r) not to desert, neglect or leave the Demised Premises unoccupied or unused for a period of more than three (3) consecutive months without the written consent of the Lessor first had and obtained.
- Not to store or bring upon the Demised Premises any article of a (s) specially combustible inflammable or dangerous nature except for diesel fuel, natural gas, butane gas, propane gas, or other hydrocarbons or chemicals used in connection with the operation and maintenance of the Demised Premises and the improvements and activities conducted thereon PROVIDED THAT such diesel fuel natural or butane gas and other chemicals are properly stored and all waste products and materials are disposed of in an environmentally safe and sound manner and in accordance with the Environmental Health Services Act, Chapter 232, The Statute Law of The Bahamas, Revised Edition of 2000 and any statutory modification or reenactment of the same and PROVIDED FURTHER THAT the Lessee will indemnify the Lessor and keep the Lessor fully indemnified against any losses which shall occur after the date hereof in respect of damage to or pollution of or any substance on them the environment or damage to property or harm to human health caused by the Demised Premises or any substance on them whether in liquid or solid form or in the form of gas or vapor AND not to do or suffer to be done on the Demised Premises any act matter or thing which may be or become a nuisance or damage to the Lessor or to the owners tenants or occupiers of any adjoining or neighboring property or to the neighborhood and to keep fully indemnified the Lessor against all action suits or other

- proceedings claims or demands arising, directly or indirectly, out of any such act or thing as aforesaid;
- (t) Not to hold on trust for another or part with possession of the whole or any part of the Demised Premises or permit another to occupy the whole or any part of the Demised Premises without the prior written consent of the Lessor;
- (u) Not to use the Demised Premises for any illegal or immoral act or purpose;
- (v) Not to use the Demised Premises as sleeping accommodation or for residential purposes;
- (w) To be responsible for and keep the Lessor fully indemnified against all damages losses costs expenses actions demands proceedings claims and liabilities made against or suffered or incurred by the Lessor arising directly or indirectly out of any act omission or negligence of the Lessor or any person at the Demised Premises expressly or impliedly with the Lessee's control or any breach or non-observance by the Lessee of the covenants conditions or other provisions of this Lease or any of the matters to which this demise is subject;
- (x) To give notice to the Lessor of any defect in the Demised Premises which might give rise to an obligation on the Lessor to do or refrain from doing any act or thing in order to comply with the provisions of this Lease or the duty of care imposed on the Lessor pursuant to any law;
- (y) upon twenty-four (24) months prior written notice delivered by the Lessor to the Lessee, surrender from time to time to the Lessor any part of the Demised Premises as may be reasonably required by the Lessor for a "public purpose" as defined by the laws of the

Commonwealth of The Bahamas and subject to the provisions of the Constitution of the Commonwealth of The Bahamas with respect to compulsory acquisition subject to the terms (including payment of compensation) of the Acquisitions of Land Act, Chapter 252, The Statute Law of The Bahamas, Revised Edition of 2000 and any statutory modification or reenactment of the same; and

- (z) To permit the Lessor at all times during the Term to exercise without unlawful interruption or interference any of the rights granted to him by virtue of the provisions of this Lease.
- 3. The Lessor to the intent that the obligations herein contained shall continue throughout the term hereby created **HEREBY COVENANTS** with the Lessee as follows:-
  - (a) that the Lessee paying the rent hereby reserved and observing and performing the covenants and conditions herein contained and on the part of the Lessee to be observed and performed shall peaceably and quietly hold and enjoy the Demised Premises during the said term without interruption by the Lessor or any other person rightfully claiming under or in trust for him;
  - (b) That notwithstanding the provisions of sub-clause (c) of this clause the Lessee shall have the right:
    - (i) to build construct erect install place alter amend repair and maintain both on the Bed of the Sea hereby demised and in and upon the water on top of the Demised Premises all buildings structures installations apparatus equipment fixtures and things whether permanent or temporary of every nature and kind whatsoever including (without prejudice to the generality of the foregoing words) piers, wharfs, docks, dolphin mooring posts, mooring bollards,

anchors, moorings, mooring chains and mooring lines of all kinds, pipes and pipelines both fixed and floating) pumps and valves of all kind, and;

- (ii) to anchor, moor, tie up, load and unload ships, vessels and boats of all kinds within the boundaries of the Demised Premises and whether from such buildings structures installations apparatus equipment fixtures and things as aforesaid or from vessels or barges or otherwise howsoever;
- (c) that subject to the provisions of sub-clause (b) of this clause nothing contained in these presents shall be deemed to restrict the right of navigation of the public to use the water on top of the bed of the sea hereby demised as a highway for shipping and for the movement of ships vessels and boats of all kind so long as the exercise of such right or navigation by the public does not:
  - (i) interfere with obstruct damage or disturb in any way any buildings, structure, installation, apparatus, equipment and things placed on the demised premises by the Lessee and the use of the Demised Premises and the water on top of the same by the Lessee as a marina for the docking, loading and unloading of ships vessels and boats of all kinds within the boundaries of the Demised Premises by the Lessee, and;
  - (ii) interfere with obstruct damage or disturb in any way ingress, egress and regress in, through and to the entrance channels, aprons anchorages, moorings, dolphins aforesaid by ships vessels and boats of all kinds.

Provided always that no exercise by the public of the right to navigation aforesaid nor any interference obstruction, damage or disturbance as specified in paragraphs (i) and (ii) of this sub-clause caused by and/or arising thereby shall be deemed to be a breach by the Lessor of any of the covenants on the part of the Lessor herein contained and provided further that the Lessee without in any way waiving any and all rights the Lessee may have against any person or corporation causing any such interference, obstruction, damage or disturbance as aforesaid will not call upon the Lessor to prevent the same and provided further that the Lessor shall, however upon the request and at the expense of the Lessee, support the Lessee in such manner as the Lessee may reasonably request in any legal proceedings the Lessee may initiate and maintain against any person or corporation causing any such interference, obstruction, damage or disturbance as aforesaid;

which covenants on the part of the Lessee herein contained for which the Lessor has given the Lessee written notice thereof and the Lessee has not taken reasonable steps to remedy the breach of non-observance of the said covenant the Lessor shall on the written request of the Lessee made at least twelve (12) months prior to the expiration of the term hereby created enter into negotiations with the Lessee concerning any possible renewal or subsequent term, if any, to be granted by the Lessor to the Lessee.

# 4. PROVIDED ALWAYS AND IT IS HEREBY MUTUALLY AGREED AND DECLARED as follows:—

- (a) subject to Clause 2 (c) above it is agreed that the Lessee will have the right to sub-lease and/or rent marina slips at its marina within the Demised Premises for a period up to the said Term.
- (b) Notwithstanding anything herein contained the parties hereby agree that in the event Parliament approves an increase in the fees levied under the provisions of the Port Authorities (Amendment) Act, 2003

upon commercial jetties situated in the Family Islands of The Bahamas, the yearly rental for the subsequent years will be reflective of such increases, in accordance with the Act.

- that if the rent hereby reserved or any part thereof shall be at any time unpaid for thirty (30) days after becoming payable (whether formally demanded or not) or if any covenant of the Lessee herein contained shall not be performed or observed or if the Lessee or other person in whom for the time being the term hereby created goes into liquidation or is wound up other than for the purposes of amalgamation or re-construction then and in any of the said cases it shall be lawful for the Lessor after giving reasonable written notice thereof to the Lessee to re-enter upon the Demised Dremises or any part thereof in the name of the whole and thereupon this Lease shall absolutely determine but without prejudice to the right of action of the Lessor in respect of any breach of the Tenant's covenants herein contained.
- (d) that this Lease shall not confer on the Lessee the right at any time to any gold or other metals minerals ores bauxite gems or precious stones coal natural gas or mineral oil or any other natural resource or mineral or mineral oil calcareous deposits commonly known or referred to as aragonite sand aggregate or lime stone or otherwise in, under or above the Demised Premises and the same shall be saved and reserved unto the Lessor with the right to enter upon the Demised Premises or any part thereof to search and mine thereon and to extract and carry away therefrom any such metals minerals ores bauxite gems or precious stones coal natural gas or mineral oil or any other natural resource or mineral or otherwise subject however to the right of the Lessee to reasonable compensation for any loss or damage to its occupation of or improvements on the Demised Premises occasioned by such searching mining extracting

- and carrying away the amount of such compensation to be agreed between the parties and failing agreement to be determined by the Lessor at his discretion;
- (e) that this Lease shall be subject always to the right of the Government of the Commonwealth of The Bahamas to establish maintain and extend water supply or sewerage systems into through across under or over the Demised Premises in accordance with the provisions of the Laws of the said Commonwealth;
- the right to enter upon and resume possession of any part or parts of the Demised Premises which the Lessor may consider necessary for the construction of any railway tramway bridge telephone lines road or power transmission facilities or convenience or to sell lease licence or otherwise dispose of to any person any part of the Demised Premises for any of the aforesaid public purposes without compensation to the Lessee in respect of any part so resumed or sold leased licensed or otherwise disposed of as herein stipulated;
- that any notice to be served hereunder shall be in writing and shall be sufficiently served on the Lessor if hand delivered or sent by registered mail to the Director of the Department of Lands and Surveys, Bay and Armstrong Streets, P.O. Box N-592, Nassau, The Bahamas and on the Lessee, if hand delivered or sent by registered post to Graham Thomson, Sassoon House, Shirley Street and Victoria Ave. P.O. Box N-213, New Providence, The Bahamas. Any notice sent by registered post shall be deemed to be served fourteen (14) days after the envelope or package containing the same has been delivered into the care of the Postal Authority;
- 5. If either the Lessor or the Lessee shall for any reason desire to determine the Lease hereby granted after the expiration of twelve (12) months from the date

# THE SCHEDULE HEREINBEFORE REFERRED TO DESCRIPTION

#### **AREA** = 11.924 Acres

"ALL THAT certain piece parcel or lot of the sea bed containing by admeasurement Eleven and Nine Hundred and Twenty Four Thousandths (11.924) Acres or thereabouts as shown on MP File No. 2891/VI on record in the Department of Lands and Surveys situate in Harbour Island on the Island of Eleuthera in the Commonwealth of The Bahamas. ABUTTING AND BOUNDING towards the NORTH by the Sea and running thereon for a total distance of Eleven Hundred and Forty (1140.00') feet, towards the EAST along the high water mark by the land said to be the property of Rose Estates, towards the SOUTH by the Sea and running thereon for a total distance of Eleven Hundred and Twenty-three (1123.00') feet, towards the WEST by the Sea and running thereon for a total distance of Five Hundred and Thirty-four and Eighty-five hundredths (534.85') feet or however else the same may abut and bound which said piece parcel or lot of the sea bed (hereinafter called the "the Demised Premises") is more particularly delineated and shown colored pink on the plan of the area thereto annexed and marked."

# **LEASE PLAN**

**IN WITNESS WHEREOF** the parties have hereunto set their hands and affixed their seals the day and year first hereinbefore written.

| IN WITNESS WHEREOF the          | )   |
|---------------------------------|---|
| Official Seal of the Minister   | )   |
| Responsible for Lands & Surveys | )   |
| THE HON. HUBERT ALEXANDER       |   |
| MINNIS                          | ) MINISTED DESPONSIBLE                            |
| and the said Minister           | ) MINISTER RESPONSIBLE<br>) FOR LANDS AND SURVEYS |
| Subscribed his                  | )   |
| signature hereto                | )   |
|                                 | )   |
|                                 | ) 01 lh   |
| In the presence of:             | ) WITNESS   |
|                                 | WIINESS   |

# COMMONWEALTH OF THE BAHAMAS NEW PROVIDENCE

| 1 Cardia A. P. Ferguson .   | f the Easton                            |
|---|---|
| District of the Island of New Providence  |   |
| of the Bahamas, do hereby make  | oath and say that I was present and say |
| THE HONOURABLE HUBERT ALI   | EXANDER MINNIS of the Western           |
| District of the said Island of New Provider   | nce MINISTER RESPONSIBLE FOR            |
| LANDS AND SURVEYS sign seal as and the Indenture of Lease dated the day of therein mentioned; and that I subscribed | of Novembra D 2018 for the purposes     |
| execution thereof.  |   |
|   |   |
| Sworn to at Nassau Bahamas  | )                                       |
| thisday of  |   |
| A.D., 20  | ) Calla                                 |
|   | WITNESS                                 |

BEFORE ME:

NOTARY PUBLIC

| IN WITNESS WHEREOF                                   | )        |
|--|----------|
| The Common Seal of                                   |          |
|  | 3 MM     |
| was duly affixed hereto by<br>the President/Director | LESSEE// |
| and  | Mille    |
| the Vice President/Secretary                         | )        |
| said Company   | ) 11/2/1 |
| In the presence of:                                  | )        |
|  | WITNESS  |

#### COMMONWEALTH OF THE BAHAMAS

# NEW PROVIDENCE

| J    | I, L. Ryan Pinder of the Eastern   |             |       |
|------|--|-------------|-------|
| 35   | Districtin the Island of New Providence  | e one of    | the   |
| ]    | Islands in the Commonwealth of The Bahamas,, make oat  | h and say   | that  |
|      | I was present and saw the common seal of 4 M Hanbour Island Lie  | affixed to  | the   |
|      | Indenture of Lease dated the day of A.D., by   |             |       |
| j    | President/Director and Socretary   | Dire        | ctor  |
|      | respectively, of the said Company and I  |             |       |
| \$   | said President / Director and Secretury  | *******     |       |
| 4    | sign execute and deliver the said indenture of Lease as and for the ac   | et and deed | d of  |
| 1    | the said Company for the purposes therein mentioned and that I subsc   | ribe my na  | ame   |
| i    | as the witness to the due execution thereof. Further that the sea  | l affixed   | and   |
| ]    | impressed at the foot or end of the said Indenture of Lease is the Co  | mmon sea    | ıl of |
|      | the said Company and was affixed and impressed   |             |       |
|      | said by the  |             |       |
|      | with the authority of the Board of the said Company and in confor  | mity with   | the   |
| 100  | Articles of Association of the said company.   |             |       |
|      |  |             |       |
|      | a series and a ser |             |       |
| 3    | Sworn to at New Providence )   |             |       |
|      | )  |             |       |
| 0.00 | thisl.D., day of )   |             |       |
|      |  |             |       |
| 0    | October A.D.2018 )   |             |       |
| _    | WITNESS  |             |       |
|      |  |             |       |
|      | (1/01/01/  |             |       |
|      | x (wey)  |             |       |
|      |  |             |       |

JUSTICE OF THE PEACE

**BEFORE ME:** 

# RECORDED IN THE DEPARTMENT OF LANDS AND SURVEYS

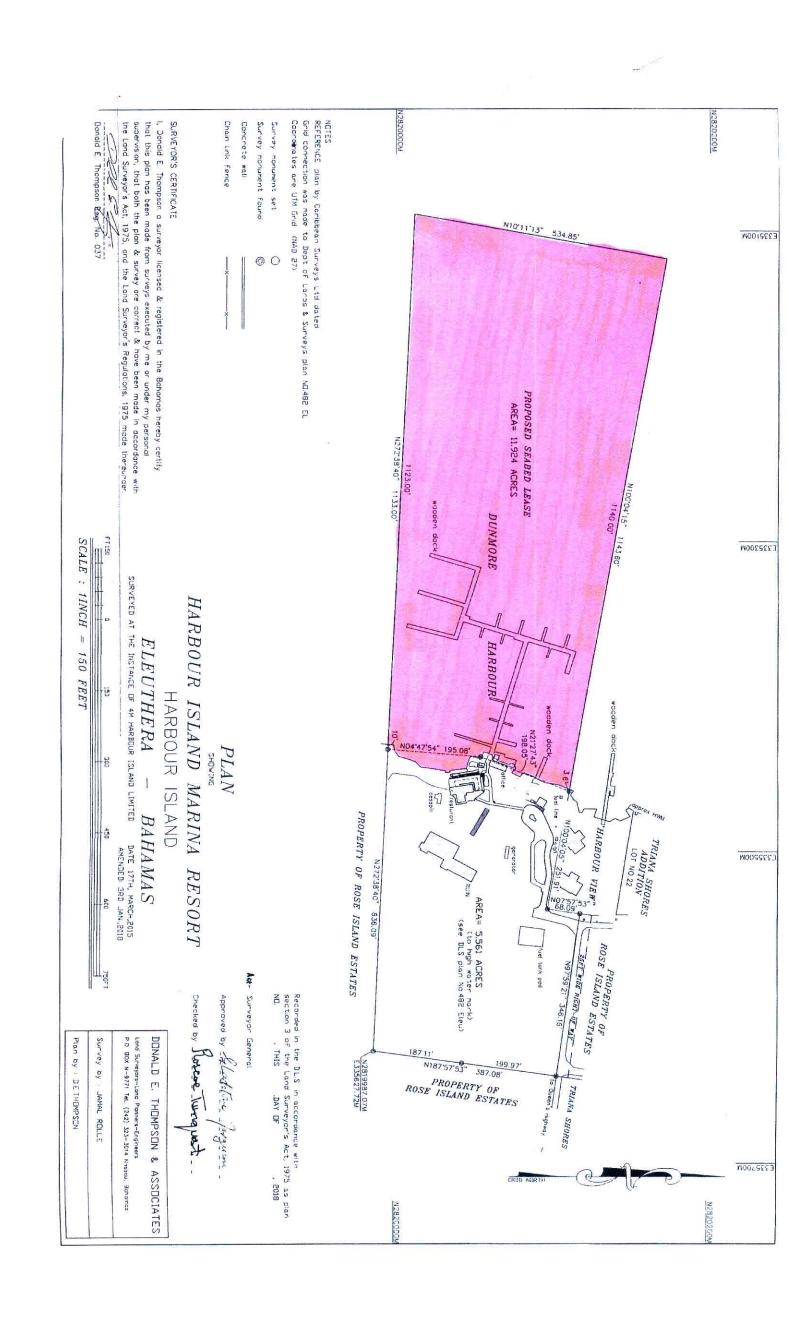
THIS 22 DAY OF November A.D. 2018 AND NUMBERED

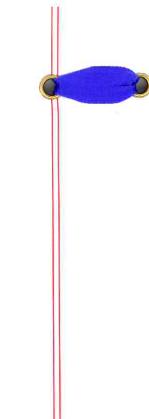
CROWN LEASE NO. 1145

SURVEYOR GENERAL

DEPARTMENT OF LANDS AND SURVEYS

# LEASE DIAGRAM





| A. D., 2018 |
|-------------|
| November    |
| DAY OF      |
| NA          |
| DATED: THIS |

THE MINISTER RESPONSIBLE FOR LANDS AND SURVEYS

TO

4M HARBOUR ISLAND LTD.

LEASE

DEPARTMENT OF LANDS AND SURVEYS

# APPENDIX C: SPILL PREVENTION / HURRICANE AND EMERGENCY ACTION PLAN

#### ENVIRONMENTAL TRAINING PLAN

#### 1 Purpose

This purpose of this document is twofold. Firstly it is to ensure that all existing and new employees are provided with sufficient information, on how to use the EMP manual, that will be located onsite. Secondly, it is to provide all employees with some basic environmental awareness training, so that they can incorporate Best Environmental Practices into their daily work routine.

This training plan contains the following sections:

- 3.0 Competence requirements
- 4.0 Induction Training
- 5.0 Employee Personal Development
- 6.0 Work Environment

#### 2 Procedure

The developer is responsible for identifying the individuals that will be a part of the project team. The EM is responsible for the identification of competency requirements, and ensuring that all existing and new employees are properly trained to work within the project team and work environment. Training records for all employees shall be kept on file at the project site.

#### 3.0 Competence requirements

The Developer/Owner and the Project Management Team shall identify the required level of qualifications and experience / training that staff need to possess for each post. Previous experience and formal qualifications will also be recorded during the recruitment process as appropriate.

The competencies necessary for personnel performing activities affecting operational, quality and environmental performance are defined in the general job descriptions and employment contracts. Once a new employee is hired, the individual is sent an employment acceptance letter, and a contract of employment. Each new employee has a file that is created to record progress, training records and any other history of activities during the employee tenure with the company. At minimum each new employee is required to have the basic job skills, such as being able to communicate both orally and in writing. For more technical (Supervisory) or management level employees, a basic high school diploma is mandatory, as well as the necessary degrees and certifications appropriate for the job role.

#### 4.0 Induction training

All new employees shall receive induction training, which as a minimum includes a Health & Safety, Quality and Environmental induction. This educates the employee on the use and importance of the proper job PPE's, what to do in the event of an emergency, the correct protocols and procedures to follow and the responsible party who should be notified. All of these standards and guidelines are included in the site Environmental Management Plan, which is the document that is used to manage all environmental related matters on the project site. The induction training shall be organized and document by the project's EM, and can be administered by any of the project's senior management team members.

Induction training is carried out through presentation and the provision of the Environmental Management Plan. This document is available onsite at all times, and all employees have access to the document, should they need to review or understand the document to a greater extent. Once the employee completes the induction, the document is signed by the individual and kept on the employee's personal to verify that the training has been done.

Where appropriate, a three-month probation is carried out with new employees and is recorded on the induction form, along with any immediate training needs.

#### 5.0 Employee personal development

Training requirements are reviewed annually during annual appraisal, or at any time that the management team feels that further development is required for the individual. The employee personal development can be either or both of the following:

#### ENVIRONMENTAL TRAINING PLAN

- i) External training courses.
- ii) Internal training courses.

Any external training such as technical or management training are documented and a record is kept on the individual's personal file. External training can take on the form of industry and/or environmental training and standards certifications. Similarly, internal training are also documented and a record is kept on the employee's personal file. These can take on the form of on the job training, online courses and personal development through the use of daily policy and procedures.

The employees training plan is always updated and reviewed, for further improvement and how it can best meet the employees and project needs.

#### 6.0 Work environment

Appropriate work environments have been considered and implemented in accordance with the project conditions, and the standards and guidelines set out in the EMP document. This includes the appropriate working environment for general staff, contractors and construction workers. Health & Safety and environmental issues have been considered and appropriate practices implemented in the support of safe working environments in the EMP document.

# FIRE DRILLS / EVACUATION PROCEDURES

Fire drills are critical for ensuring the safety of the staff guests visiting the island and dolphin facility, and for those entering the property or building. Practicing scheduled fire drills will help ensure individuals have the knowledge to safety escape a fire without injuring themselves or others.

Fire drills should be conducted by the person responsible for the building, or the designated person responsible for fire and safety. There is no minimum amount of time drills can be conducted. However, the key is to ensure that staff are well prepared on how to react in an emergency, as in the case of a fire

All fire drills should be recorded and documented.

#### **Pre-Fire Drill Procedures**

To be conducted by supervisory staff or maintenance personnel.

1. Contact the fire alarm monitoring company and advise them of the upcoming fire drill. In this case since the island is a relatively far distance from the mainland, it would not be practical to carry out this step in the drill, unless there was an actual fire.

# **Initiating the Fire Drill**

Is there a "Fire Drill" feature on the panel? (If Installed)

Yes – utilize this feature to activate alarms for the purpose of the fire drill.

No – activate the nearest manual pull station or announcement alert.

2. Record the time from the activation of the fire alarm/announcement to the evacuation of all staff and clientele.

# **During the Fire Drill**

Supervisory staff are to monitor the evacuation process and note any of the following:

- Are individuals closing the doors upon exiting rooms?
- Are individuals remaining calm and proceeding towards the nearest exit?

- Are individuals assembling at the designated muster point?
- Are fire wardens (if applicable) ensuring the safe evacuation of all individuals?
- Are all individuals being accounted for (if applicable)?
- Are exits guarded to prevent re-entry into the building?

#### **After the Fire Drill**

- 1. Record the total evacuation time in the evacuation checklist report.
- 2. Silence the alarms, reset the manual pull station and reset the fire alarm system if available.
- 3. Ensure the fire alarm system is back to normal operating condition.
- 4. Inform individuals that they can re-enter the building.
- 5. Contact the fire alarm monitoring company if possible or external contact to advise that the fire drill is complete.
- 6. Re-evaluate any concerns that arose during the fire drill and discuss as a group (ex. safety meeting).
- 7. Keep record of the fire drill and any notes on the evacuation checklist report.

# **EMERGENCY ACTION PLAN**

for



Name of Site: <u>Harbour Island Resort and Marina</u>

Site Location: <u>Harbour Island</u>, <u>Eleuthera</u>, <u>The Bahamas</u>

Preparation Date: May 16, 2019

## **EMERGENCY PERSONNEL NAMES AND PHONE NUMBERS**

DESIGNATED RESPONSIBLE OFFICIAL (Property/Project Manager)

1. Name: Mr. Michael Johnson Mobile contact: (242) 359-7212
Project Site Manager

2. Name: Franklyn Hall Mobile: (242) 556-5135

**Environmental Manager** 

# **Local Island Contact for Emergency**

Name: <u>Frances Hepburn</u>

Administrator and Commissioner's Office

Contact: (242) 333-3031

## **EVACUATION ROUTES**

- Evacuation route maps have been posted in each work area. The following information is marked on evacuation maps:
  - 1. Emergency exits
  - 2. Primary and secondary evacuation routes
  - 3. Locations of fire extinguishers
  - 4. Assembly points
- Site personnel should know at least two evacuation routes.

# **EMERGENCY PHONE NUMBERS**

POLICE AND FIRE EMERGENCY: (242) 333-2111 (919) – National Police and Fire Emergencies

MEDICAL EMERGENCY: (242) 333-2277 Harbour Island Community Clinic

## **UTILITY COMPANY EMERGENCY CONTACTS**

(Specify name of the company, phone number and point of contact)



**Bahamas Power and Light** 

Contact (If Applicable): Phone: (242) 333-2255



**Water and Sewerage Corporation** 

Contact (If Applicable): Phone: (After 6:00 pm) (242) 333-2417



**BTC** 

Contact (If Applicable): Phone: (242) 333-2376



**Cable Bahamas** 

Contact (If Applicable): Phone: (242) 300-2200

Gas Company (if applicable):

# EMERGENCY REPORTING AND EVACUATION PROCEDURES

Types of emergencies to be reported by site personnel are:

- Medical
- Fire (\*See Fire Drills Procedure Appendix)
- Severe Weather
- Bomb Threat (\*See Bomb Threat Checklist Appendix)
- Chemical Spill
- Oil Spill (\*See Oil Spill Control Procedures Appendix)
- Extended Power Loss
- Flooding/Storm Surge

| • | other (specify) |   |
|---|-----------------|---|
|   |                 | (e.g., terrorist attack/hostage taking) |

# **MEDICAL EMERGENCY**

| •    | Call medical emergency phone number (check applicable):  |
|------|--|
|      | <ul> <li>□ Paramedics</li> <li>□ Ambulance</li> <li>□ Fire Department</li> <li>□ Other</li> </ul>  |
|      | Provide the following information:  a. Nature of medical emergency, b. Location of the emergency (address, building, room number), and c. Your name and phone number from which you are calling.   |
| •    | Do not move victim unless necessary.   |
| •    | Call the following personnel trained in CPR and First Aid to provide the required assistance prior to the arrival of the professional medical help:  |
| Name | Phone  |
| Name | Phone:   |
| •    | If personnel trained in First Aid are not available, as a minimum, attempt to provide the following assistance:  1. Stop the bleeding with firm pressure on the wounds (note: avoid contact with blood or other bodily fluids).  2. Clear the air passages using the Heimlich Maneuver in case of choking. |
| •    | of choking.  In case of rendering assistance to personnel exposed to hazardous materials, consult the Material Safety Data Sheet (MSDS) and wear the appropriate personal protective equipment. Attempt first aid ONLY if trained and qualified.   |

Date: May 16, 2019

#### **FIRE EMERGENCY**

#### When fire is discovered:

- Activate the nearest fire alarm (if installed)
- Notify the local Fire Department by calling 919.
- If the fire alarm is not available, notify the site personnel about the fire emergency by the following means (check applicable):

| Voice         | Radio           |
|---------------|-----------------|
| Communication | Other (specify) |
| Phone Paging  | - •             |

#### *Fight the fire ONLY if:*

- The Fire Department has been notified.
- The fire is small and is not spreading to other areas.
- Escaping the area is possible by backing up to the nearest exit.
- The fire extinguisher is in working condition and personnel are trained to use it.

#### *Upon being notified about the fire emergency, occupants must:*

- Leave the building using the designated escape routes.
- Assemble in the designated area (specify location):
- Remain outside until the competent authority (Designated Official or designee) announces that it is safe to reenter.

# Designated Official, Emergency Coordinator or supervisors must:

- Disconnect utilities and equipment unless doing so jeopardizes his/her safety.
- Coordinate an orderly evacuation of personnel.
- Perform an accurate head count of personnel reported to the designated area.
- Determine a rescue method to locate missing personnel.
- Provide the Fire Department personnel with the necessary information about the facility.
- Perform assessment and coordinate weather forecast office emergency closing procedures
- Ensure that all employees have evacuated the area/floor.
- Report any problems to the Emergency Coordinator at the assembly area. Assistants to Physically Challenged should:
- Assist all physically challenged employees in emergency evacuation.

Date: May 16, 2019

#### **EXTENDED POWER LOSS**

In the event of extended power loss to a facility certain precautionary measures should be taken depending on the geographical location and environment of the facility:

• Unnecessary electrical equipment and appliances should be turned off in the event that power restoration would surge causing damage to electronics and effecting sensitive equipment.

**Upon Restoration of heat and power:** 

• Electronic equipment should be brought up to ambient temperatures before energizing to prevent condensate from forming on circuitry.

#### **CHEMICAL SPILL**

| The following are the locations of:   |
|---|
| Spill Containment and Security Equipment:                                     |
| Personal Protective Equipment (PPE):<br>Material Safety Data Sheet<br>(MSDS): |

When a Large Chemical Spill has occurred:

- Immediately notify the designated official and Emergency Coordinator.
- Contain the spill with available equipment (e.g., pads, booms, absorbent powder, etc.).
- Secure the area and alert other site personnel.
- Do not attempt to clean the spill unless trained to do so.
- Attend to injured personnel and call the medical emergency number, if required.
- Call a local spill cleanup company or the Fire Department (if arrangement has been made) to perform a large chemical (e.g., mercury) spill cleanup.

|               | Name of Spill Cleanup Company: |  |
|---------------|--------------------------------|--|
| Phone Number: | Phone Number:                  |  |

• Evacuate building as necessary

When a Small Chemical Spill has occurred:

- Notify the Emergency Coordinator and/or supervisor (select one).
- If toxic fumes are present, secure the area (with caution tapes or cones) to prevent other personnel from entering.
- Deal with the spill in accordance with the instructions described in the MSDS.
- Small spills must be handled in a safe manner, while wearing the proper PPE.
- Review the general spill cleanup procedures.

Date: May 16, 2019

#### **OIL SPILL**

| The following are the locations of:                                   |
|---|
| Spill Containment and Security Equipment:                             |
| Personal Protective Equipment (PPE): Material Safety Data Sheet MSDS: |

#### When a Large Oill Spill has occurred:

- Immediately notify the designated official and Emergency Coordinator.
- Contain the oil spill with available equipment (e.g., pads, booms, absorbent powder, etc.).
- Secure the area and alert other site personnel.
- Do not attempt to clean the spill unless trained to do so.
- Be prepared to evacuate dolphins from pens if necessary

# When a Small Oil Spill has occurred:

- Notify the Emergency Coordinator and/or supervisor (Vicky or Samir Andrawos).
- Small spills must be handled in a safe manner, while wearing the proper PPE.
- Review the general oil spill cleanup procedures.

Date: May 16, 2019

# TELEPHONE BOMB THREAT CHECKLIST

| INSTRUCTIONS CALLER. YOUR NAME: _                 | ŕ                                    |   |               |   |                            |
|---|--------------------------------------|---|---------------|---|----------------------------|
| CALLER'S IDEN<br>APPROXIMATE<br>ORIGIN OF CAI     | NTITY SEX: Ma<br>E AGE:<br>LL: Local | ıle Fema                                    | le Adult _    | Juvenile  |                            |
| Booth   | ACTERISTICS                          | SPE   | ECH           | LANG  | GUAGE                      |
| Loud<br>High<br>Pitch<br>Raspy                    | Soft                                 | Fast Distinct Stutter                       | Slow          | Excellent Fair Foul                                   | Good Poor                  |
| ACC   | ENT                                  | MANNER                                      |               | BACKGRO   | UND NOISES                 |
| Local<br>Foreign<br>Race                          | Local                                | Calm Rational Coherent Deliberate Righteous |               | Factory  Machines  Moffice  Machines  Street  Traffic | Animals<br>Quiet<br>Voices |
|   |                                      | BOMB FA                                     | CTS           |   |                            |
| PRETEND DIFF<br>AGREEABLE TO<br>When will it go o | O FURTHER CO                         | ONVERSATION,                                | , ASK QUESTIC | ONS LIKE:   | SEEMS                      |
| Where is it locat                                 | ed? Building _                       | Area  |               |   |                            |
| What kind of bo                                   |                                      |   |               |   |                            |
| What kind of pa                                   | ckage?                               |   |               |   |                            |
| How do you kno                                    |                                      |   |               |   | _                          |

| What is your name and address? |  |
|--------------------------------|--|
| · ·                            |  |

If building is occupied, inform caller that detonation could cause injury or death.

Activate malicious call trace: Hang up phone and do not answer another line.

Call Police Emergency at 919 and relay information about call.

Did the caller appear familiar with plant or building (by his/her description of the bomb location)? Write out the message in its entirety and any other comments on a separate sheet of paper and attach to this checklist.

Notify your supervisor immediately.

#### SEVERE WEATHER AND NATURAL DISASTERS

#### Tornado:

- When a warning is issued by sirens or other means, seek inside shelter.
   Consider the following:
  - Small interior rooms on the lowest floor and without windows.
  - Hallways on the lowest floor away from doors and windows, and
  - Rooms constructed with reinforced concrete, brick, or block with no windows.
- Stay away from outside walls and windows.
- Use arms to protect head and neck.
- Remain sheltered until the tornado threat is announced to be over.

#### Flood/Storm Surge:

## *If indoors:*

- Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.
- Follow the recommended primary or secondary evacuation routes.

#### If outdoors:

- Climb to high ground and stay there.
- Avoid walking or driving through flood water.

#### Hurricane:

• The nature of a hurricane provides for more warning than other natural and weather disasters. A hurricane watch issued when a hurricane becomes a threat to a coastal area. A hurricane warning is issued when hurricane winds of 74 mph or higher, or a combination of dangerously high water and rough seas, are expected in the area within 24 hours.

#### Once a hurricane watch has been issued:

- Stay calm and await instructions from the Emergency Coordinator or the designated official.
- Moor any boats securely or move to a safe place if time allows.
- Continue to monitor local TV and radio stations for instructions.
- Move early out of low-lying areas or from the coast, at the request of
  officials
- If you are on high ground, away from the coast and plan to stay, secure the building, moving all loose items indoors and boarding up windows and openings.
- Collect drinking water in appropriate containers.

#### Once a hurricane warning has been issued:

- Be ready to evacuate as directed by the Emergency Coordinator and/or the designated official.
- Leave areas that might be affected by storm tide or stream flooding. *During a hurricane:*
- Remain indoors and consider the following:
   Small interior rooms on the lowest floor and without windows,
  - Hallways on the lowest floor away from doors and windows, and

 Rooms constructed with reinforced concrete, brick, or block with no windows.

#### **CRITICAL OPERATIONS**

During some emergency situations, it will be necessary for some specially assigned personnel to remain at the work areas to perform critical operations.

#### Assignments:

| Work Area | Name | Job Title | Description of Assignment |
|-----------|------|-----------|---------------------------|
|           |      |           |                           |
|           |      |           |                           |

- Personnel involved in critical operations may remain on the site upon the permission of the site designated official or Emergency Coordinator.
- In the case of emergency will not permit any of the personnel to remain at the facility, the designated official or other assigned personnel shall notify the appropriate offices to initiate backups. This information can be obtained from the Emergency Evacuation Procedures included in the EMP document.

The following offices should be contacted:

Name/Location: <u>Harbour Islend – Eleuthera Ba</u>hamas

Telephone Number: <u>242-3332275</u>

Name/Location: Michael Johnson – Site Manager (Harbour Island)

Telephone Number: <u>242-3597212</u>

**TRAINING**The following personnel have been trained to ensure a safe and orderly emergency evacuation of other employees:

| Facility: |       |                |      |
|-----------|-------|----------------|------|
| Name      | Title | Responsibility | Date |
|           |       |                |      |
|           |       |                |      |
|           |       |                |      |
|           |       |                |      |
|           |       |                |      |
|           |       |                |      |
|           |       |                |      |



# **Hurricane Policy**

In light of the hurricanes which caused major problems to our sites in the Bahamas. Bahamas Marine Construction has produced this policy. This policy should apply to all sites.

#### Contents

- 1. Hurricane Classification
- 2. Hurricane Tracking
- 3. Key Decisions
- 4. Preparation
- 5. Return to work

#### **Hurricane Classification**

#### Saffir Simpson Hurricane Intensity Scale

Category One - A Minimal Hurricane

Winds: 74-95 mph, 64-83 kts, 119-153 km/h Minimum surface pressure: higher than 980 mbar, Storm surge: 3-5 ft, 1.0-1.7 m

Damage primarily to shrubbery, trees, foliage, and unanchored homes. No real damage to other structures. Some damage to poorly constructed signs. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings. Example: Hurricane Jerry (1989)

Category Two - A Moderate Hurricane

Winds: 96-110 mph, 84-96 kts, 154-177 km/h Minimum surface pressure: Range 979-965 mbar, Storm surge: 6-8 ft, 1.8-2.6 m

Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing materials of buildings; some window and door damage. No major damage to buildings. Coast roads and low-lying escape routes inland cut by rising water 2 to 4 hours before arrival of hurricane centre. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying areas required. Example: Hurricane Bob (1991)

Category Three - An Extensive Hurricane

Winds: 111-130 mph, 97-113 kts, 178-209 km/h Minimum surface pressure: 964-945 mbar, Storm surge: 9-12 ft, 2.7-3.8 m

Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some damage to roofing materials of buildings; some wind and door damage. Some structural damage to small buildings. Mobile homes destroyed. Serious flooding at the coast and many smaller structures near coast destroyed; larger structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane centre arrives. Flat terrain 5 feet or less above sea level flooded inland 8 miles or more. Evacuation of low-lying residences within several blocks of shoreline possibly required. Example: Hurricane Gloria (1985)

#### Category Four - An Extreme Hurricane

Winds 131-155 mph, 114-135 kts, 210-249 km/h Minimum surface pressure: 944-920 mbar, Storm surge: 13-18 ft, 3.9-5.6 m

Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows and doors. Complete failures of roofs on many small residences. Complete destruction of mobile homes. Flat terrain 10 feet or less above sea level flooded inland as far as 6 miles. Major damage to lower floors of structures near shore due to flooding and battering by waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane centre arrives. Major erosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required, and of single story residences within 2 miles of shore. Example: Hurricane Andrew (1992)

#### Category Five - A Catastrophic Hurricane

Winds: greater than 155 mph, 135 kts, 249 km/h Minimum surface pressure: lower than 920 mbar, Storm surge: higher than 18 ft, 5.6m

Shrubs and trees blown down; considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes. Major damage to lower floors of all structures less than 15 feet above sea level within 500 yards of shore. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane centre arrives. Massive evacuation of residential areas on low ground within 5 to 10 miles of shore possibly required. Example: Hurricane Camille (1969)

#### **Hurricane Tracking**

During Hurricane season tracking and checking should be carried out at various times every day. There is a vast amount of information on hurricane tracking available on the internet and on local television or radio.

Some good sources on the internetare:

- 1. www.weatherchannel.com
- 2. www.caribwx.com
- 3. www.kronor.com
- 4. <u>www.stormcarib.com/guide.htm</u>
- 5. www.noaa.com

Attached in "Appendix I" is a tracking chart which can be used to plot the advance of hurricanes.

#### **Key Decisions**

Once it has been ascertained that a hurricane strike is imminent.

- It is imperative that the senior site agent should be briefed in the decision making of the removal of all plant & equipment to safeareas.
- All employees should be trained in these procedures so that no time is wasted when the key
  decisions are implemented. Each site should have a designated person responsible for these
  operations.

#### **Habour Island Marina Site Preparation**

The following tasks need to be carried out to the site to make the site safe and secure. These tasks need to be started minimum of 2 days before the hurricane is due.

- All equipment and materials brought to a safe area (ideally the site compound or yard) that has no risk of flood and be parked together with brakes on. Trucks should be filled with aggregate to weigh them down.
- Window shutters should be placed if they are available if not plywood placed on the windows.
- Computer data backed up and stored in a safe secure area.
- Electric supplies should bedisconnected.
- All confidential and essential records held on the site should be and kept in a secure and watertight place off the ground.
- All Computers and electrical goods stored likewise.
- Any portable offices tied down.
- Any portable toilets removed by provider or tied down.
- Some ventilation should be left in offices to avoid differential pressures.
- Any loose materials in the area gathered up and stored.
- Any trees likely to damage offices cut down or trimmed.
- Asphalt and concrete plants should have their bins filled and in asphalt plants, the hot storage should be filled with dry stone. Bitumen heaters should be turned off. All gantries, masts and any loose parts should be taken down.
- All Turbidity curtains removed.
- All plant and vehicles should be left fueled and fuels supplies should not be let rundown as there can be shortages in the aftermath of hurricanes.
- All employees should be allowed adequate time to return home to make the necessary arrangements to ensure the safety of their families and homes.

#### Return to work

Once the all-clear has been given and we are in a position to return to work, the works areas need to be checked by the Project Manager and Site Supervisor to ensure they are safe. The following things need to be examined.

- Structural integrity of site offices, welfare facilities, and accommodations
- Check off all services to ensure that the electrical supplies are still safe.
- All equipment and materials need to be checked to ensure that it is still in safe working order.
- Sanitation facilities need to be checked or replaced.
- A roll call of all personnel
- Check of works carried out

#### CONSTRUCTION SITE SEWER MANAGEMENT PLAN

During construction, it is very important to manage and control domestic sewage and wastewater. This is very important for human health and the environment. The management and planning of the domestic and wastewater from human and other waste during construction shall be managed by the 4M project management team, and activities recorded and logged by the project's EM. This Management Plan meets the local standards that have been put in place to regulate all domestic and wastewater activities, and disposal, for the island of Eleuthera and Harbour Island.

The benefits of having an On-site Sewage Management plan will assist with:

- Better management and disposal of human waste during construction management;
- Management of local wastewater from general human use and disposal
- Help to control the spread or prevention of bacteria and disease.

#### **PURPOSE**

The purpose of the On-site Sewage Management Plan is to:

- Guide the developer towards sustainable on-site management of domestic sewage and effluent water.
- Protect and enhance the quality of public health and the environment, and other adjacent properties from any spread of disease or bacteria
- Prevent contamination of soil, substrate and groundwater
- Keep records of Sewer management and control, and maintain records for public health officials

#### **OBJECTIVES**

The On-site Sewage Management systems shall be selected, area sited operated and maintained to ensure the following objectives are met:

- Reduction of public health risk sewage contains bacteria, viruses, parasites and other disease-causing organisms. Contact with effluent should be minimized or eliminated.
- Protection of surface water surface waters are not contaminated by any flow from treatment systems and land application areas (including effluent, rainfall run-off and contaminated groundwater flow).
- **Protection of groundwater-** groundwater will not be contaminated by any flow from either the treatment systems or land application areas.
- Protection of land and vegetation land is not contaminated by any flow from treatment systems, effluent, rainfall run-off or removed tank solids

#### HANDLING AND DISPOSAL OF WASTE

- A local sewer contractor from the main land Eleuthera has been contracted to place portable toilets onsite for construction workers, that can handle both liquid and solid domestic human waste.
- Once the portable toilets are full the contractor shall be notified, and will then return to extract the waste with a vacuum sealed tank sewer disposal truck.
- The truck will then be placed on a barge, where it shall be transported to the mainland, to make its journey onward to North Eleuthera.
- At North Eleuthera, the DEHS has designated a landfill disposal site for domestic human waste. The disposal truck shall dispose of all human domestic waste, and make a return journey when notified by the site project superintendent.

These measure meet the local government standards, and are regulated by the DEHS.



# SPILL PREVENTION & RESPONSE PLAN

HARBOUR ISLAND MARINA PROJECT

The following Spill Prevention and Response measures will be implemented to prevent or mitigate escalation in the event of a possible Spill.

#### **SPILL PREVENTION MEASURES**

The following proactive measures will be adopted so as to prevent the likelihood of spill event:

- Training of Bahamas Marine Construction Staff and contractors regarding proper methods for transporting, transferring and handling substances that have the potential impact to human health or the environment.
- Preventative program including inspection and maintenance schedules to confirm and maintain the mechanical integrity and operability of equipment.
- Implementation of Standard Operation Procedures (SOPs) for handling materials including refueling vehicles, the use of diesel as oil blankets, the use of diesel tanks, the use and handling of processing chemicals, and managing secondary containment areas.
- Fuel will be purchased locally and immediately transferred to vehicles on site using a fuel pump. There are no current plans to have fuel stored on site during the marina construction phase.
- Provision of secondary containment, drip trays or other overflow and drop containment measures, for hazardous materials containers at connection points or other possible overflow points. Identification and provision of all equipment necessary to handle, transfer or transport materials properly.
- Use of transfer equipment that is compatible with and suitable for the characteristics of the materials transferred and designed to ensure safe transfer.
- Use of dripless hose connections for vehicle tank and fixed connections with storage tanks.
- Review of all potential pollutants characteristics prior to introduction to site and establishment of proper storage, handling and transportation procedures and spill risk analysis.
- Material Safety Data Sheets (MSDS) for all contaminants on-site will be readily available. These will include human health effects of chemicals handled and will be

included in the required chemical environmental and safety training for all employees handling or otherwise exposed to the contaminants. All appropriate personal protective equipment, handling and response procedures will also be identified in the MSDS or otherwise recommended by the suppliers/manufacturers and will be followed by the Project staff.

- Bulk transfers of chemicals during delivery will be observed by BMC personnel to identify preliminary hazard analysis methods.
- SOPs for chemical transportation, unloading, transfer, storage if required, handling, use and disposal shall be developed, kept current, effectively implemented.

#### SPILL CONTROL AND COUNTERMEASURES

The following spill control and countermeasures will be followed in the event of a spill incident:

- Maintenance of updated emergency contact information list at all spill response kits locations.
- Maintenance of spill route maps (perceived overland flow path [flow gradient] and likely contamination point [i.e. surface water features, potable boreholes etc.] of a given contaminant substance) at potential spill locations.
- Document availability of all spill response equipment that is capable of handling a large spill.
- Document availability of specific personal protective equipment and the necessary training needed to respond to different potential spills.
- Maintenance of spill response kits on all Project fuel and lubrication sites and vehicles.
- Maintenance of spill response guidelines at all spill response kit locations.
- Maintenance of an updated table of all contaminants on-site and recommended spill response procedures.
- Development, implementation and regular training and testing of a facility-wide Spill Response Plan.

- First-aid trained personnel on site.
- All spills will be reported to appropriate management personnel.

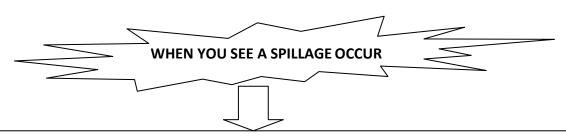
#### SPILL RESPONSE PROCEDURE & COMMUNICATIONS

The Spill Response Procedure describes what to do when you see a spillage occur, as seen on the next page.

The Project Manager is responsible that Emergency arrangements are made and communication lines are established with relevant agencies and authorities, such as:

- Harbour Island, Ministry of Health Clinic tele: (242) 333-2227;
- Chris Goslin, Governor's Harbour ambulance service (emergencies) tele: (242) 332-3178 or (242) 557-7006 (cell)
- Police tele: (242) 333-2111;
- Fire-brigade;
- Air Ambulance;
- Other relevant local authorities; and
- Sub-Contractor's staff;

The Project Manager is to ensure that employees on the project are aware of the emergency telephone numbers, addresses, and response procedures. Furthermore he ensures, either via the local agent or direct, that BEST Commission and the local authorities are made aware of the existence of the project. **ALL** spills are to be reported to the BEST Commission.



- 1) Check
  - a. type of spillage (fluid / solid)
  - b. estimate quantity
  - c. spillage continues (If Yes lake action to stop it/If No proceed)
  - d. source of spillage
  - e. danger of explosion (If Yes ask for assistance / If No proceed)
  - f. danger of fire (if Yesask for assistance / if No proceed)
- 2) Ask for assistance
  - a. when possible start spillage recovery
- 3) Inform Project Manager, Project Environmental Manager

Superintendent/Foreman
Minor spillage: can be treated with available spillage recovery set
Major spillage: assistance is required

#### MINOR SPILLAGE

Superintendent or Foreman:

- 1. To stop and I or take over activities
  - 2. To start spillage recovery

#### Superintendent or Foreman:

Log on daily report

- a. type of spillage
- b. estimated quantity
- C. reason of recovery
- d. cause of spillage
- e. measures (to be) taken to avoid reoccurrence
- 1. Inform Project Manager within 24hrs (Should be address immediately and remediation within 12hrs)

#### **MAJOR SPILLAGE**

Superintendent or Foreman:

- 1. Check Location-immediately
  - a. Ensure safety
- 2. Check Spillage-immediately
  - a. type of spillage
  - b. estimated quantity
  - c. spillage continues
  - d. source of spillage
- 3. Instruct personnel-immediately
  - a. Tostopand/ortakeoveractivities
  - b. Tostart spillage recovery
- 4. Inform Project manager, Environmental Managerwithin 1hr
- 5. Tactic Meeting with key personnel

Project Manager or Project Environmental Manager:

- 1. Immediately determine what kind of assistance is required
- 2. Inform ENGINEER within 1hr of notification
- $\textbf{3.} \ \ \mathsf{ENGINEER} \ \mathsf{to} \ \mathsf{inform} \ \mathsf{Employer} \ \textbf{within} \ \textbf{1} \ \mathsf{hr} \ \mathsf{of} \ \mathsf{notification}$
- 4. Request assistance from 3rd Parties within 1 hr
- **5.** Inform DEHS & BEST Commission-verbally in 1hr, written within 48hrs

#### **EMERGENCY RESPONSE EQUIPMENT**

In the unlikely eventuality there is a spill, on the site there will be Environmental Emergency Response kits.

These spill kits will consist of the following listed materials (or similar) (See Appendix 1: Spill Kit Specifications):

- Absorption pads (43 x 48 cm)
- Absorption rolls (96 cm x 40 m)
- Spill drum for contaminated materials
- Absorption socks (7.6 cm x 1.2 m)
- Sack of absorption grit
- Plastic foil

Once an eventual spill has been cleaned-up all contaminated materials will be packed in plastic sacks and / or foil and placed in the disposal drum. This drum will be transported to an eventual waste recycling / treatment location.

#### **EMERGENCY PREPAREDNESS**

The Contractor is anticipating preparation in general for the following scenarios:

- Serious personal injury/fatality;
- Road traffic accident;
- Fire or explosion;
- Spillage;
- Severe weather conditions (Hurricanes, Tropical Storms, Tornadoes);
- Evacuation of work site; and
- Damage to Third party Property.

Priority for action of each scenario is as follows:

- 1. Saving lives and people safety;
- 2. Avoid or limiting environmental damage;
- 3. Control of situation;

- 4. Establishing site safety; and
- 5. Salvage and repair.

#### SPILL REPORTING PROTOCOL

Step 1: All personnel on the work site and assigned to the project will be responsible for implementation with the Project Manager and Project Environmental Manager providing coordination of efforts. A report will be generated by the Contractor, and disseminated to relevant parties including BEST Commission.

#### **Emergency Contacts:**

Sanjeev Gupta (Contractor) Project Manager sa.gupta@isdbahamas.com (242) 424-8123

Janeen Bullard (Contractor) Environmental Manager jmbullard2109@gmail.com (242) 357-9262

Rochelle Newbold Director BEST Commission (242) 322-4546

Jolton Johnson (In case of Emergency and major marine spills) Sr. Deputy Administrator Eleuthera Administrator's Office (242) 333-2275

Step 2: When contact is made with the above individuals, report the following information:

- 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 Harbour Island Marina and Resort Manager, the

reporter will communicate the above information to him/her as soon as possible. From that point forward, the Project Engineer will coordinate all further activities in response to spill control.

#### 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 storm water 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.

Clean-up 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 clean-up of spills at Harbour Island Marina and Resort. Disposal of the pollutant and/or pollutant contaminated material will be in a manner and location as approved by DEHS.

#### Appendix 1: Spill Kit Specifications

#### SpillTech RSPKHZ-55 HazMat 55-Gallon Kit Refill



Availability: Usually ships in 2 to 5 days

Item #: T9AB2094051

Price: \$202.95

#### **Product Information**

#### SpillTech RSPKHZ-55 HazMat 55-Gallon Kit Refill

Kit Includes: 130 Pieces

- 100 15" x 19" Pads
- 10 3" x 4' Socks
- 5 18" x 18" Pillows
- 2 Pairs Nitrile Gloves
- 2 Pairs Safety Goggles
- 1 Emergency Guide Book
- 4 Disposal Bags & Ties
- 6 Tamper Proof Seals

#### **Product Specifications**

| LENGTH INCHES               | 24      |
|-----------------------------|---------|
| WIDTH INCHES                | 22      |
| HEIGHT INCHES               | 18.25   |
| CAPACITY/ABSORPTION GALLONS | 48.9    |
| COLOR FINISH                | Yellow  |
| CONSTRUCTION                | Various |
| GALLON KIT                  | 55      |
| LIMITED WARRANTY            | 1 Year  |

| MANUFACTURERS PART NUMBER | RSPKHZ-55         |
|---------------------------|-------------------|
| PACKAGE QUANTITY          | 1                 |
| PADS                      | 100               |
| PILLOWS                   | 5                 |
| SOCKS                     | 10                |
| KIT TYPE                  | HazMat Kit Refill |
| BRAND                     | SpillTech         |
| DESCRIPTION               | HazMat Kit Refill |
| WEIGHT LBS                | 35.89             |
|                           |                   |

#### General Sales

For product information or to place an order, please contact us at <u>sales@globalindustrial.com</u>, or 1-888-978-7759.

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## WASTE MANAGEMENT PLAN HABOUR ISLAND MARINA

#### WASTE MANAGEMENT PLAN

#### **SOLID WASTE MANAGEMENT**

Waste materials shall be removed and disposed of at the Department of Environmental Health Services Landfill.

The following practices and procedures will be applied:

- Ensure that an adequate number of appropriate waste containers are available on site.
- All spill clean-up material (i.e. used sorbent pads) will be stored in lined containment drums and disposed of at an approved facility.
- Designate a safe area for temporary waste storage with adequate containment, secure and protected from weather until removal and disposal can be arranged.
- Remove all waste materials from the site as soon as possible.
- Any portable toilet(s) that are on-site should be secured to avoid being knocked over by heavy
  winds and vandalism. They must be adequately maintained on a regular basis. Toilets must be
  located more than 100ft from the edge of the open water. They will be rented and maintained
  by a local company
- If potentially contaminated soils or waters are encountered during the work, the Contractor will contact the Environmental Manager immediately. Contaminated soils or waters must be assessed by a qualified environmental consultant and disposed of off-site at a regulated facility.
- Waste from demolition will be recycled and reused in the surrounding community and excess material will be disposed of at the Landfill. Previous material such as lumber and pilings was sorted and collected by Habour Island residents and only concrete slabs disposed of.

#### **HAZARDOUS WASTE MANAGEMENT**

All concrete work must be completed in a manner that ensures water quality standards are maintained. Runoff from uncured concrete, concrete wash water or other chemicals may be high in pH and are considered harmful to fish and aquatic life; therefore, there shall be no contact with open water through spillage, hosing off surfaces, rain, or cleaning of tools. Cement and other materials will be kept in a covered storage location to prevent the potential for mixing with water and substances being released into the environment. Any excess material shall be removed upon project completion and disposed of at DEHS Landfill. An equipment washing site will be bunded, lined to contain any concrete and chemicals and away from the water's edge. All accepted equipment washing locations must be cleaned up prior to demobilization.

## APPENDIX D: FERTILIZATION / PESTICIDE MANAGEMENT PLAN AND VECTOR CONTROL MANAGEMENT

## FERTILIZATION AND PESTICIDE MANAGEMENT PLAN

#### **Safety Policy**

Pests found on grass, trees, shrubs as a result of any landscape development or transport of native and exotic flora, can create significant problems in the natural environment. For this reason it is necessary to control such pests with a variety of pesticides, applied over a period of time. Similarly, it is important to care for the sub-surface in which all of these floras grow and thrive. In order to accomplish this there are some level of risks involved with the use of pesticides, herbicides and also fertilizers. The very chemicals pesticides that we use to remediate such pests can also create health risks to people, animals and the environment.

For this reason it is important to develop an integrated fertilizer and pesticide management plan to minimize such risks. In order to do this, horticulture professionals will have to manage the use application and use of such chemicals in order to adopt the Industry Best Management Practices for controlling undesirable pests and associated conditions. These measures will have to be adopted at all time to ensure safety and promote a controlled management approach for dealing with pests and the adverse impacts as a result of their infestation.

#### **Pest Management**

Pests can be a combination of living organisms, that can interfere with human, plants and the physical environment. They can be populated on a seasonal by various environmental factors such as wind, poor landscape maintenance, or seasonal diseases that can spread from region to region. In the most extreme cases species of plants and even ground covers can be totally wiped out if these conditions are not controlled

#### **Environmental Manager**

1. The Environmental Manager shall ensure that an effective and routine integrated pest control and fertilization program is implemented and carried out. The EM will ensure that any contractor involved in the execution of the integrated pest control program adheres to all safety, and Best management Practices at all times. The EM will also ensure that proper records are kept, and proper communication is promoted to alert all concerned parties prior to the scheduling and use of any chemicals, of fertilization of surface and sub-surface areas.

.

#### **Integrated Pest Management Procedures**

The procedures implemented will determine when to control pests, and whether to use mechanical, physical, chemical, cultural, or biological means. Prior to the application of any pest control measures a scouter or designated trained person will conducted inspections and gather information, on areas to be treated, and the level or degree of treatment needed. Using this approach allows specific areas to be identified, and to determine the level of application based on the level of infestation.

It will be the policy of the facility under the guidance of the EM to determine the type of chemical to be used, the quantity and the frequency be it monthly quarterly or bi-annually. Similarly, Best Management Practices must be used for the application of any fertilizers, and the time of application. Proper measures must be taken so as to avoid any run-off from fertilizers residuals, that can impact water streams and low lying areas that may affect animals or pet consumption. Through well informed media weather reports make planning more effective, so that such application are administered a few days prior to any inclement weather.

#### BEST MANAGEMEN PRACTICES FOR AN INTEGRATED FERTILIZATION AND PESTICIDE MANAGEMENT PLAN:

- 1. Integrated Pest Management programs are designed prevent pest problems whenever possible. This is done through monitoring, regular inspections, high standards of sanitation and pest proofing measures, or modification of environmental conditions leading to pest problems.
- 2. 4M Harbour and Marina will establish pest tolerance thresholds for common pests. These thresholds will serve as an indicator for pest population levels and the point at which control measures will be undertaken. Control measures will not be undertaken if pest damage or populations are below threshold levels. Threshold values will vary for each organism (e.g., the threshold may be higher for crickets than for venomous insects). Thresholds will not be set based on aesthetic criteria alone.
- 3. When pests do exceed tolerance thresholds, non-chemical pest control measures (e.g., sanitation, screening, physical barriers, vacuuming, mulching, irrigation, fertilization, manual weeding, insect nest removal, pest-resistant plant selection) will be practiced.
- 4. Pesticides will be used when appropriate, along with other management practices or when other pest prevention and non-chemical control measures have failed to reduce pests below tolerance thresholds. Cost or staffing considerations alone will not be adequate justification for the use of chemical control agents. When a pesticide must be used, the smallest amount of the reduced-risk product that will meet pest management goals will be used.
- 5. Pesticide Applications. The EM in conjunction with the 4M Management Office must approve pesticide applications in advance; antimicrobial agents and insecticide and rodenticide baits, because they pose less risk to human health, are exempt from approval Pesticide Applications.
- 6. Pesticide Use and Selection. To ensure the safety of students and staff, the management will use the following criteria to ensure that the least hazardous pesticide and/or the least hazardous method of control be utilized:
  - a. No use of any pesticide classified as highly acutely toxic. This includes Hazard Category I and II, signal words DANGER and WARNING.
  - b. listed as neuro) A pesticide will not be used if the facility does not have information on its ingredients, including inert ingredients.

Source:

 $http://www.brandon.ca/images/pdf/Parks/Integrated\%20Pest\%20Management\%20Plan. \\pdf$ 

#### **Record Keeping**

Records of pesticide use shall be maintained on site to meet the requirements of the state regulatory agency and Facilities Management policy. Records must be current and accurate. These records shall be made available upon request to school staff and the general public during normal operating hours, and shall be kept for at least three years.

#### Facility Management will keep records of the following:

- 1. Current list of pesticides used, pesticide Material Safety Data Sheets (MSDSs), pesticide product labels, and available manufacturer information about inert ingredients;
- 2. Records of all pest control actions (location, purpose, and complete information on the pesticide as indicated in 1);
- 3. Information on the number of pests or other indicators of pest activity that can verify the need for action.

#### **Vector Control Methodology**

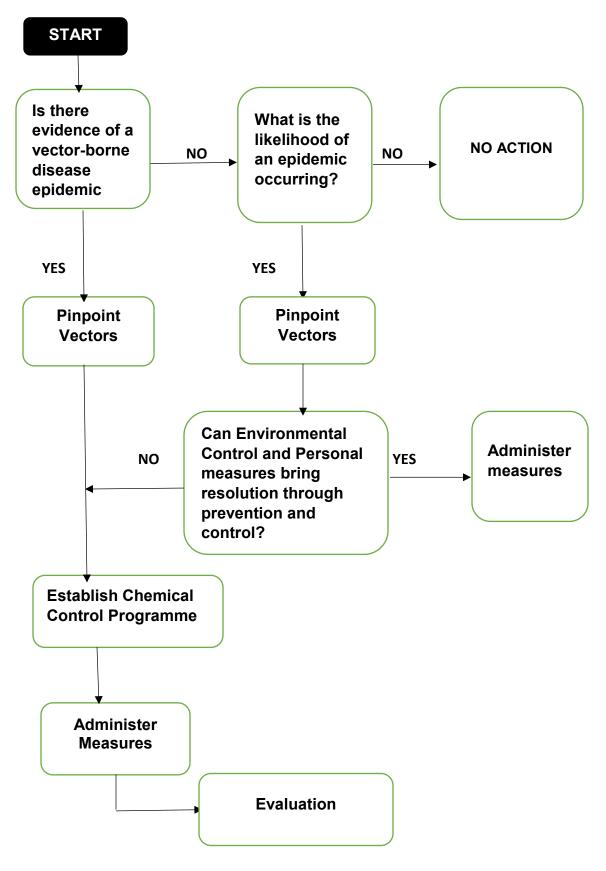
According to WHO and other health control agencies, disease vector is any living organism that transmits an infectious disease to humans (or in agriculture to animals and plants). A vector picks up the disease from an infected host or the environment then transfers it to a new host through a bite when feeding or by mechanical transmission such as defecating on the skin or from particles on the outside of the body.

The 4M Harbour Island Marina and Resort project seeks to promote Best Management Practices in environmental management by adhering to sustainable site practices which are environmentally sensitive towards waste management, nursery operations and pest management. The project will be utilizing a variety of resources and technologies where environmental management will be evaluated and documented. The implementation of Environmental Management plans will be the responsibility of the on-site project manager. The EMP has set up the procedures, regulations, policies and will monitor to confirm adherence, offer insights and corrective actions if required.

| HARBOUR ISLAND MARINA AND RESORT PEST CONTROL             |   |        |     |                    |  |  |  |  |
|---|---|--------|-----|--------------------|--|--|--|--|
| CONSTRUCTION STATUS REPORT TABLE                          |   |        |     |                    |  |  |  |  |
| DATE:   |   | STAFF: |     |                    |  |  |  |  |
| PEST CONTROL  | Υ | N      | GPS | FIGURE AND CAPTION |  |  |  |  |
| 1. Adherence to the Integrated Pest Management plan?      |   |        |     |                    |  |  |  |  |
| 2. Application schedule and quantities being followed?    |   |        |     |                    |  |  |  |  |
| 3. Proper chemical usage?                                 |   |        |     |                    |  |  |  |  |
| 4. Proper waste disposal- not exacerbating pests/rodents? |   |        |     |                    |  |  |  |  |
| 5. Imported materials/vegetation checked for exotics?     |   |        |     |                    |  |  |  |  |
| 6. Lob lac scale (insect, See annotation below) found?    |   |        |     |                    |  |  |  |  |
| STATUS REPORT   |   |        |     | •                  |  |  |  |  |
| CURRENT STATUS REPORT                                     |   |        |     |                    |  |  |  |  |
| ISSUES TO FOLLOW UP ON                                    |   |        |     |                    |  |  |  |  |

#### **Implementation of Vector Control Programme**

#### **Data flow Diagram**



#### **Process For Implementation**

Limited to non-existence of maintenance of sanitary facilities after a natural disaster, conflicts or by the environment of makeshift homes in emergency situations create favorable conditions for the propagation of insects and rats.

Epidemics can occur in cases related to the transmission of vector-borne diseases to an effected population. Long-term control of vectors and diseases transmission are aided appropriately by environmental control measures combined with facilities for personal hygiene.

In the case of an active epidemic or about to occur, control measures are not appropriate enough for the needs of emergency short term action.

Obtaining a rapid and maximum control of vectors should be the essential approach in facing the threat of an epidemic.

The supplementation of long-term control measures and prevention of epidemic disease outbreaks maybe require a chemical measure.

Depending on upon which vectors need to be targeted, a chemical control measure programme is still the most appropriate and suitable, although chemical control measures should supplement any sanitary measures, in the case of an epidemic.

Relying only on Health statistics from the decision to implement vector control programme should not be the basis; such can be the case of a field/site supervisor awaiting for health statistics to indicate an epidemic situation, where the seriousness and urgency may have reached its peak and passed by the time the epidemic response activities have been initiated.

#### **MEASURES FOR MOSQUITO CONTROL**

#### Mosquito vector control methods

The aim of vector control is to interrupt or eliminate local transmission of diseases, reduce vulnerability to disease, and prevent secondary infections from introduced diseases so they do not create further outbreaks. It requires a very strong integrated management approach, along with the right technical personnel and equipment. For diseases such as malaria vector control methods can be very challenging, since each species of insect have their own distinct bionomics.

#### **Integrated vector management**

The WHO recommends an Integrated vector management (IVM) is a new approach to the control of <u>vector-borne diseases</u> that uses a rational decision-making process to optimize the use of resources for vector control.

IVM establishes partnerships across multiple and uses a range of interventions based on local knowledge about the vectors, diseases and disease determinants and encourages collaboration with the health services, other public services and local communities

The key elements of an IVM strategy are (WHO, 2012):

- 1. Advocacy, social mobilization and legislation: promotion and embedding of IVM principles in designing policies in all relevant agencies, organizations and civil society; establishment or strengthening of regulatory and legislative controls for public health; empowerment of communities.
- 2. Collaboration with health and other sectors: consider options for collaboration with public and private sectors; strengthen channels of communication among policy makers, vector-borne disease programme managers and other partners.
- 3. Integrated approach: ensure rational use of available resources by addressing several diseases, integrating non-chemical and chemical control methods and other disease control measures.
- 4. Evidence-based decision making: adapt strategies and interventions suitable for the local ecology, epidemiology and resources, guided by operational research and routine monitoring and evaluation.
- 5. Capacity building: provide the required material, financial and human resources at national and local level for an IVM strategy.

#### **Below are Methods Used in Vector Control Management Strategies**

#### 1. Environmental management

This simply involves removing breeding opportunities for mosquitoes., such as open containers with stagnant water, and other areas where mosquitoes may find conducive for breeding and laying of larvae

#### 2. Mechanical control

This involves for malaria prevention, sleep in bed nets impregnated with insecticide (LLINs); Drilling holes in containers, tyres, etc to drain water; and removal or safe storage of scrap.

#### 3. Biological control

This method introduces agents to affect reproduction, growth and activity of vector insects or change the transmission dynamics of a disease in an environmentally safe way, including, biological larvicides: (formulations of bacteria), eg *Bacillus thuringiensis*, *Bacillus sphaericus*, as wettable powders for spraying, and granules or briquettes for manual dispersion; (Bellini et al, 2014).

#### 4. Chemical control

This method involves the application of insecticides that is done as complementary action to physical and biological control methods, and only when there is no other option. larvicidal application:

#### **REFERENCES:**

Centers for Disease Control and Prevention. A–Z Index. (link)

CDC, Division of Vector Borne Diseases. (link accessed 7 Oct 2016)

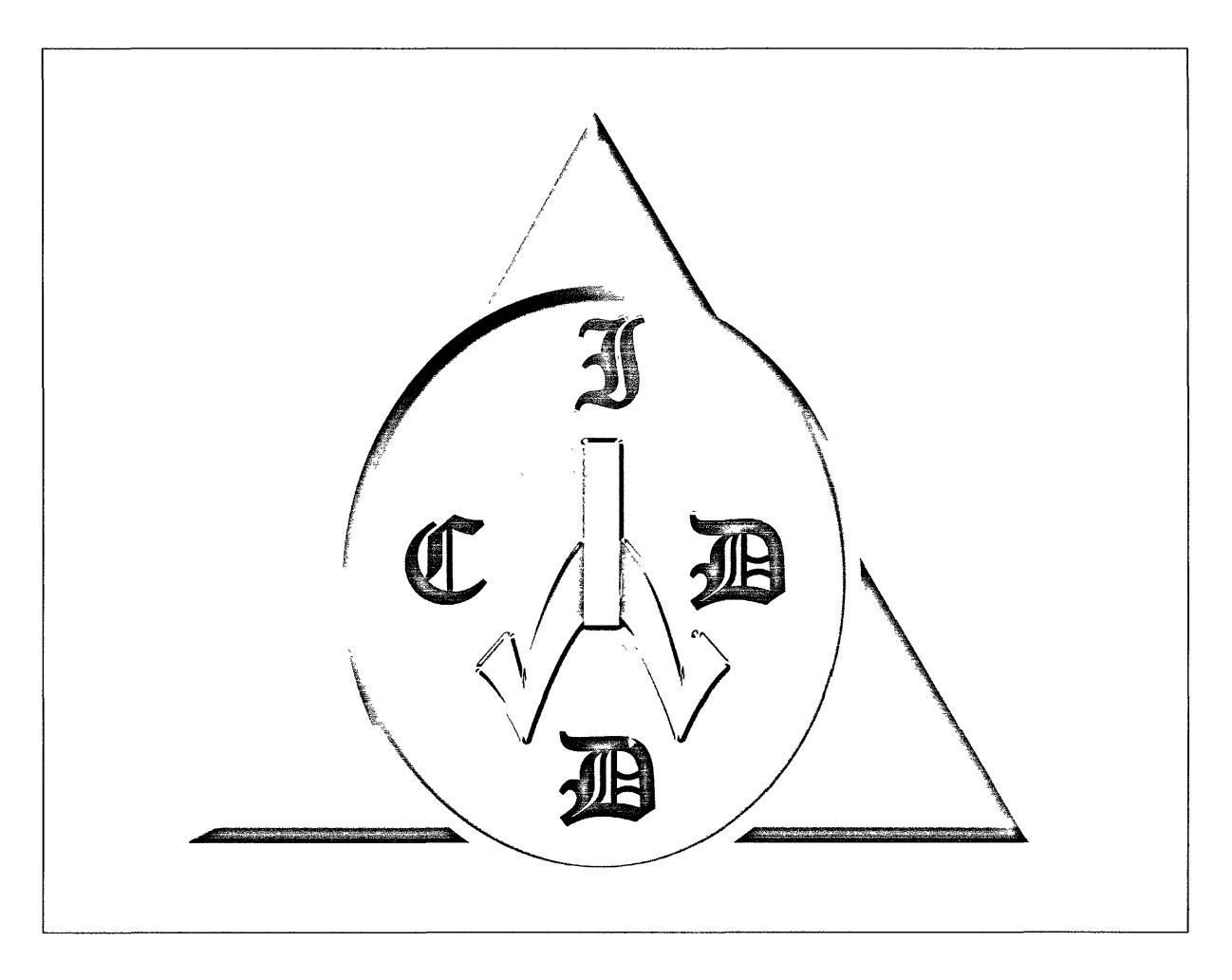
WHO. 2014. A global brief on vector-borne diseases. WHO, Geneva.

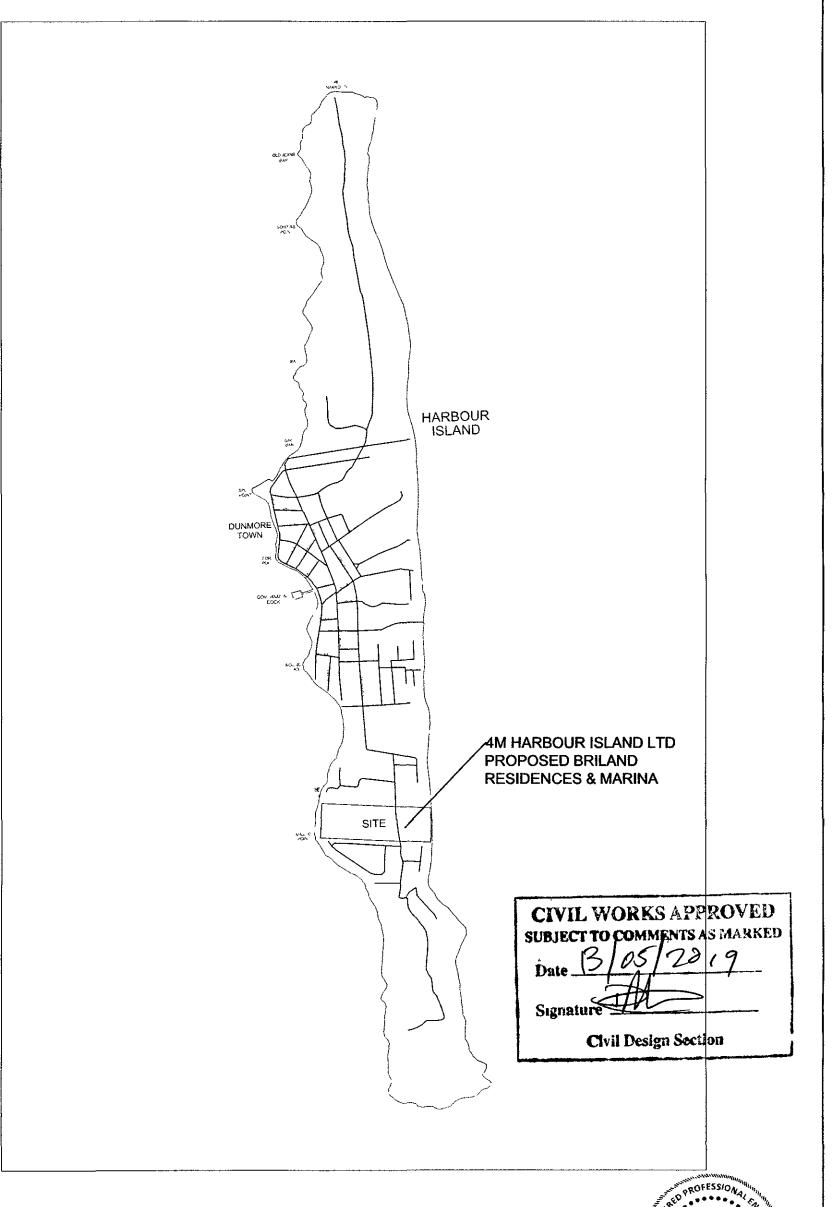
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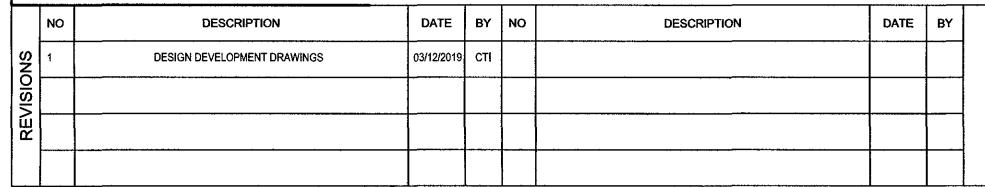
## APPENDIX E: STORMWATER, INFRASTRUCTURE, DRAINAGE AND ROADWAYS MANAGEMENT

# 4M HARBOUR ISLAND LTD PROPOSED BRILAND RESIDENCES & MARINA CIVIL ROADS & DRAINAGE SET

| CIVIL | ROADS & DRAINAGE DRAWING INDEX     |
|-------|------------------------------------|
| Α-    | 00 COVER SHEET W/LOCATION PLAN     |
| Α-    | 01 SURVEY & CONTOUR PLAN           |
| A-    | 02 ROAD LAYOUT SHEET               |
| A-    | 03 DRAINAGE PLAN                   |
| A-    | 04 PROPOSED DEMOLITION PLAN        |
| B-    | 01 ROAD PROFILES - ROAD 1          |
| B-    | 02 ROAD PROFILES - ROAD 2          |
| B-    | 03 ROAD PROFILES - ROAD 3          |
| B-    | 04 ROAD PROFILES - ROAD 4 (1 OF 2) |
| B-    | 05 ROAD PROFILES - ROAD 4 (2 OF 2) |
| B-    | 06 ROAD PROFILES - ROAD 5          |
| B-    | 07 ROAD PROFILES - ROAD 6          |
| B-    | 08 ROAD PROFILES - ROAD 7          |
| B-    | 09 ROAD PROFILES - ROAD 8          |
| B-    | 10 ROAD PROFILES - ROADS 9, 10, 11 |
| B-    | 11 ROAD PROFILES - ROAD 12         |
| B-    | 12 ROAD PROFILES - ROAD 13         |
| B-    | 13 ROAD CROSS SECTIONS             |
| B-    | 14 UTILITY SECTIONS                |
| B-    | 15 ROAD DETAIL SHEET               |









ENGINEER OF RECORD

ISLAND DIMENSIONS DEVELOPMENT COMPANY

Farrington House, Gladstone Road

P O Box EE-15036

Nassau, Bahamas

Tel# (242)-341-6318/25

Fax#. (242)-368-6312

| THE ALLE FOR      |        |
|-------------------|--------|
| MR MICHAEL WIENER |        |
| 4M HARBOUR ISLAND | LTD.   |
| HARBOUR ISLAND, B | AHAMAS |
| ·                 |        |

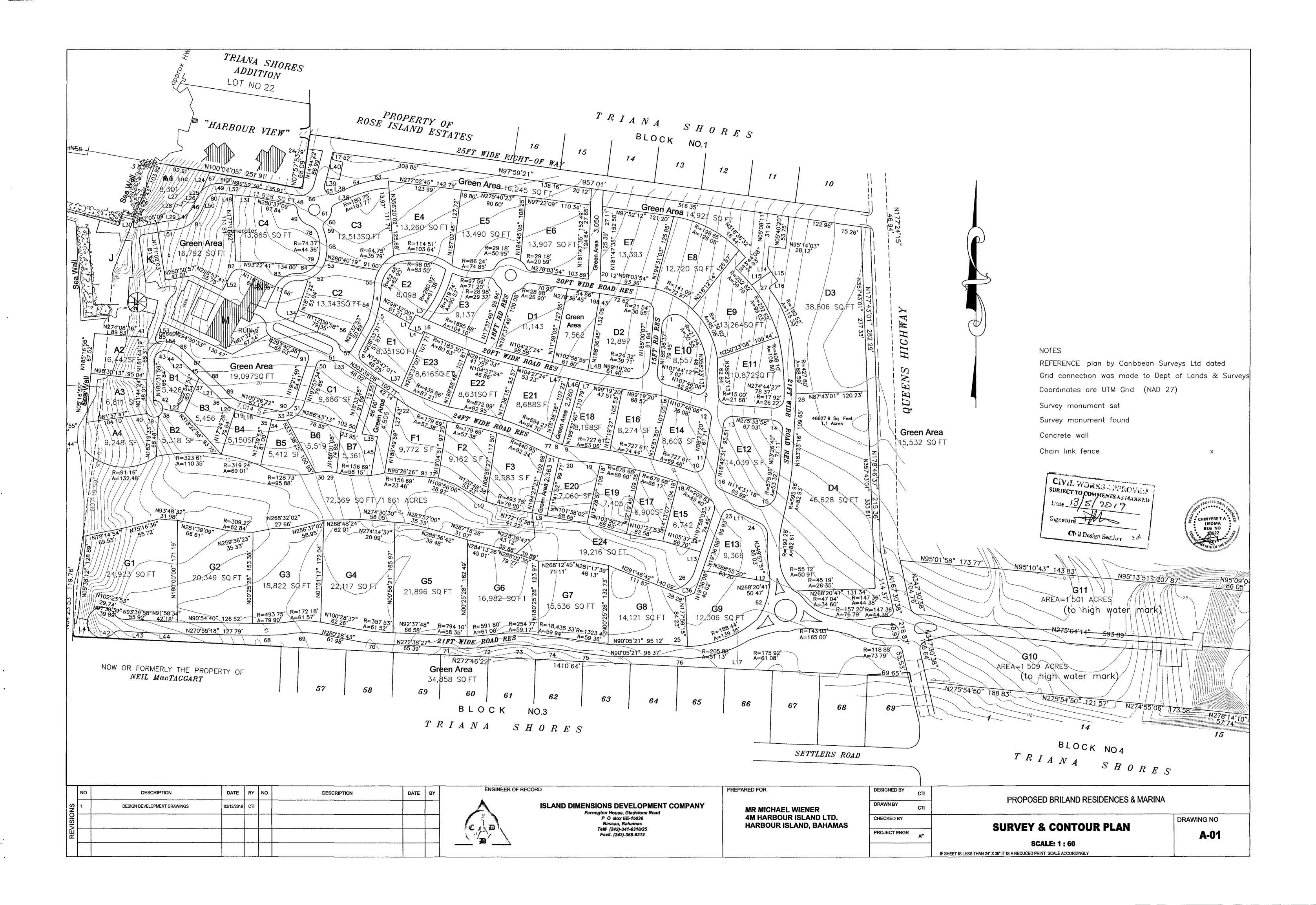
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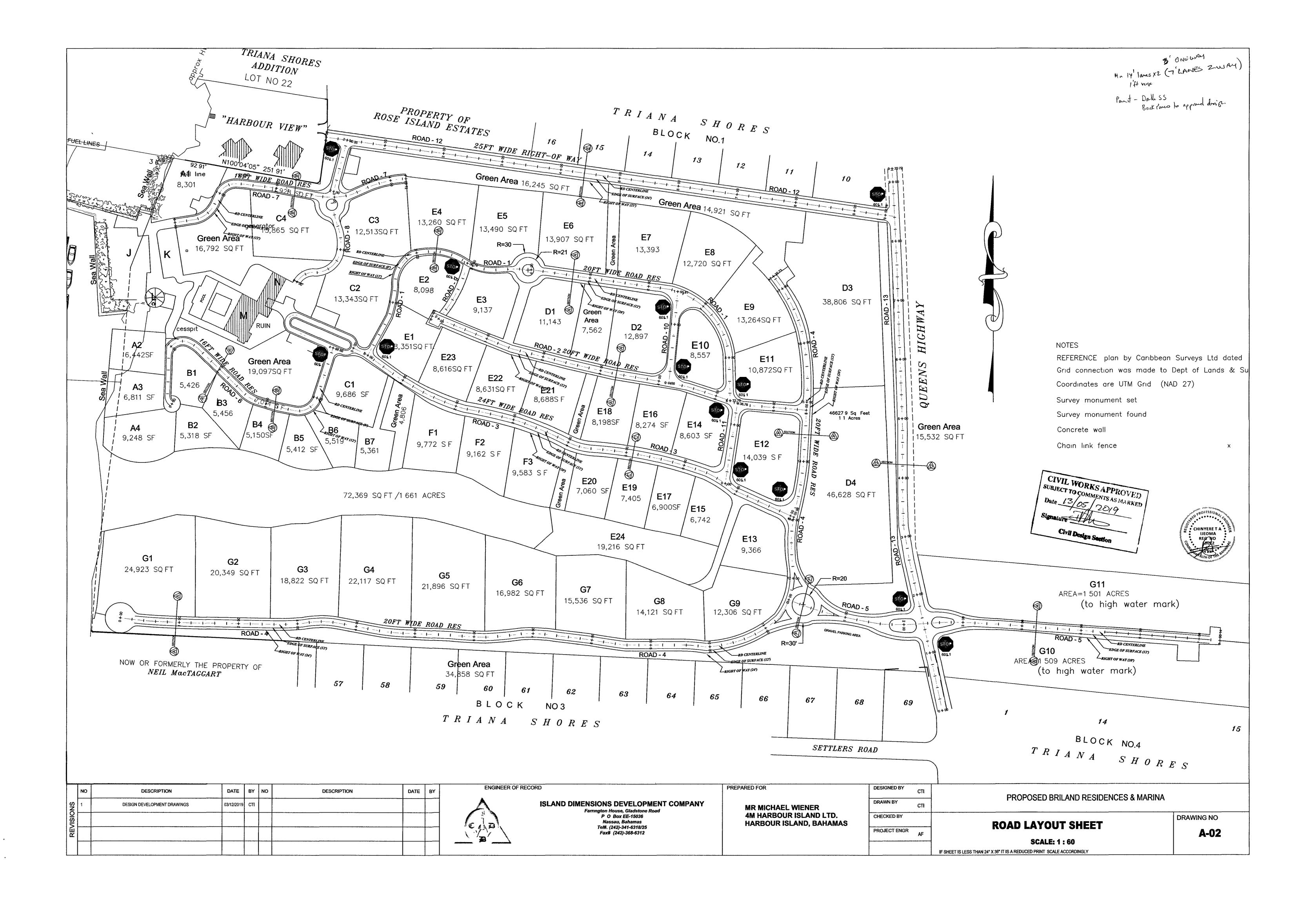
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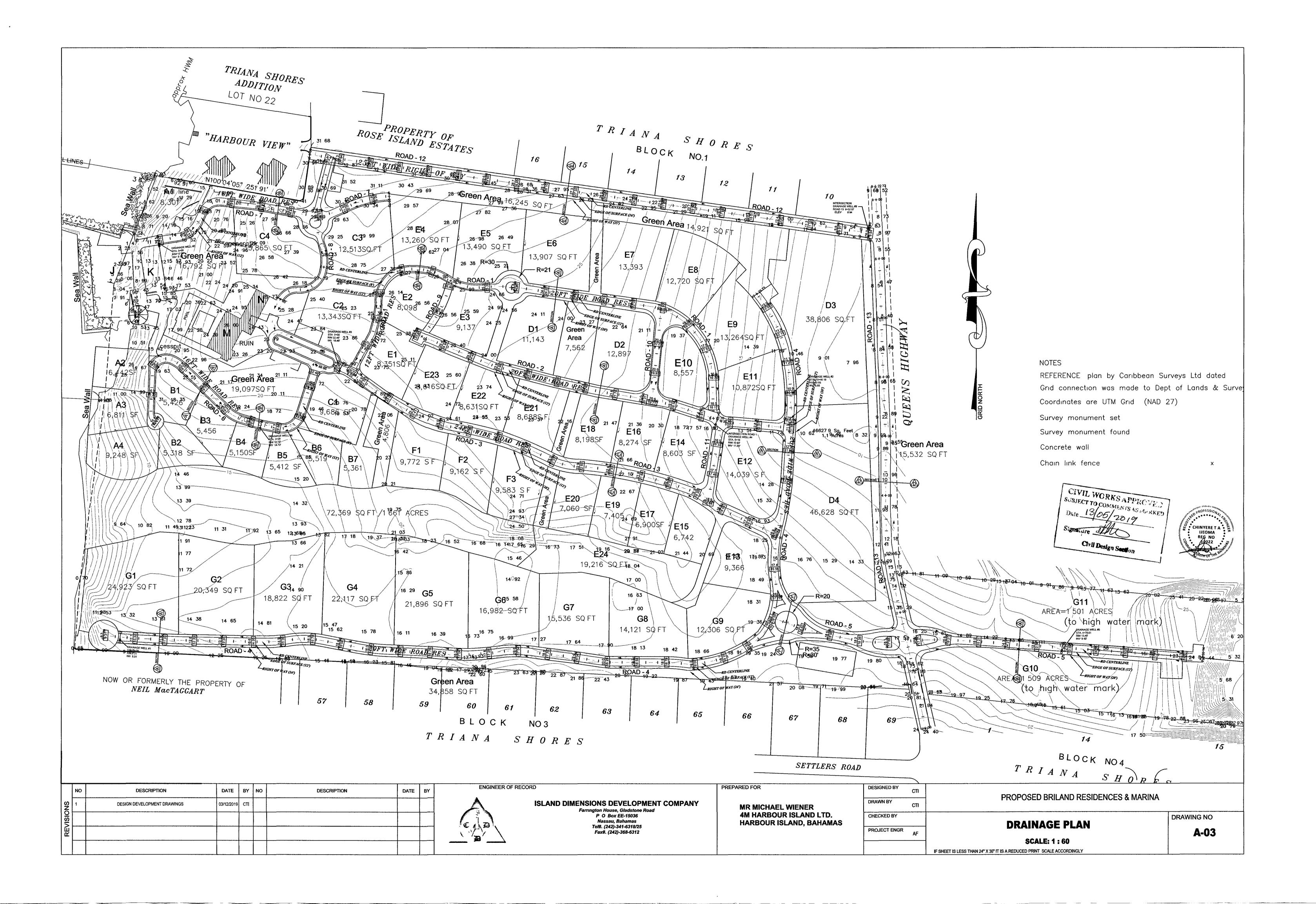
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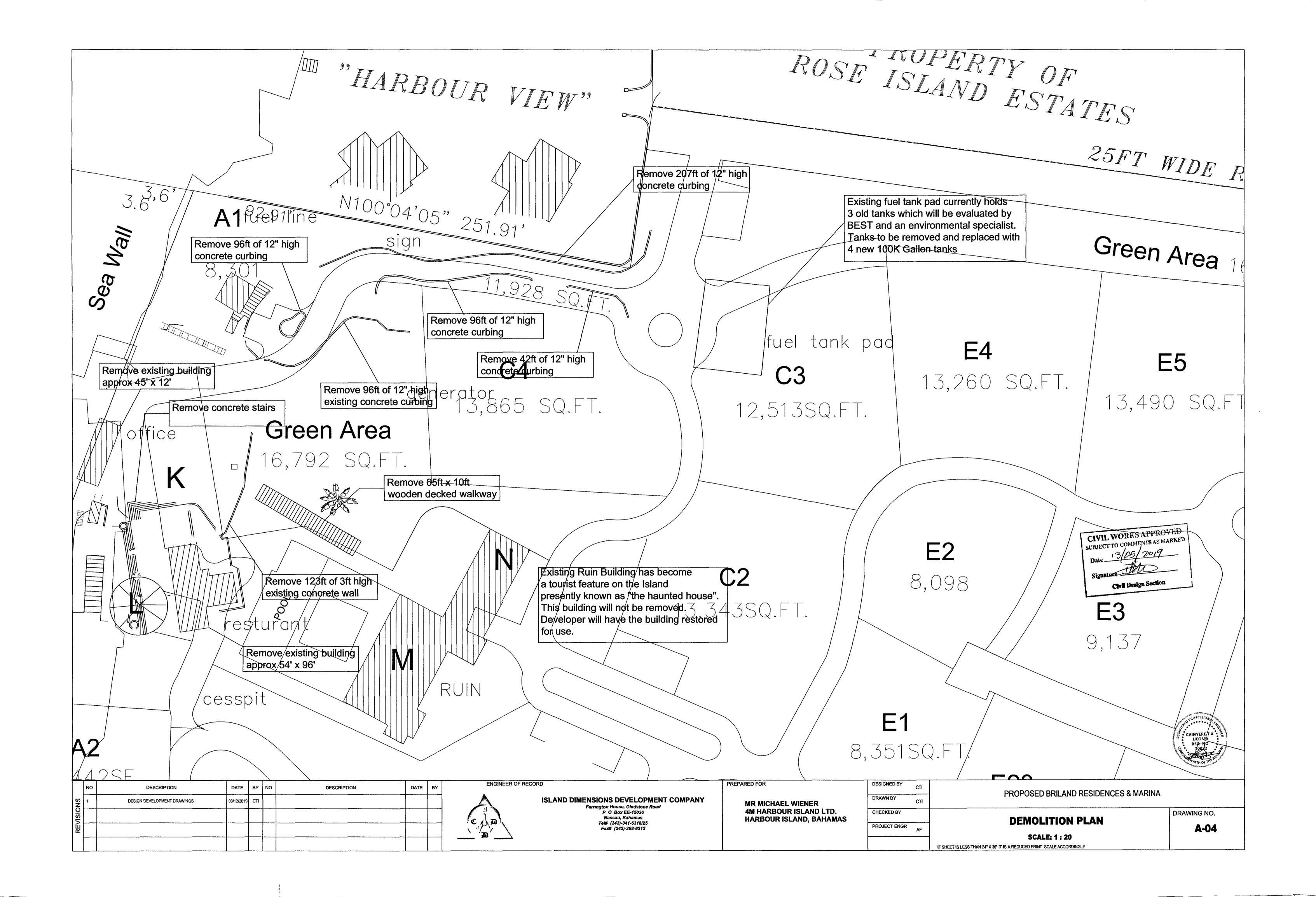
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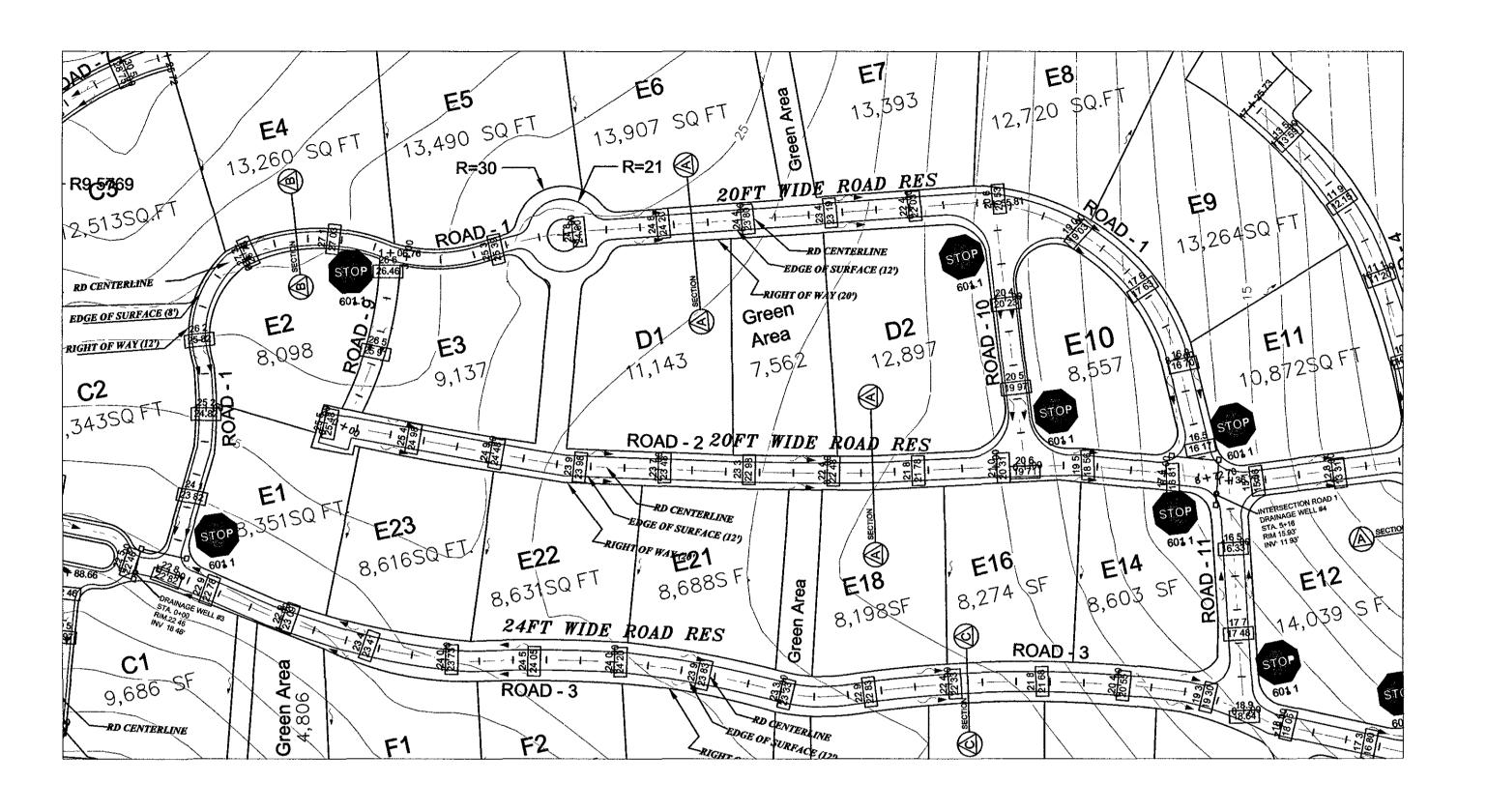
DRAWING NO

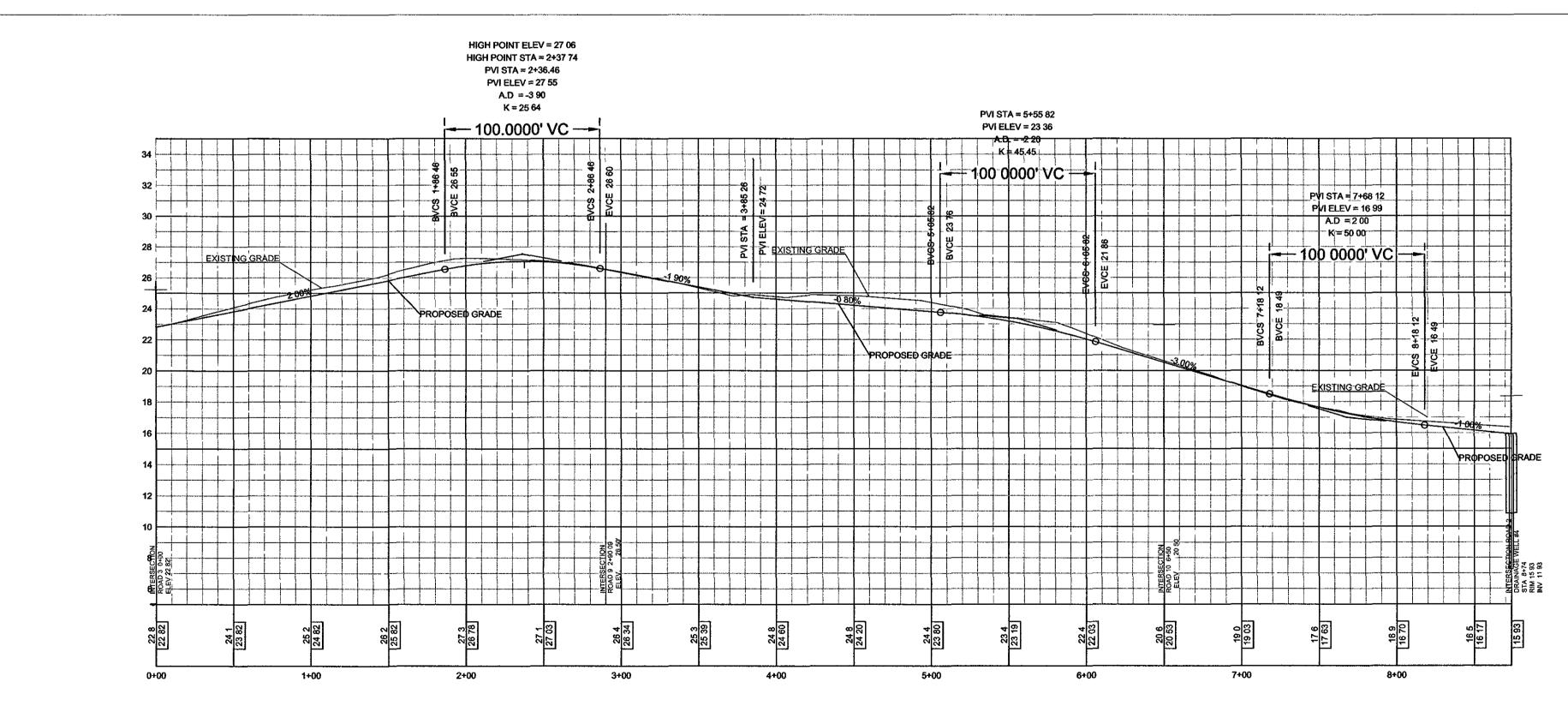












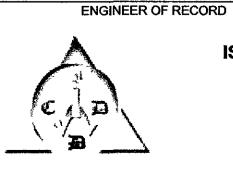




### **PROFILE - ROAD 1**

STA: 0+00 TO 8+73.97 SCALE: V-1:5 H-1:50

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| 1  | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019                    | СТІ                                      |  |  |  |  |  |
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|    | NO<br>1                     | 1 DESIGN DEVELOPMENT DRAWINGS | 1 DESIGN DEVELOPMENT DRAWINGS 03/12/2019 | 1 DESIGN DEVELOPMENT DRAWINGS 03/12/2019 CTI |



ISLAND DIMENSIONS DEVELOPMENT COMPANY

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Nassau, Bahamas

Tel# (242)-341-6318/25

Fax# (242)-368-6312

MR MICHAEL WIENER 4M HARBOUR ISLAND LTD. HARBOUR ISLAND, BAHAMAS

PREPARED FOR

| DESIGNED BY  | СТІ |  |
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| DRAWN BY     | СТІ |  |
| CHECKED BY   |     |  |
| PROJECT ENGR | AF  |  |

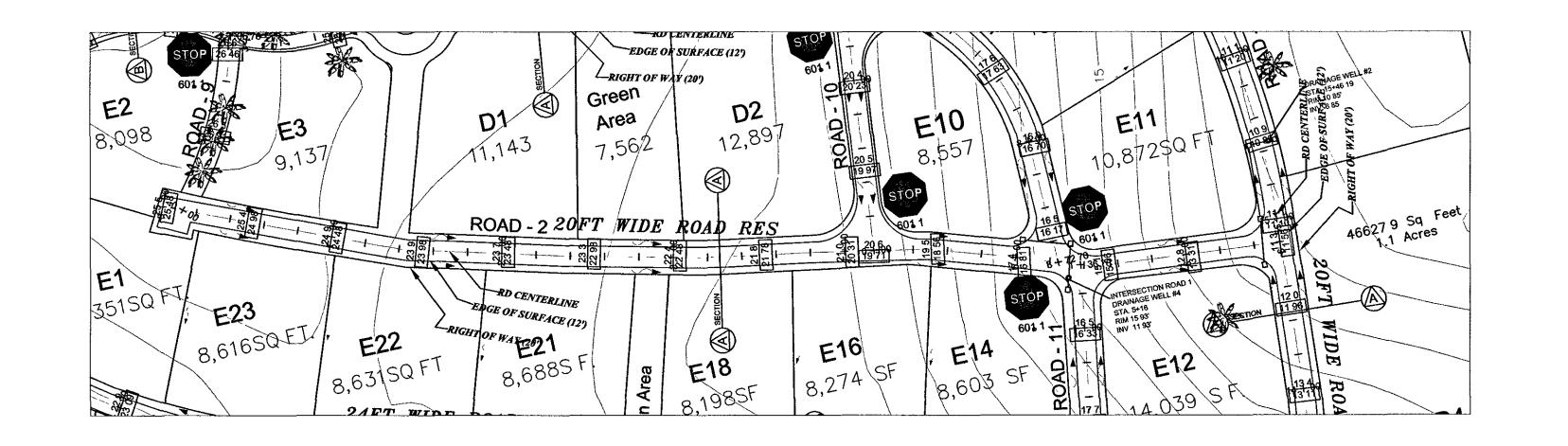
PROPOSED BRILAND RESIDENCES & MARINA

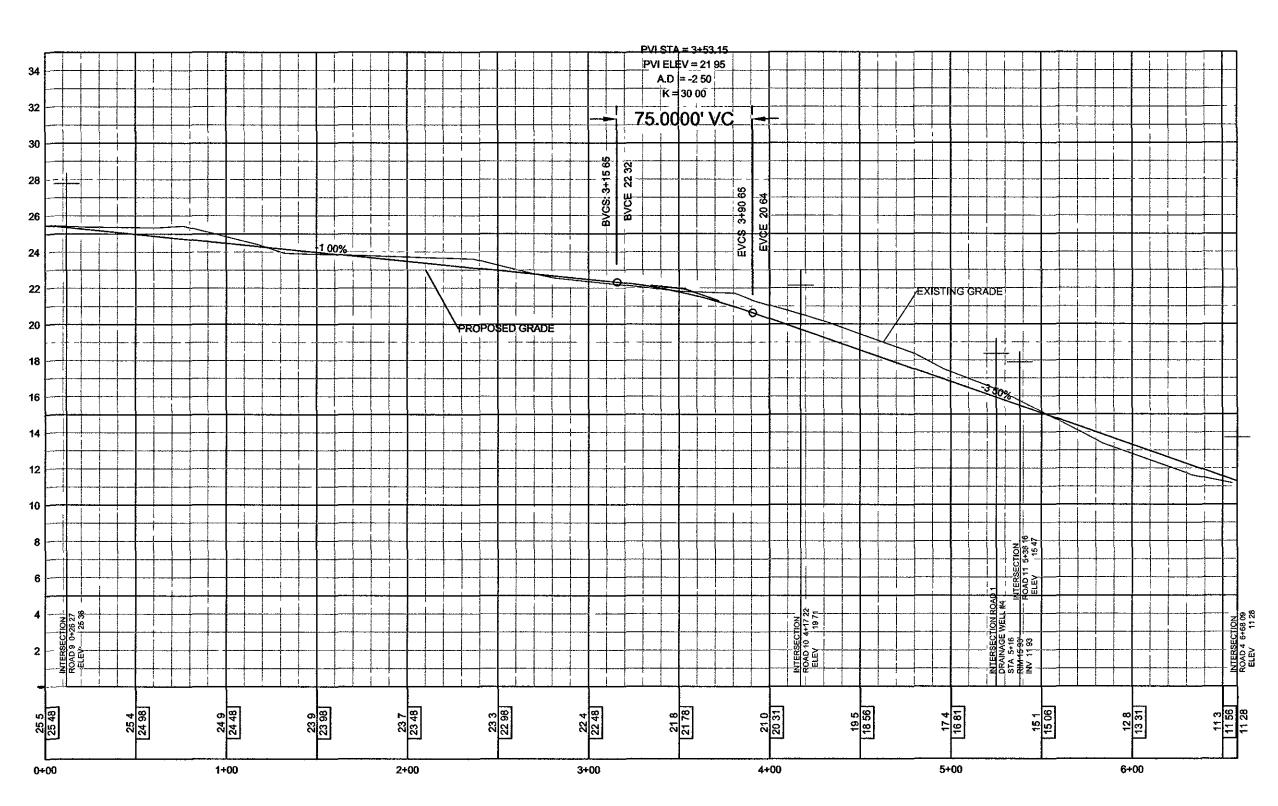
**ROAD PROFILES - ROAD 1** 

DRAWING NO **B-01** 

SCALE: 1:50

IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY





CIVIL WORKS APPROVED
SUBJECT TO COMMENTS AS MARKED

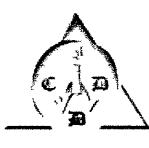
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ENGINEER OF RECORD

ISLAND DIMENSIONS DEVELOPMENT COMPANY

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PREPARED FOR

| DESIGNED BY  | CTI |
|--------------|-----|
| DRAWN BY     | СТІ |
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PROPOSED BRILAND RESIDENCES & MARINA

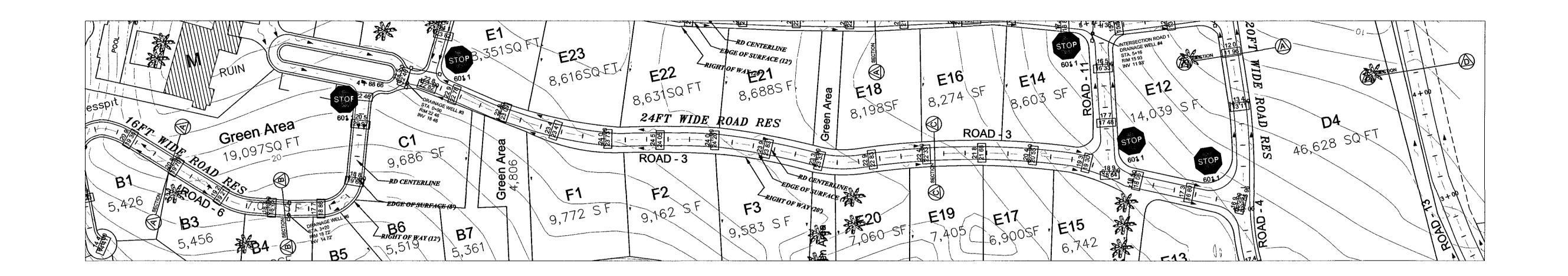
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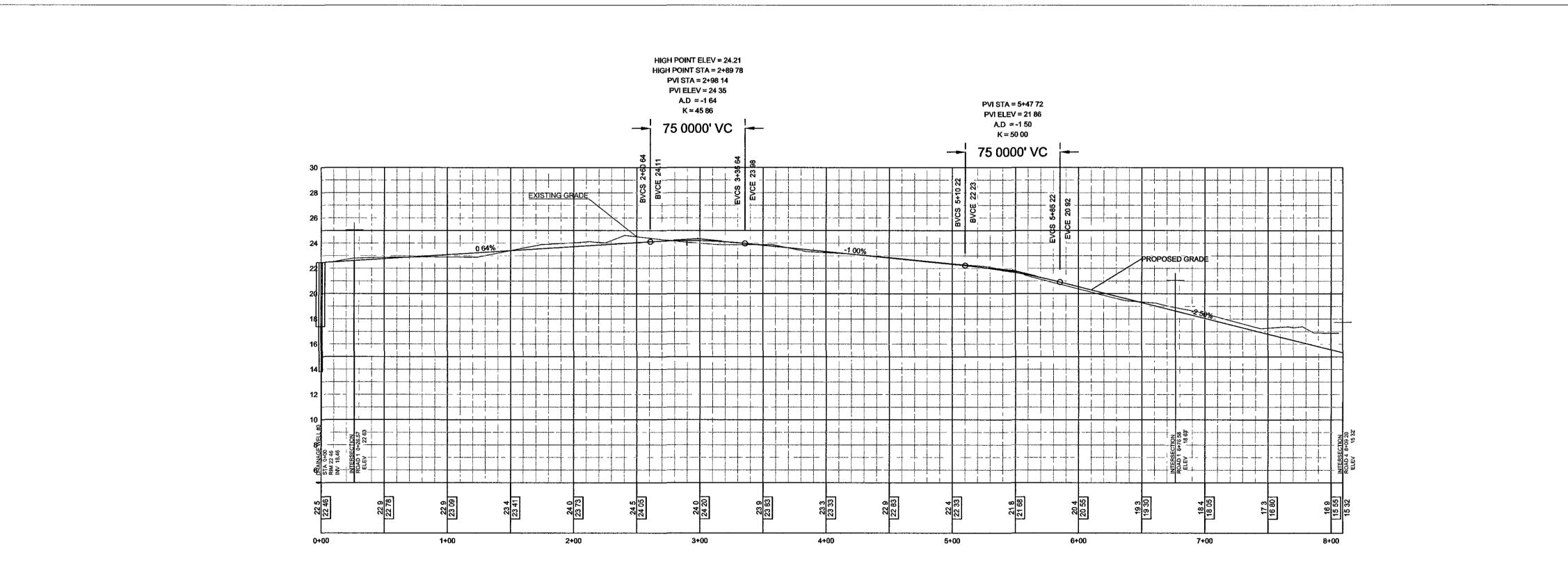
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IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY





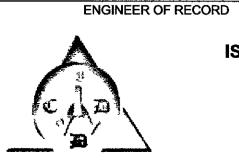
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SUBJECT TO COMMENTS AS MARKED
Date 1905/2019
Signature
Civil Design Section



PROFILE - ROAD 3

STA: 0+00 TO 8+09.20 SCALE: V-1:5 H-1:50

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ISLAND DIMENSIONS DEVELOPMENT COMPANY

Farrington House, Gladstone Road

P O Box EE-15036

Nassau, Bahamas

Tel#. (242)-341-6318/25

Fax# (242)-368-6312

| PREPARED FOR                |
|-----------------------------|
|                             |
|                             |
| MR MICHAEL WIENER           |
| 4M HARBOUR ISLAND LTD.      |
| HARBOUR ISLAND, BAHAMAS     |
| IIAINDOUN IOLAID, DAIIAIIAG |
|                             |

|              |     | _ |
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| DESIGNED BY  | СП  |   |
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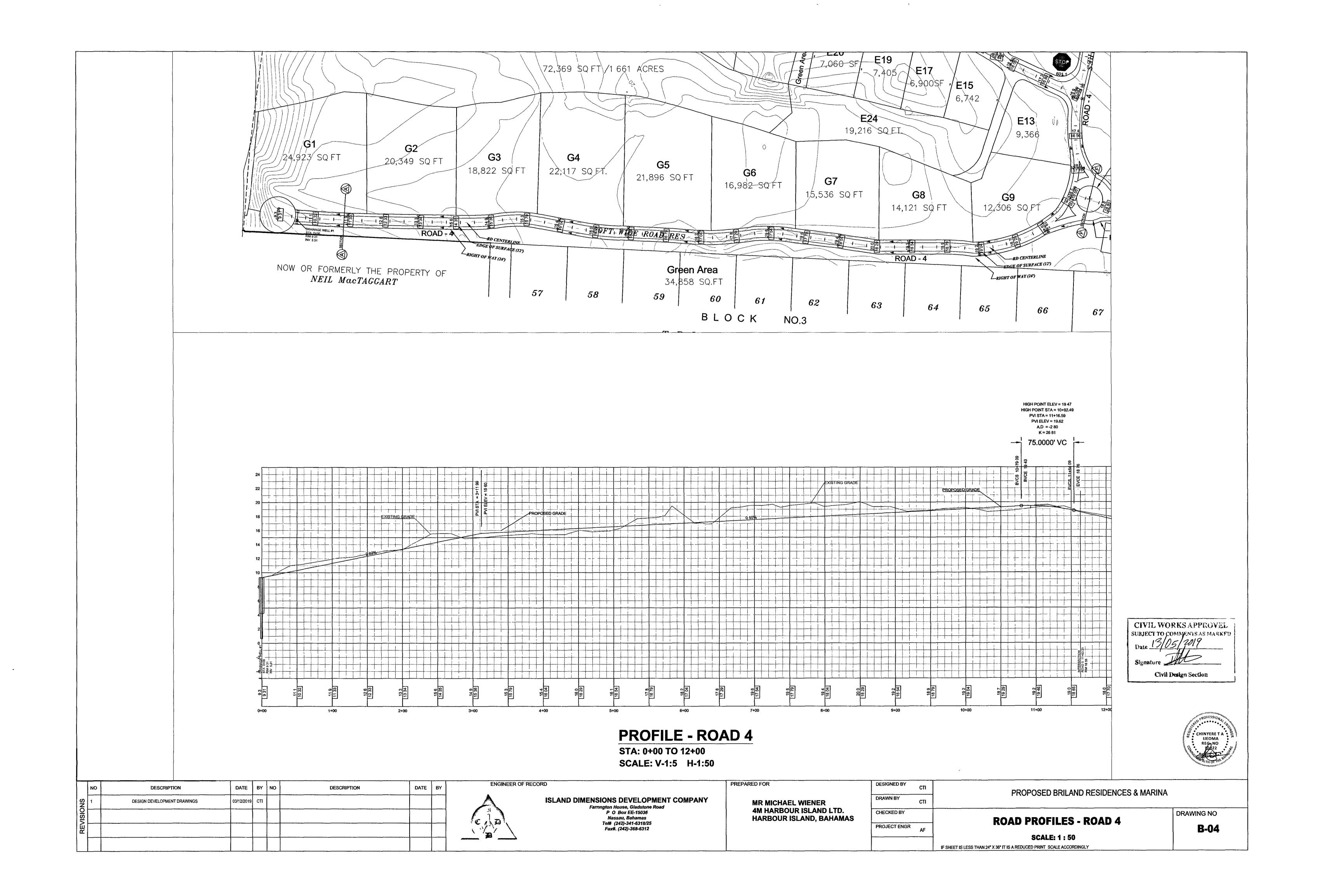
PROPOSED BRILAND RESIDENCES & MARINA

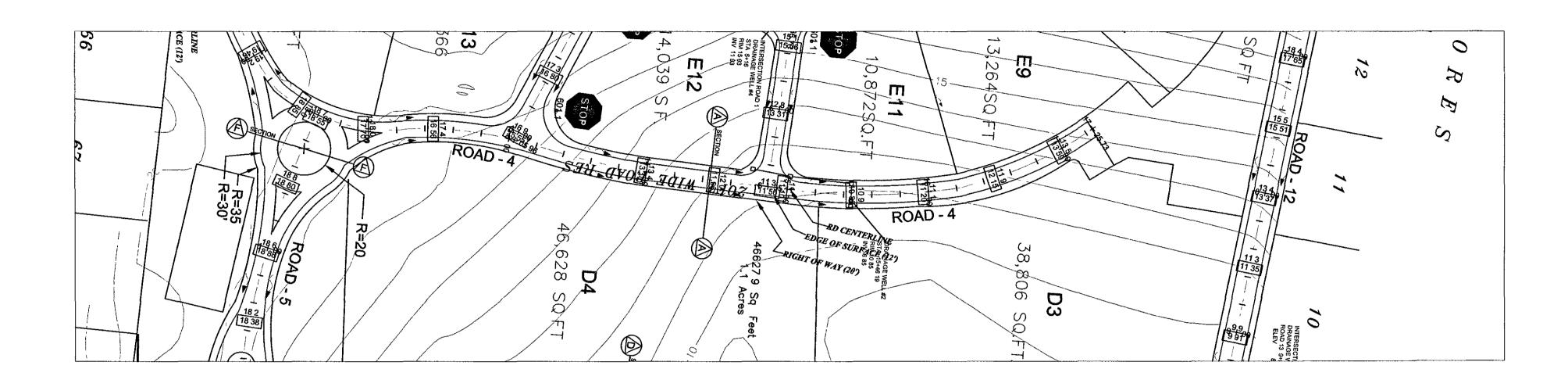
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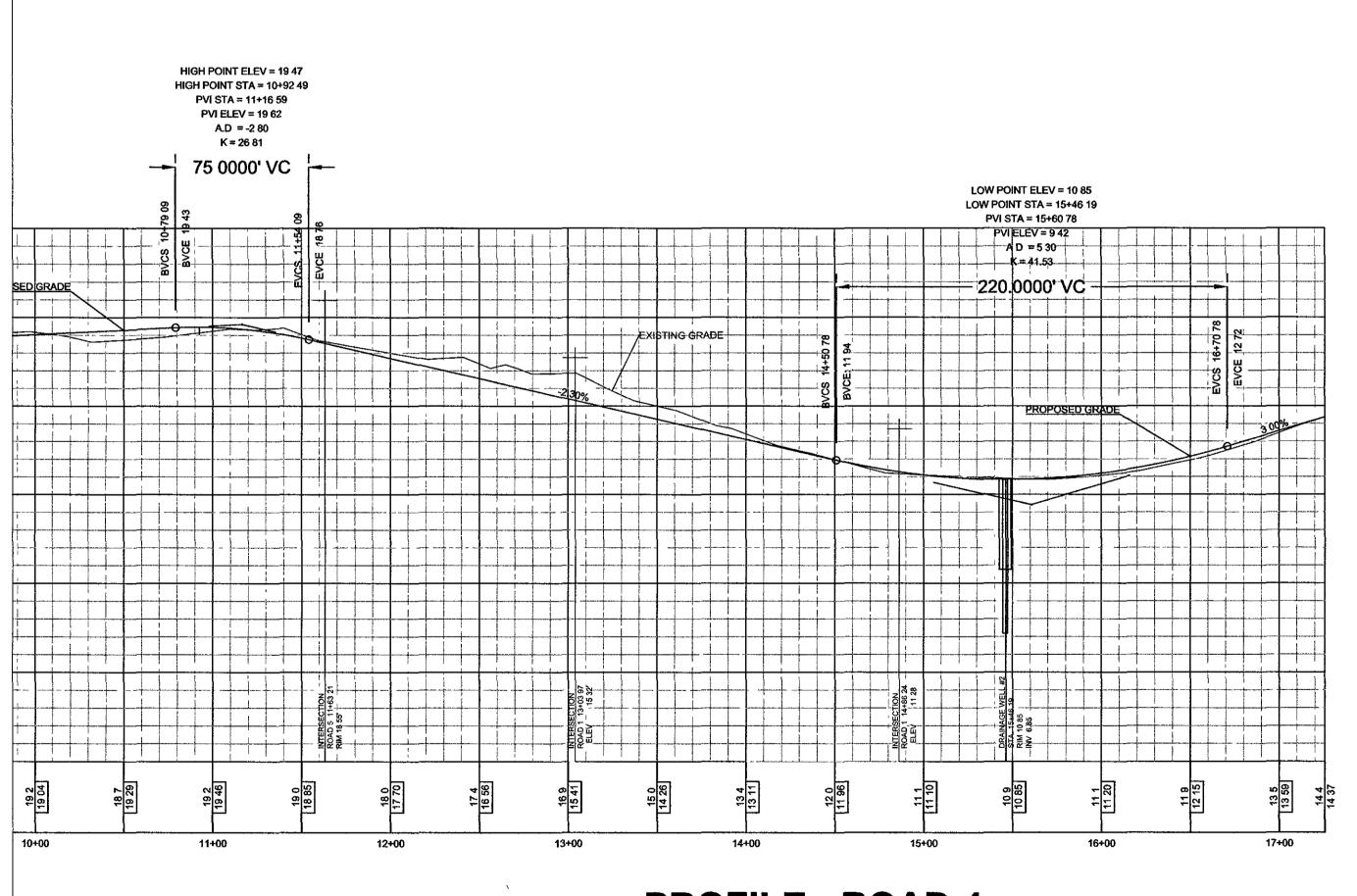
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IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY







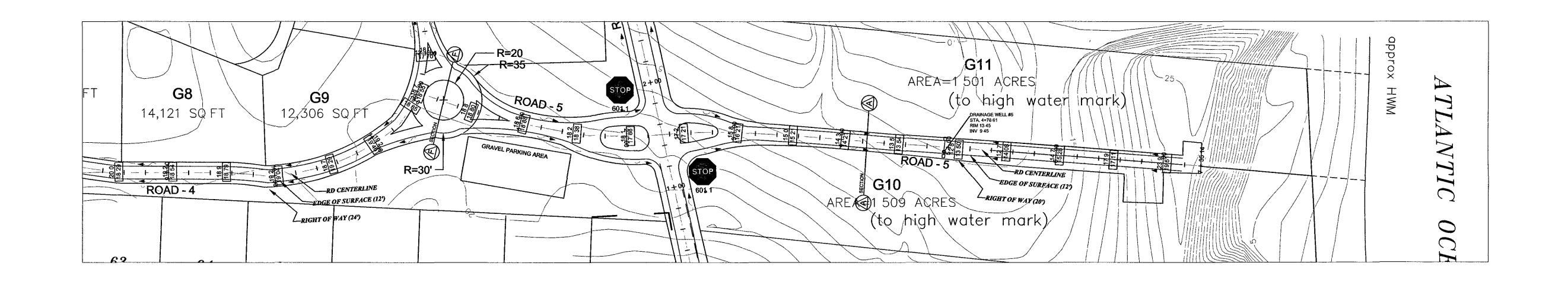
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Date 13/05/2019
Signature 10
Civil Design Section

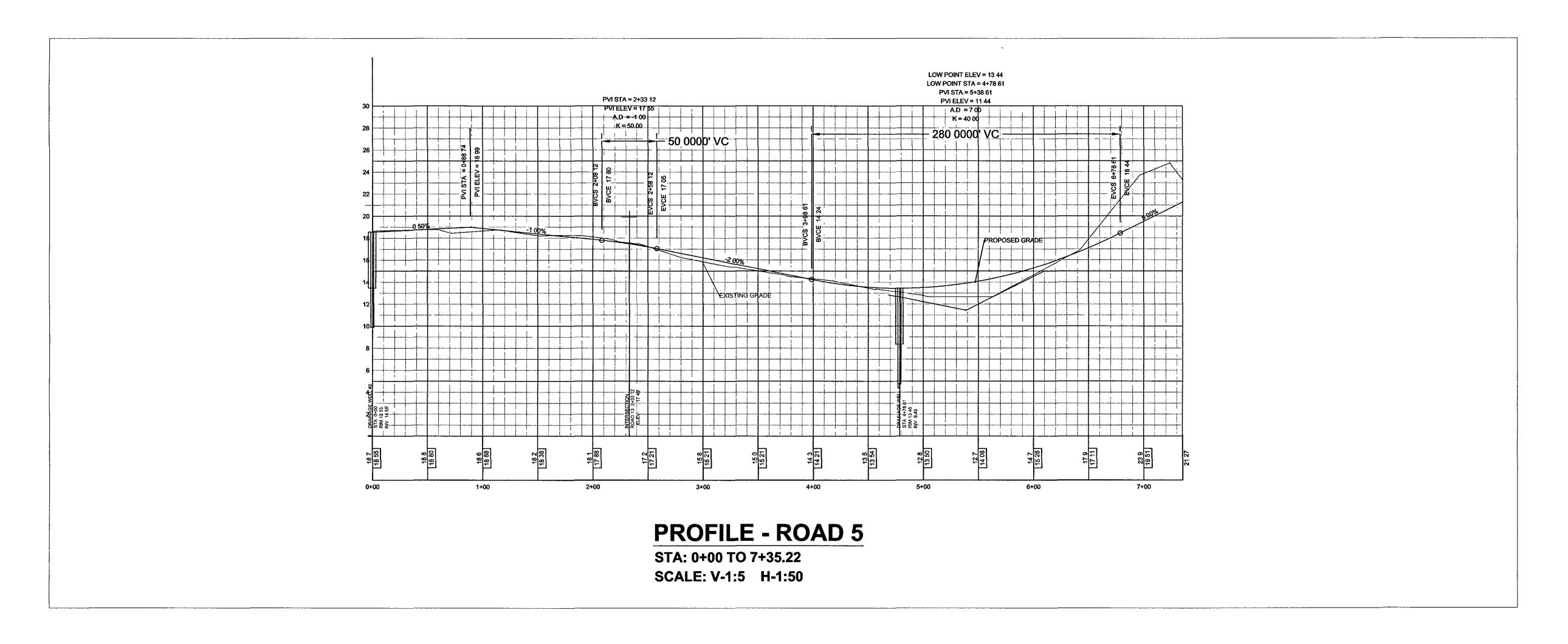


STA: 12+00 TO 17+25.73 SCALE: V-1:5 H-1:50



| NO         | DESCRIPTION                 | DATE BY NO     | DESCRIPTION                             | DATE BY | ENGINEER OF RECORD   | PREPARED FOR                                      | DESIGNED BY CTI | PROPOSED BRILAND RESIDENCES & MARINA                                    |            |
|------------|-----------------------------|----------------|---|---------|--|---|-----------------|---|------------|
| <u>8</u> 1 | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019 CTI | *************************************** |         | ISLAND DIMENSIONS DEVELOPMENT COMPANY Farrington House, Gladstone Road | MR MICHAEL WIENER                                 | DRAWN BY CTI    | THOI OOLD BILLAND RESIDENCES & WARRING                                  |            |
| OIS        |                             |                |   |         | P O Box EE-15036 Nassau Bahamas  | 4M HARBOUR ISLAND LTD.<br>HARBOUR ISLAND, BAHAMAS | CHECKED BY      |   | DRAWING NO |
|            |                             |                |   |         | Tel#. (242)-341-6318/25<br>Fax#. (242)-368-6312                        | HARDOOK ISLAND, BAHAMAS                           | PROJECT ENGR    | ROAD PROFILES - ROAD 4  | B-05       |
|            |                             |                |   |         |  |   | A               | SCALE: 1 : 50   |            |
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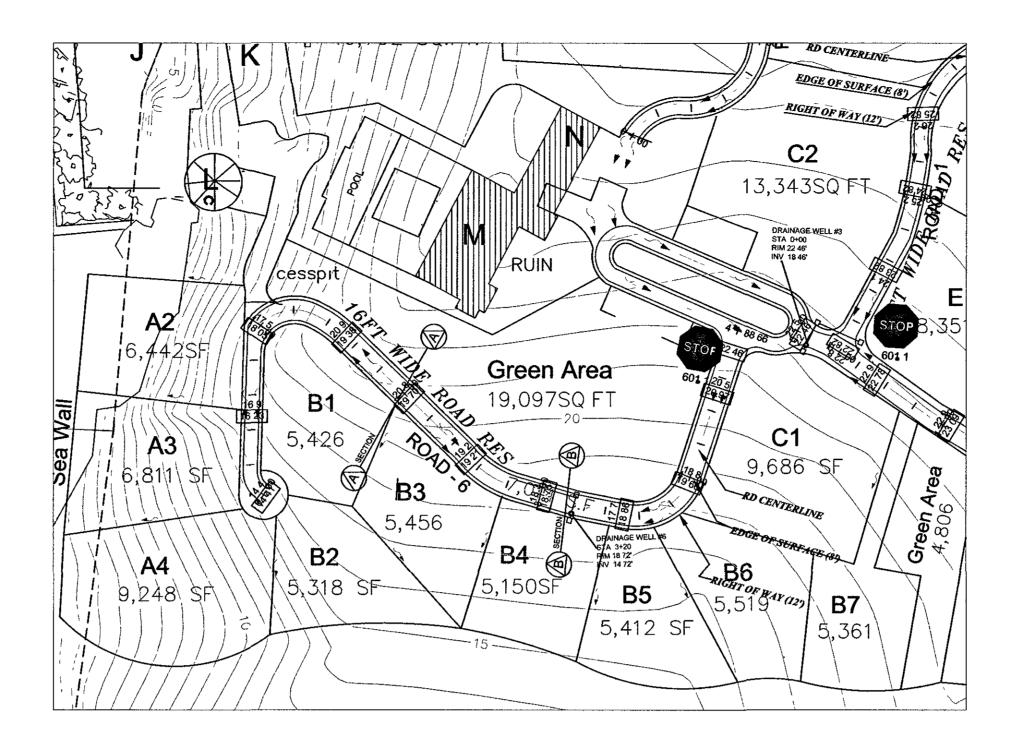


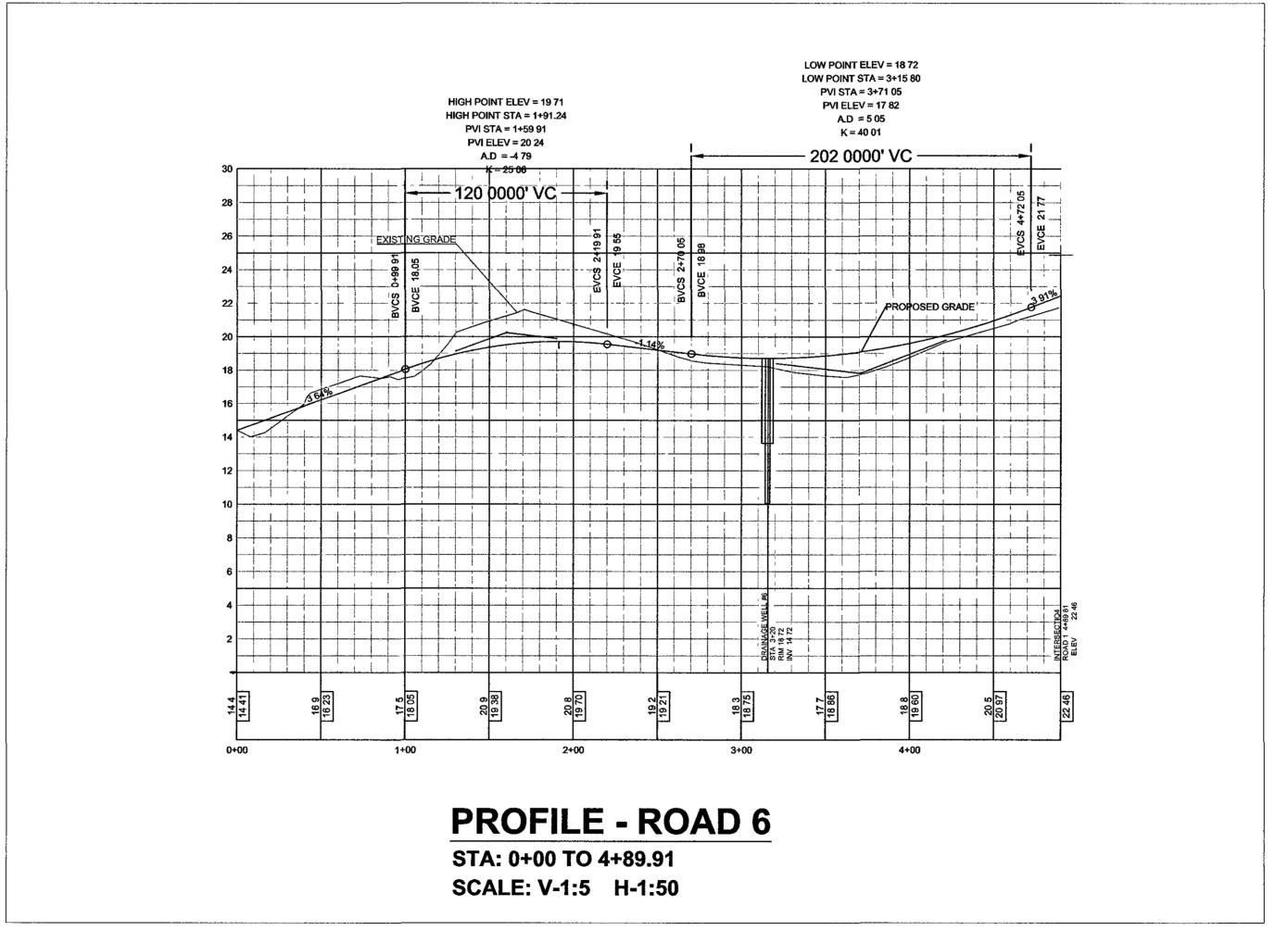


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SUBJECT TO COMMENTS AS MARKED
Date 13/05/2019
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| NO         | DESCRIPTION                 | DATE       | BY NO | DESCRIPTION | DATE BY | ENGINEER OF R | RECORD   | PREPARED FOR                                      | DESIGNED BY CTI | PROPOSED BRILAND RESIDENCES & MARINA                                    |   |
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| <b>S</b> 1 | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019 | СТІ   |             |         | A             | ISLAND DIMENSIONS DEVELOPMENT COMPANY Farrington House, Gladstone Road | MR MICHAEL WIENER                                 | DRAWN BY CTI    |   |   |
| OISI       |                             |            |       |             |         |               | P O Box EE-15036<br>Nassau, Bahamas                                    | 4M HARBOUR ISLAND LTD.<br>HARBOUR ISLAND, BAHAMAS | CHECKED BY      | DOAD DROELLES DOAD 5  |   |
|            |                             |            |       |             |         |               | Tel# (242)-341-6318/25<br>Fax# (242)-368-6312                          |   | PROJECT ENGR AF | ROAD PROFILES - ROAD 5 B-06   | i |
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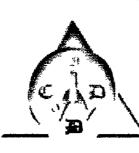
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Date 13/05/2019

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ENGINEER OF RECORD

ISLAND DIMENSIONS DEVELOPMENT COMPANY

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Nassau, Bahamas

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Fax#. (242)-368-6312

MR MICHAEL WIENER
4M HARBOUR ISLAND LTD.

HARBOUR ISLAND, BAHAMAS

| <br>DESIGNED BY | СТІ |  |
|-----------------|-----|--|
| DRAWN BY        | СТІ |  |
| CHECKED BY      |     |  |
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PROPOSED BRILAND RESIDENCES & MARINA

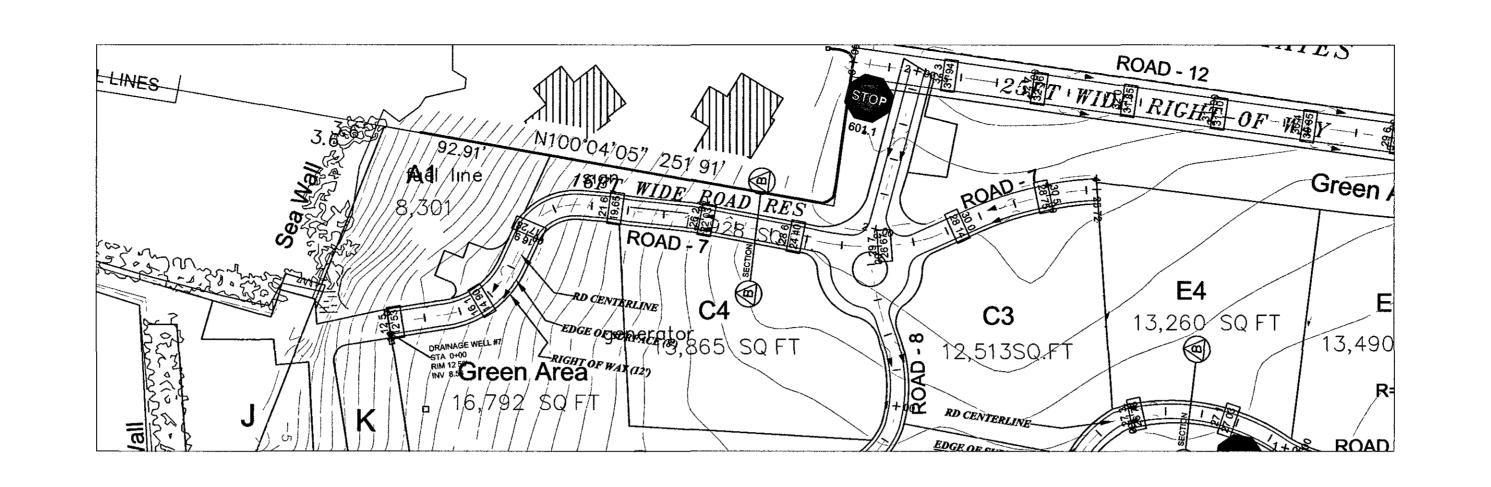
**ROAD PROFILES - ROAD 6** 

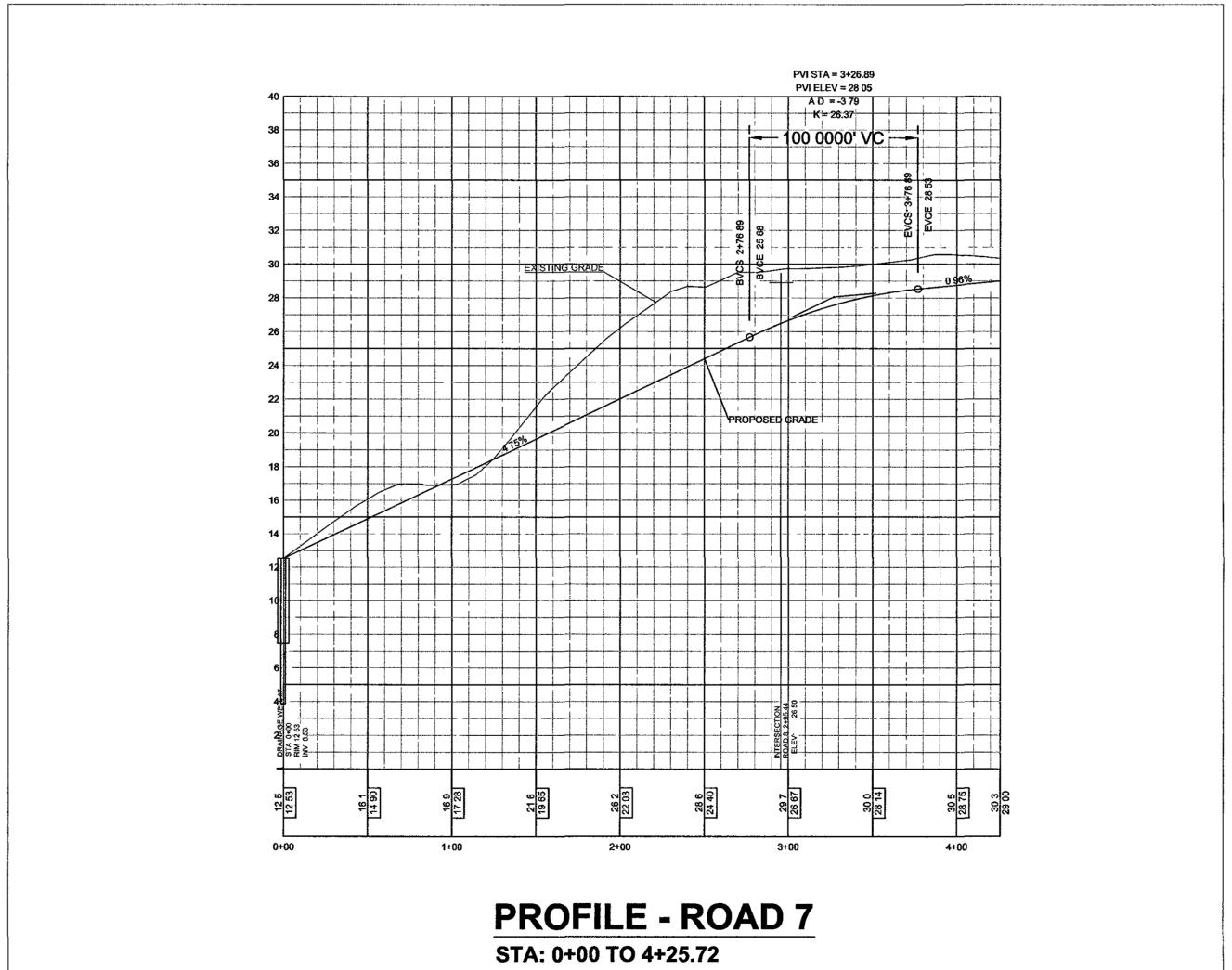
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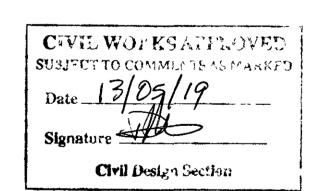
SCALE: 1:50

IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY

**B-07** 



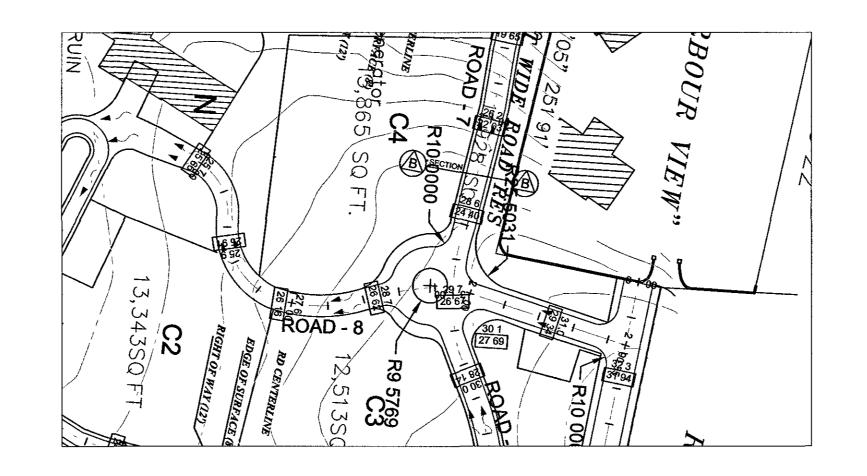


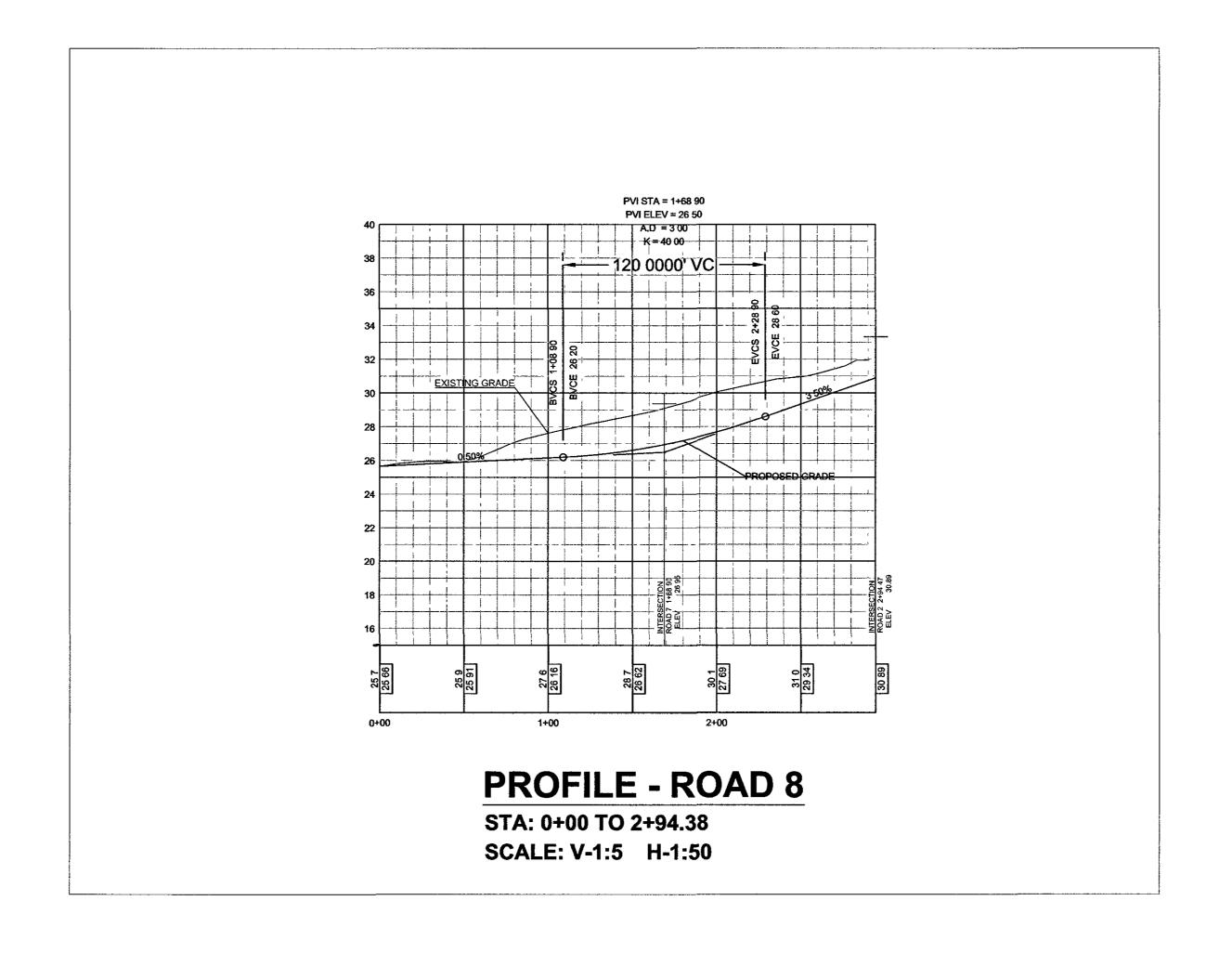


STA: 0+00 TO 4+25.72 SCALE: V-1:5 H-1:50



| NO           | DESCRIPTION                 | DATE BY NO     | DESCRIPTION | DATE | BY ENGINEER OF RECORD | D  | PREPARED FOR                                      | DESIGNED BY CTI | PROPOSED BRILAND RESIDENCES & MARINA                                    |             |
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| <b>S</b> N 1 | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019 CTI |             |      |                       | ISLAND DIMENSIONS DEVELOPMENT COMPANY Farrington House, Gladstone Road | MR MICHAEL WIENER                                 | DRAWN BY CTI    |   |             |
| /ISIC        |                             |                |             |      |                       | P O Box EE-15036<br>Nassau, Bahamas                                    | 4M HARBOUR ISLAND LTD.<br>HARBOUR ISLAND, BAHAMAS | CHECKED BY      | ROAD PROFILES - ROAD 7  | DRAWING NO. |
| RE           |                             |                |             |      |                       | Tel#. (242)-341-6318/25<br>Fax#. (242)-368-6312                        |   | PROJECT ENGR AF |   | B-08        |
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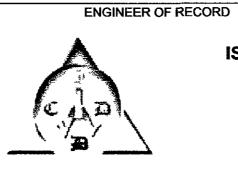


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SUBJECT TO COMMENTS AS MARKED
Date 13/05/28/9
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ISLAND DIMENSIONS DEVELOPMENT COMPANY

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MR MICHAEL WIENER 4M HARBOUR ISLAND LTD. HARBOUR ISLAND, BAHAMAS

PREPARED FOR

| DESIGNED BY  | СТІ |
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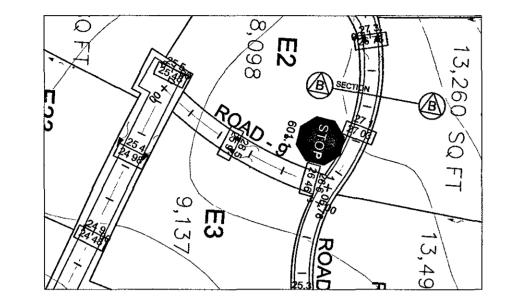
PROPOSED BRILAND RESIDENCES & MARINA

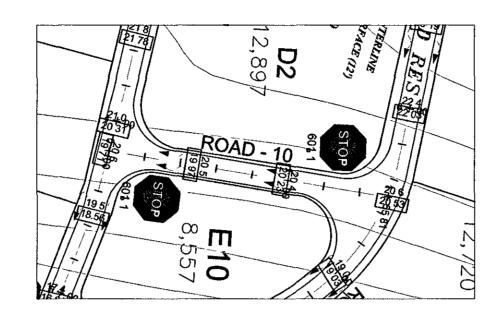
**ROAD PROFILES - ROAD 8** 

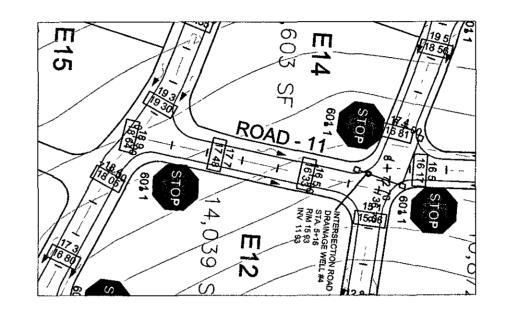
DRAWING NO **B-09** 

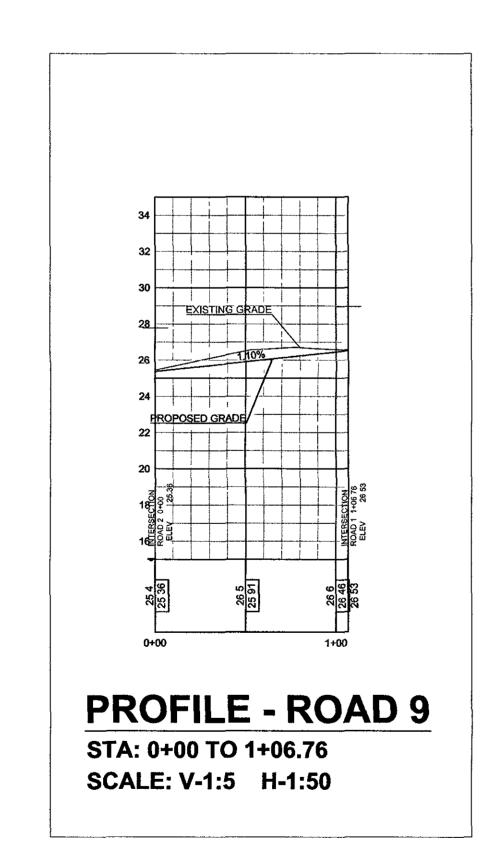
SCALE: 1:50

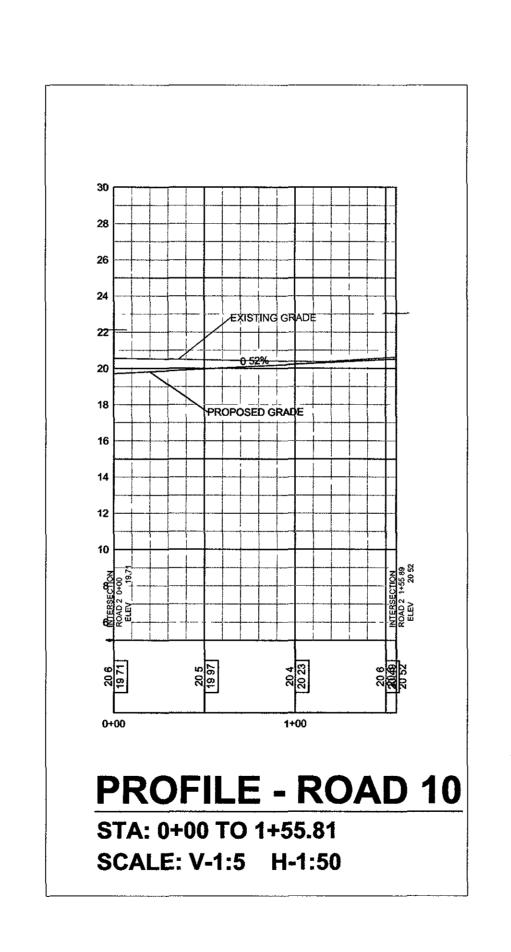
IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY

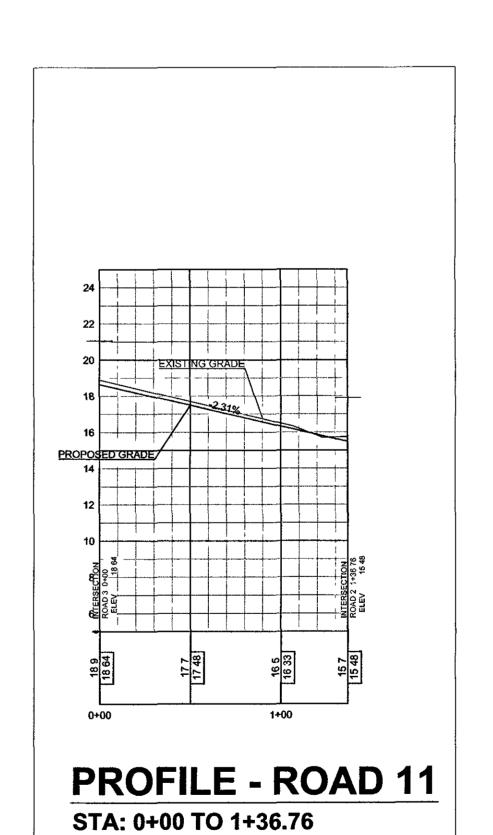








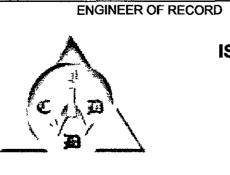








|     | NO | DESCRIPTION                 | DATE       | BY   | NO | DESCRIPTION | DATE | BY |   |
|-----|----|-----------------------------|------------|------|----|-------------|------|----|---|
| SZ  | 1  | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019 | CTI  |    |             |      |    |   |
| SIO |    |                             |            |      |    |             |      |    |   |
| REV |    |                             |            |      |    |             |      |    |   |
|     |    |                             |            | <br> |    |             |      |    | - |



ISLAND DIMENSIONS DEVELOPMENT COMPANY

Farrington House, Gladstone Road

P O Box EE-15036

Nassau, Bahamas

Tel#. (242)-341-6318/25

Fax#. (242)-368-6312

MR MICHAEL WIENER 4M HARBOUR ISLAND LTD. HARBOUR ISLAND, BAHAMAS

PREPARED FOR

| DEGIGIALD DI | CTI |   |
|--------------|-----|---|
| DRAWN BY     | СТІ |   |
| CHECKED BY   |     | D |
| PROJECT ENGR | 4.5 | N |

SCALE: V-1:5 H-1:50

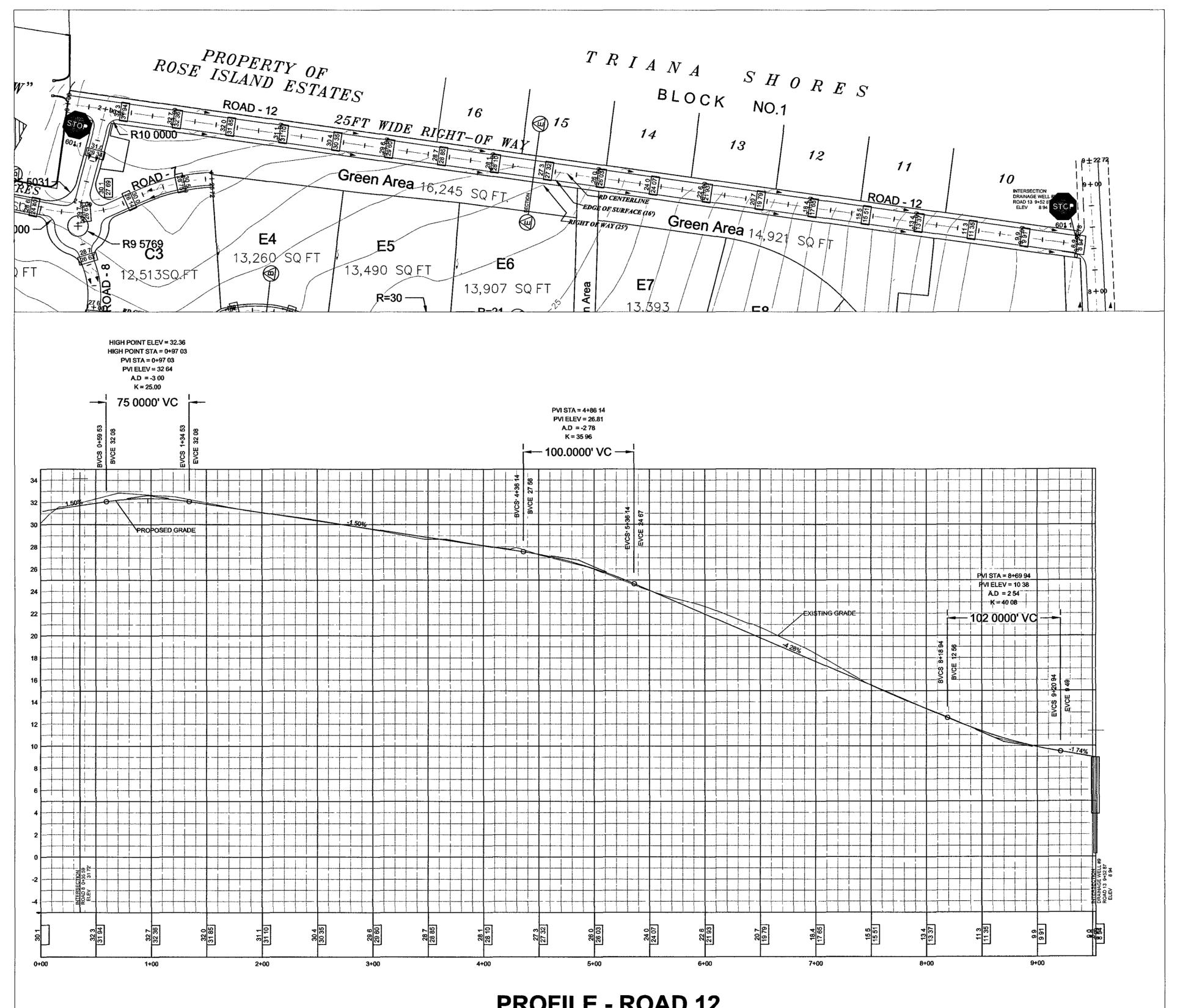
PROPOSED BRILAND RESIDENCES & MARINA

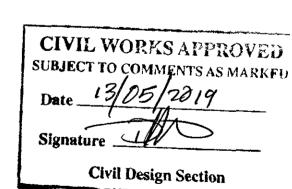
ROAD PROFILES - ROADS 9, 10 & 11

IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY

DRAWING NO

B-10



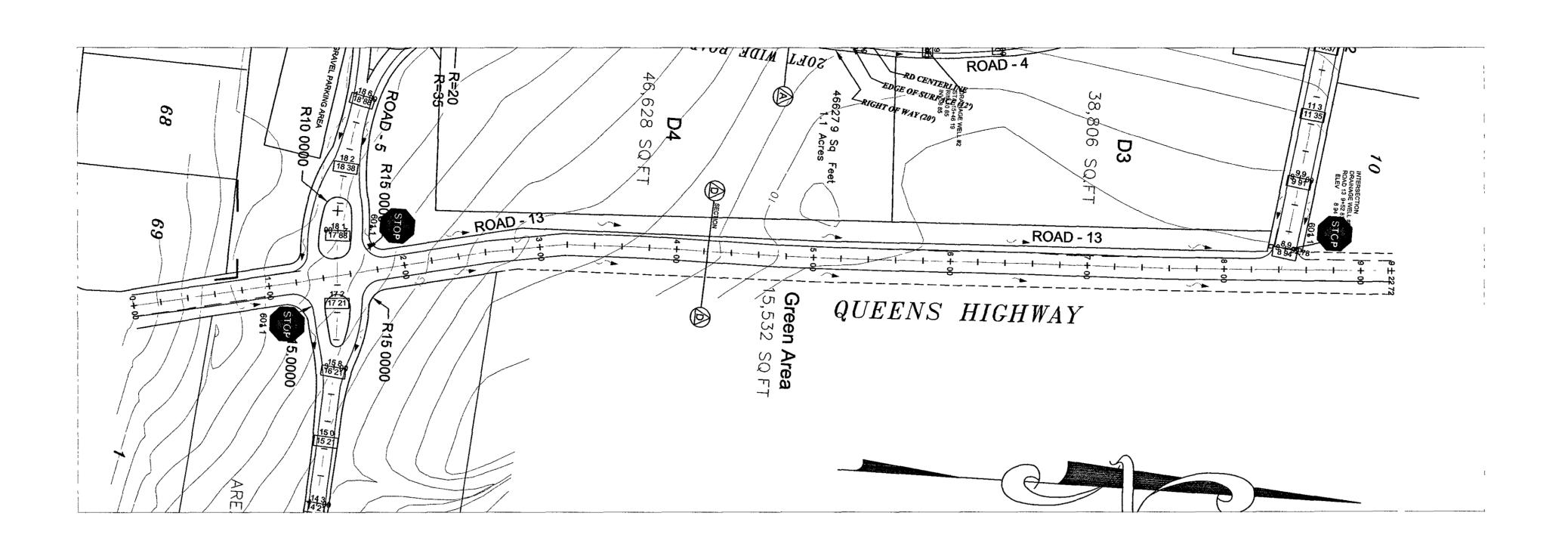


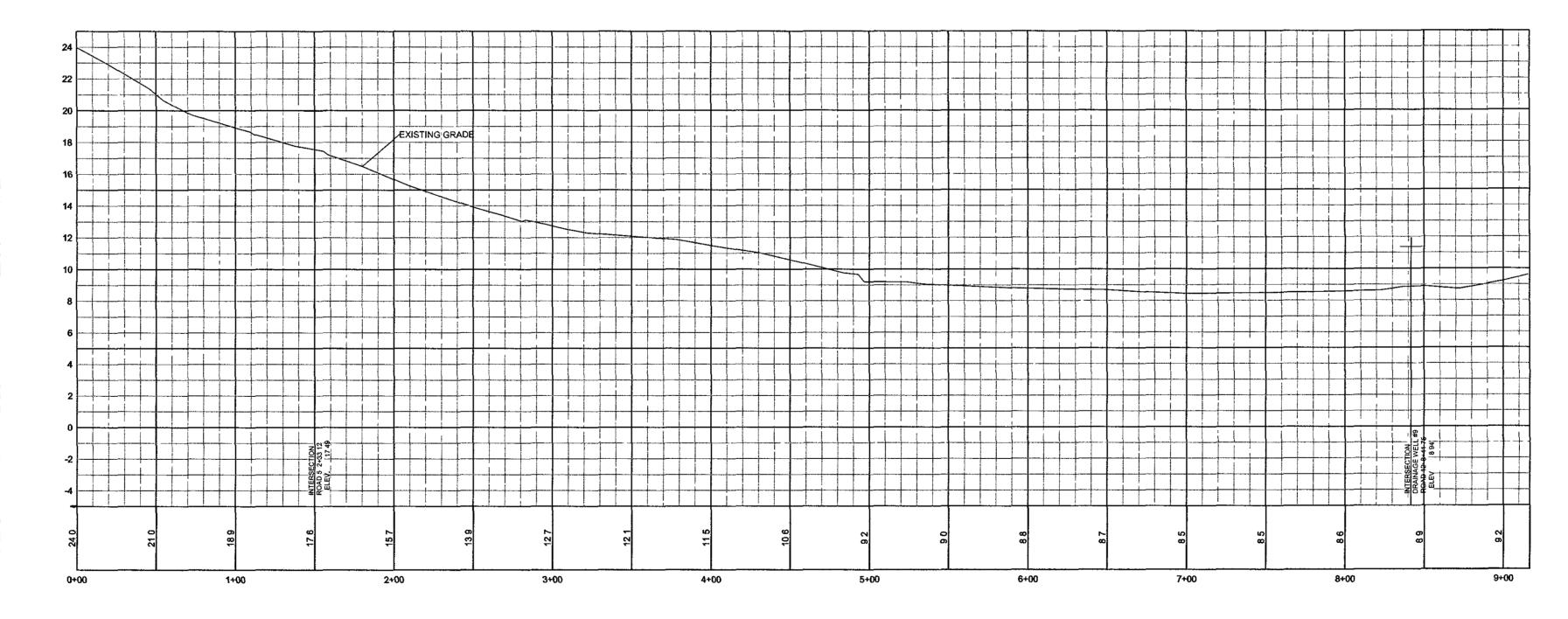


STA: 0+00 TO 9+52.78 SCALE: V-1:5 H-1:50



| NO         | DESCRIPTION                                  | DATE BY NO | DESCRIPTION | DATE BY  | ENGINEER OF RECORD   | PREPARED FOR                                      | DESIGNED BY                              | PROPOSED BRILAND RESIDENCES & MARINA   |                       |
|------------|--|------------|-------------|--|--|---|--|--|-----------------------|
| <u>φ</u> 1 | 1 DESIGN DEVELOPMENT DRAWINGS 03/12/2019 CTI |            |             | ISLAND DIMENSIONS DEVELOPMENT COMPANY Farrington House, Gladstone Road | adstone Road WICHAEL WICHER  |   | TI PROPOSED BRILAND RESIDENCES & WARRING |  |                       |
| REVISIO    |  |            |             |  | P O Box EE-15036<br>Nassau, Bahamas<br>Tel#. (242)-341-6318/25<br>Fax#. (242)-368-6312 | 4M HARBOUR ISLAND LTD.<br>HARBOUR ISLAND, BAHAMAS | CHECKED BY PROJECT ENGR                  | ROAD PROFILES - ROAD 12  | ING NO<br><b>B-11</b> |
|            |  |            |             |  |  |   |  | SCALE: 1:50  IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY |                       |





CIVIL WORKS APPROVED

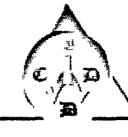
#### **PROFILE - ROAD 13 EXISTING QUEENS HIGHWAY**

PREPARED FOR

STA: 0+00 TO 9+16.62 SCALE: V-1:5 H-1:50



|      | NO | DESCRIPTION                 | DATE       | BY  | NO | DESCRIPTION | DATE | BY |  |
|------|----|-----------------------------|------------|-----|----|-------------|------|----|--|
| SS   | 1  | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019 | СТІ |    |             |      |    |  |
| 1810 |    |                             |            |     |    |             |      |    |  |
| REV  |    |                             |            |     |    |             |      |    |  |
|      |    |                             |            |     |    |             |      |    |  |



ENGINEER OF RECORD

ISLAND DIMENSIONS DEVELOPMENT COMPANY

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Nassau, Bahamas

Tel#. (242)-341-6318/25

Fax#. (242)-368-6312

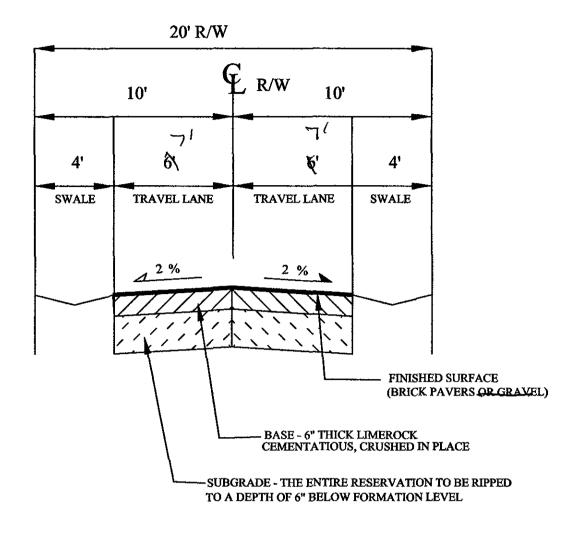
| MR MICHAEL WIENER       |
|-------------------------|
| 4M HARBOUR ISLAND LTD.  |
| HARBOUR ISLAND, BAHAMAS |
|                         |

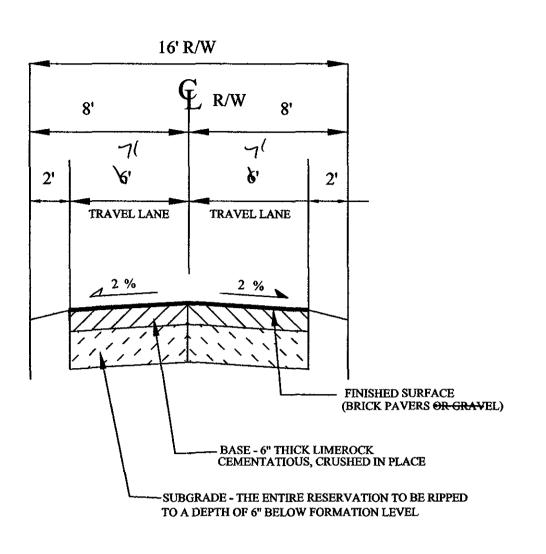
DESIGNED BY

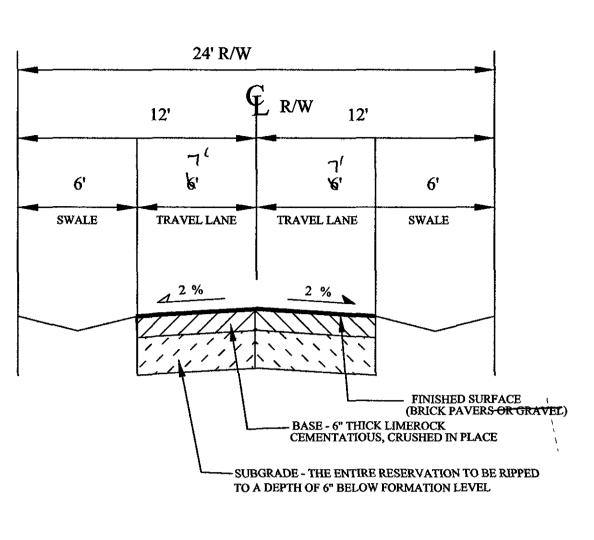
|              | CTI | PROPOSED BRILAND RESIDENCES & MARINA |
|--------------|-----|--------------------------------------|
| DRAWN BY     | СТІ |                                      |
| CHECKED BY   |     | ROAD PROFILES - ROAD 13              |
| PROJECT ENGR | ۸E  | MOAD I NOI IEEO - NOAD 10            |

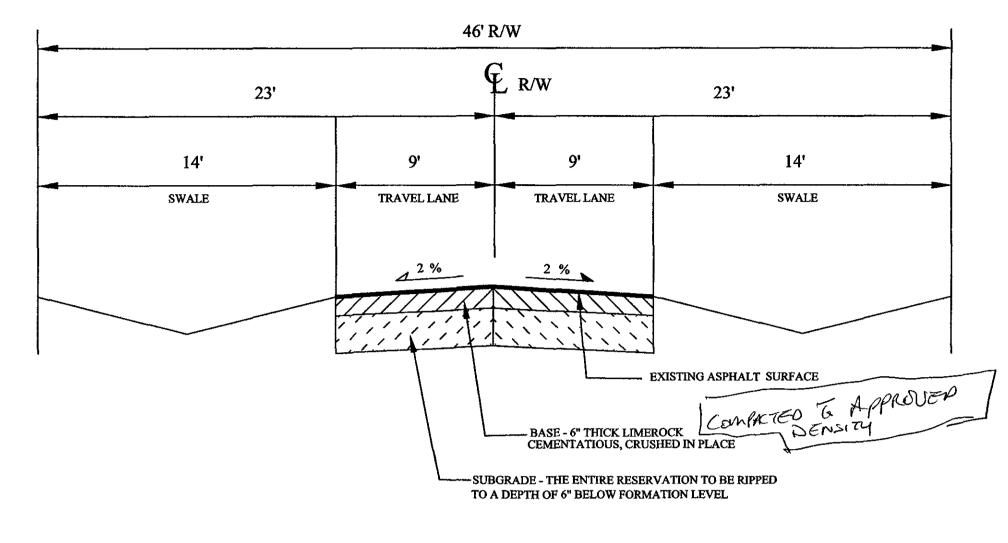
DRAWING NO

SCALE: 1:50 IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY **B-12** 









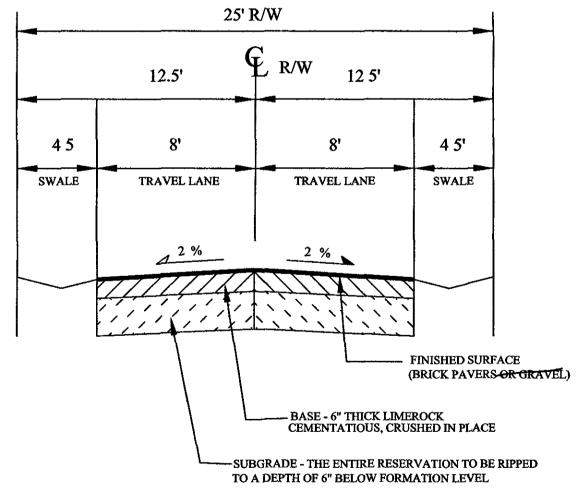
#### **SECTION A ROADS 1, 2, 4**

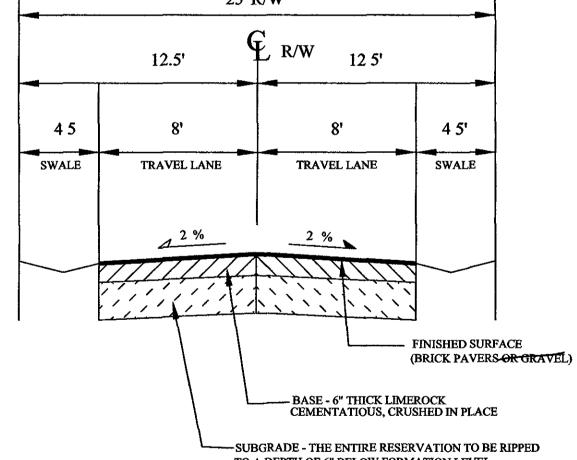
**SECTION B ROADS 6, 7, 8** 

**SECTION C** ROAD 3

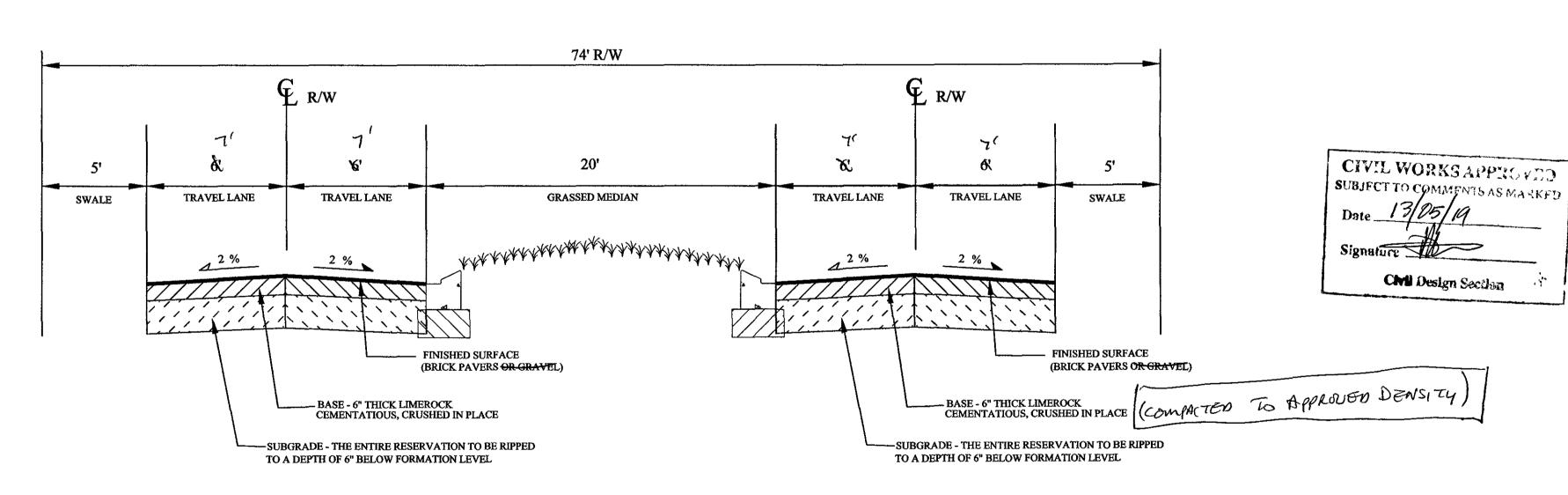
TENCINEEROO BRICK PRIVISAS,

#### **SECTION D ROADS 13-QUEENS HIGHWAY**





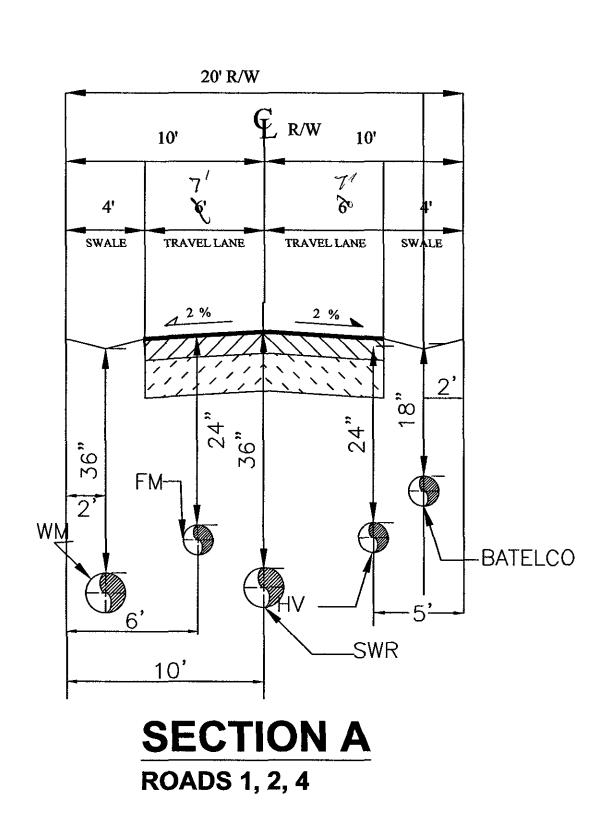


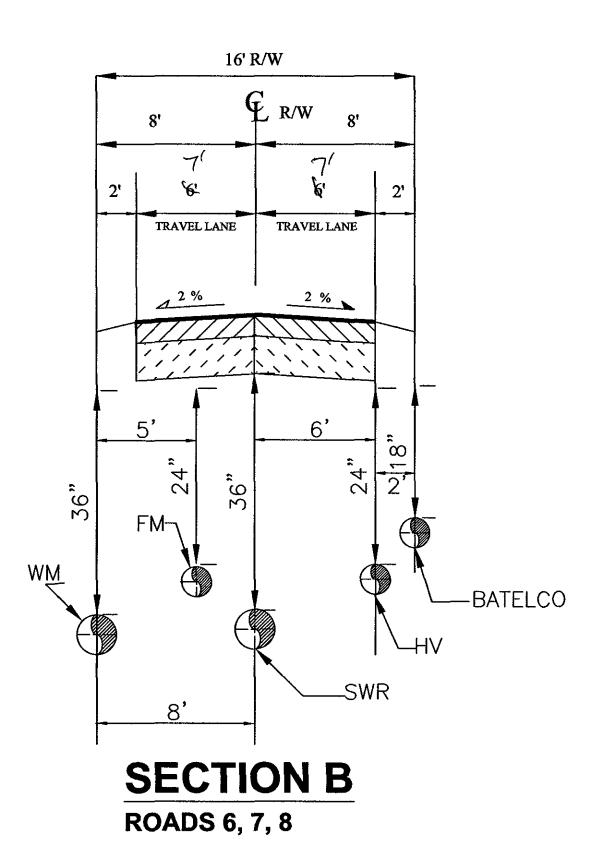


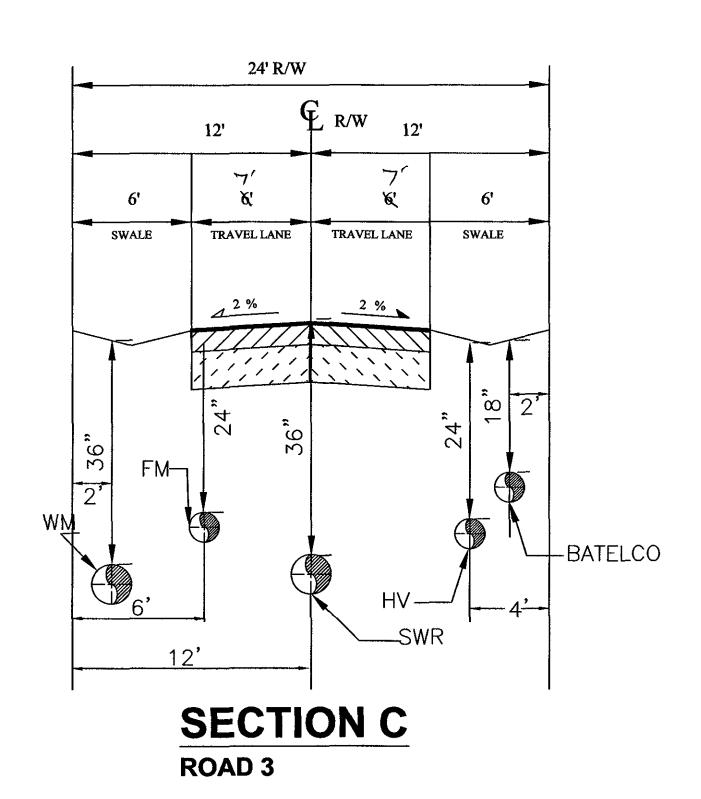
#### **SECTION F ROUNDABOUT**

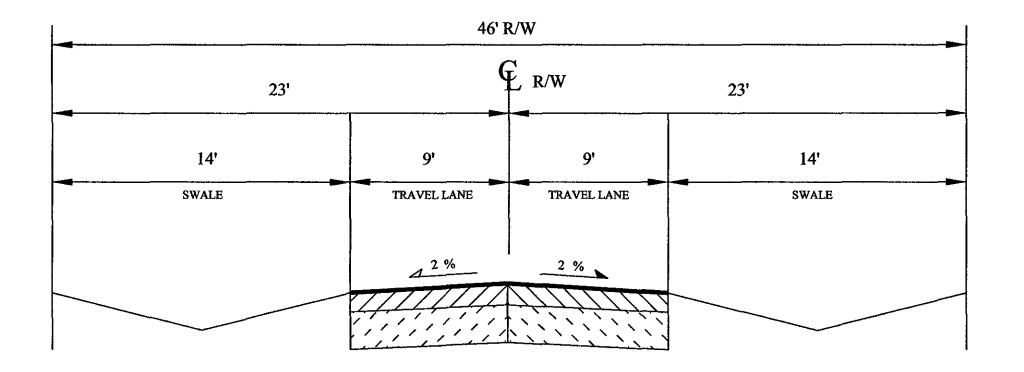


| NO                            | DESCRIPTION                 | DATE BY NO     | DESCRIPTION | DATE BY | ENGINEER OF RECORD | CORD  | PREPARED FOR                                      | DESIGNED BY CTI | PROPOSED BRILAND RESIDENCES & MARIN                                     | NA          |
|-------------------------------|-----------------------------|----------------|-------------|---------|--------------------|---|---|-----------------|---|-------------|
| 1 DESIGN DEVELOPMENT DRAWINGS | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019 CTI |             |         | A                  | ISLAND DIMENSIONS DEVELOPMENT COMPANY  Farrington House, Gladstone Road | MR MICHAEL WIENER                                 | DRAWN BY CTI    |   |             |
|                               |                             |                |             |         |                    | P O Box EE-15036<br>Nassau, Bahamas                                     | 4M HARBOUR ISLAND LTD.<br>HARBOUR ISLAND, BAHAMAS | CHECKED BY      | ROAD CROSS SECTIONS   | DRAWING NO. |
|                               |                             |                |             |         |                    | Te#. (242)-341-6318/25<br>Fax#. (242)-368-6312                          | ,   | PROJECT ENGR AF | RUAD CRUSS SECTIONS   | B-13        |
|                               |                             |                |             |         |                    |   |   |                 | SCALE: N.T.S.   |             |
|                               |                             |                |             |         |                    |   |   |                 | IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY |             |

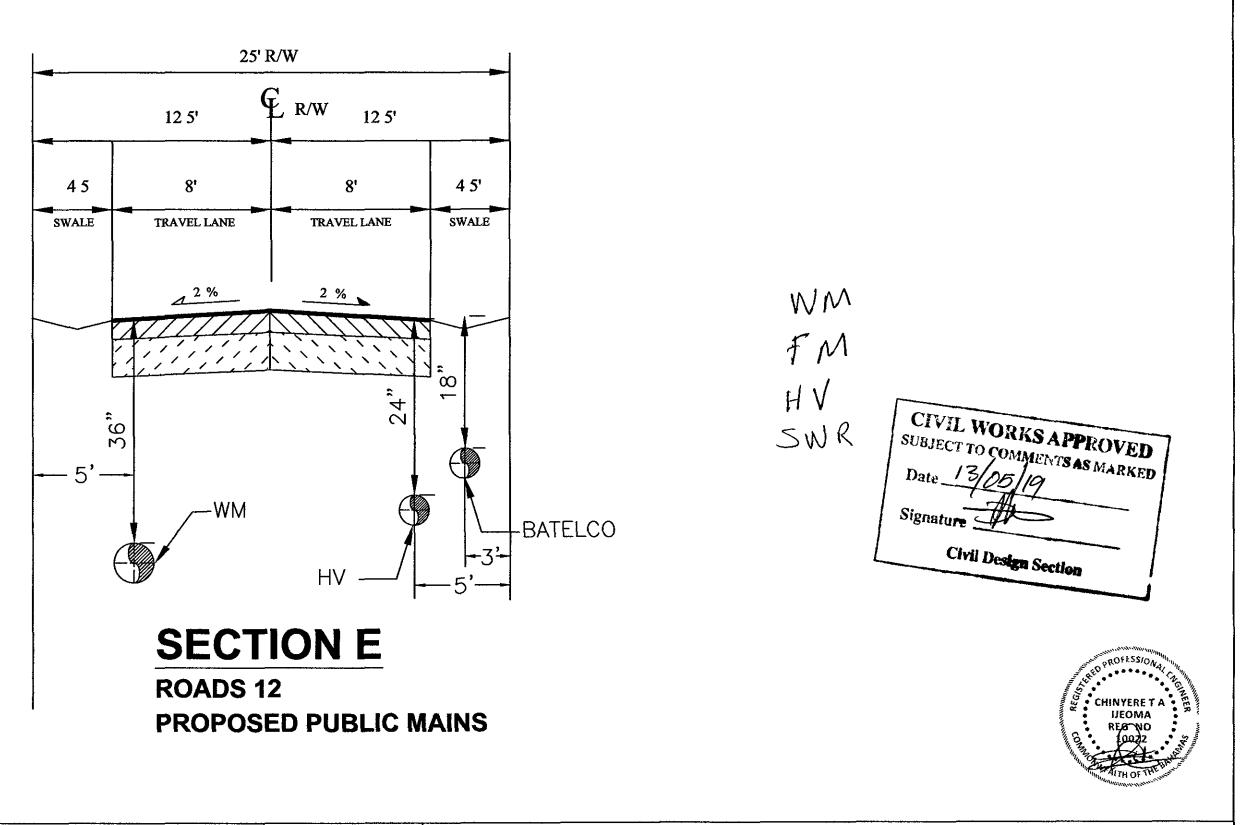




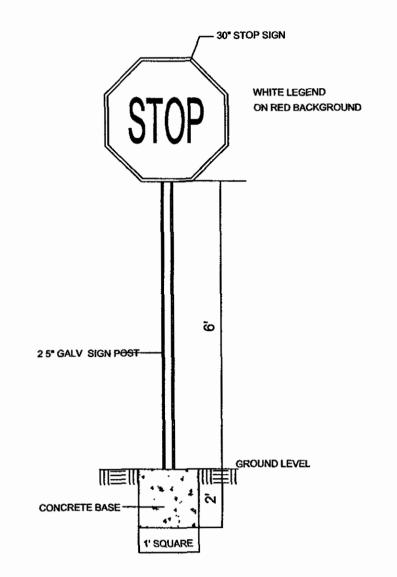




## SECTION D ROADS 13-QUEENS HIGHWAY



| NO NO 1 | DESCRIPTION  DESIGN DEVELOPMENT DRAWINGS | DATE BY 03/12/2019 CTI | NO | DESCRIPTION | DATE | BY ENGINEER OF R | ISLAND DIMENSIONS DEVELOPMENT COMPANY  Farrington House, Gladstone Road               | PREPARED FOR  MR MICHAEL WIENER                   | DESIGNED BY CTI DRAWN BY CTI | PROPOSED BRILAND RESIDENCES & MARINA   |                  |
|---------|--|------------------------|----|-------------|------|------------------|---|---|------------------------------|--|------------------|
| REVISIO |  |                        |    |             |      |                  | P O Box EE-15036<br>Nassau, Bahamas<br>Te#. (242)-341-6318/25<br>Fax#. (242)-368-6312 | 4M HARBOUR ISLAND LTD.<br>HARBOUR ISLAND, BAHAMAS | PROJECT ENGR AF              | UTILITY SECTIONS   | DRAWING NO  B-14 |
|         |  |                        |    |             |      |                  |   |   |                              | SCALE: N.T.S.  IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY |                  |

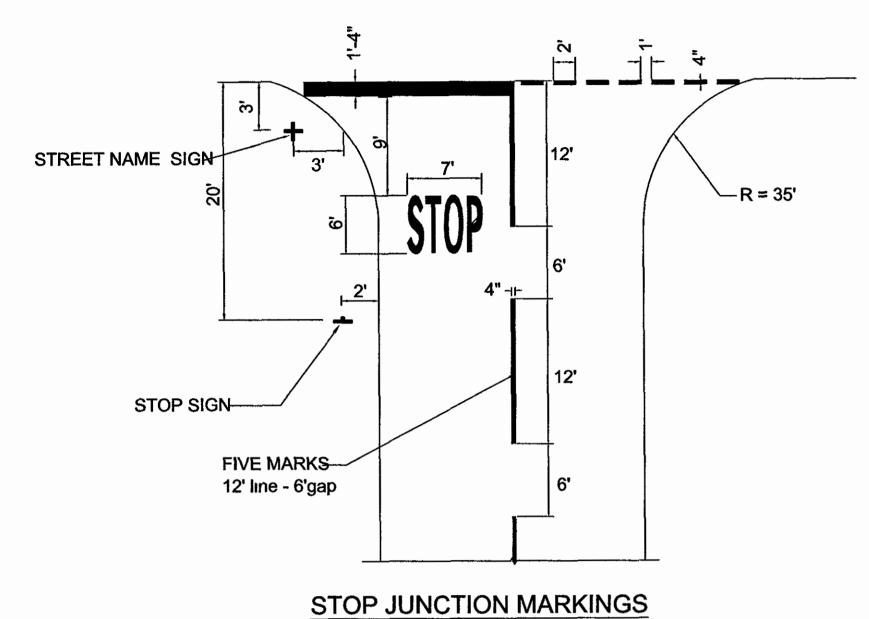


**ERECTED SIGN DETAIL** 



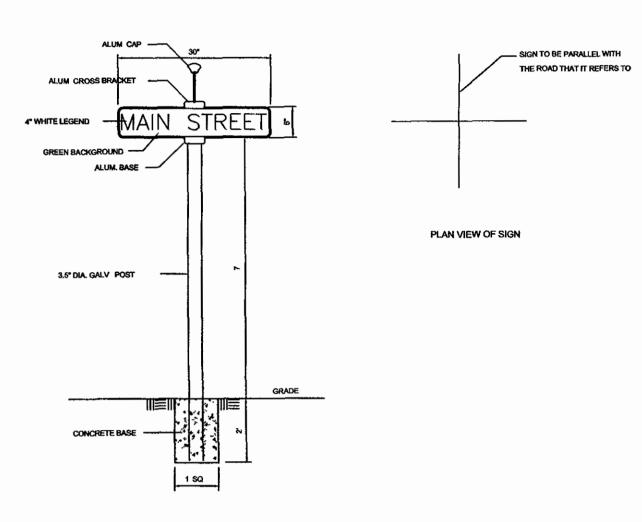
MINISTRY OF WORKS & UTILITIES

JANUARY 2003



NTS

MINISTRY OF PUBLIC WORKS
JANUARY 2002



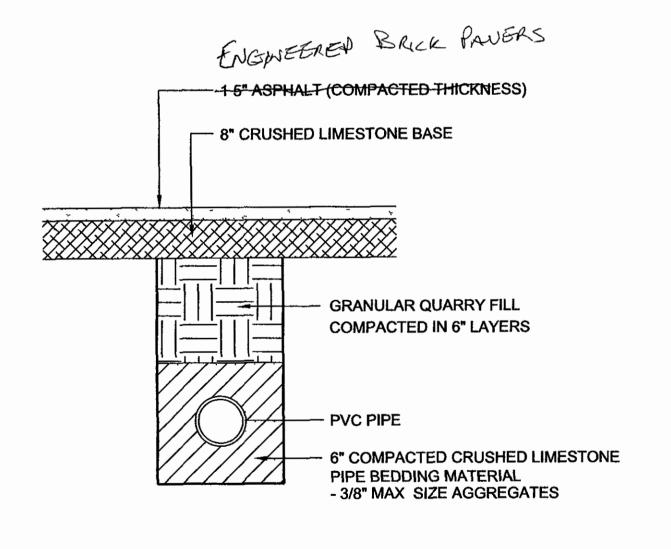
**ERECTED STREET NAME SIGN DETAIL** 

NIS

MINISTRY OF WORKS & UTILITIES

FEBRUARY 2003

ROUND HEAVY DUTY FRAME



NOTE FOR PVC PIPE < 12" DIA A=6" OTHERWISE AS DIRECTED BY ENGINEER & SLOTED COVER
(US FOUNDRY)

TOP OF CONCRETE TO HAVE
A NEAT CONCRETE FINISH

2' SQUARE

FLOWEROM WELL

8"

WEEP HOLE

3/4" rock

12" SCHEDULE 80 PVC PIPE

REINFORCED CONC W/ 1/2" DIA U BARS @
10" C C or Concrete Block Construction

REINFORCED Block Construction

2" SQUARE

12" DIA PVC (SCH 80)

14" X 14" X 16" SCREEN BOX

14" X 14" X 16" SCREEN BOX

CEMENT GROUT (MIN 2" THICK)

CIVIL WORKS APPROVED

SUBJECT TO COMM, TSAS MARKED

WELL DEPTH 150"

TYPICAL CATCHPIT/WELL DETAIL

PREPARED FOR

# CHINYERE T A IJEOMA REG NO 10022

Civa Design Section

### TYPICAL PIPE TRENCH DETAIL

|      | NO | DESCRIPTION                 | DATE       | BY      | NO | DESCRIPTION | DATE | BY |
|------|----|-----------------------------|------------|---------|----|-------------|------|----|
| NS   | 1  | DESIGN DEVELOPMENT DRAWINGS | 03/12/2019 | CTI     |    |             |      |    |
| SIO  |    |                             |            |         |    |             |      |    |
| REVI |    |                             |            |         |    |             |      |    |
|      |    |                             | 1          | <u></u> |    |             |      |    |

ENGINEER OF RECORD

ISLAND DIMI

ISLAND DIMENSIONS DEVELOPMENT COMPANY

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MR MICHAEL WIENER 4M HARBOUR ISLAND LTD. HARBOUR ISLAND, BAHAMAS

CHECKED BY

PROJECT ENGR AF

DESIGNED BY

PROPOSED BRILAND RESIDENCES & MARINA

ROAD DETAIL SHEET

IF SHEET IS LESS THAN 24" X 36" IT IS A REDUCED PRINT SCALE ACCORDINGLY

SCALE: N.T.S.

DRAWING NO

B-15